Department of Defense
Fiscal Year (FY) 2021 Budget Estimates

February 2020

Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E − Volume II, Budget Activity 5

Table of Contents

UNCLASSIFIED
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.

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:

Budget Activity	***OSDPE / Project***	***Project Title***
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:

Budget Activity	***Old OSDPE / Project: Title***	***New OSDPE / Project***
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 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.

Department of Defense
FY 2021President's Budget
Exhibit R-1 FY 2021 President's Budget
Total Obligational 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

Department of Defense
FY 2021President'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

Department of Defense
FY 2021President'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

Department of Defense
FY 2021President's Budget
Exhibit R-1 FY 2021 President's Budget
Total Obligational Authority
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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				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

R-1 21PB: FY 2021 President's Budget (Published Version), as of January 17, 2020 at 11:58:58

Department of the Army
FY 2021President's Budget
Exhibit R-1 FY 2021 President's Budget
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(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

Department of the Army
FY 2021President's Budget
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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				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

R-1 21PB: FY 2021 President's Budget (Published Version), as of January 17, 2020 at 11:58:58

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	Sec
1	0601101A	In-House Laboratory Independent Research	01	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	U
	Basic Research			491,263	574,484			574,484	
6	0602105A	Materials Technology	02	79,432					U
7	0602115A	Biomedical Technology	02						U
8	0602120A	Sensors and Electronic Survivability	02	90,023					U
9	0602122A	TRACTOR HIP	02	8,674					U
10	0602126A	TRACTOR JACK	02	400					U
11	0602134A	Counter Improvised-Threat Advanced Studies	02						U
12	0602141A	Lethality Technology	02		69,961			69,961	U
13	0602142A	Army Applied Research	02		30,819			30,819	U
14	0602143A	Soldier Lethality Technology	02		145,900			145,900	U
15	0602144A	Ground Technology	02		143,899			143,899	U
16	0602145A	Next Generation Combat Vehicle Technology	02		263,547			263,547	U
17	0602146A	Network C3I Technology	02		138,016			138,016	U

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	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)	Sec
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 HIP	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	2,000	219,565	U
17	0602146A	Network C3I Technology	02	114,404				114,404	U

Department of the Army
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Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	Sec
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

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	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)	Sec
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	Countermine Systems	02						U
35	0602716A	Human Factors Engineering Technology	02						U
36	0602720A	Environmental Quality Technology	02						U

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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		1,553,764	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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37	0602782A	Command, Control, Communications Technology	02						U
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	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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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	0603313A	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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69	0603466A	Air and Missile Defense Advanced Technology	03		82,113			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
		Advanced Technology Development		1,561,576	1,531,516			1,531,516	
78	0603305A	Army Missle Defense Systems Integration	04	60,301	59,487			59,487	U
79	0603308A	Army Space Systems Integration	04						U
80	0603327A	Air and Missile Defense Systems Engineering	04	44,743	52,480		500	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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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
		Advanced Technology Development		1,203,590				1,203,590	
78	0603305A	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	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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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 Maturation (MIP)	04		23,043			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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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						U
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					U
105	0604119A	Army Advanced Component Development & Prototyping	04		112,806		4,529	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			404,000	U
110	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	10,324					U
111	0604403A	Future Interceptor	04		2,000			2,000	U
112	0604541A	Unified Network Transport	04		29,700			29,700	U
113	0604644A	Mobile Medium Range Missile	04		5,000			5,000	U

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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	0604403A	Future Interceptor	04	7,992				7,992	U
112	0604541A	Unified Network Transport	04	40,677				40,677	U
113	0604644A	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	Cyberspace 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		11,114	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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114	0604785A	Integrated Base Defense (Budget Activity 4)	04			2,020	2,020	2,020	U
115	0305251A	Cyberspace Operations Forces and Force Support	04	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	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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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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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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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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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 (GBOSS-E)	05	5,976				5,976	U
158	0605034A	Tactical Security System (TSS)	05						U
159	0605035A	Common Infrared Countermeasures (CIRCM)	05	23,321		2,300	2,300	25,621	U
160	0605036A	Combating Weapons of Mass Destruction (CWMD)	05						U

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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						U
171	0605203A	Army System Development & Demonstration	05		164,883		19,527	184,410	U
172	0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05						U
173	0605380A	AMF Joint Tactical Radio System (JTRS)	05	15,379					U
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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161	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) 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	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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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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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	3,900	59,755	U
184	1205117A	Tractor Bears	05						U
		System Development & Demonstration		3,199,798		97,825	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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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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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	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						U
208	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	71,306				71,306	U

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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 PULL	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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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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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 (JADOCS)	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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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		2,300	2,300	81,724	U
240	0203808A	TRACTOR CARD	07						U

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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	WWMCCS/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

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	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)	Sec
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	259				259	U
244	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	166				166	U
245	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	75,575				75,575	U
246	0208053A	Joint Tactical Ground System	07	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	U
250	0303141A	Global Combat Support System	07	86,908				86,908	U
251	0303142A	SATCOM Ground Environment (SPACE)	07	18,684				18,684	U
252	0303150A	WWMCCS/Global Command and Control System	07						U
255	0305172A	Combined Advanced Applications	07						U
256	0305179A	Integrated Broadcast Service (IBS)	07	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

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	Sec
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	4,214	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		34,168	1,878,294	
267	0608041A	Defensive CYBER - Software Prototype Development	08						U
		Software and Digital Technology Pilot Program							
Total Research, Development, Test & Eval, Army				11,371,268	12,543,435		147,304	12,690,739	

Department of the Army
FY 2021President'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

Line No	Program Element Number	Item	Act	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)	Sec
261	0305232A	RQ-11 UAV	07						U
262	0305233A	RQ-7 UAV	07						U
263	0307665A	Biometrics Enabled Intelligence	07						U
264	0708045A	End Item Industrial Preparedness Activities	07	61,012				61,012	U
265	1203142A	SATCOM Ground Environment (SPACE)	07						U
266	1208053A	Joint Tactical Ground System	07						U
9999	9999999999	Classified Programs		3,983				3,983	U
		Operational Systems Development		1,998,539		75,342	75,342	2,073,881	
267	0608041A	Defensive CYBER - Software Prototype Development	08	46,445				46,445	U
		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	

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

Appropriation 2040: Research, Development, Test & Evaluation, Army

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Appropriation 2040: Research, Development, Test & Evaluation, Army

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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 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*							
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	-	10.044	4.803	6.534	-	6.534	7.611	9.016	10.571	10.144	Continuing	Continuing
DX7: *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*	-	0.325	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.325
EY2: *Integrated Soldier Power Data System - Core*	-	3.667	1.191	4.059	-	4.059	4.375	4.472	4.571	4.671	Continuing	Continuing
EY3: *Soldier Power Generator*	-	0.318	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.318
EY4: *Universal Battery Charger*	-	1.361	1.186	0.999	-	0.999	0.999	0.999	0.999	0.999	Continuing	Continuing
FK4: *Soldier Borne Sensor (SBS)*	-	0.000	1.252	1.476	-	1.476	2.237	3.545	5.001	4.474	Continuing	Continuing
S65: *Platoon Power Generator*	-	4.373	1.174	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.547

A. Mission Description and Budget Item Justification

This program element contains five projects:

Project DX7 - Tactical Communications and Protective System (TCAPS): TCAPS enables Soldiers to communicate over radios in combat environments while simultaneously providing hearing protection from both steady state and impulse noise.

Project EY2 - Integrated Soldier Power Data System - Core: Integrated Soldier Power and Data Hub, Conformal Wearable Battery, Squad Power Manager (SPM) fills the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, such as situational awareness displays, GPS systems, weapon sensors, radios, and other devices.

Project EY3 - Soldier Power Generator (SPG) - fills the power and energy gap created by the increase in mission essential and power consuming devices, by providing a single charging solution capable of providing power to handheld communication devices and a suite of military batteries. SPG is intended for use in the most austere operating environments providing the Soldier with energy independency for extended mission duration. The system will provide the Soldier with a lightweight, worn or carried power generation capability, integrated within the warfighters combat load.

Project EY4 - Universal Battery Charger: Universal Battery Charger (UBC) fills the power and energy gap created by the increase in mission essential, Soldier portable power consumers, by providing a family of charging solutions capable of providing power to handheld communication devices and a suite of military batteries.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*

Project FK4 - Soldier Borne Sensor (SBS): The SBS is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. The SBS will be procured in multiple Tranches/increments. RDTE funding will be used to develop, integrate, and qualify additional capabilities for each tranche. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy. This SBS project is not a new start: funding from this project transferred from PE: 06005053A / Grounds Robotics project 655053.FB8.

S65 - Soldier Power: Soldier Power enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Platoon Power Generation (PPG) - PM E2S2: This project supports the demonstration and development of a PPG. The Small Unit Power (SUP) PPG (1kW Generator) will provide small units with sufficient portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	10.382	5.803	3.917	-	3.917
Current President's Budget	10.044	4.803	6.534	-	6.534
Total Adjustments	-0.338	-1.000	2.617	-	2.617
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.338	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	2.617	-	2.617

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*	

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
DX7: *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*	-	0.325	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.325
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Description: The Tactical Communications and Protective System (TCAPS) and TCAPS-Lite provide Soldiers with advanced, active hearing protection that simultaneously protects Soldiers' hearing while enabling situational awareness and mission command. TCAPS protects Soldiers against harmful impulse and steady state noises experienced in combat environments while also enabling Soldiers to communicate with each other using voice communications over a tactical radio, while TCAPS-Lite provides protection for Soldiers without a radio. Both systems enhance survivability and situational awareness by allowing Soldiers to amplify faint sounds that would not otherwise be audible. TCAPS and TCAPS-Lite reduces Soldiers noise induced hearing damage and includes integration and interface of products on Soldiers.

TCAPS and TCAPS-Lite contribute to the reduction of post-service disability compensation and limits lost in-service time related to hearing injuries. TCAPS Program of Record will continue to employ commercial-off-the-shelf (COTS) solutions that are evaluated periodically. The commercial solutions that meet the technical requirements and are rated the best by the Soldiers will transition to production and fielding.

Justification: No FY 2021 funding requested.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: TCAPS testing and evaluation. ***Description:*** Test articles procurement and testing & evaluation.	0.182	-	-
Title: FY 2019 Rescission ***Description:*** TCAPS system engineering and program management support.	0.143	-	-
Accomplishments/Planned Programs Subtotals	0.325	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B55510: *Tactical Communications And Protective System*	10.368	-	0.000	-	0.000	-	-	-	-	0.000	10.368

Remarks

D. Acquisition Strategy

Program terminated. TCAPS was an ACAT IV program that leveraged commercial-off-the-shelf (COTS) technology. TCAPS conducted periodic relook of commercial technology to seek improved capabilities, reduce costs and transition to production. Used Defense Logistics Agency (DLA), General Services Administration (GSA) and other contracts to acquire products for evaluation and production.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SEPM	MIPR	PEO Soldier : Ft Belvoir, VA	0.870	0.064		-		-		-		-	0.000	0.934	-
		Subtotal	0.870	0.064		-		-		-		-	0.000	0.934	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Articles (Engineering Assessment)	MIPR	DLA DSCP : Philadelphia, PA	0.082	-		-		-		-		-	0.000	0.082	-
Test Articles (Development Test)	MIPR	DLA DSCP : Philadelphia, PA	0.150	-		-		-		-		-	0.000	0.150	-
Test Articles (OT)	MIPR	DLA DSCP : Philadelphia, PA	0.405	-		-		-		-		-	0.000	0.405	-
		Subtotal	0.637	-		-		-		-		-	0.000	0.637	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Annual Relook of Technology/Evaluation	MIPR	ATEC, AEC, OTC, ARL-SLAD : Various Locations	0.752	-		-		-		-		-	0.000	0.752	-
Developmental and Operational Test	Various	ATEC, AEC, OTC, ARL-SLAD : Various Locations	1.879	0.261		-		-		-		-	0.000	2.140	-
Customer Test	Various	Army Hearing Program Office : Various Locations	0.028	-		-		-		-		-	0.000	0.028	-
		Subtotal	2.659	0.261		-		-		-		-	0.000	2.920	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.166	0.325		0.000		-		-		-	0.000	4.491	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*

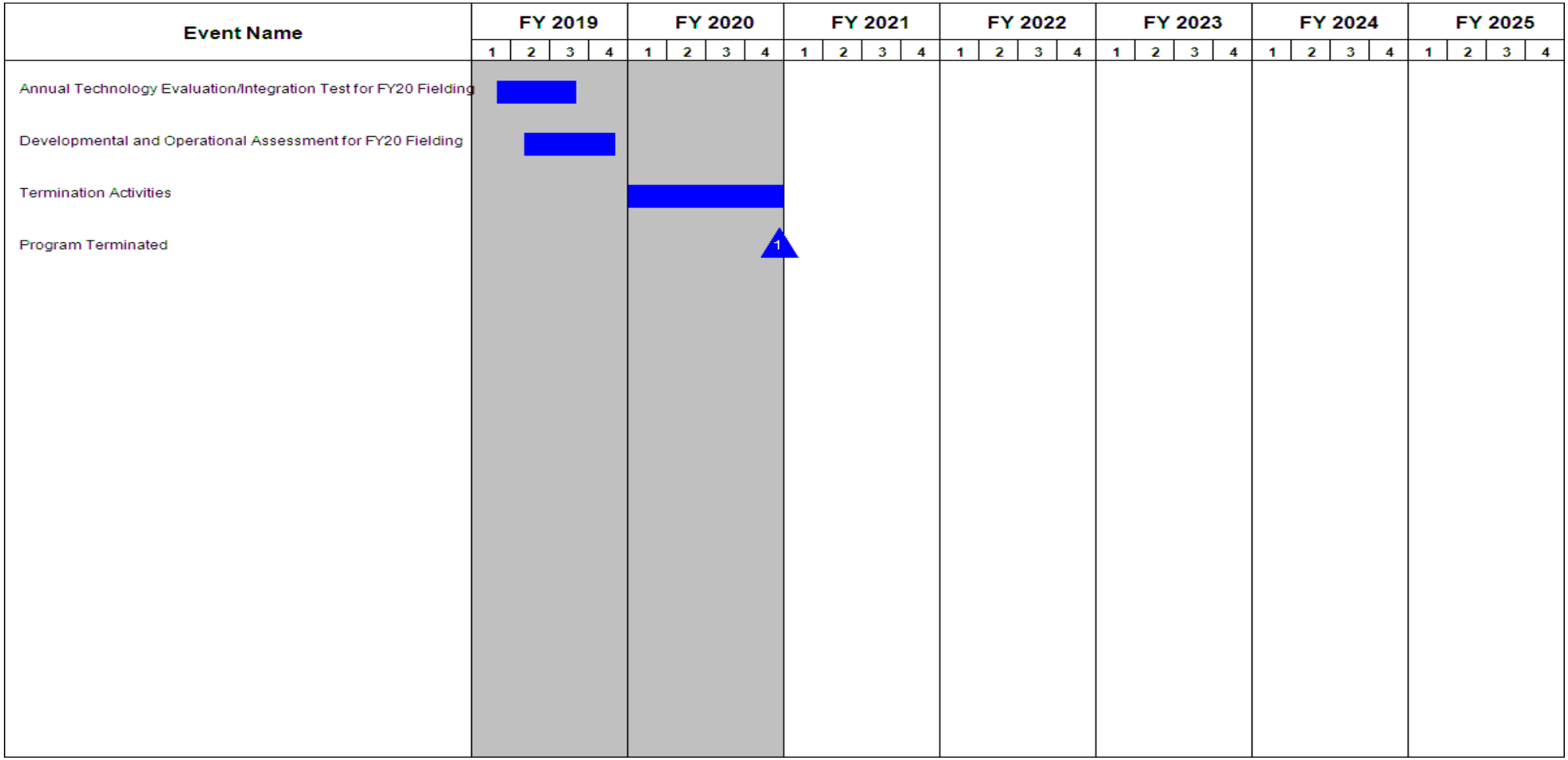

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** DX7 / *TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Annual Relook of Technology for Evaluation/Integration Test for FY16 Fielding	1	2015	3	2015
Technical Gen 2 headset test	3	2015	4	2015
Operation Gen 2 headset test	4	2015	4	2015
Developmental and Operational Assessment for FY16 Fielding	2	2015	4	2015
TCAPS/TCAPS Lite Post Implementation Review	4	2016	4	2016
VIC3 cable test	4	2016	4	2016
Annual Relook of Technology for Evaluation/Integration Test for FY17 Fielding	1	2016	3	2016
Developmental and Operational Assessment for FY17 Fielding	2	2016	4	2016
Annual Relook of Technology for Evaluation/Integration for FY18 Fielding	1	2017	3	2017
Developmental and Operational Assessment for FY18	2	2017	4	2017
Annual Relook of Technology for Evaluation/Integration Test for FY19 Fielding	1	2018	3	2018
Developmental and Operational Assessment for FY19 Fielding	2	2018	4	2018
Annual Technology Evaluation/Integration Test for FY20 Fielding	1	2019	3	2019
Developmental and Operational Assessment for FY20 Fielding	2	2019	4	2019
Termination Activities	1	2020	4	2020
Program Terminated	4	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY2 / *Integrated Soldier Power Data System - Core*	

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
EY2: *Integrated Soldier Power Data System - Core*	-	3.667	1.191	4.059	-	4.059	4.375	4.472	4.571	4.671	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ISPDS-C includes power and data managing/distribution devices, cutting-edge energy storage solutions, and power scavenging devices. These capabilities fill the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, such as heads up displays, situational awareness displays, GPS systems, weapon sensors, radios, and other devices. This RDT&E line develops power sources and power management solutions for the individual Soldier and squad for use in all operating environments. ISPDS-C systems will enable dismounted Soldiers to execute their missions more efficiently, for longer durations and with fewer battery resupplies while reducing the logistical and physical burden associated with moving fuel and batteries, and allow dismounted Soldiers to operate independently for longer missions.

Justification: FY21 RDT&E develops and evaluates low power Intra-Soldier wireless solutions, fuel cell based solutions and improved batteries.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Test and Evaluation ***Description:*** Test and validate new battery chemistries and interfaces with the ISPDS-C and Squad Power Manager. ***FY 2020 Plans:*** Continued to evaluate intra-Soldier wireless technologies and test and validate new battery chemistries. ***FY 2021 Plans:*** Develop and integrate power distribution technology, characterize Soldier peripherals, improve current battery chemistries, test and validate new battery chemistries, and evaluate ISW solutions. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Fact of life scope increase for ISPDS-C and CWB testing requirements.	0.443	0.209	0.762
Title: Test and Evaluation of E-textile integrated vest ***Description:*** Test and validate E-Textile cables solutions and interface with the Nett Warrior System. ***FY 2020 Plans:*** Integrate launderable E-textile connectors into existing E-textile vest designs for testing and evaluations. ***FY 2021 Plans:***	0.061	0.120	0.454

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY2 / *Integrated Soldier Power Data System - Core*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Integrate and evaluate E-Textile Cables within the Nett Warrior and Soldier worn power architecture. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Procurement of additional test items based on better understanding of system characteristics (e.g., connectors for E-textiles).			
Title: System Engineering & Program Management ***Description:*** Conduct system engineering and project management for ISDPS-C efforts and power characterization efforts. ***FY 2020 Plans:*** Continue to conduct system engineering and project management for ISDPS-C efforts and Intra-soldier wireless technologies. ***FY 2021 Plans:*** Continue to conduct system engineering and project management for ISDPS-C efforts and power characterization studies. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Management of new configurations, and creation of technical drawing packages and materiel release documents.	0.787	0.162	0.400
Title: ISPDS-C/CWB Capability Improvements Integration ***Description:*** Evaluate higher energy density power solutions. ***FY 2020 Plans:*** Conduct integration of intra-Soldier wireless and fuel cells capable of supporting the variety of power devices used in tactical formations. ***FY 2021 Plans:*** Conduct integration of power distribution technologies and fuel cells capable of supporting the variety of power devices used in tactical formations and Integrate emerging alternative fuel cell technologies such as SI-Anode batteries. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Transition to Silicon Anode or other improved battery chemistries.	0.662	0.384	2.133
Title: Develop alternative CWB sources. ***Description:*** Develop alternative CWB sources. ***FY 2020 Plans:*** Conducted Critical Design Review (CDR) and first article testing. Delivery of CWBs. ***FY 2021 Plans:***	0.719	0.262	0.310

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY2 / *Integrated Soldier Power Data System - Core*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Test and evaluate alternative battery technologies. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Fact of life scope increase for the CWB second source qualification effort.			
Title: FY 2019 Rescission	0.995	-	-
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:*** Funding transferred in accordance with Title 15 USC 638	-	0.054	-
Accomplishments/Planned Programs Subtotals	3.667	1.191	4.059

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• S65: *Platoon Power Generator*	4.373	1.174	0.000	-	0.000	-	-	-	-	0.000	5.547
• EY4: *Universal Battery Charger*	1.361	1.186	0.999	-	0.999	0.999	0.999	0.999	0.999	Continuing	Continuing
• EY3: *Soldier Power Generator*	0.318	-	0.000	-	0.000	-	-	-	-	0.000	0.318
• R09103: *Universal Battery Charger*	8.456	7.865	10.066	-	10.066	-	-	-	-	0.000	26.387
• R08090: *Integrated Soldier Power Data System - Core*	22.318	17.495	17.818	-	17.818	-	-	-	-	0.000	57.631

Remarks

D. Acquisition Strategy

Pursue a variety of Soldier power products under full and open competition. Initiatives range from Commercial-Off-The-Shelf (COTS) solutions to developmental efforts. The type of solicitation depends on the maturity of the technology. The power initiatives will be evaluated through scheduled test and evaluation events, and if successful, selected for procurement and subsequent fielding and sustainment. The acquisition strategy varies by product. For example, the CWB acquisition strategy consists of two phases: Phase one includes the purchase of test articles using the Defense Logistics Agency (DLA) Special Operational (Spec Ops) Equipment Tailored Logistic Support Program (TLSP) and General Services Administration (GSA) contracts. Phase two establishes an Indefinite Delivery Indefinite Quantity (IDIQ) contract through the Army Contracting Command (ACC) which qualifies a minimum of two vendors to take into production. The Project Manager office will establish IDIQ

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY2 / *Integrated Soldier Power Data System - Core*

contracts to support the ISPDS-C requirements over time. Each ISPDS-C system will be procured under purchase orders for production quantities that will be awarded on a Firm Fixed Price (FFP) contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY2 / *Integrated Soldier Power Data System - Core*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering & Program Management Support	MIPR	Various : Various	1.889	0.786		0.155		0.473		-		0.473	0.000	3.303	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.054		-		-		-	0.000	0.054	-
		Subtotal	1.889	0.786		0.209		0.473		-		0.473	0.000	3.357	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ISPDS-C, CWB Capability Improvements Integration	MIPR	Various : Various	3.572	1.382		0.649		2.371		-		2.371	0.000	7.974	-
Squad Power Manager ECP	MIPR	Various : Various	0.993	0.993		-		-		-		-	0.000	1.986	-
		Subtotal	4.565	2.375		0.649		2.371		-		2.371	0.000	9.960	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Various : Various	1.210	0.506		0.333		1.215		-		1.215	0.000	3.264	-
		Subtotal	1.210	0.506		0.333		1.215		-		1.215	0.000	3.264	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.664	3.667		1.191		4.059		-		4.059	0.000	16.581	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY2 / *Integrated Soldier Power Data System - Core*

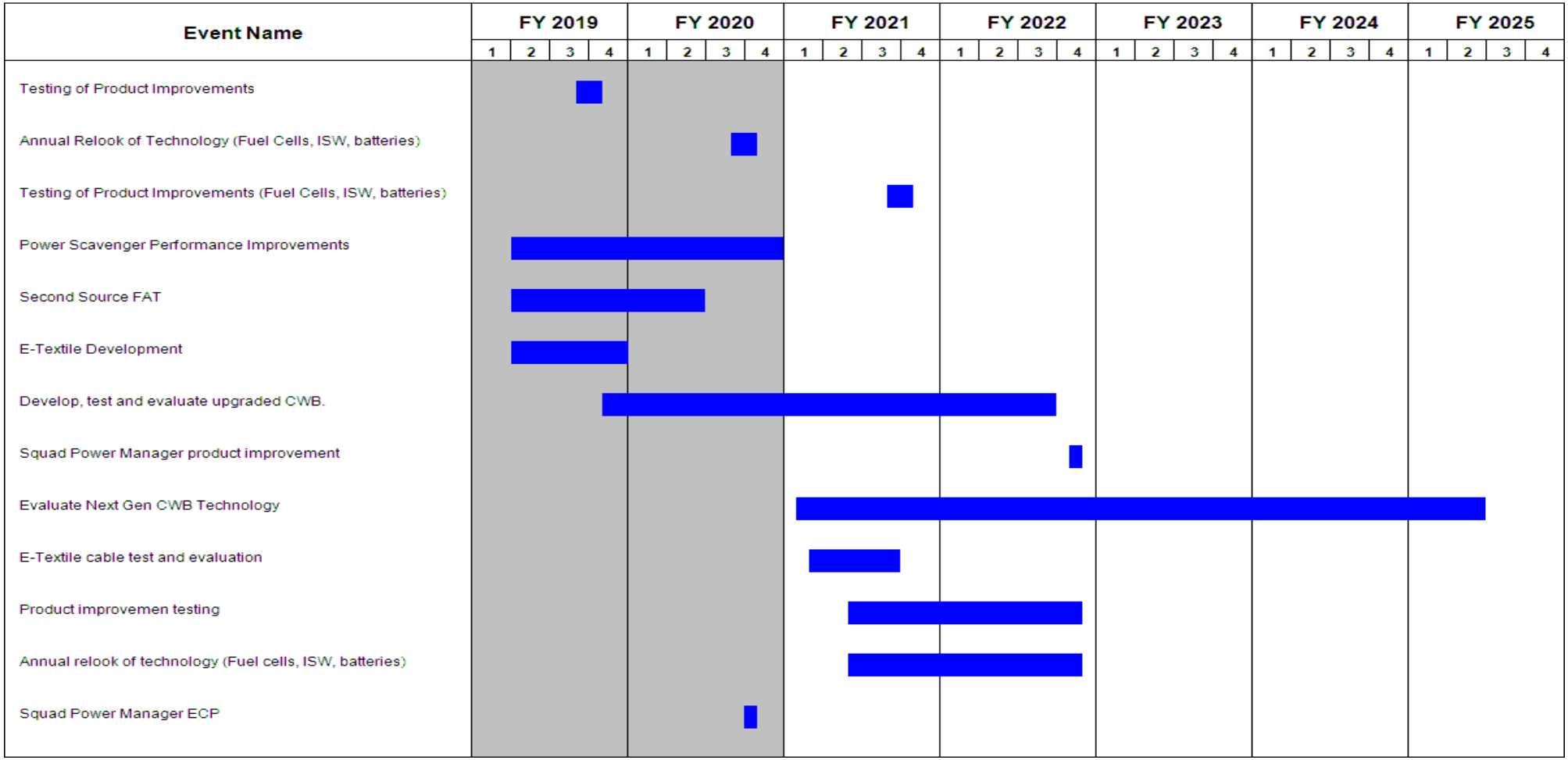

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY2 / *Integrated Soldier Power Data System - Core*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Testing of Product Improvements	3	2019	4	2019
Annual Relook of Technology (Fuel Cells, ISW, batteries)	3	2020	4	2020
Testing of Product Improvements (Fuel Cells, ISW, batteries)	3	2021	4	2021
Power Scavenger Performance Improvements	2	2019	4	2020
Second Source FAT	2	2019	2	2020
E-Textile Development	2	2019	4	2019
Develop, test and evaluate upgraded CWB.	4	2019	3	2022
Squad Power Manager product improvement	4	2022	4	2022
Evaluate Next Gen CWB Technology	1	2021	2	2025
E-Textile cable test and evaluation	1	2021	3	2021
Product improvemen testing	2	2021	4	2022
Annual relook of technology (Fuel cells, ISW, batteries)	2	2021	4	2022
Squad Power Manager ECP	4	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY3 / *Soldier Power Generator*	

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
EY3: *Soldier Power Generator*	-	0.318	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.318
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2019, funding for Soldier Power Generator was realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project: S65 (Soldier Power).

A. Mission Description and Budget Item Justification

Soldier Power Generation (SPG) fills the power and energy gap created by the increase in mission essential and power consuming devices, by providing charging solutions capable of providing power to handheld communication devices and a suite of military batteries. SPG is intended for use in the most austere operating environments providing the Soldier with energy independency for extended mission duration. The system will provide the Soldier with a lightweight, worn or carried power generation capability, integrated within the warfighters combat load.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Test and Evaluation ***Description:*** Test emerging technologies.	0.315	-	-
Title: FY 2019 Rescission	0.003	-	-
Accomplishments/Planned Programs Subtotals	0.318	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• S65: *Platoon Power Generator*	4.373	1.174	0.000	-	0.000	-	-	-	-	0.000	5.547
• EY2: *Integrated Soldier Power Data System - Core*	3.667	1.191	4.059	-	4.059	4.375	4.472	4.571	4.671	Continuing	Continuing
• EY4: *Universal Battery Charger*	1.361	1.186	0.999	-	0.999	0.999	0.999	0.999	0.999	Continuing	Continuing
• R09103: *Universal Battery Charger*	8.456	7.865	10.066	-	10.066	-	-	-	-	0.000	26.387

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY3 / *Soldier Power Generator*

D. Acquisition Strategy

Develop a range of Soldier Power Generation technologies, based on technical tests and Soldier feedback, to determine the best material solution and then award a competitive contract to pursue test articles. Any follow on production for successful test articles will be through competitively awarded contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY3 / *Soldier Power Generator*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering and Program Management (SEPM)	MIPR	PEO Soldier, Ft. Belvoir, VA : TBD	-	0.045		-		-		-		-	0.000	0.045	-
		Subtotal	-	0.045		-		-		-		-	0.000	0.045	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test	TBD	Various : TBD	-	0.273		-		-		-		-	0.000	0.273	-
		Subtotal	-	0.273		-		-		-		-	0.000	0.273	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.318		0.000		-		-		-	0.000	0.318	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY3 / *Soldier Power Generator*

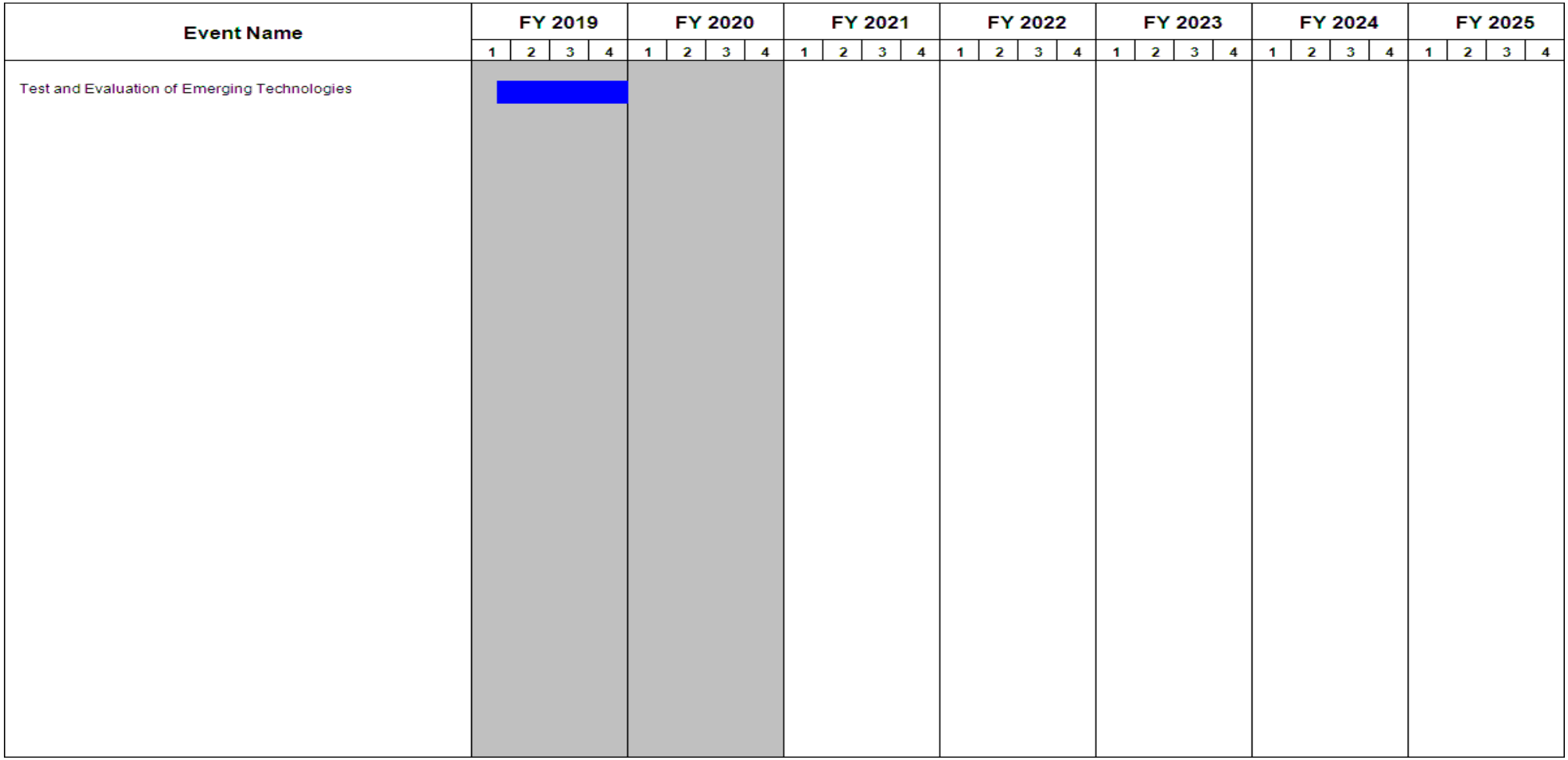

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY3 / *Soldier Power Generator*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation of Emerging Technologies	1	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY4 / *Universal Battery Charger*	

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
EY4: *Universal Battery Charger*	-	1.361	1.186	0.999	-	0.999	0.999	0.999	0.999	0.999	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Universal Battery Charger: Universal Battery Charger (UBC) fills the power and energy gap created by the increase in mission essential, Soldier portable power consumers, by providing a family of charging solutions capable of providing power to handheld communication devices and military batteries to support mounted and dismounted formations. The UBC is suited for mounted and dismounted operations at the company level and below in multi-domain and austere operating environments. The system can draw power from wall outlets, vehicle power, and solar power sources. The UBC enables dismounted Soldiers to execute their missions with fewer battery resupplies, thus reducing the logistical burden associated with moving fuel and batteries. The UBC capability allows dismounted Soldiers to operate independently for longer missions. The UBC also fills the power and energy gap associated with bulk charging. Develop and integrate vehicular on-the-move charging systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Test & Evaluation ***FY 2020 Plans:*** Continue to evaluate reduction of UBC and weight as well as increase the battery recharging performance. ***FY 2021 Plans:*** Continue evaluation and improvement of Family of UBCs by decreasing weight and increasing battery recharging performance. Test and evaluation efforts also consider bulk charging initiatives. Develop and integrate vehicular on-the-move charging systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Reduced FY 2021 funding eliminates scheduled T&E efforts.	1.100	0.997	0.849
Title: System Engineering & Program Management ***FY 2020 Plans:*** Conduct design and development of next generation UBC. ***FY 2021 Plans:*** Conduct design and development of improved UBC and bulk charging capabilities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decreased FY 2021 funding results in reduced system engineering efforts.	0.243	0.135	0.150
Title: FY 2019 Rescission	0.018	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY4 / *Universal Battery Charger*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: FY 2020 SBIR/STTR Transfer	-	0.054	-
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	1.361	1.186	0.999

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• R09103: *Universal Battery Charger*	8.456	7.865	10.066	-	10.066	-	-	-	-	0.000	26.387
• S65: *Platoon Power Generator*	4.373	1.174	0.000	-	0.000	-	-	-	-	0.000	5.547
• EY2: *Integrated Soldier Power Data System - Core*	3.667	1.191	4.059	-	4.059	4.375	4.472	4.571	4.671	Continuing	Continuing
• EY3: *Soldier Power Generator*	0.318	-	0.000	-	0.000	-	-	-	-	0.000	0.318
• R08090: *Integrated Soldier Power Data System - Core*	22.318	17.495	17.818	-	17.818	-	-	-	-	0.000	57.631

Remarks

D. Acquisition Strategy

Contracts will be awarded to test, evaluate, and procure the next generation family of battery chargers to meet the increased power demand on the Soldier. A full and open, five year Indefinite Delivery Indefinite Quantity (IDIQ) production contract was awarded 27 January 2016 to procure the UBC. FY 2020 efforts establish a new Indefinite Delivery Indefinite Quantity (IDIQ) contract with Firm Fixed Price (FFP) delivery orders through the Army Contracting Command (ACC) which qualifies a minimum of two vendors to take into production. UBC systems will be procured under purchase orders for production quantities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) EY4 / *Universal Battery Charger*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering/ Program Management Support	MIPR	Various : Various	0.250	0.246		0.135		0.150		-		0.150	Continuing	Continuing	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.054		-		-		-	0.000	0.054	-
		Subtotal	0.250	0.246		0.189		0.150		-		0.150	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	MIPR	Various : Various	1.413	1.115		0.997		0.849		-		0.849	Continuing	Continuing	-
		Subtotal	1.413	1.115		0.997		0.849		-		0.849	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.663	1.361		1.186		0.999		-		0.999	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY4 / *Universal Battery Charger*

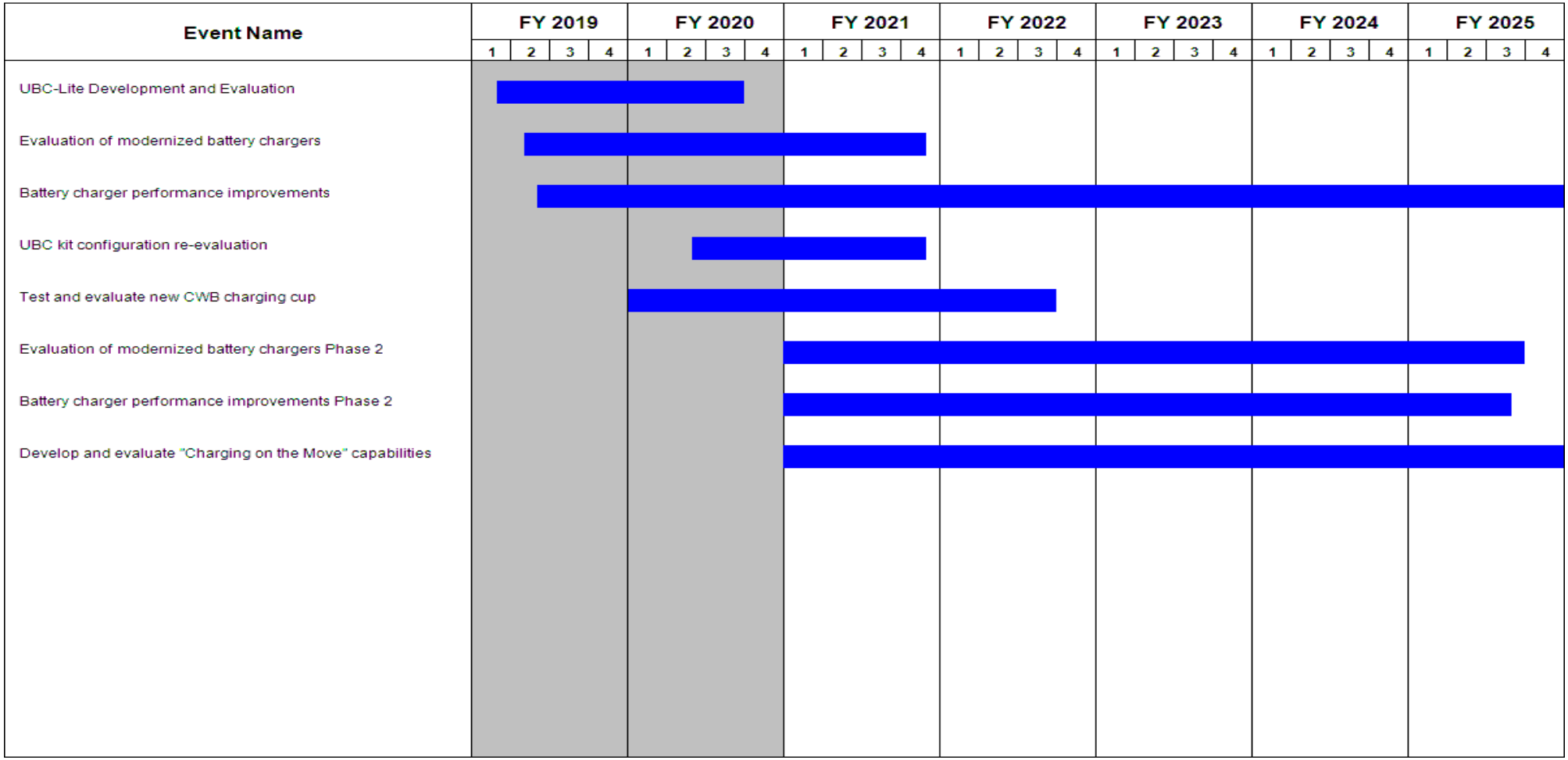

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** EY4 / *Universal Battery Charger*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UBC-Lite Development and Evaluation	1	2019	3	2020
Evaluation of modernized battery chargers	2	2019	4	2021
Battery charger performance improvements	2	2019	4	2025
UBC kit configuration re-evaluation	2	2020	4	2021
Test and evaluate new CWB charging cup	1	2020	3	2022
Evaluation of modernized battery chargers Phase 2	1	2021	3	2025
Battery charger performance improvements Phase 2	1	2021	3	2025
Develop and evaluate "Charging on the Move" capabilities	1	2021	4	2025

Note

Beginning in FY 2018, funding for Universal Battery Charger was realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project S65/Soldier Power. Prior to this realignment Soldier and Small Unit Power initiated developmental and test power solutions for the UBC technologies.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) FK4 / *Soldier Borne Sensor (SBS)*	

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
FK4: *Soldier Borne Sensor (SBS)*	-	0.000	1.252	1.476	-	1.476	2.237	3.545	5.001	4.474	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2019, this project was funded in PE: 0605053A / Grounds Robotics project, FB8.

A. Mission Description and Budget Item Justification

Project FK4 - Soldier Borne Sensor (SBS): The SBS is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. The SBS will be procured in multiple tranches/increments. RDTE funding will be used to develop, integrate, and qualify additional capabilities for each tranche. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Soldier Borne Sensor (SBS)	-	1.195	1.476
Description: The SBS provides the squad a "quick look" capability providing Situational Awareness (SA).			
FY 2020 Plans: The program will utilize Other Transaction Authority (OTA) prototype projects to rapidly incorporate new technologies including GPS-denied operation and integration with the Adaptive Soldier Architecture (ASA) into prototypes for evaluation. The OTA scope of work (technologies integrated) will be determined based on affordability. OTAs will be established with multiple manufacturers, if affordable.			
FY 2021 Plans: The program will complete OTA prototype project(s) to rapidly incorporate new technologies including improved thermal cameras, improved obstacle avoidance, and integration with the Adaptive Squad Architecture into prototypes for evaluation. Additionally, the program plans to integrate SBS with systems such as Tactical Assault Kit (TAK)/Nett Warrior, Enhanced Night Vision Goggle (ENVG) and Heads Up Display (HUD) Integrated Visual Augmentation System (IVAS).			
FY 2020 to FY 2021 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** FK4 / *Soldier Borne Sensor (SBS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 to FY 2021 SBS increase funds the integration of advanced technology into prototypes and testing of those prototypes. The test results will be used to determine the best value materiel solution available for Tranche 2.			
Title: FY 2020 SBIR/STTR Transfer	-	0.057	-
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	-	1.252	1.476

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• W63798: *Soldier Borne Sensor (SBS)*	24.437	23.362	18.907	-	18.907	18.141	19.081	19.273	19.168	0.000	142.369
• FB8: *Soldier Borne Sensor (SBS)*	3.354	-	0.000	-	0.000	-	-	-	-	0.000	3.354
• K36400: *Helmet Mounted Enhanced Vision Devices*	112.251	50.632	207.626	-	207.626	245.012	6.436	318.684	-	Continuing	Continuing
• K36402: *IVAS/Heads Up Display*	-	-	906.045	-	906.045	1,045.688	319.670	-	148.426	Continuing	Continuing
• 0604710A: *Night Vision Systems - Eng Dev*	139.337	143.696	61.445	-	61.445	38.094	31.349	37.520	95.108	Continuing	Continuing
• 0603774A: *Night Vision Systems Advanced Development*	7.072	200.791	24.316	-	24.316	22.282	16.958	72.311	34.349	Continuing	Continuing
• R80501: *Ground Soldier System*	36.506	116.265	154.937	-	154.937	182.025	185.295	188.627	190.514	Continuing	Continuing
• 0604818A: *Army Tactical Command & Control Hardware & Software*	163.229	129.974	162.513	-	162.513	156.333	106.957	90.035	81.010	Continuing	Continuing

Remarks

In FY 2019, this project was funded in PE: 0605053A / Grounds Robotics project, FB8.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** FK4 / *Soldier Borne Sensor (SBS)*

D. Acquisition Strategy

The program office is utilizing Defense Logistics Agency - Tailored Logistics Support contracts to procure Tranche 1 systems in FY 2020 through FY 2021.

SBS will initiate one, or more, OTA prototype project(s) in FY 2020. These prototypes will be evaluated in an open fly-off to determine the best solution for Tranche 2. The fly-off is planned for late FY 2021. Production of Tranche 2 is planned to start in FY 2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) FK4 / *Soldier Borne Sensor (SBS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.057		-		-		-	0.000	0.057	-
		Subtotal	-	-		0.057		-		-		-	0.000	0.057	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Improved Imaging	MIPR	Night Vision Electronic Sensors Directorate (NVESD) : Fort Belvoir, Virginia 22060	-	-		0.010	Feb 2020	-		-		-	Continuing	Continuing	-
Tranche 2 Prototype	TBD	TBD : TBD	-	-		0.665	Feb 2020	0.615	Feb 2021	-		0.615	Continuing	Continuing	-
		Subtotal	-	-		0.675		0.615		-		0.615	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	Various	Various : Multiple	-	-		0.520	Jan 2020	0.265	Dec 2020	-		0.265	Continuing	Continuing	-
		Subtotal	-	-		0.520		0.265		-		0.265	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tranche 2- Technology Integration and Testing	TBD	Various : Various	-	-		-		0.596	Apr 2021	-		0.596	Continuing	Continuing	-
		Subtotal	-	-		-		0.596		-		0.596	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) FK4 / *Soldier Borne Sensor (SBS)*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		1.252		1.476		-		1.476	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** FK4 / *Soldier Borne Sensor (SBS)*

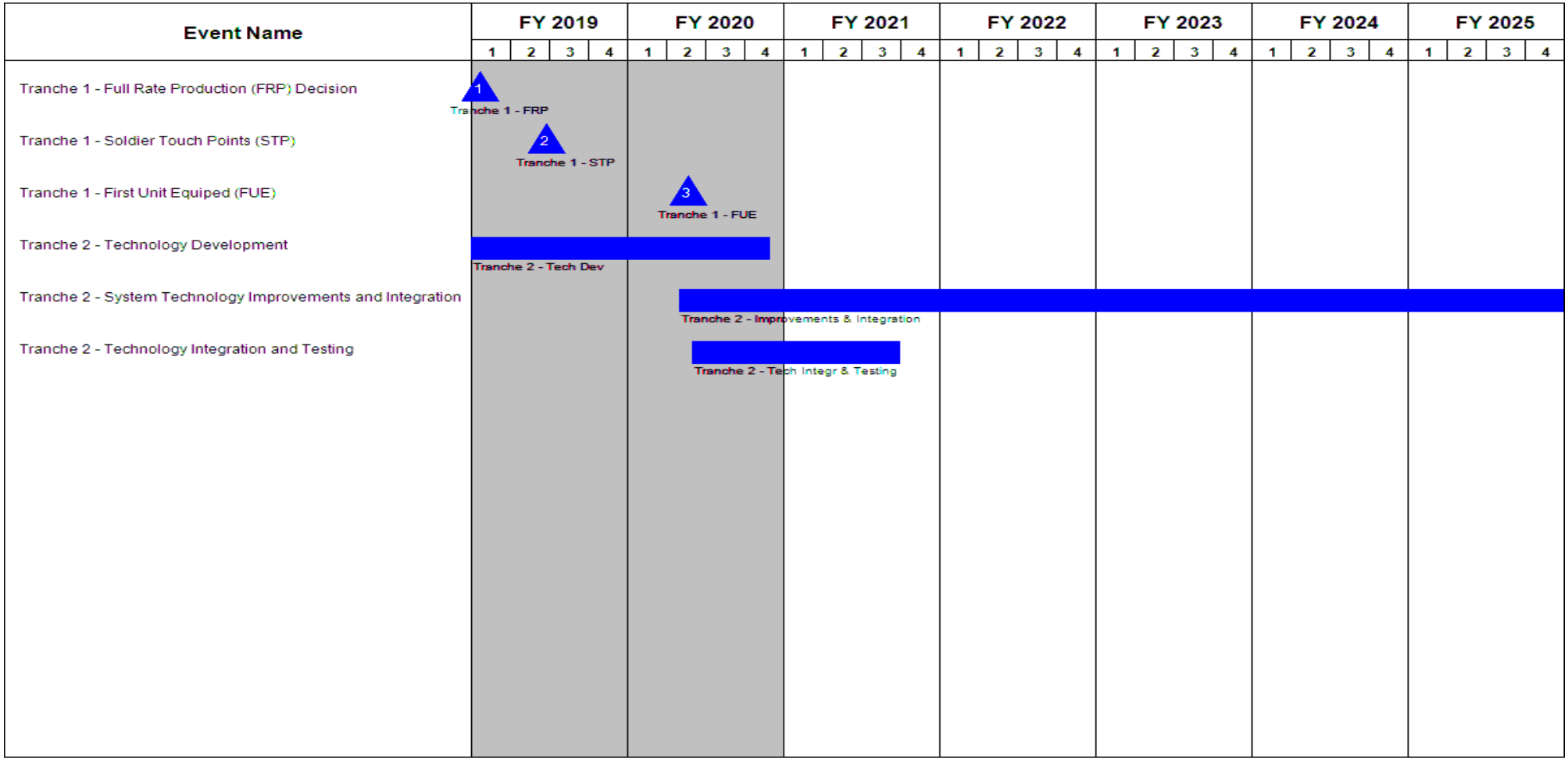

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** FK4 / *Soldier Borne Sensor (SBS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Tranche 1 - Full Rate Production (FRP) Decision	1	2019	1	2019
Tranche 1 - Soldier Touch Points (STP)	2	2019	2	2019
Tranche 1 - First Unit Equiped (FUE)	2	2020	2	2020
Tranche 2 - Technology Development	4	2018	4	2020
Tranche 2 - System Technology Improvements and Integration	2	2020	4	2025
Tranche 2 - Technology Integration and Testing	2	2020	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) S65 / *Platoon Power Generator*	

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
S65: *Platoon Power Generator*	-	4.373	1.174	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.547
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Soldier and Small Unit Power (SUP) enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Power solutions address energy deficits resulting from increased power demands associated with providing the Soldier with increased situational awareness displays, Global Positioning System (GPS) systems, weapon sensors, radios, and other devices. The Soldier and Small Unit Power system develops and tests power sources and solutions suited for the individual Soldier, team, squad, and platoon in the most austere operating environments. Develops and evaluates additional sources of power such as individual Soldier worn systems, renewable energy, and kinetic energy harvesting technologies. This effort is consistent with the Sep 2013 Small Unit Power CDD, the Dec 2011 Operational Energy ICD, and the Mar 2011 Soldier Protection CDD, and the Universal Battery Charger CPD (May 2015).

Platoon Power Generation - PM E2S2: This project supports the demonstration and development of a Platoon Power Generation (PPG). The Small Unit Power PPG will provide small units with no less than 900 Watts of portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices. It will provide sufficient power to recharge and power all Platoon equipment and fulfill residual power gaps at the Squad and Soldier level. The generator will provide Platoon power for charging batteries when away from vehicles in all Brigade Combat Teams (Stryker, Armor and Infantry), Rangers and Special Forces in austere environments. FY 2020 funds will be used to complete the Engineering and Manufacturing Development (EMD) Phase.

Funding supports modernization of the current power generation for Soldier borne sensors by investigating technology insertions including, but not limited to a modified COTS generator concept and proprietary fuel atomization. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational energy concepts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Platoon Power Generation (PPG) - PM E2S2	2.532	1.120	-
Description: Manage an EMD phase R&D contract for the PPG. ***FY 2020 Plans:*** Complete EMD Phase and Developmental Testing, which culminates in a user test. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding was decreased as program ended development work and enters full production phase.			
Title: FY 2019 Rescission	1.841	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** S65 / *Platoon Power Generator*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: FY 2020 SBIR/STTR Transfer	-	0.054	-
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	4.373	1.174	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• R08090: *Integrated Soldier Power Data System - Core*	22.318	17.495	17.818	-	17.818	-	-	-	-	0.000	57.631
• R09103: *Universal Battery Charger*	8.456	7.865	10.066	-	10.066	-	-	-	-	0.000	26.387
• EY2: *Integrated Soldier Power Data System - Core*	3.667	1.191	4.059	-	4.059	4.375	4.472	4.571	4.671	Continuing	Continuing
• EY4: *Universal Battery Charger*	1.361	1.186	0.999	-	0.999	0.999	0.999	0.999	0.999	Continuing	Continuing
• EY3: *Soldier Power Generator*	0.318	-	0.000	-	0.000	-	-	-	-	0.000	0.318

Remarks

D. Acquisition Strategy

PEO CS/CSS Effort on the Platoon Power Generation - PM E2S2:

Utilizing Other Transactional Agreement (OTA) contract vehicle culminating in an EMD award of three (3) Firm Fixed Price (FFP) contracts supporting an 18-24 month Engineering and Manufacturing Development (EMD) phase. Three selected contractors have been awarded EMD contracts and will separately fabricate and produce the minimum order of 13 Small Unit Power Platoon Power Generation (>900 Watts) systems. After completing a successful down select, two contractors have been selected to undergo developmental test (DT), logistics development, and early operational assessment (EOA). Upon successful completion of these tests and completion of logistics supportability, the performance data and Soldier's feedback will be utilized in preparation for Milestone C (MS C) 4th Qtr FY20.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** S65 / *Platoon Power Generator*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platoon Power Generation	Various	PM E2S2 : Fort Belvoir, VA	0.225	0.242		0.056		-		-		-	0.000	0.523	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.054		-		-		-	0.000	0.054	-
		Subtotal	0.225	0.242		0.110		-		-		-	0.000	0.577	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platoon Power Generation	C/FFP	Picatinny : Contractor Sites	6.118	3.240		0.242		-		-		-	1.500	11.100	-
		Subtotal	6.118	3.240		0.242		-		-		-	1.500	11.100	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platoon Power Generation	MIPR	APG : APG	2.819	0.600		0.435		-		-		-	0.600	4.454	-
		Subtotal	2.819	0.600		0.435		-		-		-	0.600	4.454	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platoon Power Generation	MIPR	Ft. Benning : Ft. Benning	0.220	0.291		0.387		-		-		-	0.220	1.118	-
		Subtotal	0.220	0.291		0.387		-		-		-	0.220	1.118	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / *Soldier Systems - Warrior Dem/Val*	Project (Number/Name) S65 / *Platoon Power Generator*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.382	4.373		1.174		-		-		-	2.320	17.249	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** S65 / *Platoon Power Generator*

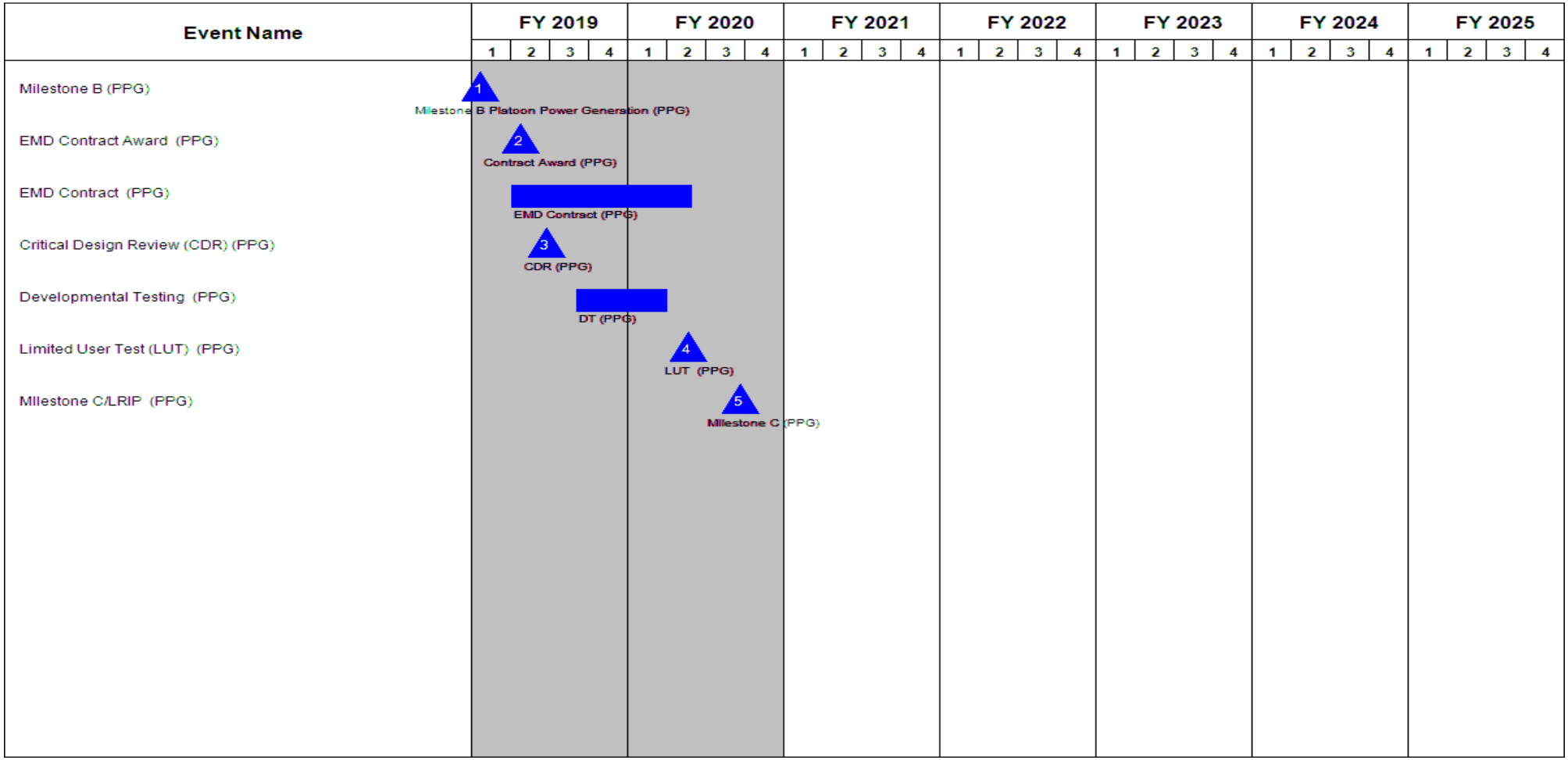

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604827A / *Soldier Systems - Warrior Dem/Val*	**Project (Number/Name)** S65 / *Platoon Power Generator*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B (PPG)	1	2019	1	2019
EMD Contract Award (PPG)	2	2019	2	2019
EMD Contract (PPG)	2	2019	2	2020
Critical Design Review (CDR) (PPG)	2	2019	2	2019
Developmental Testing (PPG)	3	2019	1	2020
Limited User Test (LUT) (PPG)	2	2020	2	2020
MIlestone C/LRIP (PPG)	3	2020	3	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*							
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	-	50.380	85.198	82.459	-	82.459	99.934	96.504	89.756	79.203	0.000	583.434
FE8: *Vehicle Protection Suite*	-	25.887	47.698	82.459	-	82.459	99.934	96.504	89.756	79.203	0.000	521.441
XU9: *Active Protection System*	-	24.493	37.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	61.993

Note

There is no funding request for Program Element (PE) 0604852A Suite of Survivability Enhancement Systems - EMD Project XU9 Active Protection System in Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

Current ground combat vehicle platforms and tactical wheeled vehicles within Army Brigade Combat Teams (BCTs) lack the ability to effectively detect, track, divert, disrupt, neutralize, or destroy incoming direct or indirect fired threat munitions. Current solutions to defeat these threats, Explosive Reactive Armor (ERA) and Slat armor, do not provide preemptive or active protection and impose secondary blast hazards to crew, dismounted soldiers, and adjacent vehicles and equipment. The Suite of Vehicle Protection Systems - EMD PE 0604852A will develop and mature solutions to increase the protection of the Army's ground systems from both current and next generation direct or indirect fired threat munitions.

The Active Protection System will install and characterize Non-Developmental Item (NDI) Active Protection Systems on Abrams, Bradley, and Stryker demonstrator vehicles. The Active Protection System effort will assess the maturity, performance, and integration risk of NDI Active Protection Systems, develop and refine Abrams, Bradley, and Stryker Active Protection System installation kit designs, and build prototypes necessary to conduct performance and safety testing to obtain an Active Protection System Urgent Materiel Release (UMR). Active Protection System effort will execute installation design refinement and required testing to meet urgent fielding of NDI APS on Abrams, Bradley and Stryker pending Army leadership approval. The Active Protection System NDI effort served to inform the Vehicle Protection Suite Trade Study.

The Vehicle Protection Suite (VPS) Project (FE8) will design, mature, and evaluate combinations of active, reactive, and passive solutions and leverage both Horizontal Technology Integration (HTI) principles and the Army's Modular Active protection system Controller (MAC) to develop tailored vehicle Survivability Sets that will mitigate existing protection gaps, allow for future technology insertion to meet evolving threats, and minimize the impact to the current capabilities hosted on Army ground system platforms.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604852A *I Suite of Survivability Enhancement Systems - EMD*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	52.839	98.698	93.844	-	93.844
Current President's Budget	50.380	85.198	82.459	-	82.459
Total Adjustments	-2.459	-13.500	-11.385	-	-11.385
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-18.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.459	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-11.385	-	-11.385

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: FE8: *Vehicle Protection Suite*		
Congressional Add: *Radar Sensor Technology*	-	5.000
Congressional Add Subtotals for Project: FE8	-	5.000
Congressional Add Totals for all Projects	-	5.000

Change Summary Explanation

The decrease in FY 2021 funding is due to the Reimbursable Manpower for this line being realigned from Reimbursable Civilian Funding ($3.826 million) to Direct Operations and Maintenance and reduced by $6.367 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

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
FE8: *Vehicle Protection Suite*	-	25.887	47.698	82.459	-	82.459	99.934	96.504	89.756	79.203	0.000	521.441
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Current ground combat vehicle platforms and tactical wheeled vehicles within Army Brigade Combat Teams (BCTs) lack the ability to effectively detect, track, divert, disrupt, neutralize, or destroy incoming direct or indirect fired threat munitions. Current solutions to defeat these threats, Explosive Reactive Armor (ERA) and Slat armor, do not provide preemptive or active protection and impose secondary blast hazards to crew, dismounted soldiers, and adjacent vehicles and equipment.

Vehicle Protection Suite (VPS) will design, mature, and evaluate combinations of active, reactive, and passive solutions and leverage both Horizontal Technology Integration (HTI) principles and the Army's Modular Active Protection System Controller (MAC) to develop tailored vehicle Survivability Sets that will mitigate existing protection gaps, allow for future technology insertion to meet evolving threats, and minimize the impact to the current capabilities hosted on Army ground combat system platforms.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Modular Active protection system Controller (MAC) Framework Integration of Non-Developmental Items (NDI) and Developmental Technologies	12.744	25.594	66.671
Description: (Title Change, previously Modular Active protection system Controller (MAC) Framework Integration of Non-Developmental Items (NDI)) Development effort to incorporate the MAC framework and Non-developmental technologies on to ground combat vehicle platforms. The development effort will include design development, prototype build, component and platform qualification testing and logistics products.			
FY 2020 Plans: Integrated the Laser Warning Receiver (LWR) with the MAC development effort, to include design development, prototype build, component and platform qualification testing and logistics products onto the Abrams, Bradley, AMPV, Stryker, and other identified combat vehicle platforms.			
FY 2021 Plans: Continue LWR with the MAC integration design efforts, to include design development, prototype build, component and platform qualification testing and logistics products onto the Abrams, Bradley, AMPV, Stryker, and other identified ground combat vehicle platforms.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Increase is due to the continuation of efforts to integrate the MAC onto ground combat vehicle platforms, to initiate ground combat vehicle platform logistics product development, and to initiate software development.			
Title: VPS - Trade Study ***Description:*** (Title Change, previously VPS - Trade Study and Analysis of Alternatives (AoA)) A VPS Trade Study identified technologies, active, reactive and passive protection solutions, to pursue in the next phase of the program (Tranche II). A Trade Study was deemed sufficient for the identification of technologies to pursue in Tranche II.	2.806	-	-
Title: Survivability Improvements ***Description:*** Funding for the continued maturation of Science and Technology (S&T) funded protection technologies, design development of the platform integration, test, and logistic products of active, reactive, and passive survivability improvements onto ground combat vehicle platforms. ***FY 2020 Plans:*** Qualification testing, and logistic products of developed armor tile upgrades on the Army Ground Combat Vehicles. Initiation of Tranche II technology integration and testing on to ground combat platforms identified via the VPS trade study or as they emerge from industry or government Science and Technology efforts. These potential Tranche II technologies include but are not limited to: counter improvised explosive devices technologies, soft kill and hard kill active protection system technologies, top attack defense, signature management, radar system upgrades, and other emerging technologies. ***FY 2021 Plans:*** Continue qualification testing and logistic product development of passive and reactive armor tiles on ground combat vehicle platforms. Continue Signature Management vehicle integration; top attack, and vehicle Camouflage, concealment, Deception, and Obscuration (CCDO) engineering development, testing, and transportation onto ground combat vehicles. Continuation of Tranche II technology integration and testing onto ground combat platforms identified via the VPS trade study or as they emerge from industry or government S&T efforts. Continued trade studies and engineering assessments of technology integration on existing and emerging ground vehicles. Technologies include but are not limited to: counter improvised explosive devices technologies, soft kill and hard kill active protection system technologies, top attack defense, radar system upgrades, signature management, vehicle Camouflage, concealment, Deception, and Obscuration (CCDO), and other emerging vehicle protection technologies. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to the development delay of pre-emptive technology surviviability improvements.	-	10.995	9.882
Title: Vehicle Protection Suite Government Engineering and Program Management ***Description:*** Government program management support and program oversight.	4.423	4.170	5.906

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 Plans: Continued government program management support to support VPS program planning, to include the oversight of MAC characterization and development of MAC-compliant VPS survivability sets and initiation of Surivivability Improvement projects. ***FY 2021 Plans:*** Continuing government program management support to provide VPS program planning, to include the oversight of: MAC characterization and development of MAC-compliant, active, reactive, and passive VPS survivability set protection solutions and continuation of Surivivability Improvement projects. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase is due to additional personnel required to support new survivability improvements and LWR with MAC integration onto ground combat vehicle platforms.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	1.939	-
Title: FY 2019 Rescission	5.914	-	-
Accomplishments/Planned Programs Subtotals	25.887	42.698	82.459

	FY 2019	FY 2020
Congressional Add: Radar Sensor Technology ***FY 2020 Plans:*** Radar Sensor Technology	-	5.000
Congressional Adds Subtotals	-	5.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

C. Other Program Funding Summary ($ in Millions)

Remarks

In Fiscal Year (FY) 2021, $3.826 million in Reimbursable Manpower for this line has been realigned from Reimbursable Civilian Funding to Direct Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

D. Acquisition Strategy

In FY 2018, the VPS program initiated characterization of the MAC compliant/NDI capabilities (hardware, software, interfaces, etc.) to inform the VPS Trade Study. The MAC compliant/NDI capabilities characterization efforts will be achieved through bailments, Cooperative Research and Development Agreements (CRADA), and Other Transactional Agreements (OTA) with industry partners. The VPS Trade Study will assess the cost, maturity, complexity, performance, and physical properties of alternative survivability sets to determine the optimal application of VPS solutions onto the Army's ground combat platforms. The VPS Tranche II solutions (soft and hard kill integration with MAC, threat detection, passive and active signature management, active blast defeat, and other protection technologies) based on the results of the Trade Study will have a decision point and program initiation in FY 2020. Along with the Tranche II activities starting in FY 2020, the VPS program will initiate MAC with LWR integration onto ground combat vehicle platforms, logistics product development, and software development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Protection Suite Program Management	MIPR	TACOM Warren, Michigan : Various	0.446	4.423	Oct 2018	4.332	Feb 2020	5.906	Oct 2020	-		5.906	24.549	39.656	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.939		-		-		-	0.000	1.939	-
		Subtotal	0.446	4.423		6.271		5.906		-		5.906	24.549	41.595	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAC Framework Integration of Non-Developmental Items (NDI) and Developmental Technologies	MIPR	Various TACOM Warren : Warren, MI	10.210	12.026	Dec 2018	23.494	Jun 2020	66.671	Jun 2021	-		66.671	32.010	144.411	-
Survivability Improvements	MIPR	Various TACOM Warren : Warren, MI	-	-		10.306	Feb 2020	5.000	Oct 2020	-		5.000	230.687	245.993	-
Radar Sensor Technology	TBD	Various TACOM Warren : Warren, MI	-	-		5.000	Aug 2020	-		-		-	0.000	5.000	-
FY 2019 Rescission	Allot	N/A : N/A	-	5.914		-		-		-		-	0.000	5.914	-
		Subtotal	10.210	17.940		38.800		71.671		-		71.671	262.697	401.318	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Protection Suite Trade Study	MIPR	Various : TACOM Warren Michigan	-	2.806	Jan 2019	-		-		-		-	0.000	2.806	-
		Subtotal	-	2.806		-		-		-		-	0.000	2.806	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Survivability Improvements	MIPR	Various TACOM Warren : Warren, MI	-	-		0.528	Jun 2020	4.882	Jun 2021	-		4.882	1.823	7.233	-
MAC Framework Integration of Non-Developmental Items (NDI) and Developmental Technologies	MIPR	Various TACOM Warren : Warren, MI	-	0.718	Jul 2019	2.099	Jun 2020	-		-		-	76.663	79.480	-
		Subtotal	-	0.718		2.627		4.882		-		4.882	78.486	86.713	N/A

Remarks

N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.656	25.887		47.698		82.459		-		82.459	365.732	532.432	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

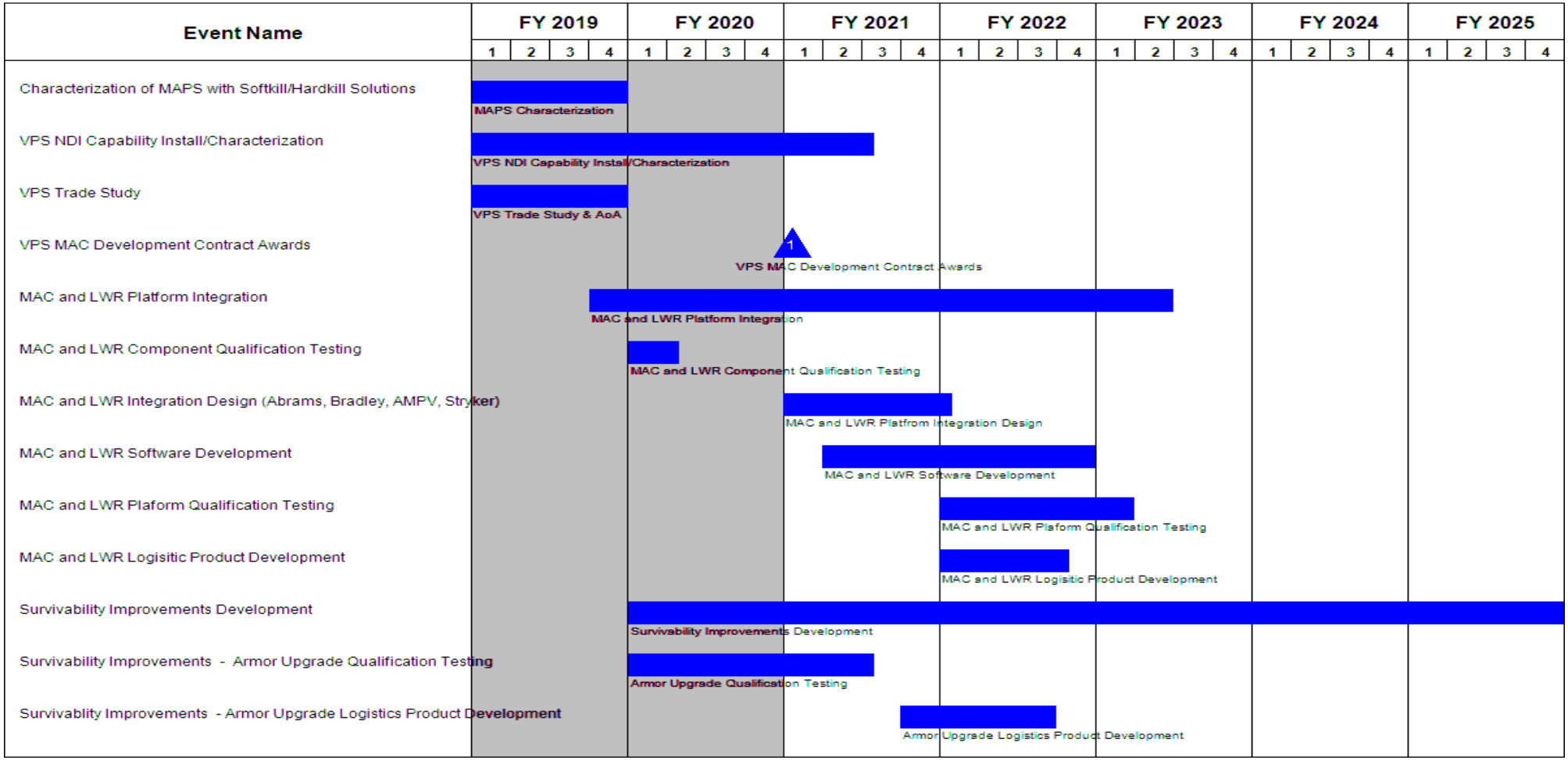

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

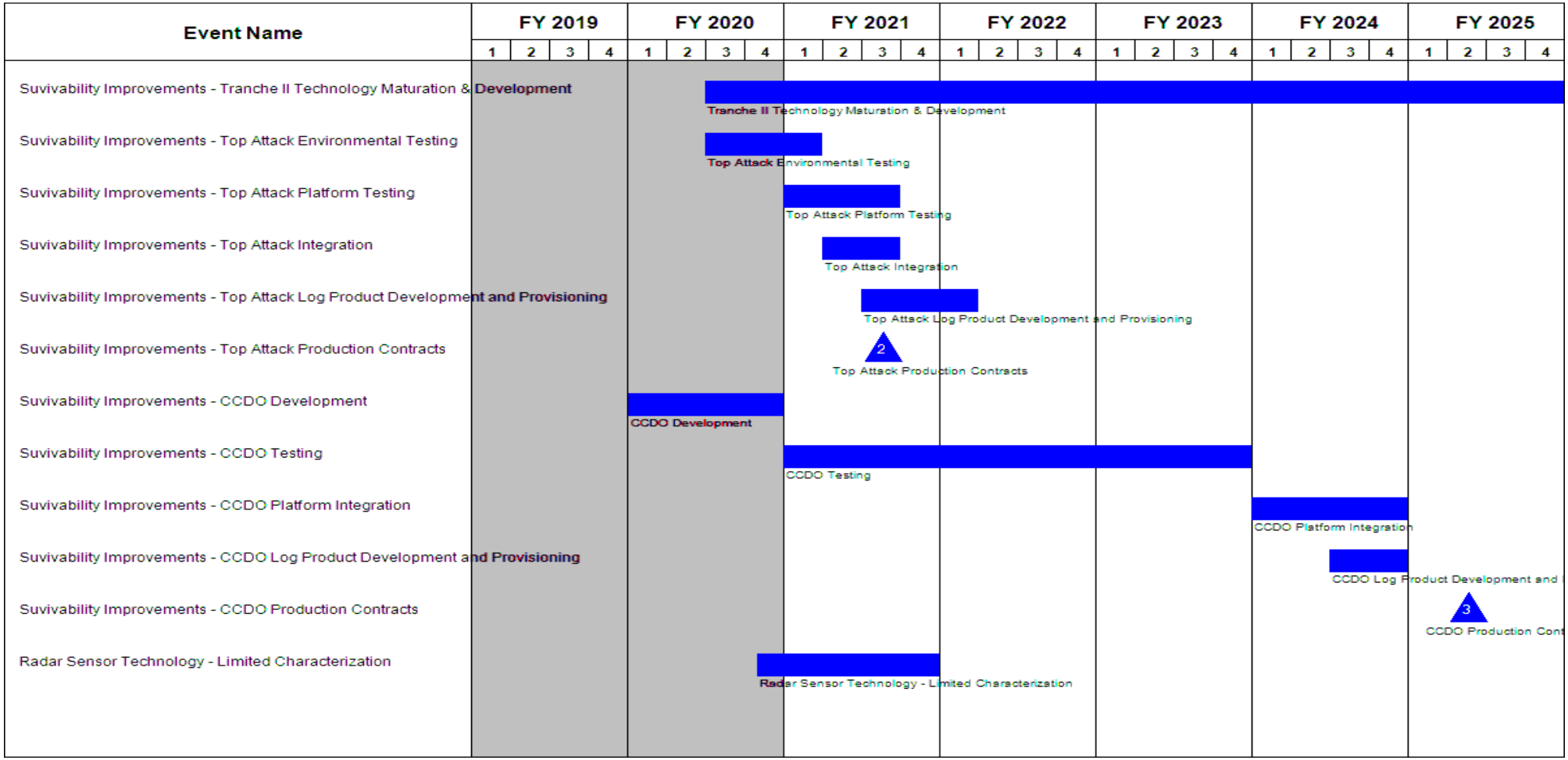

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Characterization of MAPS with Softkill/Hardkill Solutions	1	2019	4	2019
VPS NDI Capability Install/Characterization	2	2018	3	2021
VPS Trade Study	2	2018	4	2019
VPS MAC Development Contract Awards	1	2021	1	2021
MAC and LWR Platform Integration	4	2019	2	2023
MAC and LWR Component Qualification Testing	1	2020	2	2020
MAC and LWR Integration Design (Abrams, Bradley, AMPV, Stryker)	1	2021	1	2022
MAC and LWR Software Development	2	2021	4	2022
MAC and LWR Plaform Qualification Testing	1	2022	1	2023
MAC and LWR Logisitic Product Development	1	2022	4	2022
Survivability Improvements Development	1	2020	4	2025
Survivability Improvements - Armor Upgrade Qualification Testing	1	2020	3	2021
Survivablity Improvements - Armor Upgrade Logistics Product Development	4	2021	3	2022
Suvivability Improvements - Tranche II Technology Maturation & Development	3	2020	4	2025
Suvivability Improvements - Top Attack Environmental Testing	3	2020	1	2021
Suvivability Improvements - Top Attack Platform Testing	1	2021	3	2021
Suvivability Improvements - Top Attack Integration	2	2021	3	2021
Suvivability Improvements - Top Attack Log Product Development and Provisioning	3	2021	1	2022
Suvivability Improvements - Top Attack Production Contracts	3	2021	3	2021
Suvivability Improvements - CCDO Development	1	2020	4	2020
Suvivability Improvements - CCDO Testing	1	2021	4	2023
Suvivability Improvements - CCDO Platform Integration	1	2024	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Suvivability Improvements - CCDO Log Product Development and Provisioning	3	2024	4	2024
Suvivability Improvements - CCDO Production Contracts	2	2025	2	2025
Radar Sensor Technology - Limited Characterization	4	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

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
XU9: *Active Protection System*	-	24.493	37.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	61.993
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

There is no funding request for Program Element (PE) 0604852A Suite of Survivability Enhancement Systems - EMD Project XU9 Active Protection System in Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

The Active Protection System effort will install and characterize Non-Developmental Item (NDI) Active Protection Systems on Abrams, Bradley, and Stryker demonstrator vehicles. The Active Protection System effort will assess the maturity, performance, and integration risk of NDI Active Protection Systems, develop and refine Abrams, Bradley, and Stryker Active Protection System installation kit designs, and build prototypes necessary to conduct performance and safety testing to obtain an Active Protection System Urgent Materiel Release (UMR). The Active Protection System NDI effort will also serve to inform the Vehicle Protection Suite Analysis of Alternatives (AoA).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Abrams	-	9.148	-
Description: Funding provided supports APS test support for the M1A2 SEPv3 ***FY 2020 Plans:*** The Abrams APS effort completed the necessary characterization and government, contractor and safety testing of the modified Abrams APS A-Kit with the existing B-Kit on an M1A2 SEPv3 to obtain an Abrams APS Urgent Material Release. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Abrams APS complete: There is no funding request for PE 0604852A Suite of Survivability Enhancement Systems - EMD Project XU9 Active Protection System in FY 2021.			
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Bradley	24.493	26.649	-
Description: Funding provided support APS integration and test support for Bradley ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Completed engineering, logistics, and program management to mature the Bradley APS integration kit design, developed software releases across Bradley vehicle variants to operate the APS, and executed contractor testing of the vehicle software version updates prior to the execution of system performance and safety testing necessary to obtain a Bradley APS UMR. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Bradley APS: There is no funding request for PE 0604852A Suite of Survivability Enhancement Systems - EMD Project XU9 Active Protection System in FY 2021.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	1.703	-
Accomplishments/Planned Programs Subtotals	24.493	37.500	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• GA0700: *M1 Abrams Tank (MOD)*	959.041	353.292	392.013	-	392.013	374.060	387.201	389.299	497.035	Continuing	Continuing
• GZ2400: *Bradley Program (MOD)*	514.424	415.740	493.109	-	493.109	467.648	261.313	54.993	30.562	Continuing	Continuing
• GM0100: *Stryker (Mod)*	127.289	397.687	0.000	-	0.000	-	-	-	-	Continuing	Continuing

Remarks

Stryker is not resourced to procure any active protection systems.

D. Acquisition Strategy

The Active Protection System Project XU9 is a continuation of efforts previously executed under PE 0203735A - Combat Vehicle Improvement Programs.

The APS installation and characterization effort will evaluate platform (Abrams, Bradley, Stryker) performance with an NDI APS solution installed. Platform performance evaluation includes APS sensor assessments, minimum live threat characterization, surface danger zone characterization, co-site mitigation (antennas/radiators), electromagnetic interference assessment/characterization, energetic radiation assessment, and a durability assessment. The NDI APS installation and characterization is being executed through a partnership between the US Army, NDI APS solution vendors, and prime contractors for Abrams, Bradley, and Stryker vehicles. NDI APS vendor support, to include procurement of demonstration hardware, is contracted on a Firm-Fixed Price (FFP) basis, while platform prime contractor technical support

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

is provided on a Cost Plus Fixed-Fee (CPFF) basis. The results from the installation and characterization effort has resulted in moving forward with installation design refinement and required testing to meet urgent fielding of NDI APS on Abrams and Bradley. Characterization of APS solutions for Stryker revealed that while they were capable of intercepting threats, no solutions were suitable for Stryker. Continued limited characterizations of APS solutions are planned to better understand their functionality, generate performance data, and determine if future integration onto a Stryker platform is feasible.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.703		-		-		-	0.000	1.703	-
		Subtotal	-	-		1.703		-		-		-	0.000	1.703	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Active Protection System (APS) Installation Kit Development and Prototype Build - Abrams	SS/ Various	US Army TARDEC; Rafael Advanced Defense Systems; General Dynamics Land Systems (GDLS) : Warren, MI	9.902	-		-		-		-		-	0.000	9.902	-
Active Protection System (APS) Installation Kit Development and Prototype Build - Bradley	SS/ Various	US Army TARDEC; Israeli Military Industries (IMI); BAE Systems : Warren, MI	8.865	23.687	Aug 2019	26.189	Feb 2020	-		-		-	0.000	58.741	-
Active Protection System (APS) Installation Kit Development and Prototype Build - Stryker	SS/ Various	US Army TARDEC; Artis, LLC.; General Dynamics Land Systems (GDLS) : Warren, MI	0.061	-		-		-		-		-	0.000	0.061	-
Active Protection System (APS) Installation Kit Development and Prototype Build - 4th System	C/CPIF	Contract : Texas	25.000	-		-		-		-		-	0.000	25.000	-
		Subtotal	43.828	23.687		26.189		-		-		-	0.000	93.704	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO) Support	MIPR	PEO Ground Combat Systems : Warren, MI	3.276	0.180	Oct 2018	0.176	Jul 2020	-		-		-	0.000	3.632	-
		Subtotal	3.276	0.180		0.176		-		-		-	0.000	3.632	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing - Abrams Active Protection System (APS)	MIPR	Various : Army Test Centers	19.782	-		9.432	Feb 2020	-		-		-	0.000	29.214	-
Government Testing - Bradley Active Protection System (APS)	MIPR	Various : Army Test Centers	9.271	0.626	Jan 2019	-		-		-		-	0.000	9.897	-
Government Testing - Stryker Active Protection System (APS)	MIPR	Various : Army Test Centers	3.374	-		-		-		-		-	0.000	3.374	-
		Subtotal	32.427	0.626		9.432		-		-		-	0.000	42.485	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	79.531	24.493		37.500		-		-		-	0.000	141.524	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

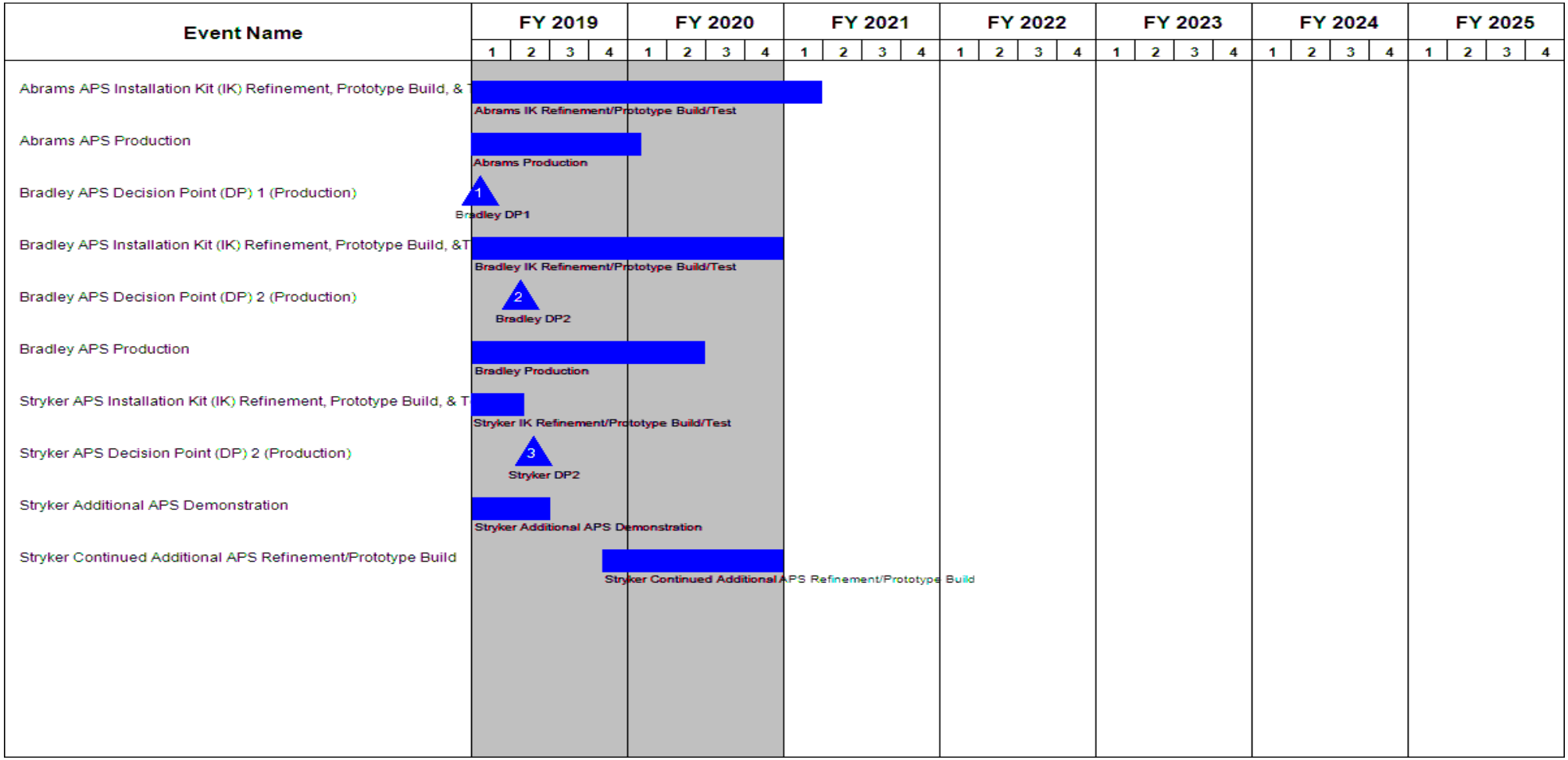

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Abrams APS Demonstrator Design and Install	3	2016	1	2017
Abrams APS Characterization	1	2017	4	2017
Abrams APS Decision Point (DP) 1 (Production)	1	2018	1	2018
Abrams APS Installation Kit (IK) Refinement, Prototype Build, & Test	1	2018	1	2021
Abrams APS Decision Point (DP) 2 (Production)	2	2018	2	2018
Abrams APS Production	2	2018	1	2020
Bradley APS Demonstrator Design and Install	4	2016	4	2017
Bradley APS Characterization	4	2017	3	2018
Bradley APS Decision Point (DP) 1 (Production)	1	2019	1	2019
Bradley APS Installation Kit (IK) Refinement, Prototype Build, &Test	1	2019	4	2020
Bradley APS Decision Point (DP) 2 (Production)	2	2019	2	2019
Bradley APS Production	1	2019	2	2020
Stryker APS Demonstrator Design and Install	4	2016	3	2017
Stryker APS Characterization	4	2017	2	2018
Stryker APS Decision Point (DP) 1 (Production)	2	2018	2	2018
Stryker APS Installation Kit (IK) Refinement, Prototype Build, & Test	3	2018	2	2019
Stryker APS Decision Point (DP) 2 (Production)	2	2019	2	2019
Stryker Additional APS Demonstration	1	2019	2	2019
Stryker Continued Additional APS Refinement/Prototype Build	4	2019	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.722	10.732	11.611	-	11.611	35.263	7.988	4.871	17.436	Continuing	Continuing
509: *LIGHTWEIGHT 155M HOWITZER*	-	1.722	7.632	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.354
HB6: *Mobile 155MM Howitzer*	-	0.000	3.100	11.611	-	11.611	35.263	7.988	4.871	17.436	Continuing	Continuing

Note

Project 509 LIGHTWEIGHT 155M HOWITZER funding decrease from Fiscal Year (FY) 2020 to FY 2021 is the result of the completion of the operational demonstration of the M777 Extended Range Howitzer.

A. Mission Description and Budget Item Justification

This program element encompasses engineering and manufacturing development for artillery weapons systems.

Project 509 supports the Lightweight 155mm Howitzer (LW155), also known as the M777A2, which is a Joint Service program between the United States Marine Corps (USMC) and US Army which provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. The LW155 was first introduced into the USMC in April 2005 and the Marines have fielded the howitzer to all active units. The Army fielded the howitzer to its Stryker Brigade Combat teams (SBCT), Fires Brigades, National Guard and Infantry Brigade Combat Teams (IBCT). The LW155 fires unassisted projectiles to a range of 30 kilometers (km) and assisted projectiles to 40km. It is a successful joint service program between the USMC and US Army working together to develop, produce, field, and sustain the howitzer. The howitzer will be going through obsolescent replacement of electronic components in its digital fire control system, since it has been in the field for more than ten years.

Current development efforts are focused on extending the range of the LW155 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (greater than 40km) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (greater than 70km). An operational demonstration of the M777 Extended Range (M777ER) howitzer will be conducted at the end of FY 2020 to assess the performance of best available projectiles and objective hardware of M777ER howitzer.

Project HB6 supports the mobile howitzer program. The Mobile 155mm Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing towed howitzer systems. Program activities in FY 2021 will be focused on using Cooperative Research and Development Agreements

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604854A *I Artillery Systems - EMD*

(CRADAs) to evaluate vendor mobile howitzer systems against system requirements. Evaluation will include safety testing, US ammunition compatibility testing, and assessment of mobility, survivability and transportability.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	1.779	15.832	7.626	-	7.626
Current President's Budget	1.722	10.732	11.611	-	11.611
Total Adjustments	-0.057	-5.100	3.985	-	3.985
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.100			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.057	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.985	-	3.985

Change Summary Explanation

The increase in FY 2021 funding is due to ramp up from risk testing in FY 2020 to full testing and bid sample test occurring in FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

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
509: *LIGHTWEIGHT 155M HOWITZER*	-	1.722	7.632	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.354
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding decrease from Fiscal Year (FY) 2020 to FY 2021 is the result of the completion of the operational demonstration of the M777 Extended Range Howitzer.

A. Mission Description and Budget Item Justification

The Lightweight 155 millimeter (mm) Howitzer (LW155), also known as the M777A2, is a Joint Service program between the United States Marine Corps (USMC) and United States Army which provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. The LW155 was first introduced into the USMC in April 2005 and the Marines have fielded the howitzer to all active units. The Army fielded the howitzer to its Stryker Brigade Combat teams (SBCT), Fires Brigades, National Guard and Infantry Brigade Combat Teams (IBCT). The LW155 saw extensive action in Afghanistan, receiving high marks for its performance. It replaces all howitzers in all USMC missions and replaces the M198 howitzer as the general support artillery for light forces in the Army. The LW155 fires unassisted projectiles to a range of 30 kilometers (km) and assisted projectiles to 40km. The addition of the digital fire control system enables the weapon to program and fire the improved Excalibur precision-guided munitions to ranges in excess of 40km with better than 10-meter Circular Error Probable (CEP) accuracy. The LW155 is the first ground combat system whose major structures are made of high strength titanium alloy and the system makes extensive use of hydraulics to operate the breech, load tray, recoil and wheel arms. It is a successful joint service program between the USMC and United States Army working together to develop, produce, field, and sustain the howitzer. The howitzer will be going through obsolescent replacement of electronic components in its digital fire control system, since it has been in the field for more than ten years.

Production and fielding of the LW155 concluded and entered into the Sustainment Life Cycle Phase. Current development efforts are focused on extending the range of the LW155 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (greater than 40km) as stated in the Joint United States Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and United States Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the United States Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (greater than 70km). An operational demonstration of the M777 Extended Range (M777ER) howitzer will be conducted at the end of FY 2020 to assess the performance of best available projectiles and objective hardware of M777ER howitzer.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Management Services ***Description:*** Funding supports management services within the Program Management Office, Towed Artillery Systems	0.204	-	-
Title: Product Development	1.518	5.459	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Funds engineering support from the Armaments Research Development and Engineering Center ***FY 2020 Plans:*** Funding supported the integration of enhanced structural components and recoil system components into the M777 Extended Range (M777ER) howitzer for the Operational Assessment. Also, funding supported Digital Fire Control System software update to include firing tables updates for new projectiles and corresponding NATO Ballistic Kernel integration. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease from FY 2020 to FY 2021 is the result of the completion of the operational demonstration of the M777 Extended Range Howitzer.			
Title: Opertional Assessment ***Description:*** Funding will support operational assessment of M777 Extended Range Howitzer in a controlled test environment. ***FY 2020 Plans:*** Funding supported the Operational Assessment of the M777ER scheduled for 4th Quarter FY 2020. Operational Assessment evaluated transportability and mobility of production-representative M777ER hardware and measured range of best available projectiles. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease from FY 2020 to FY 2021 is the result of the completion of the operational demonstration of the M777 Extended Range Howitzer.	-	1.827	-
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:*** Funding transferred in accordance with Title 15 USC 638	-	0.346	-
Accomplishments/Planned Programs Subtotals	1.722	7.632	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• GZ1700: *M777 Mods*	3.086	2.367	10.983	-	10.983	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

Procurement funding supports active retrofits and hardware refresh for previously contracted Digital Fire Control System components, addressing obsolescence.

D. Acquisition Strategy

Production and fielding of the M777A2 has concluded and has now entered into the Sustainment Life Cycle Phase. Current Research Development Test & Evaluation (RDTE) efforts are focused on extending the range of the M777A2 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (>40 KM) as stated in the Joint US Army, USMC JORD for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the ERCA program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (>70KM). An operational demonstration of the M777 Extended Range howitzer will be conducted at the end of FY 2020 to support the decision point for procurement in support of an Urgent Materiel Release.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Sub Allot	Program Management Towed Artillery Systems : Picatinny Arsenal, NJ	0.794	0.204	Nov 2018	-		-		-		-	0.000	0.998	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.346		-		-		-	0.000	0.346	-
		Subtotal	0.794	0.204		0.346		-		-		-	0.000	1.344	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Armaments Research & Developmet Center : Picatinny Arsenal, NJ	6.956	1.518	Nov 2018	5.459	Nov 2019	-		-		-	0.000	13.933	Continuing
Long Lead Prototypes	MIPR	Watervliet Arsenal : Watervliet, NY	1.920	-		-		-		-		-	0.000	1.920	Continuing
		Subtotal	8.876	1.518		5.459		-		-		-	0.000	15.853	N/A

Remarks

FY 2020 increase funds the operational assessment of the M777 Extended Range (M777ER) howitzer for the Army's modernization Long Range Precision Fires.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Assessment	MIPR	Army Test & Evaluation Command : Yuma, AZ	-	-		1.827	Jul 2020	-		-		-	0.000	1.827	Continuing
		Subtotal	-	-		1.827		-		-		-	0.000	1.827	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
FY2020 increase funds test center costs in support of the Operational Assessment at Yuma Test Center.															

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.670	1.722		7.632		-		-		-	0.000	19.024	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

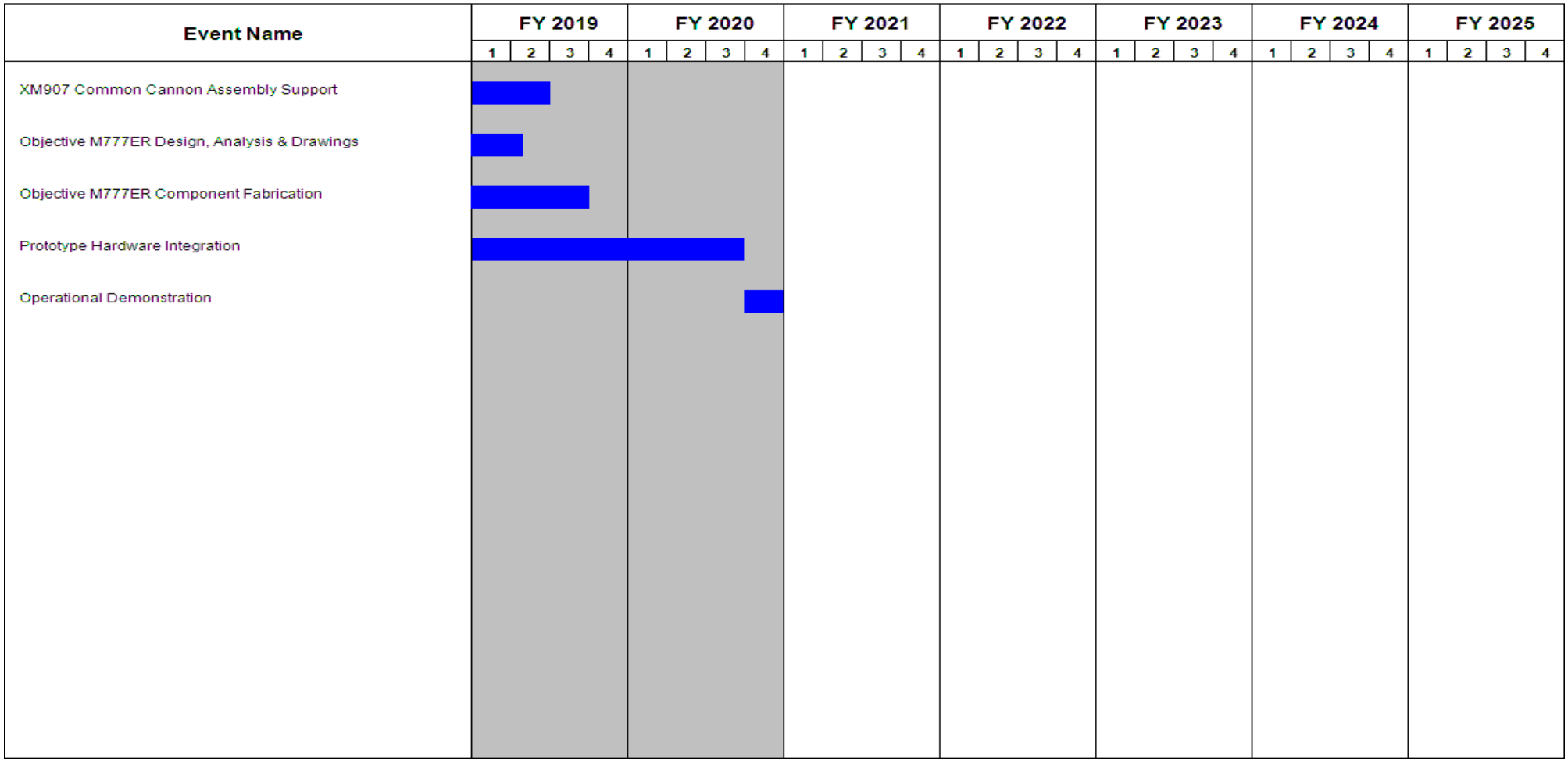

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
XM907 Common Cannon Assembly Support	1	2015	2	2019
Objective M777ER Design, Analysis & Drawings	1	2015	1	2019
Objective M777ER Component Fabrication	2	2018	3	2019
Prototype Hardware Integration	1	2019	3	2020
Operational Demonstration	4	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) HB6 / *Mobile 155MM Howitzer*	

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
HB6: *Mobile 155MM Howitzer*	-	0.000	3.100	11.611	-	11.611	35.263	7.988	4.871	17.436	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project HB6 supports the mobile howitzer program. The Mobile 155 millimeter (mm) Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing and future towed howitzer systems. Program activities in Fiscal Year (FY) 2021 will be focused on evaluation of vendor mobile howitzer systems against system requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Mobile Howitzer Analysis ***Description:*** Conducts analysis of prototype and existing mobile howitzers. ***FY 2020 Plans:*** Funding conducted the analysis of prototype and existing mobile howitzers and evaluate systems based on mobility and survivability attributes. Suitable systems were further assessed in an operational environment. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease is the result of proceeding into testing of mobile systems.	-	2.959	-
Title: Testing and Engineering Support ***Description:*** Live fire testing of Mobile Howitzer and associated engineering support. ***FY 2021 Plans:*** Funding will provide range time for United States (US) ammunition compatibility testing and system safety release to mature systems for operational evaluation. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase is due to ramp up from risk reduction testing to full testing in FY 2021.	-	-	9.226
Title: Bid Sample Test	-	-	2.385

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile 155MM Howitzer*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Funding will support engineering and operational evaluation of Mobile Howitzer vendor systems against the Operational Needs Statement (ONS). ***FY 2021 Plans:*** Funding will support engineering and operational evaluation of Mobile Howitzer vendor systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase is the result of mobile howitzer bid sample test occurring in FY 2021.			
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:*** Funding transferred in accordance with Title 15 USC 638	-	0.141	-
Accomplishments/Planned Programs Subtotals	-	3.100	11.611

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for the Mobile Howitzer Program is to evaluate existing industry prototypes and fielded systems and assess capability of mobility and survivability attributes. Evaluation will be conducted by US Army engineers and the Army Test and Evaluation Command.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) HB6 / *Mobile 155MM Howitzer*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.141		-		-		-	0.000	0.141	-
		Subtotal	-	-		0.141		-		-		-	0.000	0.141	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobile Howitzer Analysis	MIPR	Combat Capability Development Command, Armaments Center : Picatinny Arsenal, NJ	-	-		2.959	Oct 2019	-		-		-	0.000	2.959	-
		Subtotal	-	-		2.959		-		-		-	0.000	2.959	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing and Engineering Support	MIPR	Yuma Test Center / Combat Capability Development Command, Armaments Center : Yuma, AZ / Picatinny, NJ	-	-		-		9.226	Oct 2020	-		9.226	Continuing	Continuing	-
Bid Sample Test	MIPR	Yuma Test Center : Yuma, AZ	-	-		-		2.385	Jul 2021	-		2.385	0.000	2.385	-
		Subtotal	-	-		-		11.611		-		11.611	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		3.100		11.611		-		11.611	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) HB6 / *Mobile 155MM Howitzer*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile 155MM Howitzer*

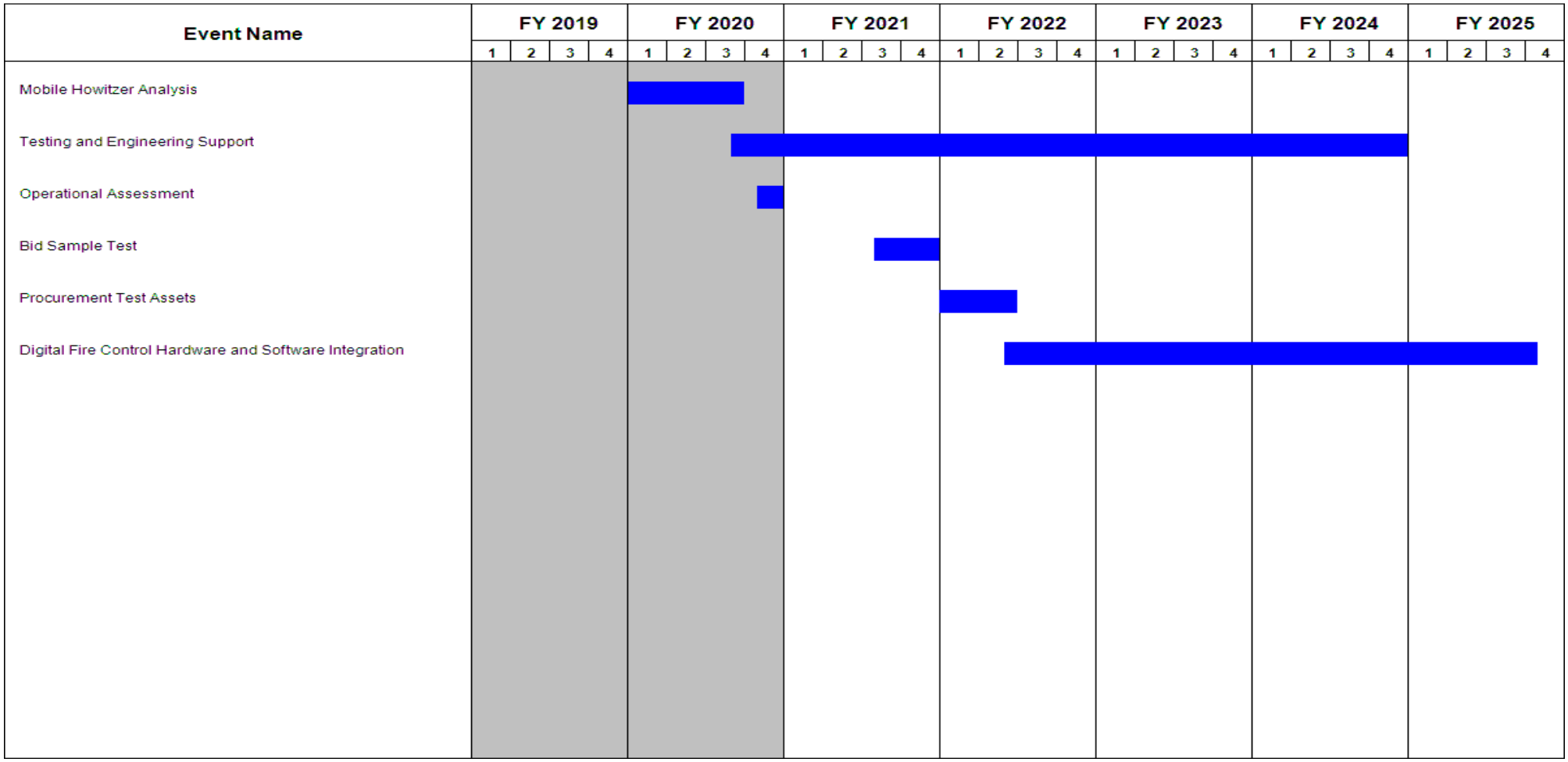

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile 155MM Howitzer*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mobile Howitzer Analysis	1	2020	3	2020
Testing and Engineering Support	3	2020	4	2024
Operational Assessment	4	2020	4	2020
Bid Sample Test	3	2021	4	2021
Procurement Test Assets	1	2022	2	2022
Digital Fire Control Hardware and Software Integration	2	2022	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605013A *I Information Technology 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	-	74.551	88.689	142.678	-	142.678	122.951	133.093	171.810	44.313	0.000	778.085
099: *Army Human Resource System*	-	1.424	2.270	0.981	-	0.981	0.315	0.210	0.000	0.000	0.000	5.200
184: *Installation Support Modules*	-	1.547	1.377	1.410	-	1.410	1.277	1.294	1.307	1.320	0.000	9.532
193: *Medical Communications For Combat Casualty*	-	2.367	0.052	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.419
738: *AcqBiz*	-	22.400	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.400
FE9: *ALTESS (P&R Forms)*	-	0.112	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.112
FL9: *Army Accessioning IT Development*	-	0.000	31.279	48.727	-	48.727	25.081	17.243	16.378	14.302	0.000	153.010
FM7: *Human Resouces Information Technology*	-	0.000	9.102	13.682	-	13.682	13.624	13.664	7.734	7.771	0.000	65.577
FM8: *Information Technology for Training Systems*	-	0.000	18.320	41.697	-	41.697	33.798	24.495	4.167	4.213	0.000	126.690
FM9: *Information Technology for Criminal Investigations*	-	0.000	1.142	1.236	-	1.236	1.241	1.244	1.246	1.258	0.000	7.367
T04: *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	-	17.802	15.236	10.971	-	10.971	11.372	2.233	0.000	0.000	0.000	57.614
T05: *Army Business System Modernization Initiatives*	-	27.530	5.720	20.818	-	20.818	33.024	69.445	137.680	12.118	0.000	306.335
VR3: *ASMIS-R (REPORTIT)*	-	1.369	2.836	3.156	-	3.156	3.219	3.265	3.298	3.331	0.000	20.474
XV6: *Army Leader Dashboard*	-	0.000	1.355	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.355

A. Mission Description and Budget Item Justification

This program supports efforts to plan, design, develop, and test information technology solutions to fulfill the Army's Warfighter Support Mission and accommodate changing Army requirements while fulfilling future Army needs. Provides for development and acquisition of Combat Service Support (CSS) and business information technology solutions to help arm, sustain, fix, move, train and man the force. Completed development/acquisition efforts will also enhance sustaining base functions

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*

and power projection capabilities and facilitate global messaging and electronic data interchange (EDI). Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	77.686	126.537	150.493	-	150.493
Current President's Budget	74.551	88.689	142.678	-	142.678
Total Adjustments	-3.135	-37.848	-7.815	-	-7.815
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-37.848			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.135	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-7.815	-	-7.815

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 099 / *Army Human Resource System*	

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
099: *Army Human Resource System*	-	1.424	2.270	0.981	-	0.981	0.315	0.210	0.000	0.000	0.000	5.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Human Resource System (099) contains the following programs: Go Army Education managed by the Human Resource Command, Commanders Risk Reduction Dashboard managed by Program Executive Office Enterprise Information Systems (PEO EIS) and Regional Level Applications Software (RLAS) managed by United States Army Reserves (USAR).

In support of recruiting and retention for a more educated workforce, GoArmyEd is the virtual financial management portal and decision-support tool for 1) AD, USAR and ARNG Soldiers to request Tuition Assistance (TA); 2) Cadets to request Scholarship payments and 3) Department of the Army (DA) Civilians and Apprentices to request professional development funds. GoArmyEd is an enterprise system that enforces eligibility for higher education funds and creates efficiencies with its automated processes. Soldiers, Scholarship Cadets, DA Civilians and Apprentices use it to pursue post-secondary educational goals and professional development objectives; Army Education Counselors use it to provide educational guidance; Career Program Managers and Training Managers use it to manage civilian training; and Academic Institutions use it to deliver degree and course offerings and to report user progress and degree completions for 206K Soldiers, Cadets and Civilians.

Commanders Risk Reduction Dashboard (CRRD) began with the identification of capability gaps arising out of the 2010 Red Book and 2012 Gold Book, two extensive studies directed by senior army leadership to examine suicide prevention (Red Book) and the Army's health and discipline (Gold Book). The studies illustrated that Commanders faced capability gaps in their ability to identify high risk behavior and risk factors, analyze soldier and unit risk, and identify risk trends and develop intervention strategies. CRRD provides Commanders at echelons Company through Major Army Command the ability to visualize and take preventive action to mitigate risk factors impacting their soldiers and formations by going to one dashboard and seeing data from multiple data sources. CRRD has additional enhancements projected for the programmed $621K to improve the Increment (INC) II capability release.

The United States Army Reserve (USAR) utilizes the Regional Level Application Software (RLAS) as an enterprise system for duty attendance, military pay, Soldier records management and training calendar management to access, transact, store and manage Soldier and unit data required to conduct synchronized USAR operations. Unlike the Army Active Component (AC) where Soldier military pay is centrally managed and input at the installation level, the USAR utilizes RLAS to manage and input decentralized Soldier pay transactions at the unit level. RLAS consists of four modules: Pay, Personnel, Training, and Resource Management. Research and Development (R&D) authority and funding will provide RLAS with investment funds for necessary system development and system modifications. R&D funding amounts increase slightly towards the end of RLAS lifecycle (FY 2019 and 2020) in order to fully support the Integrated Pay and Personnel System - Army (IPPS-A) transition. Annually, USAR will provide sustainment funding. R&D authority and sustainment funding will meet the USAR Staff Judge Advocate (SJA) and Office of the Secretary of Defense Judge Advocate General (OTJAG) opinions regarding defense information Technology (IT) system for R&D activities. Necessary RLAS system development and system modifications include: 1) IPPS-A interface requirements; 2) implementing Microsoft .net Framework 4.5 standards; 3) implementing new Operating Systems (OS), system utilities and other technology products. Enhanced development and modification to RLAS will improve RLAS system

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

capabilities and bring RLAS into compliance with various Army Cyber Command (ARCYBER) and audit readiness requirements. RLAS will continue to process duty attendance, military pay, Soldier personnel transactions and training calendars until the system is fully subsumed by IPPS-A.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Commanders Risk Reduction Dashboard (CRRD) ***Description:*** CRRD is a capability that enable Commanders in the U.S. Army to identify, act upon, monitor, track, and manage soldier-level and unit-level risk. CRRD will consolidate information from multiple Army databases and present to commanders a concise dashboard visualizing which Soldiers and units within their command are impacted by a variety of risk factors. ***FY 2020 Plans:*** In FY 2020 the CRRD tool will develop additional interfaces as required by Commanders as they become more familiar with the system's capability, and refinement of existing capability based upon Commander feedback. The funding also enables interface and capability development for Executive Officers, First Sergeants, and Command Sergeants Major as authorization to use the CRRD capability grows to include those user groups (currently under policy review). Funding will also enable refinement of predictive analytics and the ability to generate and print additional reports based on Commander feedback. ***FY 2021 Base Plans:*** CRRD has additional enhancements projected for the programmed $621K to improve the Increment (INC) II capability release. Anticipation of new features and functionality to support the CRRD mission and growth. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRRD moves from full deployment to capability support from FY 2020 to FY 2021. The decrease in required funding in FY 2021 supports the anticipated new features and functionality to support the program mission and growth.	0.100	1.533	0.571	-	0.571
Title: GoArmyEd Modernization ***Description:*** GoArmyEd is an IT financial management portal and decision support tool for Soldiers, Cadets, and Civilians to request Tuition Assistance (TA) and Credentialing Assistance(CA), Scholarship Cadet payments and Army civilians to request training funds online, anytime for classroom, distance learning, and college courses. GoArmyEd enforces policies, procedures and eligibility for over $492M of funds supporting Soldier and Scholarship Cadets? higher education goals; and Civilians and Apprentices? professional development. The modernized GoArmyEd?s automated interfaces will reduce manpower and other costs while improving all users? interactions and enhancing security features. Funding will support continued modernization/automation of GoArmyEd functionality and the transition to the HRC Data Center from a vendor	0.772	0.216	0.050	-	0.050

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
datacenter. When the modernized system acquires all functionality, the legacy system will be deactivated. In support of recruiting and retention for a more educated workforce, GoArmyEd is the virtual financial management portal and decision-support tool for 1) AD, USAR and ARNG Soldiers to request Tuition Assistance (TA); 2) Cadets to request Scholarship payments and 3) Department of the Army (DA) Civilians and Apprentices to request professional development funds. GoArmyEd is an enterprise system that enforces eligibility for higher education funds and creates efficiencies with its automated processes. Soldiers, Scholarship Cadets, DA Civilians and Apprentices use it to pursue post-secondary educational goals and professional development objectives; Army Education Counselors use it to provide educational guidance; Career Program Managers and Training Managers use it to manage civilian training; and Academic Institutions use it to deliver degree and course offerings and to report user progress and degree completions for 206K Soldiers, Cadets and Civilians. ***FY 2020 Plans:*** Finalize all contingency operations. Modern GoArmyEd goes live, current GoArmyEd deactivated. ***FY 2021 Base Plans:*** Finalize all contingency operations. Modern GoArmyEd goes live, current GoArmyEd will be deactivated. NOTE: Still trying to acquire additional RDT&E for GoArmyEd Modernization. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease as it's near completion.					
Title: Regional Level Application Software (RLAS) ***Description:*** The United States Army Reserve (USAR) utilizes the Regional Level Application Software (RLAS) as an enterprise system for duty attendance, military pay, Soldier records management and training calendar management to access, transact, store and manage Soldier and unit data required to conduct synchronized USAR operations. Unlike the Army Active Component (AC) where Soldier military pay is centrally managed and input at the installation level, the USAR utilizes RLAS to manage and input decentralized Soldier pay transactions at the unit level. RLAS consists of four modules: Pay, Personnel, Training, and Resource Management. R&D authority and funding will meet the USAR Staff Judge Advocate (SJA) and Office of the Secretary of Defense Judge Advocate General (OTJAG) opinions regarding defense information Technology (IT) system for R&D activities. Necessary RLAS system development and system modifications include: 1) Integrated Pay and Personnel System ? Army (IPPS-A) interface requirements; 2) implementing Microsoft .net Framework 4.5 standards; 3) implementing new Operating Systems (OS), system utilities and other technology	0.552	0.419	0.360	-	0.360

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
products. Enhanced development and modification will improve RLAS system capabilities and bring RLAS into compliance with various Army Cyber Command (ARCYBER) and audit readiness requirements. ***FY 2020 Plans:*** Leverage virtual platform environment -move RLAS into the Army.mil highest level Active Directory Domain allowing RLAS to be accessed by users worldwide - removing RLAS from the USAR ARNET AD Enclave (remove domain). Leverage .Net architecture to improve RLAS system performance and user experience for faster load times. ***FY 2021 Base Plans:*** Minor adjustments to be made to the Architecture in the virtual platform environment. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding is due to the minor adjustments being made to the RLAS architecture.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.102	-	-	-
Accomplishments/Planned Programs Subtotals	1.424	2.270	0.981	-	0.981

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OMA - CRRD: *Capability Support (Sustainment)*	2.280	-	6.710	-	6.710	7.360	5.840	5.250	5.530	0.000	32.970

Remarks

CRRD - OMA efforts support the sustainment labor support, software maintenance and hosting, and System Integrator support. FY 2019 - $2.28M, FY 2020 - $5.59M, FY 2021 - $6.71M, FY 2022 - $7.36M, FY 2023 - $5.84M, FY 2024 - $5.25M, FY 2025 - $5.53M. Note: CRRD OMA is funded via HQDA G-1.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

D. Acquisition Strategy

GoArmyEd - The program manager makes extensive use of Integrated Product Teams (IPTs). Sub-elements of the acquisition (engineering and design, logistics planning, testing, etc.) are intensively managed by integrated teams of government and contractor personnel. Task performance is tracked against the Work Breakdown Structure (WBS) and resources allocated to each task are adjusted based on performance against the WBS. GoArmyEd contractual efforts are acquired on a firm fixed price basis on existing contractual vehicles.

CRRD - CRRD uses an incremental acquisition approach and leverages user experience experiments (UXEs) for user inputs to allow for rapid development, maximum adoption, continuous product improvements, and technical innovation. The iterative development methodology will enable expedited deployment of the capability to the field while maintaining Acquisition control through Limited Deployment Authorities to Proceed and a competitively awarded sustainment contract.

RLAS - Will utilize GSA contract support to solicit FY 2020/2021 two-year software support & development contract - hybrid Firm Fixed Price & Time and Materials. RLAS will utilize GSA contract support to solicit FY 2021/2022/2023 three-year software support & development contract - hybrid Firm Fixed Price & Time and materials. RLAS will utilize existing USAR G6 hardware / servers / virtual environment / Active Directory / level 1-2 help desk / utility software / OS / DB / and other necessary hardware and devices as needed to operate the RLAS system.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/FFP	Acquisition Contract Center : Rock Island, Il	1.519	-		-		-		-		-	0.000	1.519	-
GoArmyEd Modernization	TBD	IBM : Various	0.591	-		-		0.050		-		0.050	0.000	0.641	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.102		-		-		-	0.000	0.102	-
		Subtotal	2.110	-		0.102		0.050		-		0.050	0.000	2.262	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AHRS - ECPs/SCPs/ICPs/ RLAS	C/FFP	Hewlitt Packard : various	89.251	0.513	Mar 2019	0.571		0.360		-		0.360	0.000	90.695	-
AHRS - Software Development	C/FFP	Hewlitt Packard : various	51.723	-		-		-		-		-	0.000	51.723	-
GoArmyEd Modernization	C/FFP	IBM : Various	16.852	0.732		0.195		-		-		-	0.000	17.779	-
CRRD	C/FFP	Various : Various	8.460	0.100	Nov 2018	1.402		0.571	Nov 2020	-		0.571	0.000	10.533	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	0.079		-		-		-		-	0.000	0.079	-
		Subtotal	166.286	1.424		2.168		0.931		-		0.931	0.000	170.809	N/A

Remarks

CRRD is developed Government to Government by the Army Analytics and Visualization Lab at Redstone Arsenal via competitively awarded development contracts.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	168.396	1.424		2.270		0.981		-		0.981	0.000	173.071	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

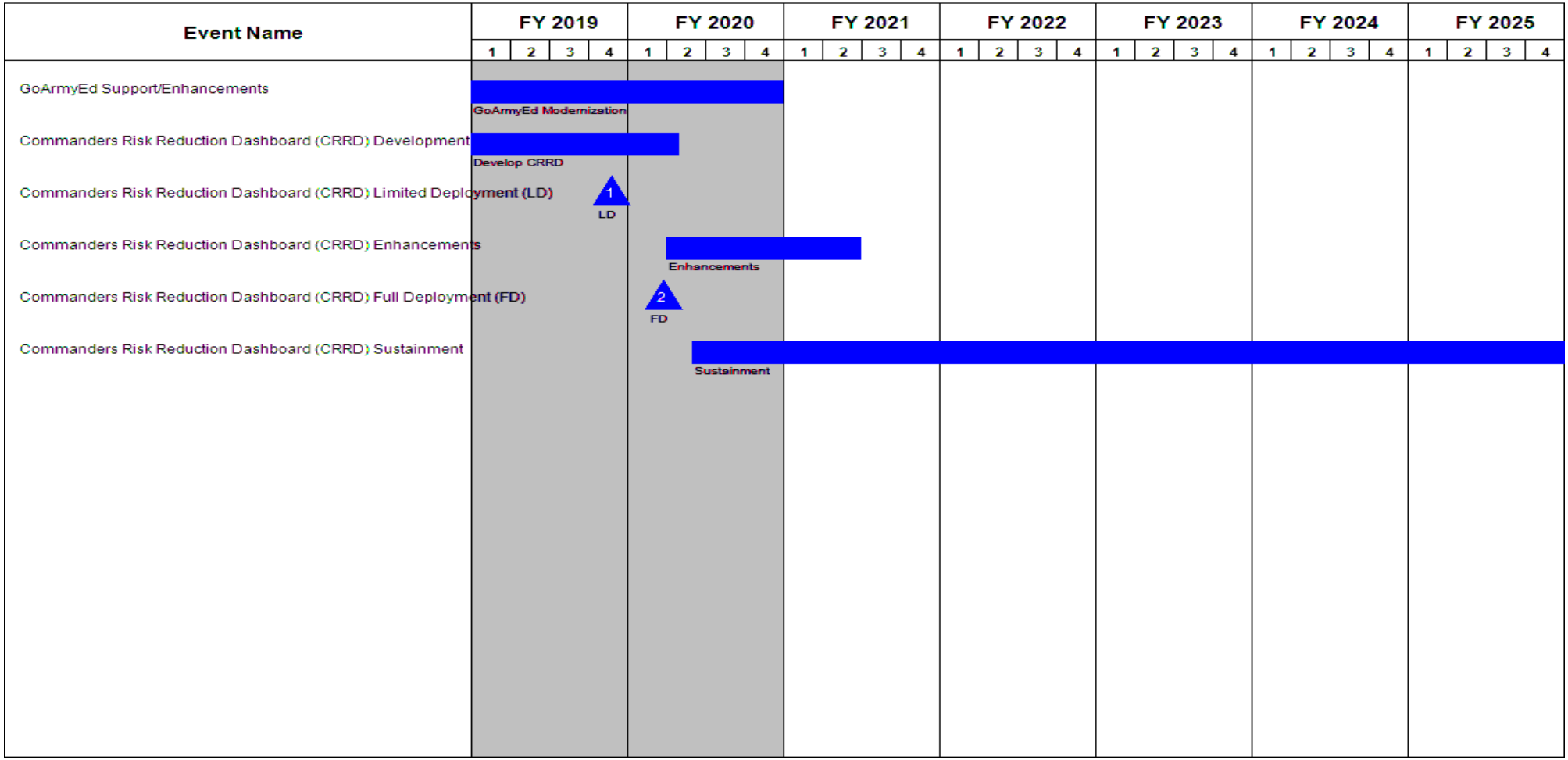

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GoArmyEd Support/Enhancements	3	2018	4	2020
Commanders Risk Reduction Dashboard (CRRD) Development	3	2015	2	2020
Commanders Risk Reduction Dashboard (CRRD) Limited Deployment (LD)	4	2019	4	2019
Commanders Risk Reduction Dashboard (CRRD) Enhancements	2	2020	2	2021
Commanders Risk Reduction Dashboard (CRRD) Full Deployment (FD)	1	2020	1	2020
Commanders Risk Reduction Dashboard (CRRD) Sustainment	2	2020	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 184 / *Installation Support Modules*	

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
184: *Installation Support Modules*	-	1.547	1.377	1.410	-	1.410	1.277	1.294	1.307	1.320	0.000	9.532
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Installation Support Modules (ISM) consists of four standardized, web based, custom-developed enterprise wide applications that integrate essential installation business practices and processes throughout the Army, to meet Army Force Generation (ARFORGEN) Brigade Combat Team readiness and deployment requirements. Three modules support human resources business functions (In/Out-Processing, Transition Processing, and Personnel Locator); the fourth module, Central Issue Facility (CIF) supports management of over $9 billion combatant Organizational Clothing and Individual Equipment inventory. The web server architecture is fully internet protocol capable and allows soldiers ready access to their records and commanders and logisticians access to information affecting readiness of combat organizations.

Coalition Warfighter Interoperability Demonstration (CWID) is a mandated Joint program that requires participation by the US Army to explore near-term technologies that support Joint and Coalition Warfare Interoperability. Funding is to facilitate Coalition Force interoperability research and development and to comply with CJCSI 6230.2 date 30 April 2005.

Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicide attempts are collected and stored in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service.

ISM Core funding is essential for supporting demands to research and develop improved systems to provide for soldier safety and inventory reduction without risking readiness. Funding supports research and development to comply with Department of Defense Instruction 8320.4 Serialized Item Management. Applications to use commercial off the shelf wireless bar code equipment to ensure inventory accuracy throughout 154 warehouses in worldwide locations potentially reduces operating costs by $500.0 million.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Army Behavioral Health Integrated Data Environment	1.547	1.377	1.410	-	1.410
Description: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicides attempts are collected and stored in a in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service. ***FY 2021 Base Plans:*** Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicides attempts are collected and stored in a in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding results from requirements adjustment do to updated analysis of system functions.					
Accomplishments/Planned Programs Subtotals	1.547	1.377	1.410	-	1.410

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• BE4162: *MACOM AUTOMATION SYSTEMS*	131.135	80.861	44.429	13.852	58.281	31.896	39.397	30.134	33.244	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

D. Acquisition Strategy

Installation Support Modules is in Post Deployment Software Support (PDSS). The present concept calls for the use of full and open competition to implement enhancements as defined by the Functional Proponent, Army Chief Information Officer (CIO). Current emphasis is to bring the ISM systems to functional readiness for transfer to an Army Data Center and virtualize the ISM systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Behavioral Health Integrated Data Environment	C/FFP	various : various	8.246	1.467	Feb 2019	1.377		1.410	Feb 2021	-		1.410	Continuing	Continuing	-
Post-Deployment Solfware Support (PDSS)	C/FFP	various : various	6.061	-		-		-		-		-	0.000	6.061	-
Coalition Warfighter Interoperability Demonstration (CWID)	C/TBD	various : various	0.091	-		-		-		-		-	0.000	0.091	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	0.080		-		-		-		-	0.000	0.080	-
		Subtotal	14.398	1.547		1.377		1.410		-		1.410	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Independent Verification and Validation (IVV) Testing	C/T&M	GDIT Corp : various	2.111	-		-		-		-		-	0.000	2.111	-
		Subtotal	2.111	-		-		-		-		-	0.000	2.111	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.509	1.547		1.377		1.410		-		1.410	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

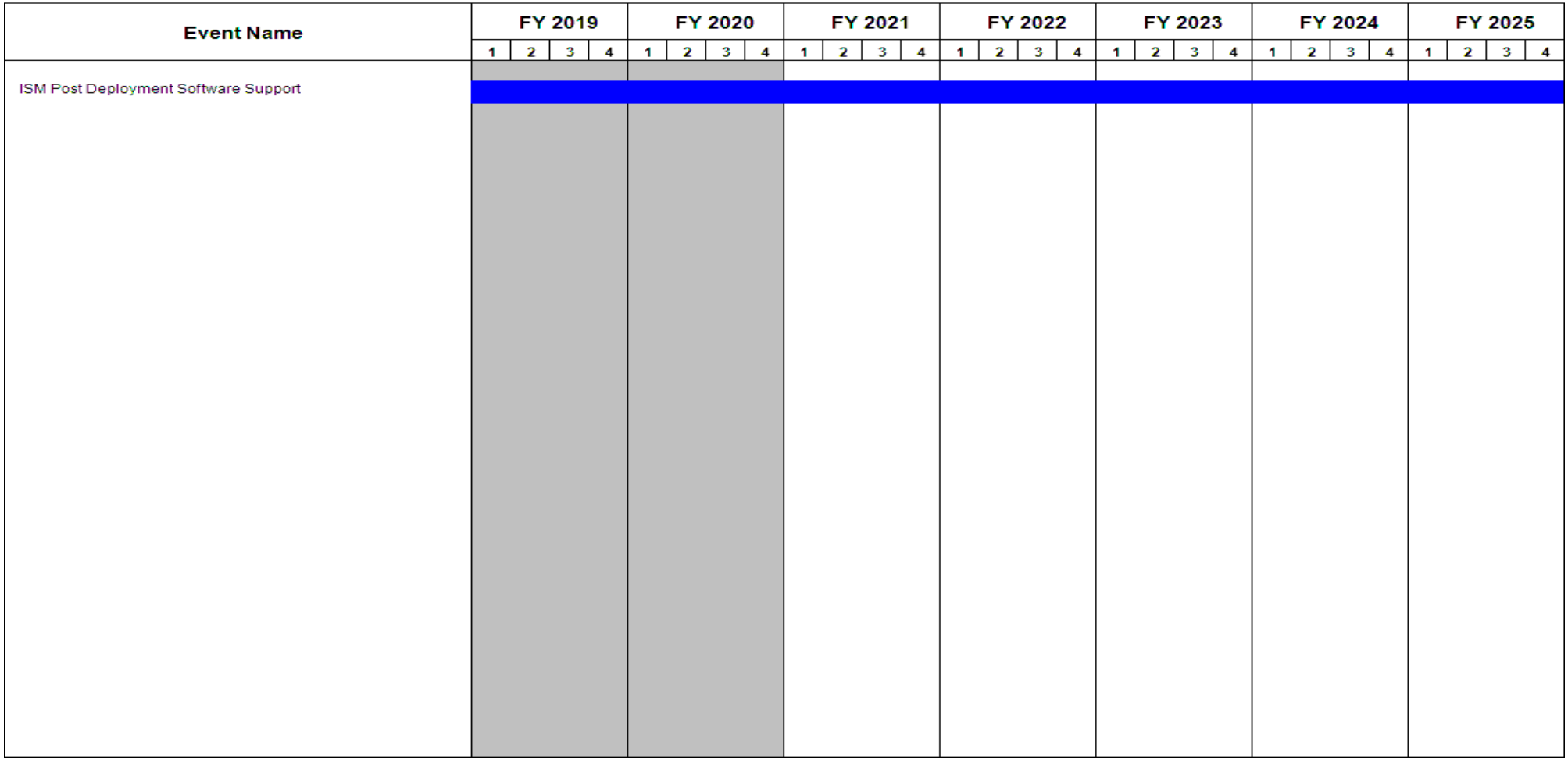

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ISM Post Deployment Software Support	4	2003	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) 193 / *Medical Communications For Combat Casualty*			
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**
193: *Medical Communications For Combat Casualty*	-	2.367	0.052	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.419
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

RDTE effort on this project completed in FY 2020.

A. Mission Description and Budget Item Justification

The Medical Communications for Combat Casualty Care (MC4) System interfaces Force Health Protection and medical surveillance information with Army Mission Command information technology systems. The MC4 System fulfills the requirements highlighted in United States Code: Title 10, Subtitle A, Part II, Chapter 55, Section 1074f, mandating the proper documentation of deployed Service members' medical treatment to include its associated medical surveillance. The MC4 System supports other Soldier protection initiatives by providing data for analyses which can be used for identification and development of critical soldier support systems such as body armor, improved helmets, traumatic brain injury protection and trauma reduction. Current MC4 Program efforts are focused on system engineering, testing, integration, and fielding automation infrastructure for Army users of the Theater Medical Information Program-Joint (TMIP-J) suite of software. Effort has also been initiated to integrate MC4 with the Army Chief Information Office (CIO) Network 2020 and Common Operating Environment (COE) and as a program of record in the Mobile/ Handheld Computing Environment Working Group. Funding provides engineering, developmental testing, and integration of information management/information technology to support Force Health Protection in accordance with the Army Equipment Modernization Plan.

RDTE effort on this project completed in FY 2020.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Engineering and Technical Support	1.136	0.050	-	-	-
Description: Engineering and Technical Support for Preplanned Program Improvements and System Upgrades, Systems Integration, Software Support and other new initiatives to improve system performance and effectiveness. Effort includes rapid integration of new IT technologies as they become available at Technology Readiness Levels (TRL) 6 or beyond, and engineering effort to modify system parameters due to cybersecurity or other pressing need.					
FY 2020 Plans: Monitor emerging technologies for potential incremental integration into system baseline.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
RDTE for this project completed in FY 2020					
Title: PMO Testing Support ***Description:*** Test augmentation by outside agencies to include test efforts for DHMS/TMIP-J and other Army unique software capabilities.	0.200	-	-	-	-
Title: MC4 Electronic Health Record Integration and Testing ***Description:*** Development testing of DHMS Electronic Health Record software; Lab site studies with technology and scenarios; Integration testing of software systems on the MC4 baseline system; test and evaluation of new capabilities for combat theater functionality.	1.031	-	-	-	-
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.002	-	-	-
Accomplishments/Planned Programs Subtotals	2.367	0.052	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• MA8000: *Family of Med Comm for Combat Casualty Care*	22.226	17.821	18.313	1.257	19.570	14.764	7.472	-	-	0.000	81.853
• OMA - 432612000: *Information Management-Automation Spt*	-	-	0.440	-	0.440	0.220	0.220	-	-	0.000	0.880

Remarks

D. Acquisition Strategy

The MC4 Program supports a number of Army Medical Information Technology/Communications initiatives. The near and mid-term focus of the MC4 program is to engineer, design, integrate, test, acquire and field the Army automation infrastructure capabilities supporting fielding of the Defense Healthcare Management

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

Systems Electronic Health Record integrated software application suite, future modernized capability, and other Army requirements. The MC4 hardware is procured as Commercial-off-the-Shelf (COTS) components. Since Electronic Health Record software is a major component of the MC4 System and being developed in increments by the Joint Program, the MC4 Program will deliver capabilities in increments, recognizing the need for future system updates and planned upgrades. The MC4 Program works with the user community to continually define and refine additional requirements and match them with available technologies to provide the user enhanced capabilities. These enhanced capabilities will be provided to the user at the earliest possible date. This approach yields the most operationally useful and supportable capability in the shortest time possible with Cost As an Independent Variable. Moreover, this approach provides an initial capability with the explicit intent of delivering improved and updated capability in subsequent updates and planned upgrades. This evolutionary development approach will be accomplished through a rapid prototyping process that will progress the system from its current functional capabilities to fully integrated objective capabilities, and forward into the future with a fully modernized system. Appropriate commercial technology enhancements (e.g. advances in operating systems, voice activated technology, cloud computing capability environment, etc.) will be incorporated into MC4 products and systems as they become available. Each MC4 System component will undergo a full range of developmental testing to include software unit testing, integration testing, interoperability testing and software qualification testing. The MC4 system updates and planned upgrades will continue to undergo follow-on testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 193 / *Medical Communications For Combat Casualty*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prog Mgmt Operations	Various	PMO : various	8.405	-		-		-		-		-	0.000	8.405	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.002		-		-		-	0.000	0.002	-
		Subtotal	8.405	-		0.002		-		-		-	0.000	8.407	N/A

Remarks

Funding (Prior Years) in Program Management Operations includes direct pay of PMO government employees, TDY, training, supplies, etc. in direct support of RDTE effort. At Milestone C, Program Management Operations efforts were moved to another appropriation.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	0.141		-		-		-		-	0.000	0.141	-
		Subtotal	-	0.141		-		-		-		-	0.000	0.141	N/A

Remarks

MC4 is a COTS (Commercial-Off-the-Shelf) hardware, GFE (Government Furnished Equipment) software system. MC4 provides the integration of the hardware and software and also fields to and supports the system to Army units. No product development is performed. Hardware is bought commercially off the shelf through commercial contracts and software is developed and provided by the Defense Health Medical Systems Joint Operational Medical Information Systems (DHMS/JOMIS).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Tech Spt/ Information Assurance (old contract)	Various	L-3 (was Titan) : various	9.390	-		-		-		-		-	0.000	9.390	-
Engineering & Tech Spt (new contract)	Various	CACI (formerly L-3) : Various	6.588	2.026	Jan 2019	0.050	Jan 2020	-		-		-	0.000	8.664	-
Information Assurance	Various	ISEC Support : AZ	1.783	-		-		-		-		-	0.000	1.783	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	17.761	2.026		0.050		-		-		-	0.000	19.837	N/A

Remarks

Information Assurance (IA) activities moved from ISEC to L3 in FY 2012, IA activities moved to another appropriation FY 2013; FY 2015 new competitive contract award, base year with 4 option years (option year awards in January). Final objective Theater Medical Information Program-Joint (TMIP-J) software is expected to be complete and ready for fielding 2nd Quarter FY 2018. Modernization of TMIP-J software by Joint program (Joint Operational Medical Information System [JI1]) is currently in process, requiring continued engineering and technical support to ensure an operational system for Army use.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Testing Spt	MIPR	ATEC/AMEDD Board/JITC : various	6.761	0.200		-		-		-		-	0.000	6.961	-
MC4/TMIP System Engineering	C/T&M	L-3 Communications : Frederick MD	7.889	-		-		-		-		-	0.000	7.889	-
MC4/TMIP System Engineering	Various	John Hopkins University (JHU) Applied Physics Lab : MD	32.124	-		-		-		-		-	0.000	32.124	-
MC4/TMIP System Engineering (new contract)	C/T&M	CACI (was L-3 Communications) : Frederick MD	3.639	-		-		-		-		-	0.000	3.639	-
		Subtotal	50.413	0.200		-		-		-		-	0.000	50.613	N/A

Remarks

PMO Testing Support is provided by other Government agencies (AMEDD Board, ATEC and others).

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	76.579	2.367		0.052		-		-		-	0.000	78.998	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 193 / *Medical Communications For Combat Casualty*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

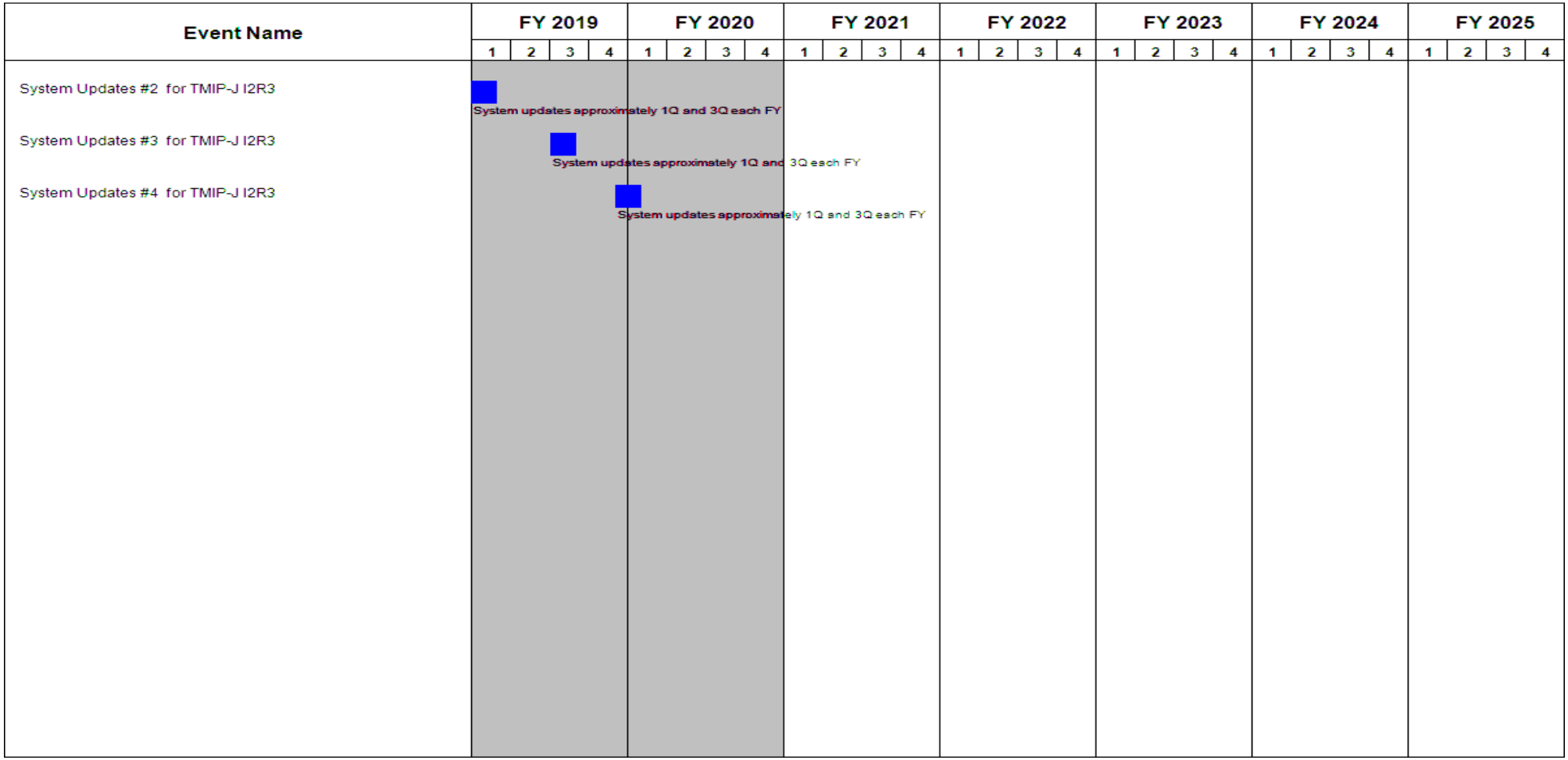

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC4/TMIP-J I2R3 Fielding Decision	2	2018	2	2018
System Updates #1 for TMIP-J I2R3	3	2018	3	2018
System Updates #2 for TMIP-J I2R3	4	2018	1	2019
System Updates #3 for TMIP-J I2R3	3	2019	3	2019
System Updates #4 for TMIP-J I2R3	4	2019	1	2020

Note

System Updates correspond to projected software change packages, to include security enhancements, throughout this time period. Updates require integration and testing prior to acceptance and release. Engineering and Technical support continues throughout this time period and is focused on hardware architecture development and cybersecurity and technology insertions for the modernized electronic health record system. .

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 738 / *AcqBiz*	

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
738: *AcqBiz*	-	22.400	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.400
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PL AcqBusiness provides acquisition-centric enterprise solutions. Delivers innovative and adaptive solutions that streamline the collection and analysis of data to support powerful decisions across the Army acquisition enterprise. PL AcqBusiness will be the premier source of information technology solutions that enable information dominance at all levels of the Army acquisition enterprise. PL AcqBusiness provides Army Acquisition practitioners with a consistent set of unique business tools, web services, and decision support tools integrated through a common architecture, which provide visibility of authoritative data, consistency in business process, and more timely support to acquisition decisions. The enterprise tools provided via PM AcqBusiness enable the reduction and eventual elimination of stovepipe and redundant tools that exist in the domain today. PL AcqBusiness provides an environment that enables centralized, role-based access to trusted and authoritative data from disparate Acquisition Domain data sources. In addition, PL AcqBusiness provides a framework for information providers to publish their data and provide their services to authorized users.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Program Management ***Description:*** This effort provides program management in support of the Human Resource Command Accessioning IT mission.	11.153	-	-	-	-
Title: Design, Development, and Test ***Description:*** This effort provides program management in support of the Human Resource Command Accessioning IT mission.	11.247	-	-	-	-
Accomplishments/Planned Programs Subtotals	22.400	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

D. Acquisition Strategy

The ACQBIZ system will sunset and Integrated Program Management Environment (IPME) will be sustained in a commercial cloud environment in FY 2019. (PE 0605013A project: 738 TO PE 0605803A)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Option/ FFP	ACC : Rock Island, IL	20.174	20.975		-		-		-		-	0.000	41.149	-
		Subtotal	20.174	20.975		-		-		-		-	0.000	41.149	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Analysis and Design, Development, Integration	TBD	TBD : TBD	85.474	-		-		-		-		-	Continuing	Continuing	Continuing
ARISS	C/CPFF	SAIC : RESTON, VA	2.973	-		-		-		-		-	0.000	2.973	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	1.425		-		-		-		-	0.000	1.425	-
		Subtotal	88.447	1.425		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	108.621	22.400		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

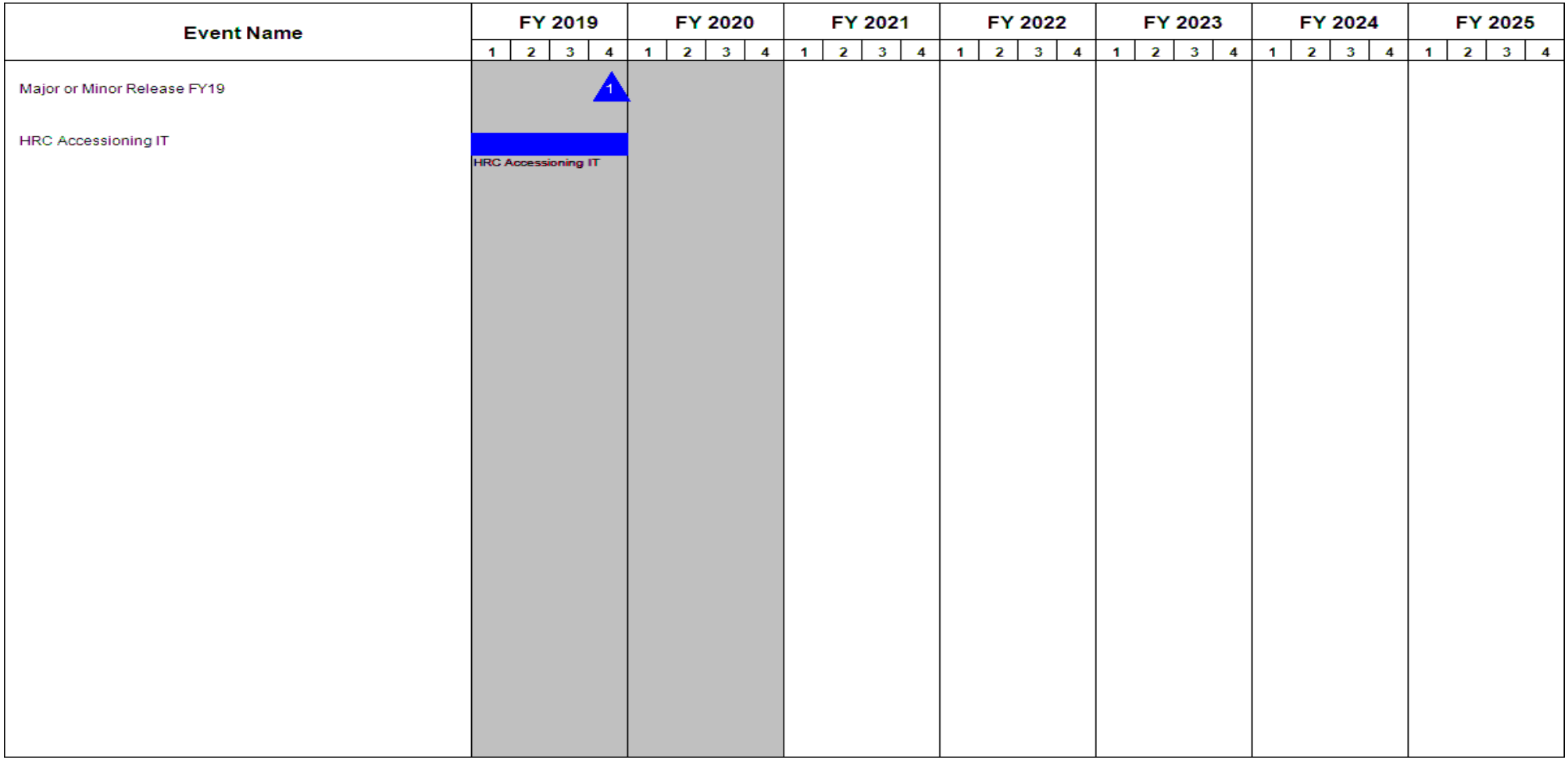

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technical Prototyping & Component Integration	1	2006	4	2018
Major or Minor Release FY15	4	2015	4	2015
Major or Minor Release FY16	4	2016	4	2016
Major or Minor Release FY17	4	2017	4	2017
Sustainment FY18	1	2006	4	2018
Sunset ACQBIZ System FY19	4	2018	4	2018
Major or Minor Release FY19	4	2019	4	2019
HRC Accessioning IT	2	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FE9 / *ALTESS (P&R Forms)*	

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
FE9: *ALTESS (P&R Forms)*	-	0.112	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.112
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the P&R Forms application; which supports the creation and production of the Committee Staff Procurement Backup Book (P-Forms), as well as Research, Development, Test and Evaluation Descriptive Summaries (RDTE, or R-Forms). Using P&R Forms, budgetary forms and data can be quickly and efficiently submitted, coordinated, and approved.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Continued development of the Army's Budget System ***Description:*** The P&R Forms application supports the creation and production of the Committee Staff Procurement Backup Book (P-Forms), as well as Research, Development, Test and Evaluation Descriptive Summaries (RDTE, or R-Forms). Using P&R Forms, budgetary forms and data can be quickly and efficiently submitted, coordinated, and approved.	0.112	-	-	-	-
Accomplishments/Planned Programs Subtotals	0.112	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FE9 / *ALTESS (P&R Forms)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
P&R System	SS/ Various	ALTESS : Radford, Virginia	0.217	0.112		-		-		-		-	0.000	0.329	-
		Subtotal	0.217	0.112		-		-		-		-	0.000	0.329	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.217	0.112		0.000		-		-		-	0.000	0.329	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FE9 / *ALTESS (P&R Forms)*

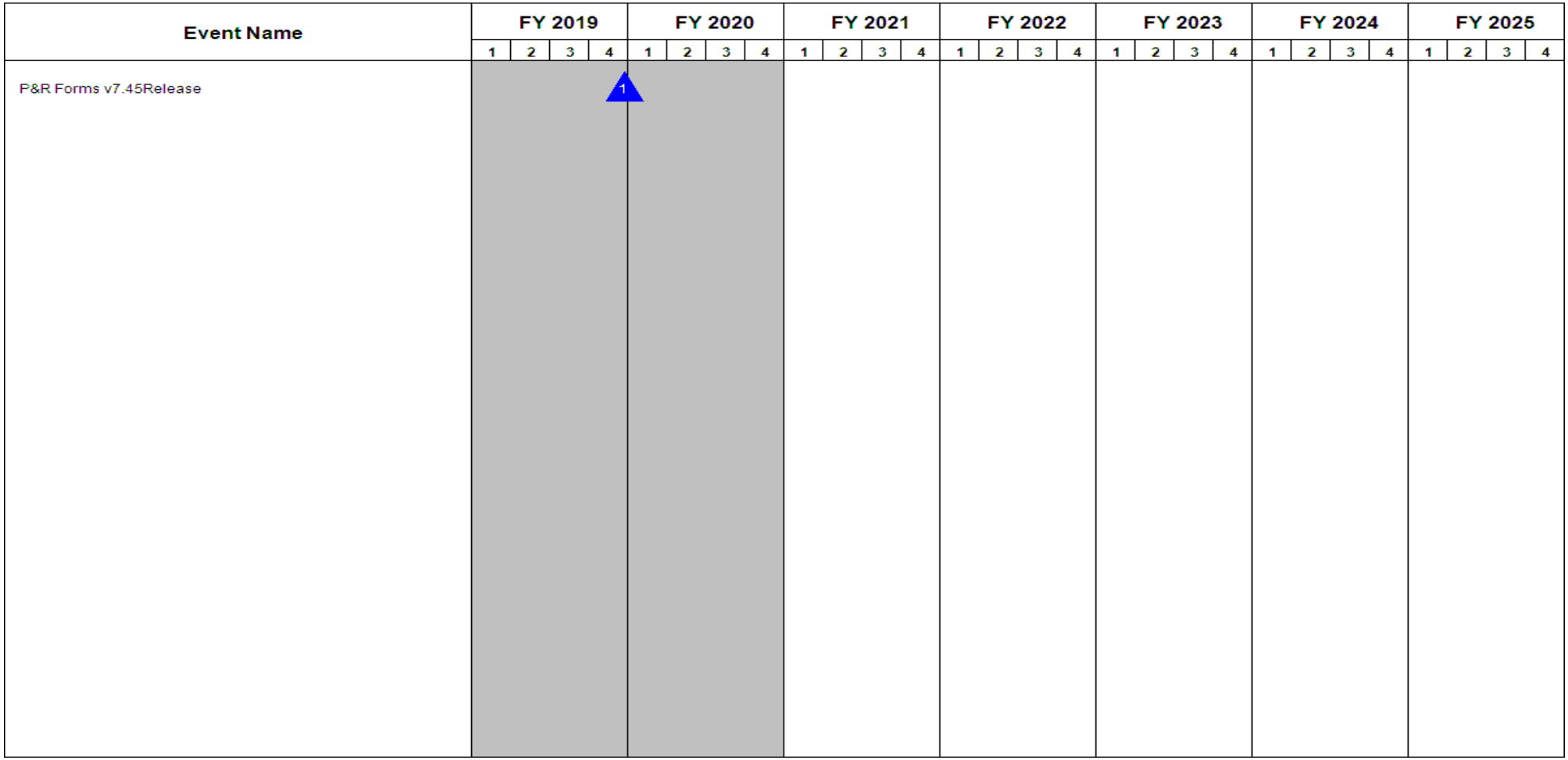

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FE9 / *ALTESS (P&R Forms)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Application Support and assist users for FY18 Presidential Budget	2	2017	3	2017
Application Support and assist users for FY19 BES	4	2017	1	2018
P&R Forms v7.1 Release	2	2017	2	2017
P&R Forms v7.2 Release	4	2017	4	2017
P&R Forms v7.3 Release	2	2018	2	2018
P&R Forms v7.4 Release	4	2018	4	2018
P&R Forms v7.45Release	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FL9 / *Army Accessioning IT 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
FL9: *Army Accessioning IT Development*	-	0.000	31.279	48.727	-	48.727	25.081	17.243	16.378	14.302	0.000	153.010
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Accessions Information Environment (AIE): supports the Army's Accessions Enterprise (AE). AIE aligns authorities, responsibilities, and resources, for Total Army accessions. It provides the Army's strength through its four missions: (1) Enlist Soldiers, (2) Commission Officers, (3) Fulfill In-Service requirements, and (4) Support and sustain. AIE will replace 11 legacy systems with 33 modules of the current legacy Accessions IT systems which have experienced frequent outages and unstable performance, directly impairing the Army's ability to make its recruiting mission. Successful implementation is of utmost priority for the enterprise. AIE is a COTS-based information technology (IT) software system that will modernize the AE. It will be a fully integrated Army-wide enterprise level software system for the accessions workforce to acquire the best-qualified warfighting talent (officer/enlisted/internal recruiting requirements) to meet Army recruiting and accessions requirements. Key AIE functions / core capabilities include: lead generation & management, prospecting, interviewing, processing, pay & incentives, intelligence, marketing, training / leader development. This effort will ultimately ensure the accessions workforce has the information needed to engender commitments, lead future Soldiers, and engage communities in direct contact with young Americans. In FY 2021, AIE will continue prototyping efforts, adding required capabilities to deployed functionality. AIE prototyping started in FY 2019, continued in FY 2020, and will continue to execute within the DoD 5000.75 Acquisition, Testing and Deployment phase. The prototype will be matured to increase functionality to be deployed based on the planned iterative Capability Waves. The FY 2021 funding will continue to support iterative Wave requirements analysis, business process reengineering, design, capability configuration, interface development, capability integration, cybersecurity engineering (to include Risk Management Framework continuous monitoring), systems engineering, software licenses for configuration and early adopter user environment, System Test & Evaluation, and Cloud Hosting (applications and data storage) to expand the prototype solution to an additional 6,466+ recruiters while preparing deployment and training to an additional 15,611+ recruiters.

HRC Accessioning IT: Additionally, this program supports the development requirements for the US Army Human Resources Command (USAHRC) which provides the IT solutions and automation support necessary to accomplish the Army's Accessioning mission.

Army Suicide Prevention: This Program Element (PE) develops a pre-entry or entry assessment package that enhances the Soldier Lifecycle (e.g., selection, assignment, training, leader development). This PE enhances the Army's ability to identify individuals with a higher likelihood of having already experienced, or of potentially experiencing, sub- clinical behavioral issues, as well as to identify character strengths (e.g., resilience, grit), to ensure that the Army can meet mission requirements in the current and future operating environments. Research in this PE will result in more precise determinations of individual potential for future successful service, and more targeted identification of need for individual assistance (e.g., intervention, training, behavioral health) to increase likelihood of future success.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Accessions Information Environment (AIE)	-	29.282	42.740	-	42.740

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: AIE will provide a fully integrated enterprise level COTS-based capability enabling transparency, efficiency and effectiveness of the accessions workforce to acquire the best-qualified talent to meet Army recruiting and accessions requirements. It will ultimately replace the current legacy Accessions IT systems that have been in existence for over 30 years, and which have experienced frequent outages and unstable performance since FY 2018. The AIE acquisition program is utilizing the DoD 5000.75 Business Capability Acquisition Cycle (BCAC) currently in the Requirements and Acquisition Planning Phase. ***FY 2020 Plans:*** AIE will continue prototyping efforts, started in FY 2019, by adding required capabilities to the deployed pilot solution. In FY 2020, the AIE program will enter the Acquisition, Testing and Deployment phase within the DoD 5000.75 acquisition process. This phase will allow the prototype capability to be matured to increase functionality to be deployed based on the planned iterative Capability Waves. Specifically, the FY 2020 funding will support iterative Wave requirements analysis, business process reengineering, design, capability configuration, interface development, capability integration, cybersecurity engineering (Risk Management Framework continuous monitoring), systems engineering, software licenses for configuration and early adopter user environment, System Test & Evaluation, and Cloud Hosting (applications and data storage) in order to expand the prototype solution to 2,600+ recruiters. ***FY 2021 Base Plans:*** In FY 2021, AIE will continue prototyping efforts, started in FY 2019, and continued in FY 2020, by adding required capabilities to deployed functionality, and will continue to execute within the DoD 5000.75 Acquisition, Testing and Deployment phase. The prototype will be matured to increase functionality to be deployed based on the planned iterative Capability Waves. The FY 2021 funding will continue to support iterative Wave requirements analysis, business process reengineering, design, capability configuration, interface development, capability integration, cybersecurity engineering (to include Risk Management Framework continuous monitoring), systems engineering, software licenses for configuration and early adopter user environment, System Test & Evaluation, and Cloud Hosting (applications and data storage) to expand the prototype solution to an additional 6,466+ recruiters while preparing deployment and training to an additional 15,611+ recruiters. ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The programmed increase between FY 2020 and FY 2021 is due additional core capabilities required for Waves 3 & 4. Wave 3 adds marketing capabilities and training to 35 additional locations for an additional 6,466 users. Wave 4 adds Training/Leader Development capabilities and prepares for deployment and training to 90+ additional locations for an additional 15,611 users.					
Title: HRC Accessioning IT ***Description:*** Description: Funding supports the development requirements for the US Army Human Resources Command (USAHRC) which provides the IT solution and automation support necessary to accomplish the Army's Accessioning mission. The AIE acquisition program utilizes the DoD 5000.75 Business Capability Acquisition Cycle (BCAC) currently in the Requirements and Acquisition Planning Phase. ***FY 2021 Base Plans:*** The FY 2021 funds support the Army's Accessioning Mission to include the Army Recruiting Information Support System (ARISS). Efforts are ongoing to support Financial Audit Readiness Requirement and technical requirements gathering, analysis and documentation to support TRADOC mission. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The programmed increase between FY 2020 and FY 2021 relates to the increased workload for prototype capability in Waves 3 & 4. Wave 3 adds marketing capabilities and training to 31 additional locations for an additional 6,466 users. Wave 4 adds Training/Leader Development capabilities and training to 43 additional locations for an additional 8,238 users.	-	-	3.802	-	3.802
Title: Army Suicide Prevention ***Description:*** This Program Element (PE) develops a pre-entry or entry assessment package that enhances the Soldier Lifecycle (e.g., selection, assignment, training, leader development). This PE enhances the Army?s ability to identify individuals with a higher likelihood of having already experienced, or of potentially experiencing, sub-clinical behavioral issues, as well as to identify character strengths (e.g., resilience, grit), to ensure that the Army can meet mission requirements in the current and future operating environments. Research in this PE will result in more precise determinations of individual potential for future successful service, and more targeted identification of need for individual assistance (e.g., intervention, training, behavioral health) to increase likelihood of future success.	-	1.908	2.185	-	2.185

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Work in this PE is performed by the U.S. Army Resiliency Directorate in Arlington, VA. ***FY 2020 Plans:*** This effort develops a pre-entry or entry assessment package, identifying risk of sub-clinical behavioral issues and identifying character strengths, to enhance the Soldier Lifecycle (e.g., selection, assignment, training, leader development). FY 2020 funding will support validation assessment of the instruments. ***FY 2021 Base Plans:*** This effort develops a pre-entry or entry assessment package, identifying risk of sub-clinical behavioral issues and identifying character strengths, to enhance the Soldier Lifecycle (e.g., selection, assignment, training, leader development). FY 2021 funding will support validation assessment of the instruments. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding due to economic adjustments.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.089	-	-	-
Accomplishments/Planned Programs Subtotals	-	31.279	48.727	-	48.727

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Accessions Information Environment (AIE):
AIE is following the tailored Acquisition process for Defense Business Systems (DBS) in accordance with DoD 5000.75 and is currently designated as a Business System Category (BCAT) II program. AIE is acquiring a COTS solution (application hosting) to support the Army's Accessions Enterprise requirements. A competitive prototype contract was awarded on 30 April 2019 to execute the pilot phase. The prototyping efforts will result in capability to be delivered in waves:

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

Infrastructure & Application Pilot (Wave 1): (FY2020) Includes foundational operational capabilities (commercial cloud & network capabilities, initial data migration from legacy systems, critical interfaces, and defined data models) and provides initial functional capability (Lead Generation/Management, Prospecting, Interviewing, and Processing) to up to 344 Early Adopters as well as 717 operational users at 4 sites

Wave 2: (FY2020) Provides additional capability (Pay & Incentives and Intelligence) to an additional 1942 users at 15 additional locations

Wave 3: (FY2021) Provides additional capability (Marketing) to an additional 6466 users at 35 additional locations

Wave 4: (FY2021) Provides additional capability (Training/Leader Development) to an additional 8238 users at 43 additional locations

Wave 5: (FY2022) Provides full capability to all remaining users (7373) at all remaining locations (47)

At the completion of each Wave, new capabilities will be made available to all previously fielded users through the use of Delta training packages sent to the commands. At the conclusion of all Waves, AIE will deliver the Lead Generation & Management, Prospecting, Interviewing, Processing, Pay & Incentives, Intelligence, Marketing, and Training /Leader Development capabilities to support the Army's Accessions mission. Capabilities will be delivered using an agile methodology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FL9 / *Army Accessioning IT Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - Management Services	C/FFP	Chenega Decision Services : Lorton, VA	-	-		1.761	Jun 2020	1.812	Jun 2021	-		1.812	0.000	3.573	7.288
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.089		-		-		-	0.000	0.089	-
		Subtotal	-	-		1.850		1.812		-		1.812	0.000	3.662	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - COTS Based Solution Configuration and Development	C/FFP	Booz Allen Hamilton : Herdon, VA	-	-		15.060	Apr 2020	23.847	Apr 2021	-		23.847	0.000	38.907	69.826
AIE - System Partner Interface Development	TBD	TBD : TBD	-	-		7.202	Apr 2020	8.784	Apr 2021	-		8.784	0.000	15.986	25.604
ARISS	C/CPFF	SAIC : Reston, VA	-	-		-		3.802	Jan 2021	-		3.802	0.000	3.802	3.861
Army Suicide Prevention	TBD	TBD : TBD	-	-		2.116		2.185		-		2.185	Continuing	Continuing	Continuing
		Subtotal	-	-		24.378		38.618		-		38.618	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - Cybersecurity - RMF, FedRAMP, ATO (IA/RMF Support)	TBD	TBD : TBD	-	-		1.591		1.744	Oct 2020	-		1.744	0.000	3.335	5.307
		Subtotal	-	-		1.591		1.744		-		1.744	0.000	3.335	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FL9 / *Army Accessioning IT Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - Testing, Operational and Developmental Support (ATEC/JITC)	TBD	ATEC/JITC : Various	-	-		3.460		6.553	Jan 2021	-		6.553	0.000	10.013	15.929
		Subtotal	-	-		3.460		6.553		-		6.553	0.000	10.013	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		31.279		48.727		-		48.727	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

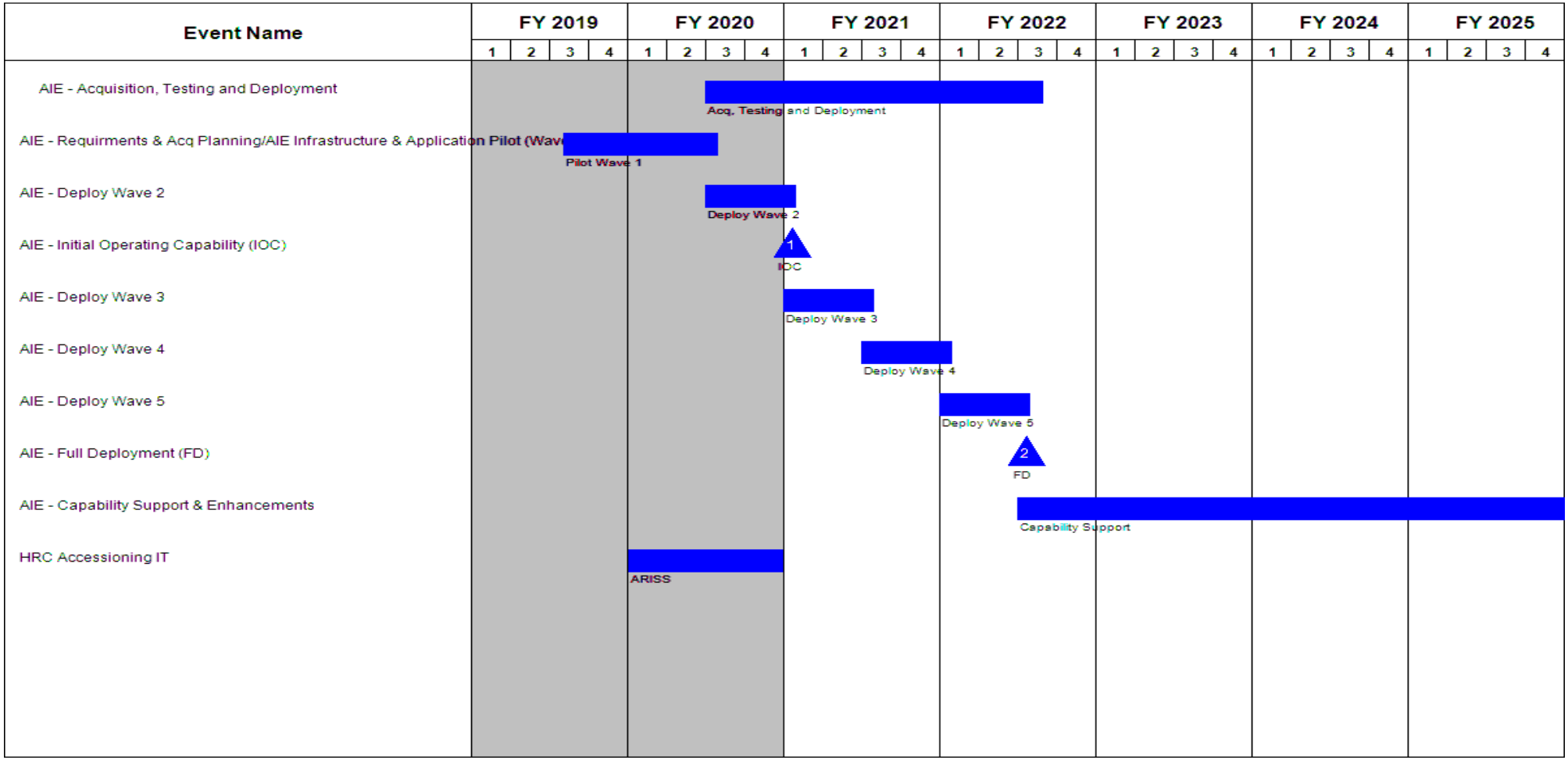

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AIE - Acquisition, Testing and Deployment	3	2020	3	2022
AIE - Requirments & Acq Planning/AIE Infrastructure & Application Pilot (Wave 1)	3	2019	3	2020
AIE - Deploy Wave 2	3	2020	1	2021
AIE - Initial Operating Capability (IOC)	1	2021	1	2021
AIE - Deploy Wave 3	1	2021	3	2021
AIE - Deploy Wave 4	3	2021	1	2022
AIE - Deploy Wave 5	1	2022	3	2022
AIE - Full Deployment (FD)	3	2022	3	2022
AIE - Capability Support & Enhancements	3	2022	3	2032
HRC Accessioning IT	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM7 / *Human Resouces Information 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
FM7: *Human Resouces Information Technology*	-	0.000	9.102	13.682	-	13.682	13.624	13.664	7.734	7.771	0.000	65.577
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The efforts under this project support the Army's Human Resources Information Technology needs.

SOLDIER FOR LIFE - TRANSITION ASSISTANCE PROGRAM XXI (SFL-TAP XXI): The Transition Assistance Program XXI (TAP-XXI) application provides an interactive, multimedia approach to pre-separation counseling and job assistance training. This application uses full motion video, graphics, and sound to train clients; and schedules clients for classroom-type instruction. It integrates a complete range of transition services and benefits for service members, Department of Defense civilian employees, and their family members as they transition from the military. TAP-XXI is a web-based, three-tiered application with a centralized database for all Transition sites. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The application also allows for access outside of Transition centers to support mobilizing and de-mobilizing during Yellow Ribbon Program events or delivery of services at home station. There is no application processing on the desktops located at Transition Centers. TAP-XXI application suite consists of the following subsystems: Transition Assistance Program - Support (TAP-Support), Transition Assistance Program -Online (TAP-Online) and TAP Virtual (Immersive Terf). The infrastructure modernization will provide system stability, support expansion requirements, and ensure reliable customer support.

Human Resource Command (HRC) Core IT: This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. The focus of the rationalization effort is to identify value-added applications capable of serving a broader Army enterprise audience and garnering efficiencies through the elimination of outdated, legacy, and duplicative applications. Applications are upgraded or enhanced to meet compliance with Army Common Operating Environment standards in accordance with Army Application Management Business Office (AAMBO). Additionally, program supports enhancements and modifications to the Interactive Personnel Electronic Records Management System (iPERMS) and iPERMS-Secure (iPERMS-S), as well as development of interfaces based upon emerging requirements, Cybersecurity, functionality and compliance with Army standards.

R-Builder is a living application database system that allows the Manning Program Evaluation Group (MM PEG) to update the database to include various cost drivers and factors used for programming, budgeting for all Army Service members pay, allowances, and benefits for the all-volunteer Army. R-Builder is used to develop the annual Program Objective Memorandum -Budget Estimate Submission (POM-BES), and to develop and manage the Army's military and civilian personnel in order to execute the President's National Security Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

The Army Review Board Agency (ARBA) operates under the delegated authority of the Secretary of the Army as the final level of appeal for service members in uniform, veterans, and their family members, adjudicating tens of thousands of claimed errors or injustices annually. ARBA is staffed with 128 military personnel, civilians, and contractors, and additional 350 external Advisors and Boards Members. ARBA struggles with the substantial process and system-related inefficiencies. The Agency currently uses the ARBA Case Tracking System (ACTS) to facilitate case adjudication and the routing of corresponding hard copy case files (a.k.a. "redwelds"). This system was custom built in 1999, strictly for tracking the hand offs of redwelds. At its inception, ACTS was a huge leap forward; however, as the organization and technology evolved, the system has not been able to meet new Agency mission objectives and streamlining initiatives. This antiquated system costs the Agency multi-millions in annual sustainment fees and lacks the agility to address changing business requirements and organizational roles.

Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes; ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) IAW public law.

ARIMS is the Army's policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY 2018) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army's classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army's records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector.

Family Advocacy System of Records (FASOR) is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: ARBA	-	1.384	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: The Army Review Board Agency (ARBA) operates under the delegated authority of the Secretary of the Army as the final level of appeal for service members in uniform, veterans, and their family members, adjudicating tens of thousands of claimed errors or injustices annually. ARBA is staffed with 128 military personnel, civilians, and contractors, and additional 350 external Advisors and Boards Members. ARBA struggles with the substantial process and system-related inefficiencies. The Agency currently uses the ARBA Case Tracking System (ACTS) to facilitate case adjudication and the routing of corresponding hard copy case files (a.k.a. ?redwelds?). This system was custom built in 1999, strictly for tracking the hand offs of redwelds. At its inception, ACTS was a huge leap forward; however, as the organization and technology evolved, the system has not been able to meet new Agency mission objectives and streamlining initiatives. This antiquated system costs the Agency multi-millions in annual sustainment fees and lacks the agility to address changing business requirements and organizational roles. ***FY 2020 Plans:*** FY 2020 funding is to modernize and re-engineer the current ARBA Case Tracking System (ACTS) that is in sustainment. ARBA?s leadership has aggressively driven business process reengineering to include end-to-end case digitization. However, ACTS? inflexibility stands in the way of Agency progress on many fronts and negatively affects the timeliness, costs, and quality of ARBA?s work products. Additionally, ARBA has undergone increasing congressional scrutiny, unfavorable media conclusions, and publicized court remands surrounding the quality and timeliness of its 18,000 annual adjudication outcomes. As a result, ARBA leadership has committed to Congress that it will drive fundamental change across the DOTMLPF-P spectrum. In summary, these significant problems result in greatly extended processing times, bottle-necked and rushed adjudication activities, numerous redundant hand-offs, and at times incorrect or contestable board outcomes. ARBA?s current process requires labor-intensive hard copy printing, collating, transporting, filing, scanning, labeling, inventorying, shipping, shredding, mailing, and tracking of redwelds and their content. - ARBA ADS Modernization capability requirements can be summarized as follows: - Lifecycle Case Management ? End-to-end Structured Process - Complete Case Digitization (electronic cases, board scheduling/voting, approvals, signatures) - Improved External Stakeholder Exchange and Case Transit - Leverage Historical Information/Comprehensive Knowledge Management Capability - Performance Assessment Framework ? Real-Time, Reliable Metrics					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Modern, Flexible and Reliable IT Platform Supporting Mobility and Information Exchange ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The modernization of the current ARBA Case Tracking System is complete.					
Title: G-1 Requirement Builder (R-Builder) ***Description:*** R-Builder is a living application database system that allows the Manning Program Evaluation Group (MM PEG) to update the database to include various cost drivers and factors used for programming, budgeting for all Army Service members pay, allowances, and benefits for the all-volunteer Army. R-Builder is used to develop the annual Program Objective Memorandum and Budget Estimate Submission, and develop and manage the Army's military and civilian personnel in order to execute the President's National Security Strategy. ***FY 2020 Plans:*** Continued modernization of the Army's Requirements Builder to budget better for the Army's military manpower requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** R-Builder's system modernization is complete.	-	0.137	-	-	-
Title: ARIMS ***Description:*** ARIMS is the Army?s policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY 2018) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army?s classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army?s records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund	-	0.853	1.045	-	1.045

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector. This funds contractor man-years for technical and analytical expertise in the integration and validation of operational databases used to store and research combat records from combat operations in Korea, Vietnam, Somalia, Panama, Persian Gulf, Afghanistan, Iraq, and other contingency operations. The effort supports over 30 distinct and unique operational databases that directly support research into Veteran claims for Post-Traumatic Stress Disorder, Agent Orange, and other medical conditions developed by Soldiers during combat and non-combat operations. Supports the Army?s Data Center Consolidation by turning data base structure to be more efficient and reduce maintenance support costs. Increased Congressional inquiries and litigation have raised leadership awareness of the need to improve records management compliance Army-wide. SecArmy directed workgroup, led by the AASA, with participation by the CIO/G-6, NETCOM, OGC, and OCLL is to provide a comprehensive solution for the Army and integrate and standardize management systems for the Army?s business operations. Enhancing and modernizing of existing ARIMS functionality and capability to support the SecArmy initiative includes updating ARIMS to support current technology such as Microsoft SharePoint environment, expanding storage capability, including network storage , and commensurate expansion of backup, security and communications capabilities over CONUS and OCONUS networks. This effort supports the ADCCP program. ***FY 2020 Plans:*** This line item funds contractor man-year for Middleware Software Engineering for the programming and integration of linkages between ARIMS, Army Information Systems and NARA?s Gateway, that generate or store long-term important records as part of functional business processes. Failure to fund at the requested level will preclude the efficient, effective, and transparent capture and preservation of important Army records generated by Army Information Systems. Without this capability, Army Information System managers will be					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
required to manually extract and index records for submission and preservation in the ARIMS system. This effort supports the ADCCP program to ensure efficient use of Army resources and fulfill RMDA?s mission. ***FY 2021 Base Plans:*** This line item funds contractor man-year for Middleware Software Engineering for the programming and integration of linkages between ARIMS, Army Information Systems and NARA?s Gateway, that generate or store long-term important records as part of functional business processes. Failure to fund at the requested level will preclude the efficient, effective, and transparent capture and preservation of important Army records generated by Army Information Systems. Without this capability, Army Information System managers will be required to manually extract and index records for submission and preservation in the ARIMS system. This effort supports the ADCCP program to ensure efficient use of Army resources and fulfill RMDA?s mission. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding due to economic adjustments.					
Title: Army SHARP Data Management ***Description:*** Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes; ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) IAW public law. ***FY 2020 Plans:*** Enable Army leaders at all levels to manage ICRS data through E-Document Format and documents upload capabilities within ICRS. Increase data element in ICRS and complete the Sexual Assault Data Management (SADMS) integration of data into ICRS. Support Advanced Analytics capabilities, increase business intelligence capabilities, and support predictive analysis for SHARP Data. Automate SHARP ICRS Reporting capabilities and facility integration of EORS system in to ICRS. ***FY 2021 Base Plans:*** Enable Army leaders at all levels to manage ICRS data through E-Document Format and documents upload capabilities within ICRS. Increase data element in ICRS and complete the Sexual Assault Data Management (SADMS) integration of data into ICRS. Support Advanced Analytics capabilities, increase business intelligence	-	0.912	1.047	-	1.047

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
capabilities, and support predictive analysis for SHARP Data. Automate SHARP ICRS Reporting capabilities and facility integration of EORS system in to ICRS. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding due to economic adjustments.					
Title: Family Advocacy System of Records (FASOR) ***Description:*** FASOR is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements. ***FY 2020 Plans:*** Continued research and development for modernization and compliance requirements that started in FY 2019. ***FY 2021 Base Plans:*** Continued modernization of legacy systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease in line with system requirements.	-	1.716	1.482	-	1.482
Title: HRC Core IT ***Description:*** HRC Core IT: This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. ***FY 2020 Plans:*** Ongoing efforts to modify the iPERMS application to replace the functionality of SnF servers with a robust scanning Web Service that will support the ARNG, 55 Military Personnel Offices (MILPOs), and remote users globally. Development is required ensure compliance with Defense Information Systems Agency Core Data Center and Cybersecurity requirements. ***FY 2021 Base Plans:***	-	2.677	8.915	-	8.915

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2021 funding continues to support iPERMS application efforts to replace the functionality of Store and Forward (SnF) servers and implement the Reduction Manual Indexing capability, and ASBS 2.0 development which also supports DA G1 Talent Management Task Force Battalion Command Assessment Program (BCAP). Additionally, USAHRC will utilize FY 2021 funding to rationalize data and databases to achieve the Army Data Strategy, modernizing applications to leverage authoritative data sources to reduce duplicate application capabilities, resulting in data and applications requiring fewer infrastructure services. This data and application rationalization allows USAHRC to operate a standard infrastructure, reducing hardware and software complexities and meets compliance with Army Common Operating Environment standards in accordance with Army Application Management Business Office (AAMBO). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Requirement increases supports HRC Core IT rationalization and modernization effort which includes: identifying and removing duplicate application functionality, reducing data elements, eliminating redundant database storage, and posturing legacy applications to move to a cloud hosted environment.					
Title: SFL-TAP XXI Modernization ***Description:*** SFL-TAP Transition Assistance Program (TAP) XXI Modernization - Modernize outdated application in order to create efficiencies and incorporate industry standards. ***FY 2020 Plans:*** FY 2020 Base research and development dollars in the amount of $1.219 million to support cyber security program requirements, National Defense Authorization Act (NDAA) update requirements, and a case synopsis module. ***FY 2021 Base Plans:*** Continued support of cyber security program requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding due to increased cyber security requirements.	-	1.049	1.193	-	1.193
Title: FY 2020 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2020 Plans:***	-	0.374	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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	-	9.102	13.682	-	13.682

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SFL--TAP	TBD	To Be Determined : To Be Determined	-	-		0.521		0.615		-		0.615	0.000	1.136	-
FY 2020 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.374		-		-		-	0.000	0.374	-
		Subtotal	-	-		0.895		0.615		-		0.615	0.000	1.510	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARIMS	TBD	TBD : TBD	-	-		0.853		1.046		-		1.046	Continuing	Continuing	Continuing
Army SHARP Data Management	TBD	Data Management : TBD	-	-		0.912		1.048		-		1.048	Continuing	Continuing	Continuing
SFL-TAP	TBD	To Be Determined : To Be Determined	-	-		0.528		0.579		-		0.579	0.000	1.107	-
HRC Core IT	TBD	To Be Determined : To Be Determined	-	-		2.677	Aug 2020	8.911		-		8.911	0.000	11.588	-
ARBA	TBD	TBD : TBD	-	-		1.384		-		-		-	0.000	1.384	-
		Subtotal	-	-		6.354		11.584		-		11.584	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
G-1 Requirements Builder (RBuilder)	TBD	TBD : TBD	-	-		0.137		-		-		-	0.150	0.287	-
Family Advocacy System of Records (FASOR)	TBD	TBD : TBD	-	-		1.716		1.483		-		1.483	Continuing	Continuing	Continuing
		Subtotal	-	-		1.853		1.483		-		1.483	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		9.102		13.682		-		13.682	Continuing	Continuing	N/A

Remarks

SFL-TAP has no additional changes from FY19-20

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

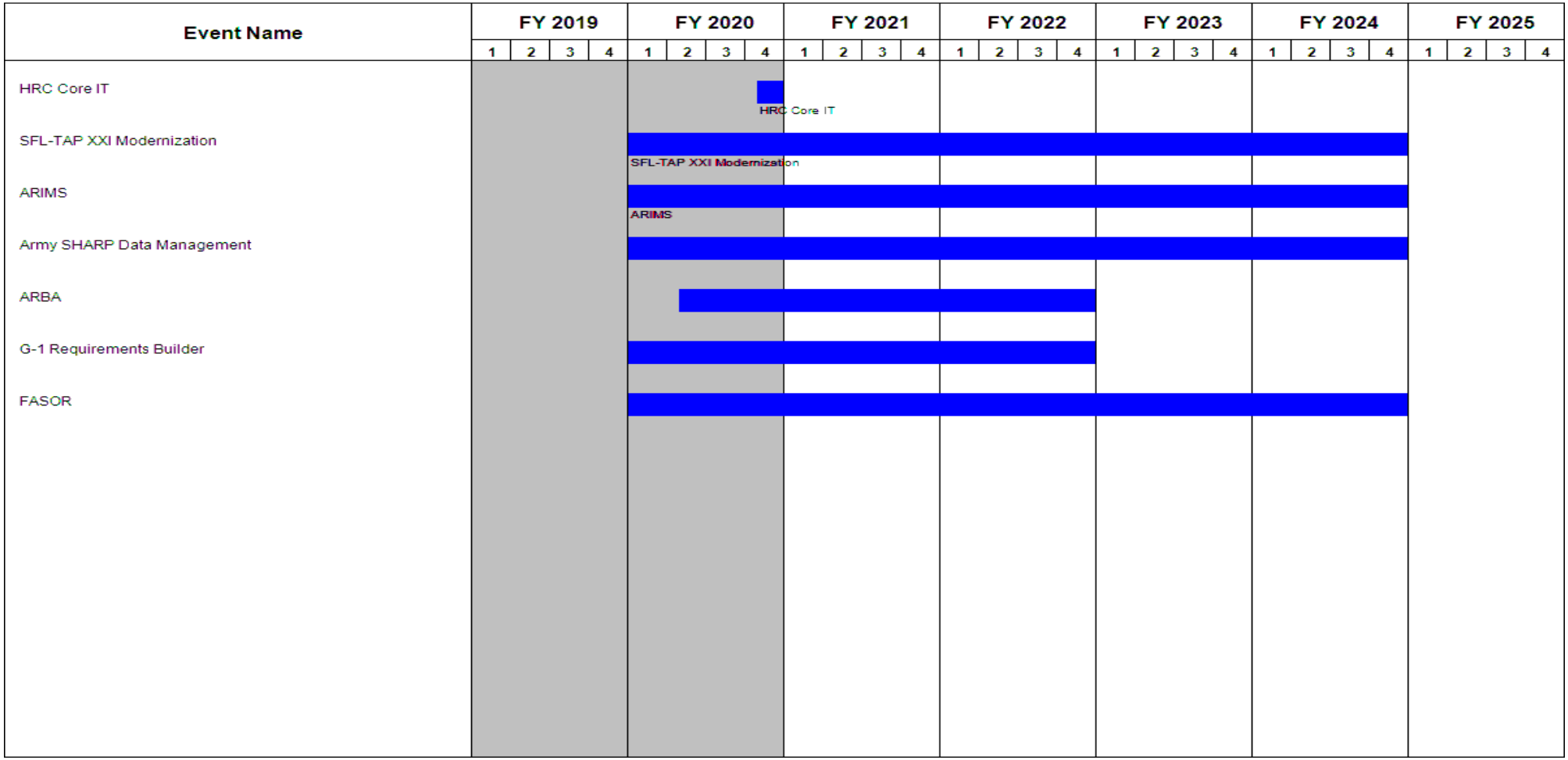

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
HRC Core IT	4	2020	4	2020
SFL-TAP XXI Modernization	1	2020	4	2024
ARIMS	1	2020	4	2024
Army SHARP Data Management	1	2020	4	2024
ARBA	2	2020	4	2022
G-1 Requirements Builder	1	2020	4	2022
FASOR	1	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM8 / *Information Technology for Training Systems*	

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
FM8: *Information Technology for Training Systems*	-	0.000	18.320	41.697	-	41.697	33.798	24.495	4.167	4.213	0.000	126.690
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds information technology systems that support Army Training. The five systems under FM8 are described below. Of those, the Army Training Information System (ATIS) is the Army's priority and the focus of the major investment in FM8. ATIS directly supports two of the four Army Unit Readiness Priorities - Training and Leader Development and an enabler for the Manning and Equipping.

1. Army Training Information System (ATIS). The Army currently lacks an enterprise level Common Operational Picture (COP) of the training environment. The ATIS is designated a Defense Business System (DBS) that will develop, integrate, test, deliver, operate, and maintain an enterprise capability for the Army training and education communities. Existing training information systems do not provide Commanders, leaders, Soldiers, and civilians a centralized COP of the training environment that enables persistent, consistent access to the Training and Education information and products necessary to support readiness to meet emerging threats. Annual costs to maintain current legacy systems is ~$75M. Without ATIS, Army organizations will continue to develop and maintain a multitude of training information systems that are not part of an enterprise, thus inhibiting efficient use of training resources, (people, time, money, material) that directly impacts the ability for units to meet readiness objectives.

ATIS will replace the functionality in 28 primary and 70 supporting information training systems with a single, integrated, user-friendly and technologically current system that will support management of the following training functions for 1.8M users:

- Training Development. Provides ability to develop and coordinate information, including training packages, training events, courses, and exercises.
- Training Management. Provides centralized ability to access and manage information, including individual and collective/unit training that supports mission tasks and individual training records.
- Enterprise Scheduling. Provides a single integrated set of applications to schedule training resources, including transportation, classrooms, ranges, supplies, and mandated legal/social individual and unit training.
- Content Management. Provides centralized access to training information anytime, anywhere, including educational and professional instruction.
- Resource Management. Provides ability to manage availability/sustainability of training enablers and resources.

ATIS is a Category II Defense Business System and will follow the Business Capability Acquisition Cycle (BCAC) in accordance with DoD 5000.75. ATIS Acquisition, Testing and Development phase will be executed as a single-vendor logical follow-on to the competitively awarded prototyping effort under Other Transaction Authority (OTA), as specifically authorized by 10 U.S.C Section 2371b, in accordance with the Acquisition Strategy. OTA is a streamlined method for transitioning successful prototype projects into follow-on production. Contract award scheduled for FY20, Q2.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

Following are the Release capabilities:

- First Release (R1) - Operational, Training and Readiness Support. R1 shall provide, as a minimum, Training Management capability with elements from Training Development, Enterprise Scheduling with readiness reporting capability. Training Management includes access to individual and collective/unit training records aligned to mission tasks. The Training Development encompasses assembling training information to include training plans, training events, courses, and exercises. The Enterprise Scheduling enables users to schedule training classrooms or ranges for unit training. The authorized released system shall be scaled to support, as a minimum, 500 sustained, concurrent users. The Release shall ensure coverage of organizations across the spectrum of all six Warfighting Functions (Intelligence, Movement and Maneuver, Fire Support, Command and Control, Protection and Sustainment). The Release shall support users that are geographically dispersed.
- Second Release (R2) - Operational Force Support. R2 shall provide, as a minimum, three capabilities in support of the Operational Force: Training Management, Enterprise Scheduling, and Resource Management. The Release shall support the expanded capabilities over a larger, more diverse and geographically dispersed section of the force with focus on FORSCOM and Brigades. The Release shall support 12,000 sustained, concurrent users. The Release shall support 1.02M unique active users annually.
- Third Release (R3) - Full Capability Support. The final release shall deliver the remaining ATIS capability: Training Development and Learning Content Management, as well as completion of remaining requirements across all five capability areas. The Learning Content Management hosts the learning content and makes it available for Soldiers to take training anytime, anywhere. The Release shall support 50,000 Sustained, concurrent users. The Release shall support 1.8 million unique active users annually. The final Release will subsume all remaining legacy systems by FY 2024.

The next four systems are not part of the ATIS Development program.

2. DLPT5 Content Analysis, Categorization & Modeling Development of DLPT5 Content Analysis, Categorization and Modeling (CACM) capabilities. For integration within the DLIFLC MIT LL TIDWA Domino system. These capabilities are in direct response to DLIFLC's DoDI assigned responsibilities for DLPT item bank maintenance, psychometric analysis and informed pool management, and closely support the DLPT Validity Framework. MIT LL Networked Pronunciation Feedback Program (NETProf) expansion will allow for further expansion and further utilization of the existing NetProF products for DLIFLC faculty and students. To reach higher levels of proficiency in foreign languages the planned dialog system would give an advantage to DLIFLC teachers to help students gain advances through practicing speaking using this new dialog system, and the connected NetProF improvement system for pronunciation for longer utterances. This feasibility study will help set new parameters for developing very advanced language teaching systems that otherwise could not be supported. This is in support of the 2+/2+/2 plan.

3. Universal Course Authoring Tool / The UCAT (Universal Curriculum and Assessment Tool) will serve as the primary curriculum and assessment development tool for curriculum development projects in meeting the directives from higher headquarters to transition into a new, digital learning environment. UCAT will support the delivery of curriculum and assessment products on a variety of different platforms in support of both resident and non-resident programs. UCAT consists of server-side applications and associated web services, databases, and client-side components which are currently under development.

4. The Army Career Tracker is leader development tool that leverages Army's prior investments to integrate education, training, assignment, self-development and other systems by linking these valuable technologies and resources into a common user-friendly portal across 1.35 million users consisting of enlisted, officers, and civilians. Users can search multiple education and training resources, monitor career development, and receive advice from their leadership. ACT provides single-site, easy

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

access, and offers a complete and personalized career picture not available until now. ACT allows users to manage career objectives and monitor progress towards career requirements and goals. ACT provides an integrated approach to supporting military and civilian personnel's personal and professional development which capitalizes on the mutual (personnel and Army) need for life-long learning. The unique inter-relationship between the user's personal growth and development, and the Army's need for Soldiers to be continuously developing, building and cultivating a culture of life-long learning is critical for the Soldier's and Army's success. Users manage their lifelong learning career objectives, monitor progress towards career development and goals, search multiple Army education and training resources, and receive personalized advice from their supervisor and Army leadership. Completed development will modernize the Army Career Tracker (ACT) system to render web pages correctly base on the size of the screen. Responsive Web Design (RWD) is an approach to web design that renders web pages based on the size of the device's display screen (e.g., computer, tablet, and phone). This allows the site to load quickly and ensures the display appears as if it were made expressly for the device being used. RWD improves user experience by displaying messages, links, and controls in a logical manner regardless of the device. The actual presentation may not look the same across different devices; rather the rendering will depend on the Operating System (OS), screen size, screen resolution, and other factors. Implementing RWD on ACT would be a step forward toward allowing ACT to render better on tablets and other mobile devices (e.g., mobile phones).

5. Enhancement of Army Training Models (ATM) will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation in support of the Army's training needs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Army Training Information System (ATIS)	-	15.501	39.550	-	39.550
Description: Army Training Information System (ATIS) is an enterprise system that will provide a common operational picture (COP) of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. These capabilities will enable Commanders, leaders, Soldiers, and civilians to better understand, visualize, describe, direct, lead, and assess training requirements so they can more effectively plan, prepare, execute, and assess training. End result is an ATIS that enables Soldiers to train as they will fight, so they can effectively fight as they have trained. ***FY 2020 Plans:*** Funding to initiate development of the objective Army Training Information System (ATIS) including achievement of the Acquisition Authority to Proceed (A-ATP) milestone. Projected development contract award on the FY20 Q2 to perform preliminary and critical design reviews. ***FY 2021 Base Plans:*** Funds design, build, and test of Release 1 in support of the training management capability to limited portions of the end user community. Begins effort in support of Release 2.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Program has exceeded FY 2019 OSD obligation and disbursement standards. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 to FY 2021 funding increase is driven by a significant increase in FY 2021 development efforts in support of R1. R1 activities began in FY 2020 with design reviews to deliver minimal capability in support of training management as the contract would have been awarded in the 2nd quarter of FY 2020. FY 2021 begins activities for R2 and add elements from the resource management and enterprise scheduling capability.					
Title: DLPT5 Content Analysis, Categorization & Modeling ***Description:*** Development of DLPT5 Content Analysis, Categorization and Modeling (CACM) capabilities. For integration within the DLIFLC MIT LL TIDWA Domino system. These capabilities are in direct response to DLIFLC?s DoDI assigned responsibilities for DLPT item bank maintenance, psychometric analysis and informed pool management, and closely support the DLPT Validity Framework. ***FY 2020 Plans:*** The overall project is broken up into smaller modules. We plan on completing more modules for the project. ***FY 2021 Base Plans:*** Continued development of the DLPT5 content analysis, categorization, and modeling capabilities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding due to economic adjustments.	-	0.858	1.152	-	1.152
Title: Universal Course Authoring Tool (UCAT) ***Description:*** The UCAT (Universal Curriculum and Assessment Tool) will serve as the primary curriculum and assessment development tool for curriculum development projects in meeting the directives from higher headquarters to transition into a new, digital learning environment. UCAT will support the delivery of curriculum and assessment products on a variety of different platforms in support of both resident and non-resident programs. UCAT consists of server-side applications and associated web services, databases, and client-side components which are currently under development. ***FY 2020 Plans:*** This will be complete in FY 2021, to prepare for this, in FY 2020 we will be looking at the overall project and making any final adjustments to ensure completion on time. ***FY 2021 Base Plans:***	-	0.235	0.300	-	0.300

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Last year of funding for this effort to finalize last modernization efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding due to completion of modernization.					
Title: Army Career Tracker ***Description:*** The Army Career Tracker is leader development tool that leverages Army?s prior investments to integrate education, training, assignment, self-development and other systems by linking these valuable technologies and resources into a common user-friendly portal across 1.35 million users consisting of enlisted, officers, and civilians. Modify the existing Individual Development Plan (IDP) feature in the Army Career Tracking system. ***FY 2020 Plans:*** Modernization developmental requirements will add new capabilities to render web pages correctly base on the size of the screen. Responsive Web Design (RWD) is an approach to web design that renders web pages based on the size of the device's display screen (e.g., computer, tablet, and phone). This allows the site to load quickly and ensures the display appears as if it were made expressly for the device being used. RWD improves user experience by displaying messages, links, and controls in a logical manner regardless of the device. ***FY 2021 Base Plans:*** Continued modernization of developmental requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding due to modernization nearing completion.	-	0.639	0.195	-	0.195
Title: Enhancement of Army Training Models (ATM) ***Description:*** Enhancement of Army Training Models (ATM) will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation in support of the Army's training needs. ***FY 2020 Plans:*** The performance objective is to modernize and enhance forecasting of training requirements and produce deliverables in support of the Budgeting and Execution cycle. These deliverables will also include improvement of the MDEP validation process (MVP) for CYBER, Missions, Intelligence, and other non-operational activities.	-	0.334	0.500	-	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Enhancements will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation. ***FY 2021 Base Plans:*** Continued modernization and enhancements of the Army Training Models. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds increase in support of increased Army Training Models.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.753	-	-	-
Accomplishments/Planned Programs Subtotals	-	18.320	41.697	-	41.697

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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Legacy systems that will be subsumed by the Army Training Information System (ATIS) are listed below. Annual cost to maintain these systems is ~$75M.

Acronym System Name

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1. ACT - Army Career Tracker (IDP and PDM only).
2. AIRS - Army IMCOM Reservation System.
3. ARM - Army Range Mapper - JMTC/TSAE (EUR).
4. ARTIMS - Army Training Information Management (NIPRnet version Only).
5. ATHD - Army Training Help Desk.
6. ATIA - Army Training Information Architecture.
7. ATLAS - Army Training and Learning Assessment System.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

C. Other Program Funding Summary ($ in Millions)

8. ATMS - Army Training Management System.
9. CAMP - Career Acquisition Management Portal.
10. DLRS-T - Distributed Learning Reporting and Scheduling Tool.
11. DLS - Distributed Learning System (Army Learning Management System).
12. ECDC - Enterprise Content Development Capability.
13. ESC - Enterprise Scheduling Capability. The Enterprise Scheduling Capability (ESC) (Interim) is used
14. GTIMS - Graduate Training Integration Management System (Aviation Resource Training System - ARTS)
15. IDMS - Inventory and Distribution Management System
16. LLC - Lifelong Learning Center
17. RFMSS - Range Facility Management Support System
18. SCINI - IMCOM Senior Commander Installation Needs and Issues
19. SMS - CGSC - Student Management System- Command and General Staff College
20. SRP GIS TK - Sustainable Range Program (SRP) Geographic Information System (GIS) ToolKit
21. SRPP - SRPWeb Portal
22. SWT - System Training Plan (STRAP) Writing Tool
23. TD2QA - Training and Doctrine Development Quality Assurance Management System
24. TDC - Training Development Capability
25. TMSS-E - Training Management Scheduling System - Enterprise
26. TSIMS - Training Support Information Management System *identified as a system to feed HQDA Training COP
27. TS-MATS - Training Support Materiel Army-wide Tracking System
28. WEB TED - Web Based Total Employee Development System

D. Acquisition Strategy

The Army Training Information System (ATIS) is a Category II Defense Business System and will follow the Business Capability Acquisition Cycle (BCAC) in accordance with DoD 5000.75. ATIS will comprise of Commercial-of-the-Shelf (COTS) and/or Government-off-the-Shelf (GOTS) that will provide a Common Operational Picture (COP) of the training environment. ATIS will provide Army Commanders, leaders, Soldiers and civilians with a Common Operating Picture (COP) of the Training Environment (TE) that enables situational awareness, effective planning, preparation, execution, and assessments of training readiness. ATIS will reduce the lifecycle costs of training by retiring more than 28 duplicative, stove-piped systems and improve performance with a net centric, standards-based, architecturally compliant system for the entire Army Training Environment.

The overarching acquisition strategy is divided into three distinct phases.
- Phase I (Prototyping) - Program Risk Mitigation. Characterized by the selection of three vendors to develop, demonstrate and deliver to the Government three ATIS Prototype systems and technical approach documentation. The prototype project was awarded to the C5 Consortium Group to three vendors: KBR, Perspecta, and CGI. (Completed)

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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- Phase II (Development) - Each Prototype will be evaluated at the end of the Phase I and one vendor will be selected for engineering, development and deployment of the ATIS production system. This phase be executed as a single-vendor logical follow-on to the competitively awarded prototyping effort under Other Transaction Authority (OTA), as specifically authorized by 10 U.S.C Section 2371b. This is a streamlined method for transitioning successful prototype projects into follow-on production.
- Phase III - (Sustainment) - Upon full deployment of the system, a Sustainment Contract will be awarded for support and potential disposal of the system at the end of its useful life. ATIS intends to use Interim Contractor Logistics Support (ICLS) for initial sustainment beginning at Limited Deployment and will then transition to a hybrid life-cycle sustainment using a combination of CLS and government entities at Full Deployment (FD).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.753		-		-		-	0.000	0.753	-
		Subtotal	-	-		0.753		-		-		-	0.000	0.753	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATIS Product Development	C/FFP	TBD : TBD	-	-		15.501	Mar 2020	39.550		-		39.550	Continuing	Continuing	Continuing
DLPT5 Content Analysis, Categorization & Modeling	TBD	TBD : TBD	-	-		0.858		1.152		-		1.152	Continuing	Continuing	Continuing
Universal Curriculum and Assessment Tool	TBD	TBD : TBD	-	-		0.235		0.300		-		0.300	Continuing	Continuing	Continuing
Army Career Tracker	TBD	TBD : TBD	-	-		0.639		0.195		-		0.195	Continuing	Continuing	Continuing
Enhanced Army Training Models	TBD	TBD : TBD	-	-		0.334		0.500		-		0.500	Continuing	Continuing	Continuing
		Subtotal	-	-		17.567		41.697		-		41.697	Continuing	Continuing	N/A

Remarks

ATIS Acquisition, Testing and Development phase will be executed as a single-vendor logical follow-on to the competitively awarded prototyping effort under Other Transaction Authority (OTA), as specifically authorized by 10 U.S.C Section 2371b. This is a streamlined method for transitioning successful prototype projects into follow-on production. Development/Production Contract performing activity and location is TBD and will be updated upon contract award in FY20, 2nd quarter, in accordance with the Acquisition Strategy.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		18.320		41.697		-		41.697	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

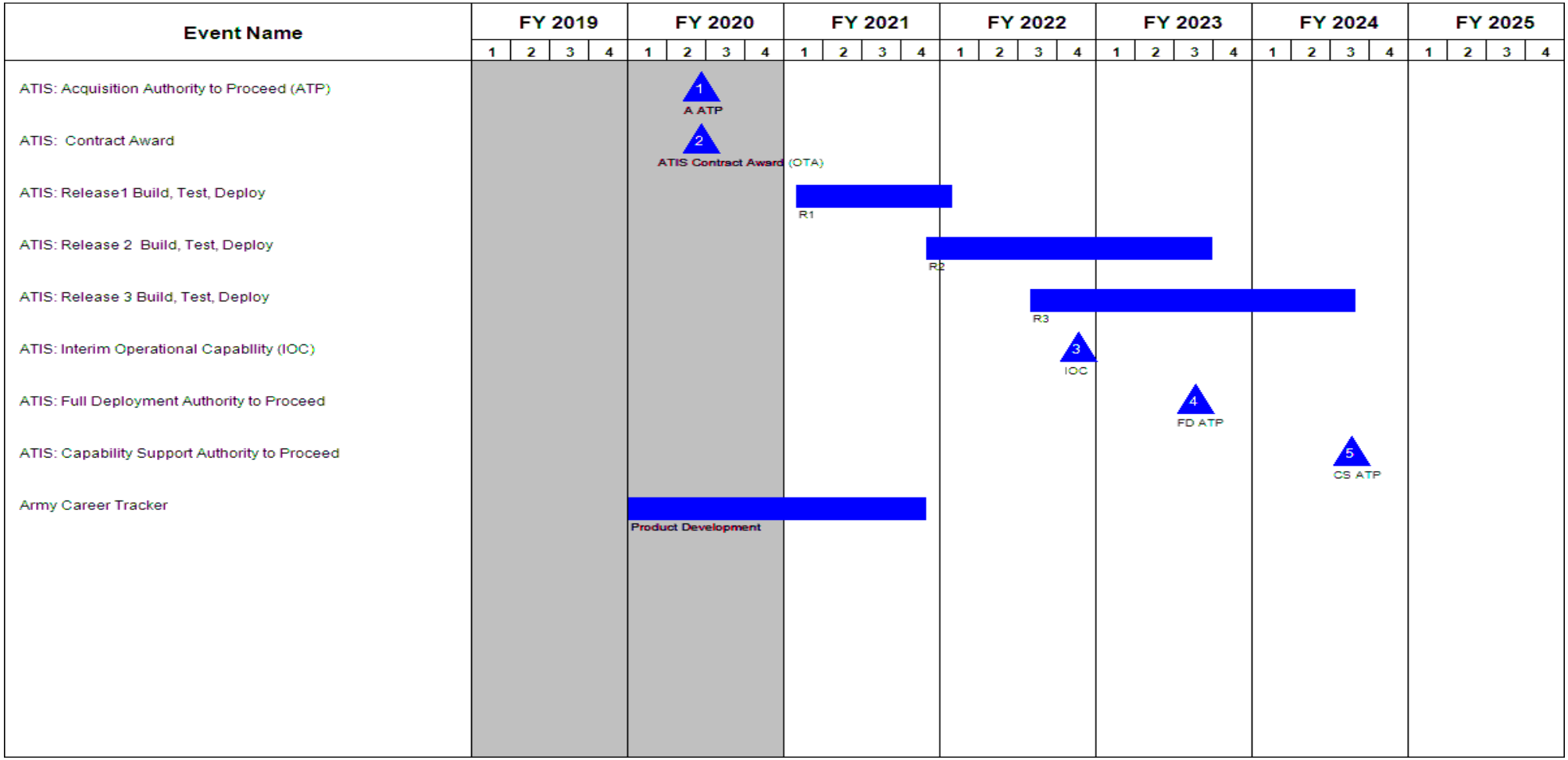

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ATIS: Functional Requirements Authority to Proceed (ATP)	2	2017	2	2017
ATIS: Acquisition Authority to Proceed (ATP)	2	2020	2	2020
ATIS: Contract Award	2	2020	2	2020
ATIS: Release1 Build, Test, Deploy	1	2021	1	2022
ATIS: Release 2 Build, Test, Deploy	4	2021	3	2023
ATIS: Release 3 Build, Test, Deploy	3	2022	3	2024
ATIS: Interim Operational Capabllity (IOC)	4	2022	4	2022
ATIS: Full Deployment Authority to Proceed	3	2023	3	2023
ATIS: Capability Support Authority to Proceed	3	2024	3	2024
Army Career Tracker	1	2020	4	2021

Note

ATIS - The ATIS program will be officially baselined at the Acquisition - Authority to Proceed (ATP).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM9 / *Information Technology for Criminal Investigations*	

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
FM9: *Information Technology for Criminal Investigations*	-	0.000	1.142	1.236	-	1.236	1.241	1.244	1.246	1.258	0.000	7.367
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project Criminal Investigation Management System (CIMS) is to develop, maintain, and operate a secure, unified comprehensive system of applications to support the Army's law enforcement mission

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Criminal Investigative Management System (CIMS)	-	1.090	1.236	-	1.236
Description: Criminal Investigative Management System (CIMS). CIMS, formerly known as the Law Enforcement Advisory Program (LEAP), is a collection of mission essential information technology (IT) systems within the United States Army Criminal Investigation Command (USACIDC) and the Office of the Provost Marshal General (OPMG). Through CIMS, the USACIDC and the OPMG developed an integrated and unified, comprehensive enterprise program / system that houses both classified and unclassified Law Enforcement Sensitive (LES) data. CIMS leverages existing and future Army Law Enforcement (LE) enterprise information technology (IT) assets and other external data sources providing a full range of law enforcement functions to support business objectives and mission. The primary component is a comprehensive enterprise system known as the Army Law Enforcement Reporting and Tracking System (ALERTS) providing Army LE stakeholders the enhanced capability to rapidly and efficiently manage a variety of LE and criminal intelligence functions as well as a broader range of senior executive reporting requirements. The Consolidated Operations Police Suite (COPS) was previously comprised of five separate applications: two of these applications have been rationalized under ALERTS; the remaining three (related to the Army Corrections discipline) require modernization to ensure continued function and security compliance. RDT&E dollars are required to further enhance & enable CIMS? consolidation/rationalization of LE applications thereby providing the LE community the tools to more quickly investigate, solve, and prevent Army crime while also facilitating the management of those placed in corrections facilities. At present, all requested CID RDT&E funding in program element 0605013A will be applied to CIMS initiatives.					
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 funds will continue to establish new congressional mandated law enforcement data transfer initiatives between multiple DoD internal and external law enforcement agencies. Provide Army law enforcement conviction data to the Federal Bureau Investigation's (FBI) National Crime Information Center (NCIC) for the prevention of the legal purchase of firearms by individuals convicted of a criminal offense. ***FY 2021 Base Plans:*** The FY 2021 funds will be utilized to incorporate the Defense Forensics Management Exchange (DFME) system consisting of three applications ? Evidence Management Portal (EMP), Evidence Collection Management Extended (ECMx) and Next Generation Identification (Livescan/Fingerprints) into the CIMS environment. The three applications provide evidence collection and management to the different branches of the military as well as the transmission of fingerprint data to the Federal Bureau Investigation's (FBI) National Crime Information Center (NCIC) for the prevention of the legal purchase of firearms by individuals convicted of a criminal offense ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in funding is due to economic adjustments.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.052	-	-	-
Accomplishments/Planned Programs Subtotals	-	1.142	1.236	-	1.236

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

USACIDC utilizes Agile development which is a process in which development is broken up into several stages. It involves constant collaboration with the stakeholders for continuous improvement and changes at each stage. Development is delivered in Releases to the customer for testing and acceptance this ensures that the project stays on track.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.052		-		-		-	0.000	0.052	-
		Subtotal	-	-		0.052		-		-		-	0.000	0.052	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Criminal Investigative Management System (CIMS)	C/CPFF	ACC-New Jersey : New Jersey	-	-		1.090	Jul 2020	1.236	Jul 2021	-		1.236	0.000	2.326	-
		Subtotal	-	-		1.090		1.236		-		1.236	0.000	2.326	N/A

Remarks

will continue to establish new congressional mandated law enforcement data transfer initiatives between multiple DoD internal and external law enforcement agencies

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		1.142		1.236		-		1.236	0.000	2.378	N/A

Remarks

Base contract started in 2017. Contract # W15QKN17F0046
2017: $2,167K/ Award Date 7/2017
2018: $3,579K Award date 6/2018
2019: $1,500K (T05) Award date 5/2019

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

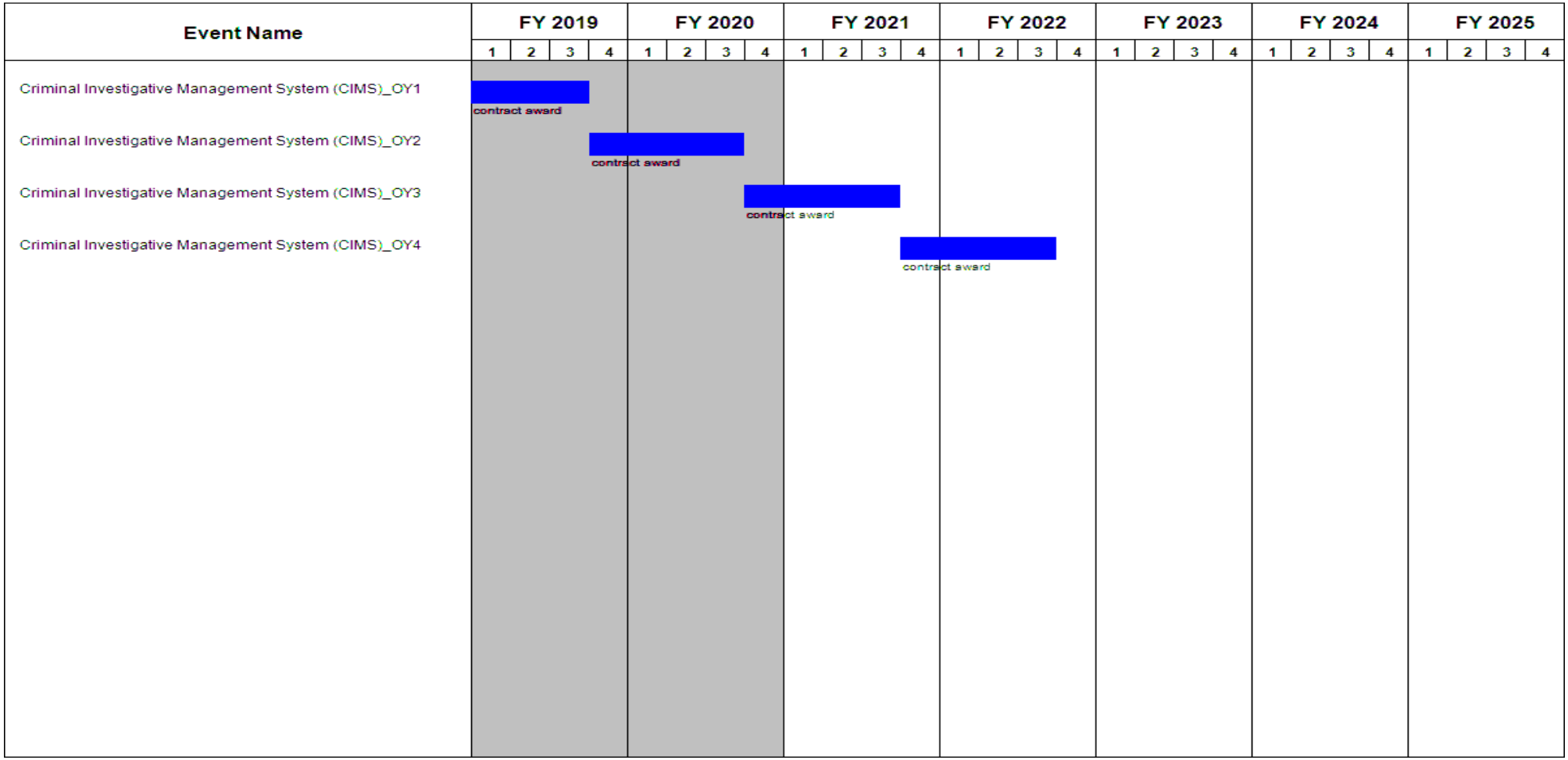

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Criminal Investigative Management System (CIMS)_Base	4	2017	3	2018
Criminal Investigative Management System (CIMS)_OY1	4	2018	3	2019
Criminal Investigative Management System (CIMS)_OY2	4	2019	3	2020
Criminal Investigative Management System (CIMS)_OY3	4	2020	3	2021
Criminal Investigative Management System (CIMS)_OY4	4	2021	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T04 / *USMEPCOM TRANSFORMTION - IT 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
T04: *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	-	17.802	15.236	10.971	-	10.971	11.372	2.233	0.000	0.000	0.000	57.614
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The US Military Entrance Processing Command Integrated Resource System (MIRS) provides automation and communications capabilities to support the peacetime, mobilization and wartime military manpower accession mission for the Armed Services. USMEPCOM conducts its work through 65 Military Entrance Processing Station (MEPS) across the country and 189 Military Entrance Test Sites (METS). MIRS provides automated support for conducting aptitude tests and medical examinations and administratively processing, enlisting and shipping applicants for the Armed Forces, Reserves, and Coast Guard. This includes support for automated versions of the Armed Services Vocational Aptitude Battery (ASVAB) tests. MIRS initiates Social Security Administration (SSA) checks for identity verification; interfaces with US Citizenship & Immigration Services (USCIS) to verify citizenship status for military service applicants to screen out individuals that may be security threats; and interfaces with the Federal Bureau of Investigation (FBI) for background screening, using digital fingerprints to identify/eliminate individuals with criminal records from entering military service.

USMEPCOM reports operationally to the Office of the Under Secretary for Personnel and Readiness and has an executive agency (EA) agreement with the Army. USMEPCOM serves all five uniformed services, but only receives funding from the Army to perform its mission.

MIRS supports recruiting capabilities through electronic interfaces and data sharing, using standard Department of Defense (DoD) data elements with Recruiting Service systems. In the event a military draft is required, MIRS supports mobilization through electronic links with the Selective Service System (SSS) as well as automated support for conducting aptitude tests and medical examinations and administratively processing, inducting and shipping SSS registrants.

Customers/beneficiaries of this investment: the Accessions Community of Interest (ACOI), including components of the Army, Navy, Air Force, Marines, Coast Guard, USMEPCOM, and Office of the Secretary of Defense (OSD) Personnel & Readiness (P&R)

Requested funding underpins system sustainability and scalability and improves cybersecurity to include protection of Personally Identifiable Information (PII). Funding covers costs to redesign/develop existing MIRS capabilities to operate efficiently in a cloud environment and to integrate with MHS-Genesis. This will allow for the closure of 65 Army data centers, in support of the Army Data Center Consolidation Plan (Army Directive 2016-38) and movement towards the Force of the Future mandate of all digital processing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: USMIRS Technical Upgrade	17.802	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Requested funding provides for: Technical refresh of core USMIRS functionality led by the Defense Digital Service (DDS). This funding also covers follow on contracts to finish the core refresh of the system after the DDS effort concludes. This funding will also migrate the system into the cloud environment.					
Title: USMIRS Modernization/Digitization ***Description:*** Requested funding supports the continued development of the prototype USMIRS 1.1 core system. Funding also supports the development of the remaining non-core applications that comprise the USMIRS System of Systems (SoS), and integration of USMIRS 1.1 with the Military Health System (MHS Genesis). Funding also supports Force of the Future mandated efforts associated with modernization/digitization by implementing modern data analytics, expanding non-cognitive testing, and digitizing the Military Entrance Processing Station (MEPS) process. ***FY 2020 Plans:*** Requested funding supports the effort to bring USMEPCOM to an all digital processing state. Continues expansion of non-cognitive testing. ***FY 2021 Base Plans:*** Starting in October of 2020 a contract will be awarded with these funds that will begin developing the USMIRS 1.1 non-core applications. Examples of these applications include our testing application as well as our order writing application. Modernized non-core applications will replace functionality of legacy applications, but will be built from scratch using modern coding, programming, and architecture. A portion of the funding in FY 2021 also supports the Force of the Future efforts mentioned in the description. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding from FY 2020 to FY 2021 represents the completion of the core USMIRS 1.1 functionality and a shift to developing the non-core applications.	-	14.544	10.971	-	10.971
Title: FY 2020 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2020 Plans:***	-	0.692	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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	17.802	15.236	10.971	-	10.971

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The overall effort of the USMEPCOM IT transformation is to modernize and fully digitize the US Military Entrance Processing Command Integrated Resource System (MIRS). The modernization of the system will minimize vulnerabilities and fully digitize 65 military entrance processing stations resulting in efficiencies to all five uniformed services.

The modernization of the USMIRS system is being accomplished using the agile method of software development in short time-boxed "sprints". Program management functions were being performed by the Defense Digital Service (DDS). DDS managed an prototype development contract with a local consulting firm called Tandem (previously known as Devmynd. Based in Chicago IL). The DDS/Tandem effort ended in December of CY2019 and produced a prototype. An in-house program management element of USMEPCOM will manage a follow-on contract to turn the prototype USMIRS 1.1 into a deployable system in FY21.

The efforts in FY21 and beyond will be to develop the non-core applications of USMIRS 1.1 (plug in items to the main system that communicate with other systems across all five uniformed services to include Army Accession Information Environment (AIE)). The contracting for this is being done through GSA Chicago as the owning contract agency. This will most likely be awarded in October of FY2021 with work beginning in October.

Milestones:
1 - Core USMIRS 1.1 prototype delivered in December of Calendar 2019.
2 - Award contract to develop core USMIRS 1.1 prototype into a Minimum Viable Product that can be deployed to the field in 2Q FY2021.
3 - Award contract to develop the USMIRS 1.1 non-core applications (plug ins) in 1Q FY2021 with work to begin 2Q FY2021.
4 - FY22 and beyond will be to primarily establish the link between various systems (AIE, MHS Genesis Etc).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Digital Services/ Tandem (Previously DEVMYND) USMIRS Prototype Development	MIPR	Defense Digital Services (DDS) Managing the Tandem contract (formerly DEVMYND) : Chicago, IL	9.600	-		-		-		-		-	0.000	9.600	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.692		-		-		-	0.000	0.692	-
		Subtotal	9.600	-		0.692		-		-		-	0.000	10.292	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop CORE USMIRS Prototype into Minimum Viable Product (MVP)	C/TBD	TBD : TBD	-	9.402	Jan 2020	-		-		-		-	0.000	9.402	-
Develop NON-CORE USMIRS 1.1 Applications	C/TBD	TBD : TBD	-	-		6.490	Jul 2020	10.971	Jul 2021	-		10.971	Continuing	Continuing	Continuing
		Subtotal	-	9.402		6.490		10.971		-		10.971	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Force of the Future Testing Modernization	Various	Various services performing testing modernization : Multiple	12.931	8.400		8.054		-		-		-	0.000	29.385	-
		Subtotal	12.931	8.400		8.054		-		-		-	0.000	29.385	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.531	17.802		15.236		10.971		-		10.971	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*

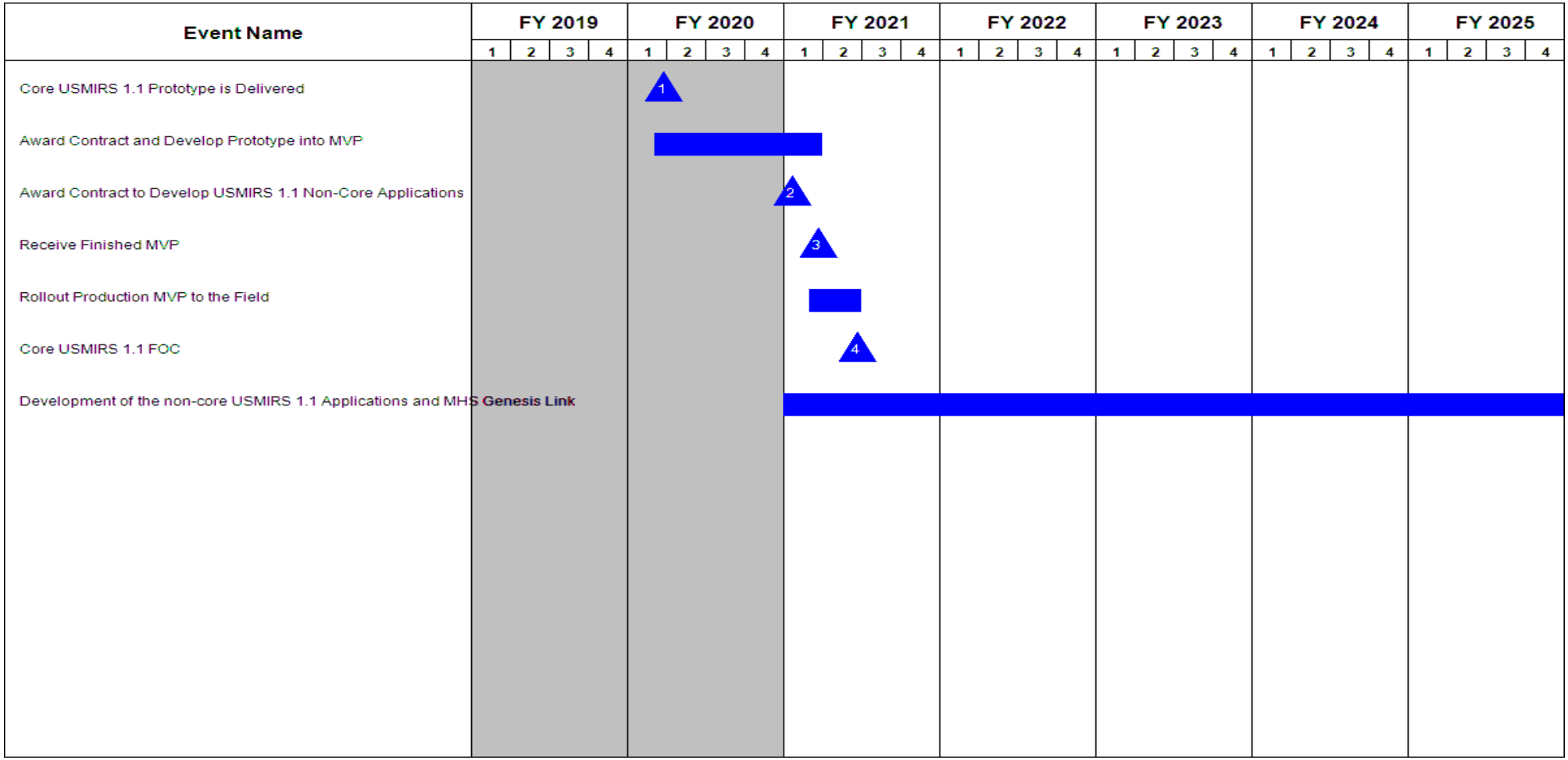

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Core USMIRS 1.1 Prototype is Delivered	1	2020	1	2020
Award Contract and Develop Prototype into MVP	1	2020	1	2021
Award Contract to Develop USMIRS 1.1 Non-Core Applications	1	2021	1	2021
Receive Finished MVP	1	2021	1	2021
Rollout Production MVP to the Field	1	2021	2	2021
Core USMIRS 1.1 FOC	2	2021	2	2021
Development of the non-core USMIRS 1.1 Applications and MHS Genesis Link	1	2021	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T05 / *Army Business System Modernization Initiatives*	

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
T05: *Army Business System Modernization Initiatives*	-	27.530	5.720	20.818	-	20.818	33.024	69.445	137.680	12.118	0.000	306.335
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Global Force Information Management (GFIM): GFIM is a Global Force Management Data Initiative (GFM DI) compliant, integrated, and interoperable digital environment that enables, thru automation, the Deploy to Redeploy/Retrograde (D2RR) end-to-end business processes in support of Dynamic Force Employment (DFE). Today, over 85% of this core Army Business Process is done manually and the tools that are available are on outdated technology platforms. GFIM will provide the tools necessary to dynamically develop, design, and document the Army's force structure at rest and in motion. GFIM will evolve both long-term and immediate bridging solutions that integrate and automate Army operational business processes, using an interoperable, collaborative environment, to enable the seamless exchange of authoritative data across the operational community of practice to provide rapid, accurate, and auditable outcomes to support risk informed senior leader decisions. GFIM will provide the core data necessary for Enterprise Resource Planning (ERP) systems, other Business Mission Area (BMA) systems and Warfighting Mission Area (WMA) systems to efficiently and effectively execute business processes in support of Army Title 10 responsibilities and war fighting operations.

The Student Information Repository (SIR) Application will replace several independent applications and business processes used to track student data including, but not limited to, personal information, grades, attendance, official records, transcripts, teaching teams, student assignments, and surveys. It is a customized information system that is comprised of separate modules that are tied in together as one system.

The Program Planning Budget (PPB)- Business Operating System (BOS) will standardize and better integrate the transactional automated information systems used in the HQDA level programming and budgeting processes. These systems are core to the PPBE business processes of the HQ for gathering programmatic requirements, balancing resources and delivering the Army's program budget to OSD. This project is streamlining programming and budgeting processes and significantly improving strategic analysis capabilities. The project is architecting, reengineering, streamlining and consolidating HQDA systems, feeder data base systems, and streamlining the associated processes. These improvements will improve capability, eliminate redundancies and reduce overall cost of operations. The PPB BOS project is complementary to the Army's General Fund Enterprise Business System (GFEBS) program. It includes a new effort in FY 2014, the Army Contract Writing System, a replacement for the DoD Standard Procurement System (SPS).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Global Force Information Management	1.151	2.768	16.085	-	16.085
Description: Global Force Information Management (GFIM): GFIM will provide the Army an enterprise, integrated authoritative force management capability for lifecycle management of force/organizational structure data for the entire Army. GFIM will establish a common standard for force structure data by implementing OSD's					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Global Force Management Data Initiative (GFM-DI). This effort will decrease/consolidate 12 legacy applications/ systems to 3 in GFIM Increment I and further to 1 system in GFIM Increment II. ***FY 2020 Plans:*** Funding will be used for continuation of Acquisition Planning and Systems Engineering support for GFIM requirements analysis and initial system design, along with prototyping efforts. ***FY 2021 Base Plans:*** Funding will be used to support system integration developmental efforts for modernizing the Army's Force Management System via the Army Organizational Server (AOS). This modernization effort addresses capability gaps for systems that require a force structure model based on authorized force structure, while accurately reflecting "boots on the ground" reality of the operational Army. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funding from $2.933 million to $16.085 million represents the ramp-up of development work associated with all components of GFIM, the majority of which is FMS Modernization. FMS Modernization remains vital to the overall GFIM effort ensuring legacy Force Management applications migrate appropriately according to the Global Force Management Data Initiative, an OSD mandated requirement for all services. Initial Operating Capability (IOC) of GFIM Increment I is anticipated NLT the end of FY 2021.					
Title: HRC CORE IT (iPERMS, iPERMS-S, ASBS 2.0, SMS WEB) ***Description:*** This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. Additionally, program supports enhancements and modifications to the Interactive Personnel Electronic Records Management System (iPERMS) and iPERMS-Secure (iPERMS-S), as well as development of interfaces based upon emerging requirements, Cybersecurity, functionality and compliance with Army standards. This effort transitions to PE 655013/FM7 in FY20.	1.756	-	-	-	-
Title: Army Business System Modernization Initiatives	2.735	2.628	2.943	-	2.943

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Modernization requirements will add new capabilities to legacy IT systems that support human resource functions such as organization and position management, training, and employment. The PPB BOS system standardize and integrate the transactional information systems used in the Headquarters Department of Army (HQDA) Programming and Budgeting processes. The program is streamlining programming and budgeting business processes and significantly improving strategic analysis capabilities. The PPB BOS architecture reengineers, streamlines, and consolidates HQDA systems and financial feeder systems; aligns to the DoD Business Enterprise Architecture (BEA); implements powerful business intelligence analytical tools to support strategic planning, programming, and budgeting within HQDA; and provides access to GFEBS funds management and execution data through system interfaces with required SFIS compliancy integral to the PPB BOS data model. The LEAP program will provide criminal intelligence querying and reporting capabilities in compliance with regulatory and policy standards for Army Law Enforcement regarding investigation of felony crimes. LEAP captures criminal case investigative information regarding incidents, location descriptors, entities (name, social security number, rank, title, physical characteristics, sex, birth place, and date), agent assignment, crime description and identifiers, statements, property data, laboratory tests; verifies and stores this data for criminal intelligence purposes: and reports this information to the proper authorities from the Division Commanding Officer to the United States Grand Jury. The system will extract necessary data for consolidation and input to Defense Incident-Based Reporting System (DIBRS) monthly reports, National Incident-Based Reporting System (NIBRS) monthly reports and the Defense Clearance and Investigations Index (DCII) daily updates. The LIMS system will automate business processes that support the forensic examiners. These processes include, but are not limited to, analytics, materials management, management reporting, Freedom of Information Act requests (FOIA), legal discovery request, court preparation and outsource processing. Civilian Personnel Online - Portal (CPOL-Portal) is a one stop secure site which provides Army civilian employees and HR specialists access to a private portal with a complete set of employment related resources, links and web based applications that require single sign-on access - Army Regional Tools (ART). CPOL-Portal will provide an Integrated Management System (IMS) in support of Civilian Workforce Transformation (CWT). It will support Civilian human capital decision making and allow leaders and employees to perform their roles more efficiently in support of Army goals and missions. CPOL Portal will provide the full spectrum of IT application support and access to Acquire, Develop, Distribute and Sustain components of the Army Civilian HCM Life-Cycle and link to G3 'Structure' IT Enterprise Applications.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The Fully Automated System for Classification (FASCLASS) is a centralized, web-based system that maintains civilian position descriptions and position related information across Department of the Army. It provides classifiers and managers capability to create, edit, and verify position descriptions. Also it offers robust search, report generation, and lookup & support capabilities. The Overseas Entitlement Tracker (OET) provides the capability to accurately track Living Quarters Allowance (LQA). LQA is provided to reimburse employees for suitable, adequate living quarters at posts where the U.S. Government does not provide quarters. OET also tracks these other overseas entitlements for employees: Advance Pay, Danger Pay, Imminent Danger Pay, Foreign Differential, Home Leave, Post Allowance, Separation Maintenance Allowance, and Temporary Quarters Subsistence Allowance. ***FY 2020 Plans:*** Continue to fund Army Business System Modernization Initiatives. ***FY 2021 Base Plans:*** Continue to fund Army Business System Modernization Initiatives. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increased requirements for installations business systems.					
Title: ARIMS ***Description:*** ARIMS is the Army?s policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY 2018) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army?s classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army?s records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund	0.855	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector. This effort transitions to 0605013A project FM7 in FY20.					
Title: Family Advocacy System of Records (FASOR) ***Description:*** FASOR is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements. This effort transitions to PE 655013/FM7 in FY20.	1.914	-	-	-	-
Title: Army SHARP ***Description:*** Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes. ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) in accordance with public law. This effort transitions to 0605013A project FM7 in FY 2020 for greater transparency.	1.453	-	-	-	-
Title: Army Training Information System (ATIS) ***Description:*** Army Training Information System (ATIS) is an enterprise system that will provide a common operational picture (COP) of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. These capabilities will enable Commanders, leaders, Soldiers, and civilians to better understand, visualize, describe, direct, lead, and assess training requirements	14.968	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
so they can more effectively plan, prepare, execute, and assess training. End result is an ATIS that enables Soldiers to train as they will fight, so they can effectively fight as they have trained. This Program transitions to PE 655013/FM8 in FY20.					
Title: SFL-TAP XXI Modernization ***Description:*** SOLDIER FOR LIFE-TRANSITION ASSISTANCE PROGRAM XXI (SFL-TAP XXI): The Transition Assistance Program XXI (TAP-XXI) application provides an interactive, multimedia approach to pre-separation counseling and job assistance training. This application uses full motion video, graphics, and sound to train clients; and schedules clients for classroom-type instruction. It integrates a complete range of transition services and benefits for service members, Department of Defense civilian employees, and their family members as they transition from the military. TAP-XXI is a web-based, three-tiered application with a centralized database for all Transition sites. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The requirements in place today represent a 300 percent increase over the pre-VOW requirements. A significant modernization effort within TAP XXI is needed. Justification: ($ in Millions) FY 2019 Base procurement dollars in the amount of $0.606 million resources the TAP XXI modernization requirements. Planned Program includes modernize client management module, Soldier module, and increase reporting capabilities. This Program transitions to PE 6550103/FM7 in FY20.	0.972	-	-	-	-
Title: Army Career Tracker (ACT) ***Description:*** Modify the existing Soldier Home Page to quickly display key career related status requiring immediate action. Use ACT professional development systems to support and enhance Soldier competitive efforts for advancement and retention. ACT will utilize the Real-Time Broker Service (RBS) to get the DoD ID Number from DMDC for new users who come to them through these other systems. This method will allow ACT to retrieve DoD ID for users that may not have been processed in the Batch Request. This Program transitions to PE 655013/FM8 in FY20.	0.250	-	-	-	-
Title: Defense Language Software Upgrade	1.476	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Development of DLPT5 Content Analysis, Categorization and Modeling (CACM) capabilities. For integration within the DLIFLC MIT LL TIDWA Domino system. These capabilities are in direct response to DLIFLC's DoDI assigned responsibilities for DLPT item bank maintenance, psychometric analysis and informed pool management, and closely support the DLPT Validity Framework. The Student Information Repository (SIR) Application will replace several independent applications and business processes used to track student data including, but not limited to, personal information, grades, attendance, official records, transcripts, teaching teams, student assignments, and surveys. It is a customized information system that is comprised of separate modules that are tied in together as one system. This Program transitions to PE 655013/FM8 in FY20.					
Title: Corp of Engineers Installation IT Support ***Description:*** Funding is used to modernize Army installation IT systems. ***FY 2021 Base Plans:*** Funding is used to modernize Army installation IT systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** This is the first year of funding for this effort.	-	-	1.790	-	1.790
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.324	-	-	-
Accomplishments/Planned Programs Subtotals	27.530	5.720	20.818	-	20.818

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

GFIM will leverage existing Force Management System Cost Plus Award Fee contract to execute development efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T05 / *Army Business System Modernization Initiatives*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SFL-TAP XXI Modernization	TBD	To Be Determined : To Be Determined	-	0.639		-		-		-		-	0.000	0.639	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.324		-		-		-	0.000	0.324	-
		Subtotal	-	0.639		0.324		-		-		-	0.000	0.963	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRODUCT DEVELOPMENT FOR KEYSTONE RETAIN SYSTEM, i-PERMS PRODUCT DEVELOPMENT	MIPR	M&RA/G-1 : ARLINGTON, VA	16.570	-		-		-		-		-	0.000	16.570	-
PPBOS PRODUCT DEVELOPMENT	MIPR	OAA : FORT BELVOIR, VA	24.751	1.235		0.846		0.987		-		0.987	0.000	27.819	-
Product Development for ACWS	C/IDIQ	PEO EIS : Alexandria, VA	45.741	-		-		-		-		-	0.000	45.741	-
ATIS	C/IDIQ	PEO EIS : FT Eustice VA	35.752	14.968		-		-		-		-	0.000	50.720	-
Army Career Tracker	C/FFP	TBD : Reston, VA	2.288	0.250		-		-		-		-	0.000	2.538	-
Army Business System Modernization Initiatives	C/IDIQ	TBD : TBD	27.639	1.500		1.782		1.956		-		1.956	Continuing	Continuing	-
Defense Language Software Upgrade	C/FFP	TBD : TBD	3.810	1.476		-		-		-		-	0.000	5.286	-
Global Force Information Management	Option/ CPAF	CACI : Chantilly, VA	-	1.151		2.768		16.085		-		16.085	Continuing	Continuing	Continuing
Army SHARP	TBD	Various : Various	-	1.453		-		-		-		-	0.000	1.453	-
SFL-TAP XXI Modernization	TBD	To Be Determined : To Be Determined	-	0.333		-		-		-		-	0.000	0.333	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HRC Core IT	C/CPFF	Digital Management, LLC / SAIC : Bethesda, MD / Reston, VA	3.407	1.756		-		-		-		-	Continuing	Continuing	Continuing
ARIMS	TBD	TBD : TBD	1.428	0.855		-		-		-		-	0.000	2.283	-
FASOR	MIPR	CECOM : CECOM	-	1.914	Aug 2019	-		-		-		-	0.000	1.914	-
Corp of Engineers Installation IT Suppor	TBD	TBD : TBD	-	-		-		1.790		-		1.790	0.000	1.790	-
		Subtotal	161.386	26.891		5.396		20.818		-		20.818	Continuing	Continuing	N/A

Remarks

Global Force Information Management (GFIM): GFIM will provide the Army an enterprise, integrated authoritative force management capability for lifecycle management of force/organizational structure data for the entire Army. In addition, it will establish a common data standard for force structure data by implementing the Global Force Management - Data Initiative (GFM-DI).

Army Training Information System (ATIS) is an enterprise system that will provide a common operational picture of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. These capabilities will enable commanders, leaders, soldiers, and civilians to better understand, visualize, describe, direct, lead and assess training requirements so they can more effectively plan, prepare, execute, and assess training. End result is an ATIS that enables soldiers to train as they fight so they can effectively fight as they have trained.

The Army Human Resources Command (HRC) has several efforts for which RDT&E will be applied. One is to prepare those systems for subsumption into the Integrated Personnel and Pay System(IPPS-A). The other is to disconnect and upgrade those systems not being subsumed by IPPS-A. Systems that will be targeted by HRC to prepare for IPPS-A subsumption or upgrade are the Automated Orders and resources System (AORS), Army Selection Board System (ASBS), Data Base Administration Suite of System (DBA), Enlisted Distribution and Assignment system (EDAS), Enlisted Promotion Model (EPM), Enterprise Service Bus (ESB), Human Resource Command Identity Management System (HIMS), Integrated Total Army Personnel Database (ITAPDB), Officer Selection Support System (OSSS), Reserve Statistics Accounting System/ Reserve Component Common Personnel Data System (RSAS/RCCPDS), Senior Enlisted Promotions Model (SEPM), Single Evaluation Processing System (SEPS), Soldier Management System Webified Suite of System (SMSWEB), Total Army Personnel Data Base - Active Enlisted (TAPDB-AE), Total Army Personnel Data Base - Active Officer (TAPDB-AO), Total Army Personnel Data Base - Active Reserve (TAPDB-AR), Total Officer Personnel Management Information System (TOPMIS), Total Officer Personnel Management Information System II (TOPMIS II), Keystone Request/Retain System, and the Interactive Personnel Electronic Records Management System (iPERMS).

HRC Core IT: Award date shown reflects iPERMS IT Integration Contract. SMS-WEB and ASBS 2.0 are on the Digital Application Support Task Order (DASTO) with an award date of 6 Feb 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T05 / *Army Business System Modernization Initiatives*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	161.386	27.530		5.720		20.818		-		20.818	Continuing	Continuing	N/A

Remarks

GFIM - In FY 2019 RCAS/FMS received $1 million for upgrading standard schema based on OSD mandate for joint interoperability and Force Structure modernization. Prototype design is planned for FY 2020.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

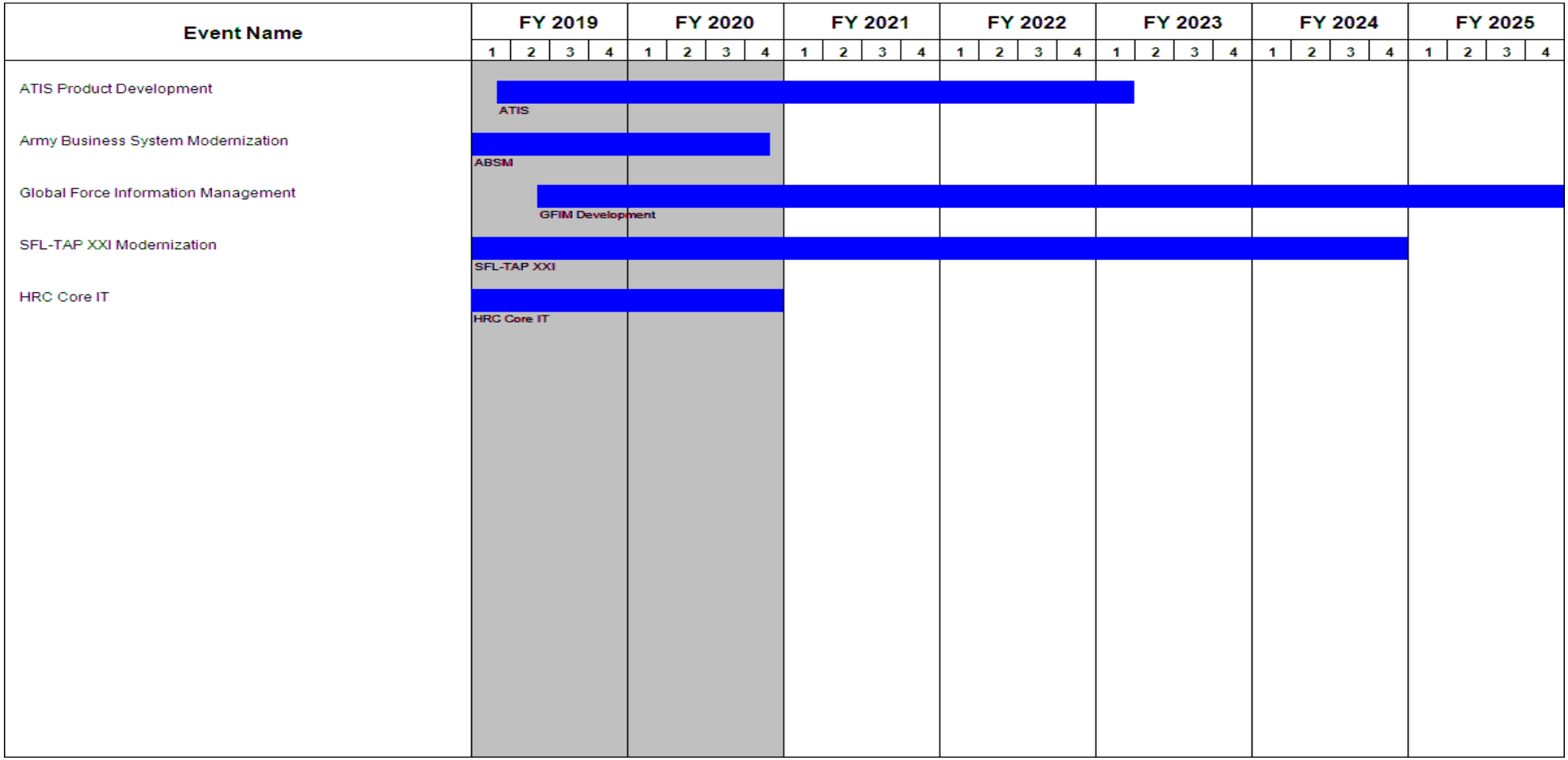

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ATIS Product Development	1	2016	1	2023
Army Business System Modernization	1	2016	4	2020
Global Force Information Management	2	2019	4	2025
SFL-TAP XXI Modernization	1	2019	4	2024
HRC Core IT	4	2018	4	2020

Note

Army Contract Writing System moved to 0605047 in FY 2017. The Commanders Risk Reduction Dashboard (CRRD) requirements moved to and are now maintained within PE 0605013A, Project 099 in FY2019.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) VR3 / *ASMIS-R (REPORTIT)*	

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
VR3: *ASMIS-R (REPORTIT)*	-	1.369	2.836	3.156	-	3.156	3.219	3.265	3.298	3.331	0.000	20.474
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Safety and Health Management System (ASHMS) initiative provides a framework of people, processes and technology to synchronize, integrate and optimize Army Safety and Occupational Health (SOH) capabilities to reserve war fighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, Families, Civilians, and contractors. An analysis of Army SOH Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policies (DOTMLPF-P) determined that the Army Safety Management Information System - Revised (ASMIS-R), a Defense Business System, is currently not able to satisfy current and emerging ASHMS capability requirements without modernization to resolve these capability gaps. Changes in requirements for the Army Safety and Health Management System (Programmatic) related to DoDI 6055.01, AR 385-10, Information Assurance requirements and direct feedback from the Safety professionals within the DoD and the Army have resulted in the need for changes in associated business processes. Additionally, a business gap analysis performed by the DASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the work place, determining hazard mitigation strategies and controls, employing these strategies and controls, and measuring their potential for reducing mishaps. Addressing these problems will have an immediate and direct impact on meeting regulatory requirements, improving data integrity, improving information assurance posture (compliance), increasing the Army's ability to reduce mishaps across the force structure, and promoting Army Force Generation (ARFORGEN) capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: ASMIS-R Development	1.369	2.656	3.156	-	3.156
Description: The Army Safety and Health Management System (ASHMS) initiative provides a framework of people, processes and technology to synchronize, integrate and optimize Army Safety and Occupational Health (SOH) capabilities to preserve war fighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, Families, Civilians, and contractors. An analysis of Army SOH Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policies (DOTMLPF-P) determined that the Army Safety Management Information System ? Revised (ASMIS-R), a Defense Business System, is currently not able to satisfy current and emerging ASHMS capability requirements without modernization to resolve these capability gaps. Changes in requirements for the Army Safety and Health Management System (Programmatic) related to DoDI 6055.01, AR 385-10, Information Assurance requirements and direct feedback from the Safety professionals within the DoD and the Army have resulted in the need for changes in associated business processes. Additionally, a business gap analysis performed by the ASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the work place,					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
determining hazard mitigation strategies and controls, employing these strategies and controls, and measuring their potential for reducing mishaps. Addressing these problems will have an immediate and direct impact on meeting regulatory requirements, improving data integrity, improving information assurance posture (compliance), increasing the Army's ability to reduce mishaps across the force structure, and promoting Army Force Generation (ARFORGEN) capabilities. ***FY 2020 Plans:*** Continue work with Army Analytics Group and contract for the development of the fourth activity. ***FY 2021 Base Plans:*** Continue work with Army Analytics Group and contract for the development of the fourth activity. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase due to increase in analytics requirements.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.180	-	-	-
Accomplishments/Planned Programs Subtotals	1.369	2.836	3.156	-	3.156

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

ASMIS-R is comprised of legacy modules (applications) that require modernization to maintain their relevancy to the Army in support of mishap reduction. As stated above, these are primarily related to meeting minimum DoD regulatory requirements related to the collection of mishap information, safety information storage, and resolving inefficiencies in data quality control and information flow.

Additionally, advances in technology allow for improvements in performance and data integrity that currently are deficiencies in the system. ASMIS-R, in its current state,

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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does not provide any IT (material solution) to the business requirements identified above. The Command has utilized a FFP contract to execute specific Task Orders to develop the tools and products through mid-year FY 2015. The CRC will be competing a new contract vehicle to support the development of products and tools from midyear FY 2015 through FY 2024.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) VR3 / *ASMIS-R (REPORTIT)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.180		-		-		-	0.000	0.180	-
		Subtotal	-	-		0.180		-		-		-	0.000	0.180	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASMIS-R	MIPR	AAG : Monterrey, CA	0.434	0.426		0.093		0.156		-		0.156	Continuing	Continuing	Continuing
		Subtotal	0.434	0.426		0.093		0.156		-		0.156	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASMIS-R	TBD	Army Contracting Command : Natick	3.021	0.943	Dec 2018	2.563		3.000		-		3.000	Continuing	Continuing	Continuing
		Subtotal	3.021	0.943		2.563		3.000		-		3.000	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.455	1.369		2.836		3.156		-		3.156	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

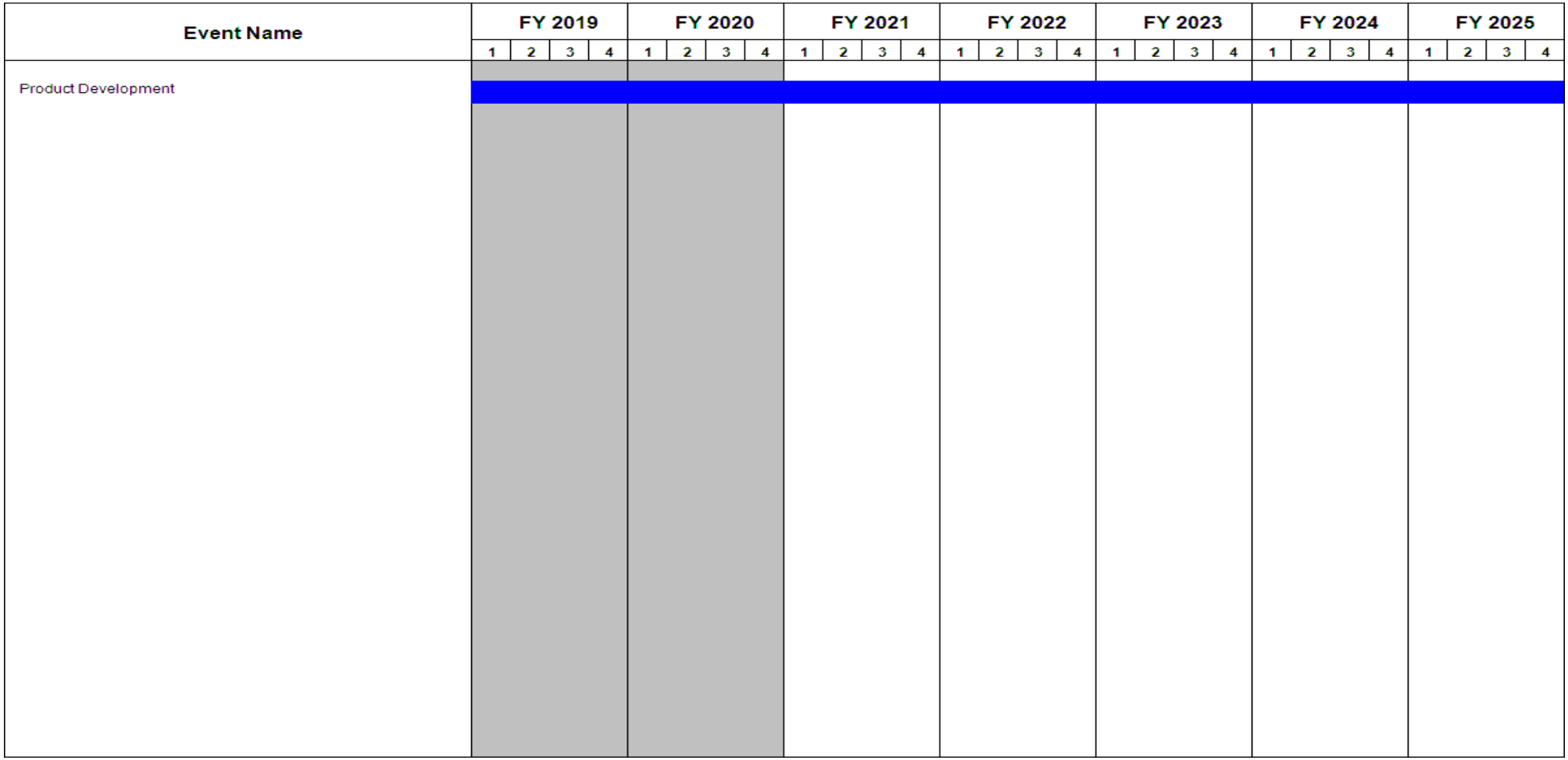

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Product Development	3	2018	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) XV6 / *Army Leader Dashboard*	

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
XV6: *Army Leader Dashboard*	-	0.000	1.355	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.355
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Army Leader Dashboard (ALD) is not a new start. On 10 May 2018 an Above Threshold Reprograming (ATR) was approved by the House Appropriations Committee-Defense (HAC-D) for $7.4 million used to award an Other Transaction Agreement (OTA) to five vendors and to complete Phase 1 of the prototype development efforts (Program Element - 0605013A / Project Number T05). In addition, ALD was allocated $9.575 million (FY 2019 RDT&E) to fund Phase 2 of the prototype development efforts in FY 2019. In FY 2020, the ALD program was given its own Project Number (XV6) under Program Element 0605013A / Information Technology Development.

A. Mission Description and Budget Item Justification

Army Leader Dashboard (ALD) is a large data management platform and tailorable solution that integrates, analyzes, and visualizes information from multiple disparate data sources, both classified and unclassified. Information relayed by the system will include timely, precise, and accurate reports and indicators for readiness, manning, equipping, training, sustainment, acquisition, and cyber security capabilities at all levels from the individual Soldier or item, to Unit levels, and to the strategic level.

The ALD will provide Army senior leaders and other users near real-time visibility and access to Army data, facilitating rapid decision making while supporting strategic, operational, and tactical planning. The ALD is one of the Chief of Staff, Army's top priorities and is endorsed by senior leaders across the entire Army.

In FY 2021 Project XV6 ALD transitions to sustainment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Army Leader Dashboard Acquisition, Testing, and Deployment Phase (FY17-FY20) / Capability Support (FY21 - FY25)	-	1.293	-	-	-
Description: During the acquisition, testing, and deployment phase the ALD program office will perform all development, data integration, test, and deployment activities for a data management and visualization solution that encapsulates all Army data. During the Capability Support Phase when the ALD system is in production, ALD will continue to establish automated connections to existing Army data (also known as Authoritative Data Sources (ADSs)). To date, ALD has identified more than 600 ADSs that will require automated data ingestion. This is a major increase from the initial requirement which focused solely on readiness (108 ADSs). The ALD team has assessed all 600+, categorized them by complexity, priority/value, and sunset/retirement dates.					
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding will support the Phase 3 Production phase, specifically on external interface partner integration and development. To date, a potential of 697 authoritative data sources have been identified that will require some sort of connection to ALD. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** In FY 2021 Project XV6 ALD transitions to sustainment.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.062	-	-	-
Accomplishments/Planned Programs Subtotals	-	1.355	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Army Leader Dashboard (ALD) has also requested Operations and Maintenance (O&M) dollars PB 2020 to fund the Production phase as a Software as a Service (SaaS) contract. The O&M dollars will maintain the selected system - licenses, helpdesk hosting, cybersecurity, and all supporting sustainment activity requirements.

D. Acquisition Strategy

In Section 815 of the National Defense Authorization Act (NDAA) for FY 2016, Public Law 114-92, Congress amended DoD's authority to carry out prototype projects using Other Transaction (OT) agreements. The OT agreements are now permanently codified in 10 U.S.C. Section 2371b, titled "Authority of the Department of Defense to Carry out Certain Prototype Projects" and offer a streamlined method for selecting and conducting prototype projects. The ALD program office is taking advantage of this useful acquisition tool to procure ALD prototypes rapidly. Section 2371b requires that competitive procedures be used "to the maximum extent practicable," and the ALD is using a "full and open" Prototype Proposal Opportunity Notice (PPON) to achieve maximum competition.

In addition to the system functional requirements, a directed needs statement directs the program to:
- Procure no less than two, and not more than four, prototypes for user assessment, development of application protocol interfaces, and development of selected software interfaces with designated Authoritative Data Sources.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

- Phase the program to deliver an initial capability of two to four prototypes no later than 30 days (from award announcement) that allows assessment of the awarded two to four prototypes and a final comparison tradeoff. The results will lead to a follow-on award of one to two prototypes for an additional assessment phase upon execution of a Decision Point.

In actuality, ALD selected five vendors to compete in Phase 1 of the prototype development (August 2019 through December 2019) which resulted in two vendors moving onto Phase 2 of the prototype development. The ALD program office is currently conducting/completing Phase 2 with one vendor (down-selected to one on 26 June 2019). Production will be acquired separately, as a sole-sourced contract, leveraging the research and information captured during the two prototyping phases.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.062		-		-		-	0.000	0.062	-
		Subtotal	-	-		0.062		-		-		-	0.000	0.062	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
External Interface Partner Integration	IA	Army Interface Partners - Multiple : TBD - Multiple	-	-		1.293	Jan 2020	-		-		-	0.000	1.293	Continuing
		Subtotal	-	-		1.293		-		-		-	0.000	1.293	N/A

Remarks

The interface development approach for ALD will be informed by the Studies & Analysis requirement during the Phase 1 Prototyping Stage in FY 2018/FY 2019.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		1.355		-		-		-	0.000	1.355	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

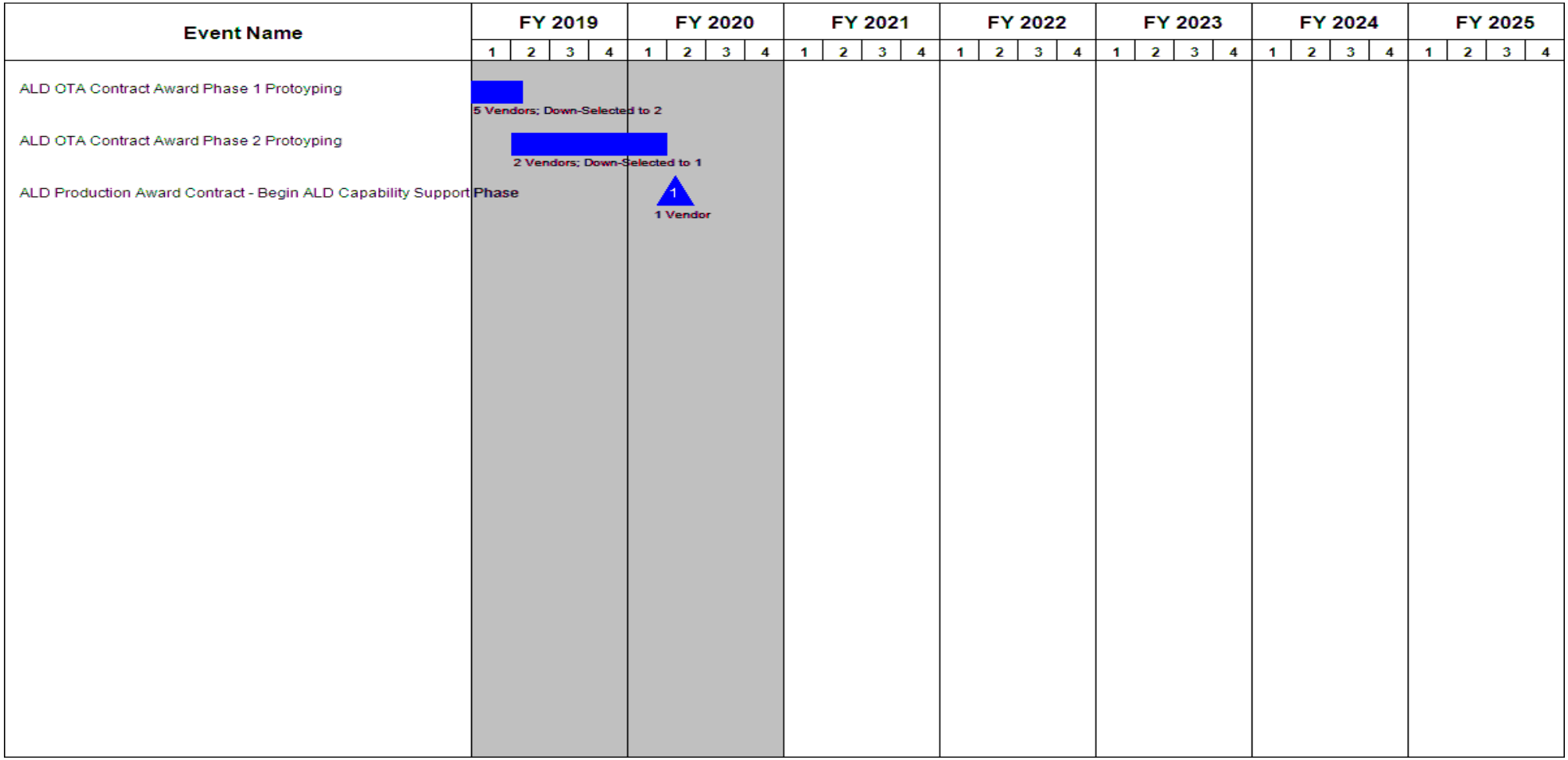

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALD OTA Contract Award Phase 1 Protoyping	4	2018	1	2019
ALD OTA Contract Award Phase 2 Protoyping	2	2019	1	2020
ALD Production Award Contract - Begin ALD Capability Support Phase	2	2020	2	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605018A *I Integrated Personnel and Pay System-Army (IPPS-A)*							
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	-	158.807	102.073	115.286	-	115.286	1.465	0.000	0.000	0.000	Continuing	Continuing
ED9: *Integrated Personnel and Pay System - Army Inc 2*	-	158.807	102.073	115.286	-	115.286	1.465	0.000	0.000	0.000	Continuing	Continuing

Note

IPPS-A Increment II (Project ED9), formerly designated as an Acquisition Category IA Major Automated Information System (MAIS) program under the authority of DoDI 5000.02, transitioned under the acquisition authority of DoDI 5000.75 to a Business System Category I (BSC 1) program as a result of the Release 2 Limited Deployment Decision Memorandum signed 3 May 2019.

A. Mission Description and Budget Item Justification

The Integrated Personnel and Pay System-Army (IPPS-A) Increment II provides an integrated, multi-Component, personnel and pay system, which streamlines the existing Human Resources (HR) systems and processes enhancing efficiency and accuracy of personnel and pay procedures in support of 1.1 million Soldiers and their Families. IPPS-A will subsume approximately 40 legacy systems (full and partial) across the Active, Reserve and National Guard Components into one single integrated system. IPPS-A is a web-based tool, available 24-hours a day, accessible to HR professionals, Combatant Commanders, pay managers and other authorized users throughout the Army. IPPS-A addresses major deficiencies in the delivery of military personnel and pay services by providing the necessary internal control and audit procedures as well as preventing erroneous payments and loss of funds. This program is an essential building block to reform the Department towards achieving greater performance and affordability in support of the National Defense Strategy and the Congressional audit mandate.

IPPS-A Increment II is the #1 HR Modernization effort in the Army and will deliver fully integrated personnel and pay services for all Army Components building on the trusted database delivered by the IPPS-A Increment I program. The program is the critical enabler for The Army People Strategy and its transition to a Talent Management System and an HR data-rich environment. Increment II will link the personnel and pay functions for all Army personnel eliminating duplicate data entry, reducing complex system maintenance, and minimizing pay discrepancies. IPPS-A Increment II will account for status changes between Active and Reserve/National Guard Components to ensure accurate credit for service and individual pay as well as enable disciplined human resource management.

FY 2021 requested budget supports the revised Acquisition Strategy approved by the Army Acquisition Executive (AAE) on 24 July 2019, and provides for the development of Release 3 Personnel System supporting the Total Force. The revised Acquisition Strategy removes the schedule concurrency, thereby reducing complexity and shifting risks to the vendor by changing the Release 3 System Integrator development contract structure from cost plus to firm fixed. The new "heel-to-toe" release development strategy is, in part, a result of rescinded statutory acquisition mandate, 10 United States Code Chapter 144A, Major Automated Information System (MAIS) Programs, which originally required completion of a program from initiation to the Full Deployment Decision within five years. This restriction forced substantial schedule compression and necessitated the high risk scheduling of concurrent releases to meet requirements within the prescribed timeframe. The revised schedule allows for a focused and systematic development, integration and delivery of the new HR and Pay system for the Total Force. Further, the revised program has facilitated the execution of Business Process Reengineering on a significant scale - allowing the Army to reduce from 154 HR Business Processes to 52.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605018A *I Integrated Personnel and Pay System-Army (IPPS-A)*		
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	164.899	142.773	66.045	-	66.045
Current President's Budget	158.807	102.073	115.286	-	115.286
Total Adjustments	-6.092	-40.700	49.241	-	49.241
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-40.700			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-6.092	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	49.241	-	49.241

Change Summary Explanation

FY 2021 RDTE increase of $49.241 million supports the revision of Increment II schedule providing for development of Release 3 (Personnel System for Reserves and Active Duty Components). On 24 July 2019, the Army Acquisition Executive (AAE) signed the revised Increment II Acquisition Strategy. On 7 January 2020, the AAE approved the re-baseline Authority to Proceed (ATP) with revised cost, schedule and performance values.

With AAE re-baseline decision, the department has revised the program's Increment II development schedule by reducing concurrency of its multiple releases and extending the Release 3 development and partial testing for the remainder of FY 2021. Revised FY 2021 RDTE is required to support Release 3 development and testing activities leading up to full operational testing in 1Q FY 2022. Buys: System Integration engineering service, data hosting, technical support contracts, external testing, interfacing and development related software.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	Project (Number/Name) ED9 / *Integrated Personnel and Pay System - Army Inc 2*	

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
ED9: *Integrated Personnel and Pay System - Army Inc 2*	-	158.807	102.073	115.286	-	115.286	1.465	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

IPPS-A Increment II (Project ED9), formerly designated as an Acquisition Category IA Major Automated Information System (MAIS) program under the authority of DoDI 5000.02, transitioned under the acquisition authority of DoDI 5000.75 to a Business System Category I (BSC 1) program as a result of the Release 2 Limited Deployment Decision Memorandum signed 3 May 2019.

A. Mission Description and Budget Item Justification

The Integrated Personnel and Pay System-Army (IPPS-A) provides an integrated, multi-Component, personnel and pay system, which streamlines the existing Human Resources (HR) systems and processes enhancing efficiency and accuracy of personnel and pay procedures in support of 1.1 million Soldiers and their families. IPPS-A will subsume approximately 40 legacy systems (full and partial) across the Active, Reserve and National Guard Components into one single integrated system. IPPS-A is a web-based tool, available 24-hours a day, accessible to HR professionals, Combatant Commanders, pay managers and other authorized users throughout the Army. IPPS-A addresses major deficiencies by providing the necessary internal control and audit procedures as well as preventing erroneous payments and loss of funds. This program is an essential building block to reform the Department towards achieving greater performance and affordability in support of the National Defense Strategy and the Congressional audit mandate. FY 2021 requested budget supports the revised Acquisition Strategy approved by the Army Acquisition Executive (AAE) on 24 July 2019, and provides for the development of Release 3 (Personnel System for the Total Force).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Analysis and Design, Development, and Integration of IPPS-A Increment II	158.807	97.438	115.286
Description: Requested funding provides for the procurement and renewal of software licenses, engineering support for the product development and system integration, data center hosting, testing and evaluation, and program management services.			
FY 2020 Plans: Under the revised schedule, IPPS-A will complete Release 3 development and integration of 60+ interfaces under the new firm fixed priced contract leading up to Development Integration Testing (DIT) preparation.			
FY 2021 Plans: Under the revised schedule, IPPS-A will complete Release 3 HR development for the Total Force encompassing Active, Reserve and Nation Guard Components. IPPS-A will complete all critical activities concerned with final Testing and Validation in support of Developmental Integration Testing, Government Acceptance Testing and leading to Operational Testing.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2021 increase of $13.213 million reflects the change in the funding level to support the revised Increment II Acquisition Strategy, which the Army Acquisition Executive (AAE) approved on 24 July 2019. On 7 January 2020, the AAE further approved the re-baseline Authority to Proceed (ATP) with the program's revised cost, schedule and performance values. With this decision, the Army has extended the program's Increment II schedule focusing on the development of a Minimum Viable Solution (MVS) for its new HR and Pay system while reducing concurrent development of multiple releases. The revised cost incorporates Release 2 (Personnel System for National Guard) lessons learned, revised System Integrator contract structure (cost plus to firm fixed) and the complexity of known risks associated with interfacing 60+ systems. FY 2020 Congressionally adjusted funding level reflects, a one-time, FY 2019 System Integrator's cost under-run as a result of successive month-to-month contract extensions during the program re-baseline. With the new approved program baseline and revised firm fixed contract in place, potential for further under-run is not foreseen.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	4.635	-
Accomplishments/Planned Programs Subtotals	158.807	102.073	115.286

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B66706: *IPPS-A INC 2*	16.800	14.100	9.071	-	9.071	9.870	-	-	-	Continuing	Continuing
• OMA - Sustainment and Support OMA: *OMA - 432612000 / 435107000*	55.369	63.429	92.891	-	92.891	94.761	89.598	88.186	59.523	Continuing	Continuing

Remarks

B66706000 (OPA) funding supports initial system implementation and fielding of IPPS-A to include new equipment training (NET). Training delivery methods include: Instructor-led Training, Distance Learning, and Computer Based Training of 66,000 HR transactional users for Increment II. Training products will be developed using the Oracle Usability Productivity Kit to include instructor manuals and lessons plans, as well as Electronic Performance Support System and job aids. The deployment approach will implement pre-deployment activities at each location beginning 360 days in advance of the deployment start date. Deployment will include an on-site data verification, workflow verification, and "over-the-shoulder" support.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

432612000 (O&M, OMA) and 435107000 (civilian pay, OMA) funding supports overall sustainment including Help Desk support (Tier I through Tier II), system maintenance break/fixes, minor enhancements, software licenses, cyber compliance, program office contractor support, civilian salaries, and program office operations.

D. Acquisition Strategy

In accordance with 10 U.S.C. 2222, IPPS-A Increment II (Project ED9) is a Priority Business System Category I (BCAT 1) program that achieved a Milestone (MS) B on 14 December 2014, while under DODI 5000.02 oversight. IPPS-A will deliver fully integrated personnel and pay services to all Army Components (Active, National Guard, and Reserve) building on the trusted database delivered by the IPPS-A Increment I program. In FY 2019, the program transitioned to DODI 5000.75 oversight, and at the direction of Army Senior Leaders, completed a restructure and re-baseline. On 24 July 2019, the Army Acquisition Executive (AAE) signed the new Increment II Acquisition Strategy. The new strategy reduces risk by minimizing concurrent development and focuses on deployment of a Minimum Viable Solution (MVS) for the remaining Increment II releases and defers additional capability to the Capability Support Phase. On 7 January 2020, the AAE signed the new Acquisition Program Baseline approving the program's new cost, schedule and performance values. The re-baselined Increment II schedule consists of three software releases (2.0, 3.0, and 4.0) that build upon one another, culminating in a MVS personnel and pay solution for the Total Force.

Release 2.0 Full Release - The full Release 2.0 replaces the Standard Installation/Division Personnel System (SIDPERS) at Army National Guard (ARNG) units in all 54 states and territories. The release 2.0 design effort began in FY15. End-to-end Business Process development considerations were evaluated to support various activities to include, but not limited to, promotions/demotions, training requirements, member benefits, duty status, and unit level manning. The program achieved a successful Release 2 Limited Deployment ATP in May 2019. By the end of calendar year 2019 the program deployed Release 2 to the ARNG in 27 states (180k users) and is on schedule to complete all deployments by April 2020.

Release 3.0 MVS - Release 3.0 MVS will provide all accountability and essential personnel services necessary to subsume numerous legacy field systems including Electronic Military Personnel Office (eMILPO) and Total Army Personnel Database-Reserve (TAPDB-R). It will allow Commanders in the field to access timely, accurate, and standardized personnel data for Soldiers in all Components. In addition to delivering most of the functions required to establish an Army-wide personnel system, Release 3.0 MVS will bring HR payroll drivers on board to enhance accuracy of pay, credit for service, and benefits. IPPS-A will serve as the authoritative data source for all personnel within the system. Design work began in FY 2017, but was not completed due to the program's need to focus on completing Release 2.0. The final design effort was completed in November 2019, and the program awarded a contract modification for Release 3.0 MVS build, testing and deployment on 22 November 2019. Release 3 MVS is scheduled for deployment to the Total Force in December 2021.

Release 4.0 MVS - Release 4.0 MVS will provide a fully integrated personnel and pay system to the Total Force. The program began work on Release 4.0 in FY 2018 but executed a stop work order in January 2019 as a result of the program's need to focus on Release 3.0 and re-baseline Increment II. As part of the new program strategy, the program will conduct a full and open competition for Release 4.0 MVS and other follow-on activities, including system Capability Support, with the goal to award a contract in 1QFY22 to support delivery to the Total Force in 3QFY25. Release 4.0 MVS will incorporate pay functionality to include, but not limited to, base pay,

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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taxes, allowances, bonuses, allotments and leave. At deployment, Release 4.0 MVS will serve as the authoritative data source for all personnel and pay transactions and will satisfy Army audit goals.

Capability Support Phase (CSP) - Anticipated in FY26, after Release 4.0 MVS is deployed and the program achieves Full Operational Capability, the program will conduct a CSP Authority to Proceed (APT) decision. During this ATP, the Functional Sponsor will approve entry of the Inc II capability into the CSP. The IPPS-A Inc II program will continue to sustain, modernize, and enhance the IPPS-A capability during this phase. Depending on available funding in FY 2026-FY 2030, the program may develop the Release 3.0 and Release 4.0 additional capabilities ahead of the planned schedule. These additional capabilities were deferred earlier in the program to focus on development and deployment of the Release 3.0 and Release 4.0 MVS. In accordance with Army leader direction, the program remains poised to begin development of a limited number of the Release 3.0 additional capabilities as early as FY 2023, in parallel with Release 4 MVS development, if so directed. This may be necessary to ensure evolving Talent Management, Strength Management, Archiving and Internal Control requirements can be addressed to support Army objectives and audit requirements in a timely manner. Early development of these limited additional capabilities will only be done when directed by Army senior leaders.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	Project (Number/Name) ED9 / *Integrated Personnel and Pay System - Army Inc 2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	Program oversight, resource justification, budget and programming, milestone and schedule tracking : Various	17.541	6.055	Jun 2019	3.609	Jun 2020	4.246	Jun 2021	-		4.246	Continuing	Continuing	Continuing
In-House Government Management Support	Allot	Program oversight, resource justification, budget and programming, milestone and schedule tracking : NCR	15.846	0.171	Apr 2019	0.060	Apr 2020	0.082	Apr 2021	-		0.082	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		4.635		-		-		-	0.000	4.635	-
		Subtotal	33.387	6.226		8.304		4.328		-		4.328	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software License -All Others	C/FFP	Various : Various	11.438	0.958	Jan 2019	0.358	Jan 2020	0.365		-		0.365	Continuing	Continuing	Continuing
Software Licenses - IBM	C/FFP	Immixtechnology INC : McLean, Va	2.776	-		-		-		-		-	0.000	2.776	-
Software Licenses - GRC	C/FFP	Mythics : Virginia Beach, VA	3.974	-		-		-		-		-	0.000	3.974	-
Software Ab Initio	C/FFP	Various : Various	3.154	2.843	Mar 2019	-		-		-		-	Continuing	Continuing	Continuing
Oracle Bundle - Software	SS/FFP	Oracle America INC : Reston, VA	20.112	-		-		-		-		-	0.000	20.112	-
Oracle - ULA	C/FFP	Myhtics : Virginia Beach, VA	7.145	-		-		-		-		-	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Licenses- CA	SS/FFP	Immix Tech : McLean, VA	0.859	-		-		-		-		-	0.000	0.859	-
Software Licenses -ESB	SS/FFP	Actuate Corp : San Mateo, CA	3.750	-		-		-		-		-	Continuing	Continuing	Continuing
Software Product Level SME Consulting Support	SS/FFP	Various : Various	12.451	0.946	May 2019	0.328	May 2020	1.009		-		1.009	Continuing	Continuing	Continuing
in House contract support of system development	C/CPFF	Various : Various	61.034	17.032	May 2019	15.064	May 2020	15.758	May 2021	-		15.758	Continuing	Continuing	Continuing
Functional in house contract support of system development-Army National Guard/Army Reserve/FMD	C/FFP	BAH : NCR	11.383	-		-		-		-		-	0.000	11.383	-
Design, Developmentand Integration - Increment II	C/CPIF	CACI : Chantilly, VA	190.028	77.858	May 2019	50.150	May 2020	61.364	Jan 2021	-		61.364	Continuing	Continuing	Continuing
Network Support/ Production Hosting Services/Hardware Leasing	MIPR	Defense Information Systems Agency (DISA) Defense Enterprise Computing Center (DECC) : various	92.226	36.922	May 2019	23.972	May 2020	27.063	May 2021	-		27.063	Continuing	Continuing	Continuing
Software Licenses -m Factory C	C/FP	ACC -NJ : New Jersey	1.806	-		-		-		-		-	Continuing	Continuing	Continuing
Software Licenses- PeopleSoft Enterprise Licenses	C/FFP	PeopleSoft : Pleasanton, CA	4.746	0.146		-		-		-		-	0.000	4.892	-
Systems Interfaces	C/ FFPLOE	FMS, DMDC, GFEBS, HRC : Various Locations	9.002	7.813	Jul 2019	0.782	Jul 2020	1.762	Mar 2021	-		1.762	Continuing	Continuing	Continuing
		Subtotal	435.884	144.518		90.654		107.321		-		107.321	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	Project (Number/Name) ED9 / *Integrated Personnel and Pay System - Army Inc 2*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities/Lease/Rents	MIPR	Facilities/Leases/ Rents : Various	17.437	0.575	Oct 2018	-		-		-		-	Continuing	Continuing	Continuing
Equipment and Supplies MISC	Various	Various : Various	5.243	0.036	May 2019	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	22.680	0.611		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Increment II-Government Acceptance Testing/ Operational Test and Evaluation	MIPR	Various Government Agencies : Various	11.353	4.616	Oct 2018	-		-		-		-	Continuing	Continuing	Continuing
Increment II - Capability Acceptance Testing (CAT) /DT	Various	Government & Support Contractors : Various	14.069	2.836	Oct 2018	3.115	Oct 2019	3.637	Oct 2020	-		3.637	Continuing	Continuing	Continuing
		Subtotal	25.422	7.452		3.115		3.637		-		3.637	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	517.373	158.807		102.073		115.286		-		115.286	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

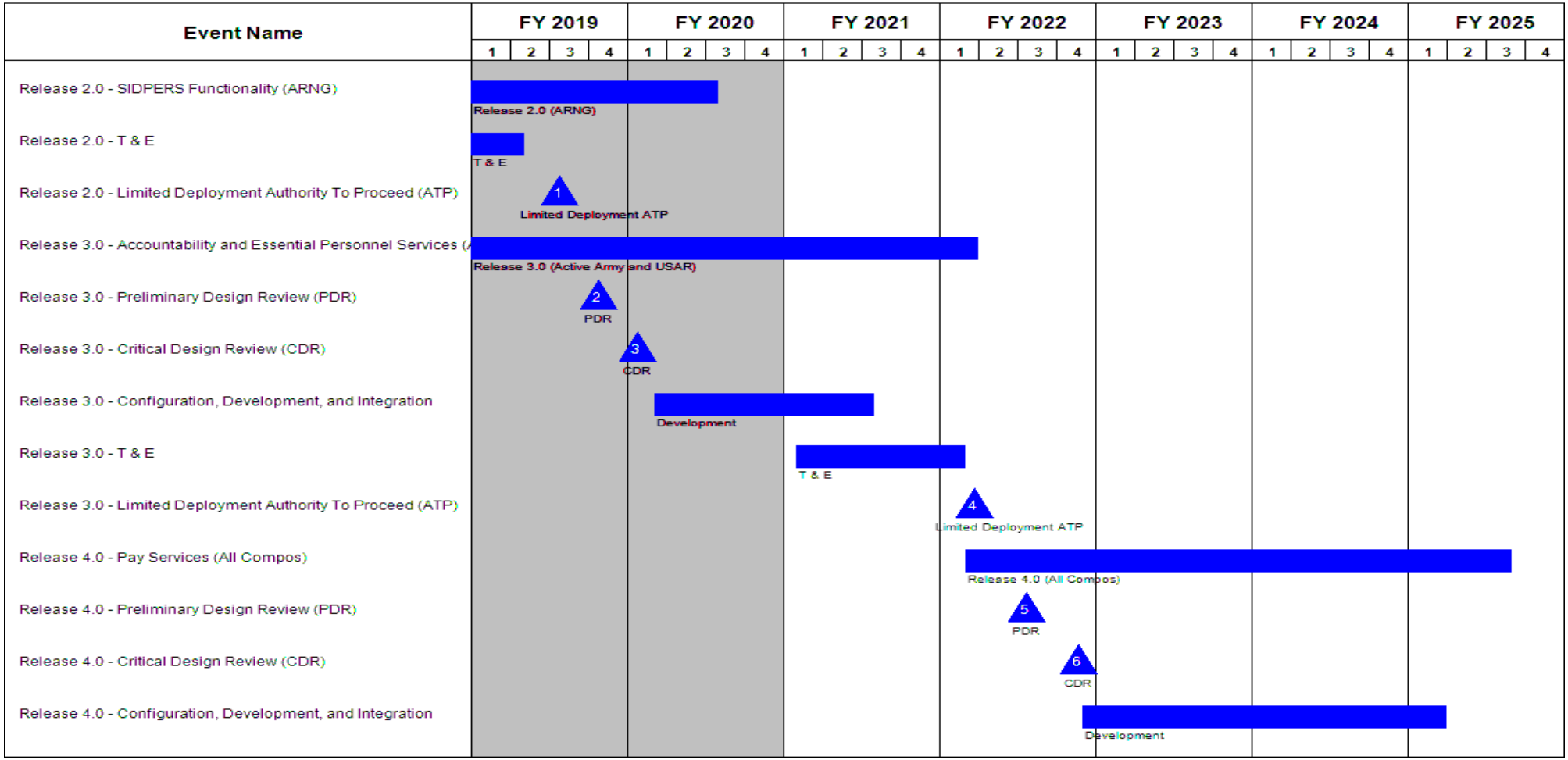

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

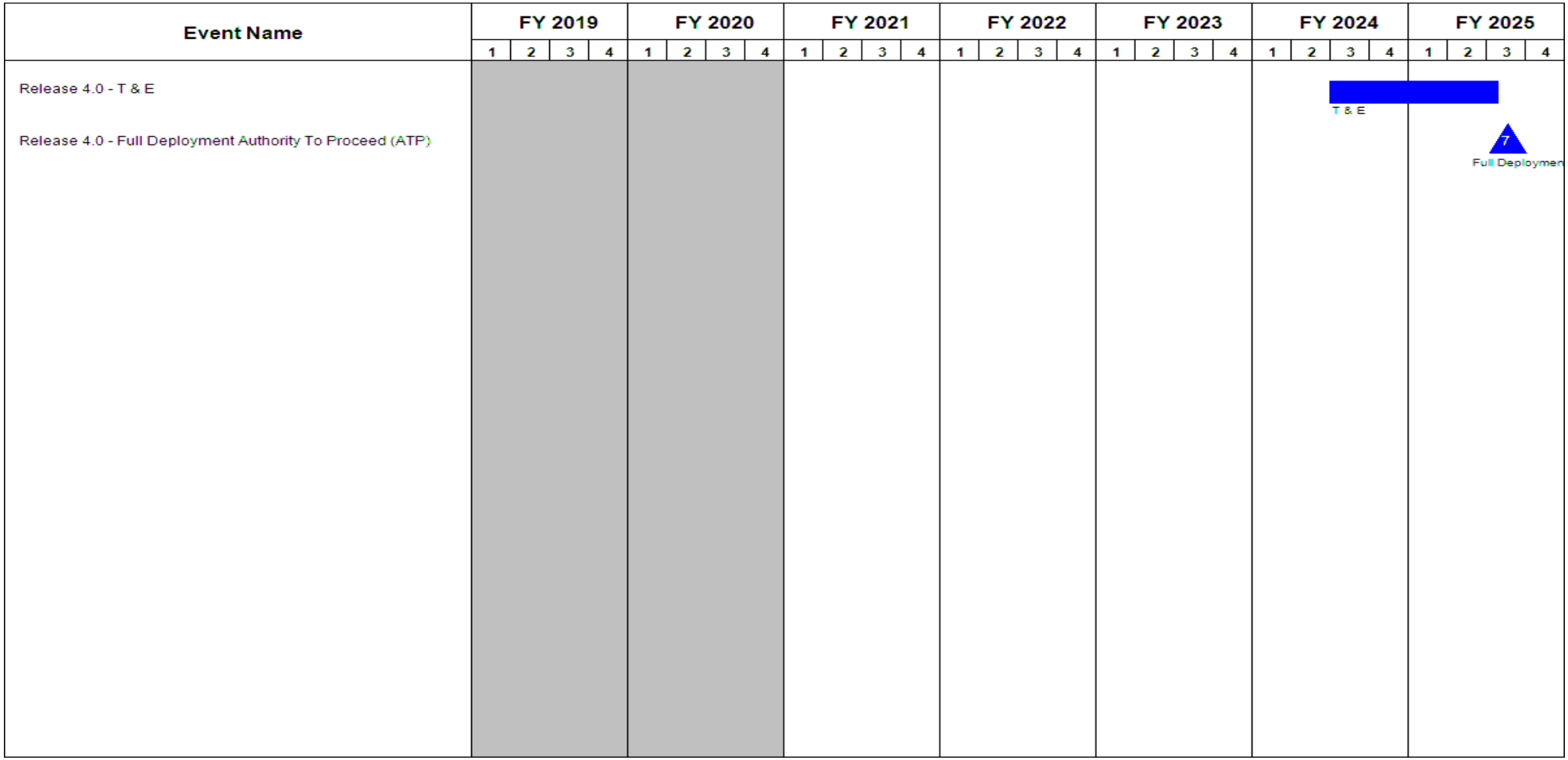

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B (MS B) - Increment II	1	2015	1	2015
Release 2.0 - SIDPERS Functionality (ARNG)	4	2015	3	2020
Release 2.0 - Configuration, Development, and Integration	3	2017	3	2018
Release 2.0 - T & E	4	2018	2	2019
Release 2.0 - Limited Deployment Authority To Proceed (ATP)	3	2019	3	2019
Release 3.0 - Accountability and Essential Personnel Services (Active and AR)	4	2017	1	2022
Release 3.0 - In Progress Review (IPR)	2	2018	2	2018
Release 3.0 - Integrated Baseline Review (IBR)	3	2018	3	2018
Release 3.0 - Preliminary Design Review (PDR)	4	2019	4	2019
Release 3.0 - Critical Design Review (CDR)	1	2020	1	2020
Release 3.0 - Configuration, Development, and Integration	1	2020	3	2021
Release 3.0 - T & E	1	2021	1	2022
Release 3.0 - Limited Deployment Authority To Proceed (ATP)	1	2022	1	2022
Release 4.0 - Pay Services (All Compos)	1	2022	3	2025
Release 4.0 - Preliminary Design Review (PDR)	3	2022	3	2022
Release 4.0 - Critical Design Review (CDR)	4	2022	4	2022
Release 4.0 - Configuration, Development, and Integration	4	2022	1	2025
Release 4.0 - T & E	3	2024	3	2025
Release 4.0 - Full Deployment Authority To Proceed (ATP)	3	2025	3	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army												Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*							
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	-	107.521	83.830	96.594	-	96.594	0.000	0.000	0.000	0.000	0.000	287.945
EB5: *Armored Multi-Purpose Vehicle*	-	107.521	83.830	96.594	-	96.594	0.000	0.000	0.000	0.000	0.000	287.945

A. Mission Description and Budget Item Justification

The Armored Multi-Purpose Vehicle (AMPV) is the materiel solution for replacement of the Army's Armored Personnel Carrier (M113) Family of Vehicles (FoV) within the Armored Brigade Combat Team (ABCT). It will mitigate current and future capability gaps in force protection, mobility, reliability, and interoperability across the Spectrum of Conflict. The AMPV will replace five mission roles currently performed by the M113 FoV by transferring the current M113 Mission Equipment Packages (MEP) to a new Military Vehicle Derivative (MVD) platform. In total, the AMPV FoV will account for approximately 30% of the ABCT's tracked fleet and consists of the following five variants:

1. Mission Command (MCmd) Vehicle: This platform enables effective mission command planning and execution for both the Tactical Operations Center (TOC) and Tactical Command (TAC) Vehicle versions of the MCmd. It will host current Battle Command Systems, future replacements, and upgrades of hardware and software.
2. Medical Treatment (MT) Vehicle: This platform will provide a protected surgical environment, with adequate lighting and accessible medical equipment. It will provide a capability for immediate medical care for one patient by a medical crew of four.
3. Medical Evacuation (ME) Vehicle: This platform will conduct ambulance type activities and provide casualty evacuation for up to four litters or six ambulatory patients, with a crew of three medical attendants.
4. General Purpose (GP) Vehicle: This platform will operate throughout the battle space by conducting re-supply, maintenance, casualty evacuation, and other tasks within the formation.
5. Mortar Carrier (MC) Vehicle: This platform will provide immediate responsive fire support to conduct fast-paced offensive operations.

The AMPV program was initiated with a Capability Development Document (CDD) that was approved on 21 June 2013 and subsequently revised on 24 October 2016. The CDD reflects a set of stable, technologically achievable requirements. A Milestone B (MS B) Defense Acquisition Board (DAB) was held on 9 December 2014 and it was followed by an Acquisition Decision Memorandum (ADM) that was signed on 22 December 2014. The ADM approved MS B for the AMPV program and entry into the Engineering and Manufacturing Development (EMD) phase. In addition, the ADM authorized the Army to proceed with award of the EMD prime contract, which occurred on 23 December 2014 to BAE Systems Land & Armaments, L.P. (BAE). A subsequent ADM was issued on 26 September 2017 and it approved: a revised acquisition documentation tailoring plan, revised Milestone C entrance criteria, and an increase in the Low Rate Initial Production (LRIP) quantity to 551 vehicles (to recognize the Army's desire for early fielding of AMPVs for the European Deterrence Initiative). An ADM was then issued on 1 November 2017 and it delegated Milestone Decision Authority to the Secretary of the Army and re-designated AMPV as an Acquisition Category (ACAT) IC program. An Army Systems Acquisition Review Council (ASARC) was held on December 20, 2018 with the Army Acquisition Executive (AAE) and the Vice Chief of Staff Army (VCSA) approving the program to enter LRIP. The program received its LRIP ADM on January 25, 2019.

The Fiscal Year (FY) 2021 planned program primarily consists of efforts associated with Production Qualification Testing (PQT), Initial Operational Test & Evaluation (IOT&E), and the Production and Deployment phase Live Fire Test and Evaluation (LFT&E). Prime contractor support will be required for testing and engineering to

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*

ensure adequate system support packages will be available during the tests. Government test locations will be used for the tests and government personnel will be responsible for the overall management of the efforts. This program supports the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT).

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	111.821	96.730	96.687	-	96.687
Current President's Budget	107.521	83.830	96.594	-	96.594
Total Adjustments	-4.300	-12.900	-0.093	-	-0.093
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-12.900			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-4.300	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.093	-	-0.093

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	Project (Number/Name) EB5 / *Armored Multi-Purpose Vehicle*	

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
EB5: *Armored Multi-Purpose Vehicle*	-	107.521	83.830	96.594	-	96.594	0.000	0.000	0.000	0.000	0.000	287.945
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Armored Multi-Purpose Vehicle (AMPV) is the materiel solution for replacement of the Army's Armored Personnel Carrier (M113) Family of Vehicles (FoV) within the Armored Brigade Combat Team (ABCT). It will mitigate current and future capability gaps in force protection, mobility, reliability, and interoperability across the Spectrum of Conflict. The AMPV will replace five mission roles currently performed by the M113 FoV by transferring the current M113 Mission Equipment Packages (MEP) to a new Military Vehicle Derivative (MVD) platform. In total, the AMPV FoV will account for approximately 30% of the ABCT's tracked fleet and consists of the following five variants:

1. Mission Command (MCmd) Vehicle: This platform enables effective mission command planning and execution for both the Tactical Operations Center (TOC) and Tactical Command (TAC) Vehicle versions of the MCmd. It will host current Battle Command Systems, future replacements, and upgrades of hardware and software.
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The Fiscal Year (FY) 2021 planned program primarily consists of efforts associated with Production Qualification Testing (PQT), Initial Operational Test & Evaluation (IOT&E), and the Production and Deployment phase Live Fire Test and Evaluation (LFT&E). Prime contractor support will be required for testing and engineering to

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

ensure adequate system support packages will be available during the tests. Government test locations will be used for the tests and government personnel will be responsible for the overall management of the efforts. This program supports the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Armored Multi-Purpose Vehicle (AMPV) Product Development	91.060	47.934	48.916

Description: AMPV Product Development costs include all efforts provided under the AMPV Engineering and Manufacturing Development (EMD) prime contract along with Government Furnished Material (GFM). Significant examples of prime contract effort include: development engineering, system engineering/program management, prototype hardware procurement, prototype system level fabrication and integration, software development, support to the government test program, and oversight of subcontractors/suppliers. Also included are all efforts performed by subcontractors / suppliers who are under contract to the AMPV EMD prime contractor. This element also includes the recurring manufacturing cost to procure the vehicles that will support Full-Up System Level (FUSL) live fire testing.

FY 2020 Plans:
Prime contractor activities in FY 2020 consisted of efforts that supported the execution of risk reduction validation testing at Aberdeen Test Center (ATC) using EMD vehicles that have been modified with design upgrade packages intended for production. This support included provision and replenishment of spare and repair parts, special tools, test measurement, diagnostic equipment (TMDE), and technical publications. Support also included on-site Field Service Representatives (FSR) to assist in vehicle repair activities during testing, Engineering Subject Matter Experts (SME) to troubleshoot any issues that may arise during testing, and the development of corrective actions in response to Test Incident Reports (TIRs). This risk reduction validation testing was ran with two vehicles conducting selected performance tests. Each vehicle performed 1,500 miles of reliability testing. This also included Live Fire under-body ballistic survivability testing conducted on four vehicles for a total of eight events. Besides ensuring that the vehicles was adequately supported before and during testing, the contractor continued work related to Logistics/Product Support to ensure the AMPV can be organically maintained. Logistics Technical Manual validation/development effort, Provisioning effort, and incorporation of engineering changes from the Limited User Test efforts will continue under the EMD contract. In addition, the contractor was responsible for maintaining the Product Support Package (PSP) that contains the integrated product support elements and any sustainment process contracts or agreements used to attain and sustain the maintenance and support concepts needed for materiel readiness.

FY 2021 Plans:
Prime contractor activities in FY 2021 consist of efforts that support PQT, the Production and Deployment phase LFT&E, and IOT&E, and potential design efforts to address changes stemming from the tests and/or to satisfy other emerging Army requirements. PQT is scheduled to begin 4QFY2020 and is planned to conclude 3QFY2022. During the PQT, the contractor will provide test/engineering support and field service representatives at the ATC, the Yuma Test Center (YTC), and at White Sands Missile Range (WSMR) as well as Electronic Proving Ground (EPG), Cold Regions Test Center (CRTC), Tropic Regions Test Center (TRTC), and Dugway Proving Grounds (DPG). In addition, the contractor will conduct Operator New Equipment Training

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
(OPNET) and Field Level Maintenance New Equipment Training (FLMNET) prior to the start of PQT. This includes all necessary equipment and materials to conduct the training. Finally, as required, the contractor will maintain and replenish the System Support Packages (SSPs) needed to complete testing. The LFT&E effort is intended to satisfy the requirements of 10 U.S.C. 2366 (Major systems and munitions programs: survivability testing and lethality testing required before full-scale production). Two of each variant will be subject to the LFT&E. The costs included in this element are the support costs provided by the AMPV prime contractor. As is the case for the PQT, the contractor will provide support personnel at the primary test location (ATC). The goal is to return each vehicle to a near operational condition after each live fire shot. The contractor must ensure that system support packages include adequate spare and repair parts. As required, the contractor will support government personnel in repairing each vehicle prior to the subsequent shot. Costs in this element also include contractor program management efforts necessary to oversee the above described activities. The contractor will support these tests by providing Field Service Representatives (FSRs) to assist in repairing and maintaining vehicles and by providing SMEs to troubleshoot any issues that might arise during testing. For the IOT&E, the contractor will inspect and repair 12 of the PQT vehicles for use in the IOT&E. Each of these vehicles will be brought to Full Mission Capable status. The contractor will also de-process 24 new LRIP vehicles upon arrival at the test site (projected to be Ft. Stewart, GA). In support of the IOT&E the contractor will provide Instructor and Key Personnel Training (I&KPT), OPNET, and FLMNET. As required, the contractor will analyze the results of the testing program and incorporate any necessary design changes into LRIP vehicles. Based on all engineering design work, the contractor will also complete and deliver a Technical Data Package (TDP). Besides ensuring that the vehicles are adequately supported before and during testing, the contractor will continue work related to Logistics/Product Support to ensure the AMPV can be organically maintained. In addition, the contractor is responsible for maintaining the Product Support Package (PSP) that contains the integrated product support elements and any sustainment process contracts or agreements used to attain and sustain the maintenance and support concepts needed for materiel readiness. The PSP includes spare/repair parts, Test Measurement and Diagnostic Equipment (TMDE), unique software, common and special tools, training packages, and TMs. The system design and product support product deliverables will be at a high level of maturity to support the IOT and validate the accuracy and utility of the comprehensive logistics PSP. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to the program's transition into the LRIP phase.			
Title: AMPV Government Program Management Costs ***Description:*** AMPV Government Program Management costs include efforts to provide Government oversight of the AMPV program. This includes Systems Engineering and Program Management. Government and support Contractor salaries are included, as well as travel and other support costs that are required to effectively manage the program. Costs in this category do not include Government Furnished Material or efforts that are specific and unique to end item testing that is performed at Government test locations.	7.483	3.050	3.657

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 Plans: Provided integrated program management for all development activities, to include providing oversight to BAE. The primary area of emphasis for the Research Development Technology & Evaluation (RDT&E) funded Government Project Management team in FY 2020 is to provide oversight to those Low Rate Initial Production (LRIP) activities that were traceable to Production Qualification Testing or Live Fire Test and Evaluation. All other Government Program Management efforts in support of LRIP were covered by Procurement funding. Also, as required, the AMPV Government Project Management team supported Army assessment efforts that relate to the AMPV design possibly being used to satisfy other emerging Army requirements. ***FY 2021 Plans:*** Provide integrated program management for all development activities, to include providing oversight to BAE. The primary area of emphasis for the RDT&E funded Government Project Management team in FY 2021 is to provide oversight to those LRIP activities that are traceable to PQT, Live Fire Test and Evaluation, and IOT&E. All other Government Program Management efforts in support of LRIP will be covered by Procurement funding. As required, the AMPV Government Project Management team will support Army assessment and experimentation efforts relating to emerging Army requirements impacting the AMPV design. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Slight increase is due to the program office support to RDTE LRIP testing activities			
Title: Government Test Costs	8.808	29.039	44.021
Description: Government Test costs are for efforts required to perform and validate system-related tests. This element includes costs of the detailed planning, conduct, support, data reduction, and reports from such testing. Also included are costs necessary to acquire data during the conduct of the Government tests. The actual test articles (i.e., functionally configured systems) are excluded from this element. Also excluded are prime contractor costs incurred in support of the Government system level test. ***FY 2020 Plans:*** Government test costs in FY 2020 were primarily related to the planning and execution of risk reduction validation testing at ATC using EMD vehicles which have been modified with design upgrade packages intended for production, mortar ammunition qualification testing, and the detailed planning of PQT Production and Deployment phase LFT&E, and IOT to be conducted in FY 2021. The risk reduction validation testing included performance and reliability testing, and ballistic Live Fire testing at ATC. The performance and reliability testing were scheduled to begin in the 1Q FY 2020 and continue until early 3Q FY 2020. These tests were conducted on two vehicles. The Live Fire testing was scheduled to begin in the 2Q FY 2020 and conclude 4Q FY 2020 or 1Q FY 2021. This was conducted on four vehicles. The performance and reliability testing included a total of 3,000 miles and selected performance sub-tests. The Live Fire tests included a total of eight under-body blast events. The mortar ammunition qualification test is an off-vehicle test designed to validate that the AMPV Mortar Carrier variant can safely transport mortar ammunition. This testing was conducted in 2Q FY 2020 at YTC. Government costs included all costs incurred at ATC and costs associated			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021

with Government personnel that were collecting/analyzing test data, as well as work associated with providing oversight of the test activities. Finally, as required, vehicle design updates incorporated as corrective actions may be proven out on modified prototype vehicles at select Government test locations. All Government costs incurred as a result of these tests were included in this element.

FY 2021 Plans:

Government Test costs in FY 2021 reflect LRIP testing activities, test data evaluation, and final reporting for PQT, LFT&E and IOT&E. The following test activities are scheduled in FY 2021 per the Test and Evaluation Master Plan (TEMP) approved at Milestone C: PQT (Performance and RAM), Full-Up System Level (FUSL), LFT&E, and IOT&E. PQT is scheduled to begin 4QFY2020 and complete in 4QFY2021, with the exception of natural environmental testing that will continue into 3QFY2022. LFT&E will begin in 1QFY2021 and end in 4QFY2021. Currently, a total of 25 vehicles will undergo PQT. As part of PQT, and in support of RAM assessments, six vehicles will run a total of 14,000 miles. The miles will be equally split between the ATC and the YTC. An additional 19 vehicles will undergo performance testing as part of PQT. This testing will be performed at ATC, YTC, WSMR, EPG, CRTC, TRTC, and DPG. PQT is conducted with production-representative vehicles from LRIP. The objectives include verification that the production-representative systems meet performance requirements, generation of data to support the system evaluation in support of the FRP decision, and determination of system readiness to enter IOT. Government costs include all costs incurred at the test sites and costs associated with Government personnel that will be collecting/analyzing test data, as well as personnel associated with providing oversight of the activities. The LFT&E will yield information to complement earlier vulnerability tests and modeling and analysis efforts. It will also be used to fill data voids from prior testing and will validate ballistic and blast performance at the system level to completely evaluate vehicle, crew, and occupant survivability. Ten vehicles will undergo testing at ATC. There are three elements to the testing: CDE, FUSL testing. CDE will be conducted on selected subsystems integrated into the AMPV to determine the consequences of various types of damage. This information will be used to confirm the impact of subsystem damage on platform functionality. Fire Survivability Testing will generate the data required to evaluate the effectiveness of the AFES. Its purpose is to protect crews and internal, stowed equipment from fires expected to be initiated by ballistic impacts. FUSL testing will demonstrate the ballistic resiliency and crew survivability of fully functional, production-representative, combat-loaded AMPV variants and investigate the synergistic effects of various damage mechanisms and failure modes. 30 AMPV LRIP vehicles will participate in the IOT&E, with an additional 6 AMPV LRIP vehicles located at the test location to serve as back-up vehicles. The IOT&E events will be conducted under realistic operational conditions using Army units executing decisive action operations IAW U.S. Army doctrine against a representative OPFOR. The test events are designed to produce data to satisfy the evaluation requirements in order to assess the operational effectiveness and suitability of the system under test. The AMPV IOT&E is scheduled to be conducted 4QFY2021-1QFY2022. The location of the IOT will be determined by the Army TSARC based on availability of units and maneuver area (At this time the location is assumed to be Ft. Stewart, GA). PM AMPV will plan and coordinate any follow-on developmental and/or operational testing that will be required due to configuration changes during production, or verification that any post production deficiencies in materiel, training, or concepts

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
have been satisfactorily corrected. PM AMPV will support Instructor and Key Personnel Training (I&KPT), OPNET, and FLMNET. PM AMPV will provide a NMIB to the IOT unit prior to OPNET, and finalize with the unit the target audience for New Equipment Training. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase is due to efforts associated with PQT, LFT&E, and IOT&E test efforts planned for FY21.			
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun ***Description:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.170	-	-
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:*** Funding transferred in accordance with Title 15 USC 638	-	3.807	-
Accomplishments/Planned Programs Subtotals	107.521	83.830	96.594

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• G80819: *Armored Multi Purpose Vehicle (AMPV)*	672.742	444.797	348.971	-	348.971	682.064	820.354	893.595	860.343	9,283.242	14,006.108

Remarks

D. Acquisition Strategy

The AMPV program entered the acquisition process at Milestone B. This was accomplished via an Acquisition Decision Memorandum (ADM) that was signed on 22 December 2014. The ADM also authorized the Army to proceed with award of the EMD prime contract with three LRIP options. The contract was awarded on 23 December 2014 to BAE Systems Land & Armaments, L.P. (BAE). The award was on a competitive basis utilizing formal Source Selection Evaluation Board (SSEB). An ASARC took place on December 20, 2018 with the AAE and the VCSA. The meeting resulted in the approval of the AMPV to enter MS C and LRIP on 25 January 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		3.807		-		-		-	0.000	3.807	-
		Subtotal	-	-		3.807		-		-		-	0.000	3.807	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Development Engineering	C/CPIF	BAE : Sterling Heights, MI	188.165	30.467	Dec 2018	18.442	Dec 2019	2.953	Dec 2020	-		2.953	0.000	240.027	-
Prototype Material Contractor	C/CPIF	BAE : Sterling Heights, MI	119.298	-		-		-		-		-	0.000	119.298	-
Prototype Material Government Furnished	Various	Various : .	26.329	1.344	Dec 2018	-		-		-		-	0.000	27.673	-
Contractor System Engineering, Data, Test and Program Management	C/CPIF	BAE : Sterling Heights, MI	123.192	10.944	Dec 2018	21.492	Dec 2019	13.887	Dec 2020	-		13.887	0.000	169.515	-
Procurment of Live Fire Test Assets	Option/ FPIF	BAE : York, PA	45.000	5.108		2.497		-		-		-	0.000	52.605	-
Contractor Support to Qualification, Live Fire, & Operational Testing	C/CPIF	BAE : Sterling Heights, MI	-	43.197	Dec 2018	5.503	Dec 2019	32.076	Dec 2020	-		32.076	0.000	80.776	-
		Subtotal	501.984	91.060		47.934		48.916		-		48.916	0.000	689.894	N/A

Remarks

Armored Multi Purpose Vehicle Tech data and system level product development costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	PMO : Warren, MI	107.561	7.483	Dec 2018	3.050	Dec 2019	3.657	Dec 2020	-		3.657	0.000	121.751	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	Allot	OASA(FM&C) : Washington, D.C.	-	0.170		-		-		-		-	0.000	0.170	-
		Subtotal	107.561	7.653		3.050		3.657		-		3.657	0.000	121.921	N/A

Remarks

Armored Multi Purpose Vehicle Support Costs.

FY 2018 NDAA SEC 825 MDAP Cost Overrun

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Testing	MIPR	Various : .	80.924	8.808	Dec 2018	29.039	Dec 2019	44.021	Dec 2020	-		44.021	0.000	162.792	-
		Subtotal	80.924	8.808		29.039		44.021		-		44.021	0.000	162.792	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	690.469	107.521		83.830		96.594		-		96.594	0.000	978.414	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

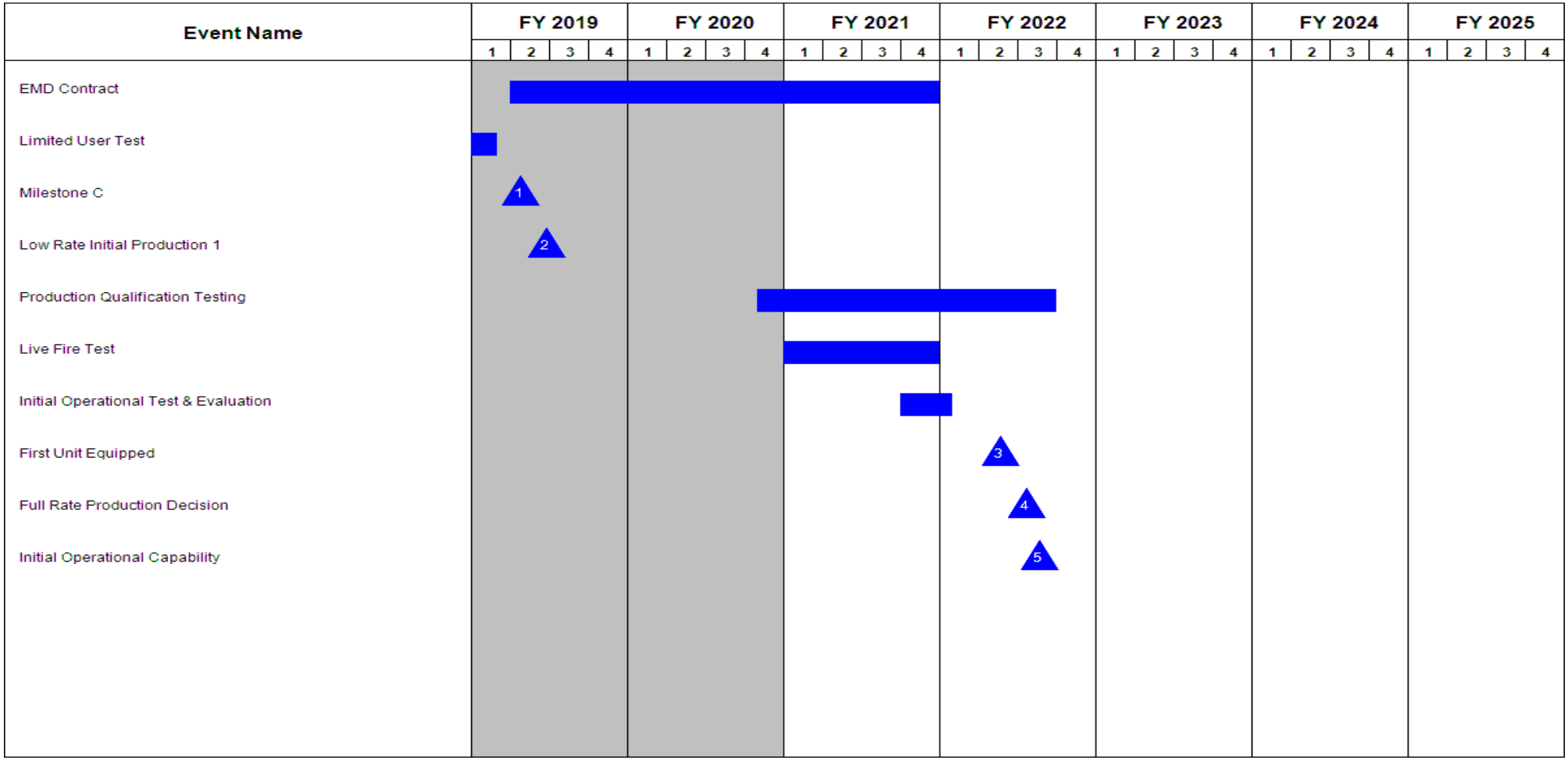

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B Decision	1	2015	1	2015
EMD Contract	1	2015	4	2021
Preliminary Design Review	3	2015	3	2015
Critical Design Review	3	2016	3	2016
Production Prove Out Test	4	2017	4	2018
Limited User Test	4	2018	1	2019
Milestone C	2	2019	2	2019
Low Rate Initial Production 1	2	2019	2	2019
Production Qualification Testing	4	2020	3	2022
Live Fire Test	1	2021	4	2021
Initial Operational Test & Evaluation	4	2021	1	2022
First Unit Equipped	2	2022	2	2022
Full Rate Production Decision	3	2022	3	2022
Initial Operational Capability	3	2022	3	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605029A *I Integrated Ground Security Surveillance Response Capability (IGSSR-C)*							
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	-	3.104	6.699	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.803
EQ2: *IntegGrdSecSurvRespC(IGSSR-C)*	-	3.104	6.699	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.803

A. Mission Description and Budget Item Justification

The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE).

This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

FY 2020 is the last year of funding for this program.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	3.207	6.699	0.000	-	0.000
Current President's Budget	3.104	6.699	0.000	-	0.000
Total Adjustments	-0.103	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.103	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	Project (Number/Name) EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*	

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
EQ2: *IntegGrdSecSurvRespC(IGSSR-C)*	-	3.104	6.699	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.803
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE).

This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command including outside supporting organizations. IGSSR-C is a software centric system providing video analytics and common control of force protection systems that will reduce the workload on the system operator. The system will be capable. of ingesting full motion video as well as sensor data from legacy and emerging FP systems, Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and a COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

FY 2020 is the last year of funding for this program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: IGSSR-C Design and Development ***Description:*** Completes Critical Design Review (CDR), procures Fixed Control Station(FCS) hardware to conduct cyber security testing, Developmental Testing (DT), Limited User Tests (LUT) and accomplishes MS C. ***FY 2020 Plans:*** FY 2020 Plans: Achieve Milestone C decision, procure three hardware sets, and complete IOT&E. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 is the last year of funding for this program.	3.104	6.395	-	-	-
Title: FY 2020 SBIR/STTR Transfer	-	0.304	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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	3.104	6.699	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• M90106: *IntegGrdSecSurvRespC (IGSSR-C)*	-	-	0.000	7.287	7.287	7.469	-	-	23.496	0.000	38.252

Remarks

D. Acquisition Strategy

IGSSR-C provides a layered approach to integrate sensors, sensor systems and unmanned systems. The IGSSR-C Capability Design Document (CDD) was approved September 2013. IGSSR-C is made up of a suite of software that achieves integration, fusion and interoperability in support of the Army Acquisition Executive's Common Operating Environment (COE) Sensor CE efforts.

The IGSSR-C program received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015, and achieved a Milestone B decision on 29 Sep 2017.

The acquisition strategy for IGSSR-C was approved on 5 December 2016 by the MDA, which approved plans to leverage a contract through the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to develop, integrate and test the software solution to meet the IGSSR-C requirements.

Milestone C is planned for 4th quarter of FY 2020

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	Project (Number/Name) EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Project Management	MIPR	PM FPS : Fort Belvoir, VA	1.075	0.545	May 2019	0.505	May 2020	-		-		-	0.000	2.125	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.304		-		-		-	0.000	0.304	-
		Subtotal	1.075	0.545		0.809		-		-		-	0.000	2.429	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Design	C/CPFF	NVESD/MTEQ : Ft. Belvoir	3.771	1.497	Feb 2019	-		-		-		-	0.000	5.268	-
IGSSR-C Prototypes	C/CPFF	NVESD/MTEQ : Ft. Belvoir	1.865	-		3.865	Jan 2020	-		-		-	0.000	5.730	-
IGSSR-C Independent Software Assessment	MIPR	Carnegie Mellon University Software Engineering Institute : Pittsburgh, PA	0.456	0.362	Apr 2019	0.451	Mar 2020	-		-		-	0.000	1.269	-
		Subtotal	6.092	1.859		4.316		-		-		-	0.000	12.267	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.698	0.156	Feb 2019	-		-		-		-	0.000	0.854	-
IGSSR-C Cyber / RAM Support	TBD	MITRE : Fort Belvoir	-	0.175		-		-		-		-	0.000	0.175	-
		Subtotal	0.698	0.331		-		-		-		-	0.000	1.029	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	1.050	0.050	Feb 2019	1.404	Feb 2020	-		-		-	0.000	2.504	-
IGSSR-C Modeling and Simulation	MIPR	Night Vision and Electronic Sensors Directorate : Ft. Belvoir, VA	0.115	0.167	Feb 2019	0.066	Mar 2020	-		-		-	0.000	0.348	-
IGSSR-C Software Support Planning and Documentation	MIPR	CECOM SEC : Aberdeen, MD	-	0.152	Feb 2019	0.104	Mar 2020	-		-		-	0.000	0.256	-
		Subtotal	1.165	0.369		1.574		-		-		-	0.000	3.108	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.030	3.104		6.699		-		-		-	0.000	18.833	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

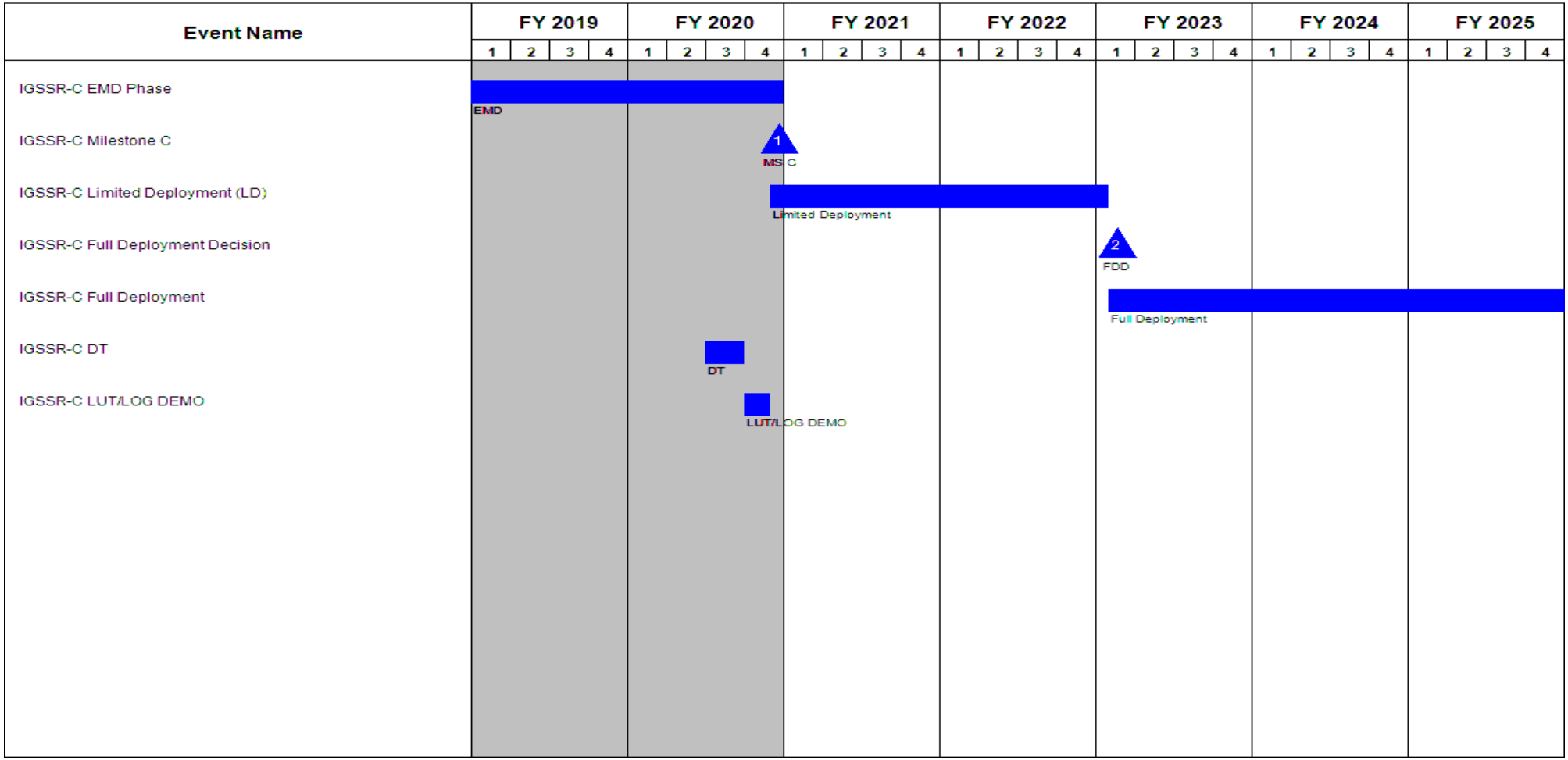

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IGSSR-C Material Development Decision	1	2016	1	2016
IGSSR-C Risk Reduction	4	2015	4	2017
IGSSR-C Milestone B	4	2017	4	2017
IGSSR-C EMD Phase	4	2017	4	2020
IGSSR-C Milestone C	4	2020	4	2020
IGSSR-C Limited Deployment (LD)	4	2020	1	2023
IGSSR-C Full Deployment Decision	1	2023	1	2023
IGSSR-C Full Deployment	1	2023	3	2026
IGSSR-C DT	3	2020	3	2020
IGSSR-C LUT/LOG DEMO	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605030A *I Joint Tactical Network Center (JTNC)*							
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	-	15.287	15.882	16.264	-	16.264	5.830	5.485	5.842	5.947	Continuing	Continuing
EA8: *Joint Tactical Networking Center*	-	15.287	15.882	16.264	-	16.264	5.830	5.485	5.842	5.947	Continuing	Continuing

Note

Joint Tactical Networking Center (JTNC) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Fiscal Year (FY) 2019 to FY 2020 funding reflects the full JTNC requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force. Prior to submission of the President's Budget, the funding is consolidated in PE 0605030A via RMD for execution.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The JTNC is responsible for ensuring secure, interoperable, and resilient tactical communications capabilities aligned to modular open architectures in support of Service, Multi-Service, and Coalition forces. The JTNC: (1) maintains a cyber-hardened DoD Information Repository (IR), (2) provides Technical Analyses/Capability Characterizations on tactical communications products, (3) provides Open Systems Architecture Standards, (4) exportability analysis and licensing reviews, and (5) serves as Technical Advisor to the Communications, Command, and Control Leadership Board (C3LB).

This mission is executed in conjunction with other government agencies to include the National Security Agency (NSA), the Joint Interoperability Test Command (JITC), the National Telecommunication and Information Administration (NTIA), the Services, as well as Matrix and Industry partners. Particular attention is paid to ensuring that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic leading to increased competition for Software Defined Radios (SDR).

Through collaboration with DoD matrixed and industry partners, the JTNC supports continued development/maturation of the DoD IR, analysis of directed software and artifacts, support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP), JTNC Standards Interface Control Working Group (ICWG), the Capabilities Characterization and Tactical Communications Marketplace (CC & TCM), and Modular Radio Architecture (MRA).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605030A *I Joint Tactical Network Center (JTNC)*		
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	15.869	15.882	5.833	-	5.833
Current President's Budget	15.287	15.882	16.264	-	16.264
Total Adjustments	-0.582	0.000	10.431	-	10.431
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.582	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	10.431	-	10.431

Change Summary Explanation

10,431 in FY21 is attributed to the RMD to realign Navy (PE 0605030N) and Air Force (PE 0605030F) to Army (0605030A) as per the Joint Budget Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / *Joint Tactical Network Center (JTNC)*	Project (Number/Name) EA8 / *Joint Tactical Networking 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
EA8: *Joint Tactical Networking Center*	-	15.287	15.882	16.264	-	16.264	5.830	5.485	5.842	5.947	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Joint Tactical Networking Center (JTNC) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Fiscal Year (FY) 2019 to FY 2020 funding reflects the full JTNC requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force. Prior to submission of the President's Budget, the funding is consolidated in PE 0605030A via RMD for execution.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The JTNC is responsible for ensuring secure, interoperable, and resilient tactical communications capabilities aligned to modular open architectures in support of Service, Multi-Service, and Coalition forces. The JTNC: (1) maintains a cyber-hardened DoD Information Repository (IR), (2) provides Technical Analyses/Capability Characterizations on tactical communications products, (3) provides Open Systems Architecture Standards, (4) exportability analysis and licensing reviews, and (5) serves as Technical Advisor to the Communications, Command, and Control Leadership Board (C3LB).

This mission is executed in conjunction with other government agencies to include the National Security Agency (NSA), the Joint Interoperability Test Command (JITC), the National Telecommunication and Information Administration (NTIA), the Services, as well as Matrix and Industry partners. Particular attention is paid to ensuring that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic leading to increased competition for Software Defined Radios (SDR).

Through collaboration with DoD matrixed and industry partners, the JTNC supports continued development/maturation of the DoD IR, analysis of directed software and artifacts, support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP), JTNC Standards Interface Control Working Group (ICWG), the Capabilities Characterization and Tactical Communications Marketplace (CC & TCM), and Modular Radio Architecture (MRA).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: DoD Waveform IR Support, Waveform Standards Evolution and Compliance & Certification Analysis	15.287	15.161	16.264

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Joint Tactical Networking Center (JTNC) aligns with the C3LB, DoD Chief Information Officer (CIO), Joint Staff, the Services, and other key stakeholders for those JTNC chartered processes that ensure secure, interoperable, and resilient tactical communications. The JTNC: (1) maintains a cyber-hardened DoD Information Repository (IR), (2) provides Technical Analyses/Capability Characterizations on tactical communications products, (3) provides Open Systems Architecture Standards, (4) exportability analysis and licensing reviews, and (5) serves as Technical Advisor to the JTNC Board of Directors (BoD). The Joint Tactical Networking Center supports the Army's Network Modernization Strategy Line of Effort 1A - Unified Network. ***FY 2020 Plans:*** Continue analysis of Board of Directors approved waveforms in accordance with Service priorities and the FY 2020 JTNC Management Plan. Continue collecting relevant software, technical documentation, cataloging and inducting other DoD Communication Waveforms listed in the DoD Communication Waveform Inventory. Continue to enhance DoD Waveform IR capability and approved Standards promulgation. Continue the development of the tactical communications vendor product capability characterization process for commercial off-the-shelf (COTS) and non-developmental item (NDI) tactical communication products. Continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use, reducing product development time and facilitating faster delivery of capabilities to warfighters. Continue to conduct technical waveform and software artifact analyses against published standards. Continue to support export requests and analyses of products for exportability. Continue to certify secure, reusable software waveforms based on government controlled open architecture to encourage a competitive, cost effective, interoperable networking environment. ***FY 2021 Plans:*** Continue analysis of Communications, Command, and Control Leadership Board approved waveforms in accordance with Service priorities and the FY 2021 JTNC Management Plan. Continue collecting relevant software, technical documentation, cataloging and inducting other DoD Communication Waveforms listed in the DoD Communication Waveform Inventory. Continue to enhance DoD IR capability and approved Standards promulgation. JTNC will serve as a technical advisor and source of engineering and analytic resources for the Lead Services in the conduct of Joint enterprise-level systems engineering and analysis and support DoD CIO in oversight of Lead Service activities with engineering expertise and assist in the identification and resolution of cross-service networking disconnects or issues. The JTNC will lead development and promulgation of the Modular Radio Architecture (MRA), a framework containing a collection of DoD standards and a description or architecture of how to use them to compose or control a communications system. The MRA defines how to implement a communications system or radio on select platforms.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Continue the development of the tactical communications vendor product capability characterization process for commercial off-the-shelf (COTS) and non-developmental item (NDI) tactical communication products. Continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use, reducing product development time and facilitating faster delivery of capabilities to warfighters. Continue to conduct technical waveform and software artifact analyses against published standards. Continue to support export requests and analyses of products for exportability. Continue to certify secure, reusable software waveforms based on Government controlled open architecture to encourage a competitive, cost effective, interoperable networking environment. Conduct technical waveform and software artifact analyses against published standards. Support export requests and analyses of products for exportability. Certify secure, reusable software waveforms based on Government controlled open architecture to encourage a competitive, cost effective, interoperable networking environment. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 to FY 2021 increase is a result of inflation rate adjustments and additional funding required to further the development of the Capabilities Characterization and Tactical Communications Marketplace.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.721	-
Accomplishments/Planned Programs Subtotals	15.287	15.882	16.264

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

The Joint Tactical Networking Center is funded by all the Services. The Joint Funding Strategy requires each of the three Service Military Departments (MILDEPs) to budget for one-third of the total program approved requirement. Army funding in FY 2022 and beyond reflects only approximately one-third of total funding. Other funding is as follows (PB20 locked positions):

Navy RDTE: 0605030N, 3077. FY 2021 = 0 // FY 2022 = 4,741 // FY 2023 = 4,835 // FY 2024 = 4,932 // FY 2025 = 5,031
Air Force RDTE: 0605030F, 655068. FY 2021 = 0 // FY 2022 = 5,852 // FY 2023 = 5,969 // FY 2024 = 6,088 // FY 2025 = 6,210

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

C. Other Program Funding Summary ($ in Millions)

Due to Joint Funding Strategy, there is no prior year funding for JTNC in the other Service lines. Prior to the year of execution, the JTNC funding is consolidated in Army PE 0605030A for execution. In accordance with the Joint Tactical Networking Center Charter updated and re-validated on 13 September 2019, the JTNC will remain under a Joint Budget Strategy funded by the three MILDEPs.

D. Acquisition Strategy

The Joint Tactical Networking Center (JTNC) is a Joint support program to the Services, the DoD Chief Information Officer (CIO), the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)), and USD Research and Engineering (USD(R&E)). JTNC core functions as defined in the JTNC Acquisition Decision Memorandum and Charter signed on 20 January 2014 and revalidated on 13 September 2019 include: Department of Defense (DoD) Information Repository (IR) management and configuration control, DoD Waveform Standards, technical analyses of Government Program of Record (POR) and Industry COTS and NDI Waveform products. The services derived from these core functions reinforce an acquisition environment which ensures that interoperable, secure, and resilient joint tactical waveforms and wireless communications applications can operate in a variety of hardware transport solutions.

The FY21 Budget supports continued development/maturation of the DoD IR, analysis of directed software and artifacts, support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP), JTNC Standards Interface Control Working Group (ICWG), the Capabilities Characterization and Tactical Communications Marketplace (CC & TCM). The FY21 budget supports the Lead Services initiative where JTNC will serve as a technical advisor and source of engineering and analytic resources in the conduct of Joint enterprise-level systems engineering and analysis and support DoD CIO. The FY21 budget supports Modular Radio Architecture (MRA) where JTNC will lead development and promulgation of a framework containing a collection of DoD standards and a description or architecture of how to use these to compose or control a communications system. The MRA defines how to implement a communications system or radio on select platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Multiple Contract Awards : Various	6.921	0.210	Oct 2018	0.138	Oct 2019	0.190	Oct 2020	-		0.190	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	G2 Software Systems : San Diego, CA	2.957	0.830	Nov 2018	0.443	Nov 2019	0.502	Nov 2020	-		0.502	Continuing	Continuing	Continuing
Program Management Support	Allot	Aberdeen Proving Grounds : Aberdeen. MD	0.857	0.255	Oct 2018	-		-		-		-	0.000	1.112	-
Program Management Support	MIPR	NIWC PACIFIC : San Diego, CA	0.364	-		0.354	Nov 2019	0.412	Dec 2020	-		0.412	Continuing	Continuing	Continuing
Program Management Support	FFRDC	MITRE : McLean, VA	0.058	-		-		-		-		-	0.000	0.058	0.058
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.721		-		-		-	0.000	0.721	-
		Subtotal	11.157	1.295		1.656		1.104		-		1.104	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Product Development Support	MIPR	NIWC PACIFIC : San Diego, CA	4.029	0.572	Nov 2018	0.470	Oct 2019	0.531	Oct 2020	-		0.531	Continuing	Continuing	Continuing
JTNC Product Development Support	C/CPFF	G2 Software Systems : San Diego, CA	8.337	2.869	Oct 2018	2.957	Nov 2019	3.077	Nov 2020	-		3.077	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	NIWC ATLANTIC : Charleston, SC	0.053	0.151	Oct 2018	2.948	Oct 2019	3.068	Oct 2020	-		3.068	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	Various : Aberdeen. MD	1.147	1.099	Oct 2018	0.002	Nov 2019	0.051	Nov 2020	-		0.051	Continuing	Continuing	Continuing
JTNC Product Development	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.184	-		-		-		-		-	0.000	1.184	1.184

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / *Joint Tactical Network Center (JTNC)*	Project (Number/Name) EA8 / *Joint Tactical Networking Center*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Product Development - Other	Allot	Aberdeen Proving Grounds : Aberdeen, MD	0.382	-		-		-		-		-	0.000	0.382	0.382
Joint Tactical Networks (JTN) Legacy Development - MIPR	MIPR	Various : Various	19.868	-		-		-		-		-	0.000	19.868	19.868
Joint Tactical Networks (JTN) Legacy Development - Contracts	C/CPIF	Various : Various	24.890	-		-		-		-		-	0.000	24.890	24.890
		Subtotal	59.890	4.691		6.377		6.727		-		6.727	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Engineering/ Technical Support	C/CPFF	G2 Software Systems : San Diego, CA	5.467	0.771	Oct 2018	0.733	Nov 2019	0.800	Nov 2020	-		0.800	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	FFRDC	MITRE Corporation : McLean, VA	0.826	0.151	Oct 2018	0.102	Oct 2019	0.152	Oct 2020	-		0.152	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Aberdeen Proving Grounds : Aberdeen, MD	2.025	0.758	Oct 2018	0.719	Nov 2019	0.786	Nov 2020	-		0.786	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	NIWC PACIFIC : San Diego, CA	1.839	0.706	Nov 2018	0.847	Oct 2019	0.916	Oct 2020	-		0.916	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Various : San Diego, CA	0.877	0.785	Nov 2018	-		-		-		-	0.000	1.662	0.877
JTNC Engineering/ Technical Support	C/CPFF	Booz Allen Hamilton : San Diego	14.965	-		-		-		-		-	0.000	14.965	14.965
		Subtotal	25.999	3.171		2.401		2.654		-		2.654	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development/Test & Evaluation	MIPR	NIWC PACIFIC : San Diego, CA	5.404	2.027	Oct 2018	1.877	Oct 2019	1.971	Oct 2020	-		1.971	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	G2 Software Systems 01 : San Diego, CA	5.958	3.652	Oct 2018	3.043	Nov 2019	3.167	Nov 2020	-		3.167	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	Multiple Awards : Various	1.340	0.171	Oct 2018	0.309	Nov 2019	0.366	Nov 2020	-		0.366	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	Booz Allen Hamilton - NSA : Ft. Meade, MD	-	0.280	Dec 2018	0.219	Nov 2019	0.275	Nov 2020	-		0.275	Continuing	Continuing	Continuing
Development/Test & Evaluation	MIPR	National Security Agency : Ft. Meade, MD	0.775	-		-		-		-		-	0.000	0.775	0.775
Development/Test & Evaluation	C/CPFF	G2 Software Systems 04 : San Diego, CA	5.078	-		-		-		-		-	0.000	5.078	5.078
Development/Test & Evaluation	MIPR	NIWC ATLANTIC : Charleston, SC	0.160	-		-		-		-		-	0.000	0.160	0.160
Development/Test & Evaluation	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.242	-		-		-		-		-	0.000	1.242	1.242
		Subtotal	19.957	6.130		5.448		5.779		-		5.779	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	117.003	15.287		15.882		16.264		-		16.264	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

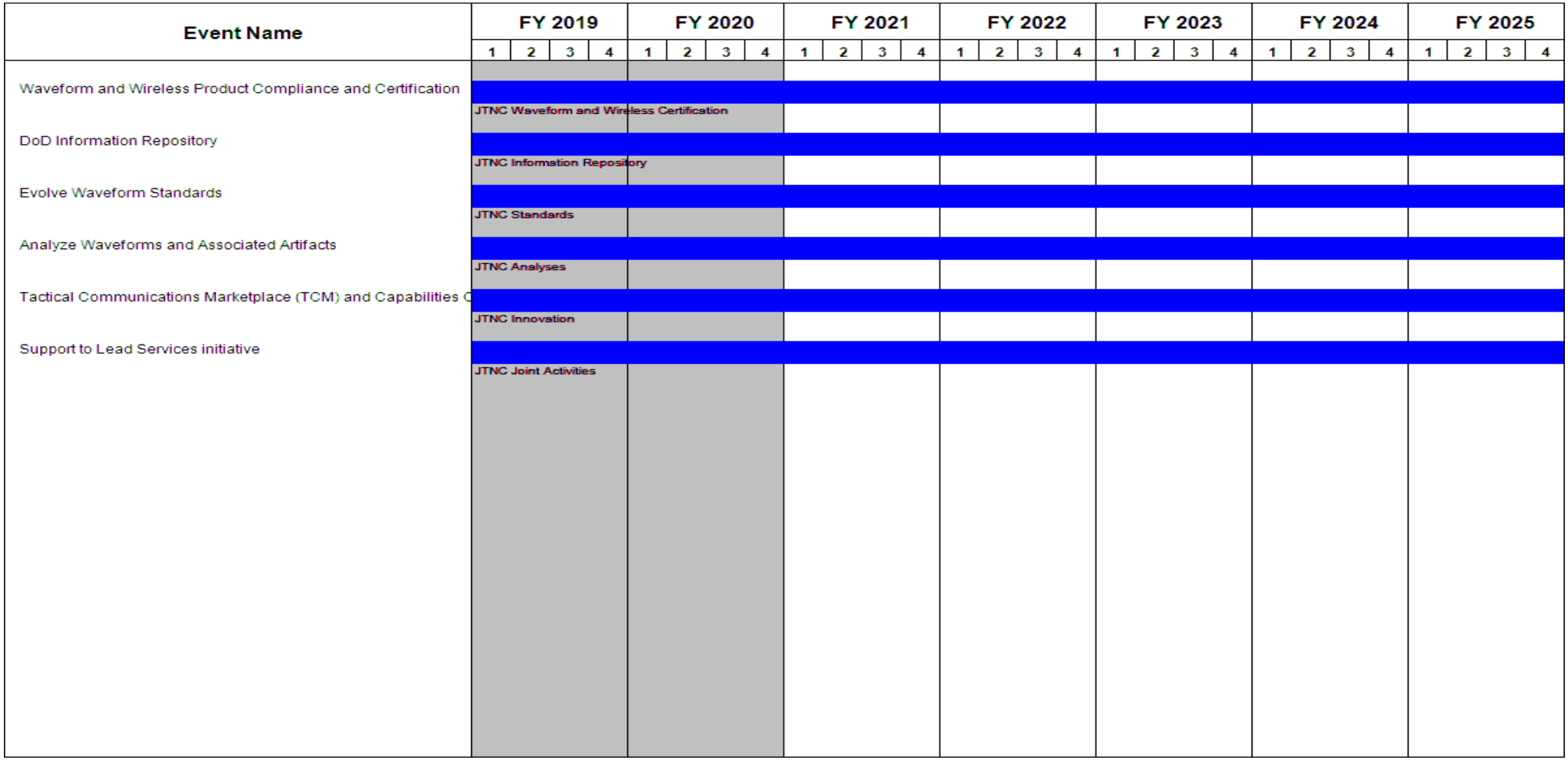

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Waveform and Wireless Product Compliance and Certification	1	2019	4	2025
DoD Information Repository	1	2019	4	2025
Evolve Waveform Standards	1	2019	4	2025
Analyze Waveforms and Associated Artifacts	1	2019	4	2025
Tactical Communications Marketplace (TCM) and Capabilities Characterization (CC)	1	2019	4	2025
Support to Lead Services initiative	1	2019	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*							
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	-	42.134	40.808	31.696	-	31.696	25.319	24.979	25.097	25.225	Continuing	Continuing
EF5: *Joint Tactical Network (JTN)*	-	12.484	15.324	10.718	-	10.718	4.302	4.156	4.074	4.196	Continuing	Continuing
EX6: *Waveforms*	-	29.650	25.484	20.978	-	20.978	21.017	20.823	21.023	21.029	Continuing	Continuing

Note

Responsibility for the development and sustainment of JENM was assigned to the PM Joint Tactical Networks (JTN) by the Joint Tactical Networking Center (JTNC) Acquisition Decision Memorandum (ADM) of 20 Jan 2014. The Army Program Executive Office (PEO) Command Control Communications Tactical (C3T) Memos of 25 Jun 2015 transferred all program, development, and configuration control of JENM by Product Manager (PdM) JENM under PM JTN to PdM Tactical Cyber Network Operations (TCNO) under PM Tactical Network (formally PM WIN-T) when Army became the Lead Service for JENM under the ADM's provisions.

Joint Enterprise Network Manager (JENM) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Fiscal Year (FY) 2019 to FY 2020 funding reflects the full JENM requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605031A by the Army, PE 0605031N by the Navy and PE 0605031F by the Air Force. USMC funding will be provided on an annual basis via Military Interdepartmental Purchase Request (MIPR). Prior to submission of the President's Budget, the funding is consolidated in PE 0605031A via RMD for execution.

JENM, funded in project EF5, is a software only program.

A. Mission Description and Budget Item Justification

EF5 project: This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The Joint Enterprise Network Manager (JENM) software provides a single, converged network management tool allowing the Warfighter to plan, configure, load, and manage the Joint Services' Tactical Radios and their networks in the field - a capability not available in legacy planning systems. JENM configures several types of tactical radios, such as the ManPack and Rifleman, enabling them to utilize Mobile Ad Hoc Networking (MANET) and other waveforms to include: TrellisWare Scalable Manet (TSM), Warrior Robust Enhanced Network (WREN), Mobile User Objective System (MUOS) waveform, Satellite Communications (SATCOM) Demand Assigned Multiple Access (DAMA), Integrated Waveform (IW), and Single Channel Ground and Airborne Radio System (SINCGARS) waveform. Using its Over-the-Air-Management (OTAM) functionality, JENM provides the Commander the ability to quickly reconfigure critical networks. JENM enhances the S6's ability to conduct Course of Action (COA) Analysis and the Military Decision Making Process (MDMP), providing commanders critical information regarding their ability to communicate.

FY 2021 radio planner prototyping efforts will design, engineer, integrate and test of planning and management capabilities for the Tactical Radio network in support of the TrellisWare Scalable Manet (TSM), and the Warrior Robust Enhanced Network (WREN) waveforms. Support to align with the Unified Network Operations (UNO)

vision to provide further integration of the Integrated Tactical Network (ITN) and Network Management of its emerging systems to enable Soldiers the ability to effectively manage the ITN. The radio planner prototyping efforts will also support the completion of MUOS waveform planning simplification and rapid provisioning of MUOS end-user terminals, as well as HF Waveform planning in support of HF modernization.

JENM planning applications and radio planner prototyping efforts are deployed on, and critically tied to the Ruggedized Application Platform - Tactical Radios (RAP-TR) hardware from Division to the Company level.

EX6 project: The Waveforms program supports the Army Network Modernization Strategy Line of Effort 1, Unified Network. These efforts are aligned to the Army's Tactical Network Capability Set development and fielding plans.

The Waveforms project is focused on efforts to improve transport technologies necessary to support the overall connectivity of the Integrated Tactical Network (ITN). The effort focuses on development and assessment to achieve improved performance, network simplification, improved spectrum efficiency and improved Electronic Warfare (EW)/Cyber resistance. This project will conduct viability assessment of Commercial Off-The-Shelf (COTS)/Non-Developmental Item (NDI) waveforms, run analysis and system engineering activities for DoD Services as Army Lead Service Activity for Ground/ Line of Sight (LoS) waveforms, work with industry partners in pursuit of alternative waveforms and software technologies, and continue development and/or integration efforts of Broadcast Waveforms (i.e. SINCGARS), ANWfs (i.e. Warrior Robust Enhanced Network (WREN)), and Radio Services (i.e. Enterprise Over The Air Management (eOTAM)) in support of Army Network Modernization, and agile mission support initiatives.

FY 2021 Base RDT&E dollars, in the amount of $20.978 million, will fund software development efforts of legacy and next generation Government waveforms and applications. FY 2021 dollars will also fund system and architectural engineering for ANWf radio communications technologies, to include cyber and electronic warfare, as well as evaluation and assessment activities for waveform and application solutions in support of Network-Cross Functional Team's (N-CFT) Capability Set (CS) for the Unified Network Line of Effort (LOE).

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	41.920	40.808	26.630	-	26.630
Current President's Budget	42.134	40.808	31.696	-	31.696
Total Adjustments	0.214	0.000	5.066	-	5.066
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.214	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	5.066	-	5.066

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EF5 / *Joint Tactical Network (JTN)*	

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
EF5: *Joint Tactical Network (JTN)*	-	12.484	15.324	10.718	-	10.718	4.302	4.156	4.074	4.196	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Joint Enterprise Network Manager (JENM) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Fiscal Year (FY) 2019 to FY 2020 funding reflects the full JENM requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605031A by the Army, PE 0605031N by the Navy and PE 0605031F by the Air Force. USMC funding will be provided on an annual basis via Military Interdepartmental Purchase Request (MIPR). Prior to submission of the President's Budget, the funding is consolidated in PE 0605031A via RMD for execution.

A. Mission Description and Budget Item Justification

EF5 project: This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The Joint Enterprise Network Manager (JENM) software provides a single, converged network management tool allowing the Warfighter to plan, configure, load, and manage the Joint Services' Tactical Radios and their networks in the field - a capability not available in legacy planning systems. JENM configures several types of tactical radios, such as the ManPack and Rifleman, enabling them to utilize Mobile Ad Hoc Networking (MANET) and other waveforms to include: TrellisWare Scalable Manet (TSM), Warrior Robust Enhanced Network (WREN), Mobile User Objective System (MUOS) waveform, Satellite Communications (SATCOM) Demand Assigned Multiple Access (DAMA), Integrated Waveform (IW), and Single Channel Ground and Airborne Radio System (SINCGARS) waveform. Using its Over-the-Air-Management (OTAM) functionality, JENM provides the Commander the ability to quickly reconfigure critical networks. JENM enhances the S6's ability to conduct Course of Action (COA) Analysis and the Military Decision Making Process (MDMP), providing commanders critical information regarding their ability to communicate.

FY 2021 radio planner prototyping efforts will design, engineer, integrate and test of planning and management capabilities for the Tactical Radio network in support of the TrellisWare Scalable Manet (TSM), and the Warrior Robust Enhanced Network (WREN) waveforms. Support to align with the Unified Network Operations (UNO) vision to provide further integration of the Integrated Tactical Network (ITN) and Network Management of its emerging systems to enable Soldiers the ability to effectively manage the ITN. The radio planner prototyping efforts will also support the completion of MUOS waveform planning simplification and rapid provisioning of MUOS end-user terminals, as well as HF Waveform planning in support of HF modernization.

JENM planning applications and radio planner prototyping efforts are deployed on, and critically tied to the Ruggedized Application Platform - Tactical Radios (RAP-TR) hardware from Division to the Company level.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: JENM Program Office Support	2.537	2.253	2.228

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EF5 / *Joint Tactical Network (JTN)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Program Management Office support in the development of the JENM system. ***FY 2020 Plans:*** Program Office funding will continue support JENM design, engineering, integration and test of mid and lower tier planning and management application for the Tactical Radio network. Support to align with the Unified Network Operations (UNO) vision to provide further integration of the lower and mid-tier Network Management with that of PM TN to enable Soldiers the ability to manage the entire, consolidated, tactical network. JENM will also work to extend our Over-The-Air-Management (OTAM) capabilities to the mounted/ tablet based environment through our participation with Dynamic Network Connectivity development. Program Office Support funding will also support completion of MUOS support for US Navy Digital Modular Radio (DMR) enhancements, Airborne Radio Communications (ARC) 210/231, USMC and USAF 117G MUOS, as well as full threshold requirement support for HMS Manpack and Leader Radios. Continued development in support of the AMF airborne radio, and the integration of USMC terrestrial based waveform planning and management capability. JENM will also manage the completion of deferred Army program requirements. JENM Program Office Support will support the completion of JENM v3.4 Transitioning to Sustainment in addition to JENM v3.5 development, which include complete MUOS simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements. ***FY 2021 Plans:*** The JENM program office funding will continue support to JENM design, engineering, integration and test of planning and management capabilities for the Tactical Radio network. The JENM program office supports the Unified Network Operations (UNO) vision, integrating lower and mid-tier Network Management capabilities to enable Soldiers to manage their entire consolidated tactical network. Program office funding will also support completion of MUOS waveform planning simplification and rapid provisioning of MUOS end-user terminals. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** In FY 2021, the program office support funding is decreasing from FY 2020 to FY 2021 to complete JENM v3.5 development and Transition to Sustainment (T2S). In FY 2021, the program office will support JENM v3.5 development which includes completing simplification of MUOS, upgrading JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements.			
Title: JENM Development ***Description:*** JENM provides consolidated communications planning, network configuration, network activation, position reporting, fault management, security management, and network health and status reporting needed to establish and maintain a mobile wireless network comprised of JTN network waveforms. JENM interfaces with other external network managers, mission planning systems, network planning systems, key management systems, and spectrum planning systems. JENM is considered a mission	9.352	11.995	7.912

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EF5 / *Joint Tactical Network (JTN)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
essential system. JENM is also considered a critical element within the Ruggedized Application Platform ? Tactical Radios (RAP-TR) hardware configuration management tool kit. ***FY 2020 Plans:*** JENM will support systems design, engineering, and integration of mid and lower tier radio planning and management application for the Tactical Radio network. JENM will provide support to the Unit Task Reorganization (UTR) systems integration effort to enable the S-6 to quickly transform the tactical network based upon the Commander?s intent and associated mission analysis. JENM will also work to extend our Over-The-Air-Management (OTAM) capabilities to the mounted/ tablet based environment through our participation with Dynamic Network Connectivity development. JENM will support completion of MUOS support for US Navy Digital Modular Radio (DMR) enhancements, Airborne Radio Communications (ARC) 210/231, USMC and USAF 117G MUOS, as well as full threshold requirement support for HMS Manpack and Leader Radios. Begin development in support of the AMF airborne radio, and the integration of USMC terrestrial based waveform planning and management capability. JENM will continue to support modifications to the SRW, MUOS, SINCGARS, SATCOM, and Integrated Waveforms. JENM will also manage the completion of deferred program requirements. JENM Program Office Support will support the completion of JENM v3.4 Transitioning to Sustainment in addition to JENM v3.5 development, which include complete MUOS simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements. ***FY 2021 Plans:*** Development funding will continue design, engineering, integration and test of planning and management application for the Tactical Radio network. Support to align with Army Network Modernization to provide further integration of the lower and mid-tier Network Management with that of PM TN to enable Soldiers the ability to manage the entire, consolidated, tactical network. Development funding will also support completion of MUOS waveform planning simplification and rapid provisioning of MUOS end-user terminals. Radio planner prototyping efforts will design, engineer, integrate and test of planning and management capabilities for the Tactical Radio network in support of the TrellisWare Scalable Manet (TSM), and the Warrior Robust Enhanced Network (WREN) waveforms. Support to align with the Unified Network Operations (UNO) vision to provide further integration of the Integrated Tactical Network (ITN) and Network Management of its emerging systems to enable Soldiers the ability to effectively manage the ITN. The radio planner prototyping efforts will also support the completion of MUOS waveform planning simplification and rapid provisioning of MUOS end-user terminals, as well as HF Waveform planning in support of HF modernization. JENM planning applications and radio planner prototyping efforts are deployed on, and critically tied to the RAP-TR hardware from Division to the Company level.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EF5 / *Joint Tactical Network (JTN)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
The Army will continue a prototyping effort that will plan, manage, and provision capabilities for simplified workflow based planning solutions to rapidly meet emerging capability requirements stemming from Network Cross Functional Team (CFT) initiatives and directed requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** JENM development funding is decreasing from FY 2020 to FY 2021 due to scheduled completion of JENM v3.5 development and its T2S. In FY 2021, JENM v3.5 development completes MUOS Simplification, upgrades JENM Public Key Infrastructure (PKI) Certificate Management, and provides Cyber Enhancements.			
Title: Test and Evaluation ***Description:*** Test and Evaluation of JENM ***FY 2020 Plans:*** JENM will provide direct support to the FY 2020 Developmental and Operational Test (DT/OT) of the PdM HMS Leader radio. JENM will undergo an Operational Test (OT) assessment to ensure it continues to meet the needs of today?s Soldiers. JENM will undergo a formal qualification test. ***FY 2021 Plans:*** JENM will undergo quarterly Regression Tests (RT) against the JENM v3.5 development baseline. Functional Quality Testing (FQT) will also be performed. The Army prototyping effort will support test assessments and evaluations. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** JENM Test and Evaluation funding is decreasing from FY 2020 to FY 2021 due to final development and T2S of JENM v3.5.	0.595	0.380	0.578
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.696	-
Accomplishments/Planned Programs Subtotals	12.484	15.324	10.718

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0605031N: *0605031N; JTN, RDTE,N*	2.617	2.677	2.705	-	2.705	1.747	-	-	-	Continuing	Continuing
• 0605031F: *0605031F; JTNC, RDTE,F*	3.735	3.798	3.844	-	3.844	3.910	3.979	-	-	Continuing	Continuing
• B99318: *Joint Network Management System*	-	-	3.904	-	3.904	1.724	1.928	1.998	2.073	Continuing	Continuing

Remarks

PE 0605031A contains only the JTN (PdM Waveforms and PdM TCNO (JENM)) RDTE funding.

Joint Enterprise Network Manager (JENM) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Fiscal Year (FY) 2019 to FY 2020 funding reflects the full JENM requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605031A by the Army, PE 0605031N by the Navy and PE 0605031F by the Air Force. USMC funding will be provided on an annual basis via Military Interdepartmental Purchase Request (MIPR). Prior to submission of the President's Budget, the funding is consolidated in PE 0605031A via RMD for execution.

JENM and baseline planning applications are deployed on the RAP-TR hardware from Division to the Company level. The RAP-TR hardware and JENM Logistics & Training capabilities are captured under the Joint Network Management System OPA-2 line (JNMS B99318) FY21 and out.

D. Acquisition Strategy

Joint Tactical Network Center (JTNC) Acquisition Decision Memorandum (ADM) (July 2012) (JENM Supporting Role). Per the December 2014 Joint Tactical Network(JTN) Select Acquisition Report (SAR), JTN was 90% expended and changed to inactive. Defense Acquisition Management Information Retrieval (DAMIR) reflected the inactive status on 3 June 2015 JTN APB (13 October 2015) (JENM Supporting Role).

Product Manager Tactical Cyber & Network Operations (TCNO) manages a Government Owned, Government Operated (GOGO) Software Development & Integration Facility which employs competitive contracting strategies for software development & sustainment of the network manager components to ensure warfighter access to the best technology and innovative capabilities while addressing emerging threats and future requirements via an affordable, operationally effective, and timely framework.

The Army will continue a prototyping effort that will plan, manage, and provision capabilities for simplified workflow based planning solutions to rapidly meet emerging capability requirements stemming from Network Cross Functional Team (CFT) initiatives and directed requirements.

JENM will support the completion of JENM v3.5 development, which include complete MUOS simplification, upgrades to JENM Public Key Infrastructure (PKI) certificate management, and cyber enhancements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM Program Management Support	MIPR	SSC PACIFIC : San Diego, CA	0.836	1.370	Nov 2018	1.417	Nov 2019	1.359	Jan 2021	-		1.359	0.000	4.982	-
JENM Program Management Support	MIPR	G2 Software Systems : San Diego, CA	1.190	1.167	Nov 2018	0.870	Nov 2019	0.869	Jan 2021	-		0.869	0.000	4.096	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.696		-		-		-	0.000	0.696	-
		Subtotal	2.026	2.537		2.983		2.228		-		2.228	0.000	9.774	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM NMRIL Development	MIPR	SSC PACIFIC : San Diego, CA	11.687	3.682	Dec 2018	4.950	Nov 2019	2.744	Jan 2021	-		2.744	Continuing	Continuing	Continuing
JENM NMRIL Development SSA	C/CPFF	G2 Software Systems : San Diego, CA	0.992	2.345	Jan 2019	2.362	Dec 2019	1.775	Jan 2021	-		1.775	0.000	7.474	-
JENM Radio Planning and Management Enhancement	MIPR	Harris, CodeMettle : Aberdeen, MD	3.640	1.795	Jan 2019	3.107	Feb 2020	2.538	Jan 2021	-		2.538	0.000	11.080	-
JENM NMRIL Development CIT	C/CPFF	BOOZ ALLEN HAMILTON INC. : San Diego, CA	0.875	1.100	Jan 2019	1.409	Feb 2020	0.855	Jan 2021	-		0.855	Continuing	Continuing	Continuing
FY 2019 SBIR/STTR Transfer	TBD	TBD : TBD	-	0.430	Jan 2019	-		-		-		-	0.000	0.430	-
		Subtotal	17.194	9.352		11.828		7.912		-		7.912	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM v3.4 System Engineering and Test	MIPR	SSC PACIFIC : San Diego, CA	2.297	0.206	Oct 2018	-		-		-		-	Continuing	Continuing	Continuing
JENM v3.5 System Engineering and Test	MIPR	NM RIL : San Diego, CA	3.178	0.389	Oct 2018	0.513	Nov 2019	0.578	Jan 2021	-		0.578	0.000	4.658	-
		Subtotal	5.475	0.595		0.513		0.578		-		0.578	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.695	12.484		15.324		10.718		-		10.718	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EF5 / *Joint Tactical Network (JTN)*

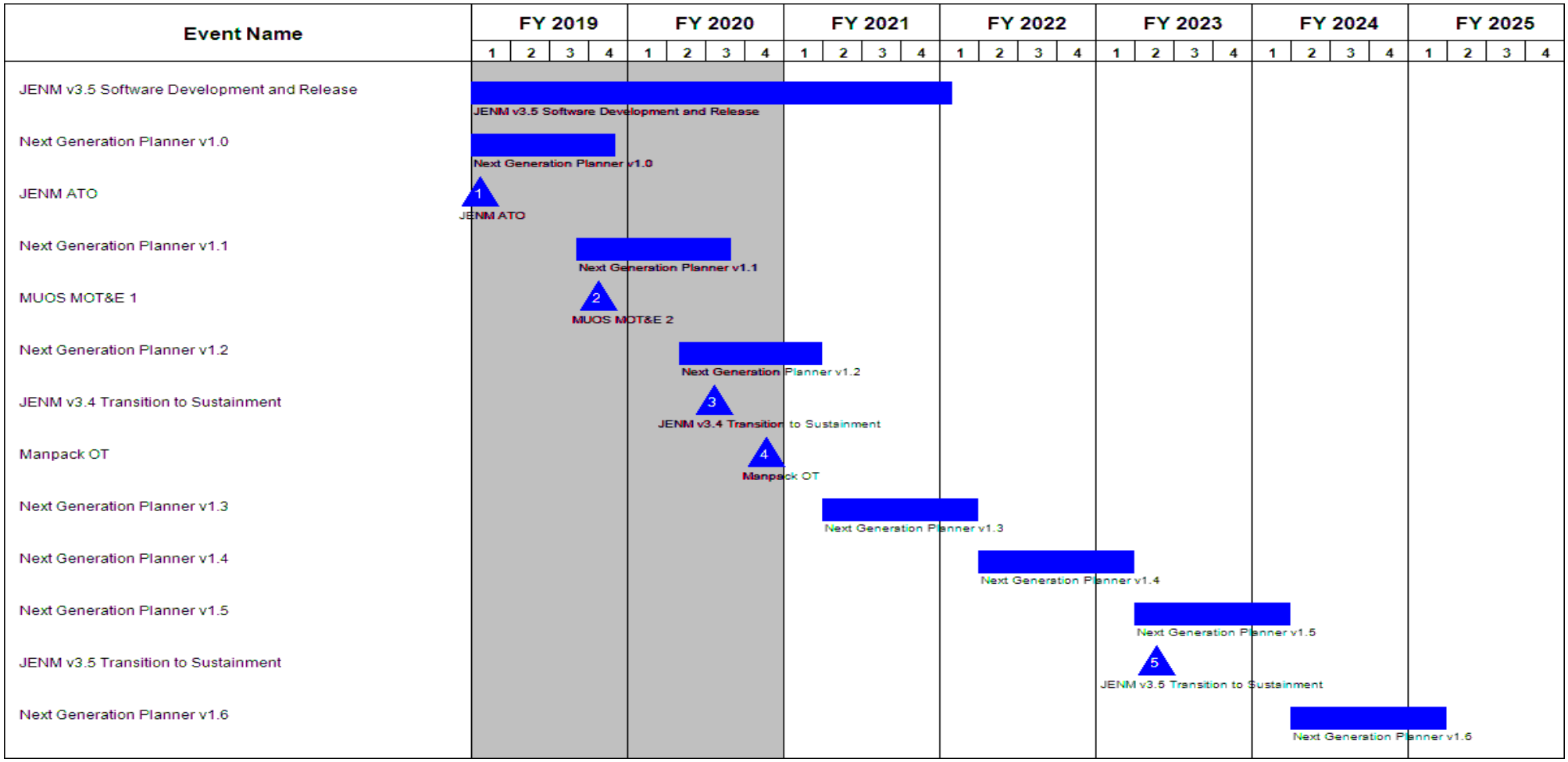

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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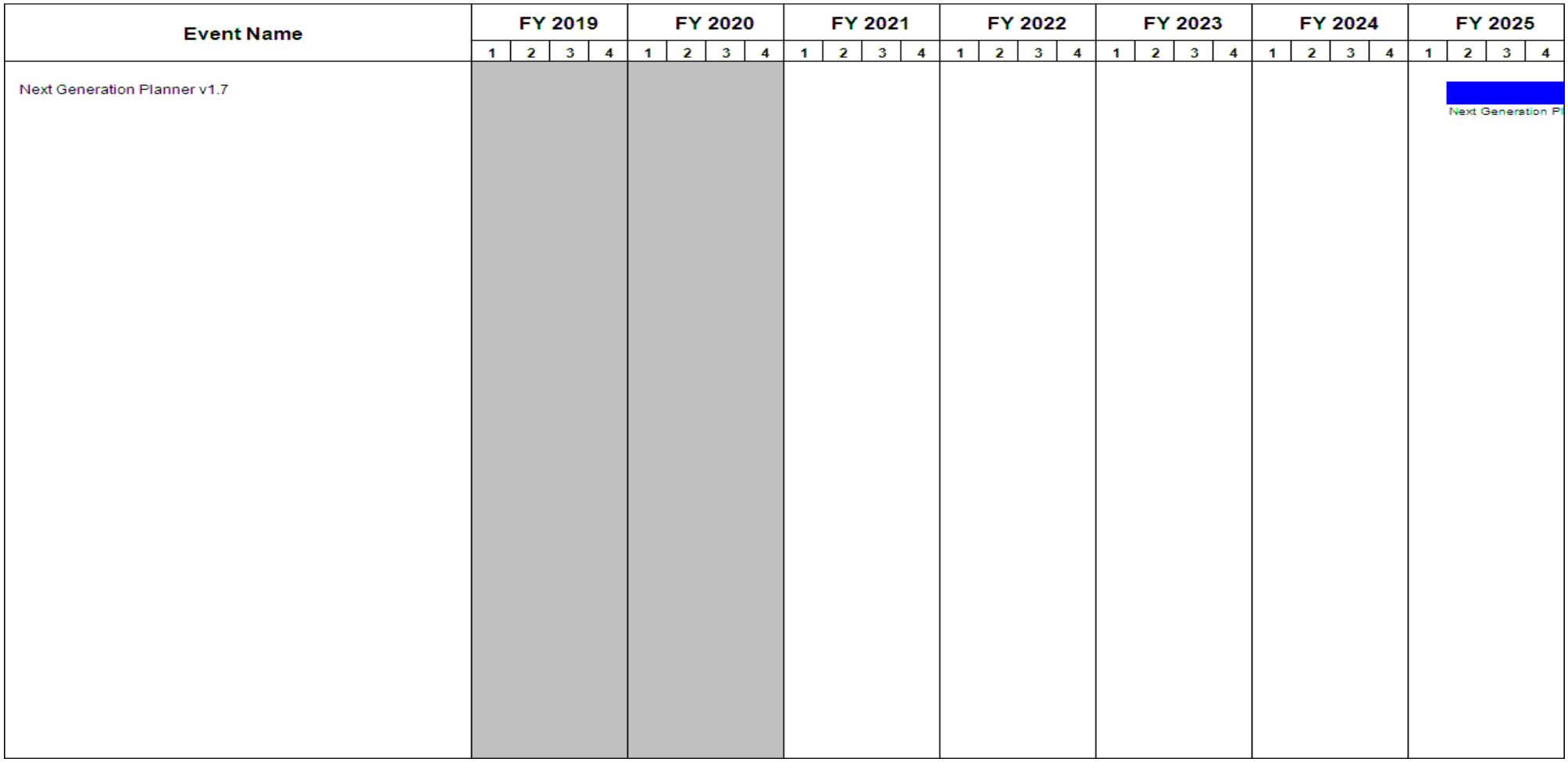

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JENM v3.5 Software Development and Release	4	2018	1	2022
Next Generation Planner v1.0	4	2018	4	2019
JENM ATO	1	2019	1	2019
Next Generation Planner v1.1	3	2019	3	2020
MUOS MOT&E 1	4	2019	4	2019
Next Generation Planner v1.2	2	2020	1	2021
JENM v3.4 Transition to Sustainment	3	2020	3	2020
Manpack OT	4	2020	4	2020
Next Generation Planner v1.3	2	2021	1	2022
Next Generation Planner v1.4	2	2022	1	2023
Next Generation Planner v1.5	2	2023	1	2024
JENM v3.5 Transition to Sustainment	2	2023	2	2023
Next Generation Planner v1.6	2	2024	1	2025
Next Generation Planner v1.7	2	2025	1	2026

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

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
EX6: *Waveforms*	-	29.650	25.484	20.978	-	20.978	21.017	20.823	21.023	21.029	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2021, $0.178 million in Reimbursable Manpower for this line has been realigned from reimbursable civilian funding to direct Operations and Maintenance (O&M). Program support costs have been accurately updated to reflect the realignments.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy Line Of Effort (LOE) 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team's capability set approach to achieve the network modernization strategy.

Product Manager (PdM) Waveforms provides the transport technologies necessary to support the overall connectivity of the Unified Network. PdM Waveforms' technology assessments, integration, and configuration management enable seamless updates and fluid communication between echelons of the Unified Network.

PdM Waveforms delivers, maintains, and upgrades portable, interoperable, Mobile Ad-hoc Networking (MANET) waveforms, Advanced Networking Waveforms (ANWf), and network enterprise services to enhance tactical warfighting capabilities. PdM Waveforms provides the Integrated Tactical Network (ITN) with a suite of waveforms and network services that are: (1) Interoperable - used by all Services; (2) Capable of operating on a variety of hardware platforms, both Program of Record and non-developmental commercial radios; (3) Secure - meet all Department of Defense and US Government information assurance requirements; (4) Operationally relevant - quickly and effectively meet evolving network mission requirements of Combatant Commanders and the Services; and (5) Affordable - drive down procurement and support costs via a robust, competitive market which adheres to open government standards.

PdM Waveforms will remain agile to accommodate emerging warfighter needs by refocusing effort strategies to address the following:

- Perform standardized viability assessment of ANWf in support of the ITN and future capability sets to proactively ensure waveform performance, in advance of formal ITN experimentation and fielding activities

- Execute WF analysis and system engineering activities for DoD as Lead Service Activity for Ground/Line of Sight (LoS) Waveforms (currently TSM, Warrior Robust Enhanced Network Narrowband(WREN NB), and Single Channel Ground and Airborne Radio System (SINCGARS)) in accordance with (IAW) Deputy Secretary of Defense memo for Enhancing DOD's Joint Tactical Networks and Datalink Modernization, 29 March 2019

- Work with industry partners in pursuit of alternative waveforms and software technologies to meet LOE 1, fill identified capability gaps, and modernize/evolve the network IAW Capability Set goals over time

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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- Continue development and/or integration efforts of Broadcast Waveforms (i.e. Single Channel Ground and Airborne Radio System (SINCGARS), Warrior Robust Enhanced Network (WREN NB)), Advanced Networking Waveforms (ANWf), and Radio Services (i.e. Enterprise Over The Air Management (eOTAM)) in support of Army Network Modernization, and agile mission support initiatives

FY 2021 Base RDT&E dollars, in the amount of $20.978 million, will fund software development efforts of legacy and next generation Government waveforms and applications. FY 2021 dollars will also fund system and architectural engineering for ANWf radio communications technologies, to include cyber and electronic warfare, as well as evaluation and assessment activities for waveform and application solutions in support of Network-Cross Functional Team's (N-CFT) Capability Set (CS) for the Unified Network Line of Effort (LOE).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Program Management Office Support ***Description:*** Provides Program Management Office (PMO) support for Waveforms enhancements. ***FY 2020 Plans:*** Program Management support for PdM Waveforms. ***FY 2021 Plans:*** Continue Program Management support for PdM Waveforms, including contractors. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to award of competitive small business management contract and realignment from reimbursable civilian funding to direct OMA.	3.383	3.138	2.879
Title: Waveforms Software Development ***Description:*** Software Development efforts within PdM Waveforms are focused on the following: 1.Cyber Electro-Magnetic Activities (CEMA) CEMA activities focus on impacting the adversary's ability to communicate while protecting and hardening Army capabilities and systems to prevent the adversary from doing the same. PdM manages and executes CEMA activities (i.e. Cybersecurity, Intrusion Detection, Intrusion Prevention, Electronic Warfare (EW), and Spectrum Management) in support of Capability Sets and Army Network Modernization to include: Cap Set 21 - Increasing EW resilience and network "fail-over" options (Primary, Alternate, Contingency, Emergency (PACE)) Cap Set 23 - Refinement of Mesh Network (e.g. MANET) for all ITN formations and Broadcast WF (e.g. SINCGARS) and anti-jam improvements Cap Set 25 - Identify and assess technologies for Automated PACE implementation 2. SINCGARS	21.100	12.340	9.758

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
- Development of a Frequency Hopping (FH)3 mode that will address the adversary's near and mid-term Electronic Attack (EA)/ Electronic Warfare (EW) capabilities which will be integrated into Capability Set (CS) 21 - Develop and provide a fully open development environment to government and vendors to help ensure standardization, interoperability, and provide the means to identify and mitigate porting issues and realize cost efficiencies - Develop requirements and advanced Waveform/Transportation Security (TRANSEC) capabilities to combat predicted threats in anticipation of next generation Single Channel Ground and Airborne Radio System (SINCGARS) (FH4) capability - Development of a new MIL-STD to accurately and completely define SINCGARS for NATO and coalition interoperability - Development of a NATO Standardized Agreement (STANAG) defining the SINCGARS interoperability mode FH2/Cipher Text (CT)2 for use by NATO and ABCANZ partners - Development of NATO Narrowband (NB) and standards documentation 3. Radio Services and applications that enable NSA certified key and radio configuration management over the air (OTA) while reducing network overhead and providing user-simplified/standardized radio network configuration tools that support the Unified Network Line of Effort (LOE) for CSs through 2028 4. Enterprise Over the Air Management (eOTAM) 2.0 will reduce OTA profile for bandwidth limited waveforms, upgrade security to meet current NSA policy for new products, and add radio health status and control capabilities needed for COTS products. eOTAM will be converged with the Black Sails suite of radio/network configuration and control tools. 5. Development and integration of Warrior Robust Enhanced Network Narrowband (WREN NB) (formerly known as Soldier Radio Waveform (SRW)) Narrowband will allow for increased scalability, range, and communications in congested and contested environments, in both Very High Frequency (VHF) and Ultra High Frequency (UHF) bands. WREN NB will provide robust communications capabilities with smaller bandwidth requirements in support of the Network Resiliency and Hardened Radio Capabilities identified in the CSs' Unified Network LOE in FY 2021-2025. 6. Integration of Dynamic Spectrum Access (DSA) into waveforms will support the Warfighter by providing more efficient use of the limited spectrum resources, increasing spectrum availability in a congested Electromagnetic Environment (EME). The Army is in need of a DSA capability that can react to the theater changes in near real-time communication networks. The DSA technology will allow Army networks to automatically adjust frequency based on geographical location to fit within spectrum allocations as the Army moves and fights in tactical theaters. ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Continue to mitigate Cyber Electro-Magnetic Activities (CEMA) threats for Single Channel Ground and Airborne Radio System (SINCGARS)/Warrior Robust Enhanced Network (WREN), mitigate interference effects & coordinated Electronic Warfare (EW) and communications threats, and develop EW Enabled cyber capabilities. ***FY 2021 Plans:*** - Mitigate CEMA threats for SINCGARS/WREN, mitigate interference effects & coordinated EW and communications threats, and develop EW enabled cyber capabilities - Work with Industry Partners to assess, analyze, and vet Advanced Networking Waveforms (ANWf) in support of the Integrated Tactical Network (ITN) and future capability set (CS) - Radio Service capability to simplify the unified network - Single Channel Ground and Airborne Radio System (SINCGARS)/ Warrior Robust Enhanced Network (WREN NB) will be integrated into ITN/CS 21 - Continue to assess and analyze ANWf in a contested and congested environment to fulfill the capability gap identified by the Network-Cross Functional Team (N-CFT) ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to shifting focus from government developed waveforms to commercial centric waveforms, aligns with Army Network Modernization and N-CFT initiatives/requirements.			
Title: Waveforms Software Support and System Engineering	2.524	2.912	4.047
Description: PdM Waveforms software support and systems engineering for waveforms and network manager applications provide the following: - Work with Industry Partners to assess, analyze, and vet ANWf for viability and readiness of technology in support of the ITN and future CS - Provide waveform and radio services engineering support in development of ITN, N-CFT, and CS' requirements and architectures; identify and develop use cases and topologies for viability and readiness assessments - Integration of Black Sails tools into Army architectures and radio networks - Manage waveform development, schedules, risk registry, and configuration control in support of ITN experimentation and system fieldings - Provide necessary assistance and oversight to Waveforms product specific engineering - Support DoD and Services in the utilization of Ground/Line of Sight (LoS) waveforms as Lead Service activity - Support Joint and Industry partners in the design, implementation, and testing of current and future SINCGARS modes - Support NATO and ABCANZ partners in ensuring interoperability with the US; development of NATO Narrowband solution ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Continue software support and systems engineering efforts as described above in support of PdM Waveforms. ***FY 2021 Plans:*** Continue software support and systems engineering efforts as described above in support of PdM Waveforms. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase due to new focus on commercial waveforms vetting analysis and characterization, which require additional resources to conduct viability assessment and working with vendors.			
Title: Waveforms Testing and Evaluation ***Description:*** PdM Waveforms performs Testing and Evaluation on Government developed waveforms and radio service technologies including Single Channel Ground and Airborne Radio System (SINCGARS), Enterprise Over the Air Management (eOTAM), and upon transition Warrior Robust Enhanced Network Narrowband (WREN NB). Advanced Networking Waveforms (ANWf) assessments support inclusion and/or movement of vendor technologies into Army experimentation and Capability Sets (CSs). - Test and Evaluation includes compatibility/interoperability, performance, Electronic Warfare (EW)/Cyber Electromagnetic Activities (CEMA) - Viability and Readiness Assessments include: *Assess Internal Research and Development (IRAD) readiness for consideration into Army architectures *Assess Technology Readiness Level (TRL) of waveforms to determine appropriate insertion and movement through Acquisition Milestones (MS) or procurement activities *Assess performance and behavior of waveform against topologies, architectures, and operational use cases as defined by N-CFT and fielding activities *Electronic Warfare (EW) and Cyber in support of Integrated Tactical Network (ITN) ***FY 2020 Plans:*** Conduct testing and evaluation procedures for continued code development and detect fixes of Government-owned waveforms and perform evaluation and characteristics analysis of commercial waveforms for potential Government utilization to meet warfighter requirements. ***FY 2021 Plans:***	2.643	7.094	4.294

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Conduct testing and evaluation procedures for continued code development and detect fixes of Government-owned waveforms and perform evaluation and characteristics analysis of commercial waveforms for potential Government utilization to meet warfighter requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to performing evaluation and characteristics analysis of Advance Networking Wavforms			
Accomplishments/Planned Programs Subtotals	29.650	25.484	20.978

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

PdM Waveforms is responsible for common core activities including developing and updating legacy waveforms and analyzing Advance Networking Waveforms (ANWf) that operate on multiple radios sets and in all operational environments that support network-centric operational warfare. Waveform developments (upgrading, developing, and maintaining) will generally be procured through full and open contract competitions.

Beginning in FY19, while maintaining legacy networking waveforms, PdM Waveforms implemented a pivoting strategy which focuses on vetting and analyzing ANWf. The Product Office has established working relationships with Industry Partners within the waveform market. The strategy consists of conducting initial analysis of commercial waveforms, documenting vulnerabilities, identifying implementation strategies, and making recommendations to senior leadership on potential Army use cases.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - CORE	MIPR	CORE : APG, MD	0.455	-		-		-		-		-	0.000	0.455	-
Program Management Support - Matrix	MIPR	C5ISR Center : APG, MD	0.761	2.052	Jan 2019	1.295	Jan 2020	1.099	Jan 2021	-		1.099	Continuing	Continuing	Continuing
Program Management Support - MITRE	MIPR	MITRE : Aberdeen, MD	0.561	-		-		-		-		-	0.000	0.561	Continuing
Program Management Support - SETA	C/CPFF	SEV1-Tech : Woodbridge, VA	2.788	1.331	Nov 2018	1.843	Nov 2019	1.780	Nov 2020	-		1.780	Continuing	Continuing	Continuing
		Subtotal	4.565	3.383		3.138		2.879		-		2.879	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development-SRW/WREN	C/CPFF	Harris : Rochester, NY	0.997	-		-		-		-		-	0.000	0.997	-
Software Development-SRW	C/CPFF	Various : APG, MD	0.920	-		-		-		-		-	0.000	0.920	-
Software Development - WNW	MIPR	SSC Atlantic : Charleston, SC	0.567	-		-		-		-		-	0.000	0.567	-
Software Development - C5ISR Center	MIPR	C5ISR Center : APG, MD	7.124	10.262		9.619		6.893		-		6.893	Continuing	Continuing	Continuing
Software Development - Technical/Coding (MA-IDIQ)	C/CPAF	MA - IDIQ : Various Locations	12.434	5.224		2.721		2.865		-		2.865	Continuing	Continuing	Continuing
Software Development - SSC LANT	MIPR	SSC LANT : Charleston, SC	1.253	0.287		-		-		-		-	Continuing	Continuing	Continuing
Software Support - WREN NB	MIPR	C5ISR Center : APG, MD	-	5.327		-		-		-		-	0.000	5.327	-
		Subtotal	23.295	21.100		12.340		9.758		-		9.758	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Support - SRW/ WREN	MIPR	C5ISR Center : APG, MD	0.947	-		-		-		-		-	0.000	0.947	-
Software Support - SRW	C/CPFF	Harris : Rochester, NY	0.306	-		-		-		-		-	0.000	0.306	-
Software Support - WNW	MIPR	SSC LANT : Charleston, SC	0.614	-		-		-		-		-	0.000	0.614	-
Software Support - WNW	C/CPFF	Various : APG, MD	0.862	-		-		-		-		-	0.000	0.862	-
Systems Engineering - MITRE	MIPR	MITRE : APG, MD	0.459	0.351		-		-		-		-	Continuing	Continuing	Continuing
Systems Engineering - SSC LANT	MIPR	SSC LANT : Charleston, SC	1.479	-		0.600		0.300		-		0.300	Continuing	Continuing	Continuing
Software Support - WREN NB	MIPR	C5ISR Center : APG, MD	-	2.173		2.312		3.747		-		3.747	Continuing	Continuing	Continuing
		Subtotal	4.667	2.524		2.912		4.047		-		4.047	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support (SRW RIL)	MIPR	C5ISR Center : APG, MD	0.146	-		-		-		-		-	0.000	0.146	-
Test and Evaluation Support (WNW RIL)	MIPR	SSC Atlantic : Charleston, SC	0.347	-		-		-		-		-	0.000	0.347	-
Test and Evaluation - C5ISR Center	MIPR	C5ISR Center : APG, MD	2.052	2.153		6.594		3.794		-		3.794	Continuing	Continuing	Continuing
Test and Evaluation - SSC LANT	MIPR	SSC LANT : Charleston, SC	0.438	-		-		-		-		-	0.000	0.438	-
Test and Evaluation - NATO	MIPR	RAND : Arlington, VA	-	0.490		0.500		0.500		-		0.500	Continuing	Continuing	Continuing
		Subtotal	2.983	2.643		7.094		4.294		-		4.294	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.510	29.650		25.484		20.978		-		20.978	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

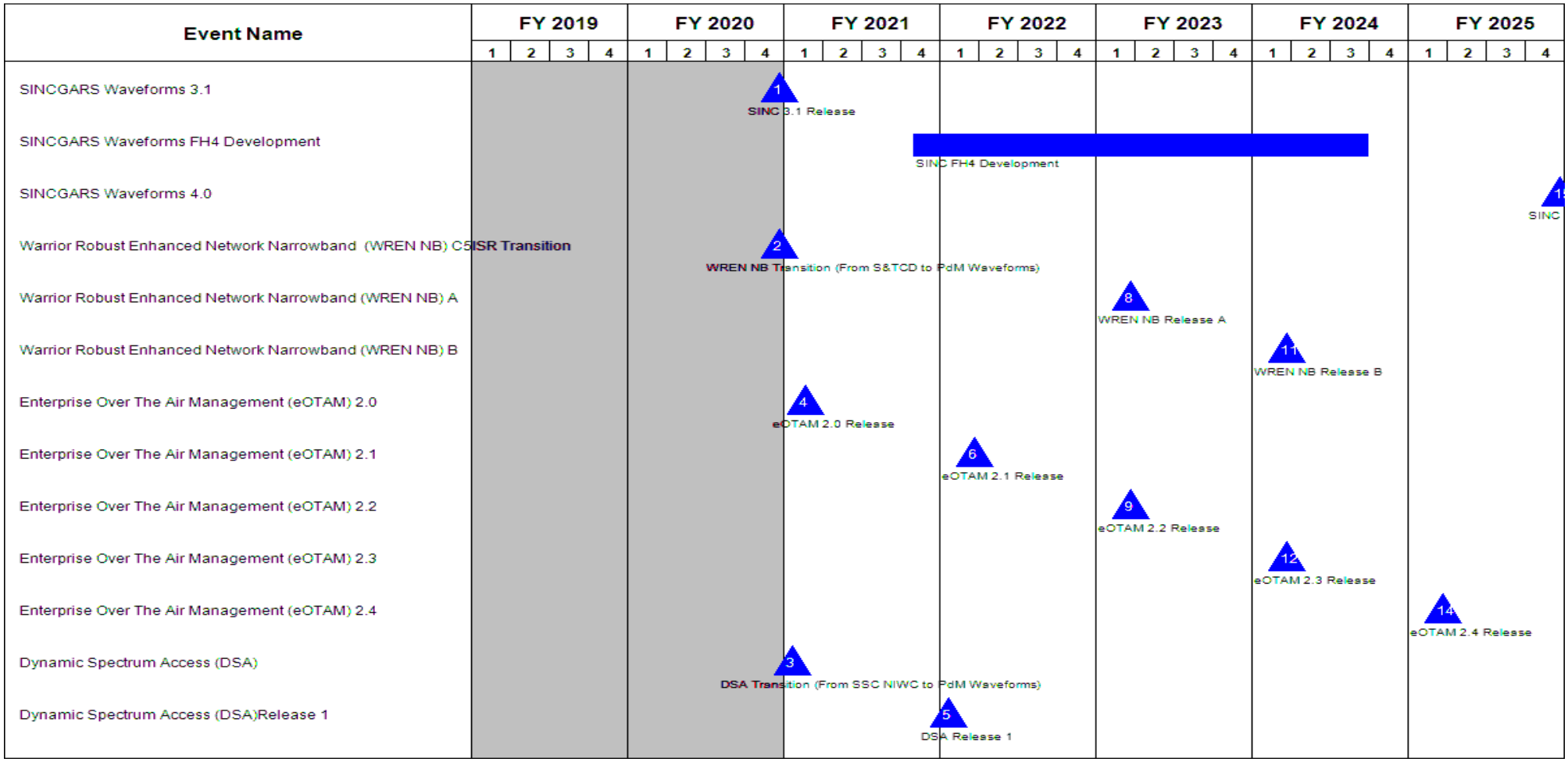

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

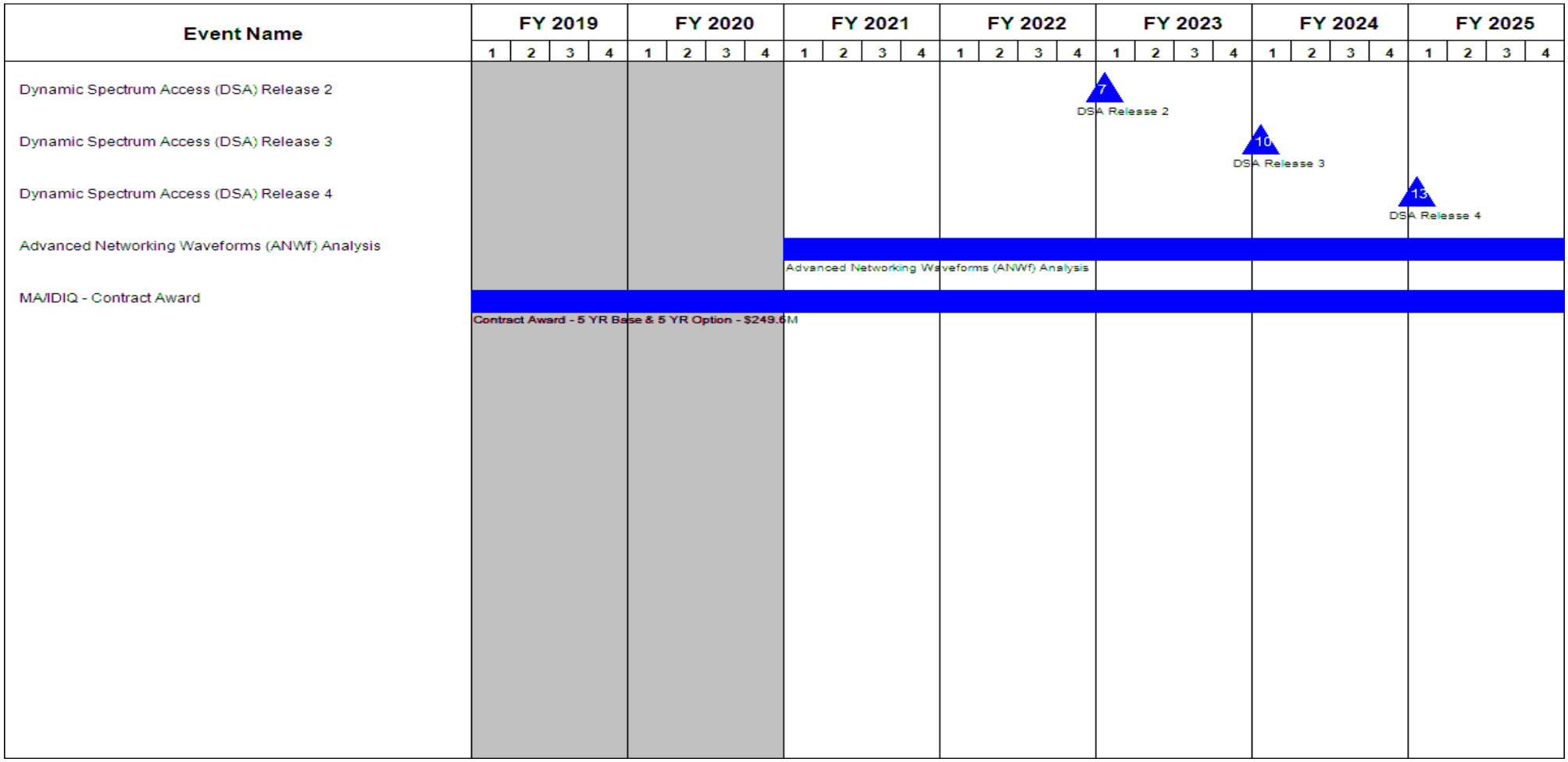

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SINCGARS Waveforms 3.1	4	2020	4	2020
SINCGARS Waveforms FH4 Development	4	2021	3	2024
SINCGARS Waveforms 4.0	4	2025	4	2025
Warrior Robust Enhanced Network Narrowband (WREN NB) C5ISR Transition	4	2020	4	2020
Warrior Robust Enhanced Network Narrowband (WREN NB) A	1	2023	1	2023
Warrior Robust Enhanced Network Narrowband (WREN NB) B	1	2024	1	2024
Enterprise Over The Air Management (eOTAM) 2.0	1	2021	1	2021
Enterprise Over The Air Management (eOTAM) 2.1	1	2022	1	2022
Enterprise Over The Air Management (eOTAM) 2.2	1	2023	1	2023
Enterprise Over The Air Management (eOTAM) 2.3	1	2024	1	2024
Enterprise Over The Air Management (eOTAM) 2.4	1	2025	1	2025
Dynamic Spectrum Access (DSA)	1	2021	1	2021
Dynamic Spectrum Access (DSA)Release 1	1	2022	1	2022
Dynamic Spectrum Access (DSA) Release 2	1	2023	1	2023
Dynamic Spectrum Access (DSA) Release 3	1	2024	1	2024
Dynamic Spectrum Access (DSA) Release 4	1	2025	1	2025
Advanced Networking Waveforms (ANWf) Analysis	1	2021	4	2026
MA/IDIQ - Contract Award	4	2018	4	2028

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605032A / *TRACTOR TIRE*							
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	-	107.926	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	107.926
ET3: *Tractor Trick*	-	107.926	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	107.926

Note

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

A. Mission Description and Budget Item Justification

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	107.926	0.000	0.000	-	0.000
Current President's Budget	107.926	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605033A *I Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*							
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	-	4.980	3.847	5.976	-	5.976	0.000	0.000	0.000	0.000	0.000	14.803
EQ3: *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	-	4.980	3.847	5.976	-	5.976	0.000	0.000	0.000	0.000	0.000	14.803

A. Mission Description and Budget Item Justification

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Light variant (man transportable/detachable) for extra small base camps or small outpost/company,Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	5.169	3.847	5.981	-	5.981
Current President's Budget	4.980	3.847	5.976	-	5.976
Total Adjustments	-0.189	0.000	-0.005	-	-0.005
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.189	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.005	-	-0.005

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	Project (Number/Name) EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

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
EQ3: *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	-	4.980	3.847	5.976	-	5.976	0.000	0.000	0.000	0.000	0.000	14.803
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Light variant (man transportable/detachable) for extra small base camps or small outpost/company, Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

FY21 Base funding in the amount of $5.981 million completes design engineering and integration activities, builds Low Rate initial Production (LRIP) engineering development models, conducts Initial Operational Test (IOT) and Logistics Demonstration, and provides Program Management support.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: GBOSS-E Design and Build	4.979	3.847	5.976
Description: GBOSS-E completes building of Prototype/Engineering Development Models (EDMs) and Development Testing (DT). ***FY 2020 Plans:*** FY 2020 Plans: Funding supports continued assembly/integration of EDMs and completion of DT and LUT. ***FY 2021 Plans:*** FY 2021 Plans: Funding supports completion of the Engineering Development phase leading to a Milestone C decision by the Milestone decision authority. Includes the low rate initial production of test assets and operational testing of the system leading to a full rate production decision. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY2021 increase of $2.1 million is to complete design, integration and build of LRIP test assets and conduct IOT and Log demo.			
Title: FY19 NDAA, Section 8109, MDAP Cost Overrun - $1,000	0.001	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Accomplishments/Planned Programs Subtotals	4.980	3.847	5.976

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System - Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities along with network integration and better mobility utilizing modular configurations. The GBOSS-E Capability Design Document (CDD) was AROC approved May 2014. In FY 2013, FY 2014 & FY 2015, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities.

GBOSS-E received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. Milestone B decision accomplished 29 September 2017, the existing United States Marine Corps (USMC) tower's design (Ground Based Operational Surveillance System) (GBOSS) will be leveraged and modified to meet the Army's GBOSS-E program requirements.

The acquisition strategy for GBOSS-E was approved by the Milestone Decision Authority (MDA) on 11 December 2016, which approved plans to leverage the Naval Surface Warfare Center (NSWC) at Crane, Indiana and the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide system design, development, and integration support, as well as a Technical Data Package (TDP) to support future procurements.

Milestone C is planned for FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Project Management	MIPR	PM FPS : Fort Belvoir, VA	1.933	0.767	May 2019	0.308	Jan 2020	0.700	Jan 2021	-		0.700	0.000	3.708	-
CVBIED JUONS 0540 Project Management	MIPR	PM FPS : Fort Belvoir, VA	0.051	-		-		-		-		-	0.000	0.051	-
MDAP Cost Overrun	TBD	OASA(FM&C) : Pentagon DC	-	0.001		-		-		-		-	0.000	0.001	-
		Subtotal	1.984	0.768		0.308		0.700		-		0.700	0.000	3.760	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Design Engineering	MIPR	NSWC Crane : Crane, IN	4.154	2.582	Feb 2019	2.257	Jan 2020	0.670	Jan 2021	-		0.670	0.000	9.663	-
GBOSS-E Software Development	TBD	TBD : TBD	0.263	0.050		-		-		-		-	0.000	0.313	-
GBOSS-E Integration Support	MIPR	NSWC Crane : Crane, IN	1.125	-		0.464	Jan 2020	1.183	Jan 2021	-		1.183	0.000	2.772	-
Tech Data	MIPR	NSWC Crane : Crane, IN	-	1.100	Feb 2019	-		-		-		-	0.000	1.100	-
CVBIED JUONS 0540 Wide Area Motion Imagery Sensor Development	MIPR	NAVAIR : Patuxent River, MD	7.208	-		-		-		-		-	0.000	7.208	-
CVBIED JUONS 0540 Wide Area Motion Imagery Sensor Development	MIPR	RDECOM : Fort Belvoir, VA	8.735	-		-		-		-		-	0.000	8.735	-
Hardware Procurement	MIPR	NSWC Crane : Crane Indiana	-	0.100	Feb 2019	-		1.664		-		1.664	0.000	1.764	-
		Subtotal	21.485	3.832		2.721		3.517		-		3.517	0.000	31.555	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	Project (Number/Name) EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NVESD Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.415	0.163	Jan 2019	0.109	Jan 2020	0.165	Jan 2021	-		0.165	0.000	0.852	-
ARL Human Systems Integration Support	MIPR	US Army ARL : Adelphi, MD	0.054	0.025	Apr 2019	0.030	Nov 2019	0.035	Nov 2020	-		0.035	0.000	0.144	-
CECOM FSD - Safety	MIPR	CECOM : APG, MD	0.054	0.016	Jul 2019	0.030	Nov 2019	0.035	Nov 2020	-		0.035	0.000	0.135	-
CECOM ILSC	MIPR	CECOM : Various	-	0.040	Aug 2019	0.507	Mar 2020	0.225	Mar 2021	-		0.225	0.000	0.772	-
		Subtotal	0.523	0.244		0.676		0.460		-		0.460	0.000	1.903	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	0.284	0.136		0.142	Jan 2020	1.299	Jan 2021	-		1.299	0.000	1.861	-
JUONS CC-0540 Test and Evaluation Support	MIPR	ATEC : Aberdeen Proving Ground, MD	1.178	-		-		-		-		-	0.000	1.178	-
		Subtotal	1.462	0.136		0.142		1.299		-		1.299	0.000	3.039	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	25.454	4.980		3.847		5.976		-		5.976	0.000	40.257	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

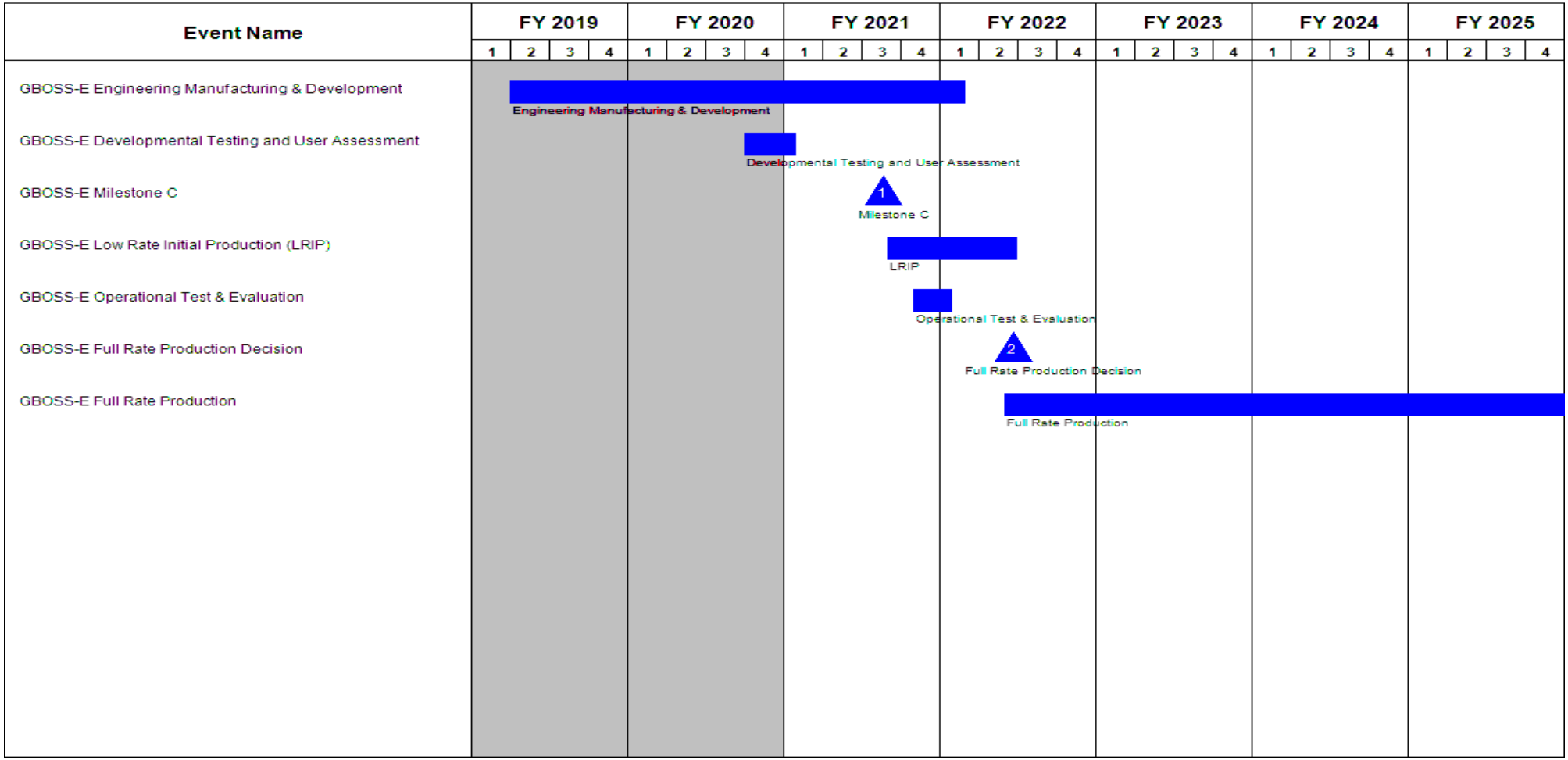

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GBOSS-E Engineering Manufacturing & Development	1	2019	1	2022
GBOSS-E Developmental Testing and User Assessment	4	2020	1	2021
GBOSS-E Milestone C	3	2021	3	2021
GBOSS-E Low Rate Initial Production (LRIP)	3	2021	2	2022
GBOSS-E Operational Test & Evaluation	4	2021	1	2022
GBOSS-E Full Rate Production Decision	2	2022	2	2022
GBOSS-E Full Rate Production	2	2022	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*							
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	-	4.326	6.928	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.254
EQ4: *Tactical Security System (TSS)*	-	4.326	6.928	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.254

A. Mission Description and Budget Item Justification

The Tactical Security System (TSS) is a modular, scalable, lightweight, rapidly deployable, ground based security and surveillance Family of Systems (FoS). The design of TSS allows for hasty emplacement and is tailorable to support short and long term security, surveillance and detection missions. The TSS and its components are designed to be employed as a stand-alone system, in a layered effort or integrated with additional force protection (FP) systems. Integration with additional sensors will be obtained through network communications and software in line with Net-Ready requirements. TSS will address four of the five base camp core protection/security capabilities identified in the Integrated Base Defense (IBD) Concept of Operations (CONOPS) which are perimeter security, entry control, persistent surveillance, warning and alerting. The TSS will be compliant with the Common Operating Environment (COE) Architecture and Implementation Plan. TSS is designed to be employed as a stand-alone system in a layered effort or integrated with additional force protection systems including motion, acoustic, seismic, surface, and detection technologies.

FY 2020 is the last year of funding for this program.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	4.490	6.928	3.057	-	3.057
Current President's Budget	4.326	6.928	0.000	-	0.000
Total Adjustments	-0.164	0.000	-3.057	-	-3.057
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.164	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-3.057	-	-3.057

Change Summary Explanation

FY 2020 is the last year of funding for this program.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

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
EQ4: *Tactical Security System (TSS)*	-	4.326	6.928	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.254
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The TSS is a modular, scalable, lightweight, rapidly deployable, ground based security and surveillance Family of Systems (FoS). The design of TSS allows for hasty emplacement and is tailorable to support short and long term security, surveillance and detection missions. The TSS and its components are designed to be employed as a stand-alone system, in a layered effort or integrated with additional force protection (FP) systems. Integration with additional sensors will be obtained through network communications and software in line with Net-Ready requirements. TSS will address four of the five base camp core protection/security capabilities identified in the Integrated Base Defense (IBD) Concept of Operations (CONOPS) which are perimeter security, entry control, persistent surveillance, warning and alerting. The TSS will be compliant with the Common Operating Environment (COE) Architecture and Implementation Plan. TSS is designed to be employed as a stand-alone system in a layered effort or integrated with additional force protection systems including motion, acoustic, seismic, surface, and detection technologies.

FY 2020 is the last year of funding for this program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: TSS Design and Build ***Description:*** TSS completes building of Engineering Development Model (EDM), initial integration with Integrated Ground Security Surveillance and Response Capability (IGSSR-C) and Common Operating Environment (COE), and Developmental Testing (DT) of prototype, achieves Milestone C decision, procures LRIP articles and completes IOT&E. ***FY 2020 Plans:*** TSS completes the Limited User Testing (LUT) and Logistics Demonstration, achieves Milestone C decision, procures three LRIP articles, and completes IOT&E. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 is the last year of funding for this program.	4.323	6.614	-	-	-
Title: FY19 NDAA, Section 8109, MDAP Cost Overrun - $3,000	0.003	-	-	-	-
Title: FY 2020 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638	-	0.314	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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	4.326	6.928	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• M90220: *TACTICAL SECURITY SYSTEM (TSS)*	-	-	0.000	14.189	14.189	-	-	-	-	0.000	14.189

Remarks

D. Acquisition Strategy

TSS will eliminate the Non-Standard Equipment (NSE) currently used in the Force Protection Suite (FPS) under the Base Expeditionary Targeting and Surveillance System - Combined (BETSS-C) Quick Reaction Capability (QRC) with improved surveillance capabilities in modular configurations along with enhanced network integration across the command and control system and Common Operating Environment (COE).

Tactical Security System (TSS) received Materiel Development Decision (MDD) approval on 6 January 2017. The acquisition concept and contracting strategy for TSS was approved on 30 April 2018 by the Milestone Decision Authority (MDA) to leverage an existing task order through Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide engineering and developmental support for the TSS design, development, and integration of an EDM and to support Operational Assessments (OA). Key efforts include the development of the EDM, testing and evaluation for TSS Key Performance Parameters (KPPs)/Key System Attributes (KSAs)/Additional Performance Parameters (APAs), and Developmental and Operational Test and Evaluation (DOT&E). MS B was achieved on 29 October 2018.

Milestone C is planned for FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Project Management	MIPR	PM FPS : Fort Belvoir, VA	0.516	0.604	Jun 2019	0.484	May 2020	-		-		-	0.000	1.604	-
TSS Project Management	TBD	PM TS : Fort Belvoir, VA	-	0.105	Jun 2019	-		-		-		-	0.000	0.105	-
RAM support	TBD	Alion : Crane, Indiana	-	0.071	Nov 2019	-		-		-		-	0.000	0.071	-
MDAP Cost Overrun	TBD	OASA(FM&C) : Pentagon, DC	-	0.003		-		-		-		-	0.000	0.003	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.314		-		-		-	0.000	0.314	-
		Subtotal	0.516	0.783		0.798		-		-		-	0.000	2.097	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Design	MIPR	Polaris Alpha : Fredericksburg, VA	1.874	0.881	Jan 2019	0.165	Jan 2020	-		-		-	0.000	2.920	-
TSS Prototypes	MIPR	Polaris Alpha : Fredericksburg, VA	0.409	0.950	Jan 2019	3.540	Jan 2020	-		-		-	0.000	4.899	-
TSS Software Development	TBD	MTEQ : Lorton, VA	0.100	0.050	Jan 2019	-		-		-		-	0.000	0.150	-
TSS Integration	MIPR	Polaris Alpha : Fredericksburg, VA	0.623	0.426	Jan 2019	0.695	Jan 2020	-		-		-	0.000	1.744	-
TSS Embedded SW development	TBD	Alion : Crane, Indiana	-	0.098	Nov 2018	-		-		-		-	0.000	0.098	-
		Subtotal	3.006	2.405		4.400		-		-		-	0.000	9.811	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.154	0.142	Jan 2019	0.102	Jan 2020	-		-		-	0.000	0.398	-
ARL Human Systems Integration Support	MIPR	US Army Research Lab : Adelphi, MD	0.025	0.026	Jan 2019	-		-		-		-	0.000	0.051	-
CECOM FSD - Safety	MIPR	CECOM : APG, MD	0.015	0.016	May 2019	0.015	Nov 2019	-		-		-	0.000	0.046	-
CECOM ILSC	TBD	CECOM : Aberdeen Proving Grounds, MD	-	0.027	Mar 2019	-		-		-		-	0.000	0.027	-
TSS LORA Support	TBD	C5ISR PRD : Aberdeen Proving Grounds, MD	-	0.014	Jun 2019	-		-		-		-	0.000	0.014	-
Contract Support Services	TBD	ACC : Fort Belvoir, VA	-	0.090	Dec 2018	-		-		-		-	0.000	0.090	-
Cyber Support	TBD	Mitre : Fort Belvoir, VA	-	0.259	Dec 2018	-		-		-		-	0.000	0.259	-
		Subtotal	0.194	0.574		0.117		-		-		-	0.000	0.885	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Test and Evaluation	MIPR	Army Evaluation Center : APG, MD	0.282	0.015	Jul 2019	1.613	Mar 2020	-		-		-	0.000	1.910	-
TSS Test Planning and Support	TBD	Redstone Test Center : Redstone, AL	-	0.549	Sep 2019	-		-		-		-	0.000	0.549	-
		Subtotal	0.282	0.564		1.613		-		-		-	0.000	2.459	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.998	4.326		6.928		-		-		-	0.000	15.252	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

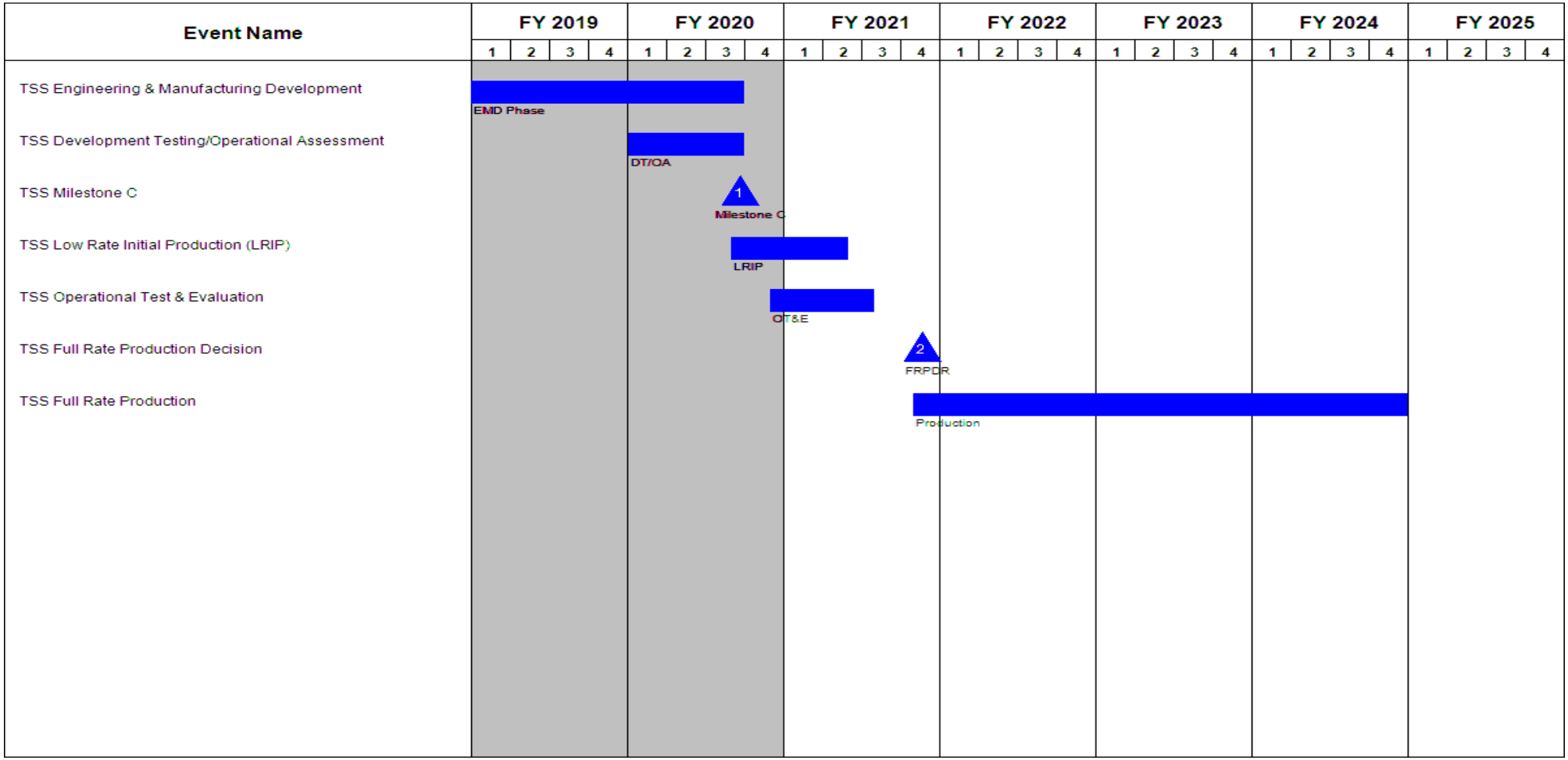

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TSS Material Development Decision	1	2018	1	2018
TSS Pre Milestone B Activities / Risk Reduction	2	2016	4	2017
TSS Milestone B	4	2018	4	2018
TSS Engineering & Manufacturing Development	4	2018	3	2020
TSS Development Testing/Operational Assessment	1	2020	3	2020
TSS Milestone C	3	2020	3	2020
TSS Low Rate Initial Production (LRIP)	3	2020	2	2021
TSS Operational Test & Evaluation	4	2020	3	2021
TSS Full Rate Production Decision	4	2021	4	2021
TSS Full Rate Production	4	2021	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*							
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	-	32.025	23.179	23.321	2.300	25.621	7.136	11.261	5.098	5.644	0.000	109.964
EB4: *CIRCM*	-	32.025	23.179	23.321	2.300	25.621	7.136	11.261	5.098	5.644	0.000	109.964

A. Mission Description and Budget Item Justification

The Common Infrared Countermeasure (CIRCM) budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA), Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

The CIRCM budget line includes CIRCM (EB4) and funding to counter emerging technology as identified in Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a and the Headquarters Department of the Army (HQDA) Directed Requirement for the Common Infrared Countermeasures Quick Reaction Capability (CIRCM QRC) approved in Nov 2018.

CIRCM (EB4)
The CIRCM is the next generation lightweight, laser-based Infrared Countermeasure (IRCM) component that will interface with both the Army's Common Missile Warning System (CMWS) and future missile warning systems (MWS) to defeat current and emerging missile threats that use multispectral technology for rotary-wing, tilt-rotor and small fixed-wing aircraft across the DoD. CIRCM receives an angular bearing hand-off from the MWS, employs a pointing and tracking system which acquires the handed-over threat and tracks the incoming missile during and after motor burnout. CIRCM jams the missile by using modulated laser energy in the missile seeker band, thus degrading the tracking capability of the missile and causing it to miss the aircraft. CIRCM is utilizing Open Systems Architecture which allows flexibility with software and hardware refreshes. These tech insertions, when coupled with future threat acquisition & integration, will ensure CIRCM performance to keep pace with future threats.

The CIRCM A-Kit includes mounting hardware, wiring harnesses, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.

JUONS SO-0010 and CIRCM QRC
As a part of Phase 2a of the JUONS (SO-0010) program, the Army integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Army and Special Operations Aircraft (SOA) platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning (ATW)/CIRCM QRC and Limited Interim Missile Warning System (LIMWS) Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system when available.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*

Fiscal Year (FY) 2021 Base Research, Development, Test, and Evaluation (RDTE) funding in the amount of $23.344 million will fund A-Kit development, integration and test activities on multi-variant platforms.

FY 2021 RDTE Overseas Contingency Operations (OCO) funding in the amount of $2.300 million will fund System Test & Evaluation (ST&E) activities and software support activities.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	33.809	46.258	36.078	-	36.078
Current President's Budget	32.025	23.179	23.321	2.300	25.621
Total Adjustments	-1.784	-23.079	-12.757	2.300	-10.457
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-23.079			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.784	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-12.757	2.300	-10.457

Change Summary Explanation

In FY 2021, Reimbursable Manpower for this line has been realigned from Reimbursable Civilian Funding to Direct Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

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
EB4: *CIRCM*	-	32.025	23.179	23.321	2.300	25.621	7.136	11.261	5.098	5.644	0.000	109.964
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Infrared Countermeasure (CIRCM) budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA), Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

The CIRCM budget line includes CIRCM (EB4) and funding to counter emerging technology as identified in Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a and the Headquarters Department of the Army (HQDA) Directed Requirement for the Common Infrared Countermeasures Quick Reaction Capability (CIRCM QRC) approved in Nov 2018.

CIRCM (EB4)
The CIRCM is the next generation lightweight, laser-based Infrared Countermeasure (IRCM) component that will interface with both the Army's Common Missile Warning System (CMWS) and future missile warning systems (MWS) to defeat current and emerging missile threats that use multispectral technology for rotary-wing, tilt-rotor and small fixed-wing aircraft across the DoD. CIRCM receives an angular bearing hand-off from the MWS, employs a pointing and tracking system which acquires the handed-over threat and tracks the incoming missile during and after motor burnout. CIRCM jams the missile by using modulated laser energy in the missile seeker band, thus degrading the tracking capability of the missile and causing it to miss the aircraft. CIRCM is utilizing Open Systems Architecture which allows flexibility with software and hardware refreshes. These tech insertions, when coupled with future threat acquisition & integration, will ensure CIRCM performance to keep pace with future threats.

The CIRCM A-Kit includes mounting hardware, wiring harnesses, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.

JUONS SO-0010 and CIRCM QRC
As a part of Phase 2a of the JUONS (SO-0010) program, the Army integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Army and Special Operations Aircraft (SOA) platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning (ATW)/CIRCM QRC and Limited Interim Missile Warning System (LIMWS) Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system when available.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

Fiscal Year (FY) 2021 Base Research, Development, Test, and Evaluation (RDTE) funding in the amount of $23.344 million will fund A-Kit development, integration and test activities on multi-variant platforms.

FY 2021 RDTE Overseas Contingency Operations (OCO) funding in the amount of $2.300 million will fund System Test & Evaluation (ST&E) activities and software support activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: CIRCM Product Development ***Description:*** CIRCM product development, support costs, & management services ***FY 2020 Plans:*** FY 2020 base funding supported continuing development and integration activities. ***FY 2021 Base Plans:*** FY 2021 Base funding supports continuing A-Kit development and integration activities for multi-variant platforms. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to the completion of A-Kit development for the lead platform (UH-60M).	9.109	10.164	15.938	-	15.938
Title: CIRCM Test & Evaluation (T&E) ***Description:*** CIRCM Test & Evaluation (T&E) activities ***FY 2020 Plans:*** RDT&E funding supported the completion of post Milestone C Initial Operational Test & Evaluation (IOT&E), and Threat & Vulnerability Analysis. ***FY 2021 Base Plans:*** FY 2021 RDTE funding supports A-Kit Integration testing and Threat & Vulnerability Analysis. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to testing requirements reduction.	20.246	10.093	7.383	-	7.383
Title: Phase 3 CIRCM QRC OCO ***Description:*** Phase 3 CIRCM QRC SEPM, Software Modeling and Simulation	2.670	1.869	0.000	2.300	2.300

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: Continued development and testing for CIRCM QRC to maximize the Army fleet protection and meet operational requirements. ***FY 2021 Base Plans:*** N/A - OCO funding only ***FY 2021 OCO Plans:*** FY 2021 RDTE OCO funding in the amount of $2.300 million will fund Phase 3 CIRCM QRC SEPM, Software Modeling and Simulation activities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to CIRCM QRC moving towards completion of development.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	1.053	-	-	-
Accomplishments/Planned Programs Subtotals	32.025	23.179	23.321	2.300	25.621

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• AZ3537: *Common Infrared Countermeasures (CIRCM)*	60.899	178.094	237.467	32.400	269.867	215.527	252.517	332.386	276.456	0.000	1,585.746

Remarks

D. Acquisition Strategy

The December 28, 2011, Defense Acquisition Executive (DAE) Acquisition Decision Memorandum (ADM) authorized entry into the Technology Maturation and Risk Reduction (TMRR) phase, designated the program a pre-Major Defense Acquisition Program (MDAP), and approved the updated exit criteria. The August 25, 2015, DAE ADM authorized entry into the Engineering and Manufacturing Development (EMD) phase and designated the program as a MDAP. The EMD contract was

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

awarded to Northrop Grumman Systems Corporation (NGSC) on August 28, 2015. The EMD contract includes priced options for Other Platform A-Kit Development, A-Kit Engineering Support, Low Rate Initial Production (LRIP) 1 and 2 Prototypes (Hardware and Installs), LRIP 1 and 2 Engineering and Test Support, Software Technical Data Package (TDP), Navy funded requirements, and Defense Exportability Features (DEF). CIRCM MS C was approved September 14, 2018, the LRIP and Engineering Support options were exercised and the program entered the Production & Deployment phase with First Unit Equipped (FUE) planned for third quarter of FY 2020, and a Full Rate Production Decision Review (FRPDR) planned for the third quarter of FY 2020.

Due to the urgency of addressing the Size, Weight, Power, and Cooling (SWaP-C) issues related to the Phase 2a JUONS SO-0010 DoN LAIRCM initial materiel solution, the Army approved a Directed Requirement for the Phase 3 ATW/CIRCM QRC (requirement updated in November 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army will no longer acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded Common Missile Warning System (CMWS) in preparation for transition to the Limited Interim Missile Warning System (LIMWS) system when available.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Program Management	Various	Various : -	26.511	3.074	Oct 2018	2.178	Oct 2019	2.318	Nov 2020	-		2.318	Continuing	Continuing	Continuing
CIRCM QRC System Engineering & Program Management	Various	Various : -	3.223	-		-		0.000		1.200	Oct 2020	1.200	Continuing	Continuing	Continuing
NDAA SEC 825 MDAP Cost Overrun	TBD	Various : -	-	0.020		-		-		-		-	0.000	0.020	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.053		-		-		-	0.000	1.053	-
		Subtotal	29.734	3.094		3.231		2.318		1.200		3.518	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-recurring Engineering (NRE) - Multi Platform A-Kit Development & Integration	C/CPFF	Various : -	78.402	3.604	Jun 2019	5.078	Jun 2020	7.050	Jun 2021	-		7.050	Continuing	Continuing	Continuing
Prototyping (A-Kit)	C/FPIF	Various : -	35.327	-		0.350		3.255		-		3.255	Continuing	Continuing	Continuing
Other - Threat Management	Various	Various : -	30.855	-		3.728		5.633		-		5.633	Continuing	Continuing	Continuing
Data - Logistics Support	Various	Various : -	1.005	-		0.804		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC NRE	C/CPFF	Various : -	6.511	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Prototyping	C/CPFF	Various : -	2.120	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC A-Kit Development & Integration	Various	Various : -	27.775	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Software Modeling & Simulation	Various	Various : Various	-	-		-		0.000		1.100		1.100	Continuing	Continuing	Continuing
		Subtotal	181.995	3.604		9.960		15.938		1.100		17.038	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Equipment	Various	Various : -	5.563	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	5.563	-		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Test and Evaluation	Various	Various : -	118.489	22.657	Apr 2019	9.988	Apr 2020	5.065	Apr 2021	-		5.065	Continuing	Continuing	Continuing
Other Testing - Test Support	Various	Various : -	35.647	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Government Integration, System Test & Evaluation	Various	Various : -	16.812	2.670		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	170.948	25.327		9.988		5.065		-		5.065	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	388.240	32.025		23.179		23.321		2.300		25.621	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

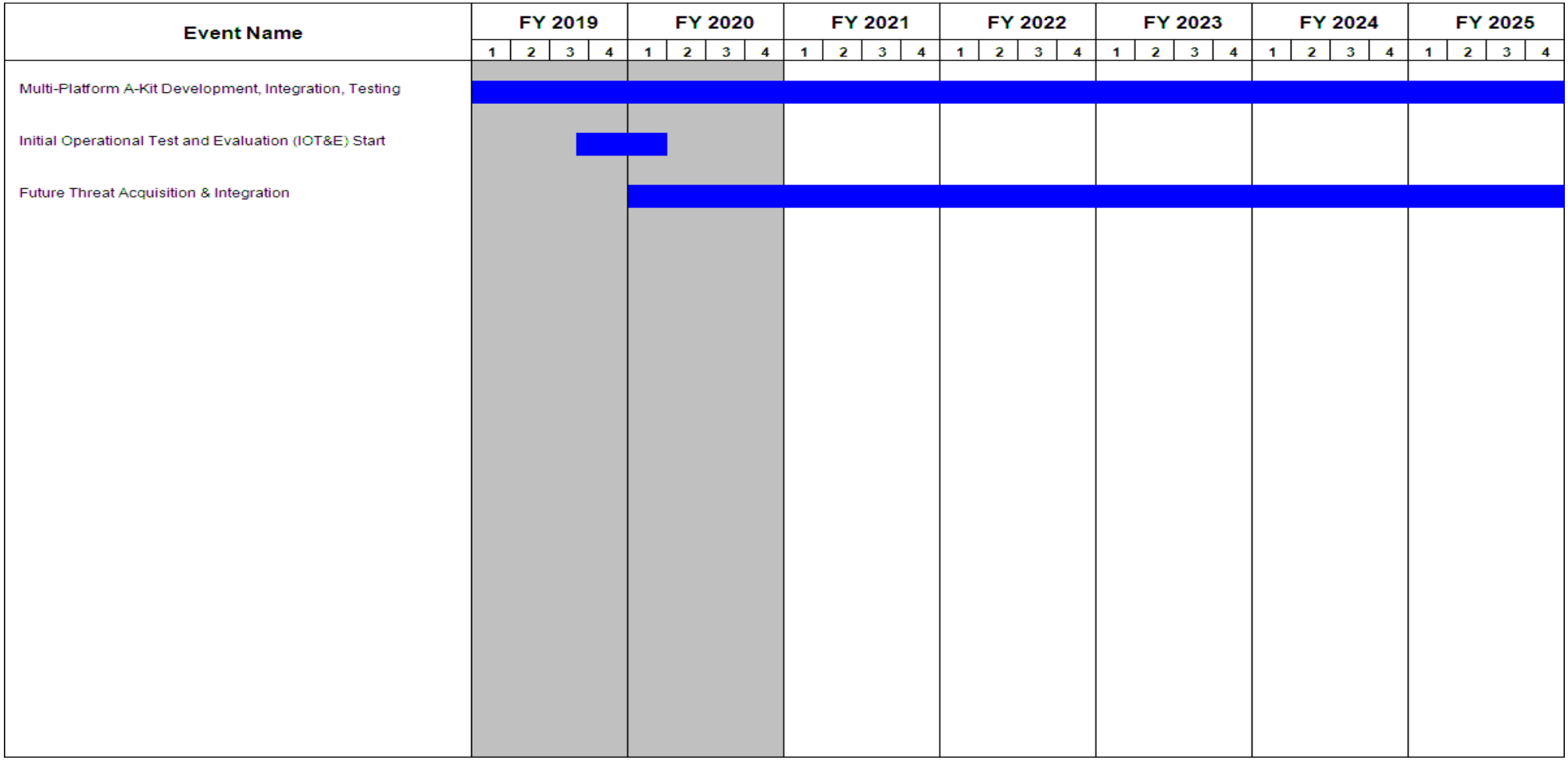

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Multi-Platform A-Kit Development, Integration, Testing	1	2015	4	2029
Engineering & Manufacturing Development (EMD) Phase	4	2015	4	2018
Developmental Test Activity	1	2016	4	2018
Prototyping	1	2016	1	2018
Reliability Demonstration Test (RDT)	2	2018	4	2018
Initial Operational Test and Evaluation (IOT&E) Start	3	2019	1	2020
Future Threat Acquisition & Integration	1	2020	4	2029

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605036A *I Combating Weapons of Mass Destruction (CWMD)*

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	-	10.883	10.000	0.000	-	0.000	0.000	0.000	0.000	7.993	0.000	28.876
EQ5: *Combating Weapons of Mass Destruction (CWMD)*	-	10.883	10.000	0.000	-	0.000	0.000	0.000	0.000	7.993	0.000	28.876

A. Mission Description and Budget Item Justification

The Man-Portable Radiological Detection System (MRDS) capability will provide increased radiological and nuclear (RN) detection, localization, presumptive identification and field-confirmatory identification capabilities that are networked to provide situational awareness at the tactical level. The MRDS will support Countering Weapons of Mass Destruction (CWMD) Interdiction and Elimination operations, specifically RN Sensitive Site Assessments and Sensitive Site Exploitation. The MRDS program will replace low density legacy COTS equipment while providing new equipment to much of the Chemical Biological RN (CBRN) force. The Joint Personal Dosimeter (JPD-I) is intended to replace Army's legacy dosimeters (Army's PDR-75A reader with the DT-236 watch). The JPD-I will provide a sensor to record and retrieve a Service member's radiation exposure from occupational to tactical levels. Future capability may also support Reconnaissance and Surveillance across the full range of CWMD operations. This capability supports Radiological and Nuclear Interdiction (RNI) and Weapons of Mass Destruction - Elimination (WMD-E) operations to: systematically locate, secure, characterize, and disable WMD programs and related capabilities.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	11.297	10.000	0.000	-	0.000
Current President's Budget	10.883	10.000	0.000	-	0.000
Total Adjustments	-0.414	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.414	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

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
EQ5: *Combating Weapons of Mass Destruction (CWMD)*	-	10.883	10.000	0.000	-	0.000	0.000	0.000	0.000	7.993	0.000	28.876
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program transitioned to the Production and Deployment stage in FY19.

A. Mission Description and Budget Item Justification

The Man-Portable Radiological Detection System (MRDS) capability will provide increased radiological and nuclear (RN) detection, localization, presumptive identification and field-confirmatory identification capabilities that are networked to provide situational awareness at the tactical level. The MRDS will support Countering Weapons of Mass Destruction (CWMD) Interdiction and Elimination operations, specifically RN Sensitive Site Assessments and Sensitive Site Exploitation. The MRDS program will replace low density legacy COTS equipment while providing new equipment to much of the Chemical Biological RN (CBRN) force. The Joint Personal Dosimeter (JPD-I) is intended to replace Army's legacy dosimeters (Army's PDR-75A reader with the DT-236 watch). The JPD-I will provide a sensor to record and retrieve a Service member's radiation exposure from occupational to tactical levels. This capability supports Radiological and Nuclear Interdiction (RNI) and Weapons of Mass Destruction - Elimination (WMD-E) operations to: systematically locate, secure, characterize, and disable WMD programs and related capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Program Management - MRDS ***Description:*** Provide Program Management ***FY 2020 Plans:*** Continue Government program management and Integrated Product Team support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Developmental funding end in FY 2020	2.496	2.700	-
Title: Test & Evaluation Planning - MRDS ***Description:*** Provides test & evaluation support (ATEC/OTC). ***FY 2020 Plans:*** Prepare Initial Operational Test & Evaluation (IOT&E) planning and review/approve detail test plans. ***FY 2020 to FY 2021 Increase/Decrease Statement:***	0.398	0.419	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Developmental funding end in FY 2020			
Title: System Engineering - MRDS ***Description:*** Provide system engineering support to the MRDS program. ***FY 2020 Plans:*** Provide system engineering support to the MRDS program ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Developmental funding end in FY 2020	0.451	0.657	-
Title: Cybersecurity/Integration - MRDS ***Description:*** Provides cybersecurity thru integration of COTS. ***FY 2020 Plans:*** Conduct updates to the software to address findings in validation test and conduct re-test as needed. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Developmental funding end in FY 2020	0.563	1.813	-
Title: Acquisition Logistics - MRDS ***Description:*** Provides Acquisition Logistics support to the MRDS program. ***FY 2020 Plans:*** Finalize work on Army training and technical manuals. Use final products in testing and update material. Complete Log Maintenance Demo (LMD). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Developmental funding end in FY 2020	0.390	0.500	-
Title: Analytical Support - MRDS ***Description:*** Provide analytical and technical support to the MRDS program. ***FY 2020 Plans:*** Provide IOT&E analytical support to the test by multiple vendors ***FY 2020 to FY 2021 Increase/Decrease Statement:***	0.243	0.536	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Developmental funding end in FY 2020			
Title: Procure LRIP Prototypes -MRDS ***Description:*** Procure Production representative MRDS LRIP Test systems	2.233	-	-
Title: Test Execution - MRDS ***Description:*** Operational Test and Evaluation of the MRDS Capability. ***FY 2020 Plans:*** Conduct Initial Operational Test & Evaluation (IOT&E) of the system ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Developmental funding end in FY 2020	3.109	3.375	-
Title: Program Management JPD - I	0.360	-	-
Title: Test & Evaluation Planning JPD- I ***Description:*** Conduct Operational Testing	0.640	-	-
Accomplishments/Planned Programs Subtotals	10.883	10.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Man-portable Radiological Detection System is a single step acquisition strategy starting at Milestone C to acquire Commercial-Off-The-Shelf equipment sets consisting of a Hands-Free search device, a Hand-Held Radioisotope Identification Device, an integrated tactical radio network, and a Situational Awareness tool in order to provide specialized Army units with a net-ready, rugged, and reliable system that can detect, identify, and characterize designated radionuclides and transmit that information securely to tactical, operational, and strategic command levels in near-real time. The contract approach will be a full and open fixed price contract for LRIP systems to support post Milestone C testing, and an indefinite delivery indefinite quantity fixed price contract for the full rate production task order. The level of technological maturity is such that MRDS entered the acquisition cycle from MDD at MS C (FY 2018). The program is working toward a Full Rate Production Decision in 4th Qtr of FY 2020 concurrent with a Full Rate Production Contract Award.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

The Joint Personal Dosimeter - Individual (JPD-I) Program Office (PO) will leverage the Navy's market research, testing and down select to meet the Army's requirements. The level of technological maturity is such that JPD-I entered the acquisition cycle from MDD at MS C (FY 2018). A Full Rate Production Decision in 1st Qtr of FY 2019 was made concurrent with a Full Rate Production Contract Award.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	Various : Various	2.496	2.570	Dec 2018	2.700	Dec 2019	-		-		-	0.000	7.766	-
Acquisition Document Development	Allot	Various : Various	0.180	-		-		-		-		-	0.000	0.180	-
		Subtotal	2.676	2.570		2.700		-		-		-	0.000	7.946	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Award	C/FFP	TBD : TBD	2.573	2.233	Feb 2019	-		-		-		-	0.000	4.806	-
		Subtotal	2.573	2.233		-		-		-		-	0.000	4.806	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity	MIPR	Edgewood Chemical and Biological Center : Edgewood, Maryland	0.740	0.563	Jan 2019	1.813	Jan 2020	-		-		-	0.000	3.116	-
Acquisition Logistics	MIPR	Communications-Electronics Command : Aberdeen Proving Ground, MD	0.674	0.390	Jan 2019	0.500	Jan 2020	-		-		-	0.000	1.564	-
Analytical Support	MIPR	Various : Various	0.470	0.243	Jan 2019	0.536	Jan 2020	-		-		-	0.000	1.249	-
Systems Engineering	MIPR	Edgewood Chemical and Biological Center : Aberdeen Proving Ground, MD	0.907	0.451	Jan 2019	0.657	Jan 2020	-		-		-	0.000	2.015	-
		Subtotal	2.791	1.647		3.506		-		-		-	0.000	7.944	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T&E	MIPR	ATEC : Aberdeen Proving Ground, MD	0.368	1.038	Dec 2018	0.419	Dec 2019	-		-		-	0.000	1.825	-
Component testing	MIPR	Various : Various	0.250	3.395	Feb 2019	3.375	Feb 2020	-		-		-	0.000	7.020	-
		Subtotal	0.618	4.433		3.794		-		-		-	0.000	8.845	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.658	10.883		10.000		-		-		-	0.000	29.541	N/A

Remarks

FY 2019 Budget control is in correct. JPEO-CBRND received a total of $10.883M in PE 6605036A. $6M for the JPDI & MRDS ATP requirement. $4.883M for the base program MRDS.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

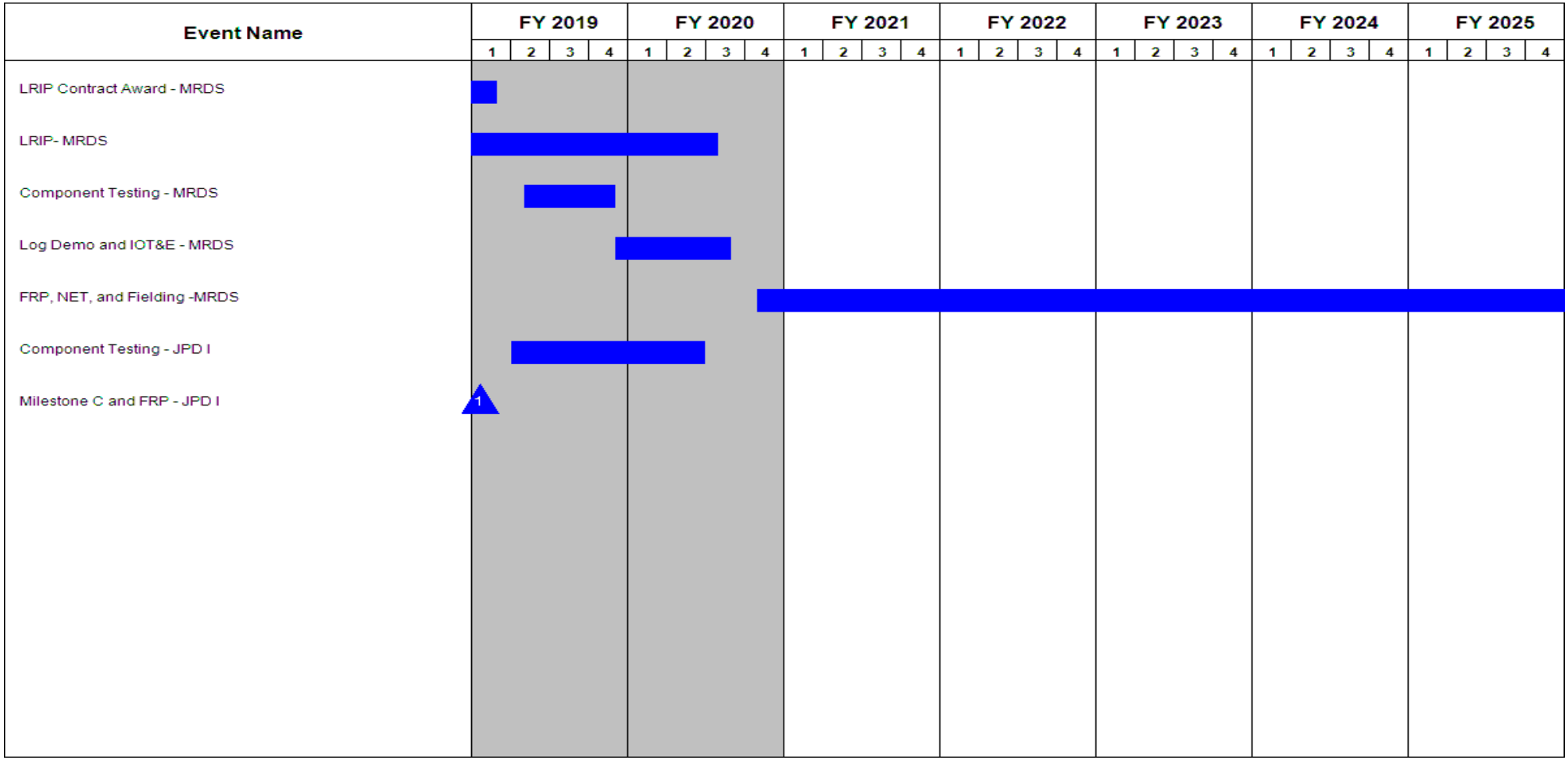

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Documentation Development - MRDS	1	2017	2	2018
Developmental Testing - MRDS	3	2017	4	2017
Milestone C - MRDS	2	2018	2	2018
LRIP Contract Award - MRDS	4	2018	1	2019
LRIP- MRDS	4	2018	3	2020
Component Testing - MRDS	2	2019	4	2019
Log Demo and IOT&E - MRDS	4	2019	3	2020
FRP, NET, and Fielding -MRDS	4	2020	4	2026
LRIP Contract Award - JPD I	2	2018	2	2018
Component Testing - JPD I	2	2019	2	2020
Milestone C and FRP - JPD I	1	2019	1	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605038A *I Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*

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	-	14.517	6.054	4.846	-	4.846	8.342	0.000	0.000	0.000	0.000	33.759
EQ7: *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	-	14.517	6.054	4.846	-	4.846	8.342	0.000	0.000	0.000	0.000	33.759

A. Mission Description and Budget Item Justification

The Nuclear, Biological, and Chemical Reconnaissance Vehicles (NBCRV) Sensor Suite Upgrade (SSU) provides maneuver formations the ability to conduct mounted reconnaissance and surveillance missions of CBRN named areas of interest (NAIs). The NBCRV SSU will answer the commander's priority intelligence requirements (PIR), and facilitate proactive risk-based decisions to ensure freedom of action and survivability. A modern and capable NBCRV SSU is a critical component for Joint Force success when operating in the complex CBRN environment. Operating with combat vehicles fighting against increasingly capable and determined enemies requires like capability with regard to protection, mobility, and lethality. The NBCRV SSU will accomplish this by integrating the capability for command and control of unmanned systems with CBRN payload. The NBCRV SSU will provide a CBRN detection, tipping and queueing to accomplish desired standoff distances to keep the warfighter out of harm's way and reduce sustainment costs over the current system. A Chemical Surface Detector (CSD) will be developed to replace the Dual Wheel Sampling System to increase maneuver speed when conducting NBC missions and increase reliability.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	15.135	6.054	0.000	-	0.000
Current President's Budget	14.517	6.054	4.846	-	4.846
Total Adjustments	-0.618	0.000	4.846	-	4.846
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.618	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.846	-	4.846

Change Summary Explanation

FY 2021 Base dollars in the amount of $4.846 million supports the development of Nuclear, Biological, and Chemical Reconnaissance Vehicles Sensor Suite Upgrade (NBCRV SSU) with the Chemical Surface Detector (CSD), Improved Mobile Chemical Agent Detector (iMCAD), Joint Chemical Agent Detector (JCAD), standoff bio-sensor detection system, standoff radiation detection system, Unmanned Aerial System (UAS) carrying Chemical, Biological, Radiological and Nuclear sensors while integrated onto the Stryker NBCRV platform and large unmanned ground vehicle. The development of the NBCRV SSU extended into FY 2021 causing a change from PB20 to PB 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	Project (Number/Name) EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	

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
EQ7: *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	-	14.517	6.054	4.846	-	4.846	8.342	0.000	0.000	0.000	0.000	33.759
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Nuclear, Biological, and Chemical Reconnaissance Vehicles (NBCRV) Sensor Suite Upgrade (SSU) provides maneuver formations the ability to conduct mounted reconnaissance and surveillance missions of CBRN named areas of interest (NAIs). The NBCRV SSU will answer the commander's priority intelligence requirements (PIR), and facilitate proactive risk-based decisions to ensure freedom of action and survivability. A modern and capable NBCRV SSU is a critical component for Joint Force success when operating in the complex CBRN environment. Operating with combat vehicles fighting against increasingly capable and determined enemies requires like capability with regard to protection, mobility, and lethality. The NBCRV SSU will accomplish this by integrating the capability for command and control of unmanned systems with CBRN payload. The NBCRV SSU will provide a CBRN detection, tipping and queueing to accomplish desired standoff distances to keep the warfighter out of harm's way and reduce sustainment costs over the current system. A Chemical Surface Detector (CSD) will be developed to replace the Dual Wheel Sampling System to increase maneuver speed when conducting NBC missions and increase reliability. In FY 2020, NBCRV SSU program will develop a prototype of integrated sensors for demonstration in Joint Warfighter Assessment 2020. In FY 2021, NBCRV SSU program will develop hardened and integrated sensors for development test in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Product Development and Unmanned Platform Integration	14.269	5.254	4.341
Description: Development of CSD, radiological detectors, standoff chemical vapor detector, unmanned platform identification and integration, Government strategic planning, system engineering, logistics, training, and Integrated Product Team (IPT) support.			
FY 2020 Plans: Continued CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continued government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, and the bulk of integration product development for the acceleration of the program.			
FY 2021 Plans: Continue CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continue government strategic planning, systems engineering, logistics, training, test and evaluation, and technical support for the accelerated program.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Funding decreases due to program transitioning to production in FY 2022.			
Title: Program Management and Oversight ***Description:*** Program Management and Oversight ***FY 2020 Plans:*** Continue Government program management, system engineering, and Integrated Product Team (IPT) support. ***FY 2021 Plans:*** Continue Government program management, system engineering, and Integrated Product Team (IPT) support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreases due to program transitioning to production in FY 2022.	0.248	0.800	0.505
Accomplishments/Planned Programs Subtotals	14.517	6.054	4.846

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) is an upgrade for the Stryker NBCRV. The acquisition strategy for the Stryker NBCRV SSU is to integrate mature sensors into the Stryker NBCRV in FY 2019 for demonstration in Joint Warfighting Assessment (JWA) 19 and system level testing. Following the testing and demonstration, the hardware and software will be fixed and updated for demonstration in JWA 20 and test in FY 2020. An In Progress Review will be held in late FY 2022 to execute a Modification Work Order for fielding in FY 2023. This schedule was accelerated from the previous schedule based on the maturity of the sensor and guidance from the Chief of Staff of the Army. The NBCRV SSU program will conduct system level testing in FY 2021 using Defense Wide funding after the Modification Work Order In Process Review to ensure system performance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Personnel	MIPR	JPEO-CBRND : Edgewood, MD	1.738	0.248	Nov 2018	0.800	Nov 2019	0.505	Nov 2020	-		0.505	Continuing	Continuing	Continuing
		Subtotal	1.738	0.248		0.800		0.505		-		0.505	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development and Sensor Integration	C/Various	Various : Various	-	12.094	Nov 2018	4.754	Nov 2019	4.341	Nov 2020	-		4.341	Continuing	Continuing	Continuing
Product Development (CSD) AGENTASE, LLC (TMRR)	Option/ CPFF	AGENTASE, LLC : Elkridge, MD	2.552	0.393	Oct 2018	-		-		-		-	0.000	2.945	-
Product Development (CSD) L3 (TMRR)	Option/ CPFF	L-3 Communications Sonoma EO, Inc : Santa Rosa,, CA	2.627	-		-		-		-		-	0.000	2.627	-
Product Development (CSD) UTC (TMRR)	Option/ CPFF	Hamilton Sundstand Space Systems : Pomona, CA	2.087	-		-		-		-		-	0.000	2.087	-
Product Development (CSD) Rad/Nuc (M2PRDS)	C/CPFF	Advanced Technologies International : Summerville, SC	1.942	-		-		-		-		-	0.000	1.942	-
Product Development (ECBC Matrix)	MIPR	ECBC : Aberdeen Proving Ground	2.259	-		0.500	Oct 2019	-		-		-	0.000	2.759	-
Product Development Unmanned Platform Development and Integration	MIPR	Various : Various	0.645	-		-		-		-		-	0.000	0.645	-
		Subtotal	12.112	12.487		5.254		4.341		-		4.341	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	MIPR	ECBC : Edgewood, MD	-	1.301	Jan 2019	-		-		-		-	Continuing	Continuing	Continuing
Requirements Development Support	Various	Various : Various	0.531	0.098	Jan 2019	-		-		-		-	0.000	0.629	-
		Subtotal	0.531	1.399		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	ECBC : Edgewood, MD	1.100	0.383	May 2019	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	1.100	0.383		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.481	14.517		6.054		4.846		-		4.846	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

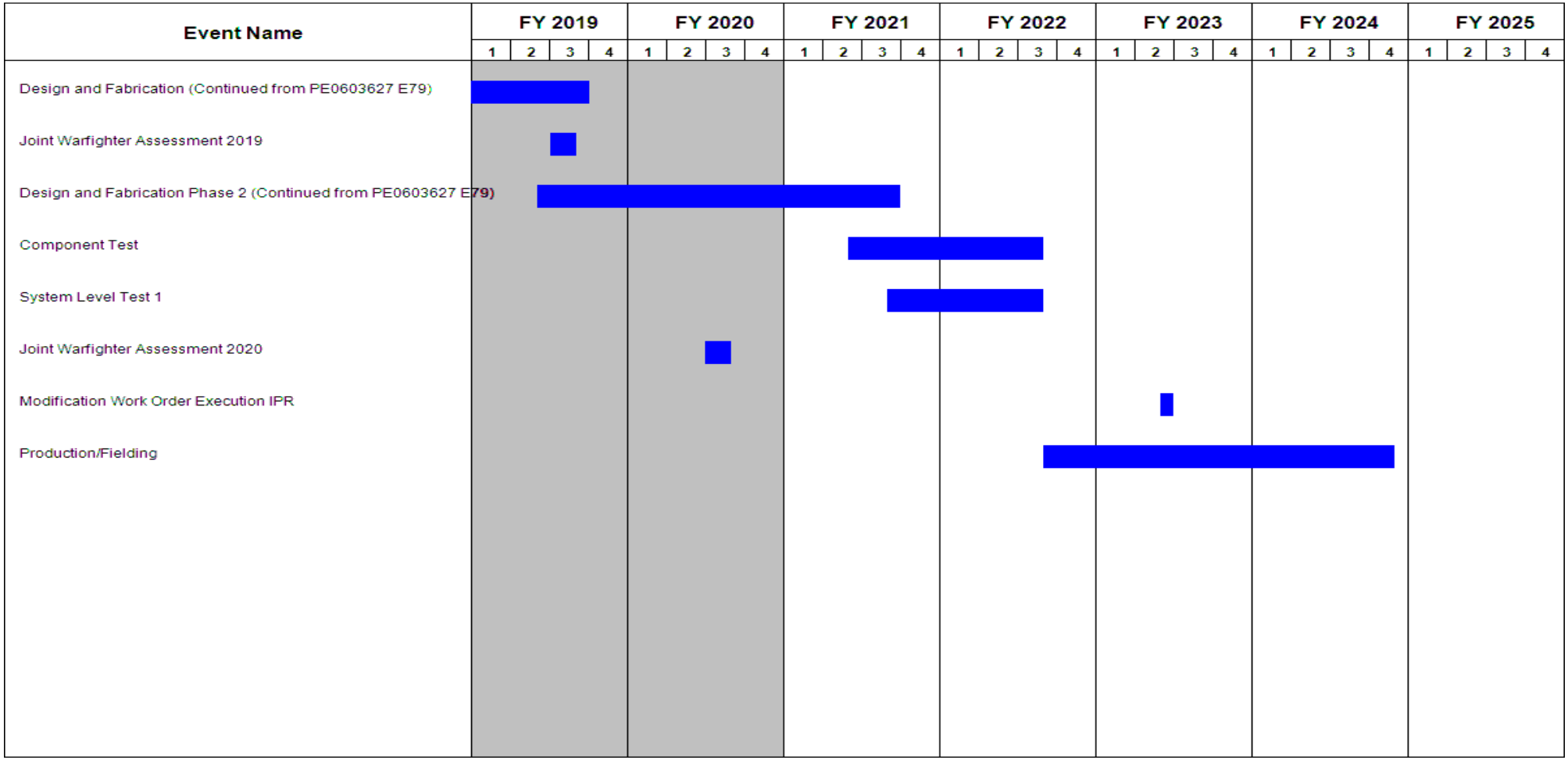

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Design and Fabrication (Continued from PE0603627 E79)	2	2017	3	2019
Joint Warfighter Assessment 2019	3	2019	3	2019
Design and Fabrication Phase 2 (Continued from PE0603627 E79)	2	2019	3	2021
Component Test	2	2021	3	2022
System Level Test 1	3	2021	3	2022
Joint Warfighter Assessment 2020	3	2020	3	2020
Modification Work Order Execution IPR	2	2023	2	2023
Production/Fielding	3	2022	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool 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	-	33.796	50.662	28.544	-	28.544	5.198	5.353	5.475	5.608	0.000	134.636
CY5: *CYBER Situational Understanding*	-	0.000	20.183	23.892	-	23.892	0.000	0.000	0.000	0.000	0.000	44.075
EV5: *Defensive CYBER Operations*	-	33.796	30.479	4.652	-	4.652	5.198	5.353	5.475	5.608	0.000	90.561

Note

Defensive Cyber Operations (DCO) programs were selected as a candidate for the BA8 Software RDT&E Appropriation Pilot Program in FY 2021. These efforts have been transferred to PE 0608041A beginning in FY 2021. Cyber Situational Understanding (SU), DCO Development Environment (DCODE) (formerly Forge), and non-software Army Cyber Command (ARCYBER) Rapid Cyber Prototyping are not part of the Software Pilot and remain within this budget line item.

A. Mission Description and Budget Item Justification

Defensive Cyber Operations (DCO) and Cyber Situational Understanding (SU) supports the Army Network Modernization Strategy Line of Effort (LOE) Key Enabler for Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy. The DCO budget line includes funding for Program Executive Office Command Control and Communications - Tactical (PEO C3T) Cyber SU and Tactical DCO Infrastructure (TDI); Program Executive Office Enterprise Information Systems (PEO EIS) Defensive Cyber Operations; and Army Cyber Command (ARCYBER) Rapid Cyber Prototyping.

Platforms/Levels:
* DCO - Tactical DCO Infrastructure (TDI) // (FY21 funds transferred to the Pilot program) // (PEO C3T)
* DCO - Cyberspace Analytics // (FY21 funds transferred to the Pilot program) // (PEO EIS)

Defensive Cyber Tools and Analytics:
* DCO - Mission Planning // (FY21 funds transferred to the Pilot program) // (PEO EIS)
* DCO - User Activity Monitoring // (FY21 funds transferred to the Pilot program) // (PEO EIS)
* DCO - DCO Development Environment (formerly Forge) (PEO EIS)
* DCO - Rapid Cyber Prototyping (ARCYBER)

655041CY5:
- Cyber SU provides tactical commanders at Brigade to Army Service Component Command (ASCC) with a broad understanding of Cyber Electromagnetic Activity (CEMA) threats by informing the commander of any cyber related impacts to physical domains, unified land operations, and the overall mission. Cyber SU allows for the visualization and understanding of physical (geographical), logical (at a specific network internet protocol), and cyber persona layers (bad actors, from individuals to nation states) of cyberspace. This is based on data/information from multiple sources and sensors that produce a CEMA overlay on the commander's Common

Operational Picture (COP) within the Command Post Computing Environment (CPCE). Supporting CEMA, Cyber SU synchronizes and integrates blue (friendly) cyberspace data, red (enemy), and grey (commercial/private sector), and enables collaboration at the tactical echelon. (PEO C3T)

655041EV5:
- Tactical DCO Infrastructure (TDI) is a software-only program, which consists of pre-configured DCO tools residing on the Tactical Server Infrastructure (TSI). The TDI capability will reside within the Command Post at echelon Corps through Brigade for both organic Cyber Network Defenders as well as remote access by Cyber Protection teams (CPT) to support defense of the Tactical Network. (PEO C3T)

- Defensive Cyber Operations (DCO) consists of platform and software programs which are key elements of the DCO Maneuver Baseline infrastructure, platform, and tools. The employment of defensive capabilities creates specific effects in cyberspace through actions that allow commanders to achieve the following objectives: deter, destroy, and defeat enemy offensive cyberspace operations; gain time; economy of force; control key terrain; protect tasked critical assets and infrastructure; and develop intelligence. DCO supports the Army Cyber Command (ARCYBER), Army Cyberspace Operations and Integration Center (ACOIC), (5) Regional Cyber Centers (RCCs), Cyber Warfare Battalion (CWB), Multi-Domain Task Force (MDTF), Cyber Protection Brigade (CPB), and (41) Cyber Protection Teams (CPTs) in COMPO 1/2/3. (PEO EIS)

- ARCYBER Rapid Cyber Prototyping provides capabilities that can quickly respond to emerging cyber threats and keep up with threat technology. ARCYBER identifies potential development and prototyping efforts via Cyber Needs Forms (CNFs) based on operational feedback, changes in tactics techniques and procedures (TTPs), and trends of adversarial activity. These are separate and distinct from DCO programs identified and are used to rapidly address a network threat/vulnerability. (ARCYBER)

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	33.796	62.262	29.738	-	29.738
Current President's Budget	33.796	50.662	28.544	-	28.544
Total Adjustments	0.000	-11.600	-1.194	-	-1.194
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-11.600			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.194	-	-1.194

Change Summary Explanation

EV5 FY20 Base funding in the amount of $11.600 million was Congressional marks for Restoring Acquisition Accountability (Contract Delays) and Improving Funds Management: Excess Growth

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605041A *I Defensive CYBER Tool Development*

CY5 FY21 Base funding in the amount of $23.892 million was aligned for Cyber SU.
EV5 FY21 Base funding in the amount of $1.194 million was reduced due to Army priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*	Project (Number/Name) CY5 / *CYBER Situational Understanding*	

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
CY5: *CYBER Situational Understanding*	-	0.000	20.183	23.892	-	23.892	0.000	0.000	0.000	0.000	0.000	44.075
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Defensive Cyber Operations (DCO) programs were selected as a candidate for the BA8 Software RDT&E Appropriation Pilot Program in FY21. These efforts are a continuation and transferred to PE 0608041A. Cyber Situational Understanding (SU) is not part of the Software Pilot and remain within this budget line item.

A. Mission Description and Budget Item Justification

Cyber Situational Understanding (SU) funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy. This funding will be executed by Program Executive Office Command Control and Communications - Tactical (PEO C3T).

655041CY5:

Cyber SU is a software-only program hosted on the Tactical Server Infrastructure (TSI) at Brigade to ASCC echelons continually integrating Commercial-Off-The-Shelf (COTS)/Non-Developmental Item (NDI) capabilities into the Common Operating Environment (COE) to produce a Cyber Electromagnetic Activity (CEMA) overlay on the commander's Common Operational Picture (COP) within the Command Post Computing Environment (CPCE). Cyber SU enables the commander and staff to concurrently defend the network/information systems, identify and target cyberspace threats, manage risks and aid in increasing operational success.

Cyber SU will allow the tactical commander to see themselves, see their battlespace and understand their battlespace; this will be accomplished with three capability drops. Cyber SU provides the visualization and understanding of physical (geographical), logical (at a specific network internet protocol), and cyber persona layers (bad actors, from individuals to nation states) of tactical cyberspace data. Cyber SU ingests existing data sources, synchronizing and integrating blue (signal, cyberspace (DCO), electronic warfare and mission command data), red (intelligence data), and grey (commercial/private sector data) and enables collaboration at the tactical edge. Cyber SU provides tactical commanders with a thorough understanding of CEMA threats by informing the commander of any cyber related impacts to physical domains, unified land operations, and the overall mission.

Cyber SU FY 2021 funding will support continued prototyping, engineering, testing, training development and program management to establish the Cyber SU initial capability in support of First Unit Equipped (FUE) 1Q22. The initial COTS/NDI system will be integrated into CPCE, and will ingest, correlate, analyze and display cyberspace data to include network health and status into useful and actionable warfighter information that can be shared with the CEMA Work Group.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Development Engineering	-	15.148	17.273

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Cyber SU requirements will be defined at the lowest level and synchronized with multiple Program of Record (PoRs) that will feed data to inform COTS/ NDI product evaluation and integration. ***FY 2020 Plans:*** FY 2020 funding will develop the necessary systems engineering/architecture products, middleware and back-end services required to establish an integration environment. In addition, FY 2020 funds will support software procurement and prototyping of candidate GOTS/COTS products to establish an initial Cyber SU capability to achieve Limited Deployment in FY 2020. Program Executive Office Command, Control and Communications-Tactical (PEO C3T) will execute these funds. ***FY 2021 Plans:*** FY21 funding supports the completion of development, prototyping and testing of systems engineering/architecture products, middleware and back-end services required to establish of the initial Cyber SU capability. In addition, FY21 funds support incorporation of Cyber effects of the Command Post Computing Environment (CPCE) applications and critical warfighting functionality into the Cyber SU framework in order to achieve FUE in 1Q22. PEO C3T will execute these funds. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase allows for incorporation of additional Cyber effects of CPCE applications into the Cyber SU framework as well as the addition of test hardware.			
Title: Systems Test and Evaluation ***Description:*** T&E efforts include the planning and execution of T&E events including Developmental Test, Interoperability Testing, Software Acceptance Testing, Integration Events, Risk Reduction Events, and Initial User Test and Evaluation. ***FY 2020 Plans:*** FY 2020 funding will provide developmental testing and initial operational test support in preparation for a limited deployment in FY 2020. PEO C3T will execute these funds. ***FY 2021 Plans:*** FY 2021 funding will allow for the completion of developmental testing (DT), user testing (UT) and user assessments (UA) for the initial Cyber SU capability, in order to gain user feedback to inform an operational assessment in 3Q21. PEO C3T will execute these funds. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Supports increased scope of DT/UT/UA events, such as DEVOPS/Risk Reduction events.	-	2.444	4.136
Title: Training	-	0.118	0.501

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: The development of training support products, including coordination with US Army Training and Doctrine Command (TRADOC) Capability Managers (TCM), US Army Cyber Command, PORs, and related organizations to develop applicable program of instruction. ***FY 2020 Plans:*** FY 2020 funding will provide the initial development for training philosophy, methods, and associated products to support a limited deployment in FY 2020. PEO C3T will execute these funds. ***FY 2021 Plans:*** FY 2021 funding provides for completion of the development and verification/validation of the New Equipment Training (NET) training support package to support FUE in 1Q22. PEO C3T will execute these funds. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase supports verification and validation of the NET support package.			
Title: Systems Engineering/Management ***Description:*** Systems Engineering/Management includes business, technical and logistical staff support and overall management of program execution, major events and reporting. ***FY 2020 Plans:*** FY 2020 funding will provide funding for program office staff (matrix and contractor) to perform duties necessary to develop, acquire/procure, have a milestone decision review and field Limited Deployment in FY 2020. PEO C3T will execute these funds. ***FY 2021 Plans:*** FY 2021 funding provides for program office staff (matrix and contractor) continued program execution support and to perform duties necessary to plan and execute activities and milestone events. PEO C3T will execute these funds. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to leveraged efficiencies in system engineering/management support across the PM Mission Command product portfolio.	-	2.473	1.982
Accomplishments/Planned Programs Subtotals	-	20.183	23.892

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

C. Other Program Funding Summary ($ in Millions)

Remarks

N/A

D. Acquisition Strategy

The Cyber SU IS ICD was approved on 9 Mar 18 by the Joint Requirements Oversight Council (JROC) and on 4 Feb 19 by the Army Requirements Oversight Council (AROC). The Requirements Definition Package (RDP) was approved on 19 Mar 19 by the AROC Requirements Board. The Cyber SU program is under an IT Box construct with a five (5) year term (FY20-24) which aligns with the current RDP.

The Program Executive Office, Command, Control and Communications-Tactical, Milestone Decision Authority (MDA), approved the Materiel Development Decision on 20 Jun 18, designating Cyber SU as an ACAT III AIS program. The program is currently scheduled for a Milestone B decision review 2Q20.

The program is employing a tailored acquisition model for Agile Software Development, under which Cyber SU will develop a series of testable, integrated subsets of capability to meet the overall full functional values of the RDP through the use of Capability Drops (CDs). Subsequent CDs are to be approved by the U.S. Army Cyber Center of Excellence in collaboration with U.S. Army Forces Command. To that end, the program office intends to evaluate and leverage COTS/NDI products to the greatest extent and leverage cyber solutions from science and technology efforts (e.g., Cyber Mission Impact Tool (CMIT), as well as ingest data from related programs (e.g, DCO, TDI, CPCE, EWPMT, UNO, DCGS-A). Prototyping and development will employ a combination of Government entities and commercial vendors via an Other Transaction Authority (OTA) contract vehicle. Coordination and integration with complimentary programs and systems (sources of cyber data feeds) will be an integral part of the program to ensure the data is made available to be consumed by the Cyber SU solution. Cyber SU will be hosted on the Tactical Server Infrastructure (TSI) and will be fielded by the CPCE/TSI program in accordance with their fielding schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*	Project (Number/Name) CY5 / *CYBER Situational Understanding*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Management	C/FFP	CACI : APG, MD	-	-		2.473		1.982		-		1.982	0.000	4.455	-
		Subtotal	-	-		2.473		1.982		-		1.982	0.000	4.455	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber SU Development/ Prototyping	C/TBD	TBD : Warren, MI	-	-		15.148		17.273		-		17.273	0.000	32.421	-
		Subtotal	-	-		15.148		17.273		-		17.273	0.000	32.421	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Development	C/TBD	TBD : TBD	-	-		0.118		0.501		-		0.501	0.000	0.619	-
		Subtotal	-	-		0.118		0.501		-		0.501	0.000	0.619	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental/ Interoperability Test	C/TBD	TBD : TBD	-	-		0.883		2.127		-		2.127	0.000	3.010	-
ATEC Support	MIPR	ATEC : APG, MD	-	-		0.731		1.821		-		1.821	0.000	2.552	-
Accreditation/Certification	C/FFP	CACI : APG, MD	-	-		0.830		0.188		-		0.188	0.000	1.018	-
		Subtotal	-	-		2.444		4.136		-		4.136	0.000	6.580	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*	Project (Number/Name) CY5 / *CYBER Situational Understanding*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		20.183		23.892		-		23.892	0.000	44.075	N/A

Remarks

Contract award dates are TBD.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

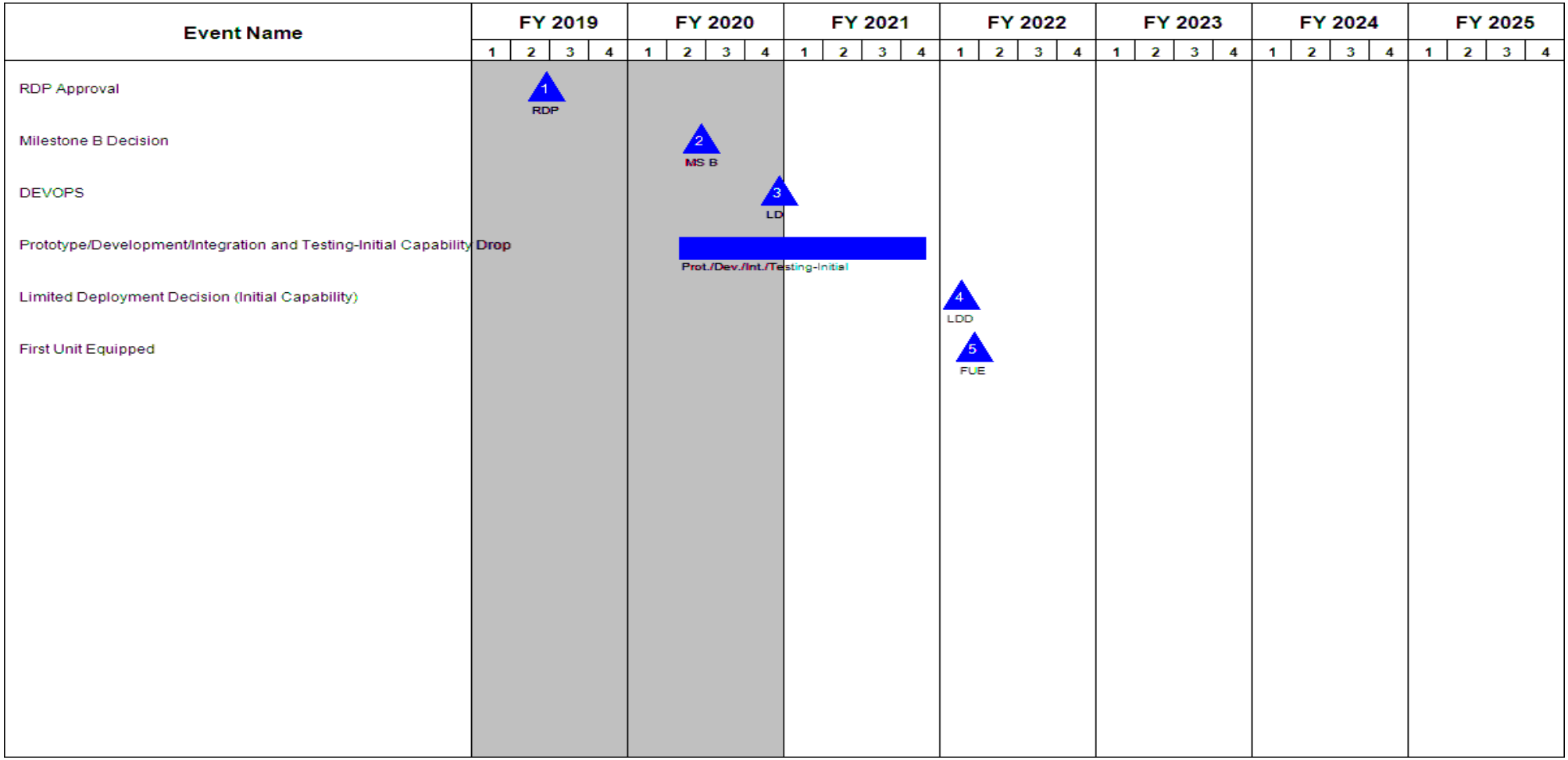

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
RDP Approval	2	2019	2	2019
Milestone B Decision	2	2020	2	2020
DEVOPS	4	2020	4	2020
Prototype/Development/Integration and Testing-Initial Capability Drop	2	2020	4	2021
Limited Deployment Decision (Initial Capability)	1	2022	1	2022
First Unit Equipped	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
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COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
EV5: *Defensive CYBER Operations*	-	33.796	30.479	4.652	-	4.652	5.198	5.353	5.475	5.608	0.000	90.561
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Defensive Cyber Operations (DCO) programs were selected as a candidate for the BA8 Software RDT&E Appropriation Pilot Program in FY 2021. These efforts have been transferred to PE 0608041A Project CD1 beginning in FY 2021. DCO Development Environment (DCODE) (formerly Forge) and non-software Army Cyber Command (ARCYBER) Rapid Cyber Prototyping are not part of the Software Pilot and remain within this budget line item.

A. Mission Description and Budget Item Justification

Defensive Cyber Operations (DCO) supports the Army Network Modernization Strategy Line of Effort (LOE) Key Enabler for the Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy. The DCO budget line includes funding for Program Executive Office Command Control and Communications - Tactical (PEO C3T) Tactical DCO Infrastructure (TDI); Program Executive Office Enterprise Information Systems (PEO EIS) Defensive Cyber Operations; and Army Cyber Command (ARCYBER) Rapid Cyber Prototyping.

Platforms/Levels:
* DCO - Tactical DCO Infrastructure (TDI) // (FY21 funds transferred to the Pilot program) // (PEO C3T)
* DCO - Cyberspace Analytics // (FY21 funds transferred to the Pilot program) // (PEO EIS)

Defensive Cyber Tools and Analytics:
* DCO - Mission Planning // (FY21 funds transferred to the Pilot program) // (PEO EIS)
* DCO - User Activity Monitoring // (FY21 funds transferred to the Pilot program) // (PEO EIS)
* DCO - DCO Development Environment (formerly Forge) (PEO EIS)
* DCO - Rapid Cyber Prototyping (ARCYBER)

655041EV5:

- Tactical DCO Infrastructure (TDI) is a software-only program, which consists of pre-configured DCO tools residing on the Tactical Server Infrastructure (TSI). The TDI capability will reside within the Command Post at echelon Corps through Brigade for both organic Cyber Network Defenders as well as remote access by Cyber Protection teams (CPT) to support defense of the Tactical Network.

- Defensive Cyber Operations (DCO) consists of platform and software programs which are key elements of the DCO Maneuver Baseline infrastructure, platform, and tools. The employment of defensive capabilities creates specific effects in cyberspace through actions that allow commanders to achieve the following objectives:

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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deter, destroy, and defeat enemy offensive cyberspace operations; gain time; economy of force; control key terrain; protect tasked critical assets and infrastructure; and develop intelligence. DCO supports the Army Cyber Command (ARCYBER), Army Cyberspace Operations and Integration Center (ACOIC), (5) Regional Cyber Centers (RCCs), Cyber Warfare Battalion (CWB), Multi-Domain Task Force (MDTF), Cyber Protection Brigade (CPB), and (41) Cyber Protection Teams (CPTs) in COMPO 1/2/3.

- ARCYBER Rapid Cyber Prototyping provides capabilities that can quickly respond to emerging cyber threats and keep up with threat technology. ARCYBER identifies potential development and prototyping efforts via Cyber Needs Forms (CNFs) based on operational feedback, changes in tactics techniques and procedures (TTPs), and trends of adversarial activity. These are separate and distinct from DCO programs identified and are used to rapidly address a network threat/vulnerability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: DCO - Tactical DCO Infrastructure (TDI) (PEO C3T)	6.339	4.794	-
Description: DCO Tactical DCO Infrastructure is a software-only program which consists of pre-configured DCO Tools on the Tactical Server Infrastructure (TSI) residing within the Command Post, at Brigade through Corps, for both organic Cyber Network Defenders as well as remote access by Cyber Protection Teams (CPTs) to support defense of the tactical network. ***FY 2020 Plans:*** FY 2020 funding will support the development engineering, integration and testing of Capability Drop 1 (CD1). CD1 will upgrade the DCO tools integrated on the TSI, expand the sensor architecture to more command post applications, thus increasing the tactical commander?s defensive cyber posture. This effort?s funding will be executed by PEO C3T. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funds transferred to the BA8 Software RDTE Appropriation Pilot Program PE 0608041A Project CD1.			
Title: DCO - Cyberspace Analytics (PEO EIS)	14.090	14.296	-
Description: DCO Cyberspace Analytics Big Data Platform (BDP) is a scalable software based capability hosted in the cloud, called Gabriel Nimbus (GN), which offers interfaces and visualization accessible by cyberspace defenders at all levels to facilitate counter-reconnaissance activities meant to discover the presence of advanced or sophisticated cyber threats and vulnerabilities. ***FY 2020 Plans:*** FY 2020 funding supports development engineering, integration, and testing of quarterly capability releases. Key priorities are the standup of Secret Internet Protocol Router Network (SIPR) and Joint Worldwide Intelligence Communications System (JWICS) enclaves, the extension of capabilities to the Regional Cyber Centers (RCC), and development of applications deployable across DCO platforms such as Big Data Platform (BDP). Key to mission success is the collection of data on our platforms and the integration with Gabriel Nimbus (GN) through the Lower Echelon Analytic Platform (LEAP) which are vital to achieve this vision. ***FY 2020 to FY 2021 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2021 funds transferred to the BA8 Software RDTE Appropriation Pilot Program PE 0608041A Project CD1.			
Title: DCO - Mission Planning (PEO EIS) ***Description:*** DCO Mission Planning (DCOMP) solution acts as the lead application integrator for the Army's Big Data Platform. It is a software application-based, scalable warfighting capability for Army DCO mission command and planning at the tactical and strategic levels. ***FY 2020 Plans:*** FY 2020 funding supports development engineering, integration, and testing of capability drops 2, 3, 4, and 5. It supports hosting efforts on Gabriel Nimbus (GN) to support Initial Operational Capability (IOC) of PhalanX use for operational use. This includes prioritizing development requirements to include integrating use with the Garrison DCO Platform (GDP) and Deployable DCO System (DDS) that are fielded. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funds transferred to the BA8 Software RDTE Appropriation Pilot Program PE 0608041A Project CD1.	8.133	2.000	-
Title: DCO - User Activity Monitoring (PEO EIS) ***Description:*** DCO User Activity Monitoring is the primary capability within the Army's overall Insider Threat program. UAM is primarily a software-based, scalable solution (some hardware in the on-premise solution) that proactively identifies and mitigates internal risks associated with the theft or misuse of critical, mission essential data. It utilizes an integrated approach with a centralized UAM cell sending data to a core Insider Threat Hub. ***FY 2020 Plans:*** FY 2020 funding supports development engineering, integration, and testing of capability drops 1 and 2. It will achieve Initial Operational Capability (IOC) by 2Q20. It provides protection against insider threat through the deployment of capability in defense of our most critical networks. Proactively identifies and mitigates internal risks associated with the theft or misuse of critical, mission essential data. Assists with the establishment of the Army's Insider Threat (InT) Protection Program that utilizes full-spectrum solutions to assess, deter, deny, defend, defeat, and evolve against the insider threat. Facilitates the ability to identify insiders threats based on policy violations, as well as the capturing of certain risk behaviors that rate the likelihood of an incident caused by a trusted insider. Integrates behavioral based analysis capability through the use of GN. The Army will implement UAM for all Soldiers, civilians, and contractors with access to JWICS and SIPRNet. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funds transferred to the BA8 Software RDTE Appropriation Pilot Program PE 0608041A Project CD1.	-	1.434	-
Title: DCO - Threat Emulation (PEO EIS)	0.761	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: DCO Threat Emulation capability is a software based suite of tools used to gain access to evaluated networks and through multi-vectors of unknown, partially known, or known access methods. Threat Emulation will enable the implementation of real world threat tactics techniques and procedures (TTPs) against risk areas such as web services, endpoints, passwords and identities, phishing and social engineering, mobile devices, and wired/wireless network systems in order to reveal critical security exposures.			
Title: DCO - Development Environment (formerly Forge) (PEO EIS) ***Description:*** DCO Development Environment (DCODE) (formerly Forge) is a world class facility that provides continual integration, upgrade/test, optimization and Soldier operational environment. It is designed to provide centralized lifecycle management and consists of the following capabilities: (1) Forge - physical or virtual asset that provides integration and assessment capabilities during the development and integration phases of operations (centrally managed patching and security); (2) Armory - authoritative source for capabilities within the approved baseline at ten locations (eight regional and two mobile); and (3) Mission Network - provides the capability to remove into multiple networks (provides save and secure infrastructure framework for Cyber Protection Teams). ***FY 2020 Plans:*** DCODE Requirements Definition Package (RDP) is slated to be approved by the Army Requirements Board 2Q20. DCODE continues to assess new cyber technologies within controlled environment, test capabilities in integrated environment, provide virtual training access 24/7 worldwide, and test/push approved enhancement remotely. ***FY 2021 Plans:*** FY 2021 funding continues assessment of new cyber technologies within controlled environment, test capabilities in integrated environment, provide virtual training access 24/7 worldwide, and test/push approved enhancement remotely. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds increase to support development.	2.747	0.900	3.143
Title: DCO - Rapid Cyber Prototyping (ARCYBER) ***Description:*** DCO Rapid Cyber Prototyping provides software based capabilities that can quickly respond to emerging cyber threats and keep up with threat technology. Cyber Needs Forms (CNF) identify potential development and prototyping efforts based on operational feedback, changes in TTPs and trends of adversarial activity. It is used when gaps identified in the CNF are non-program of record cyber operations-peculiar equipment and capabilities to rapidly address a network threat/vulnerability. ***FY 2020 Plans:***	-	1.000	0.999

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 funding supports development engineering and prototyping software based Emerging Threat Response Development. ***FY 2021 Plans:*** FY 2021 funding supports development engineering and prototyping software based Emerging Threat Response Development. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Minor change to economic adjustment.			
Title: DCO - Management Services (PEO EIS) ***Description:*** Program management services consists of System Engineering and Technical Assistance (SETA) contractors and government/contract matrix support from Software Engineering Center (SEC), Information Systems Engineering Command (ISEC), and Army Test and Evaluation Command (ATEC) for development engineering, integration, and testing of software based DCO capabilities. ***FY 2020 Plans:*** FY 2020 funding provides continued program management services and support. ***FY 2021 Plans:*** FY 2021 funds program management services and support for DCODE (formerly Forge) sites. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Majority of DCO efforts transferred to the Software RDTE Pilot program in FY 2021. Remaining management services support DCODE (formerly Forge).	1.726	6.055	0.510
Accomplishments/Planned Programs Subtotals	33.796	30.479	4.652

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B63103: *Advanced Cyber Tool Development*	51.343	56.962	54.753	-	54.753	70.097	36.783	39.402	45.850	Continuing	Continuing
• OMA - N/A: *Information Mgmt-Automation Support (MDEP MU2Z SAG 432612)*	-	-	-	-	-	-	-	-	-		

Remarks

OPA PE B63103 for DCO procurement, fielding, and new equipment training.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

OMA SAG 432612 for DCO License Renewals and non-traditional sustainment for FY19-20. Funds were aligned to SAG 151251 in FY21 (transferred to BA8 Software RDTE Appropriation Pilot Program PE 0608041A Project CD1).
OMA SAG 435106 for Civilian Pay was established by the Army starting in FY19 due to Reimbursable to Direct conversion for DCO.

D. Acquisition Strategy

The DCO Information System Capabilities Development Document (IS ICD) was approved on 19 Dec 17 by the Army Requirements Oversight Council (AROC). DCO programs are under an IT Box construct with five year term (FY18-22) which aligns with current Requirements Definition Package (RDP).

The Milestone Decision Authority (MDA), approved the Materiel Development Decision (MDD) on 13 Apr 18, designating Tactical DCO Infrastructure (TDI) as an ACAT III program. The TDI program's RDP was approved on 8 Nov 18 by the Army Requirement Board (ARB). Under subsequent reviews, the MDA approved a tailored defense unique software intensive acquisition approach for TDI. To support this agile acquisition approach, the TDI program office will develop and deploy pre-configured software in a series of capability drops in order to deliver full functional values of the RDP that align with DCO priorities. The TDI program had a Full Deployment Decision (FDD) of TDI's initial capability approved by the MDA on Sep 19, which allowed the program to achieve IOC Oct 19. TDI is hosted on the Tactical Server Infrastructure (TSI) and will be fielded by the CPCE/TSI program in accordance with their fielding schedule. Execution of the TDI program will be a combination of government entities and commercial vendors.

The ARB approved Cyber Analytics and DCO Tool Suite RDPs on 24 Apr 18; Mission Planning on 26 Jun 18; and User Activity Monitoring and Forensics and Malware on 16 Oct 18. The MDA designated these as ACAT IV programs. Under subsequent reviews, the MDA approved agile acquisition approach to develop and deliver preconfigured software in a series of releases and capability drops in order to deliver full functional values of the RDP that align with DCO priorities. DCO programs utilize standard and 874 agile pilot evolutionary acquisition processes (30-90 rapid acquisition approach). DCO continually delivers new technologies and capabilities as a prototype and fields updated capabilities. DCO contract strategy utilizes multiple existing contracts vehicles to include Other Transactional Authority (OTA), Federal Acquisition Regulation (FAR)-based, Blanket Purchase Agreement (BPA), and Basic Ordering Agreement (BOA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - Tactical DCO Infrastructure (TDI) (PEO C3T)	C/FFP	CACI : Aberdeen Proving Ground (APG), MD	7.697	0.578	Oct 2018	1.180	Mar 2020	-		-		-	0.000	9.455	-
DCO - Cyberspace Analytics (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	0.552	-		-		-		-		-	0.000	0.552	-
DCO - Tools Suite (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	0.189	-		-		-		-		-	0.000	0.189	-
DCO - Garrison Defensive Platform (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	0.913	-		-		-		-		-	0.000	0.913	-
DCO - Mission Planning (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	0.542	-		-		-		-		-	0.000	0.542	-
DCO - Deployable DCO System (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	0.189	-		-		-		-		-	0.000	0.189	-
DCO - Management Services (PEO EIS)	Various	PEO EIS : Ft Belvoir, VA	-	1.726	Oct 2018	6.055	Oct 2019	0.510	Oct 2020	-		0.510	Continuing	Continuing	Continuing
		Subtotal	10.082	2.304		7.235		0.510		-		0.510	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - TDI (PEO C3T)	C/CPFF	Parsons and CACI : Aberdeen Proving Ground (APG), MD	6.821	4.519	Apr 2019	3.299	Jan 2020	-		-		-	0.000	14.639	-
DCO - Cyberspace Analytics (PEO EIS)	C/FFP	ACC-RI : IL	21.687	14.090	Nov 2018	14.296	Dec 2019	-		-		-	0.000	50.073	-
DCO - Garrison Defensive Platform (PEO EIS)	C/FFP	ACC-RI : IL	2.060	-		-		-		-		-	0.000	2.060	-
DCO- Garrison Defensive Platforms (PEO EIS)	C/Various	ACC-PI : NJ	9.690	-		-		-		-		-	0.000	9.690	-
DCO - Mission Planning (PEO EIS)	C/CPFF	ACC-RI : IL	-	8.133	Nov 2018	2.000	Feb 2020	-		-		-	0.000	10.133	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - User Activity Monitoring (PEO EIS)	C/T&M	ACC-RI : IL	-	-		1.434	Feb 2020	-		-		-	0.000	1.434	-
DCO- Threat Emulation (PEO EIS)	C/FFP	ACC-RI : IL	-	0.761	Jul 2019	-		-		-		-	0.000	0.761	-
DCO - Rapid Cyber Prototyping (ARCYBER)	C/TBD	ACC-RI : IL	-	-		1.000	Jan 2020	0.999	Jan 2021	-		0.999	0.000	1.999	-
DCO- Mission Planning (PEO EIS)	MIPR	USAF, AFMC AIR FORCE RESEARCH LAB : NY	14.520	-		-		-		-		-	0.000	14.520	-
		Subtotal	54.778	27.503		22.029		0.999		-		0.999	0.000	105.309	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - TDI (PEO C3T)	MIPR	DLA : Philadelphia, PA	-	0.174	Jan 2019	-		-		-		-	0.000	0.174	-
		Subtotal	-	0.174		-		-		-		-	0.000	0.174	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - TDI (PEO C3T)	MIPR	ATEC : Aberdeen Proving Ground (APG), MD	0.828	1.068	Oct 2018	0.315	Jan 2020	-		-		-	0.000	2.211	-
DCO - Cyberspace Analytics (PEO EIS)	IA	ATEC & SEC : MD	4.923	-		-		-		-		-	0.000	4.923	-
DCO - Tools Suite (PEO EIS)	IA	ATEC & SEC : MD	0.500	-		-		-		-		-	0.000	0.500	-
DCO - Garrison Defensive Platform (PEO EIS)	IA	ATEC & SEC : MD	0.500	-		-		-		-		-	0.000	0.500	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCO - Deployable DCO System (PEO EIS)	IA	ATEC & SEC : MD	0.500	-		-		-		-		-	0.000	0.500	-
DCO - Mission Planning (PEO EIS)	MIPR	ATEC : MD	1.865	-		-		-		-		-	0.000	1.865	-
DCO - DCO Development Environment (DCODE, formerly Forge (PEO EIS)	IA	ATEC & SEC & TOBYHANNA : Various	-	2.747	Jan 2019	0.900	Jan 2020	3.143	Jan 2021	-		3.143	Continuing	Continuing	Continuing
		Subtotal	9.116	3.815		1.215		3.143		-		3.143	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	73.976	33.796		30.479		4.652		-		4.652	Continuing	Continuing	N/A

Remarks

DCO-TDI(PEO C3T): Award dates reflect the date that funding was/will be sent onto a pre-existing contract or to another organization.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

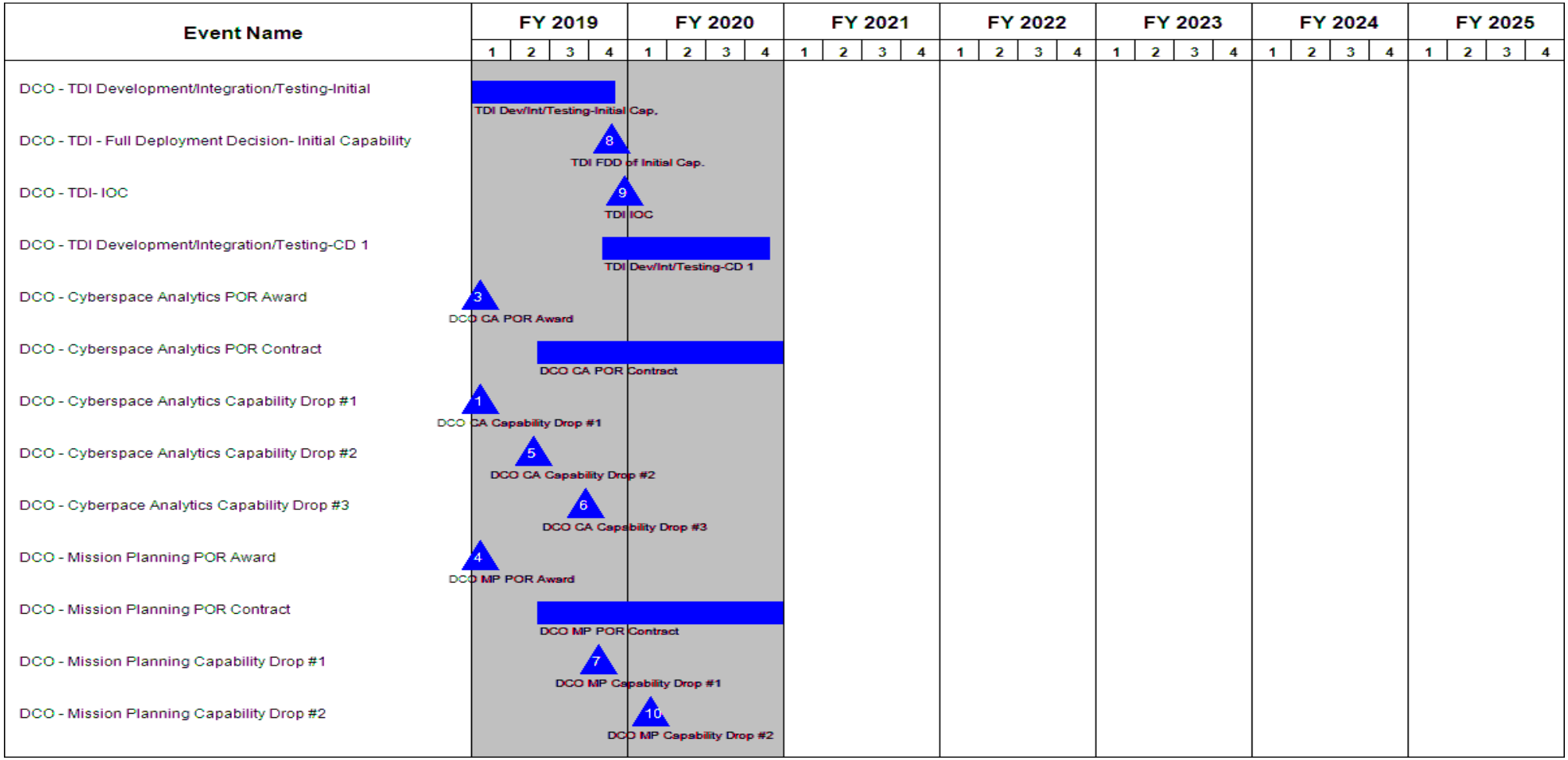

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

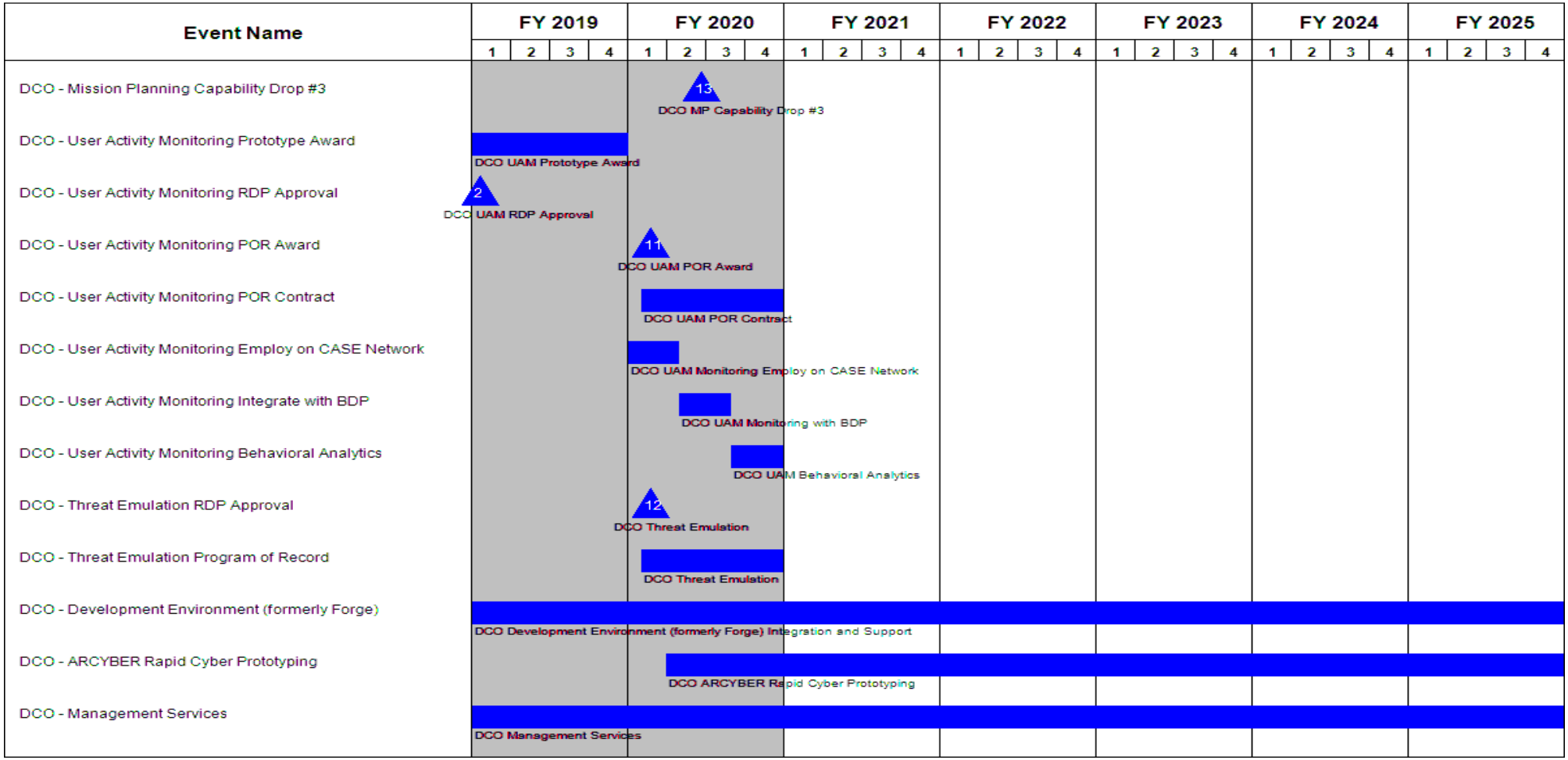

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DCO - Tactical DCO-Infrastructure (TDI) - RDP Approval	3	2018	3	2018
DCO - TDI Development/Integration/Testing-Initial	1	2019	4	2019
DCO - TDI - Full Deployment Decision- Initial Capability	4	2019	4	2019
DCO - TDI- IOC	4	2019	4	2019
DCO - TDI Development/Integration/Testing-CD 1	4	2019	4	2020
DCO- Cyberspace Analytics RDP Approval	3	2018	3	2018
DCO - Cyberspace Analytics POR Award	1	2019	1	2019
DCO - Cyberspace Analytics POR Contract	2	2019	4	2020
DCO - Cyberspace Analytics Capability Drop #1	1	2019	1	2019
DCO - Cyberspace Analytics Capability Drop #2	2	2019	2	2019
DCO - Cyberpace Analytics Capability Drop #3	3	2019	3	2019
DCO - Mission Planning RDP Approved	3	2018	3	2018
DCO - Mission Planning POR Award	1	2019	1	2019
DCO - Mission Planning POR Contract	2	2019	4	2020
DCO - Mission Planning Capability Drop #1	4	2019	4	2019
DCO - Mission Planning Capability Drop #2	1	2020	1	2020
DCO - Mission Planning Capability Drop #3	2	2020	2	2020
DCO - User Activity Monitoring Prototype Award	1	2019	4	2019
DCO - User Activity Monitoring RDP Approval	1	2019	1	2019
DCO - User Activity Monitoring POR Award	1	2020	1	2020
DCO - User Activity Monitoring POR Contract	1	2020	4	2020
DCO - User Activity Monitoring Employ on CASE Network	1	2020	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DCO - User Activity Monitoring Integrate with BDP	2	2020	3	2020
DCO - User Activity Monitoring Behavioral Analytics	3	2020	4	2020
DCO - Threat Emulation RDP Approval	1	2020	1	2020
DCO - Threat Emulation Program of Record	1	2020	4	2020
DCO - Development Environment (formerly Forge)	1	2019	4	2025
DCO - ARCYBER Rapid Cyber Prototyping	2	2020	4	2025
DCO - Management Services	1	2019	4	2025

Note

DCO is capability owner and full operational capability is defined when programs have completed the development and testing of the last capability drop within the IT Box (reaching full functional values of the RDP).

Current DCO IT box ends in FY22. Army Capabilities Manager (ACM, formerly TRADOC Capability Manager (TCM)) is working a new DCO IS ICD to align with a new IT Box construct for FY23-27.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605042A *I Tactical Network Radio Systems (Low-Tier)*							
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	-	18.761	28.404	28.178	-	28.178	47.525	27.188	26.594	26.467	0.000	203.117
FA1: *Manpack Radio*	-	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
FA2: *Rifleman Radio (RR)*	-	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for operational demonstration evaluations, testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

The Handheld, Manpack, and Small Form Fit (HMS) radio program is a single Acquisition Category IC program encompassing: handheld radios (one-channel Rifleman Radio (RR), two-channel Leader Radio (LR), and single-channel data radio) and Manpack (MP) radio (Generation 1 and Generation 2 radios). HMS provides voice and data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. HMS radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communication. HMS radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

Tactical Network Radio Systems (Low-Tier) provide both Classified and Unclassified communications. The radios provide the Single Channel Ground and Airborne Radio System (SINCGARS) legacy waveform for Classified and Unclassified communications. They also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The MP radio provides the Mobile User Objective System (MUOS) waveform for Tactical Satellite communications. The HMS program is currently in the process of conducting significant testing, including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the ITN architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. The Army intends to test and integrate two-channel communication technologies, utilizing existing Army two-channel radio variants (MP Radios), in support of Air to Ground. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*		
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	3.825	35.654	50.297	-	50.297
Current President's Budget	18.761	28.404	28.178	-	28.178
Total Adjustments	14.936	-7.250	-22.119	-	-22.119
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.250			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	14.936	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-22.119	-	-22.119

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA1 / *Manpack Radio*	

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
FA1: *Manpack Radio*	-	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for operational demonstration evaluation, testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

The Manpack (MP) radios, both Generation 1 legacy and Generation 2 advanced, provide voice and data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. MP radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

MP radios provide both Classified and Unclassified communications. MP radios provide the Single Channel Ground and Airborne Radio System (SINCGARS) legacy waveform for Classified and Unclassified communications. MP radios also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The MP radio provides the Mobile User Objective System (MUOS) waveform for Tactical Satellite communications. The HMS program is currently in the process of conducting significant testing, including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. The Army intends to test and integrate two-channel communication technologies, utilizing existing Army two-channel radio variants (MP Radios), in support of Air to Ground. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Program Management	0.075	0.550	0.700

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: PdM HMS Manpack's program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings. ***FY 2020 Plans:*** During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Matrix and Contractor support. ***FY 2021 Plans:*** During this timeframe, funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funds for Program Management is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.			
Title: HMS Engineering/Technical Support ***Description:*** Overall technical analysis support to PdM HMS' Manpack and ITN products. ***FY 2020 Plans:*** To provide technical support, including systems engineering to evaluate technical alternatives and test support. System Engineering efforts includes: communication architecture analysis, identifying alternatives to reduce costs, improving system performance, and achieving tactical radio objectives. Technical test support includes: planning and execution of laboratory and field test events, support for testing of mature production representative prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance. ***FY 2021 Plans:*** FY 2021 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funds for Engineering/Technical Support is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.	1.452	1.000	1.540
Title: Test and Evaluation	0.367	21.822	14.774

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Manpack's Test and Evaluation focuses on the key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, suitability and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. All radios awarded a contract were required to go through the Qualification Test (QT) to qualify for a Customer Test (CT). Following CT there was a Sandbox, Soldier Feedback Study, and Field / Lab Based Risk Reduction (FBRR/LBRR) that serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers. The OT will include support from Army and DoD operational testers and will use communication scenarios based on the Operational Mode Summary / Mission Profile of the system(s) under test. The OT will be designed to validate that HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from OT will facilitate the delivery orders for Full Rate Production. HMS also supports ITN's iterative evaluation and capability implementation strategy. ***FY 2020 Plans:*** The FY 2020 funding is needed to conduct testing for the MP candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; engineering and technical support at test events; and to fully fund the testing requirements on the MP candidate radios as laid out in the HMS Acquisition Strategy approved May 2014. HMS is planning an operational test in FY 2020 to assess required capabilities, operational efficacy, and interoperability across the communications network. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground. ***FY 2021 Plans:*** The FY 2021 funding will facilitate testing for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease in funds for Test and Evaluation is due to the completion of Operational Test in FY 2020. The program office continues to support ITN's iterative evaluation and capability implementation strategy.			
Accomplishments/Planned Programs Subtotals	1.894	23.372	17.014

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• FA2: *Rifleman Radio (RR)*	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B95004: *Handheld Manpack Small Form Fit (HMS)*	298.475	468.026	550.848	-	550.848	687.792	838.216	989.541	852.259	Continuing	Continuing

Remarks

D. Acquisition Strategy

MP Radio is currently executing a May 2014 approved acquisition strategy to procure Non-Developmental Items (NDI). Utilizing a full and open competition strategy, the MP base contract was awarded to all potential industry partners. The MP contract was awarded on 26 February 2016, and procures NDI MP radios for use in a classified environment. As laid out in the Acquisition Strategy, these candidate NDI radios will need to demonstrate through testing, compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for Full Rate Production (FRP). The MP is currently capable of running the following waveforms: Single Channel Ground and Airborne Radio System (SINCGARS), Satellite Communications (SATCOM) - Army managed waveforms, Mobile User Objective System (MUOS) - Navy managed waveform, and other advanced networking waveforms.

The Army will procure radios through a multiple step selection process:
a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (26 February 2016)
b. Awarded initial delivery orders based on Qualification Test results (19 December 2016)
c. Awarded second delivery orders based on Customer Test results (31 July 2017)
d. Award(ed) LRIP delivery orders (30 April 2018, 06 June 2019, and 3QFY20)
e. Achieve Full Rate Production (2QFY21)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA1 / *Manpack Radio*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Office Support	Various	PEO C3T & CECOM : Various; APG, MD	0.860	0.075	Dec 2018	0.550		0.700		-		0.700	0.000	2.185	-
		Subtotal	0.860	0.075		0.550		0.700		-		0.700	0.000	2.185	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering/Technical Support	Various	PEO C3T, ARL, C5ISR, & ATC : Various	1.842	1.452	Jan 2019	1.000		1.540		-		1.540	0.000	5.834	-
		Subtotal	1.842	1.452		1.000		1.540		-		1.540	0.000	5.834	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Follow on Delta Development & Testing	Various	EPG : Ft. Huachuca	2.447	-		-		6.639		-		6.639	0.000	9.086	-
Follow on Delta Development & Testing (2)	Various	OTC : Various	6.446	0.367	Nov 2018	21.822		-		-		-	0.000	28.635	-
ITN Testing	Various	Various : TBD	-	-		-		8.135		-		8.135	0.000	8.135	-
		Subtotal	8.893	0.367		21.822		14.774		-		14.774	0.000	45.856	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.595	1.894		23.372		17.014		-		17.014	0.000	53.875	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

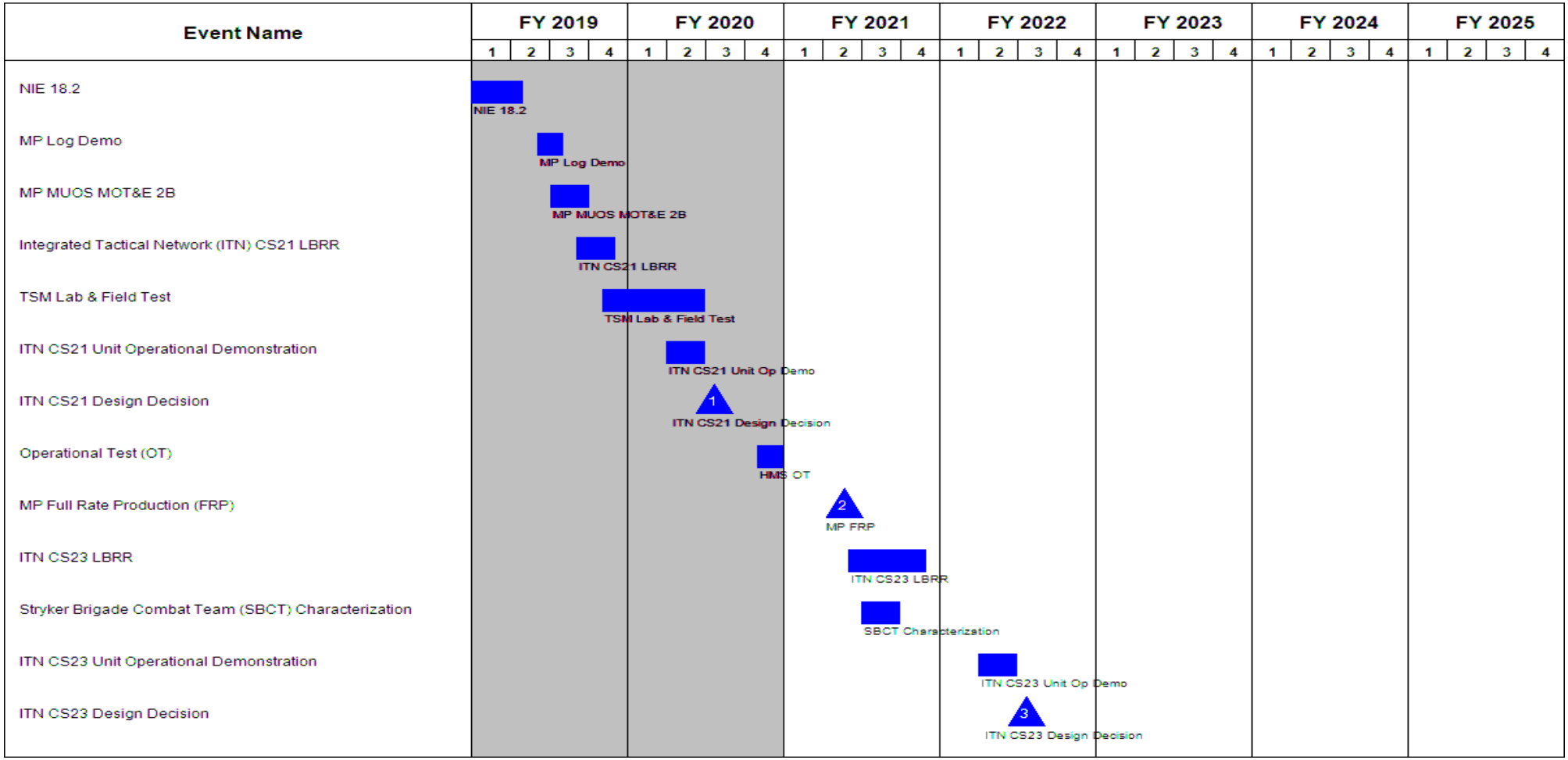

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

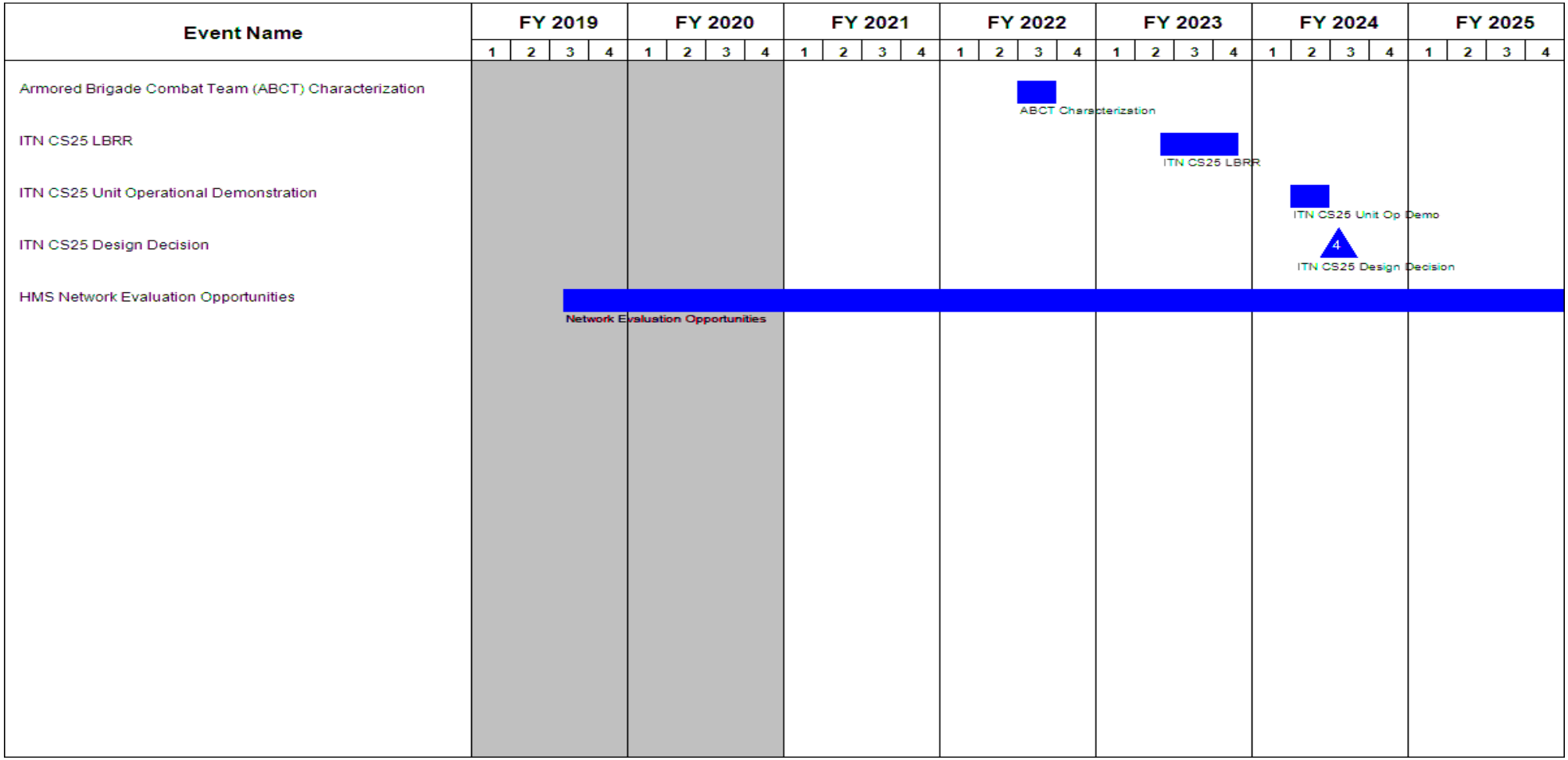

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Manpack (MP) Customer Test (CT)	2	2017	4	2017
MP Sandbox and Soldier Feedback Study	1	2018	2	2018
MP Field/Lab Base Risk Reduction Test (FBRR/LBRR)	3	2018	4	2018
NIE 18.2	1	2019	1	2019
MP Log Demo	2	2019	3	2019
MP MUOS MOT&E 2B	3	2019	3	2019
Integrated Tactical Network (ITN) CS21 LBRR	3	2019	4	2019
TSM Lab & Field Test	4	2019	2	2020
ITN CS21 Unit Operational Demonstration	2	2020	2	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	4	2020	4	2020
MP Full Rate Production (FRP)	2	2021	2	2021
ITN CS23 LBRR	2	2021	4	2021
Stryker Brigade Combat Team (SBCT) Characterization	3	2021	3	2021
ITN CS23 Unit Operational Demonstration	2	2022	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
ITN CS25 LBRR	2	2023	4	2023
ITN CS25 Unit Operational Demonstration	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024
HMS Network Evaluation Opportunities	3	2019	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA2 / *Rifleman Radio (RR)*	

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
FA2: *Rifleman Radio (RR)*	-	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for evaluation (lab and field based risk reduction events), testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

The HMS handheld radios include the one-channel Rifleman Radio (RR), two-channel Leader Radio (LR), and single-channel data radio. Handheld radios provide voice/data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. Handheld radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communication (RR/LR). Handheld radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

Handheld radios provide both Classified and Unclassified communications. Handheld radios provide the Single Channel Ground and Airborne Radio System (SINCGARS) legacy waveform for Classified and Unclassified communications. Handheld radios also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The HMS program is currently in the process of conducting significant tests including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Program Management	1.729	0.475	0.827

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: PdM HMS Handheld's program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings. ***FY 2020 Plans:*** During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Matrix and Contractor support. ***FY 2021 Plans:*** During this timeframe, funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funds for Program Management is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.			
Title: HMS Engineering/Technical Support ***Description:*** Overall technical analysis support to PdM HMS' Handheld and ITN products. ***FY 2020 Plans:*** Provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieving tactical radio objectives. Technical test support for the planning and execution of laboratory and field test events, including support for testing of mature production representative prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance. ***FY 2021 Plans:*** FY 2021 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funds for Engineering/Technical Support is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.	1.865	0.400	1.026
Title: Test and Evaluation	13.273	4.157	9.311

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Handheld's Test and Evaluation focuses on the evaluation of key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. All radios awarded a contract will be required to go through the Qualification Test (QT) to qualify for Field Based Army Evaluation Center (AEC) Evaluation/Lab Based Risk Reduction (FBAE/LBRR) that will serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers. The OT will include support from Army and DoD operational testers and will use communication scenarios based on the Operational Mode Summary / Mission Profile of the system(s) under test. The OT will be designed to validate that the HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from the OT will facilitate the delivery orders for Full Rate Production. HMS also supports ITN's iterative evaluation and capability implementation strategy. ***FY 2020 Plans:*** The FY 2020 funding is needed to conduct testing for the LR candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; and to fund the testing requirements on the LR candidate radios as laid out in the HMS Acquisition Strategy addendum approved in March 2017. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground. ***FY 2021 Plans:*** The FY 2021 funding will facilitate testing for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funds for Test and Evaluation is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.			
Accomplishments/Planned Programs Subtotals	16.867	5.032	11.164

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• FA1: *Manpack Radio*	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
• B95004: *Handheld Manpack Small Form Fit (HMS)*	298.475	468.026	550.848	-	550.848	687.792	838.216	989.541	852.259	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

On 13 September 2016 the Army Acquisition Executive approved a decrease to the Basis of Issue (BOI) for the single channel RR, increase the BOI for the two channel LR and move forward with acquisition activities for the two channel LR. An acquisition strategy addendum adding LR was approved in March 2017. The addendum continued the multi-vendor approach utilizing the existing Indefinite Delivery Indefinite Quantity (IDIQ) RR base contract (awarded 29 April 2015) to on-ramp LR capabilities (18 September 2018). The LR effort is a separate competition under the Handheld radio suite. As laid out in the acquisition strategy, these candidate non-developmental radios will need to demonstrate through testing, compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for Full Rate Production (FRP).

The LR will simultaneously run Single Channel Ground and Airborne Radio System (SINCGARS) and other advanced networking waveforms, in one radio with both handheld and mounted configurations, for fixed and mobile sites.

The Army will procure radios through a multiple step selection process:
a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (18 September 2018)
b. Awarded LRIP delivery orders to support SFAB and ITN fieldings/evaluations (18 September 2018)
c. Award LRIP delivery orders based on results of the best value trade-off construct (2QFY20 & 4QFY20)
d. Achieve Full Rate Production (2QFY21)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA2 / *Rifleman Radio (RR)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Office Support	Various	PEO C3T & CECOM : Various; APG, MD	0.858	1.729	Dec 2018	0.475		0.827		-		0.827	0.000	3.889	Continuing
		Subtotal	0.858	1.729		0.475		0.827		-		0.827	0.000	3.889	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HMS Engineering/ Technical Support	Various	PEO C3T, ARL, C5ISR, & ATC : Various	0.454	1.865	Jan 2019	0.400		1.026		-		1.026	0.000	3.745	-
		Subtotal	0.454	1.865		0.400		1.026		-		1.026	0.000	3.745	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Follow on Delta Development & Testing	Various	EPG : Fort Huachuca	4.776	-		-		1.176		-		1.176	0.000	5.952	-
Follow on Delta Development & Testing (2)	Various	OTC : Various	5.360	0.174	Nov 2018	4.157		-		-		-	0.000	9.691	-
ITN Testing	Various	Various : TBD	-	13.099	Dec 2019	-		8.135		-		8.135	0.000	21.234	-
		Subtotal	10.136	13.273		4.157		9.311		-		9.311	0.000	36.877	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.448	16.867		5.032		11.164		-		11.164	0.000	44.511	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

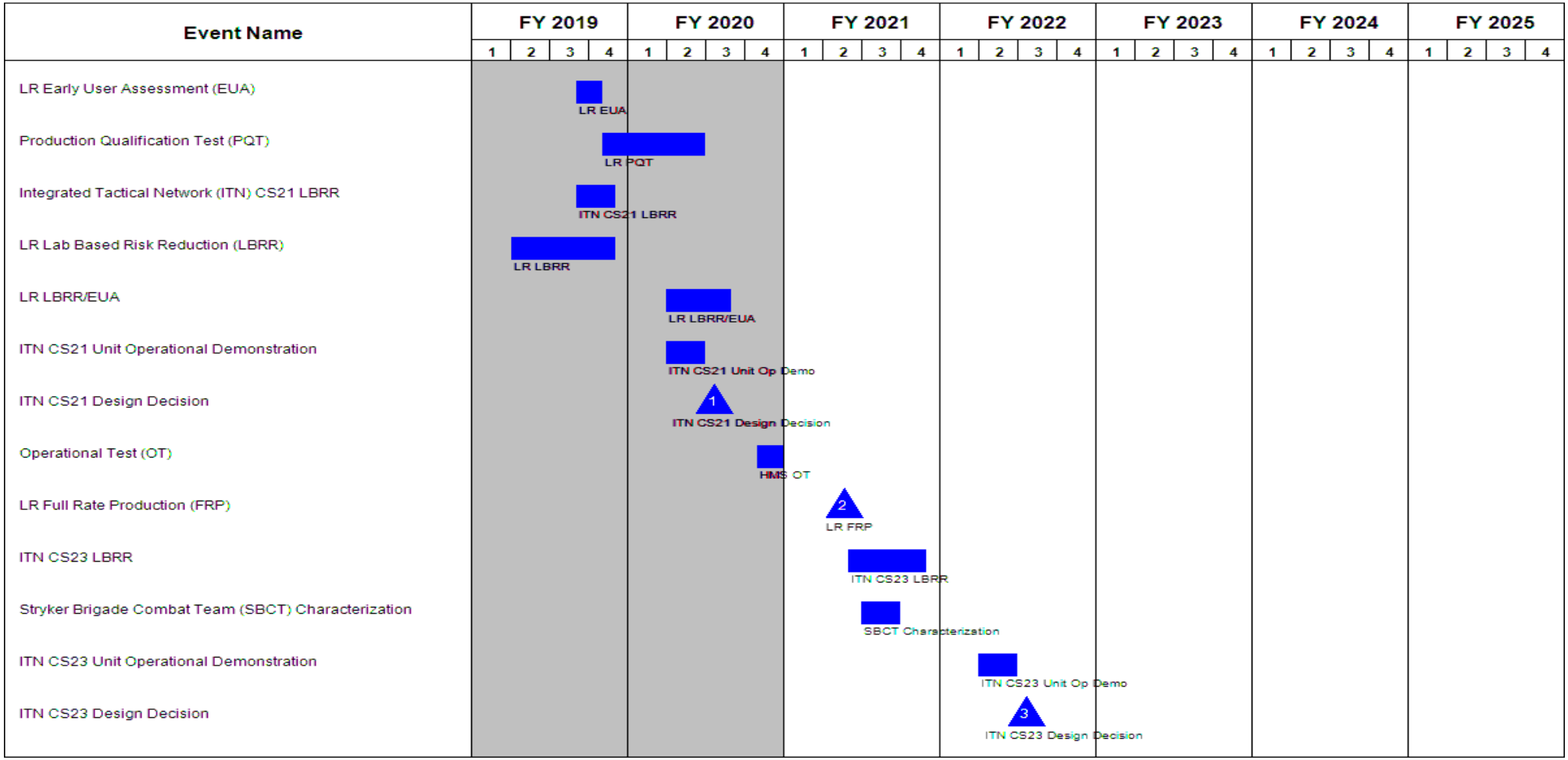

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

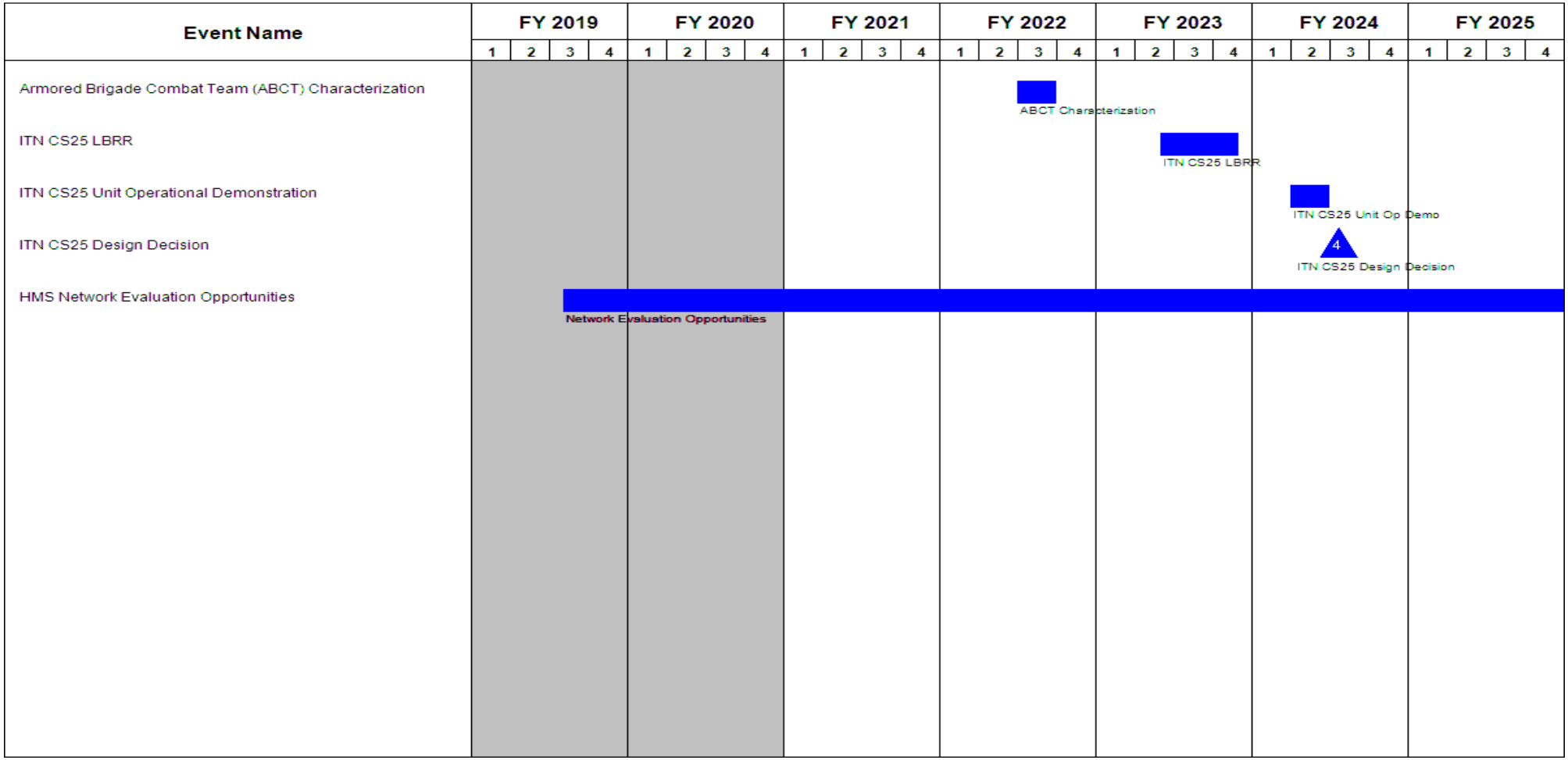

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Leader Radio (LR) Release For Proposal (RFP)	4	2017	4	2017
LR Qualification Test (QT)	1	2018	2	2018
LR Lab Based Risk Reduction	4	2018	4	2018
LR Contract Award	4	2018	4	2018
LR Early User Assessment (EUA)	3	2019	4	2019
Production Qualification Test (PQT)	4	2019	2	2020
Integrated Tactical Network (ITN) CS21 LBRR	3	2019	4	2019
LR Lab Based Risk Reduction (LBRR)	2	2019	4	2019
LR LBRR/EUA	2	2020	3	2020
ITN CS21 Unit Operational Demonstration	2	2020	2	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	4	2020	4	2020
LR Full Rate Production (FRP)	2	2021	2	2021
ITN CS23 LBRR	2	2021	4	2021
Stryker Brigade Combat Team (SBCT) Characterization	3	2021	3	2021
ITN CS23 Unit Operational Demonstration	2	2022	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
ITN CS25 LBRR	2	2023	4	2023
ITN CS25 Unit Operational Demonstration	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024
HMS Network Evaluation Opportunities	3	2019	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605047A *I Contract Writing System*							
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	-	40.341	17.082	22.860	-	22.860	18.363	0.000	0.000	0.000	0.000	98.646
FA7: *Contract Writing System*	-	40.341	17.082	22.860	-	22.860	18.363	0.000	0.000	0.000	0.000	98.646

Note

Decisions rendered by the Milestone Decision Authority (MDA), as outlined in DoDI 5000.75, are referred to as "Authority To Proceed" and replace DoDI 5000.02 "Milestones." ACWS official MDA delegation to Program Executive Office, Enterprise Information Systems was on 19 March 2018.

A. Mission Description and Budget Item Justification

The Army Contract Writing System (ACWS) will be the Army's single, next-generation, enterprise-wide contract writing, management, execution, and close-out software system. ACWS will facilitate the standardization of Army Procurement business processes and streamline the integration with Army Enterprise Resource Planning (ERP) systems. As a financial feeder system, ACWS will meet the compliance requirements of the Federal Financial Management Improvement Act of 1996. The system will meet the full scope of Army contracting requirements, including those in secure and non-secure locations, those supporting combat or non-combat contingencies, those within or outside the borders of the Continental United States, those supporting grants and assistance agreements, and those performing weapons systems, construction, installation, and other specialized contracting activities. This is consistent with initial DoD guidance 21 October 2011, which directed the Services to develop a new contract writing system. Since awarding a contract to CGI Federal Inc. on 22 May 2017, the program completed risk reduction that aligned Army's business processes to the selected commercial-off-the-shelf (COTS) product, and reduced unnecessary requirements and interfaces. The program conducted a successful Baseline Authority to Proceed (ATP) decision on 18 August 2018, and obtained the Army Acquisition Executive's approval to award initial development task order. ACWS is on track to deploy a Minimum Viable Solution (MVS) to two pilot units during FY 2020, and achieve Initial Operational Capability (IOC) NLT 4QFY2020. If the full capability is not fully deployed by the end of FY 2023, the Army will incur the full SPS bill ($14M+/ year). ACWS will also enable the decommission of the Procurement Automated Data and Document System (PADDS) and Virtual Contracting Enterprise (VCE) systems.

ACWS was approved by The Under Secretary of Defense for Acquisition and Sustainment (USD (A&S)) as a pilot program supporting the FY 2018 National Defense Authorization Act (NDAA) Section 873 Agile Pilots. The ACWS Agile 873 pilot Realignment Plan was approved 2QFY2019 and cites duration of the Program as five years through Full Deployment. As part of the Sec 873 activities ACWS is realigning and restructuring prior to the Full Deployment (FD) to include a contract structure that enables Agile best practices and incremental capability delivery to the field. ACWS will support OSD requirements to quickly identify Agile development lessons learned, reduce procedural delays, improve policy, and enhance workforce training. Sec 873 Pilot Programs are intended to provide programs the opportunity to restructure in order to streamline contract and acquisition approaches, and tear down barriers to agile development without penalty. The process allows the Army ability to analyze and prioritize requirements to enable deployable product on demand, the cadence and content of system documentation and programmatic reviews, and a transparent culture in a blended government-system integrator team. ACWS participates in the 873 Community of Practice (CoP), sharing and utilizing lessons learned, shaping agile policy, processes, and tools for DoD.

During FY 2020, ACWS will coordinate with the Navy's eProcurement System (ePS) team to identify and implement efficiencies; the two teams will continue implementing those plans during FY 2021, including using combined buying power for potential economies of scale for license purchases.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605047A *I Contract Writing System*

FY 2021 RDTE Funding will support the development of Full Deployment (FD) functionality of ACWS. ACWS will continue/initiate development of capabilities including integration with the Logistics Modernization Program (LMP), important contracting functions to manage complex weapons procurements, and other key system interfaces and functionality. Business system interfaces will be developed with these key partners to complete system development.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	41.876	19.682	13.034	-	13.034
Current President's Budget	40.341	17.082	22.860	-	22.860
Total Adjustments	-1.535	-2.600	9.826	-	9.826
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.600			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.535	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.826	-	9.826

Change Summary Explanation

The original ACWS schedule showed two major software releases to deliver the Army Contract Writing capability and retire three legacy contract writing systems/ tools by FY2023 (SPS/ PADDS/ VCE). ACWS changed its schedule and approach in July 2018 to better align with its funding profile and the outcome of POM20-24. Adjusting to this funding profile, ACWS revised their schedule to deliver three incremental capabilities (Minimal Viable Solution [MVS], Initial Operating Capability [IOC], and Full Deployment [FD]). These changes, coupled with the risk reduction task order resulting in refined requirements, drive the increase in FY2021. The President's FY2020 budget marks ACWS by $2.6 million.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

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
FA7: *Contract Writing System*	-	40.341	17.082	22.860	-	22.860	18.363	0.000	0.000	0.000	0.000	98.646
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Contract Writing System (ACWS) will be the Army's single, next-generation, enterprise-wide contract writing, management, execution, and close-out software system. ACWS will facilitate the standardization of Army Procurement business processes and streamline the integration with Army Enterprise Resource Planning (ERP) systems. As a financial feeder system, ACWS will meet the compliance requirements of the Federal Financial Management Improvement Act of 1996. The system will meet the full scope of Army contracting requirements, including those in secure and non-secure locations, those supporting combat or non-combat contingencies, those within or outside the borders of the Continental United States, those supporting grants and assistance agreements, and those performing weapons systems, construction, installation, and other specialized contracting activities. This is consistent with initial DoD guidance 21 October 2011, which directed the Services to develop a new contract writing system. Since awarding a contract to CGI Federal Inc. on 22 May 2017, the program completed risk reduction that aligned Army's business processes to the selected commercial-off-the-shelf (COTS) product, and reduced unnecessary requirements and interfaces. The program conducted a successful Baseline Authority to Proceed decision on 18 August 2018, and obtained the Army Acquisition Executive's approval to award initial development task order. ACWS is on track to deploy a Minimum Viable Solution (MVS) to two pilot units during FY 2020, and achieve Initial Operational Capability (IOC) NLT 4QFY2020. If the full capability is not fully deployed by the end of FY 2023, the Army will incur the full SPS bill ($14M+/ year). ACWS will also enable the decommission of the Procurement Automated Data and Document System (PADDS) and Virtual Contracting Enterprise (VCE) systems.

ACWS was approved by The Under Secretary of Defense for Acquisition and Sustainment (USD (A&S)) as one of the pilot programs supporting the FY 2018 National Defense Authorization Act (NDAA) Section 873 Agile Pilots. The ACWS Agile 873 pilot Realignment Plan was approved 2QFY2019 and cites duration of the Program as five years through Full Deployment. As part of the Sec 873 activities ACWS is realigning and restructuring prior to Full Deployment that will include a contract structure that enables Agile best practices and incremental capability delivery to the field. ACWS, as Sec 873 Agile Pilot Program, will support OSD requirement to quickly identify lessons learned, reduce procedural delays, improve policy, and enhance workforce training. Sec 873 provides programs the opportunity to restructure in order to streamline contract and acquisition approaches and tear down barriers to agile development without penalty. The process allows the Army ability to analyze and prioritize requirements to enable deployable product on demand, the cadence and content of system documentation and programmatic reviews, and a transparent culture in a blended government-system integrator team as the program realigns to the Agile development methodology. ACWS participates in the 873 Community of Practice, sharing and utilizing lessons learned, shaping agile policy, processes, and tools for DoD. During FY 2020, ACWS will coordinate with the Navy's eProcurement System (ePS) team to identify and implement (where practical) additional areas for potential synergies and cost savings; the two team will continue implementing those plans during FY 2021.

FY 2021 funding will support development and test of Full Deployment (FD) functions of ACWS. ACWS will continue/initiate development of capabilities including integration with the Logistics Modernization Program, important contracting functions to manage complex weapons procurements, and other key system interfaces and functionality. Business system interfaces will be developed with these key partners to complete system development. FY 2021 funding will support these key development efforts to meet the FD ATP in 2QFY2022.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Program Office	7.786	5.906	4.533
Description: These resources in the ACWS Program Management Office include Government and contractor support for capability development, enterprise architecture, contract management, management analysis, capital/ financial planning, travel, supplies, life cycle planning, risk management, schedule management, and facilities (for both Government and contractor staff). ***FY 2020 Plans:*** ACWS will deploy the MVS software release to a second small pilot organization in FY 2020 and will then deliver the IOC release to both pilot units that previously received the MVS release. ACWS will train both pilot sites on the IOC release and will select one of the pilot organization to participate in an Initial Operational Test that will validate the capability in an operational environment and allow the Functional Sponsor to declare that the program has achieved IOC. ACWS will achieve IOC in fourth quarter FY 2020 and prepare for the deployment of the IOC capability to the Army Contracting Enterprise in early FY 2021. ***FY 2021 Plans:*** Program management support in the ACWS Government Program Management Office includes Mitre, CECOM, DASA(P), and other contractor support for resource planning, capability development, life cycle planning, risk management, schedule management, and facilities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Program Office costs remain in line with plan during product development; however, for the purpose of these justification forms, beginning for the FY 2021 submission the costs have been broken out into more defined work efforts to give more fidelity into the FY 2021 request (and beyond). FY 2021 is expected to decrease as the program moves into the design, development, and test of its final release. The largest need for design and planning coordination came during the Initial Operational Capability release that reached limited deployment during FY 2020.			
Title: Product Development	30.041	6.988	16.656
Description: Product development is responsible for design and development of ACWS. This cross-functional team of Government and contractor staff analyze and design the Minimum Viable Solution, Initial Operational Capability, and Full Deployment requirements to efficiently ensure completeness in satisfying system requirements. Hosting infrastructure (using Infrastructure as a Service [IaaS]) and managed services are also included as a requirement of the ACWS product. ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Activities going on in FY 2020 include adding critical system interface functionality necessary to retire legacy SPS and PADDS (the current operational contracting systems used by the Army). The ACWS team will work with the System Integrator feature teams to make configurations to the base COTS product specific to ACWS requirements and integration of third party software. ***FY 2021 Plans:*** Activities going on in FY 2021 include adding complex weapon system procurement and foreign military sales functionality necessary to retire legacy SPS and PADDS (the current operational contracting systems used by the Army). The ACWS team will work with the System Integrator feature teams to make configurations to the base COTS product specific to ACWS requirements and integration of third party software. Work associated with legacy contracting data migration and conversion into ACWS is also covered under this section. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Product Development costs remain in line with plan during product development; however, for the purpose of these justification forms, beginning for the FY 2021 submission the costs have been broken out into more defined work efforts to give more fidelity into the FY 2021 request (and beyond). Product Development in FY 2021 increases as the program begins to develop and test complex interfaces and functionality during the Full Deployment release.			
Title: Security	1.507	1.206	0.753
Description: Security related costs all include Information Assurance (IA)/ Risk Management Framework (RMF) activities, and cyber security support for the Cloud Solution Provider's government approved hosting environment complementing the Interim Authorization to Test (IATT) awarded in FY 2019. ***FY 2020 Plans:*** System integrator costs to support cybersecurity vulnerability scanning, system hardening, Risk Management Framework costs, and audit readiness. The Secure Activities capability will require a separate Authority to Operate (ATO) and additional work to update existing documentation for Full Deployment interfaces. ***FY 2021 Plans:*** System integrator costs to support cybersecurity vulnerability scanning, system hardening, Risk Management Framework costs, and audit readiness. The Secure Activities capability will require a separate Authority to Operate (ATO) and additional work to update existing documentation for Full Deployment interfaces. There will also be extensive work to meet audit requirements in FY 2021. ***FY 2020 to FY 2021 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
ACWS Security costs remain in line with plan during product development; however, for the purpose of these justification forms, beginning for the FY 2021 submission the costs have been broken out into more defined work efforts to give more fidelity into the FY 2021 request (and beyond). Security costs decrease in FY 2021 because most initial security controls for the system were established and validated during the Initial Operational Capability release deployed during FY 2020.			
Title: Test & Evaluation ***Description:*** The test and evaluation function is responsible for validating and inspecting capability requirements are satisfactorily addressed through design analysis and development of test scripts. The Army Test and Evaluation Command (ATEC) and Joint Interoperability Test Command (JITC) will support ACWS as testers of the system. ***FY 2020 Plans:*** Army Test and Evaluation Command (ATEC) and Joint Interoperability Test Command (JITC) testing for ACWS Initial Operational Capability (IOC) release. ***FY 2021 Plans:*** Army Test and Evaluation Command (ATEC) and Joint Interoperability Test Command (JITC) testing for ACWS Full Deployment release. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Costs have been broken out into more defined work efforts to give more fidelity into the FY 2021 request.	1.007	2.206	0.918
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.776	-
Accomplishments/Planned Programs Subtotals	40.341	17.082	22.860

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B66001: *Contract Writing System*	5.927	6.000	8.459	-	8.459	5.821	-	-	-	0.000	26.207

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OMA - ERPB / 423612000 / 5T0: *ACWS Sustainment OMA*	-	-	7.347	-	7.347	12.993	10.773	6.611	6.620	0.000	44.344

Remarks

FY 2021 base procurement funds in the amount of $3.766 million to procure requisite ACWS software licenses for Full Deployment (FD) as the solution will ultimately support 10,000 Army users across the world. OPA funds of $4.693 million support pre-deployment activities including training and deployment teams for the FD Release which will be deployed in first quarter FY2021 and run throughout the year. Funding also supports system fielding activities including training, deployment, and Organization Change Management (Soldier Touchpoints).

FY 2021 OMA funding will be used for sustainment of sites that have already been deployed in FY 2020 and FY 2021.

D. Acquisition Strategy

Through full and open competition, ACWS awarded a Single Award ID/IQ contract with a 10-year ordering period to CGI Federal Inc. on 22 May 2017. Task Order 0001 of this contract conducted risk reduction activities concurrent with development of regulatory and statutory documentation requirements. These activities were conducted for the purpose of meeting the OSD goals to sunset Standard Procurement System (SPS) in FY 2023. Risk reduction activities include Business Process Reengineering, Global Analysis, Blueprinting, Role Design, and Interface Definition. Following risk reduction, ACWS baselined the program at the IOC Authorization to Proceed (ATP), and developed initial software release interfaces (part of the Minimum Viable Solution release). Task Order 0002 was issued in August 2018 for the design, development, and testing of the Minimum Viable Solution and Initial Operational Capability releases. Task Order 0003 was issued for the purpose of acquiring and maintaining user licenses. During FY 2020, ACWS plans to issue the next Task Order for Deployment and Fielding of the solution through FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office	Various	PdM ACWS : Arlington, VA	13.239	7.786	Oct 2018	5.906	Oct 2019	4.533	Oct 2020	-		4.533	0.000	31.464	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.776		-		-		-	0.000	0.776	-
		Subtotal	13.239	7.786		6.682		4.533		-		4.533	0.000	32.240	N/A

Remarks

FY2021 projected costs include PMO contractor support labor, HW/SW tools, supplies, facility updates, and travel expenses.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Option/ Various	CGI Federal : Arlington, VA	24.503	30.041	Oct 2018	6.988	Oct 2019	16.656	Oct 2020	-		16.656	0.000	78.188	-
		Subtotal	24.503	30.041		6.988		16.656		-		16.656	0.000	78.188	N/A

Remarks

FY2021 projected costs include the development of the FD Release capability. Hosting infrastructure (using Infrastructure as a Service [IaaS]) and managed services are also included as a requirement on the ACWS Product Development System Integrator contract with CGI Federal.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security	Option/ Various	CGI Federal & PdM ACWS : ARL CSSP in AWS GovCloud West	1.500	1.507	Oct 2018	1.206	Oct 2019	0.753	Oct 2020	-		0.753	0.000	4.966	-
		Subtotal	1.500	1.507		1.206		0.753		-		0.753	0.000	4.966	N/A

Remarks

FY2021 projected costs include Information Assurance (IA)/ Risk Management Framework (RMF) activities, and required services from a Cyber Security Support Provider (Army Research Lab) for the Cloud Solution Provider's government approved hosting environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	ATEC & JTIC : TBD	0.200	1.007	Oct 2018	2.206	Oct 2019	0.918	Oct 2020	-		0.918	0.000	4.331	-
		Subtotal	0.200	1.007		2.206		0.918		-		0.918	0.000	4.331	N/A

Remarks

FY2021 projected costs include integrated testing activities with the Army Test and Evaluation Command (ATEC) and the Joint Interoperability Test Command (JITC) to achieve a Full Deployment decision(s).

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.442	40.341		17.082		22.860		-		22.860	0.000	119.725	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

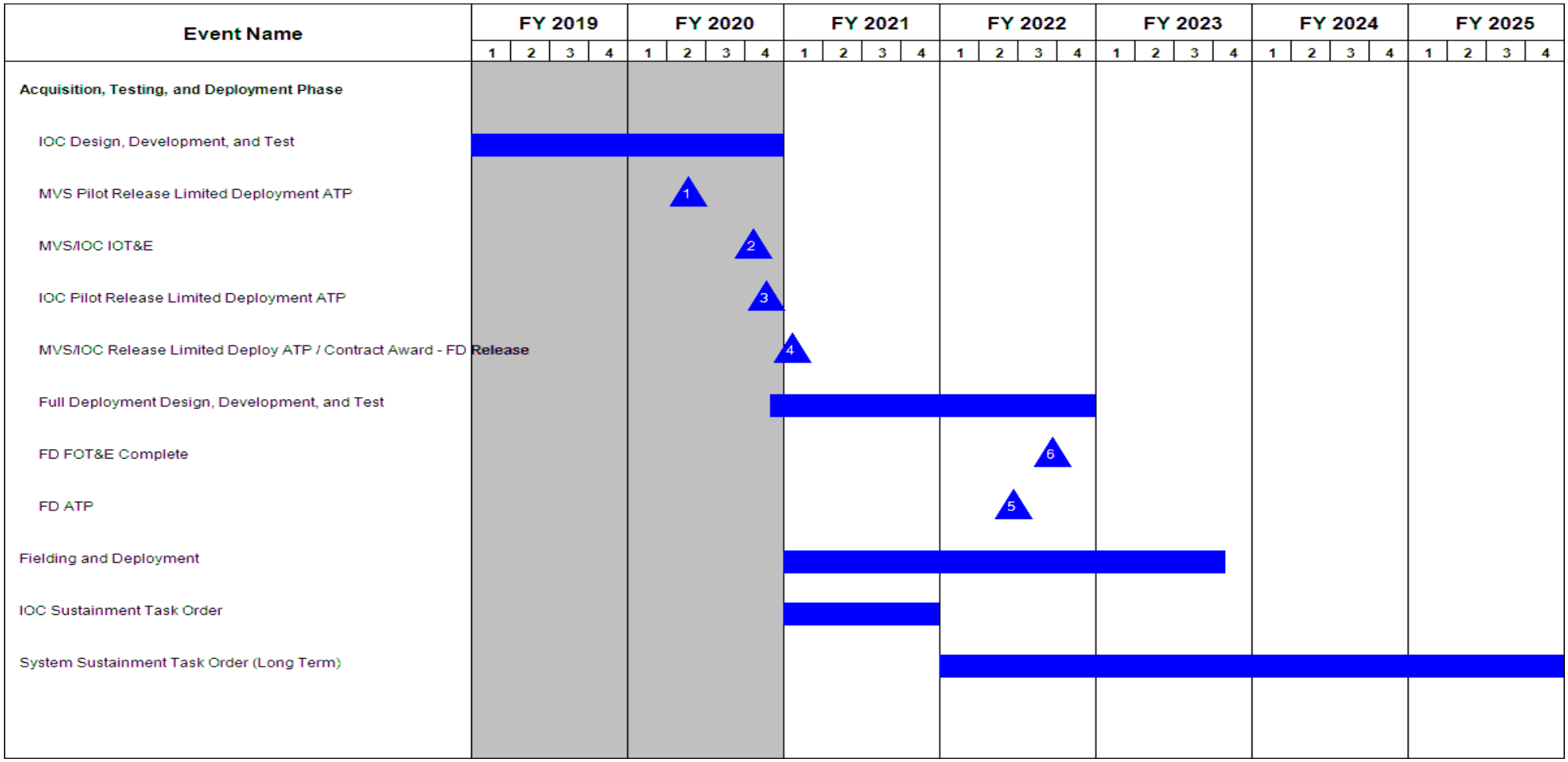

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
RFP Release ADM (Material Solution Analysis Phase)	3	2016	3	2016
ATP-1 (MS A) / Contract Award - Task Order 0001	3	2017	3	2017
Risk Reduction Activities	3	2017	4	2018
Acquisition, Testing, and Deployment Phase	3	2016	2	2022
IOC Design, Development, and Test	4	2018	4	2020
Baseline ATP / Contract Award - MVS/IOC Release Task Order	4	2018	4	2018
MVS Pilot Release Limited Deployment ATP	2	2020	2	2020
MVS/IOC IOT&E	4	2020	4	2020
IOC Pilot Release Limited Deployment ATP	4	2020	4	2020
MVS/IOC Release Limited Deploy ATP / Contract Award - FD Release	1	2021	1	2021
Full Deployment Design, Development, and Test	4	2020	4	2022
FD FOT&E Complete	3	2022	3	2022
FD ATP	2	2022	2	2022
Fielding and Deployment	1	2021	4	2023
IOC Sustainment Task Order	1	2021	4	2021
System Sustainment Task Order (Long Term)	1	2022	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605049A *I Missile Warning System Modernization (MWSM)*							
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	-	7.321	1.539	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.860
XT4: *Advanced Threat Detection System (ATDS)*	-	7.321	1.539	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.860

A. Mission Description and Budget Item Justification

The Missile Warning System Modernization (MWSM) budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA) and Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

ATDS will provide enhanced missile warning capabilities for current and future Army rotary-wing, small fixed wing, tilt-rotor platforms, and Special Operations rotary wing aircraft. Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	8.266	1.539	1.551	-	1.551
Current President's Budget	7.321	1.539	0.000	-	0.000
Total Adjustments	-0.945	0.000	-1.551	-	-1.551
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.945	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.551	-	-1.551

Change Summary Explanation

FY 2021 funding was decreased in response to rescission of the Materiel Development Decision (MDD) Request Memo on December 17, 2018. Prior to the rescission, the Army Acquisition Executive (AAE) was briefed October 22, 2018. Determination was the Army has shifted focus to Future Vertical Lift (FVL) in the Aviation arena. ATDS capability no longer aligns with the current focus and will not be pursued at this time. Remaining prior year funding supports enhanced market research and future missile warning system studies to assess existing and/or proposed technologies available for future development.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / *Missile Warning System Modernization (MWSM)*	Project (Number/Name) XT4 / *Advanced Threat Detection System (ATDS)*	

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
XT4: *Advanced Threat Detection System (ATDS)*	-	7.321	1.539	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.860
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Advanced Threat Detection System (ATDS) capability no longer aligns with the current Army focus and will not be pursued at this time; therefore there are no funding requirements for Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

The Missile Warning System Modernization (MWSM) budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA) and Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

ATDS will provide enhanced missile warning capabilities for current and future Army rotary-wing, small fixed wing, tilt-rotor platforms, and Special Operations rotary wing aircraft. Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

Justification: FY 2021 was reduced to $0 in response to the December 17, 2018 Material Development Decision (MDD) Request Memo rescission.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: FY19 Rescission	6.776	-	-
Title: ATDS ***Description:*** Enhanced market research for Future Vertical Lift (FVL). ***FY 2020 Plans:*** FY 2020 Base Research Development Technology & Evaluation (RDT&E) funding in the amount of $1.539 million funded enhanced market research activities to assess existing and/or proposed technologies available for future development. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** ATDS capability no longer aligns with the current Army focus and will not be pursued at this time; therefore there are no funding requirements for FY 2021.	0.545	1.469	-
Title: FY 2020 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638	-	0.070	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

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	7.321	1.539	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

ATDS Materiel Development Decision (MDD) Request Memo was rescinded on December 17, 2018. Prior to the rescission, the Army Acquisition Executive (AAE) was briefed October 22, 2018. Determination was the Army has shifted focus to FVL in the Aviation arena. ATDS capability no longer aligns with the current focus and will not be pursued at this time. Remaining prior year funding supports enhanced market research and future missile warning system studies to assess existing and/or proposed technologies available for future development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / *Missile Warning System Modernization (MWSM)*	Project (Number/Name) XT4 / *Advanced Threat Detection System (ATDS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Program Management - SEPM	TBD	PM ASE : HSV, AL	1.291	0.545	Jan 2019	1.469	Oct 2019	-		-		-	0.000	3.305	Continuing
FY19 Rescission	TBD	Various : Various	-	6.776		-		-		-		-	0.000	6.776	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.070		-		-		-	0.000	0.070	-
		Subtotal	1.291	7.321		1.539		-		-		-	0.000	10.151	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.291	7.321		1.539		-		-		-	0.000	10.151	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

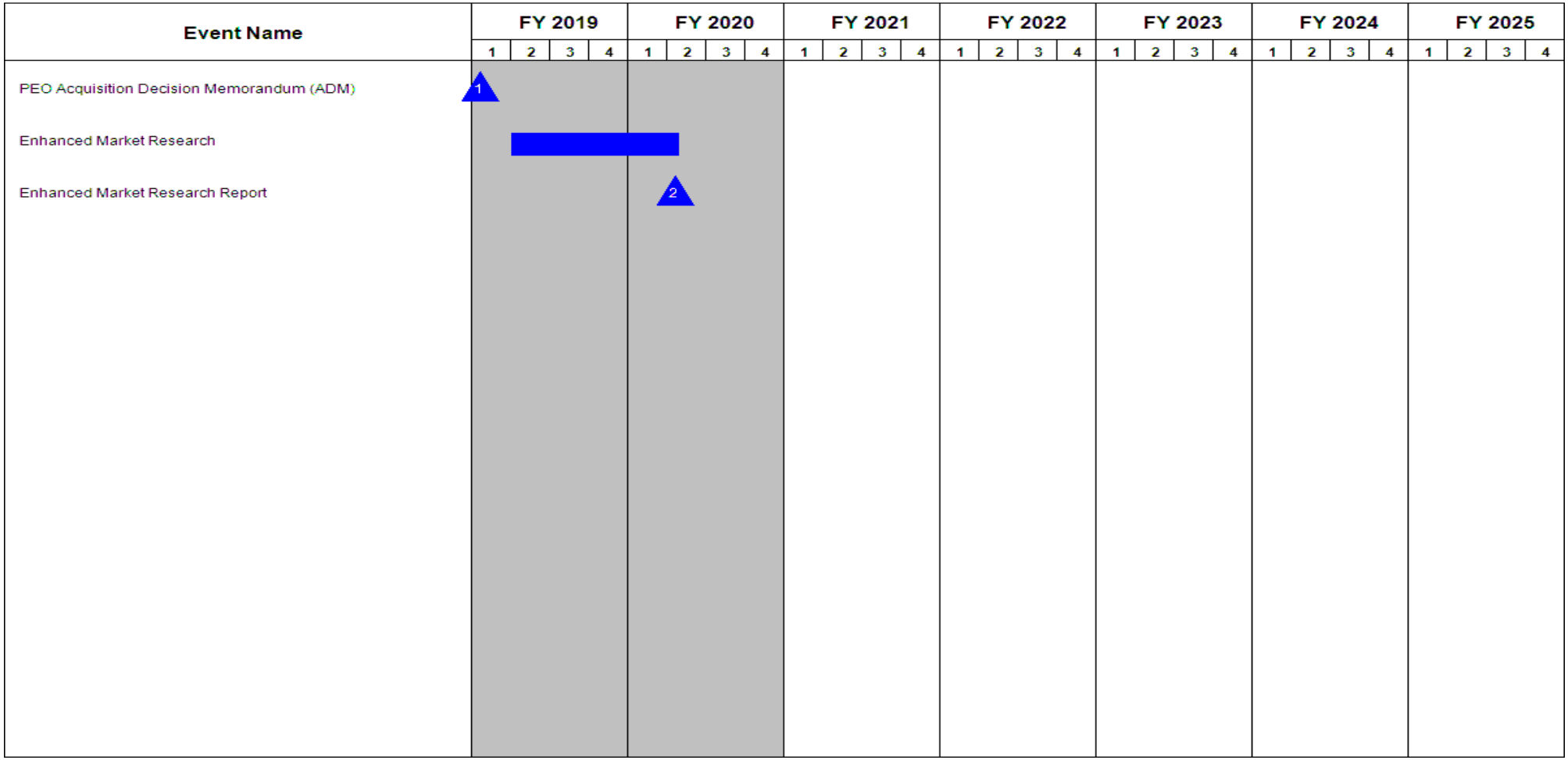

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PEO Acquisition Decision Memorandum (ADM)	1	2019	1	2019
Enhanced Market Research	2	2019	2	2020
Enhanced Market Research Report	2	2020	2	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability 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	-	56.067	132.477	35.893	64.625	100.518	51.255	18.689	16.171	13.028	0.000	388.205
ER7: *Aircraft Survivability Equipment Development*	-	15.551	49.272	32.307	-	32.307	43.009	11.809	8.232	7.843	0.000	168.023
ER8: *Common Missile Warning System (CMWS)*	-	40.516	83.205	3.586	64.625	68.211	8.246	6.880	7.939	5.185	0.000	220.182

A. Mission Description and Budget Item Justification

The Aircraft Survivability Development budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA), Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

The Aircraft Survivability Development program includes Projects titled Aircraft Survivability Equipment Development (ER7) and Common Missile Warning System (ER8). This program also includes funding for Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a, Headquarters Department of the Army (HQDA) Directed Requirement for Advanced Threat Warner (ATW) portion of Phase 3 ATW/Common Infrared Countermeasures Quick Reaction Capability (ATW/CIRCM QRC), and Limited Interim Missile Warning System Quick Reaction Capability (LIMWS QRC).

ER7: Aircraft Survivability Development.
The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army Aviation. APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) for AN/APR-39A(V) Radar Warning Receiver (RWR) implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, APR-39E(V)2, Modernized Radar Warning Receiver (MRWR), is an Army Engineering Change Proposal (ECP) to APR-39D(V)2, approved in the Acquisition Decision Memorandum (ADM) signed June 24, 2019, by Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S). This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) capability for selected aircraft; Material Development Decision (MDD) for this ECM capability phase is planned for 4 Quarter (Q) Fiscal Year (FY) 2020.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605051A *I Aircraft Survivability Development*

Justification: FY 2021 Base Research Development Technology & Evaluation (RDT&E) funding of $32.338 million supports APR-39E(V)2 hardware and software system development, prototyping, platform integration, initial system government qualification and performance testing.

ER8: Common Missile Warning System (CMWS).
The CMWS program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Inrared (IR)-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions and ensure protection against emerging IR-guided missile threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

As a part of Phase 2a of the JUONS (SO-0010) program, the Army integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Army and Special Operations Aircraft (SOA) platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning/CIRCM QRC and Limited Interim Missile Warning System (LIMWS) Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system when available.

Phase 4 LIMWS QRC addressess the HQDA Directed Requirement to provide a greater capability than the current Program of Record (POR), CMWS, to bridge the gap between CMWS and the future POR. LIMWS is required in order to maintain overmatch of quickly emerging threat technology and tactics by providing increased detection range, improved detection in clutter, more agile algorithms to rapidly respond to emerging threats, and eliminates the need for sensor alignments.

Justification:
CMWS: FY 2021 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $3.589 million funds Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, and Systems Engineering Program Management (SEPM).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605051A *I Aircraft Survivability Development*

Phase 4 LIMWS QRC: FY 2021 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $64.625 million funds development, engineering support and test of platform integration hardware and software for Army and Special Operations aircraft.

References:
- Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
- Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
- Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW/CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
- Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, March 26, 2017
- Update to the Directed Requirement for the United States Special Operations Command Joint Urgent Operational Needs SO-0010 Threat Detection and Countermeasures to Enemy Man Portable Air Defense System Capability, November 16, 2018
- Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, November 16, 2018
- Aircraft Survivability Equipment (ASE) Modernization Fielding Guidance, Change 1, November 19, 2018
- Acquisition Decision Memorandum (ADM) for Radio Frequency (RF) Project Manager Aircraft Survivability Equipment (PM ASE) Engineering Change Proposal (ECP) for Radar Warning Receiver AN/APR39-D(V)2 to AN/APR39-E(V)2, June 24, 2019 by PEO IEW&S.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	56.871	141.977	92.449	-	92.449
Current President's Budget	56.067	132.477	35.893	64.625	100.518
Total Adjustments	-0.804	-9.500	-56.556	64.625	8.069
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-9.500			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.804	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-56.556	64.625	8.069

Change Summary Explanation

In FY 2021, Reimbursable Manpower for this line has been realigned from Reimbursable Civilian Funding to Direct Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment 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
ER7: *Aircraft Survivability Equipment Development*	-	15.551	49.272	32.307	-	32.307	43.009	11.809	8.232	7.843	0.000	168.023
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Survivability Equipment Development budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA), Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of APR-39A(V) Radar Warning Receiver (RWR) implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, the APR-39E(V)2, Modernized Radar Warning Receiver (MRWR), is an Army Engineering Change Proposal (ECP) to APR-39D(V)2, approved in the Acquisition Decision Memorandum (ADM) signed June 24, 2019, by Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S). This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) capability for selected aircraft; Material Development Decision (MDD) for this ECM capability phase is planned for 4 Quarter (Q) Fiscal Year (FY) 2020.

Justification: FY 2021 Base Research Development Technology & Evaluation (RDT&E) funding of $32.338 million supports APR-39E(V)2 hardware and software system development, prototyping, platform integration, initial system government qualification, and performance testing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Phase 2 Radio Frequency Countermeasure (CM)	15.551	47.035	32.307	-	32.307
Description: Phase 2 RWR Modernization					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: Funded APR-39E(V)2 hardware and software development, prototyping, and integration. ***FY 2021 Base Plans:*** Will fund APR-39E(V)2 hardware and software system development, prototyping, platform integration, initial system government qualification and performance testing. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 includes decreased Base RDTE funding as APR-39E(V)2 is maturing in its system development.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	2.237	-	-	-
Accomplishments/Planned Programs Subtotals	15.551	49.272	32.307	-	32.307

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• AZ3511: *Radio Frequency CM*	45.103	46.353	41.890	-	41.890	57.184	160.146	140.710	78.940	0.000	570.326

Remarks

D. Acquisition Strategy

Army Radio Frequency (RF) ASE is managed by Project Manager ASE (PM ASE) for development, testing, procurement, integration and installation on Army rotary wing and fixed wing Special Electronic Mission Aircraft (SEMA) aviation platforms. PM ASE proposed a three-phased path forward commensurate with user priorities and affordability considerations. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, addresses obsolescence/Diminishing Manufacturing Sources (DMS) issues associated with the currently fielded AN/APR-39A(V) Radar Warning Receiver (RWR) via sole source Engineering Change Proposal (ECP) awarded to the APR-39A(V) manufacturer.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, APR-39E(V)2, Modernized Radar Warning Receiver (MRWR), is an Army Engineering Change Proposal (ECP) to APR-39D(V)2, approved in the Acquisition Decision Memorandum (ADM) signed June 24, 2019, by PEO IEW&S. This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats.

Phase 3 will develop and integrate active Electronic Countermeasures (ECM) capability for selected aircraft; Material Development Decision (MDD) for this ECM capability phase is planned for 4Q FY 2020.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Management	Various	Various : -	9.123	0.501	Nov 2018	1.288	Nov 2019	1.459	Nov 2020	-		1.459	Continuing	Continuing	-
Project Management	Various	Various : -	1.853	0.073	Nov 2018	0.032	Nov 2019	-		-		-	Continuing	Continuing	-
NDAA SEC 825 MDAP Cost Overrun	Various	Various : Various	-	0.028		-		-		-		-	0.000	0.028	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		2.237		-		-		-	0.000	2.237	-
		Subtotal	10.976	0.602		3.557		1.459		-		1.459	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Radar Warning Receiver (RWR) (D(V)2)	Various	Lab Demo / Study : Various	10.634	-		-		-		-		-	Continuing	Continuing	-
APR-39E(V)2 SW & HW Development	Various	OGA : Aberdeen Proving Grounds, MD	33.046	14.791	Dec 2018	44.696	Jan 2020	18.336	Oct 2020	-		18.336	Continuing	Continuing	-
Threat and Vulnerabllity Analysis/Sil Updates	MIPR	I2WD : Aberdeen Proving Grounds, MD	2.547	-		-		-		-		-	Continuing	Continuing	-
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.063	-		-		-		-		-	0.000	1.063	-
APR-39E(V)2 Platform Integration	Various	Multiple : -	4.552	-		1.019	Jan 2020	1.064	Jan 2021	-		1.064	Continuing	Continuing	-
		Subtotal	51.842	14.791		45.715		19.400		-		19.400	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support	Various	Various : -	4.685	-		-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	Various	Various : -	6.800	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	11.485	-		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT/OT	Various	Various : -	3.439	-		-		-		-		-	Continuing	Continuing	-
Government System Test and Evaluation	Various	Various : -	20.809	0.158	Mar 2019	-		11.448	Mar 2021	-		11.448	Continuing	Continuing	-
		Subtotal	24.248	0.158		-		11.448		-		11.448	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	98.551	15.551		49.272		32.307		-		32.307	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

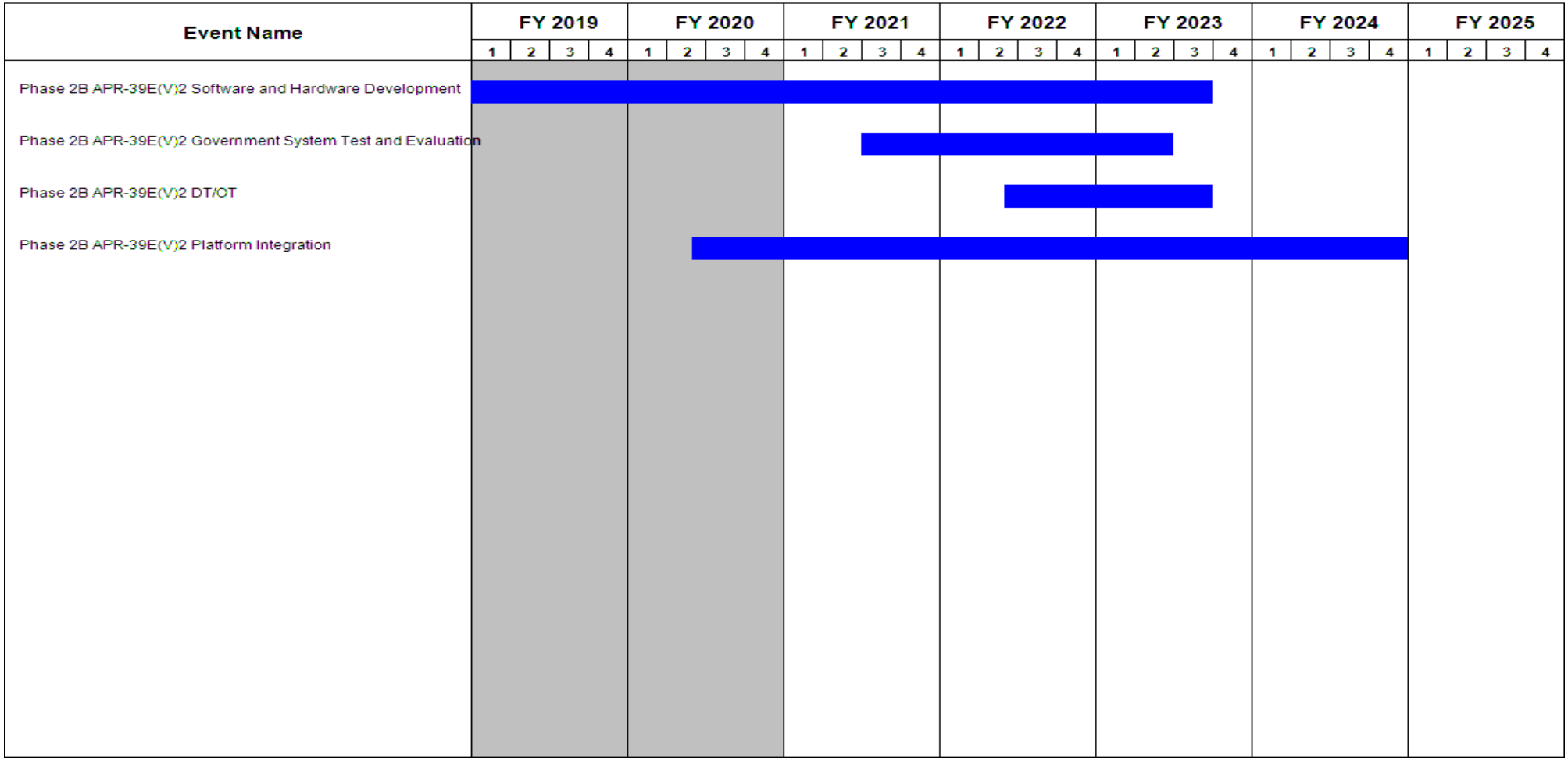

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Threat Vulnerability Analysis//SIL Updates	3	2016	4	2017
Phase 2B APR-39E(V)2 Software and Hardware Development	2	2018	3	2023
Phase 2B APR-39E(V)2 Government System Test and Evaluation	3	2021	2	2023
Phase 2B APR-39E(V)2 DT/OT	2	2022	3	2023
Phase 2B APR-39E(V)2 Platform Integration	2	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER8 / *Common Missile Warning System (CMWS)*	

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
ER8: *Common Missile Warning System (CMWS)*	-	40.516	83.205	3.586	64.625	68.211	8.246	6.880	7.939	5.185	0.000	220.182
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Missile Warning System (CMWS) budget line includes funding to support the development and integration of Aircraft Survivability Equipment (ASE) products onto Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA), Future Long Range Assault Aircraft (FLRAA) aircraft variants and future platforms.

The CMWS program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Inrared (IR)-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions and ensure protection against emerging IR-guided missile threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

As a part of Phase 2a of the JUONS (SO-0010) program, the Army integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Army and Special Operations Aircraft (SOA) platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning/CIRCM QRC and Limited Interim Missile Warning System (LIMWS) Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system when available.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

Phase 4 LIMWS QRC addresses the HQDA Directed Requirement to provide a greater capability than the current Program of Record (POR), CMWS, to bridge the gap between CMWS and the future POR. LIMWS is required in order to maintain overmatch of quickly emerging threat technology and tactics by providing increased detection range, improved detection in clutter, more agile algorithms to rapidly respond to emerging threats, and eliminates the need for sensor alignments.

CMWS: Fiscal Year (FY) 2021 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $3.589 million will fund development engineering of Threat and Vulnerability Analysis, Future Sensor and Algorithm Analysis, and Systems Engineering Project Management (SEPM).

Phase 4 LIMWS: FY 2021 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $64.625 million are required to fund development, engineering support, and test of platform integration hardware and software for Army and Special Operations aircraft.

References:
- Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
- Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
- Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW/CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
- Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, March 26, 2017
- Update to the Directed Requirement for the United States Special Operations Command Joint Urgent Operational Needs SO-0010 Threat Detection and Countermeasures to Enemy Man Portable Air Defense System Capability, November 16, 2018
- Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, November 16, 2018
- Aircraft Survivability Equipment (ASE) Modernization Fielding Guidance, Change 1, November 19, 2018

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: CMWS product development and management services	5.583	5.697	3.586	-	3.586
Description: RDTE funding supports continuing development engineering threat and vulnerability analysis, System Engineering Program Management (SEPM), and integration with other ASE Systems.					
FY 2020 Plans: FY 2020 Base RDTE dollars in the amount of $5.785 million funded Product Development - Threat and Vulnerability Analysis and Management Services - CMWS Systems Engineering Program Management.					
FY 2021 Base Plans: FY 2021 Base RDTE dollars in the amount of $3.589 million will fund Product Development - Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis and Management Services - CMWS SEPM.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2021 includes decreased funding for CMWS product development and management services.					
Title: Phase 3 CIRCM QRC OCO ***Description:*** Phase 3 CIRCM QRC will achieve a reduction in Size, Weight, and Power (SWaP). ***FY 2020 Plans:*** There is no FY 2020 Base funding for this effort. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** There are no funding requirements for FY 2021.	5.110	2.132	-	-	-
Title: Phase 4 LIMWS QRC ***Description:*** Phase 4 Limited Interim Missile Warning System (LIMWS) is a follow-on bridging solution to the JUONS SO-0010 to provide a greater capability than the current Program of Record (POR), CMWS, until the future POR is available. LIMWS is a Chief of Staff of the Army approved Directed Requirement issued by Army G-8 on March 26, 2017. LIMWS QRC provides an enhanced missile warning system to detect emerging and evolving enemy Man Portable Air Defense Systems (MANPADS) threats. FY 2021 funding is required to complete system development and conduct integration and system level testing as well as develop and test platform specific hardware (A-Kits) for integration of the LIMWS system onto Army and Special Operations Aviation Requirement (SOAR) aircraft. ***FY 2020 Plans:*** There is no FY 2020 Base funding for this effort. ***FY 2021 Base Plans:*** There is no FY 2021 Base funding for this effort. ***FY 2021 OCO Plans:*** FY 2021 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $64.625 million funds development, engineering support and test of platform integration hardware and software for Army and Special Operations aircraft. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The FY 2021 decrease in OCO funding is primarily due to completion of testing for the lead platform (UH-60M) while development for integration onto other ARMY and SOAR platforms continue.	29.823	75.113	0.000	64.625	64.625
Title: FY 2020 SBIR/STTR Transfer	-	0.263	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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	40.516	83.205	3.586	64.625	68.211

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• AZ3517: *CMWS*	97.883	144.218	10.567	149.162	159.729	10.030	8.268	8.506	8.412	0.000	437.046

Remarks

D. Acquisition Strategy

CMWS: Procurement of US Government CMWS A-Kit and B-Kits are complete. CMWS is managed as Mission Equipment for deploying units and fielded as directed by Army G-3/5/7. The CMWS program will continue to be supported through a five year services-only Cost Plus Fixed Fee or Cost Plus Incentive Fee contract, with services to begin by September 2019.

Phase 2a JUONS DoN LAIRCM and Phase 3 CIRCM QRC: JUONS S0-0010 acquisition strategy includes aircraft prime contractor engineering support contracted to a Government test organization. Aircraft integration for JUONS will be handled through government operated organizations and industry partners.

Phase 4 LIMWS QRC: Acquisition strategy included a full and open competition for selection of prime vendor for development of B-Kit and development of A-Kit and support testing for the lead program. Additional platform A-Kit development will be handled by government organizations and industry partners.

Threat and Vulnerability Analysis combines the same efforts as Vulnerability Analysis and Assessment of Technologies (VAAT) and Threat Analysis Database (TAD). Results from threat and vulnerability analysis efforts will be used to determine if an algorithm update is required to maintain missile warning threat overmatch and provide input to improve US Government authoritative threat modeling updates.

Future Sensor Algorithm Analysis is critically important because this program element supports the entire Missile Warning portfolio. Future sensor algorithm analysis and development equally supports MANPADS and Hostile Fire overmatch.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

CMWS Systems Engineering Program Management is necessary due to the nature of emerging and current threat(s). Threat(s) analyses include, when required, collaboration support with intelligence organizations, course of action planning, root cause investigations, threat and laboratory hardware maintenance, and lab tools upgrade to support specific performance analyses.

Develop Model Based System Engineering (MBSE) models of CMWS and LIMWS which will align to Program Executive Office Aviation (PEO AVN) system engineering models that will be used to support integration of ASE products onto Future Vertical Lift Future Attack Reconnaissance Aircraft (FARA) and Future Long Range Assault Aircraft (FLRAA) aircraft variants.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	8.885	0.586	Jan 2019	0.549	Jan 2020	0.750	Jan 2020	-		0.750	Continuing	Continuing	Continuing
Advanced Missile Warning System Systems Engineering Program Management	TBD	TBD : TBD	2.000	-		-		-		-		-	0.000	2.000	-
JUONS SO-0010 Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	1.627	-		-		-		-		-	0.000	1.627	-
CIRCM QRC Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	8.144	-		-		-		-		-	Continuing	Continuing	Continuing
LIMWS - SEPM	Various	Various : PM ASE, HSV, AL	6.856	-		-		-		-		-	0.000	6.856	-
SBIR / STTR Transfer	TBD	Various : Various	-	0.212		-		-		-		-	0.000	0.212	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.263		-		-		-	0.000	0.263	-
		Subtotal	27.512	0.798		0.812		0.750		-		0.750	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS tier 2/3 Upgrades	Various	Various : -	2.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database Design	Various	BAE : Various	0.455	-		-		-		-		-	0.000	0.455	-
CMWS Threat Analysis Database (TAD)	Various	BAE : Various	6.119	-		-		-		-		-	0.000	6.119	-
CMWS Enhanced Sensor Study & Evaluation	Various	Various : -	11.466	-		-		-		-		-	0.000	11.466	-
CMWS Data Modeling	TBD	Various : Various	0.688	-		-		-		-		-	0.000	0.688	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Future Sensor and Algorithm Analysis	Various	Various : TBD	2.624	1.934	Mar 2019	2.112	Mar 2020	1.282	Mar 2020	-		1.282	0.000	7.952	-
CMWS Prime Contractor--Integration Engineering	TBD	TBD,TBD : TBD	7.787	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Aircraft Integration	TBD	Various : Various	19.974	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Software	TBD	Various : Various	3.000	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Prime Contractor -- Integration Engineering	Various	Various : Various	8.842	-		-		-		-		-	0.000	8.842	-
JUONS SO-0010 Software	Various	Various : Various	1.534	-		-		-		-		-	0.000	1.534	-
JUONS SO-0010 Training	Various	Various : Various	0.200	-		-		-		-		-	0.000	0.200	-
CIRCM QRC Development Engineering	Various	Northrup Grumman : Rolling Meadow, IL	5.100	-		-		-		-		-	0.000	5.100	-
CIRCM QRC System Development and Qualification	Various	Various : Various	53.474	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Aircraft Integration	Various	Various : Various	24.223	-		-		-		-		-	Continuing	Continuing	Continuing
Limited Interim Missile Warning System (LIMWS) - Development Engineering	Various	Various : PM ASE, HSV, AL	118.263	10.828		35.925	Mar 2020	0.000		45.585	Mar 2021	45.585	0.000	210.601	-
CMWS Threat and Vulnerability Analysis	Various	Various : TBD	2.612	2.851	Mar 2019	3.011	Mar 2020	1.554	Mar 2020	-		1.554	Continuing	Continuing	Continuing
		Subtotal	268.361	15.613		41.048		2.836		45.585		48.421	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIMWS - Matrix Support	Various	Various : PM ASE, HSV, AL	6.438	0.307		2.148	Jan 2020	0.000		2.170	Jan 2021	2.170	0.000	11.063	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIMWS - Contractor Support	Various	Various : PM ASE, HSV, AL	6.032	-		-		0.000		3.797	Jan 2021	3.797	0.000	9.829	-
		Subtotal	12.470	0.307		2.148		0.000		5.967		5.967	0.000	20.892	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Test and Evaluation	TBD	Various : Various	16.156	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Test and Evaluation	Various	Various : Various	26.709	-		-		-		-		-	0.000	26.709	-
CIRCM QRC Test and Evaluation/Tech Manuals	Various	Various : Various	27.720	5.110		2.182	Mar 2020	-		-		-	Continuing	Continuing	Continuing
LIMWS - Government Testing	Various	Various : PM ASE, HSV, AL	4.145	18.688		37.015	Mar 2020	0.000		13.073	Mar 2021	13.073	0.000	72.921	-
		Subtotal	74.730	23.798		39.197		0.000		13.073		13.073	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	383.073	40.516		83.205		3.586		64.625		68.211	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

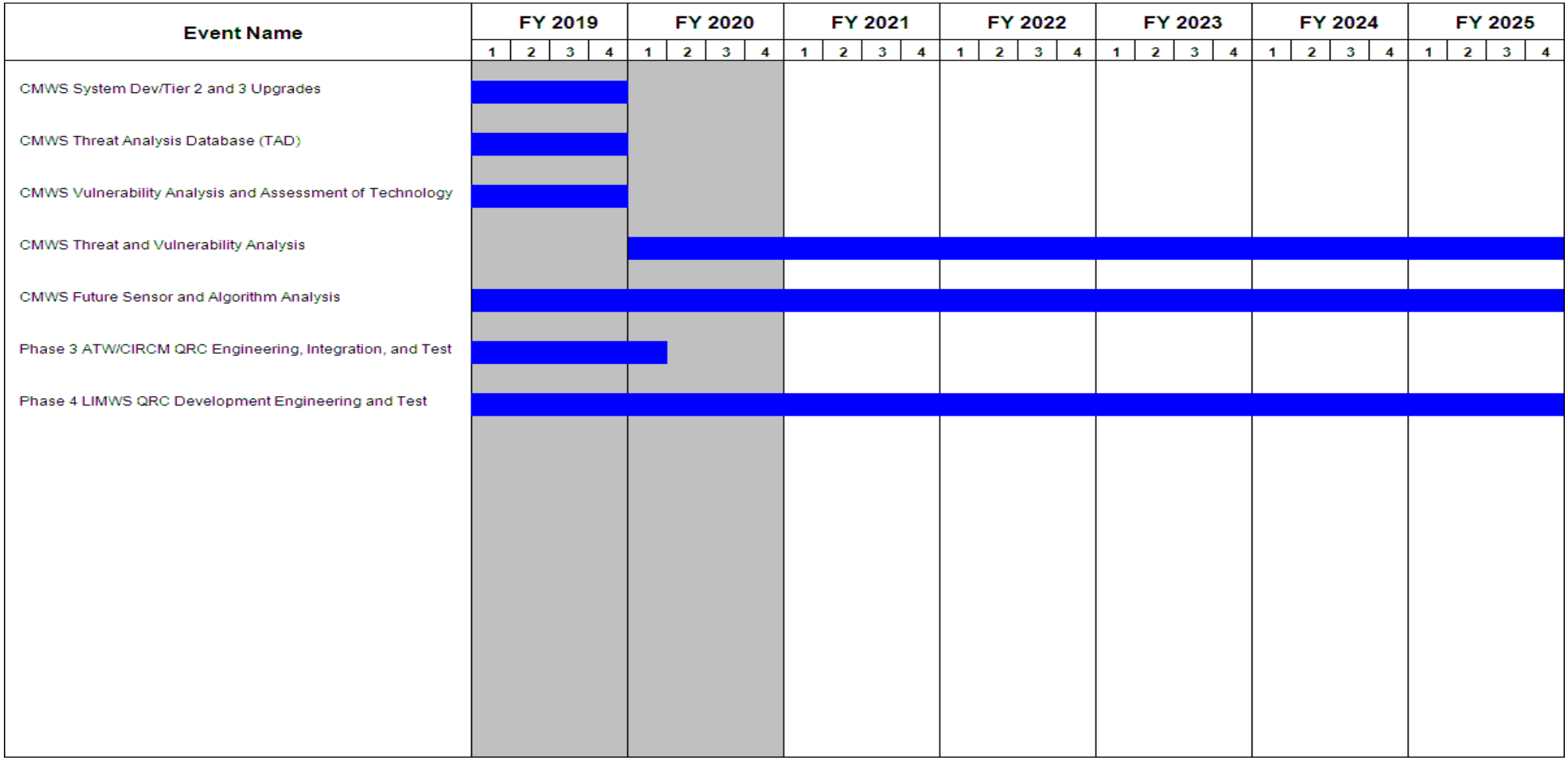

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CMWS System Dev/Tier 2 and 3 Upgrades	2	2011	4	2019
CMWS Gen 3 Production	3	2012	4	2016
CMWS Threat Analysis Database (TAD)	2	2012	4	2019
CMWS Vulnerability Analysis and Assessment of Technology	2	2015	4	2019
CMWS Threat and Vulnerability Analysis	1	2020	4	2025
CMWS Future Sensor and Algorithm Analysis	1	2017	4	2025
Phase 3 ATW/CIRCM QRC Engineering, Integration, and Test	2	2016	1	2020
Phase 4 LIMWS QRC Development Engineering and Test	3	2017	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605052A *I Indirect Fire Protection Capability Inc 2 - Block 1*							
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	-	92.674	194.366	235.770	-	235.770	341.077	181.830	98.210	13.639	0.000	1,157.566
EY7: *IFPC Increment 2 - Block 1*	-	92.674	194.366	235.770	-	235.770	341.077	181.830	98.210	13.639	0.000	1,157.566

A. Mission Description and Budget Item Justification

The Indirect Fire Protection Capability Increment 2 (IFPC Inc 2) will provide a ground-based weapon system designed to acquire, track, engage, and defeat Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. The IFPC Inc 2 system consists of a launcher and interceptor integrated with the Army Integrated Air and Missile Defense (AIAMD) open systems architecture, IAMD Battle Command System (IBCS), and the Sentinel sensor to support the Threshold CM and UAS defeat mission. The Objective counter-RAM mission employs both alternative kinetic and non-kinetic defeat solutions.

In Fiscal Year (FY) 2018, the Army evaluated alternative strategies to address an Army interim CM defense (CMD) capability at critical strategic fixed site locations while continuing the development of an IFPC capability. On 5 December 2019, the Army signed a contract with the Israeli Missile Defense Organization (IMDO) for two Interim CMD (Iron Dome) Batteries. For each of the interim capability's Iron Dome Batteries, the Army intends to employ a configuration that matches the Israeli Firing Unit.

The IFPC Inc 2 program will conduct Iron Dome experimentation to determine the ability of the two standalone interim CMD Iron Dome Batteries to interoperate with the US Army's Air and Missile Defense (AMD) Architecture including the Army's IBCS command and control (C2) network.

Concurrently with the Interim CMD assessment, the Army will develop a launcher and interceptor solution that is integrated with the IBCS and the Sentinel sensor. The Army's decision for the IFPC Inc 2 capability will decide between an U.S. industry-based CMD launcher/interceptor and a componentized Iron Dome launcher/ TAMIR-class interceptor. The Army will utilize a tailored acquisition approach to evaluate new capability and provide residual operational capability in FY 2023 and then transition into procurement and field by FY 2025.

FY 2021 Base dollars in the amount of $235.770 million are designated for experimentation with the interim CM capability and the development and integration of the IFPC Inc 2 system.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605052A *I Indirect Fire Protection Capability Inc 2 - Block 1*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	132.283	243.228	101.000	-	101.000
Current President's Budget	92.674	194.366	235.770	-	235.770
Total Adjustments	-39.609	-48.862	134.770	-	134.770
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-48.862			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-39.609	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	134.770	-	134.770

Change Summary Explanation

In FY 2021, $135.000 million has been realigned from IFPC Procurement funding line (C62002000) to align with enduring IFPC Inc 2 development and integration requirements.

In FY 2021, $1.024 million in Reimbursable Manpower for this line has been realigned from Reimbursable Civilian Funding to Direct Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

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
EY7: *IFPC Increment 2 - Block 1*	-	92.674	194.366	235.770	-	235.770	341.077	181.830	98.210	13.639	0.000	1,157.566
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Indirect Fire Protection Capability Increment 2 (IFPC Inc 2) will provide a ground-based weapon system designed to acquire, track, engage, and defeat Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. The IFPC Inc 2 system consists of a launcher and interceptor integrated with the Army Integrated Air and Missile Defense (AIAMD) open systems architecture, IAMD Battle Command System (IBCS), and the Sentinel sensor to support the Threshold CM and UAS defeat mission. The Objective counter-RAM mission employs both alternative kinetic and non-kinetic defeat solutions.

In Fiscal Year (FY) 2018, the Army evaluated alternative strategies to address an Army interim CM defense (CMD) capability at critical strategic fixed site locations while continuing the development of an IFPC capability. On 5 December 2019, the Army signed a contract with the Israeli Missile Defense Organization (IMDO) for two Interim CMD (Iron Dome) Batteries. For each of the interim capability's Iron Dome Batteries, the Army intends to employ a configuration that matches the Israeli Firing Unit.

The IFPC Inc 2 program will conduct Iron Dome experimentation to determine the ability of the two standalone interim CMD Iron Dome Batteries to interoperate with the US Army's Air and Missile Defense (AMD) Architecture including the Army's IBCS command and control (C2) network.

Concurrently with the Interim CMD assessment, the Army will develop a launcher and interceptor solution that is integrated with the IBCS and the Sentinel sensor. The Army's decision for the IFPC Inc 2 capability will decide between an U.S. industry-based CMD launcher/interceptor and a componentized Iron Dome launcher/ TAMIR-class interceptor. The Army will utilize a tailored acquisition approach to evaluate new capability and provide residual operational capability in FY 2023 and then transition into procurement and field by FY 2025.

FY 2021 Base dollars in the amount of $235.770 million are designated for the development and integration of the IFPC Inc 2 system.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Interim CMD (Iron Dome) Integration and Testing	55.827	70.231	13.675	-	13.675
Description: Funding is provided to support the assessment of operational utility and safety of the Iron Dome system as an Interim IFPC Inc 2 capability					
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continued Research Development Technology & Evaluation (RDT&E) efforts associated with Interim IFPC Inc 2 CMD system integration and testing - Conduct interoperability experimentation and follow-on system engineering and software development efforts to enable Interim CMD (Iron Dome) system to interoperate with United States (US) systems utilizing a US external command and control system - Continued review and analysis of prior Israeli Iron Dome Test events for applicability to US test requirements (Environmental tests, Electromagnetic Environmental Effects tests, Insensitive Munitions tests and assessments, Health Hazard tests, Functional Hazard Analysis, Explosive Hazard Classification tests, Hazardous Materials Assessment) for each major End Item and support vehicles of the system - Continued Cyber Security Analysis activities to obtain Authority to Operate - Conducted Safety Testing of Interim IFPC Inc 2 system - Conducted Performance Analysis and Testing of Interim IFPC Inc 2 system - Conducted Capabilities and Limitations Testing of Interim IFPC Inc 2 system - Continued US hardware, software, and interface development and integration - Continued System Performance Assessment and Modeling and Simulation efforts - Continued US hardware, software, and interface development and integration - Continued system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Continued Risk Management activities - Continued logistics assessments to determine training requirements, fielding requirements, spares packages, and required documentation - Conducted Reliability Data Analysis (Operational Availability, Failure Reports, missile BIT results) for the system and each major End Item and support vehicle of the system - Conducted Verification and Validation of Training Support Package Materials for all system major End Items equipment and support vehicles of the system - Conducted CLS for test articles					
FY 2021 Base Plans: - Continue Performance Analysis of Interim IFPC Inc 2 systems - Continue Logistics Assessments - Continue system engineering, integration, logistics engineering, system evaluation management, technical configuration control, and business management activities					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue assessment of Interim IFPC Inc 2 systems launcher and interceptor interoperability with US command and control system - Continue interoperability system engineering and software development efforts to enable Interim CMD (Iron Dome) system to interoperate with United States (US) systems utilizing a US external command and control system ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Interim IFPC enters Operational Assessment in FY 2021. Funding requirements decrease to completion of required interim capability qualification and testing.					
Title: IFPC Inc 2 Integration and Testing ***Description:*** Funding is provided to support the development, integration, and testing of the IFPC Inc 2 capability FY 2021 - The IFPC program is pending a materiel solution decision that impacts the RDTE resources and their required allocations. Therefore, IFPC funding is not detailed in the accompanying R-3. ***FY 2020 Plans:*** - Continued RDT&E efforts associated with Enduring IFPC Inc 2 development - Conducted modified prototype launcher and interceptor All-up Round Magazine experimentation with IBCS and Sentinel Radar - Initiated detailed design activities following the US Army final Decision Briefing for the IFPC Inc 2 system - Conducted launcher componentization activities (Communications and Data Uplink) - Conducted interceptor componentization (Weapons Interface Controller and Engagement Calculator software development) - Performed system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Conducted Cybersecurity Analysis events (Cooperative Vulnerability Identification, Adversarial Cybersecurity Development Test & Evaluation, Interim Authority to Operate) - Continued engineering and technical support of Enduring IFPC Inc 2 hardware, software and interface development and integration - Performed technical assessments, concept studies, cost reduction, risk management, final design, and required documentation - Awarded interceptor development,integration and test Other Transaction Authority (OTA)	36.847	115.308	222.095	-	222.095

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Completed interceptor hardware and software design - Built Enduring IFPC interceptor prototypes - Begun Enduring IFPC interceptor component qualification - Begun Enduring IFPC interceptor qualification - Begun Enduring IFPC interceptor model accredited - Begun Enduring IFPC interceptor integration with launcher - Begun Enduring IFPC interceptor Integration with mission command ***FY 2021 Base Plans:*** - Continue enduring launcher, interceptor, and system hardware and software design - Continue enduring launcher and interceptor development activities, to include Communications and Data Uplink with mission command and sensor, and launcher Weapons Interface Controller and Engagement Calculator software development - Continue engineering and technical support of the enduring IFPC Inc 2 hardware, software and interface development - Continue building enduring IFPC Inc 2 launchers and interceptors - Continue enduring IFPC Inc 2 launcher and interceptor model accreditation - Continue enduring IFPC Inc 2 interceptor integration with launcher - Continue enduring IFPC Inc 2 launcher and interceptor Integration with mission command and sensor ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Marginal increase as development and integration continues towards enduring IFPC Inc 2.					
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:*** Funding transferred in accordance with Title 15 USC ?638	-	8.827	-	-	-
Accomplishments/Planned Programs Subtotals	92.674	194.366	235.770	-	235.770

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• DU3: *IFPC2*	10.324	-	0.000	-	0.000	-	-	-	-	0.000	10.324
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	31.286	9.337	106.261	-	106.261	237.803	392.134	368.447	274.566	0.000	1,419.834
• C62001: *IFPC Inc 2-I Block 1 Missile 1*	166.536	-	0.000	-	0.000	-	-	-	-	0.000	166.536
• E10: *Sentinel*	37.847	95.720	109.259	-	109.259	116.381	65.512	69.343	30.849	0.000	524.911
• WK5057: *Sentinel Mods*	77.752	133.910	58.884	33.496	92.380	68.767	78.707	164.633	166.731	Continuing	Continuing
• S40: *Army Integrated Air and Missile Defense*	318.850	208.638	193.929	-	193.929	63.678	33.162	94.758	74.936	0.000	987.951
• BZ5075: *IAMD Battle Command System*	-	29.629	201.587	-	201.587	353.561	416.995	413.356	417.415	Continuing	Continuing

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (AIAMD) architecture.

D. Acquisition Strategy

As reported in Oct 2018, the Army will rapidly field an Interim CMD capability with the Israeli Iron Dome. Concurrently, the Army will integrate an IFPC capability of a launcher and interceptor leveraging the AIAMD open systems architecture and IBCS as the Fire Control component, and US sensor (Sentinel).

The Army approved a Directed Requirement to initiate procurement of the Israeli Iron Dome Missile System for an Interim IFPC CMD capability on 9 Feb 2019. Congress approved ATR actions to align IFPC FY 2018 and 2019 Procurement to fund the Interim CMD (Iron Dome) purchase and to repurpose the FY 2019 RDTE funds in May 2019.

To support the Interim CMD requirement, the Army has signed a 10 U.S. Code, paragraph 2373 procurement contract: two interim Iron Dome batteries for technical evaluation, assessment of operational utility, and safety evaluation. Additionally, the IFPC program will perform logistics analysis and assessments to determine Iron Dome training requirements, fielding requirement, spares packages, maintenance policies, and required Operational and Maintenance documentation. In FY 2020, IFPC will continue its logistics assessments, Modeling and Simulation analysis, and integration activities, as well as conduct Performance Analysis and Testing of the Interim IFPC solution at White Sands Missile Range prior to their deployment for operational assessment.

In support of the IFPC solution, the Army utilized the Department of Defense Ordnance Technology Consortium (DOTC) OTA process to request proposals for technology readiness assessments on launcher alternatives in FY 2019. Additionally, the Army verified technology readiness of interceptor alternatives in FY 2018. These actions will inform the IFPC materiel solution decision. The Army will utilize a tailored acquisition approach to evaluate new capability and provide residual operational capability in FY 2023 and then transition into procurement and field by FY 2025.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interim IFPC - PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	-		0.957	Apr 2020	-		-		-	0.000	0.957	-
IFPC - PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	3.618	Sep 2019	0.529	Jul 2020	-		-		-	Continuing	Continuing	Continuing
IFPC - PM Admin (SBIR/ STTR/FFRDC)	Various	Various : Various	-	0.674	Sep 2019	4.127	Jul 2020	-		-		-	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		8.827		-		-		-	0.000	8.827	-
		Subtotal	-	4.292		14.440		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interim IFPC - System Engineering & Integration	Various	Multiple Activities : Multiple Locations	10.104	10.779	Dec 2019	11.242	Apr 2020	4.752	Jan 2021	-		4.752	0.000	36.877	-
Interim IFPC Eng and Product Dev	Various	Multiple Activities : Multiple Locations	-	-		2.723	Apr 2020	-		-		-	0.000	2.723	-
Interim IFPC - System/ Subsystem Dev and Integration	Various	Multiple Activities : Multiple Locations	-	-		16.418	Apr 2020	-		-		-	0.000	16.418	-
IFPC - System Eng & Integration	Various	Multiple Activities : Multiple Locations	-	27.323	Sep 2019	9.915	Aug 2020	222.095	Jan 2021	-		222.095	Continuing	Continuing	Continuing
IFPC Eng and Product Dev/Fabrication	Various	Multiple Activities : Multiple Locations	-	-		11.096	Jul 2020	-		-		-	Continuing	Continuing	Continuing
IFPC System/Subsystem Dev and Integration	Various	Multiple Activities : Multiple Locations	-	-		1.816	Jul 2020	-		-		-	Continuing	Continuing	Continuing
IFPC Interceptor System Engineering & Integration	TBD	Multiple Activities : Multiple Locations	-	-		14.328	Jul 2020	-		-		-	Continuing	Continuing	Continuing
IFPC Interceptor System/ Subsystem Development and Integration	SS/CPFF	To Be Determined : To Be Determined	-	-		66.905	Jul 2020	-		-		-	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	10.104	38.102		134.443		226.847		-		226.847	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interim IFPC - PM Log Support	MIPR	Various : Huntsville, Alabama	-	-		0.941	Apr 2020	-		-		-	0.000	0.941	-
Interim IFPC - Log Support	TBD	TBD : TBD	-	42.600	Dec 2019	7.155	Apr 2020	8.923	Jan 2021	-		8.923	0.000	58.678	-
IFPC Interceptor Log Support	Various	Multiple Activities : Redstone Arsenal, Alabama	-	4.023		0.951	Sep 2020	-		-		-	Continuing	Continuing	Continuing
		Subtotal	-	46.623		9.047		8.923		-		8.923	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interim IFPC Operational Testing	IA	Multiple Activities : Multiple Locations	17.440	2.448	Dec 2019	31.573	Apr 2020	-		-		-	0.000	51.461	-
IFPC Developmental Testing	IA	WSMR : WSMR	-	1.209		0.901	Jul 2020	-		-		-	Continuing	Continuing	Continuing
IFPC Interceptor System/ Subsystem Developmental Testing	IA	Multiple Activities : Multiple Locations	-	-		3.962	Jul 2020	-		-		-	Continuing	Continuing	Continuing
		Subtotal	17.440	3.657		36.436		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	27.544	92.674		194.366		235.770		-		235.770	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

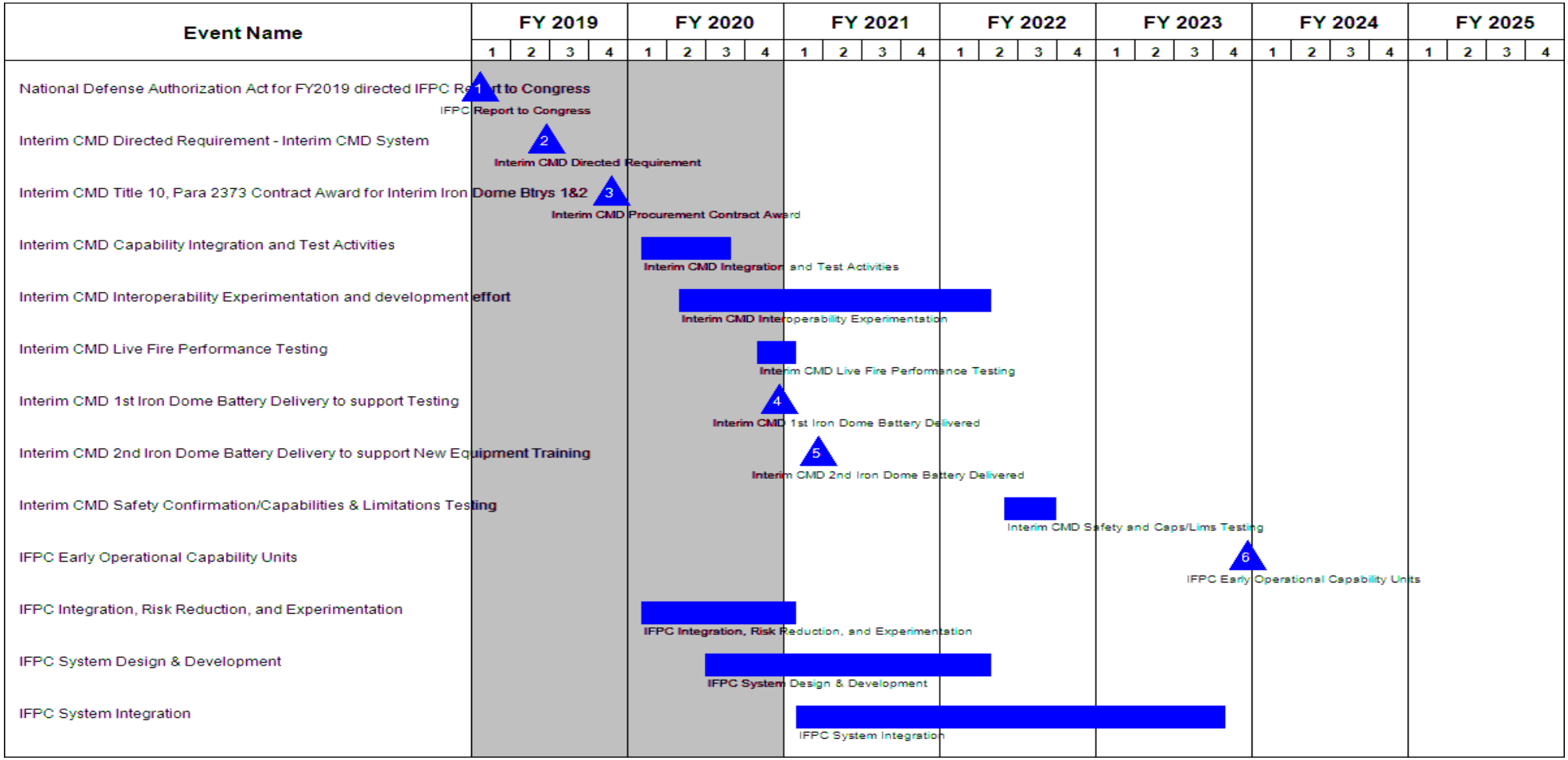

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

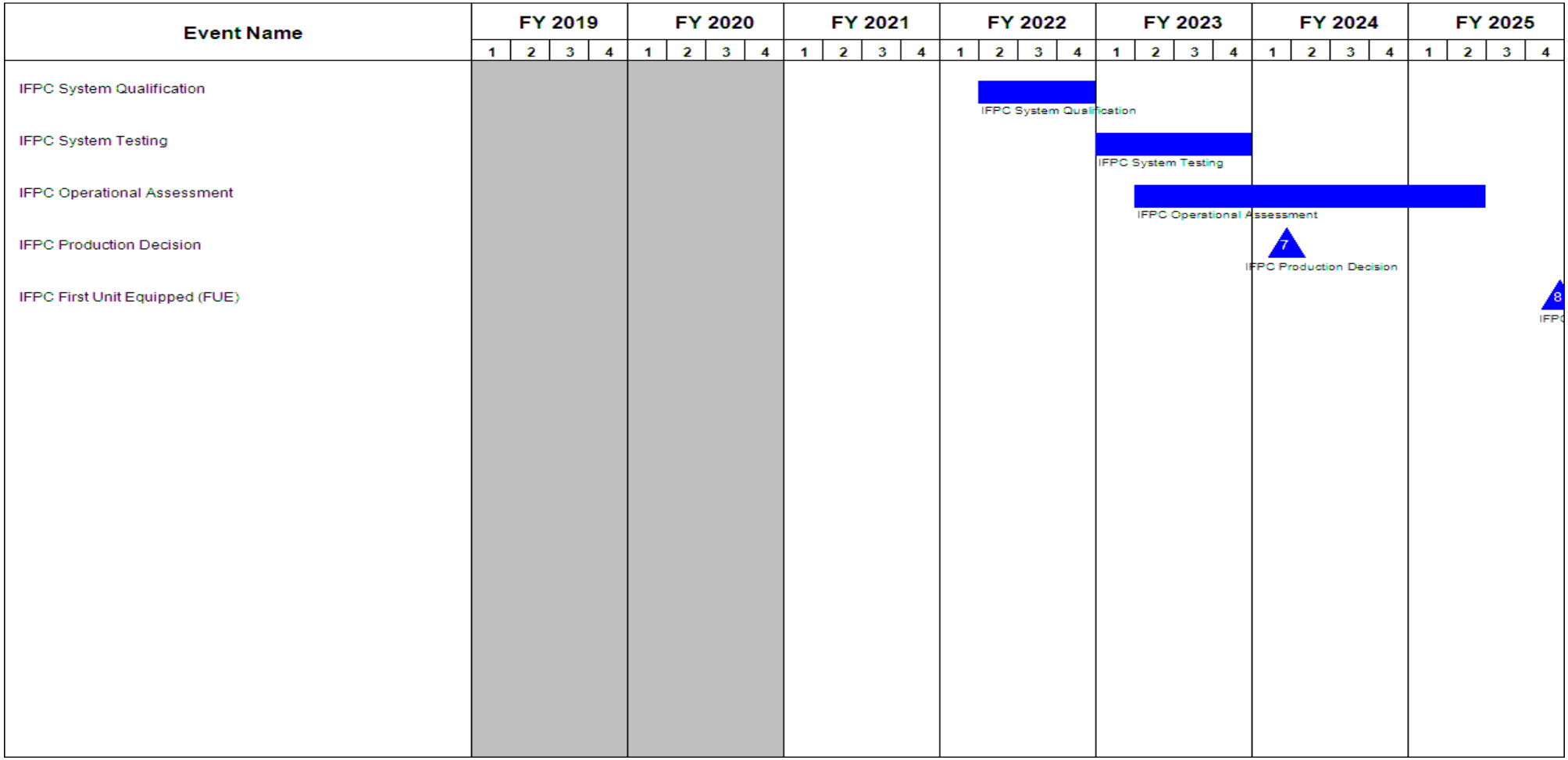

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
National Defense Authorization Act for FY2019 directed IFPC Report to Congress	1	2019	1	2019
Interim CMD Directed Requirement - Interim CMD System	2	2019	2	2019
Interim CMD Title 10, Para 2373 Contract Award for Interim Iron Dome Btrys 1&2	4	2019	4	2019
Interim CMD Capability Integration and Test Activities	1	2020	3	2020
Interim CMD Interoperability Experimentation and development effort	2	2020	2	2022
Interim CMD Live Fire Performance Testing	4	2020	1	2021
Interim CMD 1st Iron Dome Battery Delivery to support Testing	4	2020	4	2020
Interim CMD 2nd Iron Dome Battery Delivery to support New Equipment Training	1	2021	1	2021
Interim CMD Safety Confirmation/Capabilities & Limitations Testing	2	2022	3	2022
IFPC Early Operational Capability Units	4	2023	4	2023
IFPC Integration, Risk Reduction, and Experimentation	1	2020	1	2021
IFPC System Design & Development	3	2020	2	2022
IFPC System Integration	1	2021	4	2023
IFPC System Qualification	2	2022	4	2022
IFPC System Testing	1	2023	4	2023
IFPC Operational Assessment	2	2023	2	2025
IFPC Production Decision	1	2024	1	2024
IFPC First Unit Equipped (FUE)	4	2025	4	2025

Note

CMD: Cruise Missiles Defense
FUE:
FY: FIscal Year
IFPC: Indirect Fire Protection Capability

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*							
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	-	65.311	26.104	13.710	-	13.710	10.556	17.791	26.515	22.552	0.000	182.539
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	7.842	4.646	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.488
FB3: *Robotics Architecture*	-	1.792	2.876	2.702	-	2.702	2.706	2.707	2.716	2.715	0.000	18.214
FB4: *Common Robotic Systems*	-	24.527	5.396	2.352	-	2.352	0.000	0.000	0.000	0.000	0.000	32.275
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	10.461	5.000	5.008	-	5.008	4.011	11.014	19.722	15.821	0.000	71.037
FB7: *Robotics Enhanced Program (REP)*	-	6.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.343
FB8: *Soldier Borne Sensor (SBS)*	-	3.354	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.354
FB9: *MTRS Standardization*	-	8.123	7.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.123
FG8: *Common Robotic Controller*	-	2.869	1.186	3.648	-	3.648	3.839	4.070	4.077	4.016	0.000	23.705

A. Mission Description and Budget Item Justification

This Program Element supports modernization of the current Ground Robotic fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

FB2: The Man Transportable Robotic System (MTRS) Inc. II is the Army's Soldier transportable, remotely operated, medium size (<= 164 lbs.) common robotic system. The system utilizes both radio and tethered communications allowing dismounted Soldiers to perform hazardous missions from a safe standoff distance. The MTRS Inc. II system consists of an Operator Control Unit (OCU), a suite of various mission payloads, and a mobility platform. Open architecture and the Ground Robotic Autonomous Systems (RAS) Interoperability Profile (IOP) requirements are employed to reduce obsolescence risks and to maximize efficiency in acquiring future capabilities. MTRS Inc. II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units.
FB2 does not have any funding in FY 2021.

FB3: Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference

(CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, and common control. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Small Multipurpose Equipment Transport (S-MET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type I (RCIS Type I), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Medium) (CRS(M)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat Vehicle (RCV), etc.), new standards addressing emerging requirements and Modular Mission Payloads (MMP) (i.e. Cyber Security, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc.).

FY 2021 RDTE funds in the amount of $2.702 million supports the further development and finalization of the Robotics and Autonomous Systems-Ground (RAS-G) Interoperability Profile (IOP) Version 5.0. IOP V5.0 will provide the required modular open interfaces and compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, CRS(M), TWV-LF, OMFV, RCV, ERP, robotic assault breacher vehicles, and robotic applique kits for manned ground systems. Additionally, FY 2021 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure.

FB4: The Common Robotic System - Individual (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, common robotic system. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated Warfighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

FY 2021 RDTE funding in the amount of $2.352 million will fund the development, testing and validation of Engineering Change Proposals (ECPs), which includes contractor support required for these ECP tasks, as well as the development of Modification Work Orders (MWOs). This funding will also fund further development of Maintainer Technical Manuals and other LOG products needed to transition to full organic sustainment under Full Materiel Release (FMR) in 4QFY21, and resolve open issues listed in the Get Well Plan to meet FMR. This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, payloads, sensors, condition based maintenance, electronics, standard interfaces and architectures, autonomous operations and other emerging technologies, Interoperability Profile (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

FB6: Small Multipurpose Equipment Transport (S-MET) will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The S-MET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The S-MET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. S-MET will have open architectures, a remote control, support casualty evacuation, power generation/offload and Modular Mission Payloads (MMP).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

FY 2021 RDTE funding in the amount of $5.008 million supports the development, integration, and procurement of Technical Insertions and Modular Mission Payloads (MMP) to increase mission capabilities to requirements in the Abbreviated Capability Development Document (A-CDD). FY2021 RDTE funding supports procurement of test assets, testing, development of logistics material required to support these efforts. Program support to include travel and miscellaneous expenses in support of these RDTE efforts will also be funded.

FB7: The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making. FB7 does not have any funding in FY 2021.

FB8: The Soldier Borne Sensor (SBS) is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.
In FY 2020, this project and funding will transition to PE: 06044827A / Soldier Systems - Warrior Dem/Val project 0604827A.FK4.

FB9: The Common Robotic System, Heavy (CRS(H)) is a modular large-sized system that provides enhanced protection to the EOD Soldier in order to support the Joint Force Commander with the ability to identify, render safe and dispose of explosive ordnance (EO) and improvised explosive devices (IEDs) in support of the Range of Military Operations (ROMO) and Home Land Defense (HLD) operations. CRS(H) will also enable EOD Soldiers to execute Defense Support of the Civil Authorities (DSCA) operations in response to requests from federal, state, local, and tribal authorities for domestic incidents, emergencies, disasters, designated law enforcement support and other activities. CRS(H) will support current and future missions for Explosive Ordnance Disposal (EOD) units.
The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multi-shot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier.
FB9 does not have any funding in FY 2021.

FG8: The Universal Robotic Controller (URC) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCUs) for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two URCs will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The URC will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The intent of this requirement allows the Soldier at battalion and below to use the URC to operate unmanned aerial systems (e.g. Raven, PUMA,

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

Short Range Micro (SRM), etc.) and unmanned ground vehicles (e.g. CRS(I), CRS(V), CRS(M), CRS(H), S-MET, MTRS INC II, Light Reconnaissance (LR), Wingman, Robotic Combat Vehicle (RCV), etc.) and emerging unmanned air/ground systems. The URC is defined in the Common Robotic System (Individual) (CRS(I)) Capability Development Document (CDD) and is included in the CRS(I) acquisition. A standalone requirements document is being developed.

FY 2021 RDTE funding in the amount of $3.648 million will be utilized to continue test & evaluation and Logistics product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CRS(I) CDD and Universal Controller Information System (UC IS) CDD and emerging programs of record, controller software, architecture, interface updates, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAV) programs of record via an Engineering Change Proposal (ECP). This funding will also be used to establish a common software architecture for Unmanned Ground Vehicles and Unmanned Air Systems (UAS).

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	71.435	41.308	25.872	-	25.872
Current President's Budget	65.311	26.104	13.710	-	13.710
Total Adjustments	-6.124	-15.204	-12.162	-	-12.162
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-15.204			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-6.124	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-12.162	-	-12.162

Change Summary Explanation

A portion of FY21 S-MET RDTE (655053FB6) was recolored to OPA funding due to program acceleration to buy additional S-MET systems.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB2 / *Man Transportable Robotic System (MTRS) Inc II*	

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
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	7.842	4.646	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.488
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Man Transportable Robotic System (MTRS) Inc. II is the Army's Soldier transportable, remotely operated, medium size (<= 164 lbs.) common robotic system. The system utilizes both radio and tethered communications allowing dismounted Soldiers to perform hazardous missions from a safe standoff distance. The MTRS Inc. II system consists of an Operator Control Unit (OCU), a suite of various mission payloads, and a mobility platform. Open architecture and the Ground Robotic Autonomous Systems (RAS) Interoperability Profile (IOP) requirements are employed to reduce obsolescence risks and to maximize efficiency in acquiring future capabilities. MTRS Inc. II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: MTRS Inc II RDTE ***Description:*** MTRS Inc II RDTE funding to support engineering and logistics data, and various test efforts to include test articles, test execution, and test support staff salaries, and System Engineering Program Management (SEPM) costs.	0.655	-	-
Title: MTRS Inc II RDTE - Engineering Change Proposals ***Description:*** MTRS Inc. II RDTE funding to support Government initiated Engineering Change Proposals (ECP) to the MTRS Inc. II system. ***FY 2020 Plans:*** Funding to support engineering, testing, logistics, etc. activities to support MTRS Inc. II ECP efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	-	0.370	-
Title: MTRS Inc II RDTE - IPT Matrix Support Salary ***Description:*** MTRS Inc. II RDTE funding to support engineering and various test efforts to include redesign of test articles, delta PQT test execution, software, engineering test support staff salaries, and System Engineering Program Management (SEPM) costs. ***FY 2020 Plans:***	1.160	0.716	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Funding to support engineering activities, test article redesign, testing and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.			
Title: MTRS Inc II RDTE ? TARDEC Multi-Robot Operator Controll Unit (MOCU) Software Support ***Description:*** MTRS Inc. II RDTE funding to support the following TARDEC services to include software subject matter expert support, testing support, issue remediation, and transitioning MOCU software lead to TARDEC SEC as the software sustainment agency. ***FY 2020 Plans:*** Funding to support TARDEC SW and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY2021.	1.073	0.869	-
Title: MTRS Inc II RDTE ? SPAWAR Multi-Robot Operator Control Unit (MOCU) 3 SW Support ***Description:*** MTRS Inc. II RDTE funding to provide subject matter expert support, software updates, incremental software drops for integration and testing, software test simulator, software drop test reports, debugging and issue remediation, and the transition of MOCU software to TARDEC for long term sustainment. ***FY 2020 Plans:*** Funding to support SPAWAR MOCU 3.0 SW and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	1.200	0.670	-
Title: MTRS Inc II RDTE - Virtual Clearance Training Suite (VCTS) ***Description:*** MTRS Inc. II RDTE funding to support the development activities to incorporate MTRS Inc. II into the Virtual Clearance Training Suite. ***FY 2020 Plans:***	-	0.970	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Funding to support simulator suite development and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.			
Title: MTRS Inc II RDTE - Endeavor Logistic Product development, demonstration and verification ***Description:*** MTRS Inc. II RDTE funding to support the development of a MTRS Inc. II logistic products, demonstration and verification. ***FY 2020 Plans:*** Funding to support logistic activities and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	2.643	0.470	-
Title: MTRS Inc II RDTE - Testing ***Description:*** MTRS Inc. II delta Production Qualification Testing (PQT). ***FY 2020 Plans:*** MTRS Inc. II delta Production Qualification Testing (PQT) to include reliability and performance testing. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** MTRS Inc II completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	1.111	0.370	-
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.211	-
Accomplishments/Planned Programs Subtotals	7.842	4.646	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• R67050: *Man Transportable Robotic Sys Inc II (MTRS Inc II)*	7.456	36.254	63.976	-	63.976	64.507	2.211	-	-	0.000	174.404

Remarks

D. Acquisition Strategy

The MTRS Inc II acquisition strategy executed an abbreviated Engineering Manufacturing Development (EMD) phase followed by a Production Deployment phase to integrate available payloads into the MTRS Inc II materiel solution. This EMD/Production Deployment award was based on a selection from a full and open competition. The contract is Firm Fixed Price and included a Critical Design Review (CDR) in FY 2018, design integration, Production Qualification Test (PQT) (FY 2019), Low Rate Initial Production (LRIP) Delta PQT (FY 2020) and Full Rate Production (FRP) (FY 2020). The program will obtain First Unit Equipped (FUE) under a Conditional Materiel Release (CMR) utilizing Interim Logistics Support (ILS) in FY 2020 while working toward obtaining Full Materiel Release (FMR) under organic sustainment in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB2 / *Man Transportable Robotic System (MTRS) Inc II*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	VARIOUS : MULTIPLE	1.721	3.455	Nov 2018	0.711	Nov 2019	-		-		-	0.000	5.887	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.211		-		-		-	0.000	0.211	-
		Subtotal	1.721	3.455		0.922		-		-		-	0.000	6.098	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Hardware	SS/FFP	Endeavor : Chelmsford, MA	1.977	1.160	Apr 2019	-		-		-		-	0.000	3.137	-
Virtual Clearance Training Suite (VCTS)	Various	Various : Multiple	-	-		0.965	Oct 2019	-		-		-	0.000	0.965	-
		Subtotal	1.977	1.160		0.965		-		-		-	0.000	4.102	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MTRS Inc II MOCU development	Various	Various : Multiple	1.508	2.116	Jan 2019	1.564	Oct 2019	-		-		-	0.000	5.188	-
MTRS Inc II contract data	SS/FFP	Endeavor : Chelmsford, MA	2.786	-		0.465	Oct 2019	-		-		-	0.000	3.251	-
MTRS In II Engineering Change Proposals	TBD	TBD : TBD	-	-		0.365	Oct 2019	-		-		-	0.000	0.365	-
		Subtotal	4.294	2.116		2.394		-		-		-	0.000	8.804	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB2 / *Man Transportable Robotic System (MTRS) Inc II*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test site and test site support for FAT	MIPR	VARIOUS : MULTIPLE	0.879	1.111	Dec 2018	0.365	Oct 2019	-		-		-	0.000	2.355	-
		Subtotal	0.879	1.111		0.365		-		-		-	0.000	2.355	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.871	7.842		4.646		-		-		-	0.000	21.359	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

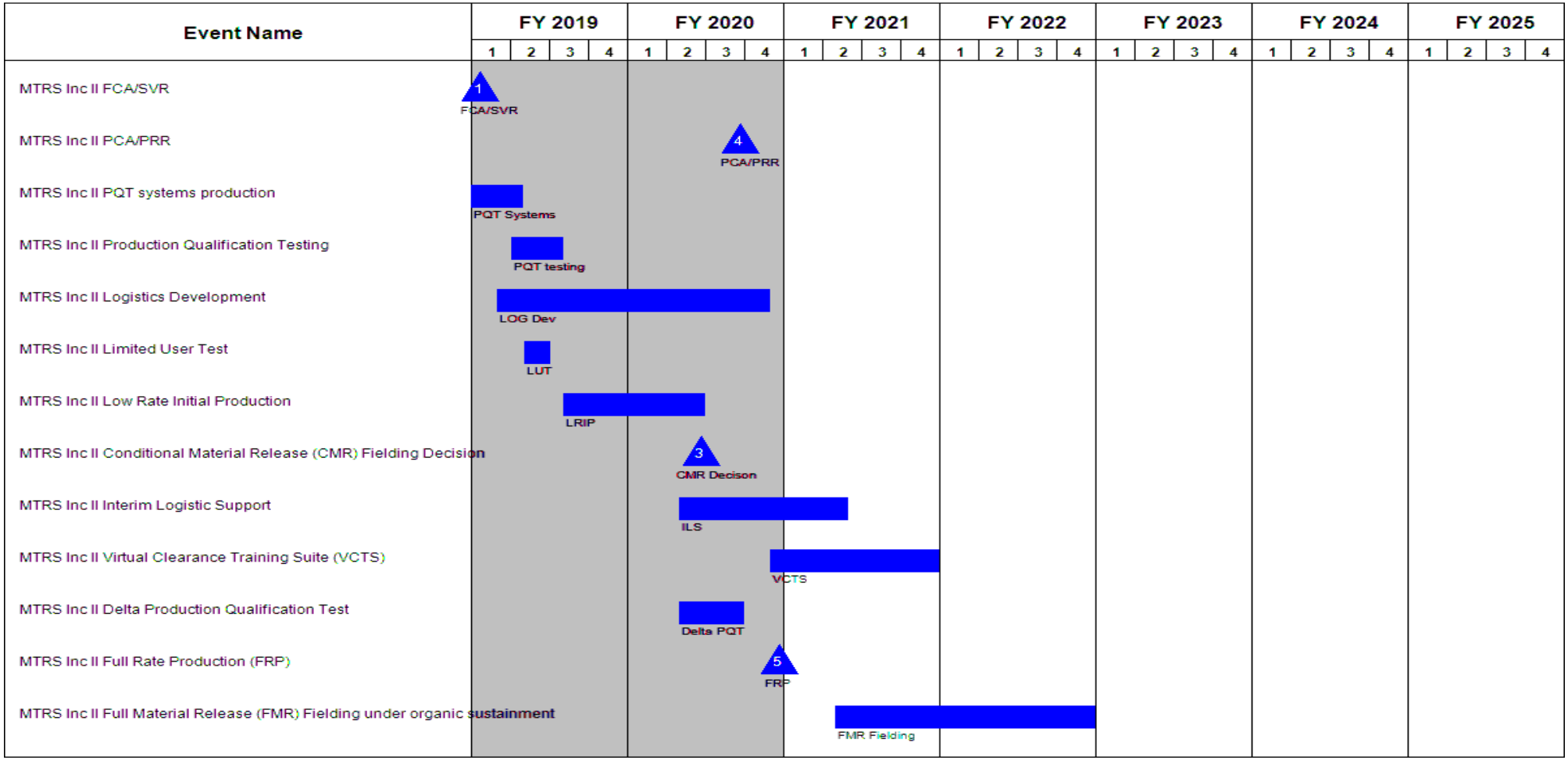

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MTRS Inc II First Unit Equipped (FUE)					2 FUE																							

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MTRS Inc II Cyber PDR	2	2018	2	2018
MTRS Inc II CDR	3	2018	3	2018
MTRS Inc II FCA/SVR	1	2019	1	2019
MTRS Inc II PCA/PRR	3	2020	3	2020
MTRS Inc II PQT systems production	4	2018	1	2019
MTRS Inc II Production Qualification Testing	2	2019	3	2019
MTRS Inc II Logistics Development	1	2019	4	2020
MTRS Inc II Limited User Test	2	2019	2	2019
MTRS Inc II Low Rate Initial Production	3	2019	2	2020
MTRS Inc II Conditional Material Release (CMR) Fielding Decision	2	2020	2	2020
MTRS Inc II Interim Logistic Support	2	2020	2	2021
MTRS Inc II Virtual Clearance Training Suite (VCTS)	4	2020	4	2021
MTRS Inc II Delta Production Qualification Test	2	2020	3	2020
MTRS Inc II Full Rate Production (FRP)	4	2020	4	2020
MTRS Inc II Full Material Release (FMR) Fielding under organic sustainment	2	2021	4	2022
MTRS Inc II First Unit Equipped (FUE)	2	2020	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

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
FB3: *Robotics Architecture*	-	1.792	2.876	2.702	-	2.702	2.706	2.707	2.716	2.715	0.000	18.214
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, and common control. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Small Multipurpose Equipment Transport (S-MET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System (RCIS), Common Robotics System (Medium) (CRS(M), Common Robotics System (Individual), (CRS(I)), Man Transportable Robotic System (MTRS) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payloads (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat (RCV) variants, robotic assault breacher vehicles, robotic applique kits for manned ground systems, etc.), and new standards addressing emerging requirements and Modular Mission Payloads (MMP) including Cyber Security, software safety requirements from MIL-STD-882E, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc.
FY 2021 RDTE funds in the amount of $2.702 million supports the further development and finalization of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 5.0. IOP V5.0 will provide the required modular open interfaces and compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, CRS(M), TWV-LF, OMFV, RCV, ERP, robotic assault breacher vehicles, and robotic applique kits for manned ground systems. Additionally, FY 2021 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure.

In FY 2021, $.178 million in Reimbursable Manpower for this line has been realigned from Reimbursable Civilian Funding to Direct Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Robotics Architecture	1.792	2.745	2.702
Description: Provide architecture tools and support for current Programs of Record (PoR) & new requirements to allow for interoperability within the Joint community for Robotics & Autonomous Systems.			
FY 2020 Plans: FY 2020 funding for Robotics Architecture will develop & apply Interoperability (IOP) & ROS-M artifacts and Conformance Validation Tools for programs of record including the Squad Multipurpose Equipment Transport (SMET), SMET Modular Mission Payloads (MMPs), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type I (RCIS Type I), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Optionally Manned Tank (OMT), and Robotic Combat (RCV). It will develop and update IOP and tools to evaluate and assess the RCIS Type I, SMET MMPs, LRR, and Enhanced Robotics Payloads (ERP) and refine tools for TWV-LF, CRS(I), MTRS Inc. II & SMET. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army RAS standards for open architecture, interoperability interfaces, and common control. It will initiate the development of IOP V5 which will provide interfaces for near term emerging programs such as key SMET MMPs & ERP payloads, CRS(V), LRR, RCV, and Autonomous Convoy Operations. Additionally, FY 2020 RDTE funds will support the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. ***FY 2021 Plans:*** FY 2021 RDTE funds in the amount of $2.702 million supports the further development and finalization of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 5.0. IOP V5.0 will provide the required modular open interfaces and compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, CRS(M), TWV-LF, OMFV, RCV, ERP, robotic assault breacher vehicles, and robotic applique kits for manned ground systems. Additionally, FY 2021 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease in funding from FY 2020 to FY 2021 is due to the completion of MTRS Inc II and CRS-H RDTE efforts in FY 2020, and the reduction of RDTE for CRS(I) and S-MET because of the limited scope of RDTE efforts needed in FY 2021.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.131	-
Accomplishments/Planned Programs Subtotals	1.792	2.876	2.702

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

D. Acquisition Strategy

In FY 2021 the Robotics Architecture line funds supporting matrix personnel & related contracts to develop IOP & ROS-M tools and supporting infrastructure. It leverages intellectual capital and products which allow for Joint interoperability and helps meet Army Program of Record cost and schedule while delivering high quality products for fielding. The architecture and tools developed under this line provide enterprise wide efficiencies and are central to the Army's acquisition philosophy of a modular open system approach between the major subsystems of robotics and autonomous systems, as described throughout the Army approved Robotics & Autonomous Systems (RAS) Initial Capabilities Document (ICD).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Multiple	0.766	0.925	Nov 2018	0.114	Oct 2019	-		-		-	0.000	1.805	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.131		-		-		-	0.000	0.131	-
		Subtotal	0.766	0.925		0.245		-		-		-	0.000	1.936	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IOP V4	Various	Various : Multiple	0.914	0.557	May 2019	-		-		-		-	0.000	1.471	-
Instantiation Tool Development	SS/CPFF	DCS : Warren, MI	-	-		0.084	Jun 2020	-		-		-	0.000	0.084	-
Conformance Verification Testing (CVT) Update	MIPR	TARDEC : Warren, MI	-	-		0.283	Apr 2020	-		-		-	0.000	0.283	-
IOP V5 Development	Various	Various : Multiple	-	-		1.053	Jan 2020	1.000	Jan 2021	-		1.000	0.000	2.053	-
Robotic Operating System - Military (ROS-M)	Various	Various : Multiple	-	-		0.783	Apr 2020	0.800	Apr 2021	-		0.800	0.000	1.583	-
IOP V4 Radio Interfaces Development	MIPR	NAVSEA : Washington D.C.	0.250	0.310	Jun 2019	-		-		-		-	0.000	0.560	-
Instantiation Tool Development	Various	Various : Multiple	-	-		-		0.100	May 2021	-		0.100	0.000	0.100	-
IOP Software Safety	RO	GVSC : Warren	-	-		-		0.150	Apr 2021	-		0.150	0.000	0.150	-
		Subtotal	1.164	0.867		2.203		2.050		-		2.050	0.000	6.284	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Conformance Verification Testing (CVT) Maintenance	MIPR	TARDEC : Warren, MI	-	-		0.110	Jan 2020	0.123	Jan 2021	-		0.123	0.000	0.233	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Robotic Operating System - Military (ROS-M) Infrastructure Management	MIPR	TARDEC : Warren, MI	-	-		0.134		0.150	Jan 2021	-		0.150	0.000	0.284	-
		Subtotal	-	-		0.244		0.273		-		0.273	0.000	0.517	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
New IOP & ROS-M Artifacts Stress Testing	MIPR	TARDEC : Warren, MI	-	-		0.184	Apr 2020	0.379	Apr 2021	-		0.379	0.000	0.563	-
		Subtotal	-	-		0.184		0.379		-		0.379	0.000	0.563	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.930	1.792		2.876		2.702		-		2.702	0.000	9.300	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

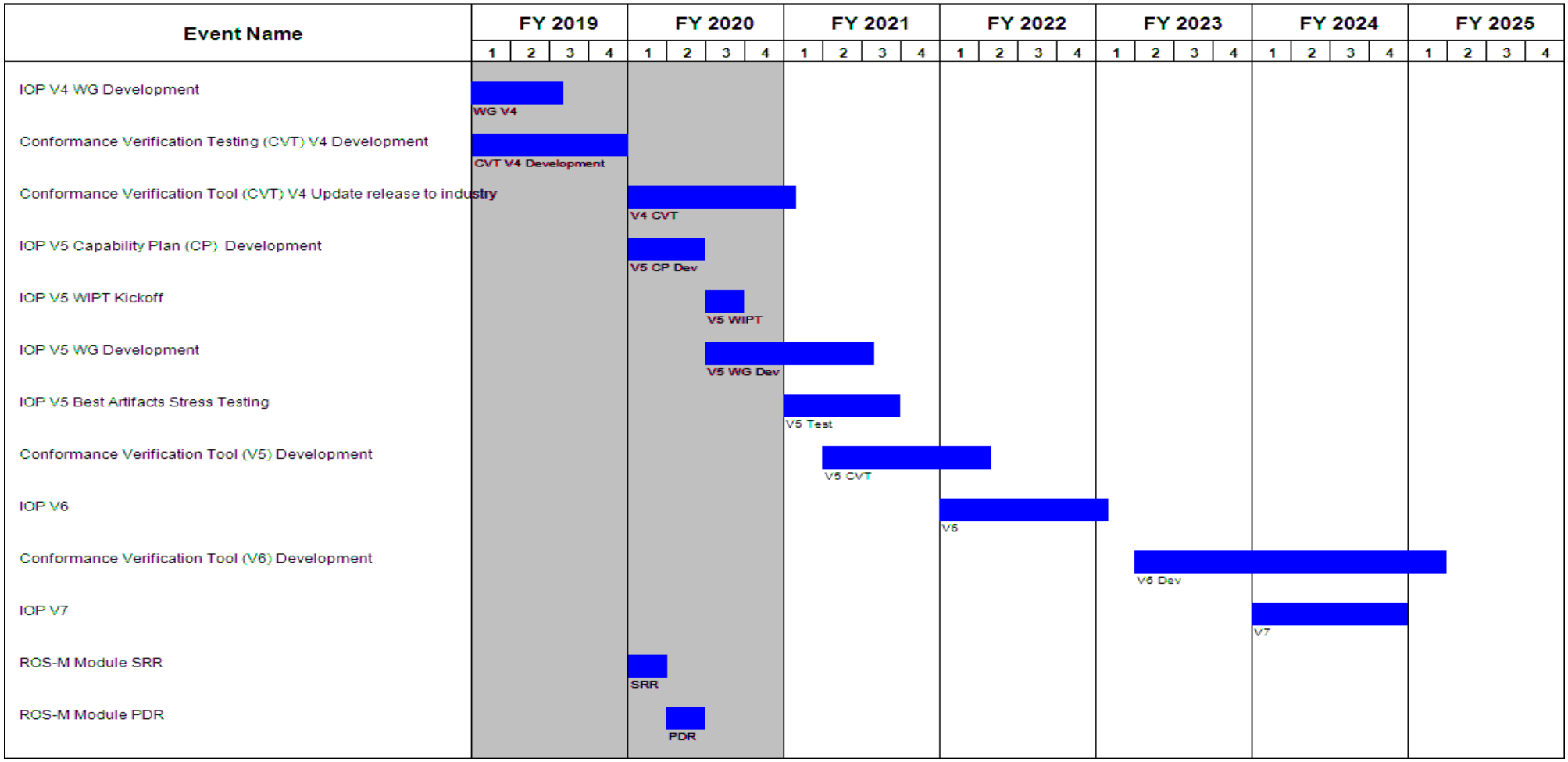

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

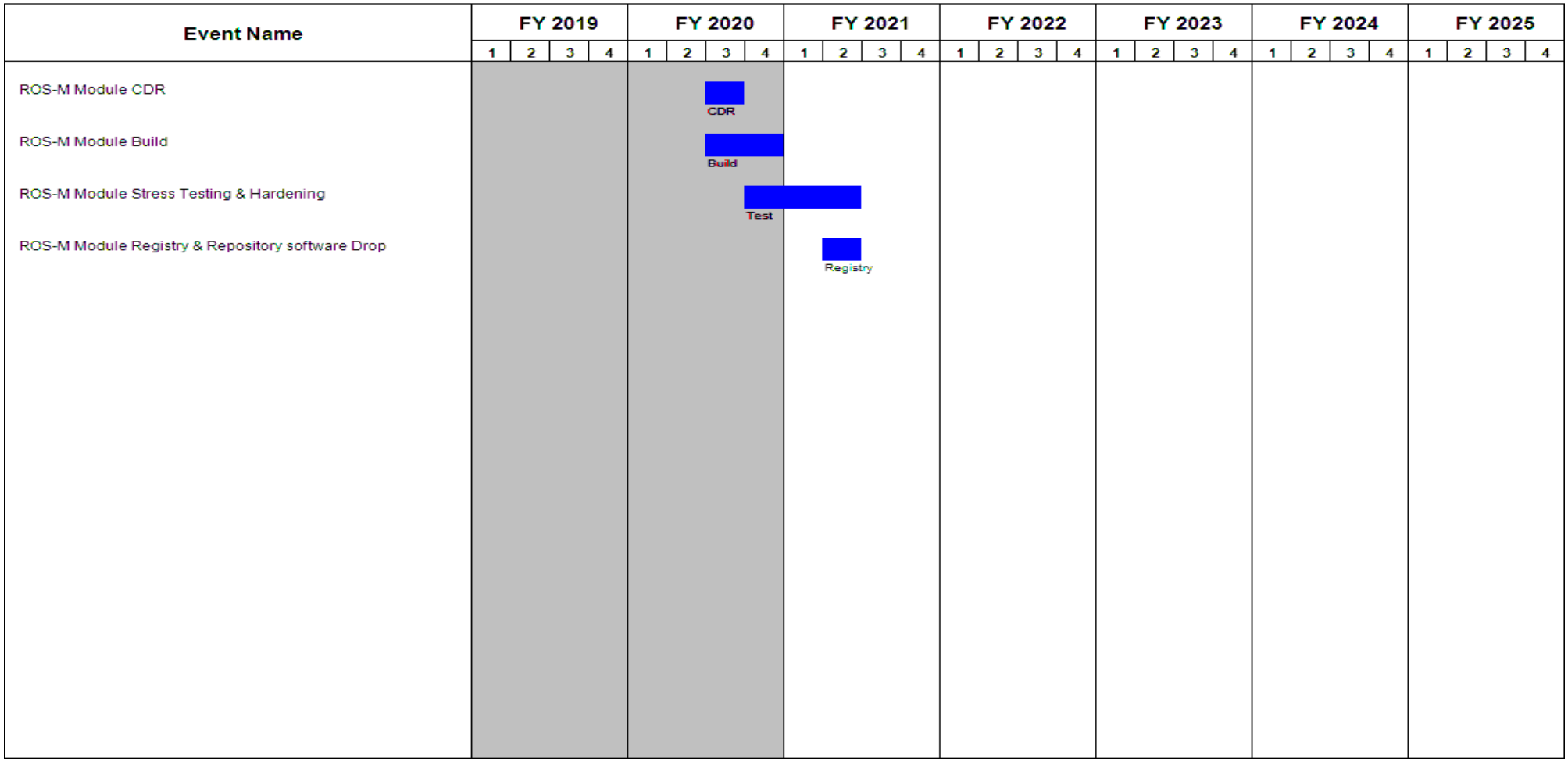

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IOP V4 Capability Plan (CP) Development	1	2018	2	2018
IOP V4 WIPT Kickoff	3	2018	3	2018
IOP V4 WG Development	3	2018	3	2019
Conformance Verification Testing (CVT) V3 Update release to industry	1	2018	4	2018
Instantiation tool development	2	2018	4	2018
Conformance Verification Testing (CVT) V4 Development	1	2019	4	2019
Conformance Verification Tool (CVT) V4 Update release to industry	1	2020	1	2021
IOP V5 Capability Plan (CP) Development	1	2020	2	2020
IOP V5 WIPT Kickoff	3	2020	3	2020
IOP V5 WG Development	3	2020	3	2021
IOP V5 Best Artifacts Stress Testing	1	2021	3	2021
Conformance Verification Tool (V5) Development	2	2021	2	2022
IOP V6	1	2022	1	2023
Conformance Verification Tool (V6) Development	2	2023	1	2025
IOP V7	1	2024	4	2024
ROS-M Module SRR	1	2020	1	2020
ROS-M Module PDR	2	2020	2	2020
ROS-M Module CDR	3	2020	3	2020
ROS-M Module Build	3	2020	4	2020
ROS-M Module Stress Testing & Hardening	4	2020	2	2021
ROS-M Module Registry & Repository software Drop	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

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
FB4: *Common Robotic Systems*	-	24.527	5.396	2.352	-	2.352	0.000	0.000	0.000	0.000	0.000	32.275
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Robotic System - Individual (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, Common Robotic System. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated War-fighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

FY 2021 RDTE funding in the amount of $2.352 million will fund the development, testing and validation of Engineering Change Proposals (ECPs), which includes contractor support required for these ECP tasks as well as the development of Modification Work Orders (MWOs). This funding will also fund further development of Maintainer Technical Manuals and other Logistics products needed to transition to full organic sustainment under Army Full Materiel Release (FMR) in 4th quarter of FY 2021, and resolve open issues listed in the Get Well Plan to meet FMR. This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, mission payloads, sensors, Condition Based Maintenance, electronics, standard interfaces and architectures, autonomous operations and other emerging technologies, Interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: CRS(I) Engineering Manufacturing Design (EMD) ***Description:*** Two vendors entered the Engineering & Manufacturing Design (EMD) Phase and support activities up to the Critical Design Review (CDR) to include providing robots to test during the Government run-off. Completed the EMD phase and down-selected to a single vendor.	5.537	-	-
Title: CRS(I) Contractor support to test and design updates ***Description:*** CRS(I) contractor to provide support to Production Qualification Test (PQT) and Limited User Test (LUT) and make critical design fixes. ***FY 2020 Plans:***	0.653	0.559	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Funding for contractor to provide direct onsite support to PQT and LUT and well as provide reach back Engineering support to troubleshoot systems under test and make design updates for critical issues found in test. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Engineering and Manufacturing Development (EMD) phase completed.			
Title: CRS(I) PQT and LUT execution ***Description:*** ATEC costs to execute Production Qualification Test (PQT) and Limited User Test (LUT). ***FY 2020 Plans:*** Funding for ATEC to execute PQT and LUT in accordance with program TEMP. ***FY 2021 Plans:*** Funding for Army Test and Evaluation Command (ATEC) to execute Production Qualification Testing (PQT) and Limited User Testing (LUT) in accordance with program Test and Evaluation Master Plan (TEMP). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Continuation of Delta Product Qualification Testing, target completion in 1st quarter of FY 2021.	5.493	1.560	0.250
Title: CRS(I) Log manuals ***Description:*** CRS(I) RDTE funding for contractor to complete development of Operator and Maintainer Technical Manuals. ***FY 2020 Plans:*** Funding for the development and verification of Technical Manuals (TM), LOG Demo, development of training packages to support CRS(I) PQT and LUT to support Conditional Materiel Release (CMR) and towards Full Materiel Release (FMR). ***FY 2021 Plans:*** Funding for further development and verification of Maintainer Technical Manuals (TM), Logistics Demonstration, training packages to support transition to full organic sustainment under Full Materiel Release (FMR). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** ECP changes will merit additional changes to manuals.	4.184	0.859	0.250
Title: CRS(I) TARDEC Software Support ***Description:*** CRS(I) RDTE funding to support the following Engineering services to include software subject matter expert support, testing support, issue remediation, and transitioning platform software lead to the software sustainment agency. ***FY 2020 Plans:***	3.250	0.859	0.452

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Funding to support TARDEC software and engineering activities to include travel and miscellaneous expenses associated with the CRS(I) RDTE efforts. ***FY 2021 Plans:*** Funding to support software and engineering activities to include travel associated with the CRS(I) software efforts to enhance security vulnerabilities and software performance. Develop Software Loader Verifier (SLV) and Software Integration Lab (SIL). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding reduced to address issues related to security vulnerabilities and remaining software performance issues in a Software Maturation Plan.			
Title: CRS(I) IPT Matrix Support Salary ***Description:*** CRS(I) RDTE funding to support System Engineering Program Management (SEPM) costs. ***FY 2020 Plans:*** Funding to support engineering activities, test article redesign, testing and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the CRS(I) RDTE efforts. ***FY 2021 Plans:*** Funding to support engineering activities, test article refurbishment, testing and salaries for Integrated Product Team (IPT) members to include travel associated with transition to full organic sustainment under Full Material Release (FMR). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Reduced support in engineering activities, testing and travel for RDTE efforts.	4.392	0.659	0.300
Title: CRS(I) SPAWAR MOCU software support ***Description:*** CRS(I) RDTE funding to provide subject matter expert support, software updates, incremental software drops for integration and testing, software test simulator, software drop test reports, debugging and issue remediation, and the transition of platform software into sustainment. ***FY 2020 Plans:*** Funding to support SPAWAR MOCU software and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc II RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Effort complete, software supported by a different agency.	1.018	0.655	-
Title: CRS(I) Engineering Change Proposals (ECPs) Development, Testing and Validation and Modification Work Orders	-	-	1.100

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: Changes to proposed configuration after baseline performance established at initial PQT. ***FY 2021 Plans:*** Funding to develop, test, and validate proposed configuration changes to the CRS(I) and its baselined performance requirements and configuration documentation. This includes CRS(I) contractor support for contractor tasks associated with these ECPs. This will also fund tasks associated with developing Modification Work Orders to retrofit fielded systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Additional testing requested for Full Material Release (FMR) and Fielding.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.245	-
Accomplishments/Planned Programs Subtotals	24.527	5.396	2.352

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• G99595: *Common Robotic System-Individual (CRS-I)*	3.563	2.285	1.154	-	1.154	1.155	1.241	1.449	1.415	0.000	12.262
• G93696: *Common Robotic System - Individual (CRS-I)*	-	30.387	54.528	-	54.528	22.857	-	-	-	0.000	107.772

Remarks

In FY 2019, CRS(I) and the Common Robotic Controller OPA funding was in the same funding line G99595. Beginning in FY 2020, CRS(I) had its own OPA funding line G93696 separate from the Common Robotic controller G99595.

D. Acquisition Strategy

The CRS(I) competitive Firm Fixed Price (FFP) contract was awarded to a single contractor in March 2019 for the CRS (I) Low Rate Initial Production (LRIP) phase. This phase includes Full Materiel Release (FMR) (FY 2021) and Full Rate Production (FRP) (FY 2021).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	Combat Support - Combat Service Support : Warren MI	2.662	4.392	Nov 2018	0.659	Oct 2019	0.300	Oct 2020	-		0.300	0.000	8.013	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.245		-		-		-	0.000	0.245	-
		Subtotal	2.662	4.392		0.904		0.300		-		0.300	0.000	8.258	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Manufacturing & Design	C/CPFF	Endeavor and Qinetiq North America : Massachusetts	18.930	7.548	Nov 2018	0.559	Oct 2019	-		-		-	0.000	27.037	-
Government Furnished Equipment	Various	Various : Multiple	-	0.200	Sep 2019	-		-		-		-	0.000	0.200	-
		Subtotal	18.930	7.748		0.559		-		-		-	0.000	27.237	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log manuals	C/CPFF	Multiple : Various	-	-		0.859	Oct 2019	0.250	Dec 2020	-		0.250	0.000	1.109	-
		Subtotal	-	-		0.859		0.250		-		0.250	0.000	1.109	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Production Qualification Testing (PQT) & Limited User Testing (LUT)	Various	Aberdeen Test Center : Aberdeen MD	0.115	8.137	Jan 2019	1.560	Dec 2019	0.250	Jan 2021	-		0.250	0.000	10.062	-
TARDEC software support	Various	TARDEC : Warren, MI	0.862	3.250	Jan 2019	0.859	Oct 2019	0.452	Jan 2021	-		0.452	0.000	5.423	-
SPAWAR software support	Various	SPAWAR : San Diego, CA	-	1.000	Apr 2019	0.655	Oct 2019	-		-		-	0.000	1.655	-
ECP/MWO Development Testing and Validation	C/CPFF	Qinetiq North America : Waltham, MA	-	-		-		1.100	Dec 2020	-		1.100	0.000	1.100	-
		Subtotal	0.977	12.387		3.074		1.802		-		1.802	0.000	18.240	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.569	24.527		5.396		2.352		-		2.352	0.000	54.844	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

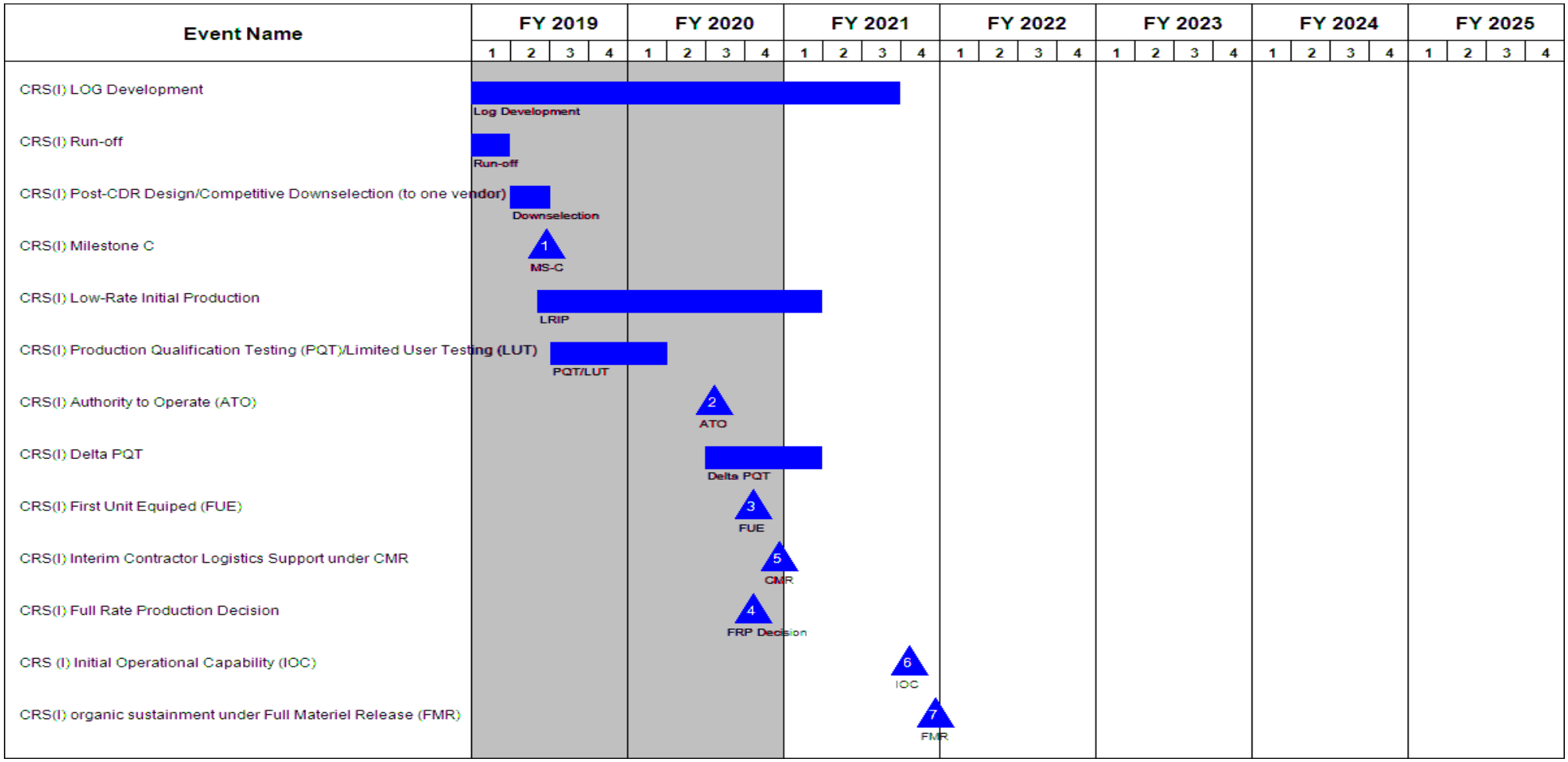

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CRS(I) Milestone B	2	2018	2	2018
CRS(I) Contract Award	2	2018	2	2018
CRS(I) LOG Development	3	2018	3	2021
CRS(I) Critical Design Review (CDR) (x2)	3	2018	3	2018
CRS(I) Run-off	1	2019	1	2019
CRS(I) Post-CDR Design/Competitive Downselection (to one vendor)	1	2019	2	2019
CRS(I) Milestone C	2	2019	2	2019
CRS(I) Low-Rate Initial Production	2	2019	1	2021
CRS(I) Production Qualification Testing (PQT)/Limited User Testing (LUT)	3	2019	1	2020
CRS(I) Authority to Operate (ATO)	3	2020	3	2020
CRS(I) Delta PQT	3	2020	1	2021
CRS(I) First Unit Equiped (FUE)	4	2020	4	2020
CRS(I) Interim Contractor Logistics Support under CMR	4	2020	4	2020
CRS(I) Full Rate Production Decision	4	2020	4	2020
CRS (I) Initial Operational Capability (IOC)	4	2021	4	2021
CRS(I) organic sustainment under Full Materiel Release (FMR)	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

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
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	10.461	5.000	5.008	-	5.008	4.011	11.014	19.722	15.821	0.000	71.037
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Small Multipurpose Equipment Transport (S-MET) will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The S-MET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The S-MET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. S-MET will have open architectures, a remote control and support casualty evacuation, power generation/offload and reintegration of Modular Mission Payloads (MMP) and technical insertions.

FY 2021 RDTE funding in the amount of $5.008 million supports the development, integration, test and purchase of Technical Insertions and Modular Mission Payloads (MMP) to increase mission capabilities to meet objective requirements in the Abbreviated Capability Development Document (A-CDD). FY 2021 RDTE funding supports remaining testing at Army Test Engineering Center (ATEC) for the Program of Record. Program support to include salaries, travel and miscellaneous expense for the S-MET program will also be funded.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: S-MET	10.461	4.773	5.008
Description: Small Multipurpose Equipment Transport (S-MET)			
FY 2020 Plans: FY 2020 RDTE funding supports the development and purchase of Technical Insertions and Modular Mission Payloads (MMP). FY 2020 RDTE funding supports Developmental testing at Aberdeen and other remaining testing required for the Program of Record to include cyber testing and air drop certification. Program support to include salaries, travel and miscellaneous expense for the SMET program will also be funded.			
FY 2021 Plans: FY 2021 RDTE funding supports the development, integration, test and procurement of Technical Insertions and Modular Mission Payloads (MMP) to increase mission capabilities to requirements in the Abbreviated Capability Development Document (A-CDD). FY 2021 RDTE funding supports procurement of test assets, testing, development of logistics material required to support these efforts. Program support to include travel and miscellaneous expenses in support of these RDTE efforts will also be funded.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2021 increase of $0.008 million covers any additional costs relative to meeting objective requirements in the Abbreviated Capability Development Document (A-CDD).			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.227	-
Accomplishments/Planned Programs Subtotals	10.461	5.000	5.008

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• R12154: *Squad Multipurpose Equipment Transport (SMET)*	-	8.768	33.355	-	33.355	30.086	35.172	46.232	94.779	0.000	248.392

Remarks

D. Acquisition Strategy

The Small Multipurpose Equipment Transport (S-MET) Assessment effort was completed as part of the Robotics Development effort under the Tactical Unmanned Ground Vehicle (654641DV7) funding line in FY 2017. This Phase I Assessment supported a rapid start to establish an Other Transaction Authority (OTA) Acquisition Strategy supporting the Directed Requirement, signed 14 April 2017. The Phase I OTA awarded a five-day test event to 8 S-MET prototype solutions in FY 2017 as part of the Robotic Enhancement Program (REP) under the Tactical Unmanned Ground Vehicle (654641DV7) funding line. In FY 2018 Phase II down selected to 4 vendors awarded the Phase II OTA. This OTA provided system testing at Aberdeen Test Center (ATC) and issued systems to Soldiers for a 7 month Technology Demonstration. Twenty systems were purchased from each of the 4 vendors issued to IBCTs. This Technology Demonstration guided the development of the Abbreviated Capability Development Document (A-CDD) approved 29 July 2019 following the Army Requirements Oversight Council (AROC) decision on 19 July 2019.

Project Manager Force Projection (PM FP) received authority from the Army Acquisition Executive (AAE), on 13 Aug 2019, to pursue a Rapid Fielding pathway under Section 804 Middle Tier Acquisition (MTA) in accordance with Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA). Under an approved Section 804 Rapid Fielding pathway, the PM will down select to one or more of the four prototypes and award refurbishment of Phase II systems, completed testing, complete logistics development to provide for an organic support strategy, and proceed into production.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

The Phase III FAR follow on contract for the Program Of Record (POR) production system was awarded on 30 Oct 2019 to General Dynamic Land Systems. Army Contracting Command - Warren received a Government Accountability Office (GAO) level protest on 14 Nov 2019. In response to the protest, the Government will be taking corrective action and resoliciting the Phase III requirement. The planned Request for Proposal (RFP) release is on 29 Jan 2020, with a target award date of 30 Apr 2020.

It is the Army's intent to maximize the use of an Open Systems Architecture (OSA), as well as the approved Unmanned Ground Vehicle (UGV) interoperability profiles (IOP) for S-MET. The PdM plans to gather sufficient data during the S-MET Technology Demonstration to reduce development efforts and provide cost savings by incorporating the developed S-MET technology to include future technical insertions and Modular Mission Payloads (MMP) into the Program of Record. Throughout the life of the program, the Army will continue to survey the marketplace to identify opportunities for technology insertions and required Modular Mission Payloads (MMP), relying on competition to drive down costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	PM FP : Warren, MI	1.000	1.461	Oct 2018	1.563	Oct 2019	1.408	Oct 2020	-		1.408	0.000	5.432	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.227		-		-		-	0.000	0.227	-
		Subtotal	1.000	1.461		1.790		1.408		-		1.408	0.000	5.659	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Requirement Technology Demonstration	C/FFP	Year Long Excursion : TBD	10.328	2.200	Dec 2018	-		-		-		-	0.000	12.528	-
Technical Insertions	C/FFP	TBD : TBD	-	3.000	Nov 2018	0.162	Nov 2019	0.800	Feb 2021	-		0.800	0.000	3.962	-
Modular Mission Payloads (MMP)	MIPR	Ft Benning : Ft Benning, GA	-	0.800	Mar 2019	0.462	Jan 2020	2.000	Nov 2020	-		2.000	0.000	3.262	-
		Subtotal	10.328	6.000		0.624		2.800		-		2.800	0.000	19.752	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber / Integration	MIPR	TBD : TBD	1.000	1.000	Oct 2018	0.962	Oct 2019	-		-		-	0.000	2.962	-
		Subtotal	1.000	1.000		0.962		-		-		-	0.000	2.962	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC Test Support	MIPR	Army Test Engineering Center : Various	3.802	1.600	Nov 2018	0.862	Nov 2019	0.800	Nov 2020	-		0.800	0.000	7.064	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Drop Testing	MIPR	NATICK : Various	-	0.400	Dec 2018	0.762	Oct 2019	-		-		-	0.000	1.162	-
		Subtotal	3.802	2.000		1.624		0.800		-		0.800	0.000	8.226	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.130	10.461		5.000		5.008		-		5.008	0.000	36.599	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

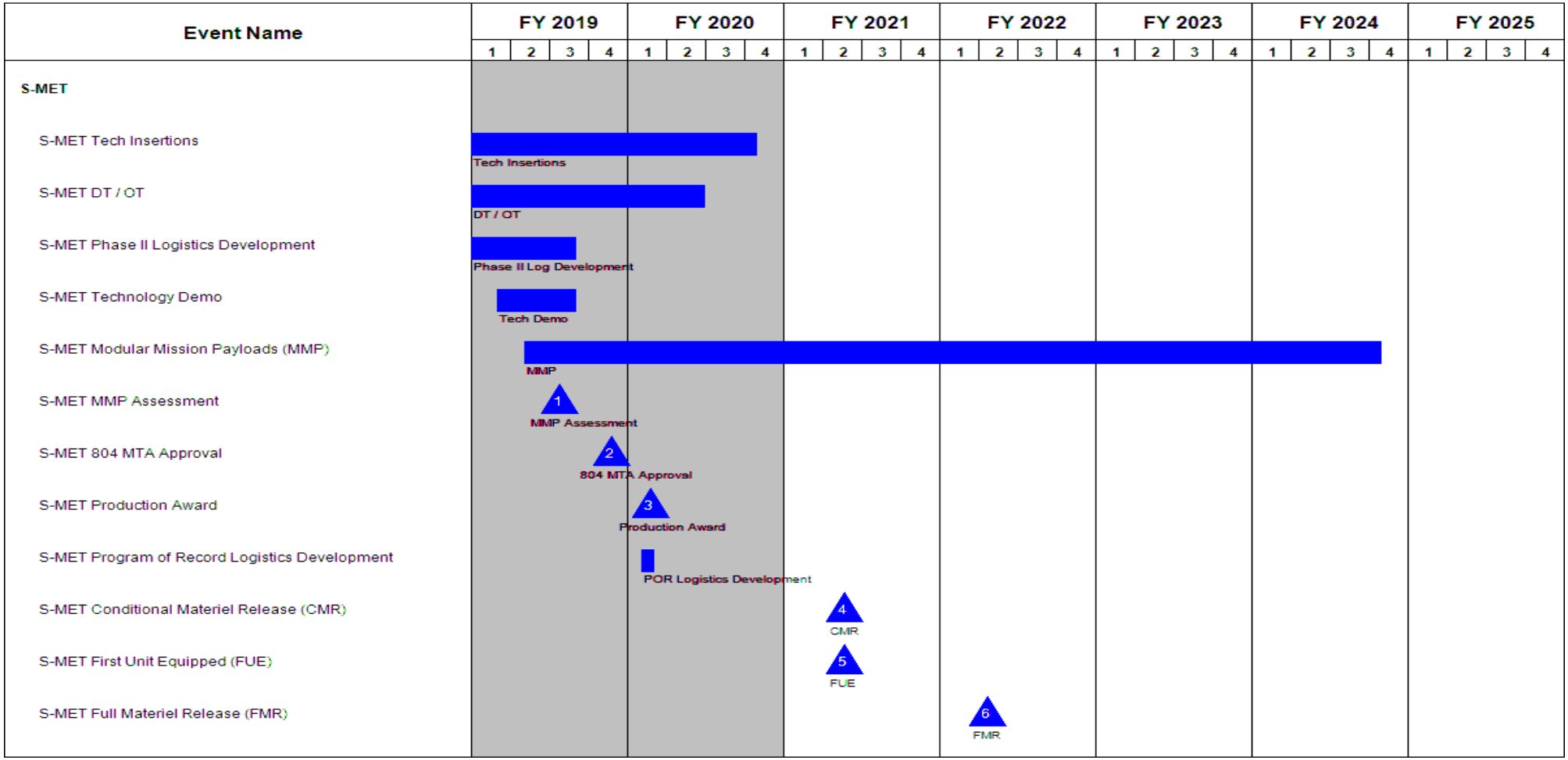

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
S-MET	1	2018	4	2022
S-MET Tech Insertions	3	2018	4	2020
S-MET DT / OT	4	2018	2	2020
S-MET Phase II Logistics Development	3	2018	3	2019
S-MET Technology Demo	1	2019	3	2019
S-MET Modular Mission Payloads (MMP)	2	2019	4	2024
S-MET MMP Assessment	3	2019	3	2019
S-MET 804 MTA Approval	4	2019	4	2019
S-MET Production Award	1	2020	1	2020
S-MET Program of Record Logistics Development	1	2020	1	2020
S-MET Conditional Materiel Release (CMR)	2	2021	2	2021
S-MET First Unit Equipped (FUE)	2	2021	2	2021
S-MET Full Materiel Release (FMR)	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

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
FB7: *Robotics Enhanced Program (REP)*	-	6.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.343
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making.

This program has no FY 2021 RDTE funding.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Robotic Enhanced Program (REP)	6.343	-	-
Description: Annual funding for the REP is broken up into two iterations occurring each fiscal year. RDTE funds are utilized in an experimental effort to inform Army User Communities (i.e. Centers of Excellence (CoE), TRADOC, ARCIC) determined requirements as outlined in the Robotic and Autonomous Systems (RAS) Strategy.			
Accomplishments/Planned Programs Subtotals	6.343	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Multiple	2.447	0.918	Apr 2019	-		-		-		-	0.000	3.365	-
		Subtotal	2.447	0.918		-		-		-		-	0.000	3.365	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Iteration 18.1	Various	Various : Multiple	0.037	-		-		-		-		-	0.000	0.037	-
Iteration 18.2	Various	Various : Multiple	1.707	-		-		-		-		-	0.000	1.707	-
Iteration 19.1	Various	Various : Multiple	-	2.049	Apr 2019	-		-		-		-	0.000	2.049	-
		Subtotal	1.744	2.049		-		-		-		-	0.000	3.793	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Iteration 18.1	Various	Various : Multiple	0.854	-		-		-		-		-	0.000	0.854	-
Iteration 18.2	Various	Various : Multiple	1.402	-		-		-		-		-	0.000	1.402	-
Iteration 19.1	Various	Various : Multiple	0.638	1.372	Jun 2019	-		-		-		-	0.000	2.010	-
REP Out-of-Cycle Initiatives	Various	Various : Various	0.598	2.004	Aug 2019	-		-		-		-	0.000	2.602	-
		Subtotal	3.492	3.376		-		-		-		-	0.000	6.868	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.683	6.343		0.000		-		-		-	0.000	14.026	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB7 / *Robotics Enhanced Program (REP)*

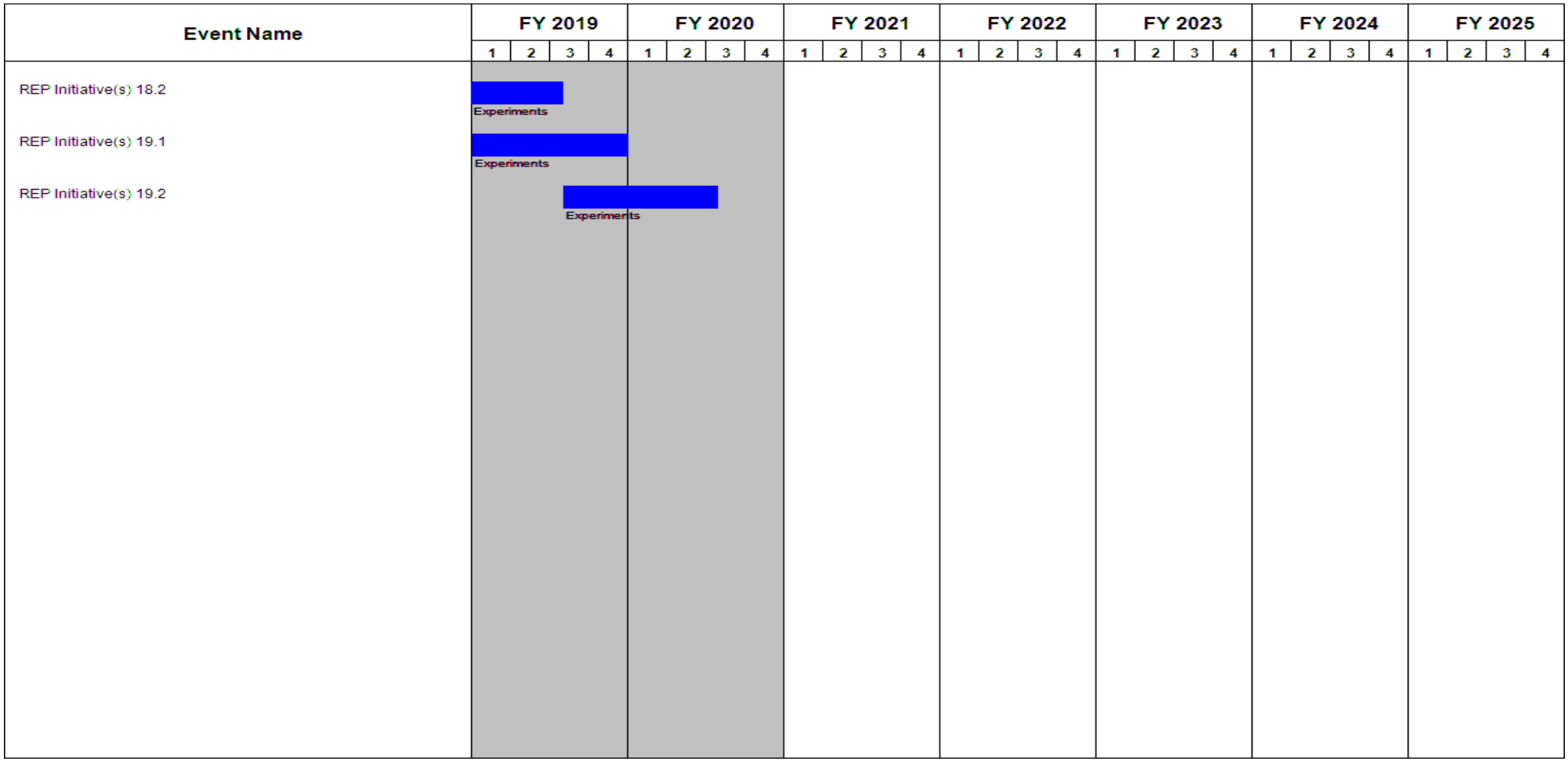

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB7 / *Robotics Enhanced Program (REP)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
REP Initiative(s) 18.1	1	2018	4	2018
REP Initiative(s) 18.2	3	2018	3	2019
REP Initiative(s) 19.1	1	2019	4	2019
REP Initiative(s) 19.2	3	2019	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

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
FB8: *Soldier Borne Sensor (SBS)*	-	3.354	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.354
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Borne Sensor (SBS) is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

In FY 2020, this project and funding transitioned to PE: 0604827A / Soldier Systems - Warrior Dem/Val, Project FK4.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Soldier Borne Sensor (SBS)	3.354	-	-
Description: The SBS is a small Unmanned Aerial System that provides the small unit a "quick look" capability providing Situational Awareness (SA) of routes, building, tunnels, obstacles blocking line of sight, and similar concealed threat locations.			
Accomplishments/Planned Programs Subtotals	3.354	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• FK4: *Soldier Borne Sensor (SBS)*	-	1.252	1.476	-	1.476	2.237	3.545	5.001	4.474	Continuing	Continuing
• W63798: *Soldier Borne Sensor (SBS)*	24.437	23.362	18.907	-	18.907	18.141	19.081	19.273	19.168	Continuing	Continuing

Remarks

D. Acquisition Strategy

SBS achieved Milestone C September 2017. The program office is utilizing Defense Logistics Agency - Tailored Logistics Support contracts to procure Tranche 1 systems in FY 2018, FY 2019, and FY 2020.

SBS plans to initiate prototype projects via other transaction agreement in. The Tranche 2 SBS solution will be selected from these prototypes in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Allot	Project Manager Soldier Sensors and Lasers : Fort Belvior, Virginia 22060	0.394	0.139	Dec 2018	-		-		-		-	0.000	0.533	-
		Subtotal	0.394	0.139		-		-		-		-	0.000	0.533	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Better Data Thermal Camera	MIPR	NVESD : Fort Belvoir, Virginia 22060	0.472	1.510	Feb 2019	-		-		-		-	0.000	1.982	-
Obstacle Avoidance	MIPR	NSRDEC : NATICK, Massachusetts 01760	-	0.148	Nov 2018	-		-		-		-	0.000	0.148	-
OTA Incremental Development	MIPR	NSRDEC : NATICK, Massachusetts 01760	-	1.026	Apr 2020	-		-		-		-	0.000	1.026	-
		Subtotal	0.472	2.684		-		-		-		-	0.000	3.156	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various : Various	0.552	0.356	Dec 2018	-		-		-		-	0.000	0.908	-
		Subtotal	0.552	0.356		-		-		-		-	0.000	0.908	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support	MIPR	Army Test and Evauation Command : White Sands Missile Range, New Mexico	0.779	0.175	Mar 2019	-		-		-		-	0.000	0.954	-
		Subtotal	0.779	0.175		-		-		-		-	0.000	0.954	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.197	3.354		0.000		-		-		-	0.000	5.551	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

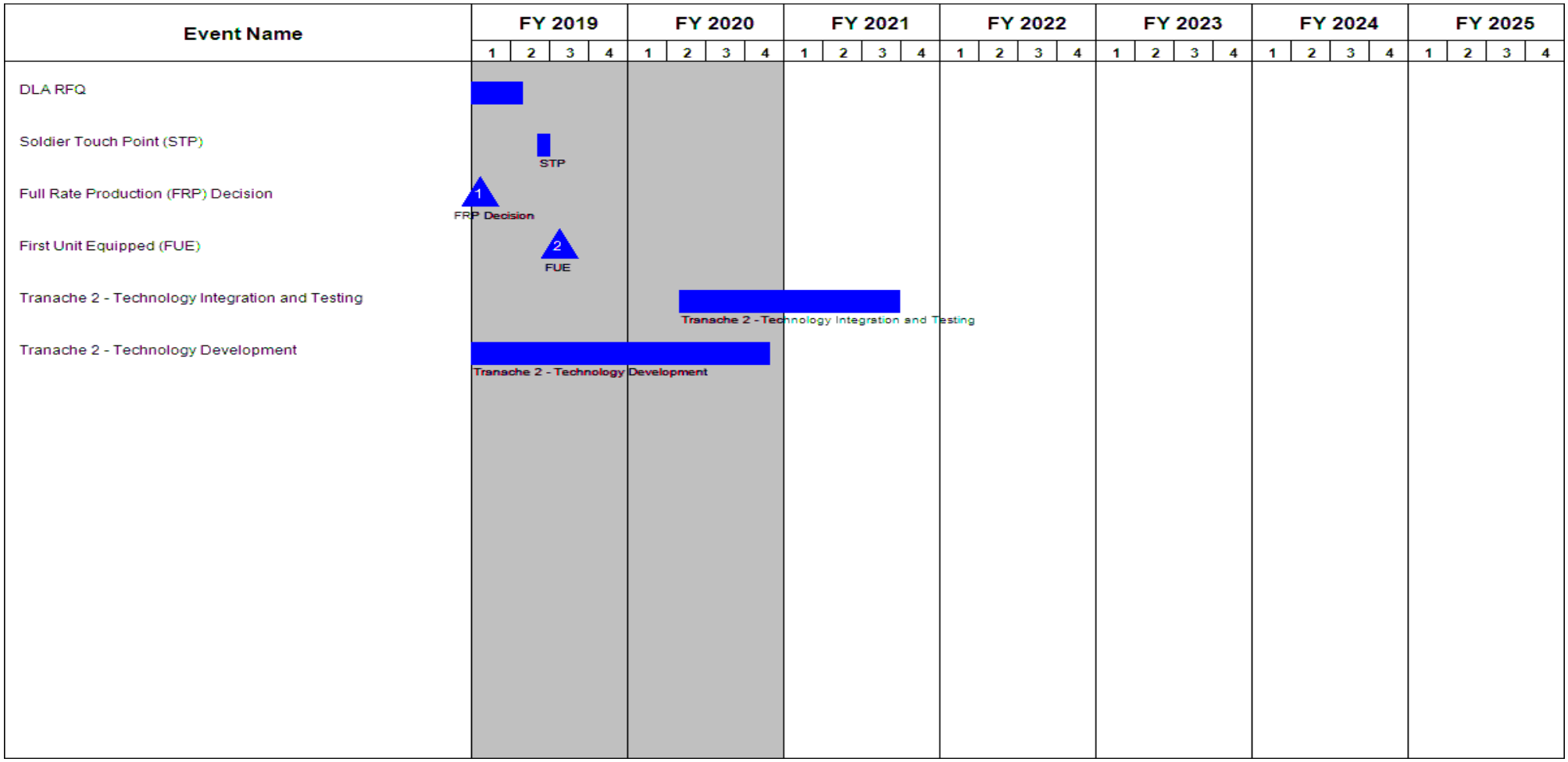

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DLA RFQ	1	2019	1	2019
Soldier Touch Point (STP)	2	2019	2	2019
Full Rate Production (FRP) Decision	1	2019	1	2019
First Unit Equipped (FUE)	3	2019	3	2019
Tranache 2 - Technology Integration and Testing	2	2020	3	2021
Tranache 2 - Technology Development	4	2018	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

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
FB9: *MTRS Standardization*	-	8.123	7.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.123
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Robotic System, Heavy (CRS(H)) is a modular large-sized system that provides enhanced protection to the Explosive Ordnance Disposal (EOD) Soldier in order to support the Joint Force Commander with the ability to identify, render safe and dispose of Explosive Ordnance (EO) and Improvised Explosive Devices (IEDs) in support of the Range of Military Operations (ROMO) and Home Land Defense (HLD) operations. CRS(H) will also enable EOD Soldiers to execute Defense Support of the Civil Authorities (DSCA) operations in response to requests from federal, state, local, and tribal authorities for domestic incidents, emergencies, disasters, designated law enforcement support and other activities. CRS(H) will support current and future missions for EOD units.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Additive Manufacturing ***Description:*** Supports 3D printed part evaluative efforts.	0.149	-	-
Title: CRS(H) IPT Matrix Support Salary Support ***Description:*** CRS(H) RDTE funding to support engineering and various test efforts to include redesign of test articles, software, engineering test support staff salaries, and System Engineering Program Management (SEPM) costs. ***FY 2020 Plans:*** Funding to support engineering activities, testing, logistics, and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the CRS(H) RDTE efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRS-H completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	1.549	0.936	-
Title: CRS(H) testing ***Description:*** CRS(H) cyber security and performance testing efforts. ***FY 2020 Plans:*** Funding is provided for cyber security testing, cyber security scans, and additional reliability and performance testing. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRS-H completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	6.425	1.937	-
Title: CRS(H) test article refurbishment	-	0.336	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: CRS(H) test article refurbishment for payloads. ***FY 2020 Plans:*** Funding is to refurbish test articles to "Like-New" condition to support payload integration activities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRS-H completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.			
Title: CRS(H) contract data ***Description:*** CRS(H) data required to support Materiel Release. ***FY 2020 Plans:*** Funding is provided for Risk Management Framework (RMF) artifacts, Logistics data, provisioning, training development, and engineering data. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRS-H completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	-	2.937	-
Title: CRS(H) Payload Development ***Description:*** CRS(H) payload development, integration, and testing activities. ***FY 2020 Plans:*** Funding is provided for CRS(H) payload development, integration, and testing activities. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CRS-H completed its RDTE activities in FY 2020 and is not funded with RDTE in FY 2021.	-	0.536	-
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.318	-
Accomplishments/Planned Programs Subtotals	8.123	7.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• W12001: *EOD Robotics Systems Recapitalization*	17.736	23.115	36.584	-	36.584	-	-	-	-	0.000	77.435

Remarks

This is a shared OPA line with Robotic Logistic Support Center (RLSC). Funding split is as follows:

Program	FY 2019	FY 2020	FY 2021
EOD (RLSC)	$13,118	0	0
CRS(H)	$4,618	$23,115	$36,584

D. Acquisition Strategy

The CRS-H acquisition strategy entered at Milestone C and awarded three Other Transaction Authority (OTA) agreements to conduct a dual phase fly-off. The CRS-H program used the fly-off results to down-select to one Original Equipment Manufacturer (OEM) and proceed directly into production in FY2019 and field under a Conditional Materiel Release (CMR) utilizing Interim Logistics Support (ILS) in FY 2020. The CRS-H program will complete all required engineering and logistics activities to support Full Materiel Release (FMR) under organic sustainment and Full Rate Production (FRP) in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Program Management costs	Various	Various : Multiple	-	1.546	Dec 2018	0.936	Oct 2019	-		-		-	0.000	2.482	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.318		-		-		-	0.000	0.318	-
		Subtotal	-	1.546		1.254		-		-		-	0.000	2.800	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform to Support Payload Development	C/TBD	Robot Logistics Support Center (RLSC) : Selfridge Air National Guard Base (SANG)	1.150	-		-		-		-		-	0.000	1.150	-
CRS(H) Payload Development	Various	Various : Multiple	-	-		0.536	Dec 2019	-		-		-	0.000	0.536	-
		Subtotal	1.150	-		0.536		-		-		-	0.000	1.686	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Contract data	SS/FFP	TBD : TBD	-	-		2.937	Nov 2019	-		-		-	0.000	2.937	-
		Subtotal	-	-		2.937		-		-		-	0.000	2.937	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) System Evaluation	Various	Various : Multiple	-	6.425	Feb 2019	1.937	Nov 2019	-		-		-	0.000	8.362	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Test Article refurbishment	SS/FFP	TBD : TBD	-	-		0.336	Nov 2019	-		-		-	0.000	0.336	-
Additive Manufacturing524	TBD	TBD : TBS	-	0.152	Jan 2019	-		-		-		-	0.000	0.152	-
		Subtotal	-	6.577		2.273		-		-		-	0.000	8.850	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.150	8.123		7.000		-		-		-	0.000	16.273	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

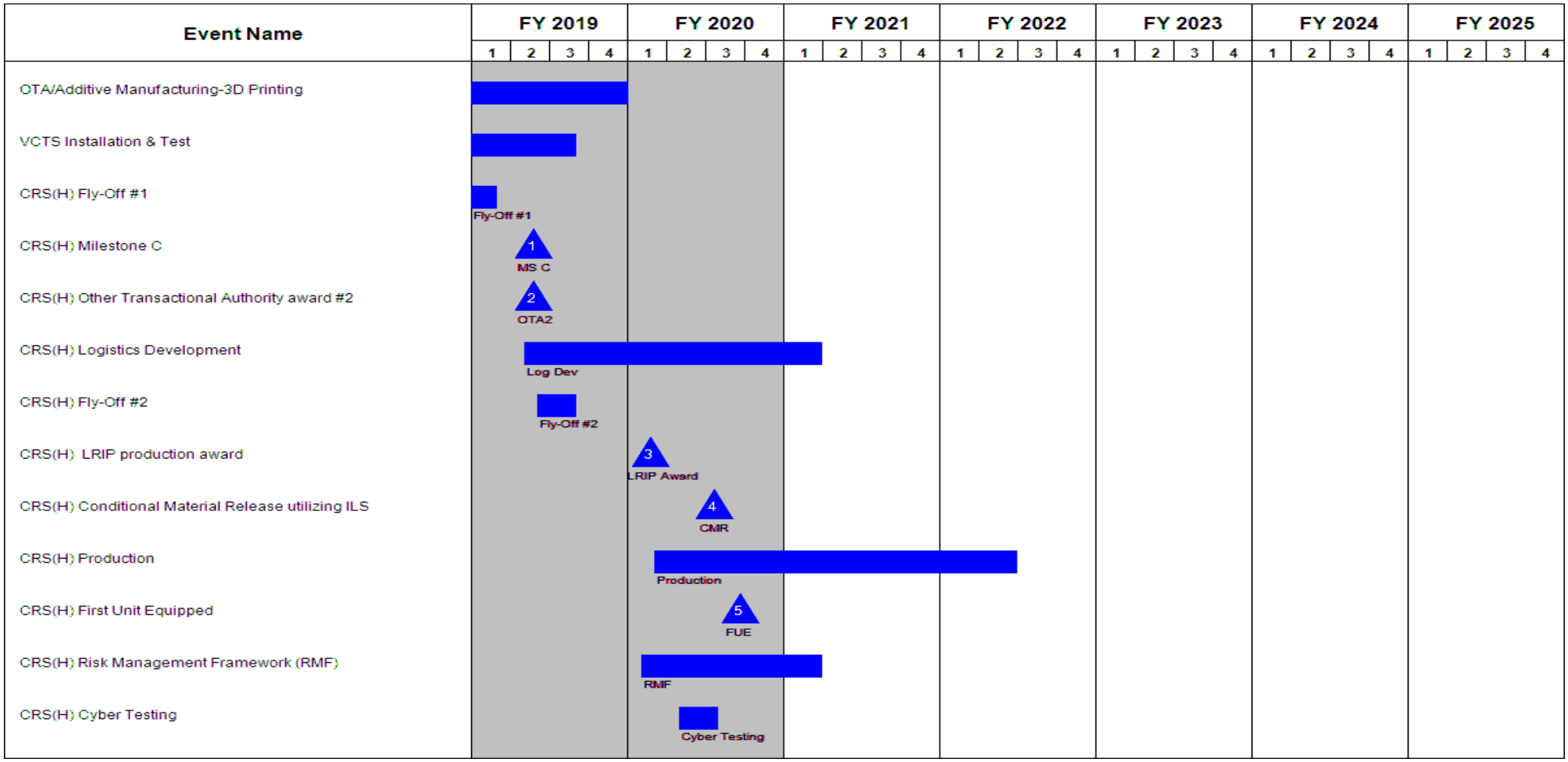

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CRS(H) Full Materiel Release (FMR) under organic sustainment											6 FMR																	

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Platform provided for Payload Test	2	2018	4	2018
OTA/Additive Manufacturing-3D Printing	2	2018	4	2019
VCTS Software Integration	2	2018	3	2018
VCTS Installation & Test	3	2018	3	2019
CRS(H) Capabilitiy Producton Document (CPD)	3	2018	3	2018
CRS(H) Request for Project Proposal (RPP) Release	3	2018	3	2018
CRS(H) Other Transactional Authority award #1	4	2018	4	2018
CRS(H) Milestone Decisions Document (MDD)	4	2018	4	2018
CRS(H) Fly-Off #1	4	2018	1	2019
CRS(H) Milestone C	2	2019	2	2019
CRS(H) Other Transactional Authority award #2	2	2019	2	2019
CRS(H) Logistics Development	2	2019	1	2021
CRS(H) Fly-Off #2	2	2019	3	2019
CRS(H) LRIP production award	1	2020	1	2020
CRS(H) Conditional Material Release utilizing ILS	3	2020	3	2020
CRS(H) Production	1	2020	2	2022
CRS(H) First Unit Equipped	3	2020	3	2020
CRS(H) Risk Management Framework (RMF)	1	2020	1	2021
CRS(H) Cyber Testing	2	2020	3	2020
CRS(H) Full Materiel Release (FMR) under organic sustainment	3	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

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
FG8: *Common Robotic Controller*	-	2.869	1.186	3.648	-	3.648	3.839	4.070	4.077	4.016	0.000	23.705
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Universal Robotic Controller (URC) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/ monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCUs) for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two URCs will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The URC will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The intent of this requirement is to allow the Soldier at battalion and below to use the URC to operate unmanned aerial systems (e.g. Raven, PUMA, Short Range Micro (SRM), etc.) and unmanned ground vehicles (e.g. Common Robotic System (Individual) CRS(I), CRS (Vehicle)(V), CRS (Medium)(M), CRS (Heavy) (H), Small Multipurpose Equipment Transport (SMET), Man Transportable Robotic System (MTRS) INC II, Light Reconnaissance (LR), Wingman, Robotic Combat Vehicle (RCV), etc.) and emerging unmanned air/ground systems. The URC is defined in the CRS(I) Capability Development Document (CDD) and is included in the CRS(I) acquisition. A standalone requirements document is being developed.

FY 2021 RDTE funding in the amount of $3.648 million will be utilized to continue test evaluation and Logistics product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CRS(I) CDD and Universal Controller Information Systems (UC IS) CDD and emerging programs of record, controller software, architecture, interface updates, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). This funding will also be used to establish a common software architecture for Unmanned Ground Vehicles and Unmanned Air Systems moving forward. Support development of IS CDD (Analysis of Alternatives (AoA), Cost- Benefit Analysis (C-BA)).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: URC improves Soldier situational awareness while reducing cognitive load on Soldiers and the robotics portfolio logistics footprint	2.869	1.132	3.648
Description: The Universal Robotic Controller (URC) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCU)s for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two URCs will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The URC will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The controller will also use haptic indicators inside the hand grips to give the user active feedback of the controlled system's movements if the UxS software is			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
programmed to use them. If and when the use of lethal systems on the URC is approved, the weaponized payloads will be controlled via several fail-safe mechanisms to prevent accidental discharge. ***FY 2020 Plans:*** FY 2020 RDTE funds will be utilized to complete test evaluation and Log product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CDD and emerging programs of record, controller software updates, risk mitigation activities, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). ***FY 2021 Plans:*** FY 2021 RDTE funds will be utilized to continue test evaluation and Log product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CDD and emerging programs of record, controller software, architecture, interface updates, risk mitigation activities, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). This funding will also be used to establish a common software architecture for UGV and UAS moving forward. Supports development of IS CDD (AoA, C-BA). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $2.462 million in funding due to the Army moving towards a software based strategy and development of IS CDD.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.054	-
Accomplishments/Planned Programs Subtotals	2.869	1.186	3.648

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• G99595: *Common Robotic System-Individual (CRS-I)*	3.563	2.285	1.154	-	1.154	1.155	1.241	1.449	1.415	0.000	12.262
• G93696: *Common Robotic System - Individual (CRS-I)*	-	30.387	54.528	-	54.528	22.857	-	-	-	0.000	107.772

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

In FY 2019, CRS(I) and the Common Robotic Controller OPA funding was in the same funding line G99595. Beginning in FY 2020, CRS(I) had its own funding line G93696 separate from the Common Robotic controller G99595.

D. Acquisition Strategy

The Universal Robotic Controller (URC) is a component of the CRS(I) and does not have its own Acquisition Strategy at this time.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management support	Various	Various : Multiple	-	0.187	Apr 2019	0.075	Oct 2019	-		-		-	0.000	0.262	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.054		-		-		-	0.000	0.054	-
		Subtotal	-	0.187		0.129		-		-		-	0.000	0.316	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Manufacturing & Development	C/CPFF	TBD : TBD	-	-		0.189	Oct 2019	3.648	Feb 2021	-		3.648	0.000	3.837	-
Engineering Change Proposal	TBD	Various : Multiple	-	-		0.490	Oct 2019	-		-		-	0.000	0.490	-
Software support	Various	Various : Various	-	1.284	Apr 2019	-		-		-		-	0.000	1.284	-
		Subtotal	-	1.284		0.679		3.648		-		3.648	0.000	5.611	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log Manuals	Various	Various : Multiple	-	0.738	May 2019	0.189	Oct 2019	-		-		-	0.000	0.927	-
		Subtotal	-	0.738		0.189		-		-		-	0.000	0.927	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC testing	Various	Varous : Multiple	-	-		0.189	Dec 2019	-		-		-	0.000	0.189	-
Contractor PQT	Various	Endeavor & QinetiQ : Massachusetts	-	0.660	Apr 2019	-		-		-		-	0.000	0.660	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	0.660		0.189		-		-		-	0.000	0.849	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.869		1.186		3.648		-		3.648	0.000	7.703	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

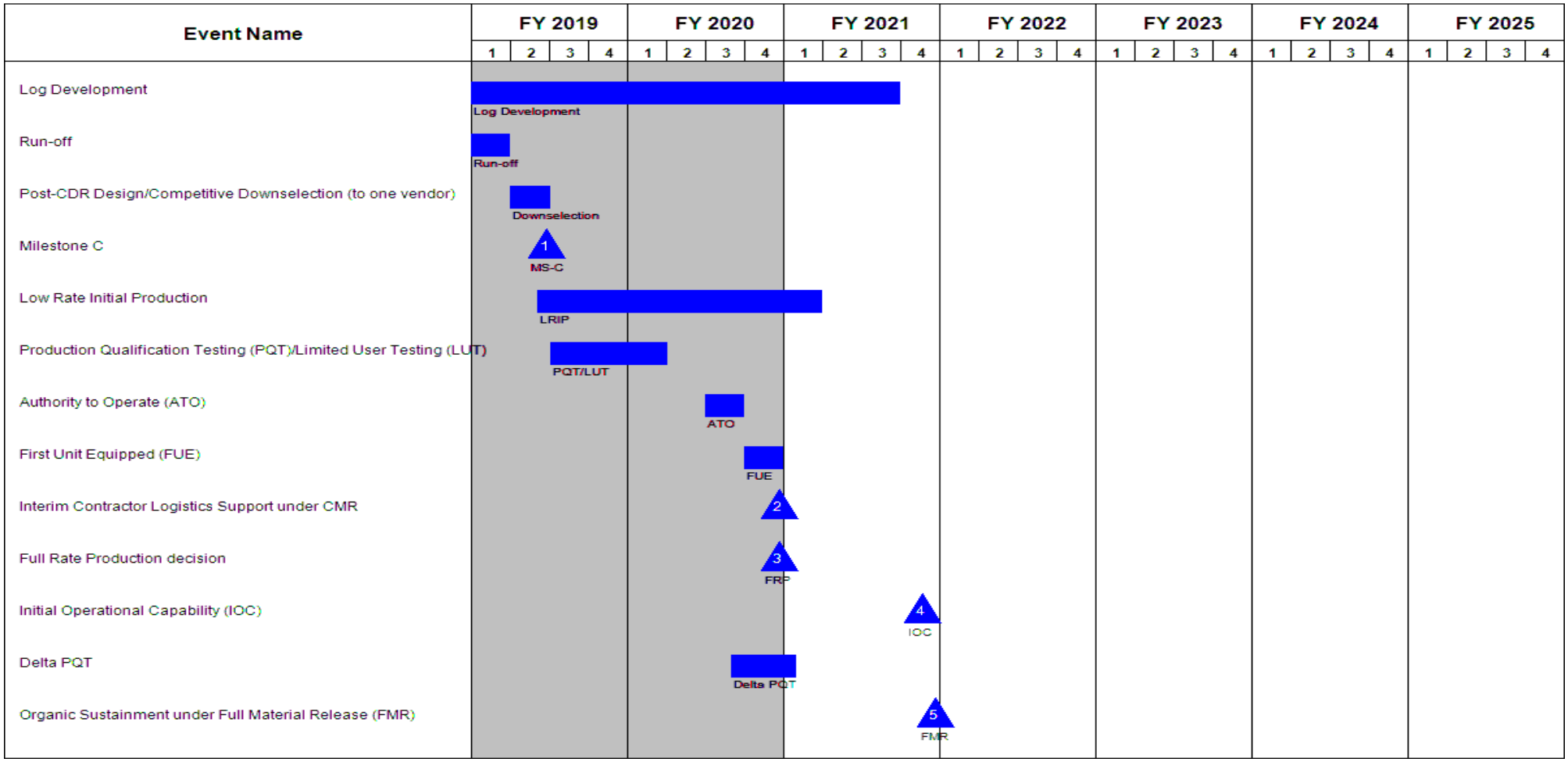

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

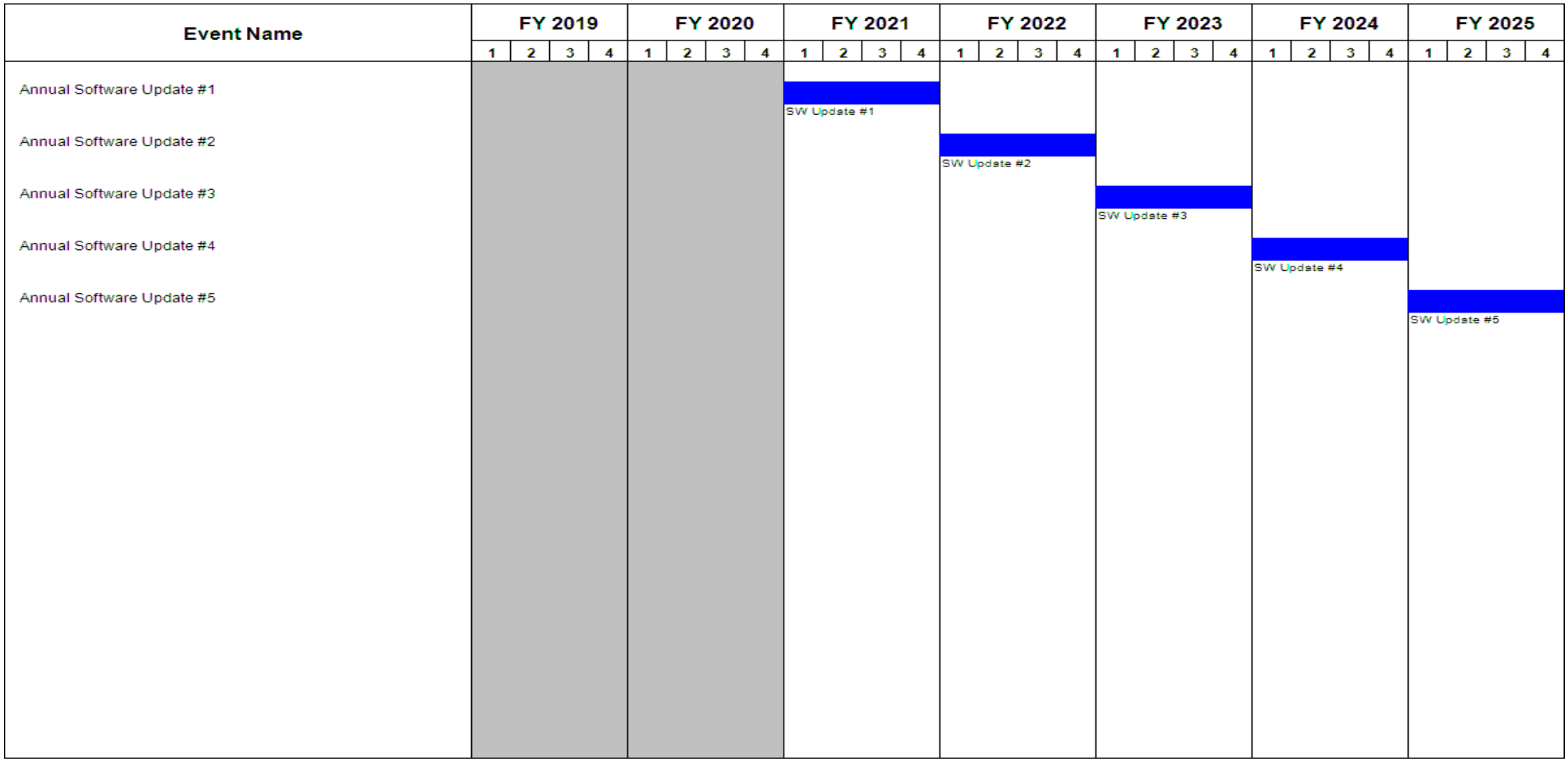

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B	2	2018	2	2018
Contract award	2	2018	2	2018
Critical Design Review	3	2018	3	2018
Log Development	3	2018	3	2021
Run-off	1	2019	1	2019
Post-CDR Design/Competitive Downselection (to one vendor)	1	2019	2	2019
Milestone C	2	2019	2	2019
Low Rate Initial Production	2	2019	1	2021
Production Qualification Testing (PQT)/Limited User Testing (LUT)	3	2019	1	2020
Authority to Operate (ATO)	3	2020	3	2020
First Unit Equipped (FUE)	4	2020	4	2020
Interim Contractor Logistics Support under CMR	4	2020	4	2020
Full Rate Production decision	4	2020	4	2020
Initial Operational Capability (IOC)	4	2021	4	2021
Delta PQT	3	2020	1	2021
Organic Sustainment under Full Material Release (FMR)	4	2021	4	2021
Annual Software Update #1	1	2021	4	2021
Annual Software Update #2	1	2022	4	2022
Annual Software Update #3	1	2023	4	2023
Annual Software Update #4	1	2024	4	2024
Annual Software Update #5	1	2025	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*							
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	-	46.451	37.696	294.739	-	294.739	239.640	165.699	59.664	60.389	0.000	904.278
FI3: *Rapid Capability Development and Maturation*	-	46.451	37.696	284.184	-	284.184	228.905	154.742	48.473	48.960	0.000	849.411
FL7: *Rapid Capability Support*	-	0.000	0.000	10.555	-	10.555	10.735	10.957	11.191	11.429	0.000	54.867

A. Mission Description and Budget Item Justification

Emerging Technology Initiatives will fund rapid prototyping and delivery of residual combat capability to enable the Army Modernization Priorities and the National Defense Strategy. These efforts include long range precision fires, air and missile defense, ground, aviation, soldier, command, control, computers, communications, cyber, intelligence surveillance & reconnaissance missions. The primary goal is to deliver experimental prototypes to an unit of action through a collaborative and accelerated acquisition process. Technologies will be demonstrated in relevant environments, performing tactical/operational scenarios.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	42.813	45.896	46.961	-	46.961
Current President's Budget	46.451	37.696	294.739	-	294.739
Total Adjustments	3.638	-8.200	247.778	-	247.778
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.200			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.638	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	247.778	-	247.778

Change Summary Explanation

The $247.945 million increase will primarily be used to develop, integrate and procure Directed Energy prototype systems supporting the Maneuver-Short Range Air Defense (M-SHORAD) mission. These prototype systems will include 50 kW-class lasers on an operational platoon of four Stryker vehicles in FY 2022. RCCTO Core Labor moved from PE0604798A DZ6 to Project FL7 in FY 2021 for greater transparency.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

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
FI3: *Rapid Capability Development and Maturation*	-	46.451	37.696	284.184	-	284.184	228.905	154.742	48.473	48.960	0.000	849.411
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will focus on high-priority, threat-based projects with the intent to deliver an operationally effective capability in the near- and mid-terms. Efforts will include accelerated materiel development and competitive prototyping based on anticipated and emerging threats and opportunities. This Project funds an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs. Current efforts include Directed Energy; Long Range Precision Fires; Air and Missile Defense; Cyber; Artificial Intelligence; Signals Intelligence (SIGINT); Unmanned Aerial Systems (UAS) and Counter UAS (C-UAS); Communications; Survivability; and other high priority emerging threats and opportunities as designated by the RCCTO Board of Directors. Funds may also allow for acceleration of critical capabilities to counter urgent and emerging threats for transition to programs of record. Funding may also be used to acquire specialized expertise to execute an initiative.

The Army RCCTO expedites the fielding of critical combat materiel capabilities to the Warfighter to meet urgent needs and support the Army modernization strategy. The RCCTO assesses Commercial-Off-The Shelf (COTS), Government Off-The- Shelf (GOTS), and Non-Developmental Item (NDI) (non-standard equipment) solutions for modification and/or integration to address changes in contested environments with enduring materiel solutions for forces deployed globally. The RCCTO procures prototypes and evaluates solutions to field residual combat capability to a unit of action and transition the capability to an acquisition program for production and sustainment when it is an enduring need.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Maturation, Prototyping, Assessment, and Integration of Emerging and Essential Technologies	46.451	35.984	284.184
Description: This effort selects technologies that show high promise for advancing and accelerating capabilities required under acquisition programs and develops and evaluates associated prototypes for accelerated identification, assessment, and transition to an acquisition program for production and fielding. It also demonstrates integrated technologies within a high fidelity and realistic operating environment and transitions them to a formal program of record on an accelerated basis. includes air and ground platform integration.			
FY 2020 Plans: These funds will be used to identify, develop, procure, modify, and evaluate prototypes providing capability prioritized by the Board of Directors (BOD) in the areas of Artificial Intelligence Cyber, EW, SIGINT, UAV, C-UAV, Communications, PNT, Survivability, Long Range Precision Fires, and other critical capability gaps. Funding supports development and procurement of			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
prototypes, system modification, engineering support, platform integration, integration materials, field service representation, early acquisition documentation, training, and developmental and operational testing needed to initiate limited fielding and/or transition to a procurement ready solution for acquisition. This also funds RCO labor (Government matrix and contractor), service contracts, travel, training, supplies, facilities and Information Technology (IT) required to execute initiative. ***FY 2021 Plans:*** These funds will be used to identify, develop, procure, modify, evaluate, and deliver prototypes providing capability prioritized by the Board of Directors (BOD) in the areas of Directed Energy; Long Range Precision Fires; Air and Missile Defense; Cyber; Artificial Intelligence; Signals Intelligence (SIGINT); Unmanned Aerial Systems (UAS) and Counter UAS (C-UAS); Communications; Survivability; and other critical capability gaps. Funding supports development and procurement of prototypes, system modification, engineering support, platform integration, integration materials, field service representation, early acquisition documentation, training, and developmental and operational testing needed to initiate limited fielding and/or transition to a procurement ready solution for acquisition. This also funds RCCTO matrix and contractor labor, service contracts, travel, security, training, supplies, facilities, and Information Technology (IT) required to execute initiatives. Specifically, significant FY 2021 funds will be used to procure 3 Directed Energy prototype systems supporting the Maneuver-Short Range Air Defense (M-SHORAD) mission. Additionally, funds projects selected from RCCTO Innovation Days, an event that reviews innovative solutions that have the potential to reduce near and mid-term operational risk against near-peer adversaries and push traditional boundaries to deliver breakthrough prototypes with residual combat capability. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $246.488 million increase will procure 3 Directed Energy prototype systems supporting the Maneuver-Short Range Air Defense (M-SHORAD) mission.			
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:*** Funding transferred in accordance with Title 15 USC 638	-	1.712	-
Accomplishments/Planned Programs Subtotals	46.451	37.696	284.184

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Army RCCTO capitalizes on current and emerging technologies to provide near-term and mid-term solutions to address emerging threats and high impact capability opportunities for U.S. Army Forces deployed globally. This is accomplished in one of two ways: 1) adapting COTS/GOTS/NDI equipment to meet operational needs and 2) developing emerging deployable capability through research and development organizations, academia, and industry. The RCCTO uses streamlined acquisition methods, processes and techniques to rapidly acquire capability; these methods vary by project. The RCCTO has procurement authority and an in-house contracting staff, with the flexibility to use both traditional and non-traditional contracting approaches. To reach non-traditional vendors, RCCTO will use non-standard contracting methods, such as Other Transaction Authority agreements. Where practicable, prototypes will be acquired using competitive procedures. Soldier touchpoints will be conducted to provide feedback in support of Army requirements generation, prototype maturation, fielding residual combat capability to a unit of action, and future capability development. When designated by the RCCTO Board of Directors, projects will be transitioned to an approved acquisition program for production and sustainment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix, Contractor	Various	TBD : Various	-	-		9.461		27.275		-		27.275	0.000	36.736	-
Facilities, IT/Supplies, Travel, Training	Various	TBD : Various	-	-		3.255		5.383		-		5.383	0.000	8.638	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.712		-		-		-	0.000	1.712	-
		Subtotal	-	-		14.428		32.658		-		32.658	0.000	47.086	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies Development	Various	TBD : Various	-	22.378		9.658		205.530		-		205.530	0.000	237.566	-
OSD - EW/Cyber Ground PoDs Development	Various	TBD : Various	-	8.975		-		-		-		-	0.000	8.975	-
		Subtotal	-	31.353		9.658		205.530		-		205.530	0.000	246.541	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies Engineering Support	TBD	TBD : Various	-	3.098		5.391		9.014		-		9.014	0.000	17.503	-
		Subtotal	-	3.098		5.391		9.014		-		9.014	0.000	17.503	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OSD - EW/Cyber Ground PoDs Test	TBD	TBD : Various	-	3.000		-		-		-		-	0.000	3.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OSD - UCIDS Test	TBD	TBD : Various	-	3.000		-		-		-		-	0.000	3.000	-
Emerging Technologies Test & Evaluation	TBD	TBD : Various	-	6.000		8.219		36.982		-		36.982	0.000	51.201	-
		Subtotal	-	12.000		8.219		36.982		-		36.982	0.000	57.201	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	46.451		37.696		284.184		-		284.184	0.000	368.331	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

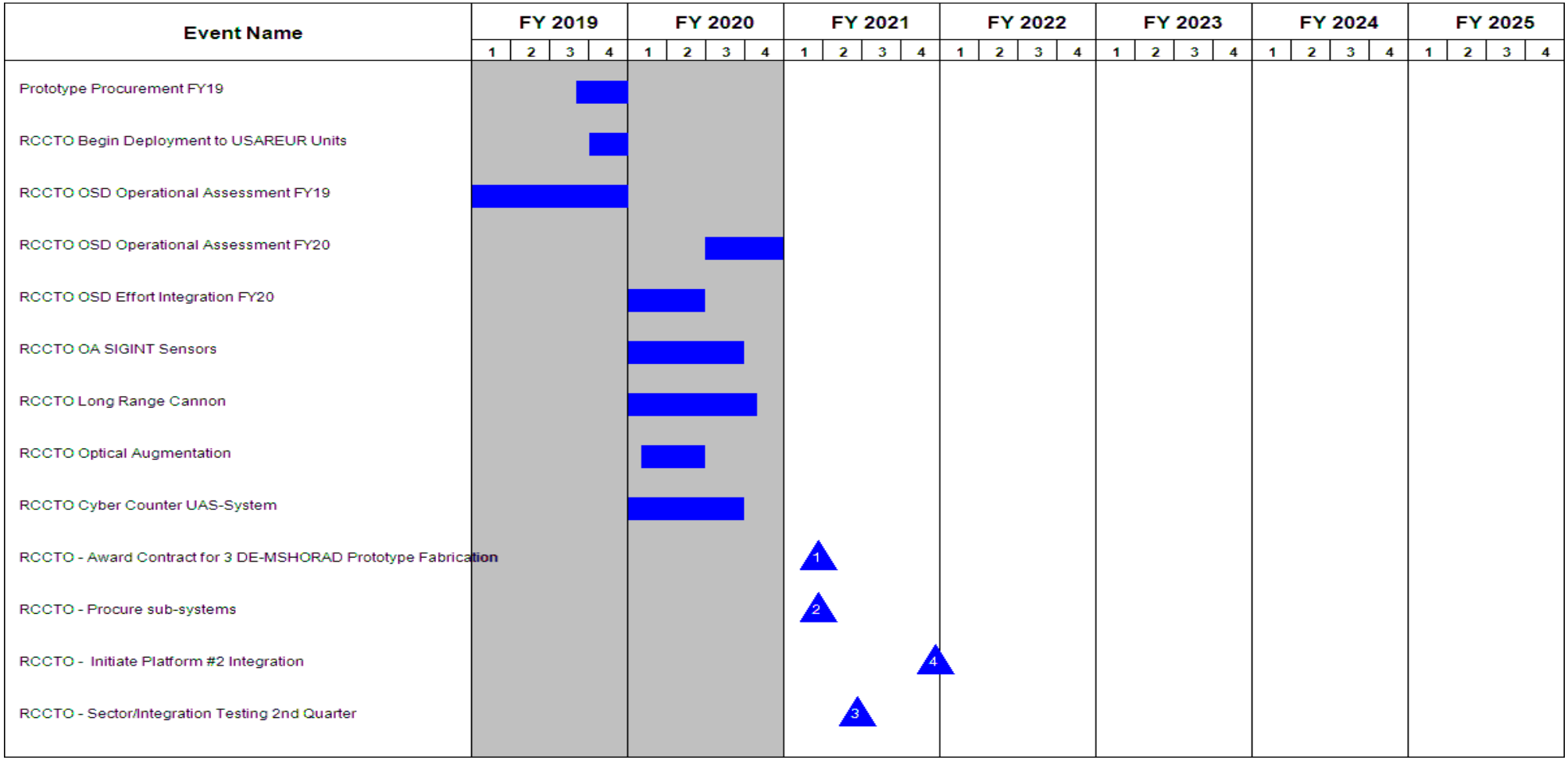

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

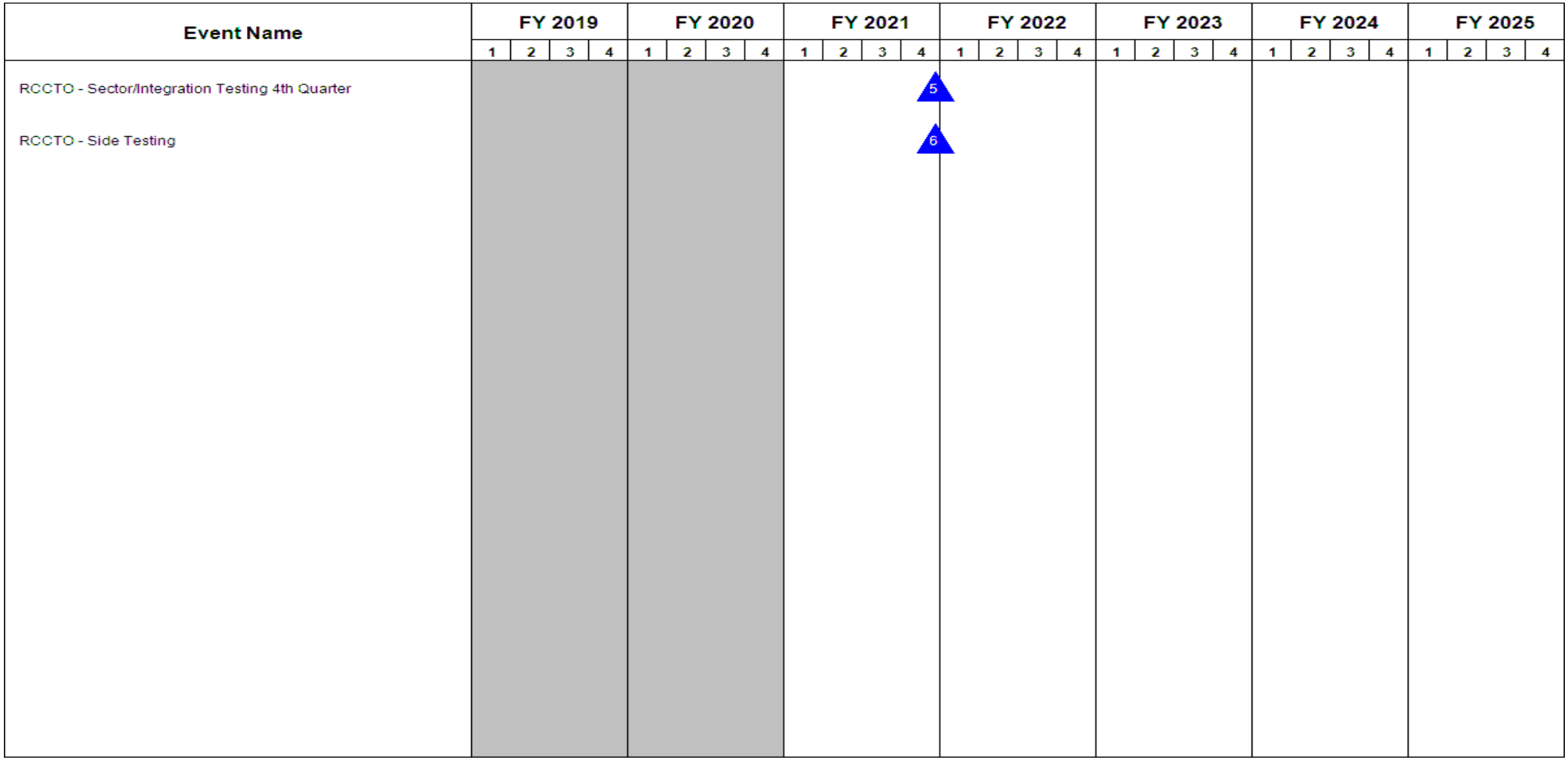

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Prototype Procurement FY19	3	2019	4	2019
RCCTO Begin Deployment to USAREUR Units	4	2019	4	2019
RCCTO OSD Operational Assessment FY19	1	2019	4	2019
RCCTO OSD Operational Assessment FY20	3	2020	4	2020
RCCTO OSD Effort Integration FY20	1	2020	2	2020
RCCTO OA SIGINT Sensors	1	2020	3	2020
RCCTO Long Range Cannon	1	2020	4	2020
RCCTO Optical Augmentation	1	2020	2	2020
RCCTO Cyber Counter UAS-System	1	2020	3	2020
RCCTO - Award Contract for 3 DE-MSHORAD Prototype Fabrication	1	2021	1	2021
RCCTO - Procure sub-systems	1	2021	1	2021
RCCTO - Initiate Platform #2 Integration	4	2021	4	2021
RCCTO - Sector/Integration Testing 2nd Quarter	2	2021	2	2021
RCCTO - Sector/Integration Testing 4th Quarter	4	2021	4	2021
RCCTO - Side Testing	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FL7 / *Rapid Capability 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
FL7: *Rapid Capability Support*	-	0.000	0.000	10.555	-	10.555	10.735	10.957	11.191	11.429	0.000	54.867
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

RCCTO Core Labor funding transitioned from PE 0604798A.

A. Mission Description and Budget Item Justification

This project funds rapid prototyping and delivery of residual combat capability to enable the Army Modernization Priorities and the National Defense Strategy. These efforts include long range precision fires, air and missile defense, ground, aviation, Soldier, cyber, and command, control, communications, computers, intelligence, surveillance & reconnaissance (C4ISR) missions. The primary goal is to deliver experimental prototypes to a unit of action through a collaborative and accelerated acquisition process. Technologies will be demonstrated in relevant environments, performing tactical/operational scenarios. Efforts will focus on high-priority, threat-based projects with the intent to deliver an operationally effective capability in the near- and mid-terms. Efforts will include accelerated materiel development and competitive prototyping based on anticipated and emerging threats and opportunities. This Project provides the Army an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs in Directed Energy; Long Range Precision Fires; Air and Missile Defense; Cyber; Artificial Intelligence; Signals Intelligence (SIGINT); Unmanned Aerial Systems (UAS) and Counter UAS (C-UAS); Communications; Survivability; and other high priority emerging threats and opportunities as designated by the RCCTO Board of Directors. Funds may also allow for acceleration of critical Program of Record capabilities to counter urgent and emerging threats. Funding may also be used to acquire specialized expertise to execute an initiative.

The Army RCCTO expedites the fielding of critical combat materiel capabilities to the Warfighter to meet urgent needs and support the Army modernization strategy. The RCCTO assesses Commercial-Off-The Shelf (COTS), Government Off-The- Shelf (GOTS), and Non-Developmental Item (NDI) (non-standard equipment) solutions for modification and/or integration to address changes in contested environments with enduring materiel solutions for forces deployed globally. The RCCTO procures prototypes and evaluates solutions to field residual combat capability to a unit of action and transition the capability to an acquisition program for production and sustainment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Core Labor	-	-	10.555
Description: Funding will be for Core Labor.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FL7 / *Rapid Capability Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
These funds will be used for Core Labor in support of rapid prototyping and delivery of residual combat capability to enable long range precision fires, air and missile defense, ground, aviation, Soldier, cyber and C4ISR missions. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** RCCTO Core Labor transferred from PE 0604798A Project DY7 to PE 0605054A Project FL7.			
Accomplishments/Planned Programs Subtotals	-	-	10.555

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FL7 / *Rapid Capability Support*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Labor	TBD	RCCTO : Fort Belvoir VA, Huntsville AL and APG	-	-		-		10.555		-		10.555	0.000	10.555	-
		Subtotal	-	-		-		10.555		-		10.555	0.000	10.555	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		10.555		-		10.555	0.000	10.555	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FL7 / *Rapid Capability Support*

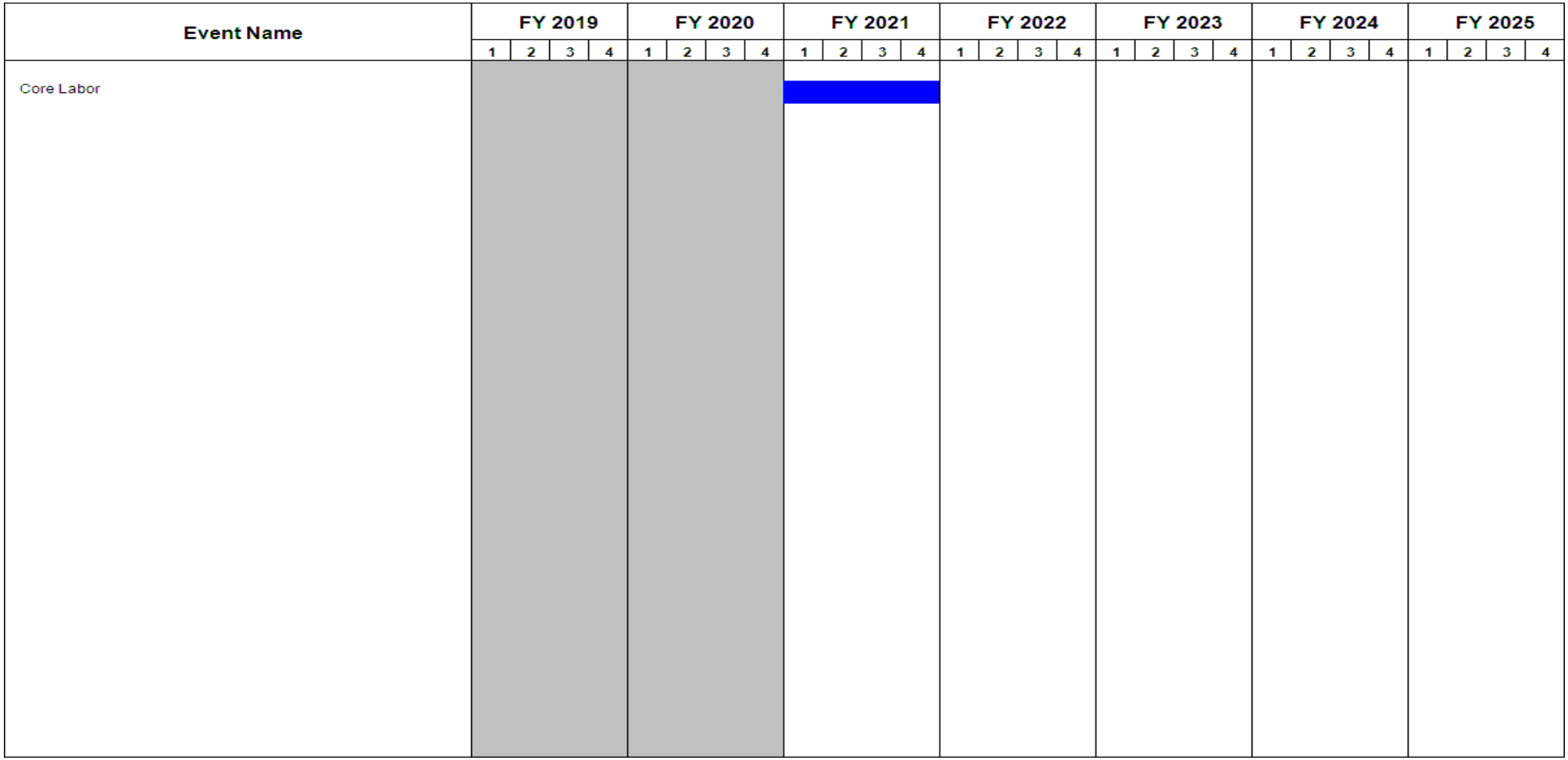

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FL7 / *Rapid Capability Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Core Labor	1	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605145A *I Medical Products and Support 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	-	0.000	0.000	0.954	-	0.954	0.973	0.992	1.012	1.032	0.000	4.963
CD6: *Medical Products and Support Systems Development*	-	0.000	0.000	0.954	-	0.954	0.973	0.992	1.012	1.032	0.000	4.963

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 Civilian Authorized Salaries and other operational requirements for the non-Army Management Headquarters Activity (non-AMHA) Research, Development, Test, and Evaluation (RDTE) functions incident to the local operation and management of the Medical Command support at the U.S. Army Medical Research and Development Command (USAMRDC).

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	0.954	-	0.954
Total Adjustments	0.000	0.000	0.954	-	0.954
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.954	-	0.954

Change Summary Explanation

FY21 increase a result of funding transferred to the Army from the Defense Health Program (DHP) research, development, testing and evaluation (RDTE) Program Element 0605145DHA Project 399A.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605145A / *Medical Products and Support Systems Development*	Project (Number/Name) CD6 / *Medical Products and Support 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
CD6: *Medical Products and Support Systems Development*	-	0.000	0.000	0.954	-	0.954	0.973	0.992	1.012	1.032	0.000	4.963
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 medical research, development, acquisition management and oversight that support the medical research, development, test, and evaluation (RDTE) programs at the United States Army Medical Research and Development Command (USAMRDC), Fort Detrick, Maryland to: (1) perform planning, programming, and budgeting; (2) manage resources; and (3) ensure compliance with United States 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 United States Army Medical Research Acquisition Activity (USAMRAA) in support of the USAMRDC Medical RDTE Program.

Additionally, this Project provides funding for the Special Immunization Program (SIP). The SIP program provides FDA licensed vaccines and investigational new drug (IND) vaccines under informed consent to laboratory workers at the United States 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.

Funding was transferred from the Defense Health Program to the Army in Fiscal Year 2021.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Civilian Authorized Salaries and Other Operational Requirements	-	-	0.954
Description: Funding is provided to the USAMRDC 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 and human research protections, health and safety compliance, environmental management, United States 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.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605145A / *Medical Products and Support Systems Development*	**Project (Number/Name)** CD6 / *Medical Products and Support Systems Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2021 Plans: 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. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** In Fiscal Year 2021, funding transferred from the Defense Health Program (DHP) RDTE Program Element 0605145DHA Project 399A.			
Accomplishments/Planned Programs Subtotals	-	-	0.954

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605145A / *Medical Products and Support Systems Development*	Project (Number/Name) CD6 / *Medical Products and Support Systems Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Civilian Salary and Other Requirements	TBD	USAMRDC : Fort Detrick, MD	-	-		-		0.954		-		0.954	0.000	0.954	-
		Subtotal	-	-		-		0.954		-		0.954	0.000	0.954	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		0.954		-		0.954	0.000	0.954	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605145A / *Medical Products and Support Systems Development*	**Project (Number/Name)** CD6 / *Medical Products and Support Systems Development*

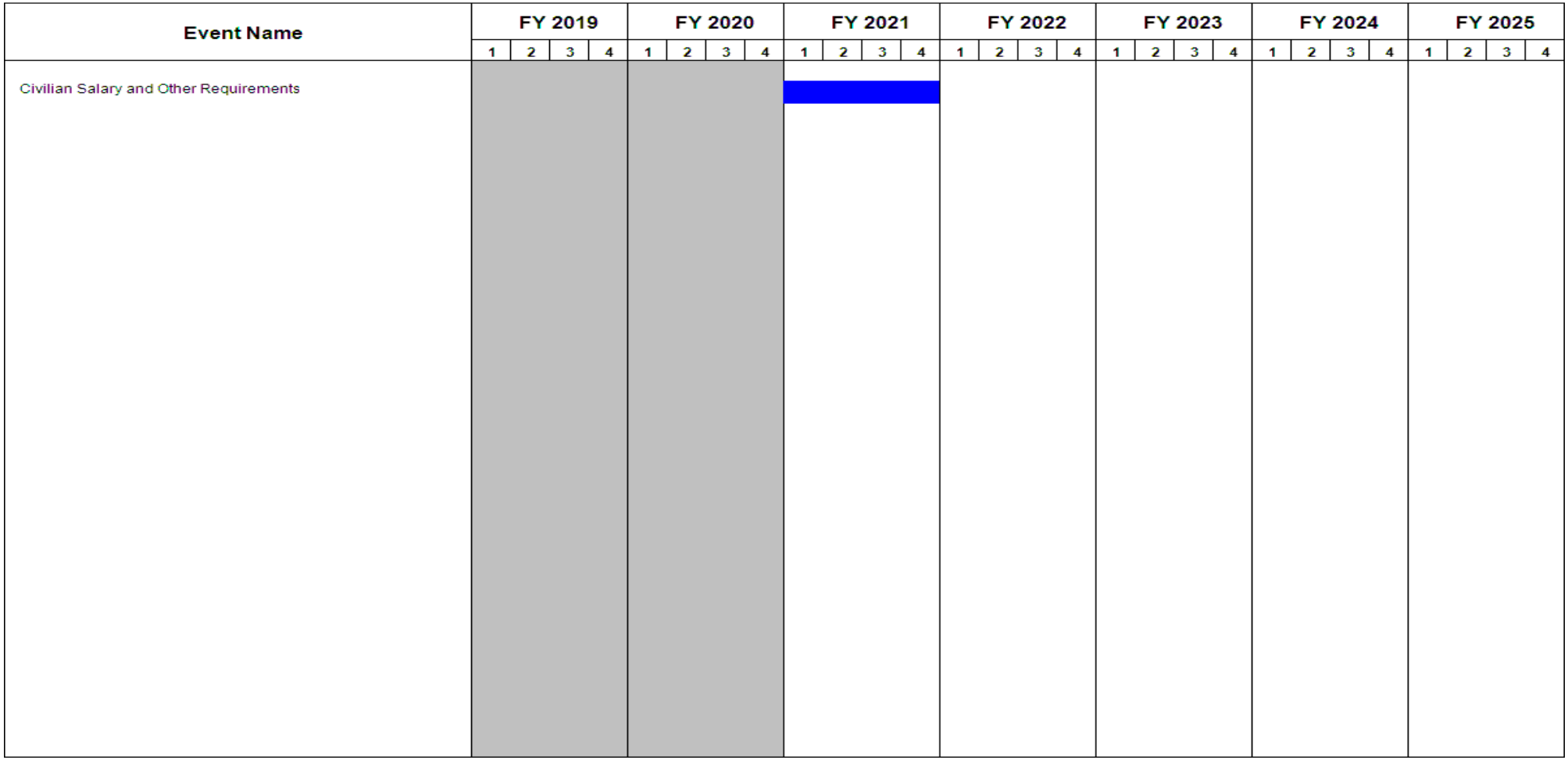

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605145A / *Medical Products and Support Systems Development*	**Project (Number/Name)** CD6 / *Medical Products and Support Systems Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Civilian Salary and Other Requirements	1	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605203A *I Army System Development & Demonstration*							
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	184.410	150.201	-	150.201	133.311	106.347	115.692	116.854	0.000	806.815
BR3: *Army System Development & Demonstration*	-	0.000	184.410	150.201	-	150.201	133.311	106.347	115.692	116.854	0.000	806.815

A. Mission Description and Budget Item Justification

The Army System Development & Demonstration budget line includes multiple efforts across the Army's Battlefield Operational Systems necessary to support projects in engineering and manufacturing development for use on programs that have not received approval for full-rate. System performance is near or at planned operational system levels.

Projects are characterized by mature system development, integration, demonstration to support Milestone C decisions, conducting live fire test and evaluation, and initial operational test and evaluation of production representative articles.

Selected programs within this budget line will exhibit a logical progression of program phases, development and production funding within the FYDP, consistent with the Department's full funding policy.

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	184.410	142.081	-	142.081
Current President's Budget	0.000	184.410	150.201	-	150.201
Total Adjustments	0.000	0.000	8.120	-	8.120
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	8.120	-	8.120

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*							
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	5.999	-	5.999	2.407	6.382	9.009	3.018	Continuing	Continuing
BR7: *Small Unmanned Aircraft System (6.5)*	-	0.000	0.000	5.999	-	5.999	2.407	6.382	9.009	3.018	Continuing	Continuing

Note

Funding has transitioned to Budget Activity (BA) 5 Program Element (PE) 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

The Rucksack Portable Unmanned Aircraft System (RPUAS) Family of Small Unmanned Aircraft System (FoSUAS) provides battalion and below ground maneuver elements with critical situational awareness and enhanced force protection. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

The RPUAS FoSUAS provides the battalion and below ground maneuver elements with an organic, on-demand, asset to develop situational awareness, enhance force protection, and secure routes, points, and areas. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. The RPUAS FoSUAS includes a combination of three separate hand-launched mission specific configurable aircraft that do not require an improved launch/recovery. The three separate mission specific configurable Unmanned Aircraft (UA) are the Short Range Reconnaissance (SRR)), the Medium Range Reconnaissance (MRR), and the Long Range Reconnaissance (LRR). In addition to the aircraft, the system contains ground control equipment, which includes an interoperable handheld ground control station (H-GCS) which incorporates the Tactical Open Government Owned Architecture (TOGA). FoSUAS will utilize existing RQ-11 in a system of systems fielding concept, with Short Range Reconnaissance (SRR) and Long Range Reconnaissance (LRR) options under development.

Justification: FY 2021 Research, Development, Test, and Evaluation (RDTE) Base funding of $5.999 million for Program Management Engineering support and to meet Capabilities Production Document (CPD) Increment II Block II related requirements. Specifically, to conduct SRR Tranche II system development, integration, testing and evaluation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605205A *I Small Unmanned Aerial Vehicle (SUAV) (6.5)*		
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	5.999	-	5.999
Total Adjustments	0.000	0.000	5.999	-	5.999
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	5.999	-	5.999

Change Summary Explanation

Funding has transitioned to Budget Activity (BA) 5 Program Element (PE) 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in Fiscal Year (FY) 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	Project (Number/Name) BR7 / *Small Unmanned Aircraft System (6.5)*	

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
BR7: *Small Unmanned Aircraft System (6.5)*	-	0.000	0.000	5.999	-	5.999	2.407	6.382	9.009	3.018	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding has transitioned to Budget Activity (BA) 5 Program Element (PE) 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

The Rucksack Portable Unmanned Aircraft System (RPUAS) Family of Small Unmanned Aircraft System (FoSUAS) provides battalion and below ground maneuver elements with critical situational awareness and enhanced force protection. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

The RPUAS FoSUAS provides the battalion and below ground maneuver elements with an organic, on-demand, asset to develop situational awareness, enhance force protection, and secure routes, points, and areas. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. The RPUAS FoSUAS includes a combination of three separate hand-launched mission specific configurable aircraft that do not require an improved launch/recovery. The three separate mission specific configurable Unmanned Aircraft (UA) are the Short Range Reconnaissance (SRR), the Medium Range Reconnaissance (MRR), and the Long Range Reconnaissance (LRR). In addition to the aircraft, the system contains ground control equipment, which includes an interoperable handheld ground control station (H-GCS) which incorporates the Tactical Open Government Owned Architecture (TOGA). FoSUAS will utilize existing RQ-11 in a system of systems fielding concept, with SRR and LRR options under development.

Justification: FY 2021 Research, Development, Test, and Evaluation (RDT&E) Base funding of $5.999 million for Program Management Engineering support and to meet Capabilities Production Document (CPD) Increment II Block II related requirements. Specifically, to conduct SRR Tranche II system development, integration, testing and evaluation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Systems Engineering Program Management	-	-	0.603
Description: Systems Engineering Program Management support for LRR and SRR development and demonstration efforts.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	**Project (Number/Name)** BR7 / *Small Unmanned Aircraft System (6.5)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Systems Engineering and Program Management support for SRR and LRR development and demonstration efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding has transitioned to BA 5 PE 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in FY 2021.			
Title: System Development and Integration ***Description:*** SRR Development Engineering efforts and development for LRR component technology. ***FY 2021 Plans:*** Efforts to conduct SRR development and integration to support CPD requirements. Also, component development for LRR. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding has transitioned to BA 5 PE 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in FY 2021.	-	-	3.972
Title: Developmental Test and Evaluation ***Description:*** Test and Evaluation efforts for SRR and LRR Development. ***FY 2021 Plans:*** Efforts to conduct testing and evaluation of mature SRR prototype system. Also, LRR component technology. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding has transitioned to BA 5 PE 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in FY 2021.	-	-	1.424
Accomplishments/Planned Programs Subtotals	-	-	5.999

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• A00010: *RQ-11 (RAVEN)*	46.438	21.420	20.851	-	20.851	16.397	16.581	21.342	21.560	Continuing	Continuing
• BR6: *Small Unmanned Aircraft System (6.4)*	-	-	1.378	-	1.378	1.387	1.392	1.753	1.786	0.000	7.696
• RA7: *RQ-11 Raven (MIP)*	6.180	3.218	0.000	-	0.000	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	**Project (Number/Name)** BR7 / *Small Unmanned Aircraft System (6.5)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

Funding has transitioned to BA 5 PE 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in FY 2021.

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	Project (Number/Name) BR7 / *Small Unmanned Aircraft System (6.5)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Program Management (SEPM)	TBD	To BE Determined : To Be Determined	-	-		-		0.603		-		0.603	Continuing	Continuing	Continuing
		Subtotal	-	-		-		0.603		-		0.603	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Engineering	TBD	To Be Determined : To Be Determined	-	-		-		3.972	Apr 2021	-		3.972	Continuing	Continuing	Continuing
		Subtotal	-	-		-		3.972		-		3.972	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	TBD	To Be Determined : To Be Determined	-	-		-		1.424	Jul 2021	-		1.424	Continuing	Continuing	Continuing
		Subtotal	-	-		-		1.424		-		1.424	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		5.999		-		5.999	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	**Project (Number/Name)** BR7 / *Small Unmanned Aircraft System (6.5)*

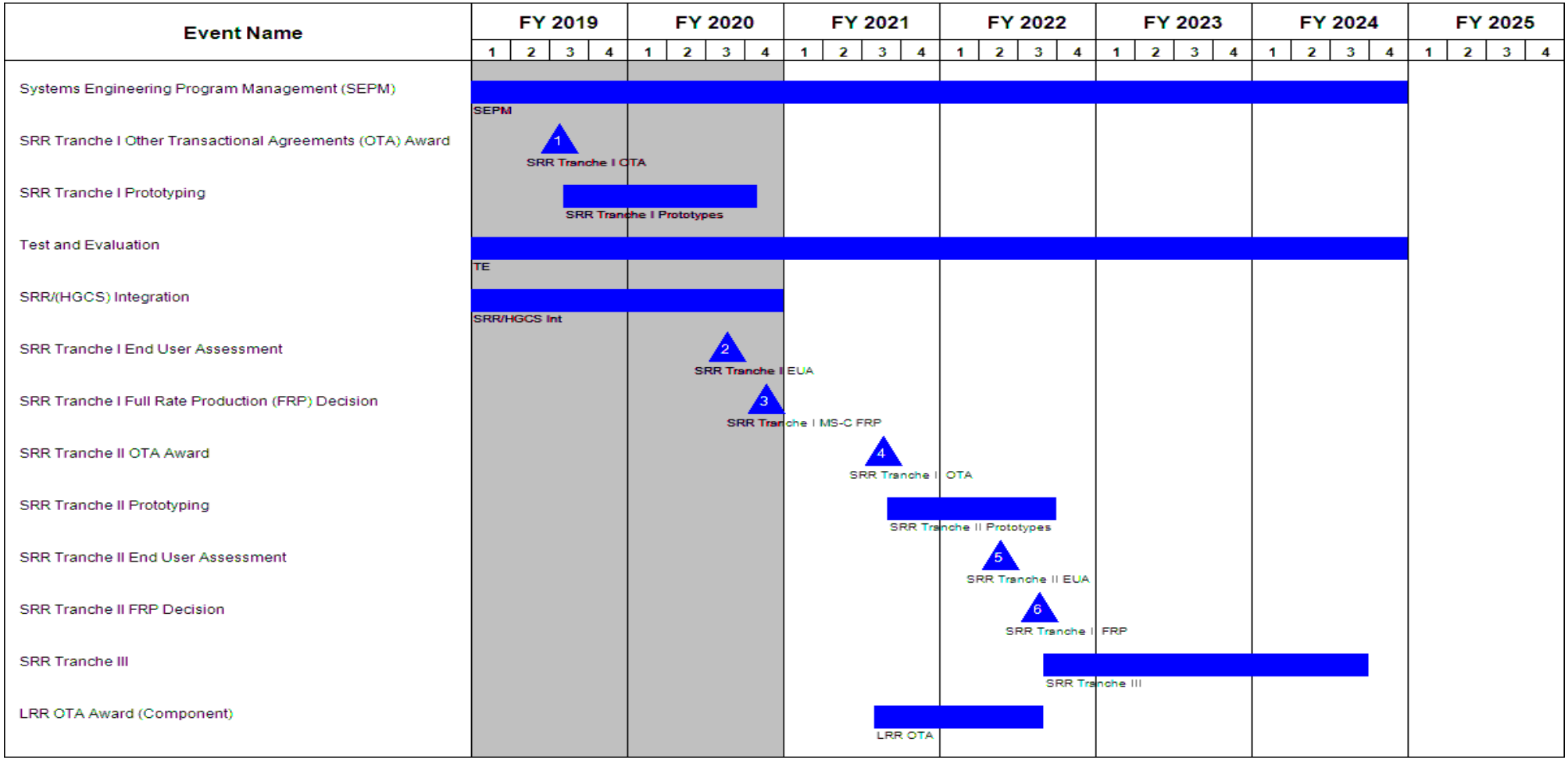

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	**Project (Number/Name)** BR7 / *Small Unmanned Aircraft System (6.5)*

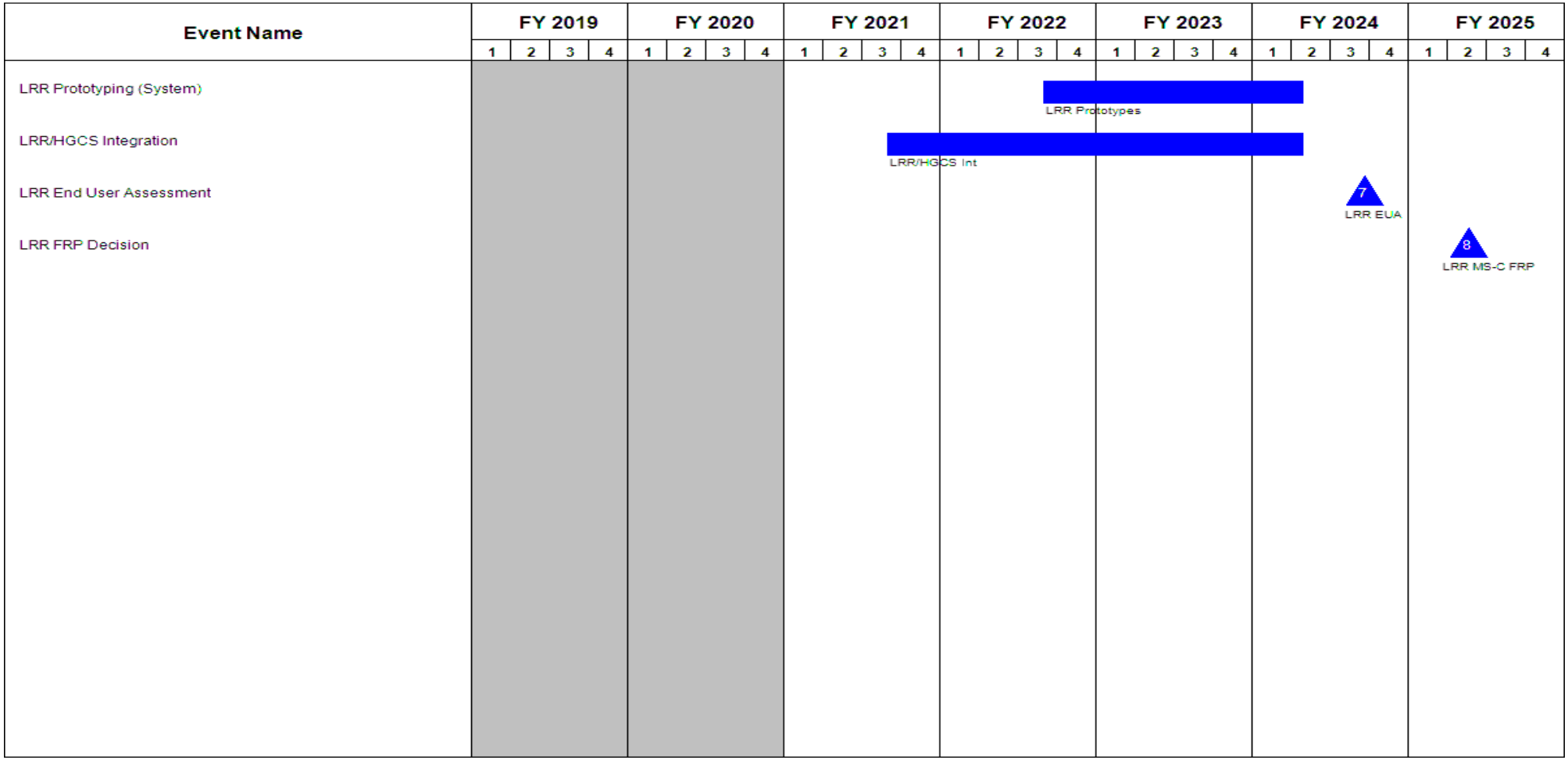

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605205A / *Small Unmanned Aerial Vehicle (SUAV) (6.5)*	**Project (Number/Name)** BR7 / *Small Unmanned Aircraft System (6.5)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Tactical Open Government Owned Architecture Development	4	2014	4	2014
Tactical Open Government Architecture Test Event 2	3	2015	3	2015
Systems Engineering Program Management (SEPM)	2	2018	4	2024
SRR Tranche I Other Transactional Agreements (OTA) Award	3	2019	3	2019
SRR Tranche I Prototyping	3	2019	4	2020
Test and Evaluation	4	2018	4	2024
SRR/(HGCS) Integration	2	2018	4	2020
SRR Tranche I End User Assessment	3	2020	3	2020
SRR Tranche I Full Rate Production (FRP) Decision	4	2020	4	2020
SRR Tranche II OTA Award	3	2021	3	2021
SRR Tranche II Prototyping	3	2021	3	2022
SRR Tranche II End User Assessment	2	2022	2	2022
SRR Tranche II FRP Decision	3	2022	3	2022
SRR Tranche III	3	2022	3	2024
LRR OTA Award (Component)	3	2021	3	2022
LRR Prototyping (System)	3	2022	2	2024
LRR/HGCS Integration	3	2021	2	2024
LRR End User Assessment	3	2024	3	2024
LRR FRP Decision	2	2025	2	2025

Note

Schedule events shown prior to Fiscal Year (FY) 2021 are for informational purposes only. Funding has transitioned to Budget Activity (BA) 5 Program Element (PE) 0605205A Small Unmanned Aerial Vehicle (SUAV) (6.5) Project BR7 Small Unmanned Aircraft System (6.5) from BA 7 PE 0305232A RQ-11 UAV Project RA7 RQ-11 Raven (MIP) starting in Fiscal Year (FY) 2021.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*							
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	-	15.379	0.000	0.000	-	0.000	0.000	0.000	14.986	32.321	Continuing	Continuing
BX3: *MIDS JTRS Ground Variant (MIDS JTRS GV)**	-	0.000	0.000	0.000	-	0.000	0.000	0.000	14.986	32.321	Continuing	Continuing
EG6: *Small Airborne Networking Radio (SANR)*	-	15.379	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.379

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2021

A. Mission Description and Budget Item Justification

The AMF radios are software programmable, multi-band, multi-mode, mobile ad hoc networking radios, providing simultaneous voice and data communications for Army Aviation platforms. The radios were planned to operate in networks supporting the Common Operating Picture, Situational Awareness, and interoperability of Mission Command systems throughout the battlefield. AMF radios were planned to ensure the Soldier's ability to communicate both horizontally and vertically via voice and data within all mission areas and Common Operating Environment. AMF radios were planned to operate waveforms that are deployed by Joint Forces today, and would have introduced networking waveforms to the Aviation community that would have enabled interoperability between air and ground forces and transport operational and Mission Command information through the tactical network. AMF radios were planned to help close capability gaps by extending data networking to company and below echelons, enabling network services to the platform and connecting Army Aviation platforms to Army ground and Joint air network domains.

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. The ADM and plan initiated a program termination action and directed an orderly shutdown of the SANR program.

The SANR subprogram (Project EG6) has no approved requirement and all SANR funding has been withdrawn in FY 2020 and beyond.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	15.964	0.000	0.000	-	0.000
Current President's Budget	15.379	0.000	0.000	-	0.000
Total Adjustments	-0.585	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.585	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	Project (Number/Name) EG6 / *Small Airborne Networking Radio (SANR)*	

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
EG6: *Small Airborne Networking Radio (SANR)*	-	15.379	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.379
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2014, the Airborne Maritime/Fixed Station (AMF) Joint Tactical Radio System (JTRS) was funded under Navy PE 0604280N, aligned under the Navy JTRS Programs. In accordance with a July 11, 2012 Acquisition Decision Memorandum (ADM), the JTRS Program of Record transitioned to a Military Department-managed program. AMF is now managed by Program Executive Office Command, Control and Communications-Tactical, under Project Manager Tactical Radios, and funded by Army PE 0605380A. On May 2, 2014, the Milestone Decision Authority (MDA), Under Secretary of Defense for Acquisition, Technology, and Logistics, issued an ADM that designated Small Airborne Link 16 Terminal (SALT) and Small Airborne Networking Radio (SANR) as subprograms under the AMF Program. In FY 2015, Project EA9 represented the total Airborne Maritime Fixed Small Airborne (AMF-SA, or SALT) RDT&E budget. In FY 2016, funding was allocated between the SALT (Project EA9) and SANR (Project EG6) subprograms. The SANR subprogram (Project EG6) has no approved requirement and funding has been withdrawn in FY 2020 and beyond.

A. Mission Description and Budget Item Justification

Per MDA direction, AMF JTRS would have procured SANR radios as Non-Developmental Items (NDI). The SANR was planned as a two-channel, software-defined, National Security Agency Type 1 certified networking radio providing seamless real-time information for operation in mobile and dynamic combat environments to meet tactical communications requirements as validated by the Army Aviation community. SANR was planned to provide increased data throughput to Army Aviation platforms via advanced networking capabilities supporting Mid-Tier and Lower Tier tactical networks, and maintain Single Channel Ground and Airborne Radio System (SINCGARS) capability. SANR was planned to replace the current SINCGARS radios on Army Aviation platforms. SANR was planned for implementation on the following platforms: Apache (AH-64E), Black Hawk (UH-60V, UH-60M, HH-60M, and MH-60M), Chinook (CH-47F and MH-47G), and Gray Eagle Unmanned Aircraft System (MQ-1C) aircraft. SANR was planned to enhance and further enable the ability of the maneuver commander to integrate and synchronize aviation forces with land based operational forces. SANR, was planned to be employed on Army aviation platforms, enable aviation combat elements (Combat Aviation Brigades, Theater Aviation Brigades, and Special Operations Aviation Regiment) to better utilize the inherent versatility of airborne communications as a complement to the unique capabilities of the other combat arms. SANR planned to provide commanders enhanced Situational Awareness and Mission Command in a package that provides a more responsive means of directing aircraft to match changing maneuver forces situations and missions.

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. The ADM and plan initiated a program termination action and directed an orderly shutdown of the SANR program.

The SANR subprogram (Project EG6) has no approved requirement and all SANR funding has been withdrawn in FY 2020 and beyond.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	**Project (Number/Name)** EG6 / *Small Airborne Networking Radio (SANR)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: FY19 Rescission	15.379	-	-
Accomplishments/Planned Programs Subtotals	15.379	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. The ADM and plan initiated a program termination action and directed an orderly shutdown of the SANR program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	Project (Number/Name) EG6 / *Small Airborne Networking Radio (SANR)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA Business Operations Management and Support	Various	Various : Various	7.966	1.170		-		-		-		-	0.000	9.136	-
		Subtotal	7.966	1.170		-		-		-		-	0.000	9.136	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - System Engineering and Requirements Validation	Various	Various : Various	4.916	2.557		-		-		-		-	0.000	7.473	-
AMF-SA - Air-Ground Integration Experimentation	Various	Various : Various	10.000	10.000		-		-		-		-	0.000	20.000	-
		Subtotal	14.916	12.557		-		-		-		-	0.000	27.473	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - Logistics Support	Various	Various : Various	1.601	0.344		-		-		-		-	0.000	1.945	-
		Subtotal	1.601	0.344		-		-		-		-	0.000	1.945	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	Project (Number/Name) EG6 / *Small Airborne Networking Radio (SANR)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - Test and Evaluation and Test Support	Various	Various : Various	3.202	1.308		-		-		-		-	0.000	4.510	-
AMF-SA- WNW Demonstration	Various	Various/AWA 17.1 : EPG	3.072	-		-		-		-		-	0.000	3.072	-
		Subtotal	6.274	1.308		-		-		-		-	0.000	7.582	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.757	15.379		0.000		-		-		-	0.000	46.136	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	**Project (Number/Name)** EG6 / *Small Airborne Networking Radio (SANR)*

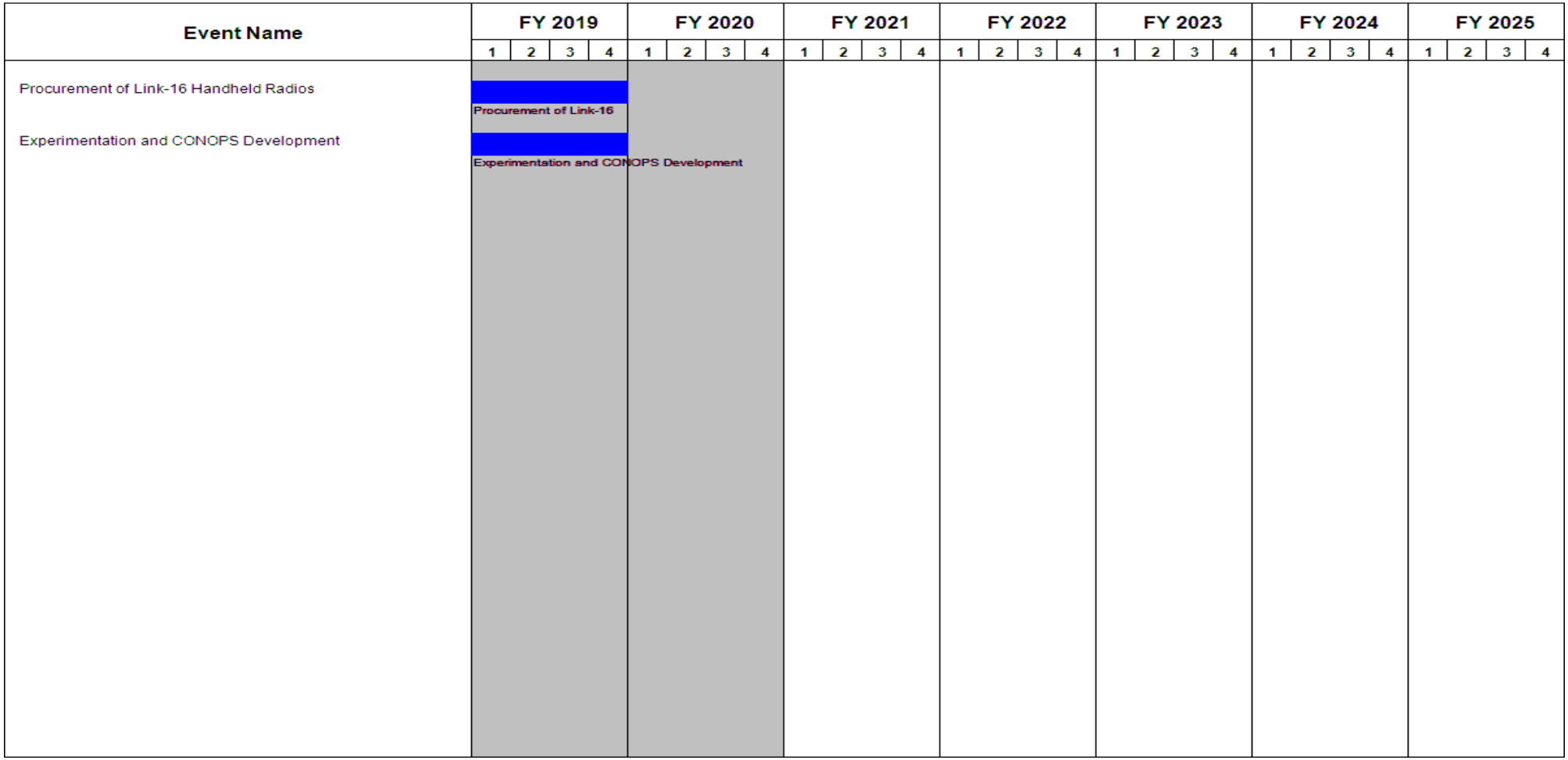

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	**Project (Number/Name)** EG6 / *Small Airborne Networking Radio (SANR)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Procurement of Link-16 Handheld Radios	2	2018	4	2019
Experimentation and CONOPS Development	3	2018	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*							
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	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing
JA6: *Joint Air-To-Ground Missile (JAGM)*	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing
Program MDAP/MAIS Code: 355												

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the United States (U.S.) Air Force, U.S. Marine Corps (USMC), and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

The Fiscal Year (FY) 2021 dollars in the amount of $8.900 million will continue the objective platform review, analysis, and threat management; continue the development of the Captive Air Training Missile (CATM) to address training needs; continue test and evaluation and develop documentation for Air Worthiness Release.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	11.758	9.500	8.900	-	8.900
Current President's Budget	12.440	6.585	8.891	-	8.891
Total Adjustments	0.682	-2.915	-0.009	-	-0.009
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.915			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.682	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.009	-	-0.009

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	Project (Number/Name) JA6 / *Joint Air-To-Ground Missile (JAGM)*	

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
JA6: *Joint Air-To-Ground Missile (JAGM)*	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the United States (U.S.) Air Force, U.S. Marine Corps (USMC), and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Full Rate Production (FRP) Decision Preparation ***Description:*** The JAGM Product Office and Other Government Agencies (OGAs) will confirm that JAGM is producible, as well as operable, safe, and logistically supportable. ***FY 2020 Plans:*** The JAGM Product Office completed government testing and Full Material Release (FMR) documentation to support a FRP decision. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decrease from FY 2020 to FY 2021 due to Full Rate Production Decision Review scheduled for May 2020.	0.673	0.426	-
Title: Post MS C Developmental, Integrated, and Operational Testing ***Description:*** The JAGM Product Office and OGAs will demonstrate JAGM Operational Suitability and Effectiveness with AH-64E.	6.729	-	-
Title: Apache AH-64E and JAGM Software Integration ***Description:*** The JAGM Product Office will continue to work JAGM capability on E-model Apaches.	2.625	-	-
Title: Integration and Counter Measure/Threat Management ***Description:*** The JAGM Product Office and OGAs will continue objective platform review, analysis, and threat management. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts.	2.413	4.214	3.789

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	**Project (Number/Name)** JA6 / *Joint Air-To-Ground Missile (JAGM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 Plans: The JAGM Product Office and OGAs conducted government software testing as well as review and analysis of objective Army platforms. Software testing included risk mitigation against emerging threats. The JAGM Product Office and OGAs performed technical assessments, concept studies, prepared documentation, and performed risk reduction efforts. ***FY 2021 Plans:*** The JAGM Product Office and OGAs will continue government software testing as well as review and analysis of objective Army platforms. The JAGM Product Office will address emerging threats via risk mitigation software testing and stand off capability to increase platform and crew survivability. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase from FY 2020 to FY 2021 due to risk mitigation against counter measure/emerging threats and analysis of objective platforms.			
Title: Captive Air Training Missile (CATM) Development ***Description:*** The CATM is used for captive flight training and for qualification of aircrews to employ tactical missiles in combat. The JAGM Product Office will develop an inert missile configuration that will meet training needs. ***FY 2020 Plans:*** The JAGM Product Office and prime contractor initiated JAGM CATM development. The prime contractor developed CATM hardware and software. ***FY 2021 Plans:*** The JAGM Product Office and prime contractor will continue JAGM CATM development. The prime contractor will develop CATM hardware and software. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase from FY20 to FY21 due to continued CATM Development.	-	1.645	1.997
Title: CATM Testing ***Description:*** The JAGM Product Office and OGAs will continue development testing and qualification of the JAGM CATM; achieve air worthiness on threshold platforms. ***FY 2021 Plans:***	-	-	3.105

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	**Project (Number/Name)** JA6 / *Joint Air-To-Ground Missile (JAGM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
The JAGM Product Office and OGAs will continue Test and Evaluation and develop documentation for Air Worthiness Release. Test and Evaluation will verify AH-64E Software Integration through captive carry and environmental testing. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase from FY 2020 to FY 2021 due to the CATM testing.			
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.300	-
Accomplishments/Planned Programs Subtotals	12.440	6.585	8.891

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• C70302: *Joint Air-to-Ground MSLS (JAGM)*	256.462	199.295	213.397	-	213.397	165.494	213.375	208.607	206.140	0.000	1,462.770
• NAVY - 0605450M: *Navy JAGM Missile RDT&E*	16.031	18.393	12.806	-	12.806	0.317	0.325	0.334	0.341	Continuing	Continuing
• NAVY - 0206138M: *Navy JAGM Missile Procurement*	24.109	90.966	49.431	-	49.431	50.418	76.246	77.770	-	Continuing	Continuing
• AF - 0201109F: *Air Force Missile Procurement*	-	15.000	0.000	-	0.000	-	-	-	-	0.000	15.000

Remarks

D. Acquisition Strategy

The JAGM Production and Deployment (PD) Acquisition Strategy (AS) was approved at Milestone C on 15 June 2018. Three Low-Rate Initial Production (LRIP) contract options were awarded in August, September, and December 2018. Initial Operational Capability (IOC) of 96 missiles and was achieved in March 2019. Initial Operational Testing was completed in May 2019. Full Rate Production Decision Review is scheduled for May 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	Project (Number/Name) JA6 / *Joint Air-To-Ground Missile (JAGM)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Eng/ Project Management	C/LH	Various : Performers	84.527	0.404	Oct 2018	0.450	Nov 2019	-		-		-	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.300		-		-		-	0.000	0.300	-
		Subtotal	84.527	0.404		0.750		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development Prime Contract	C/FFP	TD : Prime Contract	371.319	-		-		-		-		-	0.000	371.319	-
Rocket Motor Insensitive Munition (IM) Qualification	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	39.731	-		-		-		-		-	0.000	39.731	-
Electro-Mechanical Control Actuator System (EMCAS)	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	4.033	-		-		-		-		-	0.000	4.033	-
Integrated Warhead	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	2.982	-		-		-		-		-	0.000	2.982	-
EMD Long Lead Contract (Backends)	SS/FFP	Lockheed Martin : Orlando, FL	8.082	-		-		-		-		-	0.000	8.082	-
Development Engineering	C/LH	Various : Performers	21.648	-		-		-		-		-	0.000	21.648	-
EMD Prime Contract	C/FPIF	Lockheed Martin : Orlando, Florida	70.256	-		-		-		-		-	0.000	70.256	-
Apache Indefinite Delivery/ Indefinite Quantity (IDIQ) Contract	C/CPFF	Boeing Company : Mesa, AZ	16.475	2.625		-		-		-		-	0.000	19.100	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	Project (Number/Name) JA6 / *Joint Air-To-Ground Missile (JAGM)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JAGM Engineering Services	SS/CPFF	Lockheed Martin : Orlando, FL	-	-		3.364	Mar 2020	5.477	Mar 2021	-		5.477	0.000	8.841	Continuing
		Subtotal	534.526	2.625		3.364		5.477		-		5.477	0.000	545.992	N/A

Remarks

(C / FFP) - Competitive/Firm Fixed Price
(C / CPFF) - Competitive/Cost-Plus Fixed Fee
(C / LH) - Competitive/Labor Hour
(SS / FFP) - Sole Source/Firm Fixed Price
(C / FPIF) - Competitive/Fixed Price Incentive (Firm Target)

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Gov Agencies	C/LH	Various : Performers	121.477	9.411	Nov 2018	2.471	Nov 2019	3.414	Nov 2020	-		3.414	0.000	136.773	Continuing
		Subtotal	121.477	9.411		2.471		3.414		-		3.414	0.000	136.773	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	740.530	12.440		6.585		8.891		-		8.891	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	**Project (Number/Name)** JA6 / *Joint Air-To-Ground Missile (JAGM)*

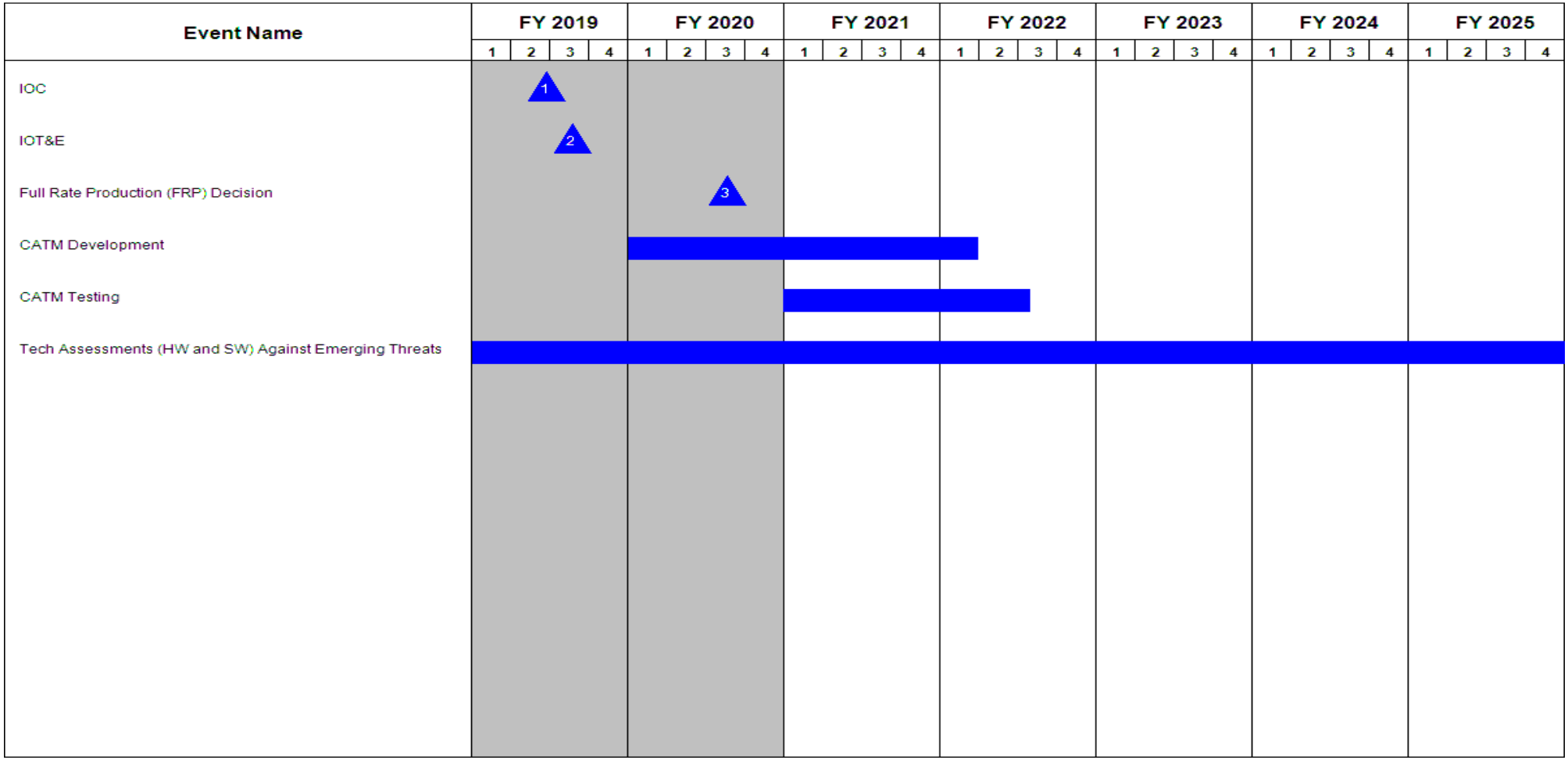

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	**Project (Number/Name)** JA6 / *Joint Air-To-Ground Missile (JAGM)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EMD	4	2015	3	2018
Army System & Integration Testing	4	2015	3	2018
Limited User Testing (LUT)	2	2018	2	2018
MS C Decision	3	2018	3	2018
IOC	2	2019	2	2019
IOT&E	3	2019	3	2019
Full Rate Production (FRP) Decision	3	2020	3	2020
CATM Development	1	2020	1	2022
CATM Testing	1	2021	3	2022
Tech Assessments (HW and SW) Against Emerging Threats	1	2019	4	2039

Note

MS: Milestone
IOC: Initial Operational Capability
IOT&E: Initial Operational Test & Evaluation
CATM: Captive Air Training Missile
HW: Hardware
SW: Software

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*							
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	-	318.850	208.638	193.929	-	193.929	63.678	33.162	94.758	74.936	0.000	987.951
S40: *Army Integrated Air and Missile Defense*	-	318.850	208.638	193.929	-	193.929	63.678	33.162	94.758	74.936	0.000	987.951
Program MDAP/MAIS Code: 205												

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) program is a designated Major Defense Acquisition Program (MDAP).

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the AMD Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Relay capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric SoS capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD design in the past. The AIAMD program will provide the user with the ability to train on a single IBCS that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will interface with the Integrated Fire Control Network (IFCN), alleviating the cost of procuring total system capabilities in the future.

AIAMD IOC will be delivered through the fielding of the IBCS-based AIAMD architecture including the IBCS EOC, Integrated Fire Control Network (IFCN) Relay, Sentinel, and Patriot components working in an integrated manner through the IFCN connection. The government controlled open architecture enables integration of future capabilities to meet emerging threats and fielding to include Indirect Fire Protection Capability (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), and Terminal High Altitude Area Defense (THAAD).

Funding in FY 2021 supports agile software development and integration, developmental testing, and operational testing, with an Initial Operational Test and Evaluation (IOT&E) beginning in fourth quarter FY 2021. Software development in version 4.6.0 will include required changes for IOT&E and beyond-IOC capabilities. The exact composition of the software build will be determined based on agile development concepts in which the user determines the priorities from the backlog in a 4.6.0 Capabilities Review in the third quarter FY 2020 and Program Increment (PI) planning sessions just prior to the start of each PI. Specific test efforts include:

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605457A *I Army Integrated Air and Missile Defense (AIAMD)*

developmental testing and requirements verification of the versions 4.5.1 and 4.6.0 software; delta qualification; interoperability certification; events leading up to IOT&E including Logistics Demonstration, New Equipment Training, Collective Training, and test planning; and the start of IOT&E. The IOT&E supports a Full Rate Production Decision in third quarter FY 2022.

AIAMD is a critical component of the Army's Air and Missile Defense strategy and is the number one AMD Cross Functional Team modernization priority program.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	322.263	208.938	130.859	-	130.859
Current President's Budget	318.850	208.638	193.929	-	193.929
Total Adjustments	-3.413	-0.300	63.070	-	63.070
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-15.300			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.413	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	63.070	-	63.070

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: S40: *Army Integrated Air and Missile Defense*		
Congressional Add: *Counter Emerging Threat*	30.000	12.069
Congressional Add: *Cyber Security*	15.000	-
Congressional Add Subtotals for Project: S40	45.000	12.069
Congressional Add Totals for all Projects	45.000	12.069

Change Summary Explanation

The FY 2019 net decrease of $3.413 million is from: -$10.163 million SBIR/STTR transfer and +$6.750 million in below threshold reprogramming actions. FY 2020 net decrease of $0.300 million is from: -$15.300 million for "prior year carryover due to test delays" and +$15.000 million for "accelerated integration to counter emerging threats". FY 2021 increase of $63.070 million is for development and integration of additional capability beyond that delivered at Initial Operational Capability (IOC).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	Project (Number/Name) S40 / *Army Integrated Air and Missile Defense*	

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
S40: *Army Integrated Air and Missile Defense*	-	318.850	208.638	193.929	-	193.929	63.678	33.162	94.758	74.936	0.000	987.951
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) program is a designated Major Defense Acquisition Program (MDAP).

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the AMD Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Relay capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric SoS capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD design in the past. The AIAMD program will provide the user with the ability to train on a single IBCS that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will interface with the Integrated Fire Control Network (IFCN), alleviating the cost of procuring total system capabilities in the future.

AIAMD IOC will be delivered through the fielding of the IBCS-based AIAMD architecture including the IBCS EOC, Integrated Fire Control Network (IFCN) Relay, Sentinel, and Patriot components working in an integrated manner through the IFCN connection. The government controlled open architecture enables integration of future capabilities to meet emerging threats and fielding to include Indirect Fire Protection Capability (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), and Terminal High Altitude Area Defense (THAAD).

Funding in FY 2021 supports agile software development and integration, developmental testing, and operational testing, with an Initial Operational Test and Evaluation (IOT&E) beginning in fourth quarter FY 2021. Software development in version 4.6.0 will include required changes for IOT&E and beyond-IOC capabilities. The exact composition of the software build will be determined based on agile development concepts in which the user determines the priorities from the backlog in a 4.6.0 Capabilities Review in the third quarter FY 2020 and Program Increment (PI) planning sessions just prior to the start of each PI. Specific test efforts include: developmental testing and requirements verification of the versions 4.5.1 and 4.6.0 software; delta qualification testing; interoperability certification; events leading up

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

to IOT&E including Logistics Demonstration, New Equipment Training, Collective Training, and test planning; and the start of IOT&E. The IOT&E supports a Full Rate Production Decision in third quarter FY 2022.
AIAMD is a critical component of the Army's Air and Missile Defense strategy and is the number one AMD Cross Functional Team modernization priority program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Product Development	220.524	155.098	86.181	-	86.181
Description: Product development in support of software development and developmental test phase activities. ***FY 2020 Plans:*** The AIAMD Systems Engineering and Integration and Engineering Manufacturing and Development (EMD) will provide support for developmental test activities; to include software integration testing and preparation/conduct of the Limited User Test. Agile software development will continue to support future capabilities and will include software changes to defeat emerging threats. Government Furnished Equipment for EOC and Relay MEIs will be provided to EMD contractors. Government Systems Engineering and Logistics and AIAMD EMD will continue LUT NET development/Collective Training development. ***FY 2021 Base Plans:*** Agile software development in version 4.6.0 supports IOC, with required changes for IOT&E, and beyond-IOC capabilities. The exact composition of the software build will be determined based on agile development concepts, directed in the FY 2019 National Defense Authorization Act (NDAA), in which the user determines the priorities from the backlog in a 4.6.0 Capabilities Review in the third quarter FY 2020 and Program Increment (PI) planning sessions just prior to the start of each PI. Anticipated changes for IOC include software changes to defeat emerging threats, address user-identified suitability requirements, and implement corrective fixes to issues identified in Limited User Test (LUT). Continued contract requirements supporting the IOC capability will address: hardware issues identified in LUT, reliability improvements, version 4.5.1 software requirements verification, logistics product updates, test support, Information Assurance /Cyber Security support, and integration of PATRIOT Ground Equipment to include corrective actions for LINK hardware and software from LUT. Government Systems Engineering and Logistics support will continue version 4.5.1 software requirements verification, Technical Data Package (TDP) updates for hardware obsolescence and engineering change proposals (ECPs); along with programmatic and logistics support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to the end of EMD phase and transitioning to production and development of follow-on capability that is separately broken out with this submission.					
Title: Test and Evaluation	53.326	32.677	40.722	-	40.722

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Test and Evaluation support for modeling and simulation, developmental test phase activities, a Limited User Test, and Initial Operational Test and Evaluation (IOT&E). ***FY 2020 Plans:*** Provided for continuation of Modeling and Simulation efforts at the Government Systems Integration Lab, Joint Interoperability Test Support, Army Test and Evaluation Center and White Sands Missile Range test support for developmental test activities. Provided for preparation and conduct of the Limited User Test. ***FY 2021 Base Plans:*** Provides for continuation of Modeling and Simulation efforts at the Government Systems Integration Lab, Joint Interoperability Test Support, Army Test and Evaluation Center and White Sands Missile Range test support for developmental test activities. Provides for preparation and conduct of the IOT&E. Specific test efforts include: developmental testing and requirements verification of the versions 4.5.1 and 4.6.0 software; delta qualification testing; interoperability certification; procurement of targets for IOT&E; events leading up to IOT&E including Logistics Demonstration, New Equipment Training, Collective Training, and test planning; and the start of IOT&E. The IOT&E supports a Full Rate Production Decision in third quarter FY 2022. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The net increase is driven by breaking out efforts beyond IOC capability into a separate planned program with this submission, an increase to procure targets for IOT&E, and an increase for the initial incremental funding of IOT&E test operations.					
Title: Product Development - Beyond Initial Operational Capability (IOC) ***Description:*** Product development in support of software development and integration efforts for additional capability beyond that fielded at IOC. ***FY 2021 Base Plans:*** Agile software development in version 4.6.0 will support IOC and will also include beyond-IOC capabilities. As part of the DoD Section 873 pilot as directed in Section 869 of the FY 2019 National Defense Authorization Act (NDAA), IAMD will use Agile development processes to develop additional capabilities above and beyond those delivered at IOC. The exact composition of the software build will be determined based on agile development concepts in which the user determines the priorities from the backlog in a 4.6.0 Capabilities Review in the third quarter FY 2020 and Program Increment (PI) planning sessions just prior to the start of each PI. As part of the Agile process, the user will prioritize and direct the firm requirements/capabilities to be developed within the	-	-	60.395	-	60.395

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
development cycle as guided by a user-prioritized roadmap. The specific requirements to be developed in FY 2021 may include: convergence of integrated fires capability; incorporation of THAAD planner; integration of Lower Tier AMD Sensor (LTAMDS); integration of other user directed sensors; and other requirements pulled from the backlog. Additional efforts will include system engineering and integration, software requirements verification, logistics product updates, contractor test support, Information Assurance /Cyber Security support, integration support from prime contractors of integrated systems, Technical Data Package (TDP) updates for hardware obsolescence and engineering change proposals (ECPs); and government systems engineering and programmatic support. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in this cost element is driven by additional funding provided for development and integration of beyond-IOC capabilities.					
Title: Test and Evaluation - Beyond IOC Capability ***Description:*** Test and Evaluation support for modeling and simulation, developmental test, and follow-on operational test events for additional capability beyond that fielded at IOC. ***FY 2021 Base Plans:*** Provides for continuation of Modeling and Simulation efforts at the Government Systems Integration Lab, Joint Interoperability Test Support, Army Test and Evaluation Center and White Sands Missile Range test support for developmental test activities. Specific test efforts include: requirements verification of the version 4.6.0 software; interoperability certification; cyber testing; and test planning of future developmental and operational tests. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in this cost element is driven by additional funding provided for development and integration of beyond-IOC capabilities.	-	-	6.631	-	6.631
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:***	-	8.794	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

B. Accomplishments/Planned Programs ($ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals	273.850	196.569	193.929	-	193.929

	FY 2019	FY 2020
Congressional Add: Counter Emerging Threat	30.000	12.069
FY 2019 Accomplishments: Counter Emerging Threat		
FY 2020 Plans: Counter Emerging Threat		
Congressional Add: Cyber Security	15.000	-
FY 2019 Accomplishments: Cyber Security		
Congressional Adds Subtotals	45.000	12.069

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• C53101: *MSE Missile*	1,131.276	702.437	603.188	176.585	779.773	765.887	1,008.835	908.799	804.295	Continuing	Continuing
• EF9: *System Integration and Test*	74.295	97.746	0.166	-	0.166	0.169	-	-	-	0.000	172.376
• EX2: *Lower Tier Air Missile Defense (LTAMD) Capability*	84.981	379.772	376.373	-	376.373	332.007	241.235	87.419	88.298	Continuing	Continuing
• C50016: *System Integration and Test Procurement*	105.395	107.157	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• DU3: *IFPC2*	10.324	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• EY7: *IFPC Increment 2 - Block 1*	92.674	194.366	235.770	-	235.770	341.077	181.830	98.210	13.639	Continuing	Continuing
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	31.286	9.337	106.261	-	106.261	237.803	392.134	368.447	274.566	0.000	1,419.834
• C62001: *IFPC Inc 2-I Block 1 Missile 1*	166.536	-	0.000	-	0.000	-	-	-	-	0.000	166.536
• E10: *Sentinel*	37.847	95.720	109.259	-	109.259	116.381	65.512	69.343	30.849	Continuing	Continuing
• BZ5075: *IAMD Battle Command System*	-	29.629	201.587	-	201.587	353.561	416.995	413.356	417.415	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 146: *Air & Msl Defense Planning Control Sys*	23.405	12.656	8.392	-	8.392	2.912	1.227	3.402	3.197	Continuing	Continuing
• AD5070: *AIR & MSL Defense Planning & Control Sys*	29.913	39.061	47.374	15.143	62.517	68.778	102.399	-	-	0.000	302.668
• 149: *Counter-Rockets, Artillery & Mortar*	14.785	6.131	0.908	-	0.908	-	-	-	-	0.000	21.824
• 0604403A: *Future Interceptor*	-	2.000	7.992	-	7.992	7.993	7.993	7.993	7.993	0.000	41.964
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	75.711	42.900	4.995	-	4.995	39.863	271.946	308.415	446.026	0.000	1,189.856
• C14300: *M-SHORAD - Procurement*	-	233.300	378.654	158.300	536.954	330.738	80.412	436.129	728.215	Continuing	Continuing

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (AIAMD) architecture. It provides for development of a common Integrated Fire Control System through an open architecture approach allowing for integration of Air Defense Artillery (ADA) components as they become available. This approach enables the AIAMD program to pursue its baseline program independent of fluctuation of other programs.

D. Acquisition Strategy

The AIAMD acquisition strategy is to deliver an Initial Operational Capability (IOC) in FY 2022. The capabilities are delivered through the fielding of the IAMD Battle Command System (IBCS) based AIAMD architecture including the IBCS Engagement Operations Center (EOC), Sentinel, and Patriot (through a Radar Interface Unit (RIU)) components connected via an Integrated Fire Control Relay, working in an integrated manner. Future capabilities include the incorporation of IBCS functionality into Indirect Fire Protection Capabilities (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), Terminal High Altitude Area Defense (THAAD) batteries, and other Army and Joint net-centric architectures using an agile software development process.

Key principles of the AIAMD acquisition approach are the following:
- Migrate from system-based acquisition to competitive component-based acquisition using agile development/operations methodology IAW FY 2019 National Defense Authorization Act direction
- Use system-of-systems acquisition approach with collaboration among AIAMD, PEO MS, PEO C3T, and Brigade Combat Team (BCT) Modernization Component Project Offices, Missile Defense Agency (MDA), and other Service Project Offices to network-enable weapons and sensor components
- Develop and procure a common Army IBCS EOC that replaces seven weapon system unique Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) components
- Establish product lines used to evaluate and select, modify and integrate modular open systems hardware and software common configuration items

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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- Conduct architecture-based System Engineering, Integration and Test (SEI&T) activities for an incrementally fielded configuration of the AIAMD Integrated Fire Control Network-compatible IBCS EOC, weapons and sensor system components

Beginning in FY 2019, AIAMD is included in the DoD Section 873 Agile Development pilot as directed in Section 869 of the FY 2019 National Defense Authorization Act. As part of this pilot, the AIAMD government team will take on additional responsibilities for software development and will initially implement activities under an Other Transaction Authority (OTA) agreement through FY 2021. Beyond the initial OTA, software as a service type contracts with multiple vendors (to include non-traditional defense contractors) is planned.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : Huntsville, AL	35.528	-		-		-		-		-	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		8.794		-		-		-	0.000	8.794	-
		Subtotal	35.528	-		8.794		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Space and Missile Defense (ASMD) System of Systems (SOS) Hardware-in-the- Loop Testbed	C/CPFF	Various : Huntsville, AL and multiple other locations	17.697	-		-		-		-		-	0.000	17.697	-
AIAMD System Engineering & Integration	C/CPFF	Various : Huntsville, AL	183.201	17.207	Oct 2018	18.308	Oct 2019	22.004	Oct 2020	-		22.004	Continuing	Continuing	Continuing
IAMD Engineering Manufacturing and Development	SS/ Various	Northrop Grumman, Raytheon, Lockheed Martin and Other : Huntsville, AL and Various other locations	1,324.922	183.262	Oct 2018	119.957	Oct 2019	104.227	Oct 2020	-		104.227	Continuing	Continuing	Continuing
Government Furnished Equipment	MIPR	Various : Multiple	23.977	5.379	Oct 2018	2.771	Oct 2019	4.753	Oct 2020	-		4.753	Continuing	Continuing	Continuing
Government Systems Engineering and Logistics	TBD	Various : Huntsville, AL	88.928	14.676	Oct 2018	12.596	Oct 2019	15.592	Oct 2020	-		15.592	Continuing	Continuing	Continuing
Advanced Electronic Protection Enhancement (AEPE)	Various	Various : TBD	21.000	-		-		-		-		-	0.000	21.000	-
Cyber Security	Various	Huntsville, AL : TBD	53.000	15.000	Jan 2019	-		-		-		-	0.000	68.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Counter Emerging Threat	Various	AMRDEC/Torch Technologies : Huntsville, AL	40.000	30.000	Jan 2019	13.901		-		-		-	0.000	83.901	-
		Subtotal	1,752.725	265.524		167.533		146.576		-		146.576	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Test Activities/ Army Evaluation Center/ Developmental Test Command/Operational Test Command	MIPR	Various : Multiple Locations	51.298	23.185	Oct 2018	7.353	Oct 2019	15.092	Oct 2020	-		15.092	Continuing	Continuing	Continuing
Modeling & Sim/Joint Interoperability Test Spt	MIPR	SED : Huntsville, AL	193.074	22.631	Oct 2018	16.153	Oct 2019	17.559	Oct 2020	-		17.559	Continuing	Continuing	Continuing
Range Support	MIPR	WSMR : White Sands, NM	51.870	7.510	Oct 2018	8.805	Oct 2019	14.702	Oct 2020	-		14.702	Continuing	Continuing	Continuing
		Subtotal	296.242	53.326		32.311		47.353		-		47.353	Continuing	Continuing	N/A

Remarks

The T&E increase from FY20 is due to procurement of targets supporting IOT&E (Other Test Activities cost category) and the initial incremental funding of IOT&E test operations (Other Test Activities and Range Support cost categories).

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,084.495	318.850		208.638		193.929		-		193.929	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

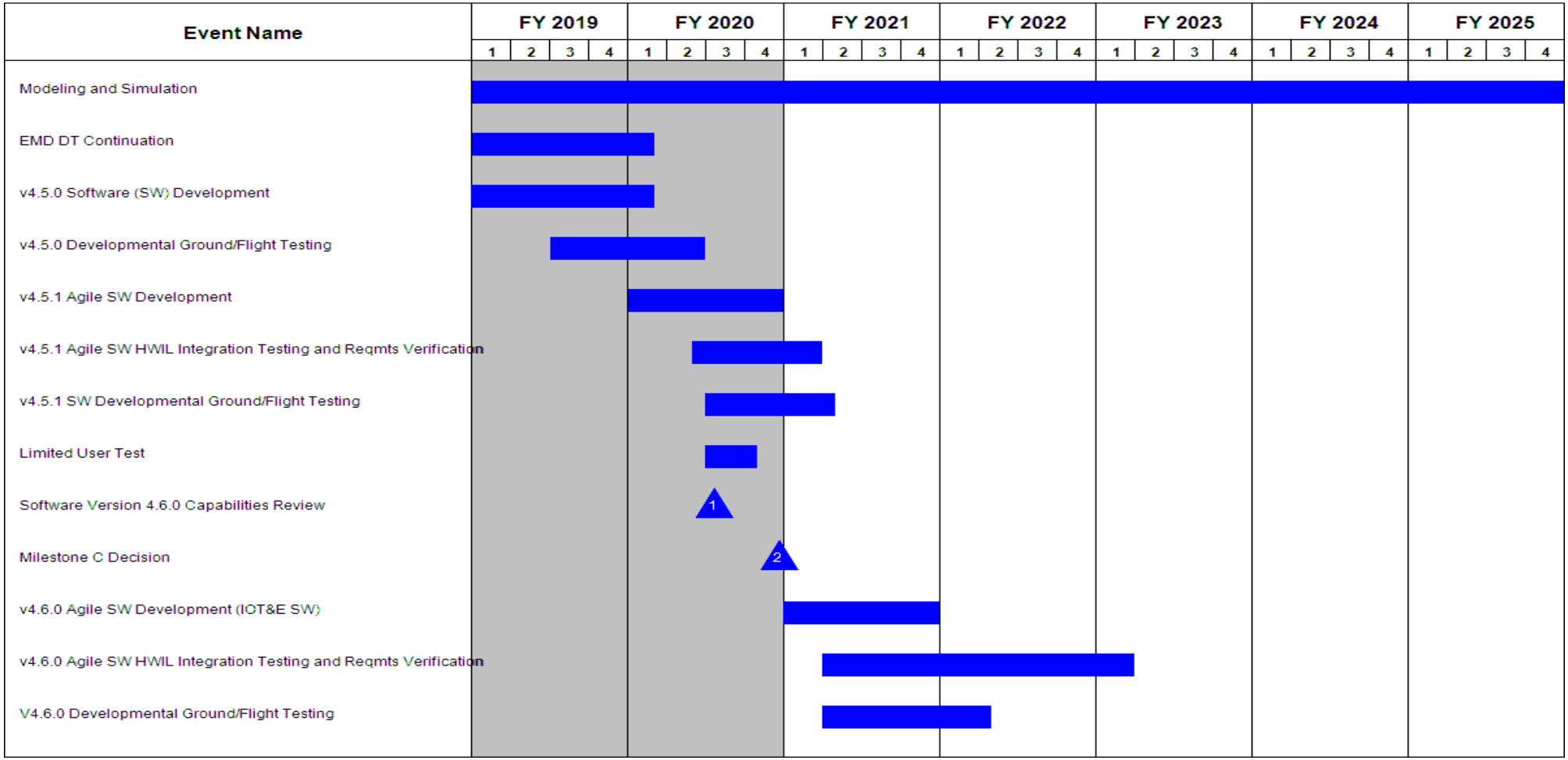
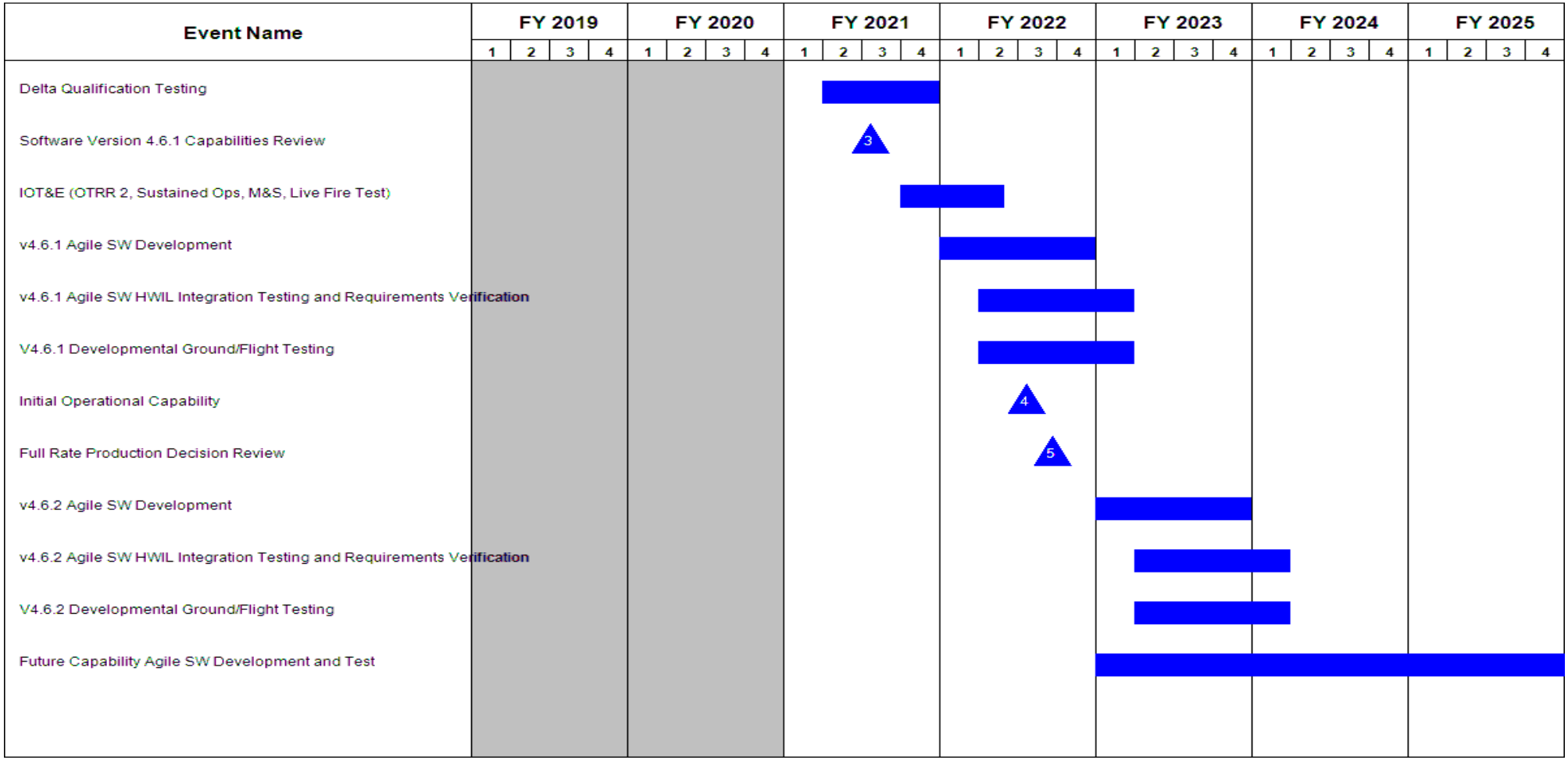


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*



Note

Based on IAMD Program Master Schedule v1.54 dated 13 Dec 2019.

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Modeling and Simulation	1	2013	4	2025
EMD Developmental Test (DT)	4	2014	1	2017
Product Readiness Review (PRR)	4	2016	4	2016
EMD DT Continuation	1	2018	1	2020
v4.5.0 Software (SW) Development	2	2018	1	2020
v4.5.0 Developmental Ground/Flight Testing	3	2019	2	2020
v4.5.1 Agile SW Development	1	2020	4	2020
v4.5.1 Agile SW HWIL Integration Testing and Reqmts Verification	2	2020	1	2021
v4.5.1 SW Developmental Ground/Flight Testing	3	2020	2	2021
Limited User Test	3	2020	4	2020
Software Version 4.6.0 Capabilities Review	3	2020	3	2020
Milestone C Decision	4	2020	4	2020
v4.6.0 Agile SW Development (IOT&E SW)	1	2021	4	2021
v4.6.0 Agile SW HWIL Integration Testing and Reqmts Verification	2	2021	1	2023
V4.6.0 Developmental Ground/Flight Testing	2	2021	2	2022
Delta Qualification Testing	2	2021	4	2021
Software Version 4.6.1 Capabilities Review	3	2021	3	2021
IOT&E (OTRR 2, Sustained Ops, M&S, Live Fire Test)	4	2021	2	2022
v4.6.1 Agile SW Development	1	2022	4	2022
v4.6.1 Agile SW HWIL Integration Testing and Requirements Verification	2	2022	1	2023
V4.6.1 Developmental Ground/Flight Testing	2	2022	1	2023
Initial Operational Capability	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Full Rate Production Decision Review	3	2022	3	2022
v4.6.2 Agile SW Development	1	2023	4	2023
v4.6.2 Agile SW HWIL Integration Testing and Requirements Verification	2	2023	1	2024
V4.6.2 Developmental Ground/Flight Testing	2	2023	1	2024
Future Capability Agile SW Development and Test	1	2023	1	2026

Note

Based on IAMD Program Master Schedule v1.54 dated 13 Dec 2019.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605625A *I Manned Ground Vehicle*							
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	205.620	327.732	-	327.732	426.892	65.638	52.251	52.778	0.000	1,130.911
CF6: *Next Generation Combat Vehicle (OMFV)*	-	0.000	205.620	327.732	-	327.732	426.892	65.638	52.251	52.778	0.000	1,130.911

A. Mission Description and Budget Item Justification

The Optionally Manned Fighting Vehicle (OMFV) is a purpose built manned platform that maneuvers Soldiers to a point of positional advantage to engage in close combat. It is designed to operate with and may operate without a crew and Soldiers under armor based on the commander's decision. It delivers decisive lethality during the execution of combined arms maneuver while also controlling maneuver robotics and semi-autonomous systems. The platform will be optimized for operations in dense urban terrain and with significantly reduced logistical burdens. The vehicle will include an architecture to allow for increased capability and growth margin. In close combat, the Optionally Manned Fighting Vehicle (OMFV) will deliver decisive lethality during the execution of combined arms maneuver. The changing character of warfare drives changes in how the Army delivers, operates, and sustains future combat capabilities. The Army's first priority is to replace the Bradley Fighting Vehicle with the OMFV.

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	378.400	320.100	-	320.100
Current President's Budget	0.000	205.620	327.732	-	327.732
Total Adjustments	0.000	-172.780	7.632	-	7.632
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-176.280			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	7.632	-	7.632

Change Summary Explanation

The increase in Fiscal Year (FY) 2021 funding is due to a change in strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605625A / *Manned Ground Vehicle*	Project (Number/Name) CF6 / *Next Generation Combat Vehicle (OMFV)*	

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
CF6: *Next Generation Combat Vehicle (OMFV)*	-	0.000	205.620	327.732	-	327.732	426.892	65.638	52.251	52.778	0.000	1,130.911
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Optionally Manned Fighting Vehicle (OMFV) is a purpose built manned platform that maneuvers Soldiers to a point of positional advantage to engage in close combat. It is designed to operate with and may operate without a crew and Soldiers under armor based on the commander's decision. It delivers decisive lethality during the execution of combined arms maneuver while also controlling maneuver robotics and semi-autonomous systems. The platform will be optimized for operations in dense urban terrain and with significantly reduced logistical burdens. The vehicle will include an architecture to allow for increased capability and growth margin. In close combat, the OMFV will deliver decisive lethality during the execution of combined arms maneuver. The changing character of warfare drives changes in how the Army delivers, operates, and sustains future combat capabilities. The Army's first priority is to replace the Bradley Fighting Vehicle with the OMFV.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Government Engineering & Program Management	-	18.765	20.987
Description: Provides Government System Engineering and Program Management support. Funding will cover the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to effectively manage Product Management Office, Maneuver Combat Systems (PM MCS). ***FY 2020 Plans:*** Provided Government System Engineering and Program Management support. This funding included the cost of government and direct support contractor labor, travel, training, supplies, equipment and facilities to effectively manage the PM MCS program. ***FY 2021 Plans:*** Provides Government System Engineering and Program Management support. This funding will include the cost of government and direct support contractor labor, travel, training, supplies, equipment and facilities to effectively manage the PM MCS program. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decease in cost from Fiscal Year (FY) 2020 to FY 2021 is due to the change in strategy of the program.			
Title: Product Development	-	114.752	286.444
Description: Decision point one is to award up to 5 vendors. There will be an insertion point for quick/win technology sprints. ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
This funding was used to both mature planned technologies as well as insert new technologies to achieve overmatch and decisive lethality. These technologies are related to growth, mobility, efficiency, lethality, and survivability. This funding also established a process for technology maturity assessment of the S&T efforts that will be supporting the OMFV program and the program management office investments. ***FY 2021 Plans:*** This funding includes the award of up to 5 vendors at decision point one after the SSEB has been conducted. The cost includes initial OMFV development costs for up to 5 vendors to mature design through production design review (PDR). The efforts include, but not limited to; hardware and software development, producibility engineering and planning, development tooling, system engineering and program management, initial logistics data and product development, and data and support equipment. The vendors can then begin their digital design. The insertion point will be for mature/quick win technology sprints if the technologies are meeting the OMFV objectives. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase in funding from FY 2020 to FY 2021 is due to the down select in the number of OEMs at decision point one.			
Title: Test & Evaluation ***Description:*** Government Modeling & Simulation ***FY 2021 Plans:*** The modeling and simulation analysis of the digital designs for up to 5 vendors as they begin their digital design, modeling simulation begins for sub-system tests, using emulators, software coding and they will continue throughout development. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 is due to the beginning of modeling and simulation.	-	-	7.108
Title: Other Support Cost ***Description:*** This cost includes OMFV studies and research and SBIR/STTR/FFRDC. ***FY 2020 Plans:*** These costs were used to conduct market research, develop a request for proposal (RFP), an analysis of alternatives (AoA), and the milestone documentation development. The AoA is to document the evaluation of the performance, operational effectiveness, operational suitability, and estimated costs of alternative systems to meet a capability need. Cost analysis was competed to include a cost analysis requirements description (CARD), and an acquisition program baseline (APB). ***FY 2021 Plans:***	-	24.420	13.193

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
This cost includes OMFV studies and research which includes the completion of the AoA, SBIR/STTR/FFRDC, and completion of milestone documentation development. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease from FY 2020 to FY 2021 is due to the change in breakout between product development and other support costs.			
Title: XM-913 ***Description:*** This cost includes the XM913, ammunition and the PM MAS EMD requirements. ***FY 2020 Plans:*** PM MCS have increased lethality through improved target acquisition capability along with other technology upgrades and insertions (i.e. laser pointing, color camera, laser range finder, etc). PM MCS will leverage the XM-913 development to increase lethality, and will characterize and develop other lethality improvements to counter evolving threats. This cost includes engineering, logistics, test, and program management to continue development and maturation. These costs will be used to procure the remaining XM913s, labor and the ammunition needed for PM MASs EMD. The ammunition is required for Target Practice - Tracer (TP-T), Armor Piercing Fin Stabilized Discarding Sabot - Tracer (APFSDS-T) , and High Explosive Airburst - Tracer (HEAB-T). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease from FY 2020 to FY 2021 is due to the funding for the XM-913 in not needed in FY 2021.	-	38.504	-
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:*** Funding transferred in accordance with Title 15 USC 638	-	9.179	-
Accomplishments/Planned Programs Subtotals	-	205.620	327.732

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• G86000: *Optionally Manned Fighting Vehicle (OMFV)*	-	-	0.000	-	0.000	-	1,689.091	1,935.873	1,820.536	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The OMFV is designed to maneuver Soldiers in the Forward Operating Environment to a position of advantage to engage in close combat and deliver decisive lethality during the execution of combined arms maneuver. The OMFV must exceed current capabilities while overmatching similar threat class systems. It must be optimized for dense urban areas while also defeating pacing threats on rural (open, semi-restricted and restricted) terrain and be characterized by the ability to spiral in advanced technologies as they mature. The capabilities desired focus to improve lethality, protection, mobility, range, survivability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		9.179		-		-		-	0.000	9.179	-
		Subtotal	-	-		9.179		-		-		-	0.000	9.179	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Support Costs	TBD	TBD : TBD	-	-		24.420	Jun 2020	13.193	Mar 2021	-		13.193	0.000	37.613	-
XM-913	MIPR	PM MAS : Picatinny, NJ	-	-		38.504	Mar 2020	-		-		-	0.000	38.504	-
Contractor costs	TBD	TBD : TBD	-	-		-		286.444	Jun 2021	-		286.444	0.000	286.444	-
Technology matruration & insertion	TBD	TBD : TBD	-	-		114.752	Jul 2020	-		-		-	0.000	114.752	-
		Subtotal	-	-		177.676		299.637		-		299.637	0.000	477.313	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	Warren, MI : TBD	-	-		18.765	Mar 2020	20.987	Mar 2021	-		20.987	0.000	39.752	-
		Subtotal	-	-		18.765		20.987		-		20.987	0.000	39.752	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	TBD	TBD : TBD	-	-		-		7.108	Jun 2021	-		7.108	0.000	7.108	-
		Subtotal	-	-		-		7.108		-		7.108	0.000	7.108	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605625A / *Manned Ground Vehicle*	Project (Number/Name) CF6 / *Next Generation Combat Vehicle (OMFV)*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		205.620		327.732		-		327.732	0.000	533.352	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

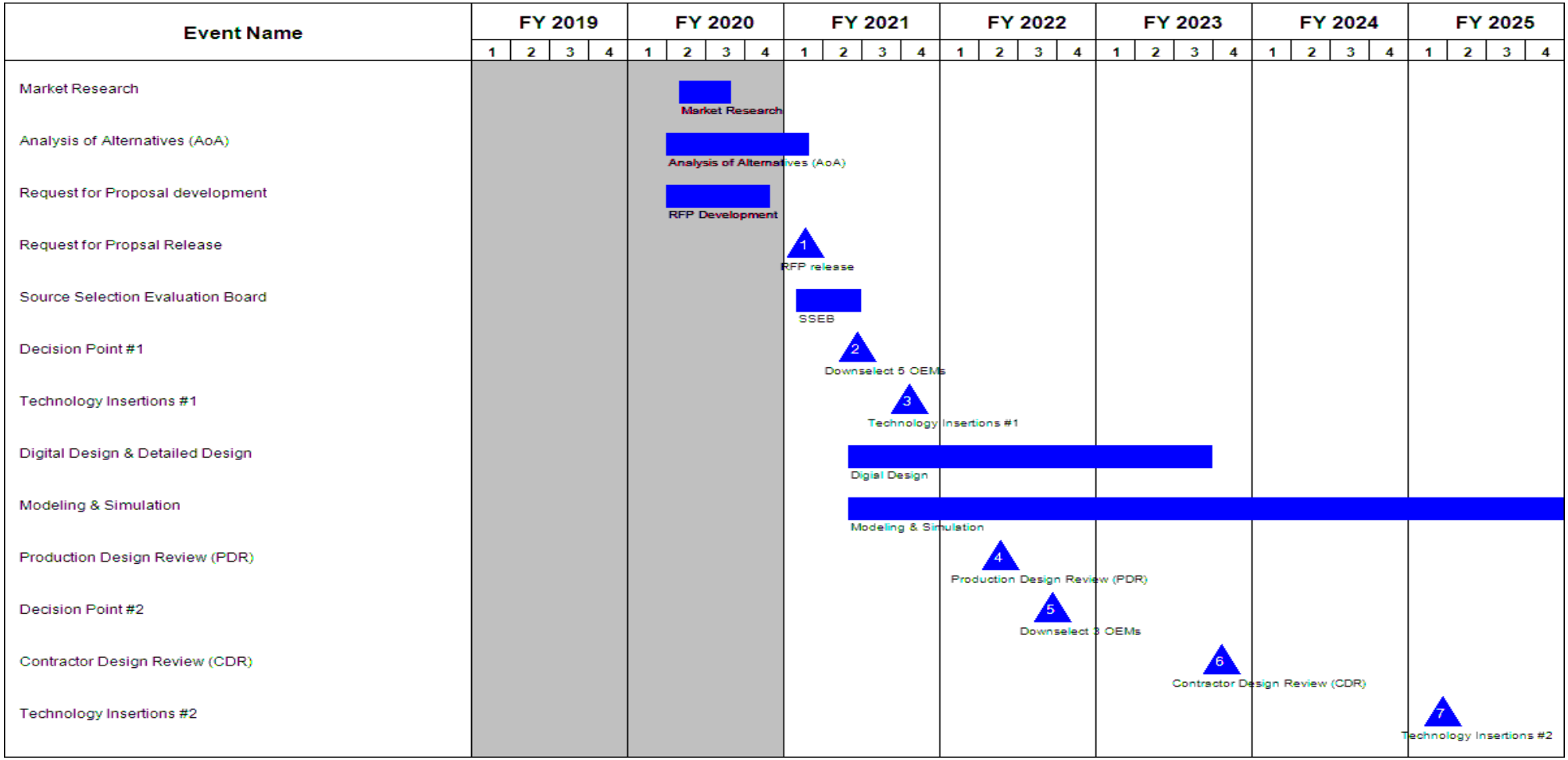


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
New Equipment Training/Limited User Test																												NET/LUT

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (OMFV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Market Research	2	2020	3	2020
Analysis of Alternatives (AoA)	2	2020	1	2021
Request for Proposal development	2	2020	4	2020
Request for Propsal Release	1	2021	1	2021
Source Selection Evaluation Board	1	2021	2	2021
Decision Point #1	2	2021	2	2021
Technology Insertions #1	4	2021	4	2021
Digital Design & Detailed Design	2	2021	3	2023
Modeling & Simulation	2	2021	4	2025
Production Design Review (PDR)	2	2022	2	2022
Decision Point #2	3	2022	3	2022
Contractor Design Review (CDR)	4	2023	4	2023
Technology Insertions #2	1	2025	1	2025
New Equipment Training/Limited User Test	3	2025	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605766A *I National Capabilities Integration (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**
Total Program Element	-	12.340	7.835	7.670	-	7.670	11.671	11.044	11.289	13.600	0.000	75.449
DX9: *National Integration To Tactical Systems(MIP)*	-	9.060	4.490	4.219	-	4.219	5.178	4.421	4.533	6.709	0.000	38.610
EX7: *Air Vigilance System Development*	-	3.280	3.345	3.451	-	3.451	6.493	6.623	6.756	6.891	0.000	36.839

Note

PE 0605766A 'National Capabilities Integration (MIP)' funds two separate efforts in two separate Projects:
(1) Project DX9 'National Integration To Tactical Systems (MIP)' provides system development research and development funds for integration of multiple projects development by Army TENCAP into enduring Programs of Record
(2) Project EX7 'Air Vigilance System Development' provides system development research and development funds to the Army's 'Air Vigilance' ACAT III Automated Information System (AIS) Program of Record (POR)

All funding is in support of the ACTIVE COMPONENT

A. Mission Description and Budget Item Justification

National Integration to Tactical Systems provides centralized monitoring and synchronization by the Army's Tactical Exploitation of National Capabilities (TENCAP) office, for the transition and integration of proven advanced technologies, prototypes and standards developed by the National Intelligence Community (IC) into Army systems and Programs of Record. This Program Element includes System Development and Integration funds for the Air Vigilance Program of Record (POR). It also enables efficient use and oversight of system development funds for final stage integration, development, and testing of successful technologies and prototypes to advance, or make compliant, Army systems and Programs of Record that have or use National capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605766A *I National Capabilities Integration (MIP)*		
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	12.340	7.835	7.677	-	7.677
Current President's Budget	12.340	7.835	7.670	-	7.670
Total Adjustments	0.000	0.000	-0.007	-	-0.007
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.007	-	-0.007

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(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
DX9: *National Integration To Tactical Systems(MIP)*	-	9.060	4.490	4.219	-	4.219	5.178	4.421	4.533	6.709	0.000	38.610
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT
Project DX9 'National Capabilities Integration (MIP)' was previously funded

A. Mission Description and Budget Item Justification

National Integration to Tactical Systems provides for centralized monitoring and synchronization by the Army's Tactical Exploitation of National Capabilities (TENCAP) office for the transition and integration of new, updated, and emerging National Intelligence Community (IC) technologies, capabilities, and standards into Programs of Record across the Army to: (1) maintain operational relevance of Army programs and address changes in technology and the threat, (2) ensure Army programs maintain interoperability with and access to the National community architecture and systems, and (3) advance Army ability to conduct analysis and tasking, collection, processing, exploitation, dissemination and feedback (TCPEDF) of intelligence data.

FY 2021 Base funding in the amount of $4.219 million provides integration funds for two (2) validated National Intel Community (IC) efforts: (1) Army TNG Integration, $3.150 million funds the continued efforts to ensure Army Programs of Record are in compliance to the National standard for Airborne Overhead Cooperative Operations/Theater Net-Centric Geolocation (AOCO/TNG), per the Joint Requirement (JROCM 101-10); (2) TENCAP Radio Frequency Exploitation (TRFE), $1.069 million funds the system development and integration efforts of the TRFE software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Army TNG Integration - Airborne Overhead Cooperative Operations (AOCO) / Theater Net-Centric Geolocation (TNG)	3.009	3.088	3.150
Description: National Intelligence Community (IC) standard for interoperability and use of specific intelligence networked capabilities.			
FY 2020 Plans: Continue to provide funds to specified Army Programs of Record (PORs) for final-stage software development and integration efforts, ensuring their compliance to the National requirement and standards that enables these PORs to be interoperable within this National Intelligence Community (IC) "Theater Net-Centric Geolocation (TNG)" network for joint tactical use and improved Army battlefield awareness. (ref. CJCSI 32450.61, AOCO 13 January 2012)			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Continues to provide funds to specified Army Programs of Record (PORs) for final-stage software development and integration efforts, ensuring their compliance to the National requirement and standards that enables these PORs to be interoperable within this National Intelligence Community (IC) "Theater Net-Centric Geolocation (TNG)" network for joint tactical use and improved Army battlefield awareness. (ref. CJCSI 32450.61, AOCO 13 January 2012) ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Aligns funds for TNG efforts to ensure compliance to National requirements			
Title: AMDAS-Next ***Description:*** System development and integration of the prototype Advanced Miniaturized Data Acquisition System 'AMDAS - Next', the subsystem that provides national data to the tactical warfighter via intelligence community partners classified national systems. *Note: capability will transfer to (pending) POR TITAN in FY 2023, funded in project BX9 in FY 2022.	3.506	-	-
Title: TENCAP Radio Frequency Exploitation (TRFE) ***Description:*** Prototype capability software that informs, influences and enhances MULTI-INT sensor systems within PEO IEW&S such as Terrestrial Layer System (TLS) by targeting modern digital communications systems employed by near-peer nation state armies. Assists with Battlespace RF Characterization for modern communication environments with the intent to synchronize SIGINT, Cyber and Electronic Warfare operations. Utilizes commercial industry components and architectures to minimize hardware costs, risk and maximizes scalability/modularity. ***FY 2020 Plans:*** Continue integration of TRFE cognitive, software-based, SIGINT-Enabled, Electronic-Warfare-and-Cyber-Attack prototype capability focused on countering Peer-State and modern communication targets and threats. ***FY 2021 Plans:*** Continues integration of TRFE cognitive, software-based, SIGINT-Enabled, Electronic-Warfare-and-Cyber-Attack prototype capability focused on countering Peer-State and modern communication targets and threats. Will inform and potentially transition to the POR Terrestrial Layer System (TLS). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Aligns funds for system development and integration of TENCAP Radio Frequency Exploitation efforts ready for transition.	2.530	1.402	1.069
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun ***Description:*** FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.015	-	-
Accomplishments/Planned Programs Subtotals	9.060	4.490	4.219

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	35.667	37.490	194.775	-	194.775	105.297	82.506	72.221	42.440	0.000	570.396
• OMA - 122011 OMA: *Contractor Logistics Support and Other Weapon Support, OMA 122011*	2.052	-	2.132	-	2.132	2.175	2.217	2.285	2.330	0.000	13.191

Remarks

D. Acquisition Strategy

The 'National Integration To Tactical Systems (Military Intelligence Program - MIP)' funds provide for transition and integration of National Intelligence Community (IC) advanced technologies and prototypes leveraged by the Army's Tactical Exploitation of National Capabilities (TENCAP) program office. The Army TENCAP acquisition strategy is driven by an annual TENCAP General Officer Steering Group (TGOSG), co-chaired by the Army G2; Army G8; and the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology [ASA(ALT)]; and includes representatives from the Army G3; Army G6; Army Training and Doctrine Command (TRADOC); and the Program Executive Office for Intelligence, Electronic Warfare and Sensors (PEO IEW&S). The TGOSG reviews, validates, prioritizes, and guides Army TENCAP efforts, according to Army and Defense strategy. Based on this TGOSG guidance, Army TENCAP invests BA 6.4 RDTE in Intelligence Community (IC) developments during the more cost-effective advanced development phase to ensure Army requirements are met with minimal redundancy with Army investments. Army TENCAP then uses BA 6.5 RDTE to manage the transition of these advanced development efforts through system development and integration into Army Programs of Record (POR). This strategy ensures these leveraged investments remain viable through multiple budget cycles, significantly increasing successful transition to recipient Army POR. Army TENCAP facilitates the continued access to National Intel Community (IC) 'joint' efforts and compatibility with those National standards and software baseline for those Army PORs that benefit from these leveraged National IC technologies, resulting in cost-savings through cost-sharing, and Army participation in collaborative Intelligence. Funds will be used for final-stage integration efforts identified and vetted through the Army TENCAP annual TGOSG, such as: advanced Air Vigilance software enhancements; POR sensor integration into the Theater Net-Centric Geolocation network; integration of the future Advanced Miniaturized Data Acquisition System (AMDAS - Next) capability into (pending) POR TITAN and operational concepts; transition and integration of Army TENCAP technologies discovered and leveraged by the annual Military Exploitation of Reconnaissance and Intelligent Technology (MERIT) project selection process, as well as other transitioning technologies discovered and/or leverage through other joint TENCAP outreach efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(MIP)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Engineers	MIPR	Multiple : Multiple	0.420	0.913	Jan 2019	0.115	Jan 2020	0.150	Jan 2021	-		0.150	0.000	1.598	Continuing
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	TENCAP : Alexandria	-	0.015		-		-		-		-	0.000	0.015	-
		Subtotal	0.420	0.928		0.115		0.150		-		0.150	0.000	1.613	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG for Multiple Army PORs	MIPR	Multiple : Multiple	28.878	4.782	Jan 2019	2.250	Jan 2020	3.000	Jan 2021	-		3.000	0.000	38.910	Continuing
TRFE	MIPR	Classified : Classified	-	2.327	Jan 2019	1.100	Jan 2020	1.069	Jan 2021	-		1.069	0.000	4.496	Continuing
		Subtotal	28.878	7.109		3.350		4.069		-		4.069	0.000	43.406	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Support Costs	Allot	PEO IEW&S/PM SAI : Aberdeen Proving Grounds, MD	0.240	0.554	Jan 2019	0.550	Jan 2020	-		-		-	0.000	1.344	Continuing
		Subtotal	0.240	0.554		0.550		-		-		-	0.000	1.344	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Test and Evaluation	MIPR	Multiple : Multiple	0.255	0.275	Jan 2019	0.275	Jan 2020	-		-		-	0.000	0.805	Continuing
TRFE	MIPR	Classified : Classified	-	0.194	Jan 2019	0.200	Jan 2020	-		-		-	0.000	0.394	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(MIP)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.255	0.469		0.475		-		-		-	0.000	1.199	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.793	9.060		4.490		4.219		-		4.219	0.000	47.562	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

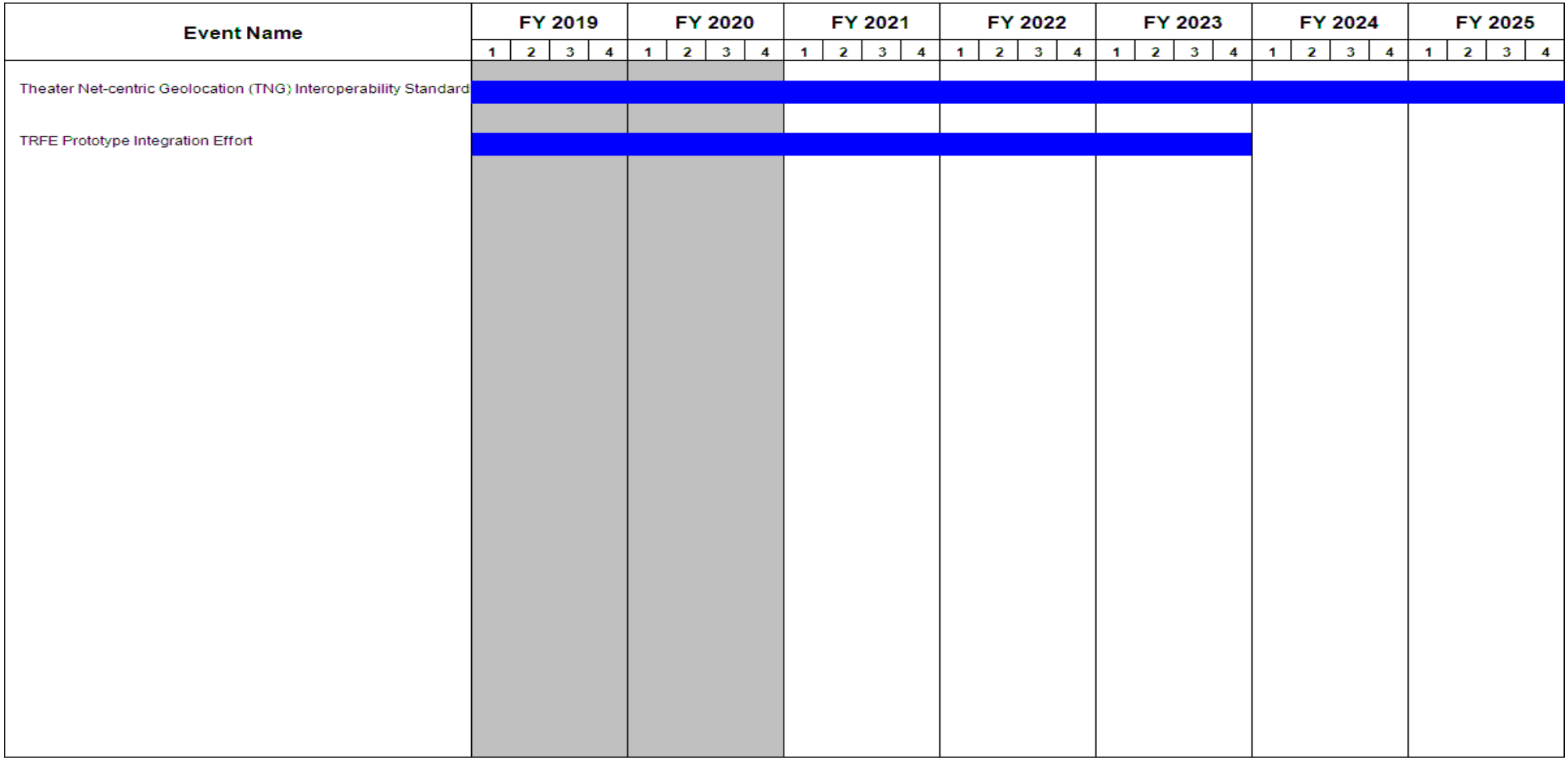


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Theater Net-centric Geolocation (TNG) Interoperability Standards	2	2014	1	2026
TRFE Prototype Integration Effort	1	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System 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
EX7: *Air Vigilance System Development*	-	3.280	3.345	3.451	-	3.451	6.493	6.623	6.756	6.891	0.000	36.839
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT

A. Mission Description and Budget Item Justification

Air Vigilance systems are a software based solution that collect critical intelligence data on emerging threat aerial systems. The intelligence data provides early warning of operations in restricted airspace to ensure force protection. An Air Vigilance system is comprised of a server unit configured and fielded with a single or multiple sub-component sensors. System Quantities are based upon server units. Operational details are classified.

FY 2021 Base funding in the amount of $3.451 million provides for system development and integration of latest software developments and hardware configurations in accordance with Capability Drop (CD) 3 requirements. This completes the BOIP of 39 sensors and 10 servers and reaches Full Deployment (FD).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Air Vigilance System Development and Integration	3.280	3.345	3.451
Description: Software and hardware engineering, development and integration efforts. ***FY 2020 Plans:*** Will provide for software development and integration to ingest latest collected sensor data into the common baseline and enhance system capabilities to meet newly identified threats and latest Capability Drop requirements. ***FY 2021 Plans:*** Will provide for software development and integration to ingest latest collected sensor data into the common baseline and enhance system capabilities to meet newly identified threats and latest Capability Drop requirements. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds align to system development which is driven by and in response to collected sensor data			
Accomplishments/Planned Programs Subtotals	3.280	3.345	3.451

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	35.667	37.490	194.775	-	194.775	105.297	82.506	72.221	42.440	0.000	570.396
• W60001: *Air Vigilance (AV) (MIP)*	8.497	8.953	8.160	-	8.160	8.521	8.692	8.866	9.043	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air Vigilance (AV) is an ACAT III Automated Information System (AIS) program of record (POR) that originated from a Quick Reaction Capability (QRC) developed and fielded cooperatively with the Intelligence Community (IC) through the efforts and mission of the Army's Tactical Exploitation of National Capabilities (TENCAP) office. The QRC was transitioned into an Army AIS POR by the AAE in May 2013 and assigned to Army Program Executive Office - Intelligence Electronic Warfare and Sensors (PEO IEWS), the chartered acquisition authority for management and execution of the Army's TENCAP mission and Milestone Decision Authority (MDA) for the AV POR. The Army TENCAP continues to leverage the IC common software development and support contract to field the AV systems, and ensure this primarily software based system can continue to access and leverage the common software, and input or ingest the latest sensor collects into the common IC data library. As an AIS POR, the AV POR is currently fielding systems per its Basis of Issue Plan (BOIP) and with software and system capabilities that meet its latest validated Capability Drop (CD) requirements. The AV POR is currently scheduled to meet Full Deployment (FD) by 2021, and will continue to evolve to meet future validated Capability Drop requirements and maintain its effectiveness against emerging threats.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineers and Technical Assistance (SETA)	Option/ CPFF	Perspecta : Alexandria, VA	0.480	0.512	Jan 2019	0.530	Jan 2020	0.550	Jan 2021	-		0.550	0.000	2.072	Continuing
		Subtotal	0.480	0.512		0.530		0.550		-		0.550	0.000	2.072	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance software updates and integration	Option/ CPAF	CACI : Sterling, VA	2.588	1.825	Jan 2019	1.865	Jan 2020	1.900	Jan 2021	-		1.900	0.000	8.178	Continuing
		Subtotal	2.588	1.825		1.865		1.900		-		1.900	0.000	8.178	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Costs, Travel, Facilities	Allot	PEO IEWS/Air Vigilance POR : Alexandria, VA	0.744	0.830	Dec 2018	0.850	Dec 2019	0.900	Jan 2021	-		0.900	0.000	3.324	Continuing
		Subtotal	0.744	0.830		0.850		0.900		-		0.900	0.000	3.324	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance system Testing and Exercises	Option/ CPAF	CACI : Sterling, VA	0.250	0.113	Jan 2019	0.100	Jan 2020	0.101	Jan 2021	-		0.101	0.000	0.564	-
		Subtotal	0.250	0.113		0.100		0.101		-		0.101	0.000	0.564	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System Development*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.062	3.280		3.345		3.451		-		3.451	0.000	14.138	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

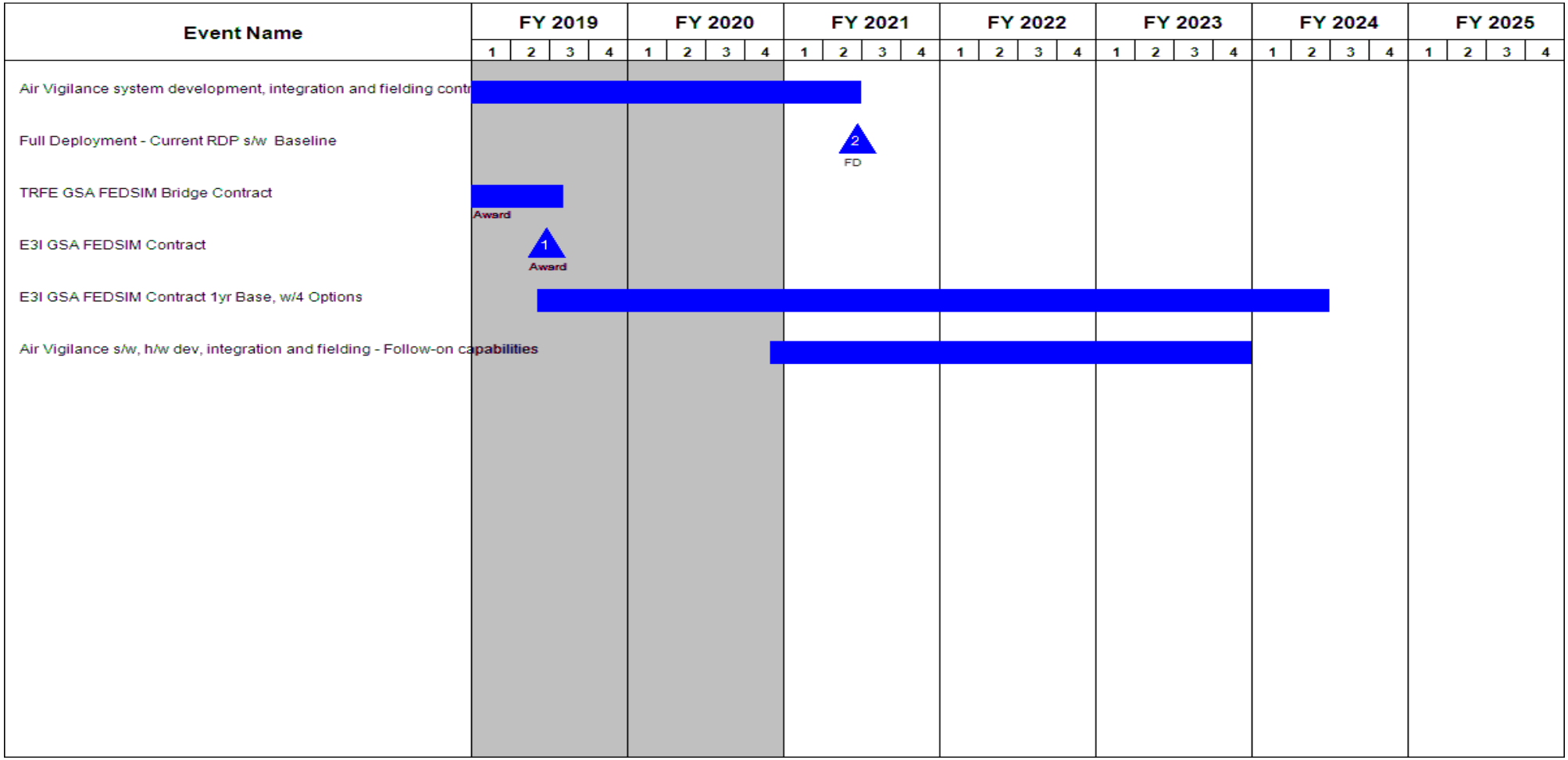


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Air Vigilance system development, integration and fielding contract	2	2016	2	2021
Air Vigilance CD #3 National Assessment Group Test	3	2018	3	2018
Full Deployment - Current RDP s/w Baseline	2	2021	2	2021
TRFE GSA FEDSIM Bridge Contract	2	2018	3	2019
E3I GSA FEDSIM Contract	2	2019	2	2019
E3I GSA FEDSIM Contract 1yr Base, w/4 Options	2	2019	2	2024
Air Vigilance s/w, h/w dev, integration and fielding - Follow-on capabilities	4	2020	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605812A *I Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*							
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	7.232	1.742	-	1.742	1.799	1.833	2.008	2.008	Continuing	Continuing
VU9: *Joint Light Tactical Vehicle*	-	0.000	7.232	1.742	-	1.742	1.799	1.833	2.008	2.008	Continuing	Continuing

A. Mission Description and Budget Item Justification

The JLTV Family of Vehicles (FoV), to include a companion trailer, is a United States Army (USA) acquisition lead, joint program with the U.S. Marine Corps (USMC). The JLTV is capable of performing multiple mission roles and designed to provide protected, sustained, networked mobility for personnel and payloads across the full range of military operations. JLTV objectives include increased protection and performance over the current fleet; and, minimizing ownership costs by maximizing commonality, fuel efficiency, reliability, and maintaining effective competition throughout the life cycle. Commonality of components, maintenance procedures, training, etc., among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized. The JLTV Trailer (JLTV-T) is the companion trailer to the JLTV and safely carries its payload while maintaining the same mobility characteristics of the prime mover. The trailer requirement as defined in the Capability Production Document (CPD), dated 21 November 2014 was validated on 7 June 2019 by the Army and required the JLTV and JLTV-T to be fielded as a system. On November 2019, Army Futures Command validated the JLTV-T Army Procurement Objective (APO) of 18,224.

This program element supports modernization of the JLTV FoV by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory Architecture, autonomous operations and other emerging technologies. This program element also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

The FY 2021 budget supports the procurement of test assets and the finalization of engineering efforts such as: Li-Ion based technologies and survivability enhancements to optimize the JLTV system architecture and drastically reduce operations and support (O&S) costs; Ongoing development of Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts such as Integrated Tactical Network (ITN) and Integrated Vision Augmentation System (IVAS); Ongoing testing to ensure cyber vulnerabilities are considered and mitigated.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605812A *I Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*		
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	2.732	1.744	-	1.744
Current President's Budget	0.000	7.232	1.742	-	1.742
Total Adjustments	0.000	4.500	-0.002	-	-0.002
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.002	-	-0.002

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*	

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
VU9: *Joint Light Tactical Vehicle*	-	0.000	7.232	1.742	-	1.742	1.799	1.833	2.008	2.008	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The JLTV Family of Vehicles (FoV), to include a companion trailer, is a United States Army (USA) acquisition lead, joint program with the U.S. Marine Corps (USMC). The JLTV is capable of performing multiple mission roles and designed to provide protected, sustained, networked mobility for personnel and payloads across the full range of military operations. JLTV objectives include increased protection and performance over the current fleet; and, minimizing ownership costs by maximizing commonality, fuel efficiency, reliability, and maintaining effective competition throughout the life cycle. Commonality of components, maintenance procedures, training, etc., among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized. The JLTV Trailer (JLTV-T) is the companion trailer to the JLTV and safely carries its payload while maintaining the same mobility characteristics of the prime mover. The trailer requirement as defined in the Capability Production Document (CPD), dated 21 November 2014 was validated on 7 June 2019 by the Army and required the JLTV and JLTV-T to be fielded as a system. On November 2019, Army Futures Command validated the JLTV-T Army Procurement Objective (APO) of 18,224.

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The FY 2021 budget supports the procurement of test assets and the finalization of engineering efforts such as: Li-Ion based technologies and survivability enhancements to optimize the JLTV system architecture and drastically reduce operations and support (O&S) costs; Ongoing development of Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts such as Integrated Tactical Network (ITN) and Integrated Vision Augmentation System (IVAS); Ongoing testing to ensure cyber vulnerabilities are considered and mitigated.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Evaluation and Assessment of current and future engineering efforts	-	7.108	1.264
Description: Funding is provided for the support of JLTV evaluation and assessment of current and future engineering efforts.			
FY 2020 Plans: Development of Training Aids, Devices, Simulators, and Simulations (TADSS) which includes both a Diagnostic and Troubleshooting Trainer (DTT) and Hands on Trainer (HOT) systems. Continuation of engineering efforts such as: Li-Ion based technologies, fuel cell technology and mainstream DoD efforts to optimize the JLTV system architecture and drastically reduce			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
(O&S) costs; Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts such as Integrated Tactical Network (ITN) and Integrated Vision Augmentation System (IVAS); Development of vehicle safety technologies to enhance occupant safety; Transportability optimization to include Dual Row Airdrop Systems; Ongoing testing to ensure cyber vulnerabilities are considered and mitigated. ***FY 2021 Plans:*** Finalization of engineering efforts such as: Li-Ion based technologies and survivability enhancements to optimize the JLTV system architecture and drastically reduce (O&S) costs; Ongoing development of Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts such as Integrated Tactical Network (ITN) and Integrated Vision Augmentation System (IVAS); Ongoing testing to ensure cyber vulnerabilities are considered and mitigated. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding due to the anticipated reduction of engineering efforts and completion of TADSS.			
Title: Test Assets ***FY 2021 Plans:*** Procurement of test assets. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 of $.478M is for the procurement of test assets.	-	-	0.478
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:*** Funding transferred in accordance with Title 15 USC 638	-	0.124	-
Accomplishments/Planned Programs Subtotals	-	7.232	1.742

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• D15603: *JOINT LIGHT TACTICAL VEHICLE*	1,279.437	972.407	0.000	-	0.000	-	-	-	-	0.000	2,251.844
• D15610: *JOINT LIGHT TACTICAL VEHICLE FAMILY OF VEHICLES*	-	-	894.414	-	894.414	711.668	845.930	845.224	845.175	Continuing	Continuing
• D15615: *JOINT LIGHT TACTICAL VEHICLE (JLTV)*	-	-	822.023	-	822.023	635.934	795.771	787.381	748.085	Continuing	Continuing
• D15618: *JOINT LIGHT TACTICAL VEHICLE TRAILER (JLTV-T)*	-	-	72.391	-	72.391	75.734	50.159	57.843	97.090	Continuing	Continuing

Remarks

JLTV is a Joint Program with the United States Marine Corps (USMC)

($ in Millions)
Marine Corps Ground Combat/Support Systems, Production 5095 - FY 2019: $572.774 FY 2020: $555.648 FY 2021: $381.675 FY 2022: $322.743 FY 2023: $300.711 FY 2024: $415.470 FY 2025: $424.338
Marine Corps Ground Combat/Support Systems, RDTE Project 3209 0605813M - FY 2019: $0 FY 2020: $2.105 FY 2021: $2.541 FY 2022: $2.023 FY 2023: $3.357 FY 2024: $2.106 FY 2025: $2.147

D. Acquisition Strategy

The JLTV Family of Vehicles (FoV), to include a companion trailer, is a United States Army (USA) lead, joint program with the U.S. Marine Corps (USMC).

The JLTV Program entered the Production and Deployment Phase with the Acquisition Decision Memorandum authorization on 25 August 2015. With Milestone C approval, the Low Rate Initial Production (LRIP) fixed price contract was awarded to Oshkosh Defense LLC on 25 August 2015. This contract consists of a three year LRIP period with options for five additional years of Full Rate Production (FRP) deliveries. JPO JLTV procured the Technical Data Package (TDP) with appropriate data rights to allow for possible future competition for production vehicles and spares. Current contract options may be exercised through 30 November 2023 assuming contractual quantity headspace is still available. Current funding indicates headspace quantity of 16,901 may be achieved in FY 2021, with competitive follow on contract award also anticipated in FY 2022. A split procurement will occur between the existing Oshkosh contract and the new competitively awarded contract based on the approved acquisition strategy.

Program achieved a successful FRP decision May 2019. The FRP Acquisition Decision Memorandum was signed June 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

The trailer requirement as defined in the Capability Production Document (CPD), dated 21 November 2014 was validated on 7 June 2019 by the Army and required the JLTV and JLTV-T to be fielded as a system. On November 2019, Army Futures Command validated the JLTV-T Army Procurement Objective (APO) of 18,224.

The JLTV program will continually monitor emerging technologies and capabilities through its partnerships with U.S. Army and Marine Corps science and technology organizations as well as through industry market research and partnerships. The JLTV program will look for opportunities to implement increased capabilities throughout the systems Life Cycle.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Light Tactical Vehicles (JLTV) Contract Service Support	SS/CPFF	Booz-Allen Hamilton, : McLean, VA	10.191	-		-		-		-		-	0.000	10.191	-
JLTV Contract Service Support for Cost Analysis for JLTV CARD	SS/CPFF	Camber Corporation, : Huntsville, AL	0.591	-		-		-		-		-	0.000	0.591	-
JLTV Service Support	MIPR	US Army Combined Arms Support Commands - CASCOM, : Ft. Lee, VA	0.200	-		-		-		-		-	0.000	0.200	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.124		-		-		-	0.000	0.124	-
		Subtotal	10.982	-		0.124		-		-		-	0.000	11.106	N/A

Remarks

Funding for Management Services has shifted from RDT&E to Procurement and Operations and Maintenance - Army(OMA).

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JLTV Live Fire Test Support	C/FFP	Oshkosh Corporation : Oshkosh, WI	19.091	-		-		-		-		-	0.000	19.091	-
Evaluation and Assessment of current and future engineering efforts	C/Various	To Be Determined : To Be Determined	7.476	-		7.108	Jan 2020	1.264	Jan 2021	-		1.264	Continuing	Continuing	Continuing
Test assets	TBD	TBD : TBD	-	-		-		0.478	Jun 2021	-		0.478	0.000	0.478	-
		Subtotal	26.567	-		7.108		1.742		-		1.742	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	Project (Number/Name) VU9 / *Joint Light Tactical Vehicle*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks FY 2021 supports the procurement of test assets under the new production contract to support live fire testing.															

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Light Tactical Vehicles (JLTV) Program Management Support	Various	TACOM Life Cycle Management Command (LCMC), : Harrison Township, MI	31.919	-		-		-		-		-	0.000	31.919	-
GFE Management / GFE / Integration	MIPR	Various : TBD	19.436	-		-		-		-		-	0.000	19.436	-
JLTV EMD/LRIP phase.	MIPR	Tank-Automotive Research, Development, and Engineering Center - TARDEC : Warren, MI	14.245	-		-		-		-		-	0.000	14.245	-
JLTV Prototype EMD/LRIP - Budget	MIPR	TACOM Life Cycle Management Command (LCMC), : Warren, MI	12.383	-		-		-		-		-	0.000	12.383	-
		Subtotal	77.983	-		-		-		-		-	0.000	77.983	N/A

Remarks

Funding for Support Costs has shifted from RDT&E to Procurement and Operations and Maintenance - Army(OMA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	Project (Number/Name) VU9 / *Joint Light Tactical Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Complete Engineering and Manufacturing Development (EMD) Test - Limited User Test (LUT)	MIPR	Army Evaluation Center (AEC) : Aberdeen Proving Ground, MD	41.342	-		-		-		-		-	0.000	41.342	-
Development Testing, MOT&E and Live Fire T&E - Log demo, and corrosion.	Various	TBD : Various	42.994	-		-		-		-		-	0.000	42.994	-
FY 2018 Rescission	TBD	N/A : N/A	5.677	-		-		-		-		-	0.000	5.677	-
		Subtotal	90.013	-		-		-		-		-	0.000	90.013	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	205.545	-		7.232		1.742		-		1.742	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

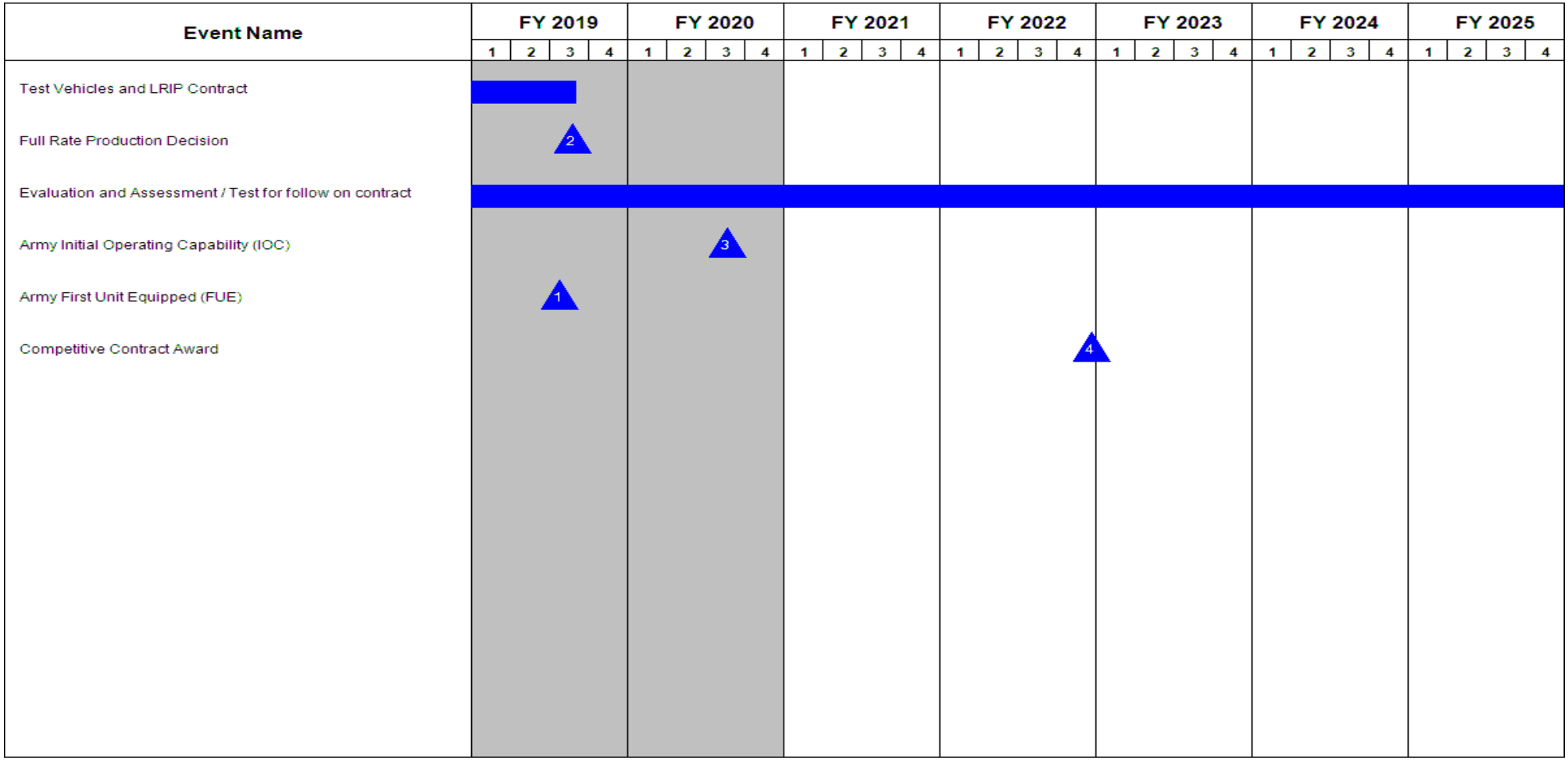

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Test Vehicles and LRIP Contract	4	2015	3	2019
Full Rate Production Decision	3	2019	3	2019
Evaluation and Assessment / Test for follow on contract	3	2018	4	2025
Army Initial Operating Capability (IOC)	3	2020	3	2020
Army First Unit Equipped (FUE)	3	2019	3	2019
Competitive Contract Award	4	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605830A / *Aviation Ground Support Equipment*							
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	-	7.616	1.664	1.467	-	1.467	1.385	1.333	1.161	0.996	0.000	15.622
EE5: *Aviation Ground Support Equipment*	-	7.616	1.664	1.467	-	1.467	1.385	1.333	1.161	0.996	0.000	15.622

A. Mission Description and Budget Item Justification

Aviation Ground Support Equipment (AGSE) conducts developmental testing and the acquisition of prototypes to enhance the functionality of current and future aircraft maintenance equipment. This will be accomplished by identifying more effective aircraft maintenance equipment, validating new maintenance concepts, improving machine interfaces, updating aircraft maintenance processes, and developing improved diagnostic technologies which will reduce Operation and Support costs. This program provides for the development of rapid battle repair procedures, tools, ground handling, and test equipment to speed the return of aircraft to a fully mission capable status. Included in this program are: Tool Set, Aviation Unit Maintenance (TS, AUM), Self-propelled Crane Aircraft Maintenance and Positioning Increment II (SCAMP II), Expeditionary Variant, Pitot Static Test Set (PSTS), Aviation Ground Power Unit Next Generation (AGPU Nex Gen), Modernized Flexible Engine Diagnostic System (MFEDS), Modernized Maintenance Stands (MMS), Aircraft Cleaning and De-icing System (ACDS), Aviation Intermediate Maintenance Shop Set (AVIM SS), Common Aviation Tool System (CATS), Generic Aircraft Nitrogen Generator (GANG), Aviation Light Utility Mobile Maintenance Cart (ALUMMC), Standard Aircraft Towing System (SATS) and development of support equipment required for maintenance of modernized/future force aircraft.

B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	7.703	1.664	1.468	-	1.468
Current President's Budget	7.616	1.664	1.467	-	1.467
Total Adjustments	-0.087	0.000	-0.001	-	-0.001
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.087	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.001	-	-0.001

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / *Aviation Ground Support Equipment*	Project (Number/Name) EE5 / *Aviation Ground Support Equipment*	

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
EE5: *Aviation Ground Support Equipment*	-	7.616	1.664	1.467	-	1.467	1.385	1.333	1.161	0.996	0.000	15.622
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aviation Ground Support Equipment (AGSE) conducts developmental testing and the acquisition of prototypes to enhance the functionality of current and future aircraft maintenance equipment. This will be accomplished by identifying more effective aircraft maintenance equipment, validating new maintenance concepts, improving machine interfaces, updating aircraft maintenance processes, and developing improved diagnostic technologies which will reduce Operation and Support costs. This program provides for the development of rapid battle repair procedures, tools, ground handling, and test equipment to speed the return of aircraft to a fully mission capable status. Included in this program are: Tool Set, Aviation Unit Maintenance (TS, AUM), Self-propelled Crane Aircraft Maintenance and Positioning Increment II (SCAMP II), Expeditionary Variant, Pitot Static Test Set (PSTS), Aviation Ground Power Unit Next Generation (AGPU Nex Gen), Modernized Flexible Engine Diagnostic System (MFEDS), Modernized Maintenance Stands (MMS), Aircraft Cleaning and De-icing System (ACDS), Aviation Intermediate Maintenance Shop Set (AVIM SS), Common Aviation Tool System (CATS), Generic Aircraft Nitrogen Generator (GANG), Aviation Light Utility Mobile Maintenance Cart (ALUMMC), Standard Aircraft Towing System (SATS) and development of support equipment required for maintenance of modernized/future force aircraft.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: SCAMP II, Expeditionary Variant ***Description:*** The SCAMP II, Expeditionary Variant, will remove and replace major aircraft components (maintenance lifting) in support of Army Aviation Maintenance. Type 2 supports maintenance on unimproved, austere locations, split operations and downed aircraft recovery.	0.620	-	-
Title: Pitot Static Test Set (PSTS) ***Description:*** PSTS is a portable aircraft air data systems tester which provides the capability of troubleshooting, repairing, and verifying proper operation of flight critical aircraft air data systems. ***FY 2020 Plans:*** Conducted logistics demonstrations, verified tech manual and developed Technical Data Package (TDP). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to completion of the logistics demonstration, technical manuals, and TDP efforts.	0.905	0.786	-
Title: Aviation Ground Power Unit Next Generation (AGPU Next Gen)	0.100	0.803	1.467

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605830A / *Aviation Ground Support Equipment*	**Project (Number/Name)** EE5 / *Aviation Ground Support Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Description: The AGPU Next Gen provides external hydraulic, pneumatic, and AC/DC electrical power to meet Army helicopter servicing requirements. ***FY 2020 Plans:*** Begin development of the Test Plan and Acquisition Documentation. ***FY 2021 Plans:*** Acquire test articles and begin the Initial Operational Test and Evaluation (IOT&E) of the AGPU Next Gen candidates. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase is due to the acquisition of test articles.			
Title: Next Generation Health Monitoring System ***Description:*** The Next Generation Health Monitoring System is funded in the AGSE line, however, NGHMS funds are being executed by the Lakota Program Office as this is the platform operational testing is being conducted.	5.000	-	-
Title: Modernized Flexible Engine Diagnostic System (MFEDS) ***Description:*** The MFEDS is an advanced technology engine test system designed to test and verify flight readiness of engines removed from aircraft for maintenance.	0.350	-	-
Title: Technical Engineering Services ***Description:*** Technical Engineering Services in support of Airworthiness and Safety certifications for Aviation Ground Support Equipment.	0.641	-	-
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:*** Funding transferred in accordance with Title 15 USC ?638	-	0.075	-
Accomplishments/Planned Programs Subtotals	7.616	1.664	1.467

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605830A / *Aviation Ground Support Equipment*	**Project (Number/Name)** EE5 / *Aviation Ground Support Equipment*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• AZ3520: *AVIATION GROUND SUPPORT EQUIPMENT*	34.818	18.624	17.584	-	17.584	14.856	15.164	16.109	13.012	0.000	130.167

Remarks

D. Acquisition Strategy

This project is an aggregate of aviation ground support equipment related projects. While the detailed acquisition strategy varies from program to program, the general strategy for each individual program is to complete the development effort through Government test (developmental and operational). Program documentation for each milestone decision is prepared, as appropriate, concurrently with the development effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / *Aviation Ground Support Equipment*	Project (Number/Name) EE5 / *Aviation Ground Support Equipment*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	Various	PM AGSE : Redstone Arsenal, AL	1.586	-		-		-		-		-	0.000	1.586	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.075		-		-		-	0.000	0.075	-
		Subtotal	1.586	-		0.075		-		-		-	0.000	1.661	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SCAMP II, Expeditionary Variant	Various	AMCOM, RSA; CCDC, RSA : Redstone Arsenal, AL	1.746	0.620	Aug 2019	-		-		-		-	0.000	2.366	-
PSTS	Various	RTC; Redstone Arsenal : Redstone Arsenal	-	0.905	Jun 2019	0.786	Apr 2020	-		-		-	0.000	1.691	-
AGPU Next Gen.	PO	RTC : Redstone Arsenal, AL	4.226	0.100	Aug 2019	0.803	May 2020	1.467	May 2021	-		1.467	Continuing	Continuing	Continuing
Modernized Flexible Diagnostic System	MIPR	RTC : Redstone Arsenal	0.045	0.350	Sep 2019	-		-		-		-	0.000	0.395	-
Next Generation Health Monitoring System	TBD	To Be Determined : To Be Determined	-	5.000	Dec 2018	-		-		-		-	0.000	5.000	-
		Subtotal	6.017	6.975		1.589		1.467		-		1.467	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	MIPR	AATD : Ft. Eustis, VA	0.977	0.641	Jun 2019	-		-		-		-	0.000	1.618	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / *Aviation Ground Support Equipment*	Project (Number/Name) EE5 / *Aviation Ground Support Equipment*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	MIPR	CCDC, AED : Redstone Arsenal, AL	0.497	-		-		-		-		-	0.000	0.497	-
		Subtotal	1.474	0.641		-		-		-		-	0.000	2.115	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.077	7.616		1.664		1.467		-		1.467	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605830A / *Aviation Ground Support Equipment*	**Project (Number/Name)** EE5 / *Aviation Ground Support Equipment*

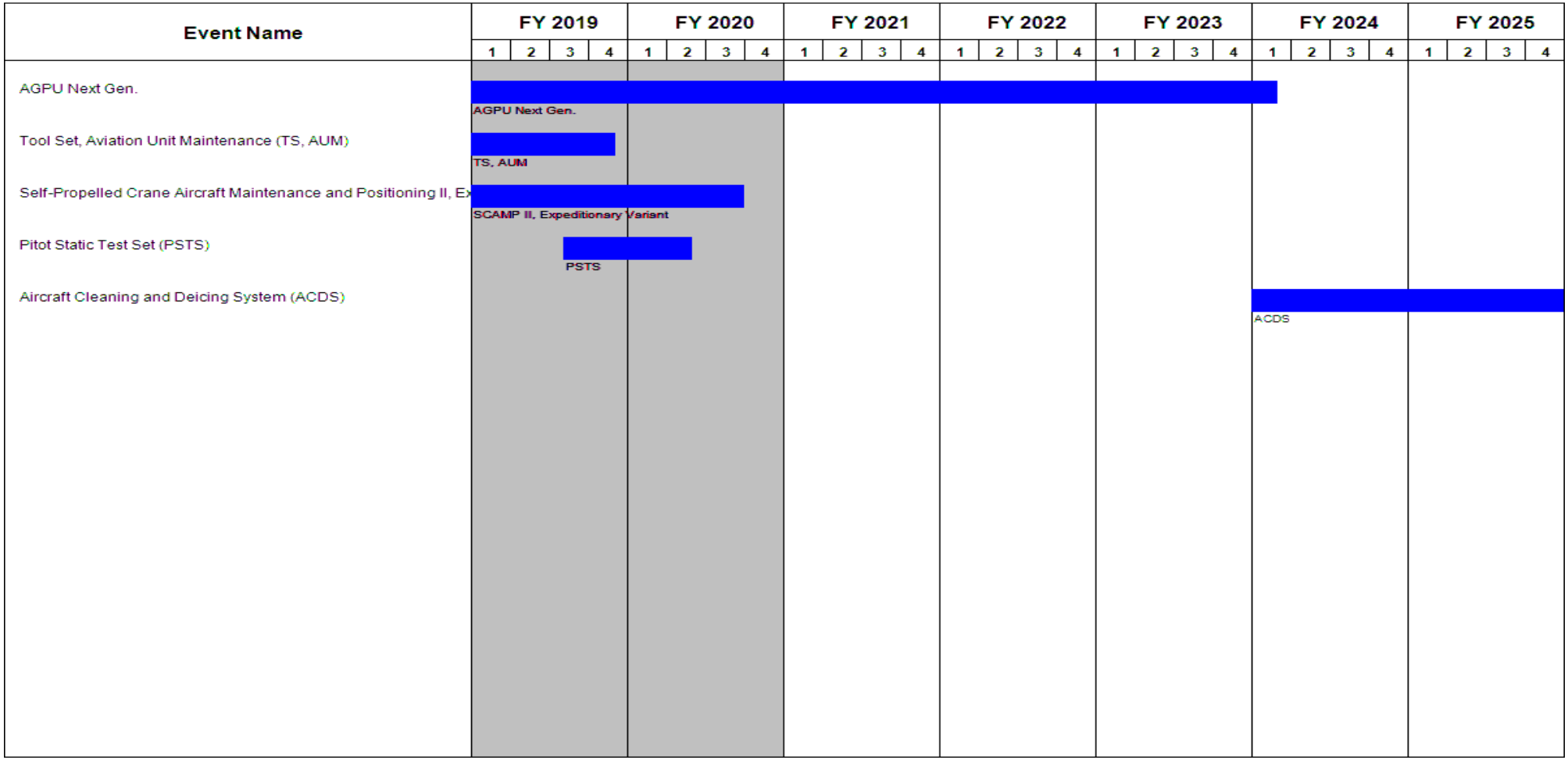

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605830A / *Aviation Ground Support Equipment*	**Project (Number/Name)** EE5 / *Aviation Ground Support Equipment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AGPU Next Gen.	4	2018	1	2024
Tool Set, Aviation Unit Maintenance (TS, AUM)	4	2016	4	2019
Self-Propelled Crane Aircraft Maintenance and Positioning II, Expeditionary Vari	3	2015	3	2020
Pitot Static Test Set (PSTS)	3	2019	2	2020
Aircraft Cleaning and Deicing System (ACDS)	1	2024	4	2025

Note

AGPU: Aviation Ground Unit Power

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*							
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	-	5.721	3.936	3.451	-	3.451	3.404	3.809	3.911	3.950	0.000	28.182
RH5: *TROJAN - RH12 - MIP*	-	5.721	3.936	3.451	-	3.451	3.404	3.809	3.911	3.950	0.000	28.182

A. Mission Description and Budget Item Justification

This project is a Military Intelligence Program (MIP). TROJAN research and development supports TROJAN Next Generation (TROJAN NexGEN), formerly TROJAN Classic XXI (TCXXI), future capabilities to fulfill the Army's need for worldwide, deployable, remotable, intelligence, surveillance and reconnaissance support that can dynamically execute operations from sanctuary-based to deployed assets in theater. In support of Army Modernization and Army Force Generation, TROJAN NexGEN will provide soldiers with a real-world, hands-on, live and near-real time Signals Intelligence (SIGINT) training environment sustaining, maintaining and enhancing their military occupational specialty proficiencies and specific target expertise. This operational readiness training will fulfill the Army's larger intelligence training requirement via a secure, collaborative architecture.

A key factor for future force success is the ability to collect, process, and use information about an adversary while preventing similar information from being disclosed. TROJAN NexGEN is a combined operational and readiness mission system which uses advanced networking technology to provide seamless rapid radio relay, secure communications to include voice, data, and electronic reconnaissance support to U.S. forces throughout the world. TROJAN NexGEN operations may be easily tailored to fit military intelligence unit training schedules and surged during specific events to involve every aspect of the tactical intelligence collection, processing, analysis and reporting systems. Engineers test and evaluate new digital intelligence collection, processing and dissemination technology using the fielded TROJAN NexGEN systems prior to the acquisition of those technologies. As part of the objective intelligence architecture, these capabilities will enable processing and dissemination of real-time intelligence data from various sources to form the intelligence needed to issue orders inside the threat decision cycle. To that end, it is imperative that TROJAN NexGEN keeps pace with digitization initiatives in order to respond aggressively to the emerging intelligence communication threat.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	5.721	3.936	3.454	-	3.454
Current President's Budget	5.721	3.936	3.451	-	3.451
Total Adjustments	0.000	0.000	-0.003	-	-0.003
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.003	-	-0.003

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*

Change Summary Explanation

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - 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
RH5: *TROJAN - RH12 - MIP*	-	5.721	3.936	3.451	-	3.451	3.404	3.809	3.911	3.950	0.000	28.182
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project is a Military Intelligence Program (MIP). TROJAN research and development supports TROJAN Next Generation (TROJAN NexGEN), formerly TROJAN Classic XXI (TCXXI), future capabilities to fulfill the Army's need for worldwide, deployable, remotable, intelligence, surveillance and reconnaissance support that can dynamically execute operations from sanctuary-based to deployed assets in theater. In support of Army Modernization and Army Force Generation, TROJAN NexGEN will provide soldiers with a real-world, hands-on, live and near-real time SIGINT training environment sustaining, maintaining and enhancing their military occupational specialty proficiencies and specific target expertise. This operational readiness training will fulfill the Army's larger intelligence training requirement via a secure, collaborative architecture.

A key factor for future force success is the ability to collect, process, and use information about an adversary while preventing similar information from being disclosed. TROJAN NexGEN is a combined operational and readiness mission system which uses advanced networking technology to provide seamless rapid radio relay, secure communications to include voice, data, and electronic reconnaissance support to U.S. forces throughout the world. TROJAN NexGEN operations may be easily tailored to fit military intelligence unit training schedules and surged during specific events to involve every aspect of the tactical intelligence collection, processing, analysis and reporting systems. Engineers test and evaluate new digital intelligence collection, processing and dissemination technology using the fielded TROJAN NexGEN systems prior to the acquisition of those technologies. As part of the objective intelligence architecture, these capabilities will enable processing and dissemination of real-time intelligence data from various sources to form the intelligence needed to issue orders inside the threat decision cycle. To that end, it is imperative that TROJAN NexGEN keeps pace with digitization initiatives in order to respond aggressively to the emerging intelligence communication threat.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Integrate Direction Finding and geo-location	1.115	0.765	1.200	-	1.200
Description: Integrate Direction Finding (DF) and geolocation (GL) technologies into TROJAN Remote Receiving Groups.					
FY 2020 Plans: Will continuously adapt/improve the latest Direction Finding (DF) and geolocation technologies for integration into TROJAN NexGEN systems in accordance with Joint Interface Control Document (JICD) 4.2. Will utilize field based risk reduction exercises to test and evaluate integrated technologies of the overall TROJAN Intelligence, Surveillance, and Reconnaissance (ISR) Enterprise. Continue to research and test for the integration of Electronics Intelligence (ELINT) capabilities.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Will continuously adapt/improve the latest Direction Finding (DF) and geolocation technologies for integration into TROJAN NexGEN systems in accordance with Joint Interface Control Document (JICD) 4.2. Will utilize field based risk reduction exercises to test and evaluate integrated technologies of the overall TROJAN Intelligence, Surveillance, and Reconnaissance (ISR) Enterprise. Continue to research and test for the integration of Electronics Intelligence (ELINT) capabilities. Resource labor for one MAT DEV technologist, two MAT DEV software engineers and two MAT DEV HW engineers will be accounted for in the Integrate Direction Finding (DF) and geolocation (GL) project. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funds increase reflects anticipated task requirements and the internal realignment of software engineer labor.					
Title: Enable assured communications for the TROJAN Network architecture (formerly Improve security of the TROJAN Network architecture). ***Description:*** Acquire and apply multi-bandwidth compression algorithm technology to maximize TROJAN intelligence network throughput. ***FY 2020 Plans:*** Will continue efforts that will enable communication in an anti-access/area denial environment; will continue testing with anti-jam technologies for satellite communications. ***FY 2021 Base Plans:*** Will continue efforts to utilize Government off the shelf (GOTS) / Commercial of the shelf (COTS) solutions to enable communication in an anti-access/area denial environment; will continue to integrate and test with technologies to enable redundant communications paths; will continue to test with anti-jam technologies for satellite communications. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funds decreased to support higher priority requirements.	1.504	1.035	0.751	-	0.751
Title: Integrate and test specialized hardware/software ***Description:*** Integrate and test specialized hardware/software for classified pre-processing of new signals of interest utilizing enhanced signal processing algorithms. Resource development of GLAIVE software (SW). Integrated several new National Security Agency (NSA) SW packages. ***FY 2020 Plans:***	1.803	1.001	0.500	-	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Will continue integration and testing of specialized hardware/software for classified pre-processing of new signals of interest utilizing enhanced signal processing algorithms. Will continue resource development of GLAIVE software. Will continue efforts to develop TROJAN Intelligence Surveillance Reconnaissance enterprise. Will continue efforts to integrate JICD 4.2 and the C4ISR Modular Open Suite of Standards (CMOSS). ***FY 2021 Base Plans:*** Will continue integration and testing of specialized hardware/software for classified pre-processing and detection of new signals of interest. Continue to resource development, integration and test of GOTS/COTS software. Will continue efforts to develop TROJAN Intelligence Surveillance Reconnaissance enterprise. Will continue efforts to integrate JICD 4.2 across all platforms. Begin efforts to integrate C4ISR Modular Open Suite of Standards (CMOSS). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funds decreased to support higher priority requirements.					
Title: Research and testing of receivers ***Description:*** Research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using Digital System Processing (DSP) and Software Defined Radio (SDR) technologies. ***FY 2020 Plans:*** Will continue research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using DSP and SDRs. ***FY 2021 Base Plans:*** Will continue research and testing of receiver packages for fixed and transportable TROJAN systems to detect and process non-standard modulations using DSP and SDRs. Integration of receiver packages to enable additional and wideband frequency ranges for COTS/GOTS Software Defined Radios. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 increase supports additional research and testing of receiver packages for fixed and transportable TROJAN systems	0.524	0.360	1.000	-	1.000
Title: Labor cost software (SW) engineers	0.775	0.775	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Labor for two software (SW) engineers in support of GLAIVE and other above applicable efforts. Labor for one Material Developer (MAT DEV) technologist, one MAT DEV software and one MAT DEV Hardware (HW) engineer. ***FY 2020 Plans:*** Will continue to resource labor for one MAT DEV technologist, two MAT DEV software engineers and two MAT DEV HW engineers. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 decrease due to labor being resourced within the Integrate Direction Finding (DF) and geolocation (GL) effort.					
Accomplishments/Planned Programs Subtotals	5.721	3.936	3.451	-	3.451

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• BA0326: *TROJAN (MIP)*	27.549	18.705	17.593	1.766	19.359	18.125	15.893	16.052	16.212	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Acquisition Strategy for the TROJAN NexGEN Systems supported by TROJAN RDT&E is to adapt and leverage from Commercial Off the Shelf (COTS) and Government Off the Shelf (GOTS) products. Additionally, the Acquisition Strategy leverages off of development by DoD and other Government agencies to the greatest extent possible. TROJAN RDT&E is used to fund the development of enhancing these technologies to meet specific user requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Labor Costs MAT DEV HW/SW Engineers	Various	CERDEC I2WD, APG, MD : MD	5.112	0.775	Oct 2018	0.775	Oct 2019	-		-		-	0.000	6.662	-
		Subtotal	5.112	0.775		0.775		-		-		-	0.000	6.662	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrate Direction Finding and geo-location	Various	APG : MD	5.095	1.114	Oct 2018	0.765	Oct 2019	1.200	Oct 2020	-		1.200	Continuing	Continuing	-
Improve security of the TROJAN Network architecture	Various	APG : MD	4.651	1.505	Oct 2018	1.035	Oct 2019	0.751	Oct 2020	-		0.751	Continuing	Continuing	-
Research and testing of Receivers	Various	APG : MD	1.896	0.524	Oct 2018	0.360	Oct 2019	1.000	Oct 2020	-		1.000	Continuing	Continuing	-
Develop Satellite Communications (SATCOM) Dishes and transceivers	Various	APG : MD	3.644	-		-		-		-		-	0.000	3.644	-
Specialized Software Enhancements	Various	APG : MD	0.998	-		-		-		-		-	0.000	0.998	-
Develop Hardware/ Software Interface	Various	APG : MD	0.445	-		-		-		-		-	0.000	0.445	-
		Subtotal	16.729	3.143		2.160		2.951		-		2.951	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration and Testing of Hardware/Software	Various	APG : MD	5.337	1.803	Oct 2018	1.001	Oct 2019	0.500	Oct 2020	-		0.500	0.000	8.641	Continuing
		Subtotal	5.337	1.803		1.001		0.500		-		0.500	0.000	8.641	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - MIP*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	27.178	5.721		3.936		3.451		-		3.451	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

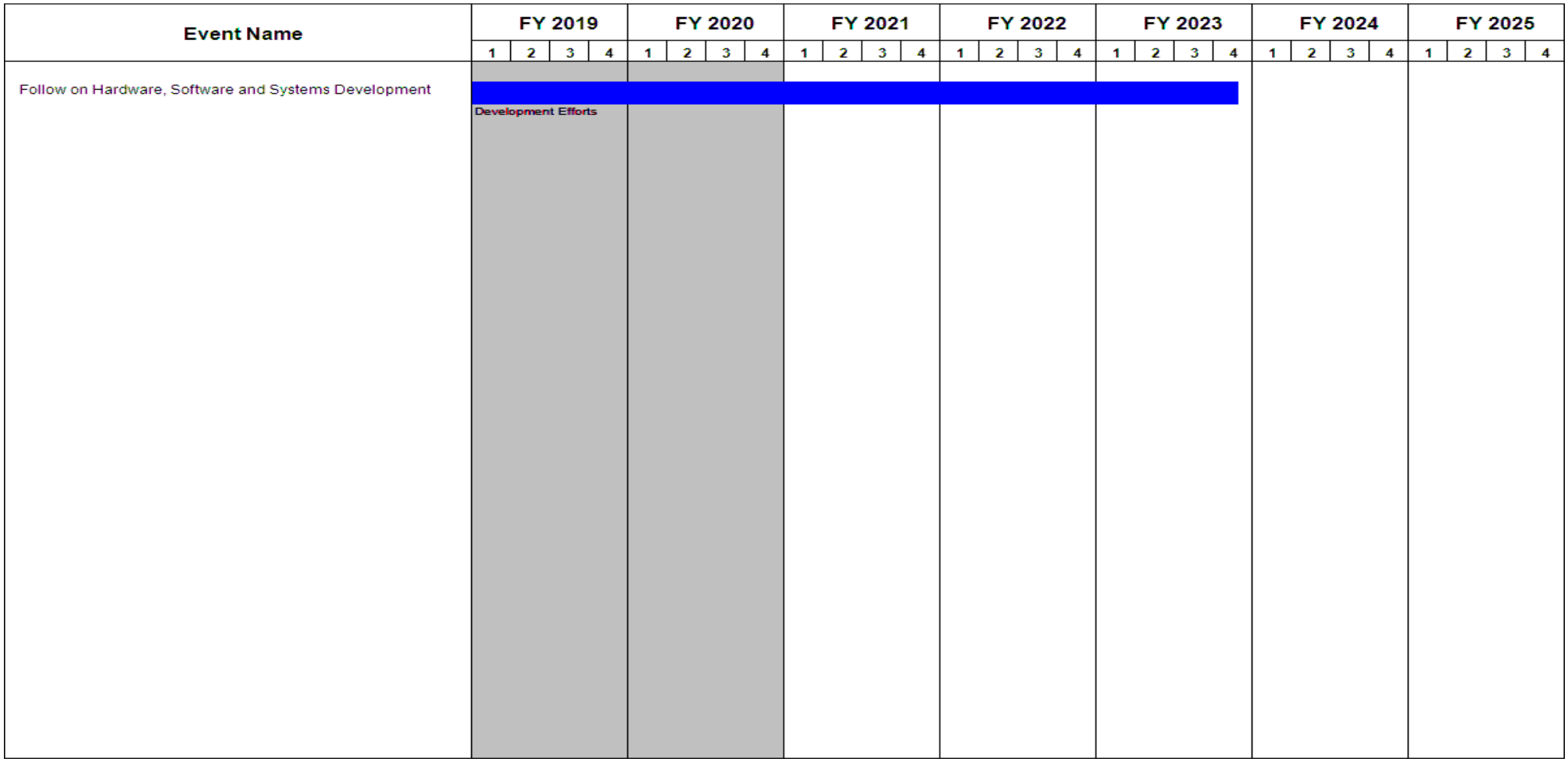

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Hardware, Software and Systems Development	1	2014	4	2018
Follow on Hardware, Software and Systems Development	1	2019	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0303267A *I Auctioned Spectrum Relocation Fund*							
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	-	18.381	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.381
XR2: *Auctioned Spectrum Relocation Fund*	-	18.381	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.381

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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	18.381	0.000	0.000	-	0.000
Total Adjustments	18.381	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	18.381	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0303367A *I Spectrum Access Research and 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	-	0.285	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.285
XR8: *Spectrum Aggregation Technologies (SAT)*	-	0.285	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.285

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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	0.285	0.000	0.000	-	0.000
Total Adjustments	0.285	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.285	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare 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	-	8.922	18.432	55.855	3.900	59.755	66.861	36.853	28.210	15.819	0.000	234.852
EW5: *Electronic Warfare Development - MIP*	-	1.881	11.001	8.697	3.900	12.597	6.212	6.286	6.352	5.654	0.000	49.983
EW6: *ARAT-TSS - MIP*	-	7.041	7.431	9.053	-	9.053	9.399	9.587	9.768	10.165	0.000	62.444
FJ5: *Terrestrial Layer System (MIP)*	-	0.000	0.000	38.105	-	38.105	51.250	20.980	12.090	0.000	0.000	122.425

A. Mission Description and Budget Item Justification

This Program Element encompasses engineering and manufacturing development for tactical Electronic Warfare (EW) terrestrial (ground) employment applications. The systems under this program provide the Army with the capability to detect, identify, locate, collect/process, report, and engage (disrupt, degrade or deny) hostile forces to prevent their effective use of communications & non-communications networks, counter-mortar/counter-battery radars, surveillance radars, electronically fused munitions and other enemy threats using the Electro-Magnetic Spectrum (EMS).

Project EW5 provides for Prophet Enhanced, the current system under the Prophet Ground acquisition program. Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade enabling the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture based system solution optimized for ease of use in a variety of configurations.

Project EW6 provides for the Army Reprogramming Analysis Team (ARAT), a Department of the Army established project to develop techniques, methods, tools and architecture to reprogram mission software embedded in Army EW systems, Force Protection Systems (FPS), and Target Sensing Systems (TSS) in response to changes in threat signatures. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within intelligence systems, 2) tools to minimize the time to develop EW Mission Software and Products (MSP) for both air and ground EW systems, 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to transmit mission software changes to field users, and 5) enhanced mission-software uploading tools. These efforts allow for rapid threat analysis, simulation, mission software development, distribution and uploading of mission software changes directly to the supported Soldier in the field. The ARAT project will develop, test and equip an Army-wide infrastructure capable of rapidly reprogramming electronic combat software embedded in offensive and defensive weapon systems.

Project FJ5 is a New Start for this Program Element in FY 2021 that provides for follow on development of the Terrestrial Layer System (TLS), an effort that initiates in FY 2020 (funded with PE 0604021A / AW7). TLS will provide Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling integrated solution to support Multi Domain Battle capability gaps and provide Force Protection, Situational Development, and Information Superiority to the maneuver forces.

FY 2021 funds Electronic Warfare (EW) Development for Prophet Enhanced efforts (Project EW5), the Army Reprogramming Analysis Team (ARAT) efforts (Project EW6) and Terrestrial Layer System efforts (Project FJ5).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	8.922	22.875	56.417	-	56.417
Current President's Budget	8.922	18.432	55.855	3.900	59.755
Total Adjustments	0.000	-4.443	-0.562	3.900	3.338
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-4.443			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.562	3.900	3.338

Change Summary Explanation

FY 2021 increase of $3.9 million OCO increase for development and integration of Theater Specific Signals of Interest (SOI) into the Prophet Enhanced system (Project EW5).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - 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
EW5: *Electronic Warfare Development - MIP*	-	1.881	11.001	8.697	3.900	12.597	6.212	6.286	6.352	5.654	0.000	49.983
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Prophet Enhanced is the current system under the Prophet Ground acquisition program. Funds provide for development and integration of Technical Insertion upgrades for Next Generation Signals and state-of-the-art Signals Intelligence (SIGINT) exploitation techniques to increase the capabilities of the Prophet Enhanced and maintain operational relevance. The Prophet Enhanced is the tactical commander's organic ground-based SIGINT/Electronic Warfare system for the Multi-Function Teams (MfTs) organic to the Brigade Combat Teams (BCTs) and Expeditionary-Military Intelligence Brigades (E-MIBs). Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations. It also incorporates product modification, integration, evaluation and demonstration events of equipment for rapid integration of Technical Insertions (TI) and product development to ensure operational relevance.

Justification:
FY 2021 Base funding in the amount of $8.697 million will support continuing non-recurring engineering development and evaluation including, but not limited to; enhancements to Prophet Enhanced Signals of Interest (SOI) baseline to support the National Defense Strategy that is Near Peer focused, integration of Intelligence Community (IC) SOI libraries, development of digital receiver upgrades, development of training systems and environments, development of the Technical Data Package (TDP), improvements to Enhanced Signal Processing (ESP) capabilities and Communications kits, and Customer Testing.

FY 2021 OCO funding in the amount of $3.900 million will support the development, integration and testing/accreditation of new, Theater Specific, signal capabilities to ensure that Prophet keeps pace with the constantly changing signal environment and to ensure that Prophet maintains its operational relevance against key enemy threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Program Management	-	0.450	0.450	-	0.450
Description: Engineering, technical and programmatic oversight of the development of next generation signals.					
FY 2020 Plans: Funds will provide for matrix and contractor system engineering and program management support for the Prophet program.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funds will provide for matrix and contractor system engineering and program management support for the Prophet program.					
Title: Signal of Interest upgrades ***Description:*** The Signal Environment that Prophet Systems exploit is constantly contested with evolving threats. This environment creates gaps in Prophet?s ability to collect and exploit these signals. Prophet must integrate the latest emerging Intelligence Community (IC) and commercial solutions upgrades to remain relevant against these numerous, key, and high-priority emerging threats. ***FY 2020 Plans:*** Continuing, but not limited to development of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2021 Base Plans:*** Continuing, but not limited to development and evaluation of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2021 OCO Plans:*** Continuing, but not limited to development and evaluation of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2) and increased signal processing capabilities for the Enhanced Signals Processing (ESP) kit baseline. The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Previously Signals of Interest had to integrated one at a time; increased funding in FY 2021 allows for the integration "libraries" of high priority Signals of Interest (SOI), which is a more economical means of increasing the number of signals the Prophet Enhanced system can exploit and enables the Prophet Enhanced system to exploit more near peer and emerging threat signal types.	1.881	4.024	4.747	3.900	8.647
Title: Proficiency Trainer and Target Signature Arrays ***Description:*** The Proficiency Trainer and Target Signature Arrays are required to conduct training to sustain operator proficiency on the Prophet Enhanced at the unit level after the system has been fielded and post New Equipment Training (NET) training.	-	2.000	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: Continued development of Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA) training systems. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** IEWTPT was an one year developmental effort, funding is not required in FY 2021					
Title: Enhanced Signal Processing and Line of Sight Testing ***Description:*** Testing required of the Enhanced Signal Processing kit and Line of Sight Communications kit onto the Prophet Enhanced system. ***FY 2020 Plans:*** Funds provide for, but are not limited to release testing of the system-level Prophet System Software (PS2) to include accreditation and productization of all New Technical Insertion (TI) capabilities. The final release software version is fielded to all the Prophet Systems to upgrade capabilities against Peer Near Peer and emerging threats. ***FY 2021 Base Plans:*** Combined testing of the Enhanced Signal Processing kit and Line of Sight Communication kit. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Majority of testing was completed in the first year, FY 2020.	-	1.044	0.200	-	0.200
Title: Enhanced Signal Processing Integration & Development ***Description:*** Effort to integrate the Enhanced Signal Processing kit into the Prophet Enhanced system. ***FY 2020 Plans:*** Non-recurring engineering included but not limited to integrate the Enhanced Signal Processing kit onto the Prophet Enhanced system. ***FY 2021 Base Plans:*** Development and evaluation of the Enhanced Signal Processing capability. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Majority of effort was completed in FY 2020.	-	3.483	0.550	-	0.550
Title: Customer Testing	-	-	0.785	-	0.785

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Customer Testing of the Prophet Enhanced system as a result of changes to the baseline. ***FY 2021 Base Plans:*** Customer Testing of the Prophet System baseline after transition to sustainment to support and maintain the PE System Full Material Release ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 is the first year of the Customer Testing effort					
Title: Technical Data Package ***Description:*** Technical Data Package (TDP) for Prophet Enhanced, to be used for sustainment support as well as for follow on systems ***FY 2021 Base Plans:*** Develop Technical Data Package (TDP) for Prophet Enhanced ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 is the first year required for funding	-	-	1.965	-	1.965
Accomplishments/Planned Programs Subtotals	1.881	11.001	8.697	3.900	12.597

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• BZ9753: *Prophet Enhanced Modifications (MIP)*	45.022	57.103	17.079	61.450	78.529	-	-	-	-	Continuing	Continuing
• BZ9751: *SPECIAL PURPOSE SYSTEMS (MIP)*	4.162	4.000	11.479	-	11.479	4.091	4.141	4.190	6.718	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Prophet Research and Development (R&D) Acquisition Strategy is structured to maintain operational relevancy of Prophet Enhanced systems in a dynamic threat environment while reducing risk and streamlining business and engineering processes. Contracting activities are to maintain SIGINT relevance and complete Technical Insertion (TI) to Prophet Enhanced systems to pursue the latest Signals of Interest and design against obsolescence. The Technical Insertion (TI) contract supports R&D and other developmental work.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Electronic Warfare & Cyber : APG, MD	1.611	-		0.450	Dec 2019	0.450	Dec 2020	-		0.450	Continuing	Continuing	Continuing
		Subtotal	1.611	-		0.450		0.450		-		0.450	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Signals of Interst Upgrade	SS/CPFF	GD Mission Systems : Scottsdale, AZ	2.212	1.881	Jan 2019	4.024	Jan 2020	4.747	Jan 2021	3.900		8.647	Continuing	Continuing	Continuing
Trainer/TSA	SS/ Various	GD Mission Systems and Various Supporting Organizations : Scottsdale, AZ	-	-		2.000	Jan 2020	-		-		-	0.000	2.000	-
Enhanced Signal Processing Integration, Development & Evaluation	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		3.483	Jan 2020	0.550	Jan 2021	-		0.550	Continuing	Continuing	Continuing
		Subtotal	2.212	1.881		9.507		5.297		3.900		9.197	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Data Package	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		-		1.965	Mar 2021	-		1.965	0.000	1.965	-
		Subtotal	-	-		-		1.965		-		1.965	0.000	1.965	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Signal Processing and Line of Sight Testing	MIPR	Army Test & Evaluation Command : Ft. Huachuca, AZ	-	-		1.044	Mar 2020	0.200	Dec 2020	-		0.200	0.000	1.244	-
Customer Testing	MIPR	Army Test & Evaluation Command : APG, MD	-	-		-		0.785	Jan 2021	-		0.785	0.000	0.785	-
		Subtotal	-	-		1.044		0.985		-		0.985	0.000	2.029	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.823	1.881		11.001		8.697		3.900		12.597	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

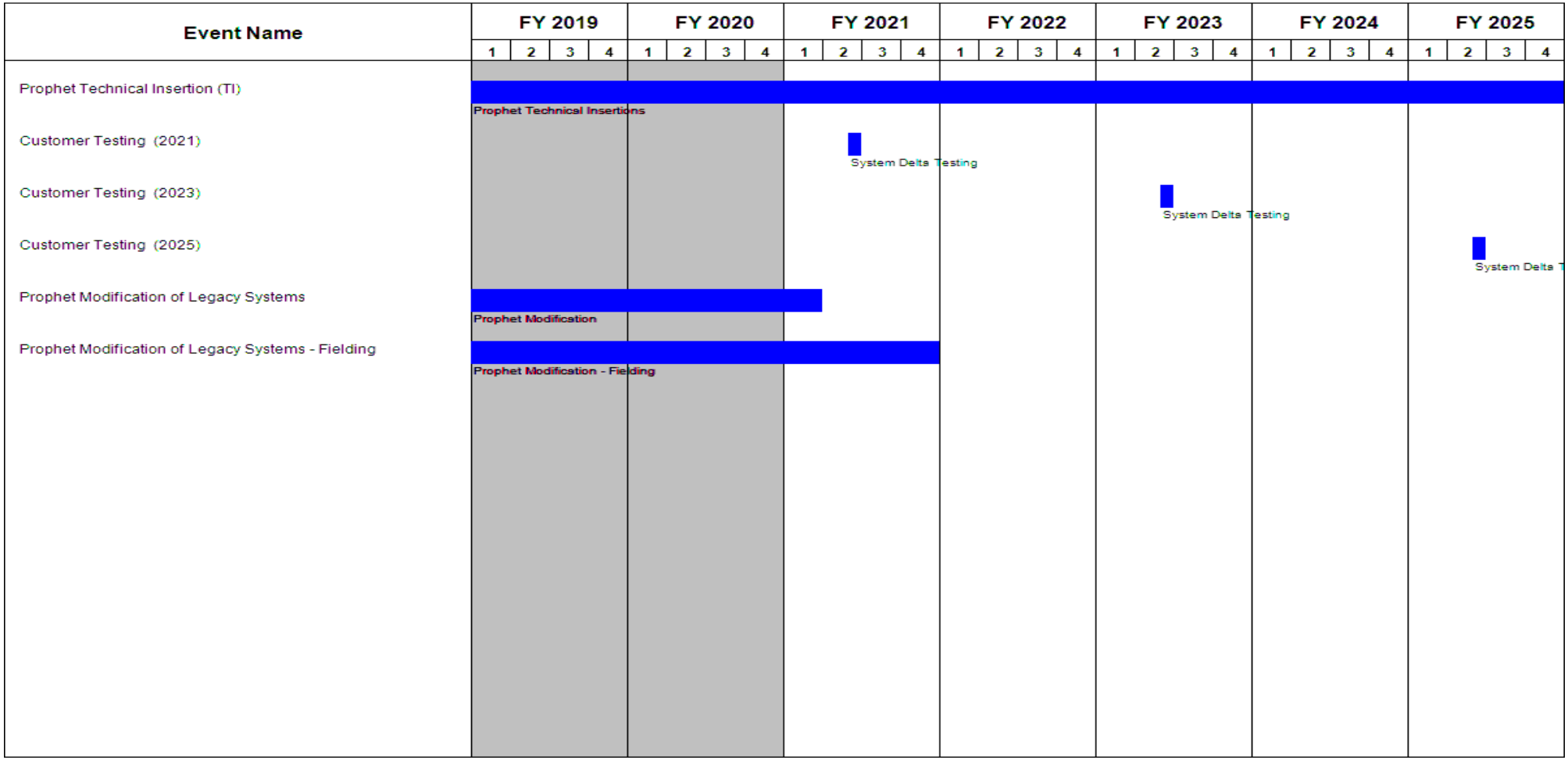

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Prophet Technical Insertion (TI)	4	2008	4	2025
Customer Testing (2021)	2	2021	2	2021
Customer Testing (2023)	2	2023	2	2023
Customer Testing (2025)	2	2025	2	2025
Prophet Modification of Legacy Systems	3	2017	1	2021
Prophet Modification of Legacy Systems - Fielding	2	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - 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
EW6: *ARAT-TSS - MIP*	-	7.041	7.431	9.053	-	9.053	9.399	9.587	9.768	10.165	0.000	62.444
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Army Reprogramming Analysis Team (ARAT) is a Department of the Army established program to develop techniques, methods, tools, and architecture to rapidly reprogram mission software embedded in Army Electronic Warfare (EW) Force Protection Systems (FPS) in response to changes in threat signatures. The regulatory guidance directing this mission is contained in Army Regulation (AR) 525-15, AR 525-22, and AR 95-1. The ARAT develops integrated technical solutions required to counter increasingly sophisticated EW Signal threats to US Forces. The ARAT mission software reprogramming infrastructure supports the Army Campaign Plan to provide the Regionally Aligned Forces tactical Commander timely rapid-reprogramming capability of EW systems with mission software. The ARAT mission responsibility is to develop and distribute Mission Software and Products to forward deployed combat forces. ARAT identifies and analyzes worldwide threat signature changes which affect EW systems; determines the impact of observed Signal Intelligence (SIGINT) signature changes; rapidly develops new mission software to adapt friendly systems to detect and defeat enemy threats to U.S. Army ground and air platforms; disseminates the Mission Software and Products to forward deployed forces, and provides government developed tools and software to upload new mission software into the affected EW systems.

A. Mission Description and Budget Item Justification

Current military operations are conducted in a rapidly changing threat environment, where Improvised Explosive Devices (IEDs), Infra Red (IR) man-portable air defense systems (MANPADS) seekers, radar guided surface-to-air-missiles (SAM), laser guided weapons, anti-helicopter mines, and targeting sensors are proliferating and evolving. Integrated solutions are required to counter increasingly sophisticated EW threats. The ARAT reprogramming infrastructure supports the tactical Commander by providing timely rapid reprogramming of mission software and information dissemination for Army supported, Joint and allied services. ARAT supports integrated reprogramming of target acquisition, target engagement, vehicle survivability, and Aircraft Survivability Equipment (ASE). ARAT rapid-reprogramming infrastructure supports tactical requirements for deployed aircraft and ground-based (e.g. Counter Radio-Controlled Improvised Explosive Device (CREW)) survivability systems. ARAT identifies and analyzes threat signature changes which affect EW systems; determines the impact of observed signature changes; develops new mission software to adapt the system to the changes; disseminates the mission software; and provides methods to upload the new mission software into the affected EW systems. Each element within the ARAT infrastructure plays a specific role within the program's rapid reprogramming process, providing the Soldier with the capability to install mission and target identification software at the lowest possible level, thus maximizing flexibility for tactical commanders. ARAT participates in the operational and developmental test design of Army EW systems, and supports Joint Service Reprogramming Exercises in all theaters. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within the intelligence system, 2) tools to minimize the time to develop Mission Software and Products (MSP), 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to rapidly transmit mission software to upload into supported EW systems. These efforts allow for rapid threat analysis, threat modeling and simulation, mission software development and testing, distribution and uploading of mission software directly to the supported Soldier in the field.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Keeping Pace with the Enemy and Technology ***Description:*** This effort focuses on developing a capability for the Government to rapidly develop and distribute organic mission software solutions for multiple EW systems. The Army must continually modernize and enhance software tools, hardware modernization, and processes counter enemy technology. ARAT EW6 Military Intelligence Program (MIP) executes Research, Development, Test, and Evaluation (RDTE) funding to provide an organic Army capability for this organization to rapidly develop, test and distribute mission software solutions for forward deployed combat forces. ***FY 2020 Plans:*** ARAT's FY 2020 plan will continue to focus on the rapid development, testing, and distribution of mission software for regions worldwide. In support of Air Mission software development, ARAT will continue automating threat simulation development, Radio Frequency automated signal generation, automating threat analysis tools, developing a universal mission software generation tool, and software hardening capability. ***FY 2021 Base Plans:*** ARAT's FY 2021 base plan to keep pace with enemy and technology will focus on gaining a decisive edge on emerging enemy technologies that are evolving rapidly. With the Army's shift to focus on peer and near peer adversaries ARAT must enhance it's ability to rapidly detect a changed or new threat, analyze the threat, develop a rapid mission software solution to detect and defeat the threat, and rapidly distribute the mission software to forward deployed combat forces. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021increased from FY 2020 in support focusing more on enhancing the Air and Ground lab infrastructure to include modernization of threat detection and threat analysis. ARAT must enhance its Air and Ground laboratories to rapidly adapt to emerging and changing threats. Modernizing the infrastructure is imperative to rapidly create mission software solutions that detect and defeat increasingly sophisticated enemy weapon systems.	3.722	4.424	4.703	-	4.703
Title: Infrastructure Improvements Multispectral ***Description:*** This effort focuses on enhancing the Army's Multispectral Missile Warning System (MWS) software sustainment infrastructure. With the worldwide proliferation of MANPADS the Army must have the capability to rapidly analyze and develop mission software solutions that detect and counter MANPADS to defend Army Aviation platforms against this lethal threat.	1.104	0.893	1.087	-	1.087

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: ARAT will continue to enhance Multispectral Mission Software development, testing, and distribution infrastructure. ARAT will continue modernization of the multispectral software development environment as well as automation of threat analysis tools and multispectral simulation capabilities. ***FY 2021 Base Plans:*** The FY 2021 plan includes modernization of the infrastructure automated testing of mission software. ARAT will continue to focus on enhancing software tools that aid in speeding up testing time of mission software. Mission software must be rigorously tested and validated prior to release to forward deployed combat forces. ARAT performs testing of thousands of test points within a mission software file. Due to the sophistication of emerging threat weapon systems ARAT will increase the amount of test points required to validate the release of mission software. ARAT will need to continue enhancing it's infrastructure to rapidly develop and test mission software. ARAT has procured new threat simulators that require software to allow the simulators to replicate enemy weapon system radars. Simulation software allows ARAT to replicate sophisticated enemy radar systems that are required to conduct laboratory testing of mission software. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 increased from FY 2020 in support of more enhancing on the Air and Ground lab infrastructure to include modernization of threat detection and threat analysis. ARAT must enhance its Air and Ground laboratories to rapidly adapt to emerging and changing threats. Modernizing the infrastructure is imperative to rapidly create mission software solutions that detect and defeat increasingly sophisticated enemy weapon systems.					
Title: Infrastructure Improvement Radio Frequency General ***Description:*** This effort focuses on enhancing the Army's Radio Frequency (RF) EW system Mission Software and Products (MSP) development and distribution infrastructure. The Army must fight in a contested and congested EW environment. Mission software solutions to defend against RF threats must be rapidly developed, tested, and distributed to Soldiers on an ever changing battlefield. ***FY 2020 Plans:*** In support of Ground Electronic Warfare Radio Frequency Mission Software development, ARAT will develop modernization efforts for the automated testing of mission software, develop laboratory environmental models that replicate actual physical and climatic environments worldwide, and optimize threat automation tools.	1.349	1.263	1.386	-	1.386

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Additionally, ARAT will create a software tool that will control various versions of Radio Frequency (RF) simulators and RF Signal Generators. ***FY 2021 Base Plans:*** ARAT FY 2021 base plan is enhance the Radio Frequency infrastructure. Intended efforts include designing and developing software that emulates radar components to reduce dependency on aging antennas and aircraft processors that are in low inventory across the Army. Emulated aircraft components reduces the maintenance requirement to repair or replace actual aircraft hardware in the ARAT laboratories. Additionally, ARAT will continue enhancing automated testing of mission software. Automated testing decreases the time it takes to validate mission software by utilizing software tools to execute the testing in lieu of having engineers perform the testing functions. ARAT will continue to enhance the Ground Electronic Warfare (Grew) mission software development and testing infrastructure. Grew efforts will include software emulation of operational environments where Grew systems will operate worldwide. The emulation software will allow ARAT to create realistic environments in a laboratory. Realistic environments include the physical and climatological components of where the GrEW systems may operate. Having the capability to model environments in a laboratory provides the ability to rapidly test and validate mission software in lieu of lengthy field testing. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 increased from FY 2020 in support of enhancing the Radio Frequency infrastructure.					
Title: Threat Flagging and Mission Data Set Reprogramming Tool Development ***Description:*** This effort focuses on enhancing the Army's capability to monitor changes in enemy EW systems that affect system performance of Army detection, declaration, and countermeasure EW systems onboard. The enemy is continuously developing or modifying it's EW systems. For Army platforms to have protection against enemy systems it must have a robust capability to immediately detect changes in threat system performance and rapidly develop, test, and distribute a mission software solution that counters the threat. This effort will enhance the Army's capability bridge detection of a change in enemy threat and the rapid development of MSP. ***FY 2020 Plans:*** ARAT will continue the design and development of the modernized Threat Change Detection (TCD) tool. This tool will provide the enhanced ability for the Army to rapidly detect and analyze National level captured signal intelligence parametric data. The TCD tool will utilize analytical tools to assess the change in threat emitters and to prioritize the lethality of a threat change and its impact to US Forces. Additionally, ARAT will continue with modernization efforts of the mission software generation tools and hardware infrastructure. Planned FY	0.866	0.851	1.877	-	1.877

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
2020 effort will include the creation of a Universal Mission Data Set Generation (UMG) tool. The UMG tool will consolidate the current multiple Mission Data Set Generation tools into a single tool. The benefit of a single tool will enhance the Mission Software development process by reducing the sustainment of 5 Generation tools into a single Generation tool. ***FY 2021 Base Plans:*** The FY 2021 Base Plan is to enhance ARAT's ability to rapidly detect threat changes worldwide. Additionally, design and develop software tools that provide the capability to enhance the accuracy and speed of mission software development and testing for Electronic Warfare systems. Planned efforts include enhancing ARAT's Threat Detection and Threat Analysis capability. Enhancing Threat Detection will provide ARAT with the ability to rapidly detect changes in known threats, assess the impact of the change in threat, develop a mission software solution to detect and defeat the threat, and distribute the new mission software to forward deployed forces. ARAT will continue to focus RDT&E efforts on enhancing the mission software development and testing infrastructure. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The FY 2020 to FY 2021 increase is $1.026M. This increase is priority based due to available funding in FY 2021. Planned efforts in FY 2021 are discussed in the FY 2021 Base Plans.					
Accomplishments/Planned Programs Subtotals	7.041	7.431	9.053	-	9.053

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The efforts to be funded in this project will require a combination of systems specific and high-tech knowledge. The contractual services portion for the project will be obtained from both the Communications-Electronics Command (CECOM) Software Engineering Center (SEC) competitive omnibus and the Research, Development and Engineering Command (RDECOM) and the Defense Technical Intelligence Center (DTIC) high tech contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	CECOM SEC : Aberdeen Proving Ground, MD	9.387	0.161		0.182	Mar 2020	0.188	Mar 2020	-		0.188	Continuing	Continuing	Continuing
		Subtotal	9.387	0.161		0.182		0.188		-		0.188	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USG Labor	Various	CECOM SEC : Various Locations	3.111	0.372		0.383		1.190		-		1.190	0.000	5.056	-
Travel	Various	CECOM SEC : Various Locations	0.838	0.080		0.084		0.088		-		0.088	0.000	1.090	-
		Subtotal	3.949	0.452		0.467		1.278		-		1.278	0.000	6.146	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	CECOM SEC, RDECOM, DTIC : Various Locations	34.726	6.428		6.782	Mar 2020	7.587	Mar 2020	-		7.587	Continuing	Continuing	Continuing
		Subtotal	34.726	6.428		6.782		7.587		-		7.587	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	48.062	7.041		7.431		9.053		-		9.053	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

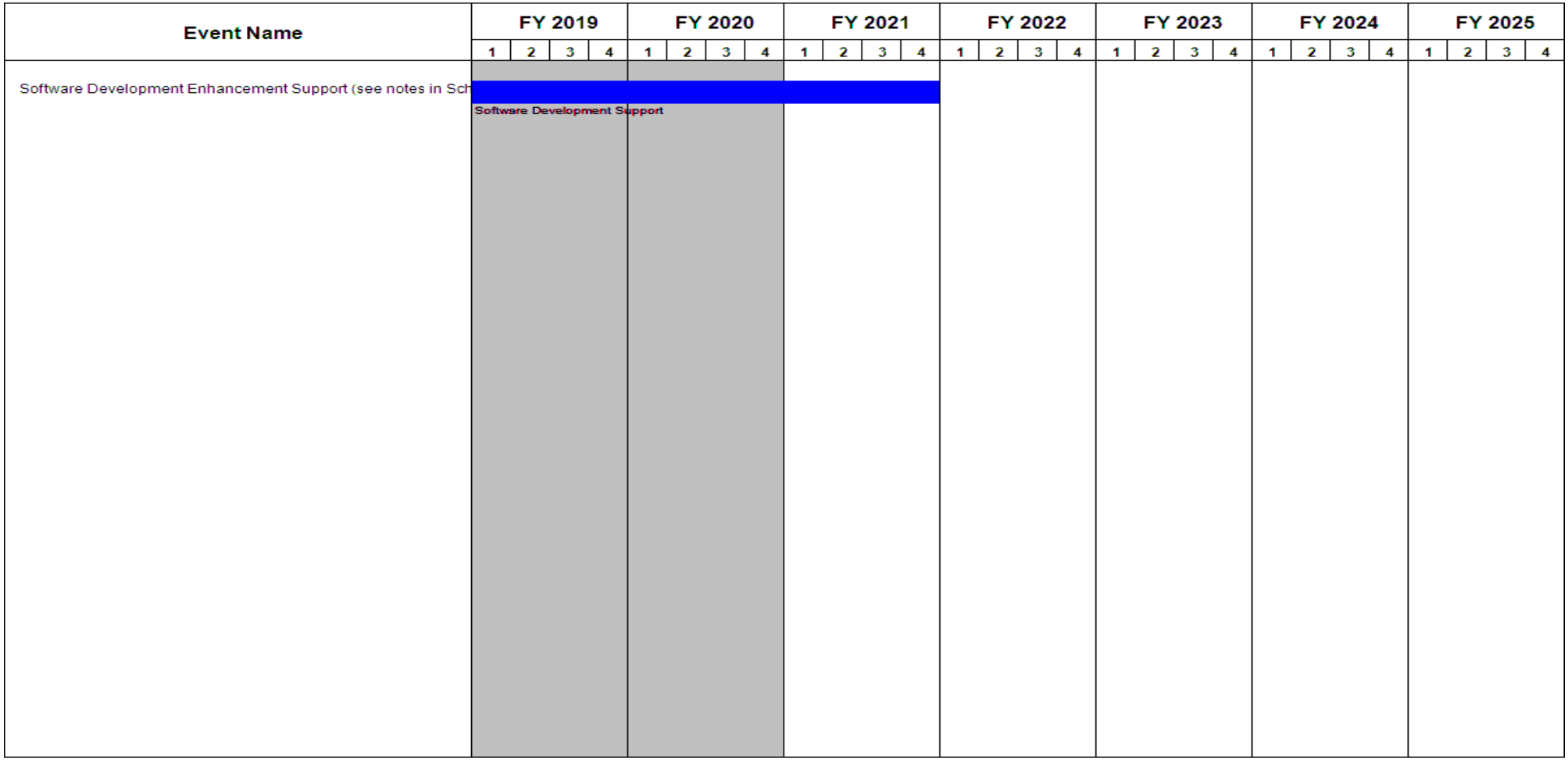

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Development Enhancement Support (see notes in Schedule Detail)	1	2015	4	2021

Note

- Software Test Automation
- Threat Analysis Data Evaluation Tool
- Enhance Data Distribution

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) FJ5 / *Terrestrial Layer System (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
FJ5: *Terrestrial Layer System (MIP)*	-	0.000	0.000	38.105	-	38.105	51.250	20.980	12.090	0.000	0.000	122.425
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY2021.

Terrestrial Layer System (TLS) is a new start effort in FY 2020, and FJ5 is a New Start Project in FY2021.

A. Mission Description and Budget Item Justification

Terrestrial Layer System (TLS) is a new start effort in FY 2020, and FJ5 is a New Start Project in FY2021. TLS provides Army maneuver forces integrated full spectrum Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling non-kinetic offensive operation options to Brigade Combat Team (BCT) and Expeditionary-Military Intelligence Brigade (EMIB) commanders. TLS' information Superiority provides Indications and Warnings, Force Protection and Situational Awareness to influence the commander's decision cycle, improve targeting timeliness and accuracy, and provide the maneuver commander with electronic attack and offensive cyber warfare options to deny, degrade, disrupt, or otherwise manipulate the targeted force. TLS employs technologically advanced systems with a modular open-system approach for multiple configurations that can be efficiently sustained and effectively upgraded to provide capabilities against changing near peer and emerging threats to address multi-domain capability gaps.

Justification:
FY 2021 Base funding in the amount of $38.105 million funds system level prototyping, platform integration and testing efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Technical / Program Management ***Description:*** Funds will provide for technical engineering and program management. ***FY 2021 Base Plans:*** FY 2021 technical engineering and program management support for TLS. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 is the first year of funding for the project.	-	-	7.318	-	7.318
Title: Platform Integration and System Development	-	-	28.036	-	28.036

Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** FJ5 / *Terrestrial Layer System (MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Development of System Level Prototypes and integration of TLS mission equipment onto vehicle platform(s). ***FY 2021 Base Plans:*** Development of System Level Prototypes and integration of TLS mission equipment onto vehicle platform(s). ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 is the first year of funding for the Program Element and the effort.					
Title: Test Events ***Description:*** System and Operational test events ***FY 2021 Base Plans:*** Testing of TLS system ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 is the first year of funding for the Program Element and the effort	-	-	2.751	-	2.751
Accomplishments/Planned Programs Subtotals	-	-	38.105	-	38.105

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• B97600: *TERRESTRIAL LAYER SYSTEMS (TLS) (MIP)*	-	-	8.081	-	8.081	39.710	88.133	167.066	186.448	0.000	489.438
• 0604021A: *Electronic Warfare Technology Maturation (MIP)*	-	23.043	22.840	-	22.840	-	-	-	-	0.000	45.883

Remarks

D. Acquisition Strategy

A competitive acquisition approach is planned for TLS development. The TLS program will use a tailored acquisition approach to rapidly deliver an integrated ground intelligence, electronic warfare and cyber capability on multiple platform types to align with maneuver forces. The TLS program will leverage authorities to accelerate delivery through rapid prototyping or rapid fielding approaches.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** FJ5 / *Terrestrial Layer System (MIP)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical / Program Management	TBD	TBD : TBD	-	-		-		7.318	Feb 2021	-		7.318	Continuing	Continuing	-
		Subtotal	-	-		-		7.318		-		7.318	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Integration and System Development	C/CPFF	TBD : TBD	-	-		-		28.036	Mar 2021	-		28.036	0.000	28.036	-
		Subtotal	-	-		-		28.036		-		28.036	0.000	28.036	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Events	MIPR	ATEC : APG, MD	-	-		-		2.751	Mar 2021	-		2.751	0.000	2.751	-
		Subtotal	-	-		-		2.751		-		2.751	0.000	2.751	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		38.105		-		38.105	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** FJ5 / *Terrestrial Layer System (MIP)*

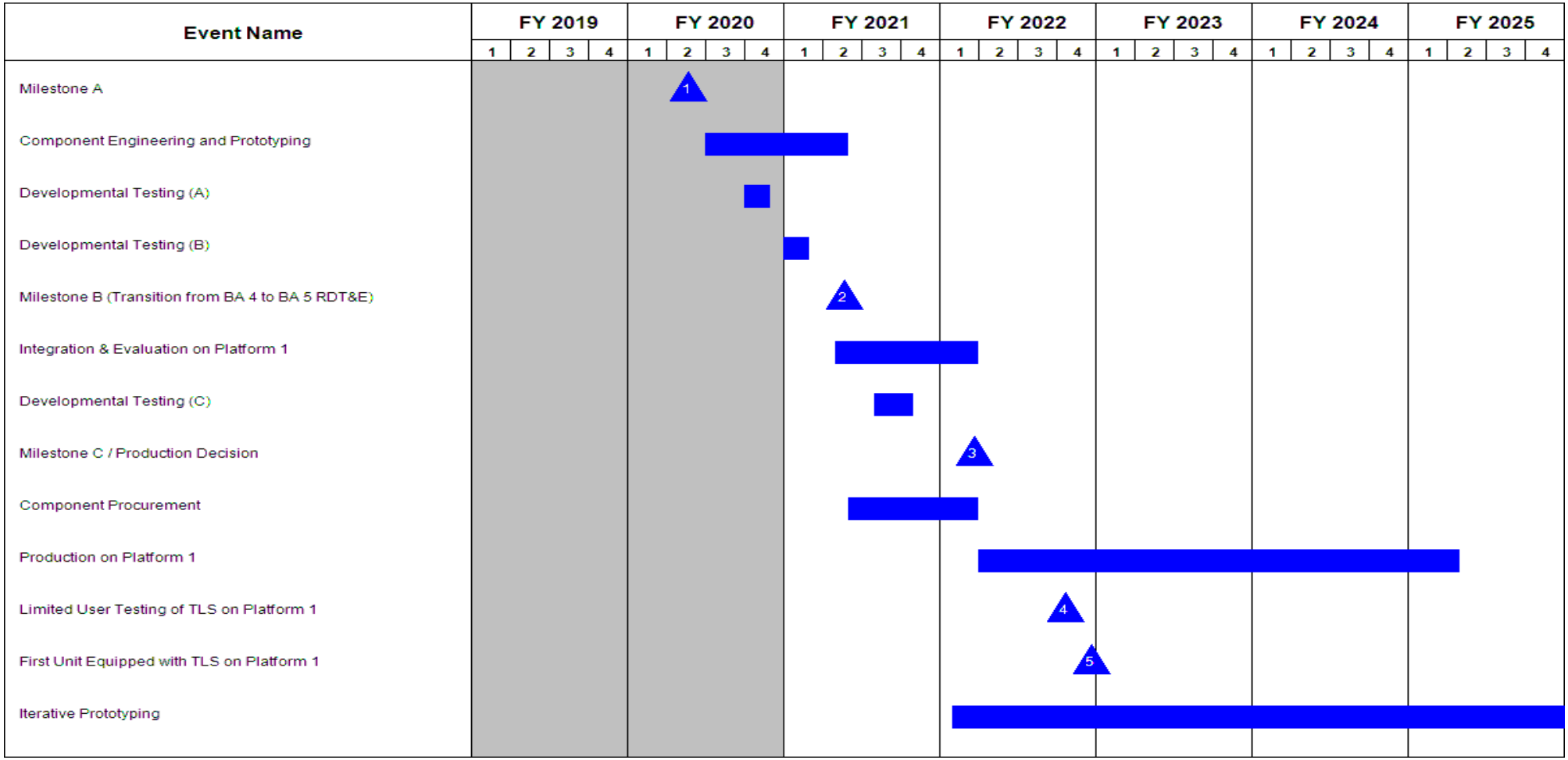

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** FJ5 / *Terrestrial Layer System (MIP)*

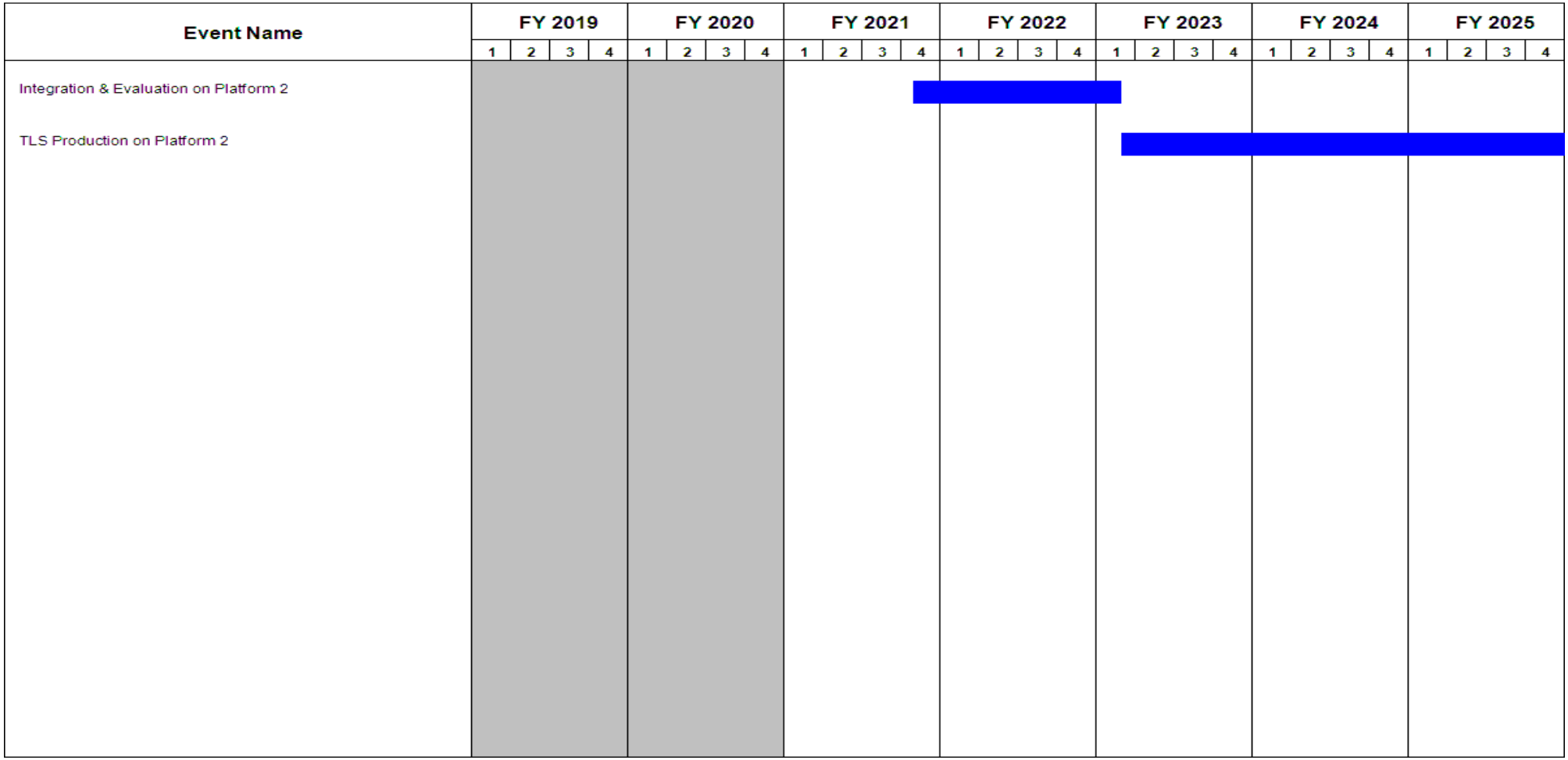

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** FJ5 / *Terrestrial Layer System (MIP)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone A	2	2020	2	2020
Component Engineering and Prototyping	3	2020	2	2021
Developmental Testing (A)	4	2020	4	2020
Developmental Testing (B)	1	2021	1	2021
Milestone B (Transition from BA 4 to BA 5 RDT&E)	2	2021	2	2021
Integration & Evaluation on Platform 1	2	2021	1	2022
Developmental Testing (C)	3	2021	4	2021
Milestone C / Production Decision	1	2022	1	2022
Component Procurement	2	2021	1	2022
Production on Platform 1	2	2022	2	2025
Limited User Testing of TLS on Platform 1	4	2022	4	2022
First Unit Equipped with TLS on Platform 1	4	2022	4	2022
Iterative Prototyping	1	2022	1	2027
Integration & Evaluation on Platform 2	4	2021	1	2023
TLS Production on Platform 2	1	2023	1	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1205117A / *Tractor Bears*							
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	-	23.170	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.170
FG3: *Tractor Bears*	-	23.170	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.170

A. Mission Description and Budget Item Justification

Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	23.170	0.000	0.000	-	0.000
Current President's Budget	23.170	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			