Department of Defense
Fiscal Year (FY) 2022 Budget Estimates

May 2021

Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E − Volume II, Budget Activity 5A

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, $12,799,645,000.00 to remain available for obligation until September 30, 2023.

The FY 2022 Overseas Contingency Operations accounted for in the base budget are as follows:

Direct War cost accounted for in the Base Budget $67,710,000: Direct War costs are those combat or direct combat support costs that will not continue to be expended once combat operations end at major contingency locations.

Enduring costs accounted for in the Base budget: $41,546,000: Enduring Requirements are enduring in theater and in CONUS costs that will likely remain after combat operations cease, and have previously been funded in OCO.

FY 2021 includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

FY 2020 includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).

COST STATEMENT

The following Justification Books were prepared at a cost of $472,560: 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 2022 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 2021.

2. Relationship of the FY 2022 Budget Submitted to Congress to the FY 2021 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***
01	0601104A / CI9	Strategic University Basic Research Alliance
02	0602141A / CJ1	Lethality Enabling University Applied Research
02	0602147A / AF1	Long Range Maneuverable Fires (LRMF) Technology
02	0602181A / CM7	Collaborative Convergence Applied Research
02	0602182A / CN4	Network Enabling University Applied Research
02	0602183A / CL5	Air Platform Enabling University Applied Research
02	0602184A / CK9	Advancing Concepts and Technology Forecasting Tech
02	0602184A / CN2	Intelligent Weapons Concepts and Technologies
02	0602184A / CN9	Soldier Enabling University Applied Research
02	0602184A / CO1	Soldier Power And Energy Concepts and Technologies
02	0602184A / CO2	Soldier-Intelligent Technology Research
02	0602386A / CP6	Biotechnology Demonstration and Evaluation
03	0603025A / CK8	Advanced Technology Development and Convergence
03	0603041A / CL9	Collab Battlefield Networked Leth Sys Adv Tech
03	0603041A / CM2	Collaborative Convergence Adv Tech Development
03	0603041A / CM8	Convergence Battlefield Integration

03	0603042A / CN3	Network Enabling University Adv Development
03	0603043A / CL4	Air Platform Enabling University Adv Development
03	0603044A / CN8	Soldier Enabled University Advanced Development
03	0603119A / CJ9	Ground Enabling University Adv Development
03	0603386A / CP7	Foundational Biotechnology Design and Development
03	0603462A / BH4	Ground Vehicle Holistic Defense Adv Tech
03	0603463A / AO3	Network C3I Advanced Technology
03	0603463A / AO6	Network C3I Advanced Technology
03	0603463A / AP6	Network C3I Advanced Technology
03	0603463A / AP8	Network C3I Advanced Technology
04	0604019A / BU9	IFPC High Energy Laser
04	0604019A / CO6	IFPC High Power Microwave (HPM)
04	0604115A / CE4	Emerging Technology Initiatives Development
04	0604403A / FM3	Future Interceptor
04	0604531A / CQ5	C-SUAS JOINT NEW CAPABILITIES DEVELOPMENT
04	0604531A / CQ6	C-SUAS JOINT ENABLING CAPABILITIES DEVELOPMENT
05	0303667A / CR1	Citizen Broadband Radio System
05	0304270A / CK3	TLS Echelon Above Brigade (EAB)
05	0604601A / S70	Personnel Recovery Support System (PRSS)
05	0604802A / CE3	Precision Munition (Sniper)
05	0604804A / VR7	Combat Service Support Systems
05	0604818A / EJ6	TACTICAL ENHANCEMENT
05	0605053A / BS9	Robotic Payloads
05	0605143A / BX5	Biometrics Enabling Capability (BEC)
05	0605531A / CQ7	C-SUAS JOINT NEW CAPABILITIES
05	0605531A / CQ8	C-SUAS JOINT ENABLING CAPABILITIES
07	0307665A / BI7	Biometrics Enabled Intelligence
07	0607131A / CP2	Precision Fire Technology Improvements

Program Element/Project Restructures:

Budget Activity	***Old OSDPE / Project: Title***	***New OSDPE / Project***
01	0601102A / AA1 AA2 AA6 AA7 AA8 AB1 AB2 AB4 AC6: Multiple	0601601A / CL3
01	0602785A / 790: Manpower/Personnel/Training Technology	0603040A / CL1
02	0602787A / MM8: Infectious Diseases and Applied Rsch Technology	0603002A / CJ3
02	0602787A / MN1: Applied Sensory Systems Trauma Technology	0602787A / MK4, MM4
02	0602141A / AH9: Advanced Warheads Technology	0602141A / CJ6
02	0602141A / AI1: Advanced Terrain Shaping Technology	0602141A / CF8
02	0602143A / BC3: Soldier Decision Making & Comms Performance Tech	0602184A / CO2
02	0602143A / BD6: Soldier Sys Interfaces/Integration- Sensor Tech	0602180A / CL7
02	0602144A / CA9: Predictive Maintenance	0602180A / CN7
02	0602145A / BF6: Crew Augmentation and Optimization Tech	0602144A / CG8
02	0602145A / BF8: Artificial Intelligence & Machine Learning Tech	0602180A / CL7
02	0602145A / BF8: Artificial Intelligence & Machine Learning Tech	0602183A / CL5
02	0602145A / BF9: Sensors for Autonomous Operations and Surv Tech	0602180A / CL2
02	0602145A / BG6: Advanced Concepts for Active Defense Technology	0602144A / CG7
02	0602145A / BH5: Platform Electrification and Mobility Tech	0602144A / CG6
02	0602145A / BH9: Protection for Autonomous Systems Tech	0603041A / CM8
02	0602145A / BI2: Sensor Protection Technology	0602144A / CG5
02	0602146A / AN7: COE - Every Receiver is a Sensor Technology	0602180A / CL2
02	0602146A / AO5: Tag Track and Locate Small Satellites Technology	0602146A / CK1, CG3
02	0602146A / AP4: CEMA Camouflage Technology	0602182A / CM9, CN5
02	0602146A / AQ9: Expeditionary Data to Decisions Technology	0602146A / CI3
02	0602146A / AV6: Airborne Engineering Support Technology	0603463A / CI7
02	0602148A / AI5: Next Gen Tactical UAS TD Technology	0602148A / CH2
02	0602148A / AJ4: Digital Vehicle Management and Control Technology	0602148A / CG9
02	0602148A / AK2: Aviation Survivability Technology	0602183A / CN1
02	0602148A / AK2: Aviation Survivability Technology	0602148A / CH3
02	0602148A / AK4: Multi-Role Small Guided Missile Technology	0602148A / CI5

02	0602148A / AK9: Adv Teaming for Tactical Aviation Operations Tech	0602183A / CL8
02	0602148A / AM4: Opt Energy Stg & Therm Mgmt for FVL Survivability	0602148A / CH4
02	0602150A / AC9: High Energy Laser Tactical Vehicle Demonstrator Te	0603466A / AD1
02	0602150A / AD2: High Energy Laser (HEL) Enabling and Support Techn	0602141A / CF7
02	0602150A / AD3: Maneuver Air Defense Technology	0602141A / CJ7
02	0602213A / CY8: Cyber Security App Research and Exper Partner Tech	0603463A / CI7
02	0602213A / CY8: Cyber Security App Research and Exper Partner Tech	0602146A / CI3
02	0603002A / MO9: Vaccines to Prevent Dengue Fever Advanced Tech	0603002A / CJ3
02	0603007A / 792: Personnel Performance & Training	0603040A / CL6
03	0603116A / AI3: Terminal Weapons Effects Against Structures and Critical Targets Tech	0603116A / CH5
03	0603118A / BC4: Soldier Decision Making&Comms Performance AdvTech	0603465A / AL9
03	0603463A / AM9: Protected SATCOM Advanced Technology	0603463A / CI7
03	0603463A / AM9: Protected SATCOM Advanced Technology	0602146A / AN3
03	0603463A / AO3: Stand-In Advanced RF Effects (STARE) Adv Tech	0603463A / AO7
03	0603463A / AO6: Tag Track and Locate Small Satellites Adv Tech	0603463A / CJ8
03	0603463A / AP6: C4ISR Integrated Demonstrations Advanced Tech	0603463A / AN4, AM9, AP9
03	0603463A / AP8: Comms/Horiz Int for Army Mod Priorities Adv Tech	0603041A / CL9, CL2, CM8
03	0603463A / AQ1: Spectrum Obfuscation Advanced Technology	0603463A / CI7
03	0603463A / AQ5: Sensor CE-Integrated Sensor Architecture Adv Tech	0603463A / CI7
03	0603463A / AQ8: High Tempo Data Driven Decision Tools Adv Tech	0603463A / CI7
03	0603463A / AU6: Automated Analytics for Operational Environment AT	0603463A / CF9
03	0603463A / AV2: LEO Advanced Technology	0603463A / CJ8
03	0603463A / BZ8: Aerial Tier Networking (High Altitude)	0602146A / AN3
03	0603465A / AJ1: Future UAS Engine Advanced Technology	0603465A / AI8
03	0603465A / AJ5: Digital Vehicle Management & Control Advanced Tech	0603465A / CH6
03	0603465A / AK3: Aviation Survivability Advanced Technology	0603465A / CH8, CG1
03	0603465A / AM5: Opt Energy Stg & Therm Mgmt for FVL Surv Adv Tech	0603465A / CH7
03	0603466A / AD6: Next Generation Fires Radar Advanced Technology	0602141A / CG4
04	0603327A / FG9: Air and Missile Defense (AMD) Electronic Warfare	0604741A / 126
04	0603619A / 606: Cntrmn/Barrier Adv Dev	0603619A / CE5

04	0603639A / BQ4: 155mm Artillery Propulsion XM654	0604802A / BQ3
04	0603639A / FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	0604802A / FG1
04	0603766A / 907: Tactical Electronic Surveillance System - Adv Dev	0603766A / BX9, CC5, BY9
04	0603774A / VT7: Soldier Maneuver Sensors - Adv Dev	0603774A / BQ5
04	0603801A / F12: Future Attack Reconnaissance Aircraft	0603801A / CK7
04	0603807A / 811: Mil HIV Vac&Drug Dev	0604807A / 849
04	0604017A / FD2: Soldier Robotics Systems	0605053A / BS9
04	0604117A / FI4: Maneuver - Short Range Air Defense (M-SHORAD)	0604117A / CR9, CS1
04	0604120A / ED5: Assured Positioning, Navigation and Timing (PNT)	1206120A / FJ8
04	0604120A / EH8: DISMOUNTED	1206120A / FJ9
04	0604120A / EH9: PSEUDOLITES	1206120A / FK1
04	0604120A / EJ2: MOUNTED	1206120A / FK2
04	0604120A / EJ3: ANTI-JAM ANTENNA	1206120A / FK3
04	0604121A / FD6: Synthetic Training Environment Refine & Prototype	0604121A / CR2, CR3, CR4, CR5, CR7
04	0604121A / SV1: Soldier/Squad Virtual Trainer	0604121A / CR4, CR6
04	0604182A / HX1: Long-Range Hypersonic Weapon	0605232A / HX2
04	0604319A / DU3: IFPC2	0605052A / EY7
04	0604710A / L67: Soldier Night Vision Devices	0604710A / BQ6
04	0604807A / 812: Mil HIV Vac&Drug Dev	0604807A / 849
04	0604808A / 016: Close Combat Capabilities ENG DEV	0604808A / CS2, CS3
04	0604823A / L86: LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)	0607148A / BY8
04	0604823A / L88: Enhanced AN/TPQ 36	0607148A / BY8
05	0304270A / EW5: Electronic Warfare Development - MIP	0607313A / CE2
05	0304270A / EW6: ARAT-TSS - MIP	0304270A / CR8
05	0604798A / FG7: Emerging Technology Initiatives	0605054A / FI3
05	0605013A / 738: AcqBiz	0605013A / FL9
05	0605013A / FL9: Army Accessioning IT Development	0605233A / CP8
05	0605036A / EQ5: Combating Weapons of Mass Destruction (CWMD)	0605036A /CS6
05	0605041A / EV5: Defensive CYBER Operations	0608041A / CD1
05	0605053A / FB8: Soldier Borne Sensor (SBS)	0604827A / FK4

05	0605766A / DX9: National Integration To Tactical Systems(MIP)	0605766A / BV3
06	0604256A / 976: Army Threat Sim (ATS)	0604759A / FF1
06	0605898A / XW7: Command HQ - ARI	0605801A / M15
07	0303140A / DV4: Key Management Infrastructure (KMI)	0605144A / BY6
07	0305208A / D07: DCGS-A Common Modules (MIP)	0605148A / BY5
07	0305208A / D07: DCGS-A Common Modules (MIP)	0605224A / CK4
07	0305208A / D07: DCGS-A Common Modules (MIP)	0604037A / BY4
07	0205402A / EF2: Integrated Base Defense	0604785A / DS4
07	0607134A / ES1: Long Range Precision Fires (LRPF)	0605231A / CO3

Program Terminations (including transfers to Procurement and Sustainment):

Budget Activity	***OSDPE / Project***	***Project Title***
02	0602143A / BB7	Soldier Lethality Technology / Exoskeleton: Technology for Man-Machine Interface
02	0602145A / BF1	Next Generation Combat Vehicle Technology / Autonomous Ground Resupply Tech
02	0602146A / AM6	Network C3I Technology / Modular RF Communications Technology
02	0602146A / AP7	Network C3I Technology / Comms/Horiz Int for Army Mod Priorities Tech
02	0602146A / AQ7	Network C3I Technology / High Tempo Data Driven Decision Tools Technology
02	0602146A / AT2	Network C3I Technology / Subterranean Detection and Monitoring Technology
02	0602146A / AU3	Network C3I Technology / Geospatially Enabled Operational Design Technology
02	0602146A / AW3	Network C3I Technology / DoD PNT M&S Collaborative Initiative (CI) Technolo
02	0602146A / BZ6	Network C3I Technology / Narrowband SATCOM Technology
02	0602150A / AC9	Air and Missile Defense Technology / High Energy Laser Tactical Vehicle Demonstrator Te
02	0602150A / AE4	Air and Missile Defense Technology / Collaborative ISR Sensors Technology
03	0603118A / BB6	Soldier Lethality Advanced Technology / Physical Augmentation: Adv Tech for Field Demo
03	0603462A / BF2	Next Generation Combat Vehicle Advanced Technology / Autonomous Ground Resupply (AGR) Adv Tech
03	0603462A / BG5	Next Generation Combat Vehicle Advanced Technology / Extended Line of Sight (ELOS) Advanced Technology
03	0603462A / BH1	Next Generation Combat Vehicle Advanced Technology / Survivability Systems Controls Advanced Technology

03	0603462A / BK6	Next Generation Combat Vehicle Advanced Technology / Adv Direct InDirect Armament Sys (ADIDAS) Adv Tech
03	0603463A / AN6	Network C3I Advanced Technology / Prot SATCOM-WB Global SATCOM Inter Canc Adv Tech
03	0603463A / AW4	Network C3I Advanced Technology / DoD PNT M&S Collaborative Initiative (CI) Adv Tech
03	0603464A / AE9	Long Range Precision Fires Advanced Technology / Low-Cost Tact Ext Range Missile (LC-TERM) Adv Tech
03	0603466A / AE1	Air and Missile Defense Advanced Technology / Close Combat High Energy Laser Advanced Technology
04	0603639A / 694	Tank and Medium Caliber Ammunition / Medium Caliber Ammunition
04	0603747A / C08	Soldier Support and Survivability / Rapid Equipping Force
04	0603804A / G11	Logistics and Engineer Equipment - Adv Dev / Adv Elec Energy Con Ad
04	0603807A / VS7	Medical Systems - Adv Dev / MEDEVAC Mission Equipment Package (MEP) - Adv Dev
04	0604021A / AW7	Electronic Warfare Technology Maturation (MIP) / Electronic Warfare Technology Maturation (MIP)
04	0604115A / AX4	Technology Maturation Initiatives / Computational Prototyping Environment (CPE)
04	0604115A / AX6	Technology Maturation Initiatives / Active Protection Systems Integration
04	0604115A / AX7	Technology Maturation Initiatives / Multi-Mission High Energy Laser (MMHEL) Sys Demo
04	0604115A / AY1	Technology Maturation Initiatives / MUM-T Platform Enabler
04	0604115A / AY3	Technology Maturation Initiatives / Strategic Long Range Cannon
05	0604622A / VR5	Family of Heavy Tactical Vehicles / TWV Protection Kits
05	0604741A / 149	Air Defense Command, Con trol and Intelligence - Eng Dev / Counter-Rockets, Artillery & Mortar
05	0604768A / 688	Brilliant Anti-Armor Submunition (BAT) / ATACMS BLK II
05	0604780A / 582	Combined Arms Tactical Trainer (CATT) Core / Synthetic Envir Core
05	0604798A / DY5	Brigade Analysis, Integration and Evaluation / Production/Field Coordination for Capability Sets
05	0604802A / 613	Weapons and Munitions - Eng Dev / MORTAR SYSTEMS
05	0604802A / EU5	Weapons and Munitions - Eng Dev / .50 Caliber All-Purpose Tactical cartridge (APTC)
05	0604802A / XT2	Weapons and Munitions - Eng Dev / 40mm Door Breach
05	0604804A / FG4	Logistics and Engineer Equipment - Eng Dev / Ultra-Lightweight Camouflage Net System (ULCANS)
05	0604808A / 415	Landmine Warfare/Barrier - Eng Dev / Mine Neutral/Detection
05	0604854A / HB6	Artillery Systems - EMD / Mobile 155MM Howitzer
05	0605033A / EQ3	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) / Grnd-Based Opnl

		Surv Sys -Exped (GBOSS-E)
05	0605053A / FB4	Ground Robotics / Common Robotic Systems
07	0203744A / EB6	Aircraft Modifications/Product Improvement Programs / MQ-1C Gray Eagle MODS
07	0305204A / 123	Tactical Unmanned Aerial V ehicles / Joint Technology Center System Integration

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 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 May 2021

Appropriation	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Research, Development, Test & Eval, Army	12,842,958	14,144,856	12,799,645
Total Research, Development, Test & Evaluation	12,842,958	14,144,856	12,799,645
Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title			
Chem Agents & Munitions Destruction	890,830	942,493	1,001,231
Total Not in Research, Development, Test & Evaluation Title	890,830	942,493	1,001,231

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 5, 2021 at 15:01:27

Department of Defense
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
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(Dollars in Thousands)

05 May 2021

Summary Recap of Budget Activities	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Basic Research	557,265	552,521	473,475
Applied Research	1,227,661	1,518,770	914,288
Advanced Technology Development	1,520,145	1,940,015	1,297,437
Advanced Component Development & Prototypes	2,895,592	3,577,387	3,806,330
System Development & Demonstration	3,072,662	2,948,445	3,392,358
Management Support	1,759,840	1,834,218	1,416,698
Operational Systems Development	1,809,793	1,716,794	1,380,248
Software and Digital Technology Pilot Programs		56,706	118,811
Total Research, Development, Test & Evaluation	12,842,958	14,144,856	12,799,645

Summary Recap of FYDP Programs			
General Purpose Forces	733,243	589,525	542,571
Intelligence and Communications	287,081	362,184	280,473
Research and Development	11,434,683	13,058,379	11,911,888
Central Supply and Maintenance	105,885	130,785	61,720
Administration and Associated Activities	61		
Space	274,732		
Classified Programs	7,273	3,983	2,993
Total Research, Development, Test & Evaluation	12,842,958	14,144,856	12,799,645

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Department of Defense
FY 2022 President's Budget
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(Dollars in Thousands)

05 May 2021

	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Summary Recap of Non-RDT&E Title FYDP Programs			
Central Supply and Maintenance	890,830	942,493	1,001,231
Total Research, Development, Test & Evaluation	890,830	942,493	1,001,231

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Department of the Army
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Department of the Army
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
1	0601102A	Defense Research Sciences	01	343,481	344,031	297,241	U
2	0601103A	University Research Initiatives	01	85,148	84,697	66,981	U
3	0601104A	University and Industry Research Centers	01	123,654	118,716	94,003	U
4	0601121A	Cyber Collaborative Research Alliance	01	4,982	5,077	5,067	U
5	0601601A	Artificial Intelligence and Machine Learning Basic Research	01			10,183	U
		Basic Research		557,265	552,521	473,475	
6	0602115A	Biomedical Technology	02		11,403	11,925	U
7	0602134A	Counter Improvised-Threat Advanced Studies	02		1,927	1,976	U
8	0602141A	Lethality Technology	02	68,852	117,484	64,126	U
9	0602142A	Army Applied Research	02	30,733	30,757	28,654	U
10	0602143A	Soldier Lethality Technology	02	141,154	201,750	105,168	U
11	0602144A	Ground Technology	02	143,172	158,158	56,400	U
12	0602145A	Next Generation Combat Vehicle Technology	02	255,041	258,351	172,166	U
13	0602146A	Network C3I Technology	02	133,804	202,257	84,606	U
14	0602147A	Long Range Precision Fires Technology	02	117,395	119,007	64,285	U
15	0602148A	Future Verticle Lift Technology	02	94,888	169,536	91,411	U
16	0602150A	Air and Missile Defense Technology	02	93,937	107,584	19,316	U
17	0602180A	Artificial Intelligence and Machine Learning Technologies	02			15,034	U
18	0602181A	All Domain Convergence Applied Research	02			25,967	U
19	0602182A	C3I Applied Research	02			12,406	U
20	0602183A	Air Platform Applied Research	02			6,597	U

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 5, 2021 at 15:01:27

Department of the Army
FY 2022 President's Budget
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(Dollars in Thousands)

05 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
21	0602184A	Soldier Applied Research	02			11,064	U
22	0602213A	C3I Applied Cyber	02	17,351	18,816	12,123	U
23	0602386A	Biotechnology for Materials - Applied Research	02			20,643	U
24	0602785A	Manpower/Personnel/Training Technology	02	20,406	20,399	18,701	U
25	0602787A	Medical Technology	02	110,928	101,341	91,720	U
		Applied Research		1,227,661	1,518,770	914,288	
26	0603002A	Medical Advanced Technology	03	82,256	94,669	43,804	U
27	0603007A	Manpower, Personnel and Training Advanced Technology	03	10,225	11,344	14,273	U
28	0603025A	Army Agile Innovation and Demonstration	03			22,231	U
29	0603040A	Artificial Intelligence and Machine Learning Advanced Technologies	03			909	U
30	0603041A	All Domain Convergence Advanced Technology	03			17,743	U
31	0603042A	C3I Advanced Technology	03			3,151	U
32	0603043A	Air Platform Advanced Technology	03			754	U
33	0603044A	Soldier Advanced Technology	03			890	U
34	0603115A	Medical Development	03		26,711	26,521	U
35	0603116A	Lethality Advanced Technology	03			8,066	U
36	0603117A	Army Advanced Technology Development	03	66,424	62,663	76,815	U
37	0603118A	Soldier Lethality Advanced Technology	03	131,119	151,370	107,966	U
38	0603119A	Ground Advanced Technology	03	136,544	196,055	23,403	U
39	0603134A	Counter Improvised-Threat Simulation	03		24,087	24,747	U
40	0603386A	Biotechnology for Materials - Advanced Research	03			53,736	U

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41	0603457A	C3I Cyber Advanced Development	03	25,492	43,357	31,426	U
42	0603461A	High Performance Computing Modernization Program	03	217,389	221,161	189,123	U
43	0603462A	Next Generation Combat Vehicle Advanced Technology	03	255,386	302,209	164,951	U
44	0603463A	Network C3I Advanced Technology	03	138,937	216,520	155,867	U
45	0603464A	Long Range Precision Fires Advanced Technology	03	196,393	177,142	93,909	U
46	0603465A	Future Vertical Lift Advanced Technology	03	180,163	220,334	179,677	U
47	0603466A	Air and Missile Defense Advanced Technology	03	79,817	175,703	48,826	U
48	0603920A	Humanitarian Demining	03		16,690	8,649	U
		Advanced Technology Development		1,520,145	1,940,015	1,297,437	
49	0603305A	Army Missle Defense Systems Integration	04	59,318	140,195	11,702	U
50	0603308A	Army Space Systems Integration	04		25,584	18,755	U
51	0603327A	Air and Missile Defense Systems Engineering	04	52,672	47,098		U
52	0603619A	Landmine Warfare and Barrier - Adv Dev	04	79,504	56,067	50,314	U
53	0603639A	Tank and Medium Caliber Ammunition	04	72,456	100,367	79,873	U
54	0603645A	Armored System Modernization - Adv Dev	04	138,300	138,685	170,590	U
55	0603747A	Soldier Support and Survivability	04	9,246	5,712	2,897	U
56	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	37,490	182,400	113,365	U
57	0603774A	Night Vision Systems Advanced Development	04	192,530	15,429	18,000	U
58	0603779A	Environmental Quality Technology - Dem/Val	04	19,089	20,906	11,921	U
59	0603790A	NATO Research and Development	04	5,184	4,589	3,777	U
60	0603801A	Aviation - Adv Dev	04	488,397	694,296	1,125,641	U

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61	0603804A	Logistics and Engineer Equipment - Adv Dev	04	7,081	8,587	7,055	U
62	0603807A	Medical Systems - Adv Dev	04	36,307	33,085	22,071	U
63	0603827A	Soldier Systems - Advanced Development	04	25,204	23,184	17,459	U
64	0604017A	Robotics Development	04	80,909	95,367	87,198	U
65	0604019A	Expanded Mission Area Missile (EMAM)	04			50,674	U
66	0604021A	Electronic Warfare Technology Maturation (MIP)	04	23,043	15,034		U
67	0604035A	Low Earth Orbit (LEO) Satellite Capability	04		21,850	19,638	U
68	0604036A	Multi-Domain Sensing System (MDSS) Adv Dev	04			50,548	U
69	0604037A	Tactical Intel Targeting Access Node (TITAN) Adv Dev	04			28,347	U
70	0604100A	Analysis Of Alternatives	04	9,811	9,714	10,091	U
71	0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04		1,328	926	U
72	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	40,745	57,083	69,697	U
73	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	364,154	308,805	327,690	U
74	0604115A	Technology Maturation Initiatives	04	171,058	141,109	270,124	U
75	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	41,690	4,813	39,376	U
76	0604119A	Army Advanced Component Development & Prototyping	04	117,335	172,990	189,483	U
77	0604120A	Assured Positioning, Navigation and Timing (PNT)	04		115,688	96,679	U
78	0604121A	Synthetic Training Environment Refinement & Prototyping	04	99,357	112,093	194,195	U
79	0604134A	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04		13,326	13,379	U
80	0604182A	Hypersonics	04	394,619	832,166	300,928	U
81	0604403A	Future Interceptor	04	1,918		7,895	U

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82	0604531A	Counter - Small Unmanned Aircraft Systems Advanced Development	04			19,148	U
83	0604541A	Unified Network Transport	04	28,478	39,192	35,409	U
84	0604644A	Mobile Medium Range Missile	04	4,794	88,100	286,457	U
85	0604785A	Integrated Base Defense (Budget Activity 4)	04	2,000	2,020	2,040	U
86	0305251A	Cyberspace Operations Forces and Force Support	04	58,611	50,525	52,988	U
87	1206120A	Assured Positioning, Navigation and Timing (PNT)	04	133,307			U
88	1206308A	Army Space Systems Integration	04	100,985			U
		Advanced Component Development & Prototypes		2,895,592	3,577,387	3,806,330	
89	0604201A	Aircraft Avionics	05	8,069	7,011	6,654	U
90	0604270A	Electronic Warfare Development	05	57,090	56,624	30,840	U
91	0604601A	Infantry Support Weapons	05	86,154	88,552	67,873	U
92	0604604A	Medium Tactical Vehicles	05		8,213	11,374	U
93	0604611A	JAVELIN	05	14,377	5,983	7,094	U
94	0604622A	Family of Heavy Tactical Vehicles	05	12,085	22,254	31,602	U
95	0604633A	Air Traffic Control	05	5,543	3,383	4,405	U
96	0604642A	Light Tactical Wheeled Vehicles	05	2,843	4,193	2,055	U
97	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	273,433	123,992	137,256	U
98	0604710A	Night Vision Systems - Eng Dev	05	135,283	54,234	62,690	U
99	0604713A	Combat Feeding, Clothing, and Equipment	05	7,295	2,734	1,658	U
100	0604715A	Non-System Training Devices - Eng Dev	05	29,785	27,013	26,540	U
101	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	70,279	62,058	59,518	U

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102	0604742A	Constructive Simulation Systems Development	05	11,158	9,779	22,331	U
103	0604746A	Automatic Test Equipment Development	05	10,466	5,375	8,807	U
104	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	7,480	7,605	7,453	U
105	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	19,177	24,064		U
106	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	8,861	3,438		U
107	0604798A	Brigade Analysis, Integration and Evaluation	05	29,852	18,737	21,534	U
108	0604802A	Weapons and Munitions - Eng Dev	05	182,119	268,858	309,778	U
109	0604804A	Logistics and Engineer Equipment - Eng Dev	05	105,668	53,676	59,261	U
110	0604805A	Command, Control, Communications Systems - Eng Dev	05	12,077	10,674	20,121	U
111	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	70,489	51,285	44,424	U
112	0604808A	Landmine Warfare/Barrier - Eng Dev	05	33,881	9,239	14,137	U
113	0604818A	Army Tactical Command & Control Hardware & Software	05	124,749	128,676	162,704	U
114	0604820A	Radar Development	05	91,782	105,271	127,919	U
115	0604822A	General Fund Enterprise Business System (GFEBS)	05	41,119	15,428	17,623	U
116	0604823A	Firefinder	05	16,583	18,278		U
117	0604827A	Soldier Systems - Warrior Dem/Val	05	4,606	6,296	6,454	U
118	0604852A	Suite of Survivability Enhancement Systems - EMD	05	81,899	62,012	106,354	U
119	0604854A	Artillery Systems - EMD	05	20,290	36,187		U
120	0605013A	Information Technology Development	05	89,541	126,498	122,168	U
121	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	97,873	111,078	76,936	U
122	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	80,381	76,140	35,560	U

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123	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	6,423			U
124	0605030A	Joint Tactical Network Center (JTNC)	05	15,228	15,671	16,364	U
125	0605031A	Joint Tactical Network (JTN)	05	39,130	30,540	28,954	U
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	3,689	5,758		U
127	0605034A	Tactical Security System (TSS)	05	7,343			U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	22,226	29,770	16,630	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	9,589			U
130	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	5,805	4,669	7,618	U
131	0605041A	Defensive CYBER Tool Development	05	50,662	28,544	18,892	U
132	0605042A	Tactical Network Radio Systems (Low-Tier)	05	27,236	20,511	28,849	U
133	0605047A	Contract Writing System	05	16,379	22,025	22,960	U
134	0605049A	Missile Warning System Modernization (MWSM)	05	1,475			U
135	0605051A	Aircraft Survivability Development	05	130,211	99,208	65,603	U
136	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	186,369	153,362	233,512	U
137	0605053A	Ground Robotics	05	24,747	12,010	18,241	U
138	0605054A	Emerging Technology Initiatives	05	36,146	294,366	254,945	U
139	0605143A	Biometrics Enabling Capability (BEC)	05			4,326	U
140	0605144A	Next Generation Load Device - Medium	05			15,616	U
141	0605145A	Medical Products and Support Systems Development	05		919	962	U
142	0605148A	Tactical Intel Targeting Access Node (TITAN) EMD	05			54,972	U

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143	0605203A	Army System Development & Demonstration	05	184,410	150,201	122,175	U
144	0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05		5,780	2,275	U
145	0605224A	Multi-Domain Intelligence	05			9,313	U
146	0605225A	SIO Capability Development	05			22,713	U
147	0605231A	Precision Strike Missile (PrSM)	05			188,452	U
148	0605232A	Hypersonics EMD	05			111,473	U
149	0605233A	Accessions Information Environment (AIE)	05			18,790	U
150	0605450A	Joint Air-to-Ground Missile (JAGM)	05	6,314	7,566	2,134	U
151	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	211,634	206,850	157,873	U
152	0605531A	Counter - Small Unmanned Aircraft Systems Sys Dev & Demonstration	05			33,386	U
153	0605625A	Manned Ground Vehicle	05	197,304	171,890	225,106	U
154	0605766A	National Capabilities Integration (MIP)	05	7,835	7,670	14,454	U
155	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	7,119	1,678	2,564	U
156	0605830A	Aviation Ground Support Equipment	05	1,596	1,413	1,201	U
157	0303032A	TROJAN - RH12	05	3,936	3,451	3,362	U
158	0303267A	Auctioned Spectrum Relocation Fund	05	7,650			U
159	0303467A	SENSR Spectrum Pipeline SRF	05	251			U
160	0303567A	Non-SENSR Spectrum Pipeline SRF	05	1,236			U
161	0304270A	Electronic Warfare Development	05	18,432	59,755	75,520	U
		System Development & Demonstration		3,072,662	2,948,445	3,392,358	
162	0604256A	Threat Simulator Development	06	41,566	41,486	18,439	U

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163	0604258A	Target Systems Development	06	27,984	35,279	17,404	U
164	0604759A	Major T&E Investment	06	140,946	119,231	68,139	U
165	0605103A	Rand Arroyo Center	06	12,573	12,989	33,126	U
166	0605301A	Army Kwajalein Atoll	06	230,051	221,965	240,877	U
167	0605326A	Concepts Experimentation Program	06	35,403	50,394	79,710	U
168	0605502A	Small Business Innovative Research	06	392,999	369,715		U
169	0605601A	Army Test Ranges and Facilities	06	356,231	390,351	354,227	U
170	0605602A	Army Technical Test Instrumentation and Targets	06	60,170	81,829	49,253	U
171	0605604A	Survivability/Lethality Analysis	06	33,632	36,001	36,389	U
172	0605606A	Aircraft Certification	06	3,319	2,736	2,489	U
173	0605702A	Meteorological Support to RDT&E Activities	06	6,094	6,360	6,689	U
174	0605706A	Materiel Systems Analysis	06	21,233	21,830	21,558	U
175	0605709A	Exploitation of Foreign Items	06	11,168	8,936	13,631	U
176	0605712A	Support of Operational Testing	06	52,280	54,116	55,122	U
177	0605716A	Army Evaluation Center	06	60,474	56,827	65,854	U
178	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,423	2,478	2,633	U
179	0605801A	Programwide Activities	06	56,800	84,510	96,589	U
180	0605803A	Technical Information Activities	06	30,434	25,487	26,808	U
181	0605805A	Munitions Standardization, Effectiveness and Safety	06	52,401	55,648	43,042	U
182	0605857A	Environmental Quality Technology Mgmt Support	06	4,489	1,715	1,789	U
183	0605898A	Army Direct Report Headquarters - R&D - MHA	06	53,320	54,564	52,108	U

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184	0606001A	Military Ground-Based CREW Technology	06	2,053			U
185	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	64,311	68,911	80,952	U
186	0606003A	CounterIntel and Human Intel Modernization	06	2,925	5,200	5,363	U
187	0606105A	Medical Program-Wide Activities	06		19,164	39,041	U
188	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	4,500	6,496	5,466	U
189	0909999A	Financing for Cancelled Account Adjustments	06	61			U
		Management Support		1,759,840	1,834,218	1,416,698	
190	0603778A	MLRS Product Improvement Program	07	14,014	9,786	12,314	U
191	0605024A	Anti-Tamper Technology Support	07	8,141	8,436	8,868	U
192	0607131A	Weapons and Munitions Product Improvement Programs	07	14,222	19,666	22,828	U
193	0607134A	Long Range Precision Fires (LRPF)	07	149,455	100,146		U
194	0607136A	Blackhawk Product Improvement Program	07	22,502	8,300	4,773	U
195	0607137A	Chinook Product Improvement Program	07	164,820	49,409	52,372	U
196	0607139A	Improved Turbine Engine Program	07	197,941	232,159	275,024	U
197	0607142A	Aviation Rocket System Product Improvement and Development	07	1,847	13,421	12,417	U
198	0607143A	Unmanned Aircraft System Universal Products	07	17,386	19,460	4,594	U
199	0607145A	Apache Future Development	07	5,224	52,502	10,067	U
200	0607148A	AN/TPQ-53 Counterfire Target Acquisition Radar System	07			56,681	U
201	0607150A	Intel Cyber Development	07		14,652	3,611	U
202	0607312A	Army Operational Systems Development	07	45,026	35,851	28,029	U
203	0607313A	Electronic Warfare Development	07			5,673	U

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204	0607665A	Family of Biometrics	07	1,576	1,276	1,178	U
205	0607865A	Patriot Product Improvement	07	83,833	178,984	125,932	U
206	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	45,447	43,060	25,547	U
207	0203735A	Combat Vehicle Improvement Programs	07	266,197	213,728	211,523	U
208	0203743A	155mm Self-Propelled Howitzer Improvements	07	191,076	217,959	213,281	U
209	0203744A	Aircraft Modifications/Product Improvement Programs	07	8,896	11,261		U
210	0203752A	Aircraft Engine Component Improvement Program	07	138	80	132	U
211	0203758A	Digitization	07	4,043	4,351	3,936	U
212	0203801A	Missile/Air Defense Product Improvement Program	07	1,235	1,241	127	U
213	0203802A	Other Missile Product Improvement Programs	07		15,268	10,265	U
214	0205412A	Environmental Quality Technology - Operational System Dev	07	10,000	250	262	U
215	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	93,743		182	U
216	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	112,468	72,817	63,937	U
217	0208053A	Joint Tactical Ground System	07		9,510	13,379	U
219	0303028A	Security and Intelligence Activities	07	26,674	23,367	24,531	U
220	0303140A	Information Systems Security Program	07	25,710	28,270	15,720	U
221	0303141A	Global Combat Support System	07	57,604	70,652	52,739	U
222	0303142A	SATCOM Ground Environment (SPACE)	07		18,002	15,247	U
223	0303150A	WWMCCS/Global Command and Control System	07	1,988			U
226	0305179A	Integrated Broadcast Service (IBS)	07	459	382	5,430	U
227	0305204A	Tactical Unmanned Aerial Vehicles	07	22,147	38,151	8,410	U

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228	0305206A	Airborne Reconnaissance Systems	07	13,177	28,858	24,460	U
229	0305208A	Distributed Common Ground/Surface Systems	07	28,821	40,771		U
230	0305219A	MQ-1C Gray Eagle UAS	07	5,000			U
231	0305232A	RQ-11 UAV	07	3,218			U
232	0305233A	RQ-7 UAV	07	7,817			U
233	0307665A	Biometrics Enabled Intelligence	07	4,350		2,066	U
234	0708045A	End Item Industrial Preparedness Activities	07	105,885	130,785	61,720	U
235	1203142A	SATCOM Ground Environment (SPACE)	07	32,764			U
236	1208053A	Joint Tactical Ground System	07	7,676			U
9999	9999999999	Classified Programs		7,273	3,983	2,993	U
		Operational Systems Development		1,809,793	1,716,794	1,380,248	
237	0608041A	Defensive CYBER - Software Prototype Development	08		56,706	118,811	U
		Software and Digital Technology Pilot Programs			56,706	118,811	
		Total Research, Development, Test & Eval, Army		12,842,958	14,144,856	12,799,645	

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FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Non RDT&E Title
(Dollars in Thousands)

05 May 2021

Summary Recap of Budget Activities	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Research, Development, Test, And Evaluation	890,830	942,493	1,001,231
Total Research, Development, Test & Evaluation	890,830	942,493	1,001,231

Summary Recap of Non-RDT&E Title FYDP Programs			
Central Supply and Maintenance	890,830	942,493	1,001,231
Total Research, Development, Test & Evaluation	890,830	942,493	1,001,231

Department of the Army
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Non RDT&E Title
(Dollars in Thousands)

05 May 2021

Appropriation: 0390D Chem Agents & Munitions Destruction

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
1	0708081D	Chemical Materials Agency	02	6,500	6,494	6,220	U
2	0708083D	Assembled Chemical Weapons Alternatives	02	884,330	935,999	995,011	U
		Research, Development, Test, And Evaluation		890,830	942,493	1,001,231	
Total Chem Agents & Munitions Destruction				890,830	942,493	1,001,231	

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

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

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604201A *I Aircraft Avionics*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.069	7.011	6.654	-	6.654	-	-	-	-	-	-
C97: *ACFT Avionics*	-	4.734	6.357	5.807	-	5.807	-	-	-	-	-	-
EW7: *Degraded Visual Environment*	-	2.552	-	-	-	-	-	-	-	-	-	-
VU3: *Networking And Mission Planning*	-	0.783	0.654	0.847	-	0.847	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2022 budget request funds the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Program Element support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems. Alternate capabilities (non-GPS) and/or complimentary PNT solutions will be investigated, studied, evaluated and developed as standalone or blended navigation functions.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as an inertial sensor interface card and Instrument Flight Rules map display. The DGNS upgrade includes Non-Recurring Engineering for the Computer Display Unit (CDU) which replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability, and optimizes pilot interface to promote safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (APNT) operations such as Resiliency and Software Assurance Modification (RSAM) in conjunction with additional system upgrades and upgrades to existing DGNS hardware in order to accommodate A-PNT in identified operational environments. This supports the requirement to maintain A-PNT throughout operations.

The Enhanced Aviation Global Air Traffic Management (GATM) Localizer Performance with Vertical Guidance (LPV) Embedded Global Positioning System (GPS) Inertial Navigation System (EGI) (EAGLE) development program upgrades existing EGI hardware to incorporate M-Code and assesses current capabilities in order to achieve A-PNT in identified operational environments. The EAGLE-M upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, and evaluate candidate solutions to cover any identified gaps. The EGI program will support enhanced A-PNT for currently fielded EGIs through software insertions, such as RSAM.

The Multi-platform Anti-jam GPS Navigation Antenna (MAGNA) is a GPS anti-jam adaptive antenna system that will be capable of receiving legacy and modernized GPS satellite signals. The MAGNA reduces the effect of GPS jamming by disrupting the GPS receiver enabling the Warfighter continued access to GPS-provided PNT in a GPS degraded environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201A *I Aircraft Avionics*

The Degraded Visual Environment (DVE) Environment Exploitation System (EES) focuses on active and passive sensor technology, synthetic vision, sensor and software data fusion, imagery processing, user interface, and multicore processing technologies to enable current and future capabilities and innovative technical solutions for the Army aviation fleet.

The Improved Data Modem (IDM) is the common solution for digitizing Army Aviation and is fielded on every modernized, rotary-wing Army aircraft, including the CH-47 Chinook, AH-64 Apache and UH-60 Black Hawk. The IDM provides the Army rotary wing fleet with critical communication capabilities, enables connectivity to multiple radios used by rotary-wing aircraft and the Blue Force Tracking transceiver, and provides the means for rapid data transfer.

The Aviation Mission Common Server (AMCS) effort is a replacement and capability upgrade for the current Army IDM-401. The AMCS program will implement IDM and Common Operating Environment capabilities utilizing a flexible open systems architecture and distributed processing resources with the capacity and architecture to perform an array of additional non-flight critical computing, data processing, radio and communications management, and graphics generation functions for the enduring and future Army Aviation fleet and de-couple non-flight critical mission system technology integration from flight critical components. The AMCS provides the ability to rapidly integrate technology upgrades required to keep pace with evolving threats on Multi-Domain Battlefield. The AMCS enables the hosting of enhanced capabilities to communicate, navigate, sense and deploy weapon systems across the Joint Force and will be the center of the future Common Digital Backbone for the enduring and future Army Aviation fleets, and is a key enabler Multi-Domain Operations.

The Aviation Mission Planning System (AMPS) is a system used to conduct pre-mission and aircraft performance planning. It recieves data from multiple sources and provides that data digitally to the aircraft to support aviation missions. AMPS is used for automated mission planning, risk assessment, and transfer of mission data to aviation platforms within an Aviation unit. This includes route generation, performance planning, communications planning, terrain analysis, data transfer, and mission rehearsal. These efforts include development and testing of a new underlying architecture to support the move of Army Aviation Mission Planning from the current structure to one that supports synchronization both vertically and horizontally between Aviation and Ground forces. It will allow aircrews to continually plan and update route, threat, and performance data throughout all phases of an Aviation mission. Development of a mobile aircraft performance planning/weight and balance calculator is currently underway and will be the first migration of AMPS capabilities to a mobile hardware agnostic environment.

The AN/ARC-220 High Frequency (HF) Radio is a US Army rotary wing high frequency solution which is operational on over 2,400 Army helicopters (primarily CH-47, UH-60, and AH-64). Key capabilities are voice and data, Automatic Link Establishment, text messaging, position reporting, and Selective Calling. It is also Voice Interoperable with standard ground HF systems in use today. Efforts include development of an Airborne Radio Control Manager (ARCM) driver to enhance the modernization of the AN/ARC-220 HF Radio.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army					Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*			
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	8.414	2.764	7.285	-	7.285
Current President's Budget	8.069	7.011	6.654	-	6.654
Total Adjustments	-0.345	4.247	-0.631	-	-0.631
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-0.151			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.345	-0.102			
• Adjustments to Budget Years	-	-	-0.631	-	-0.631

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) C97 / *ACFT Avionics*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C97: *ACFT Avionics*	-	4.734	6.357	5.807	-	5.807	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Fiscal Year FY2022 budget request funds for the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems. Alternate capabilities (non-GPS) and/or complimentary PNT solutions will be investigated, studied, evaluated and developed as standalone or blended navigation functions.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as an inertial sensor interface card and Instrument Flight Rules map display. The DGNS upgrade includes Non-Recurring Engineering for the Computer Display Unit (CDU) which replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability, and optimizes pilot interface to promote safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (APNT) operations such as Resiliency and Software Assurance Modification (RSAM) in conjunction with additional system upgrades and upgrades to existing DGNS hardware in order to accommodate A-PNT in identified operational environments. This supports the requirement to maintain A-PNT throughout operations.

The Enhanced Aviation Global Air Traffic Management (GATM) Localizer Performance with Vertical Guidance (LPV) Embedded Global Positioning System (GPS) Inertial Navigation System (EGI) (EAGLE) development program upgrades existing EGI hardware to incorporate M-Code and assesses current capabilities in order to achieve A-PNT in identified operational environments. The EAGLE-M upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, and evaluate candidate solutions to cover any identified gaps. The EGI program will support enhanced A-PNT for currently fielded EGIs through software insertions, such as RSAM.

The Multi-platform Anti-jam GPS Navigation Antenna (MAGNA) is a GPS anti-jam adaptive antenna system that will be capable of receiving legacy and modernized GPS satellite signals. The MAGNA reduces the effect of GPS jamming by disrupting the GPS receiver enabling the Warfighter continued access to GPS-provided PNT in a GPS degraded environment.

The AN/ARC-220 High Frequency (HF) Radio is a US Army rotary wing high frequency solution which is operational on over 2,400 Army helicopters (primarily CH-47, UH-60, and AH-64). Key capabilities are voice and data, Automatic Link Establishment, text messaging, position reporting, and Selective Calling. It is also Voice Interoperable with standard ground HF systems in use today. Efforts include development of an Airborne Radio Control Manager (ARCM) driver to enhance the modernization of the AN/ARC-220 HF Radio.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: EAGLE Navigation System A-PNT Integration	4.734	1.857	5.807

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: The GATM LPV GPS EGI EAGLE development program upgrades existing EGI hardware to incorporate M-Code and assesses current capabilities in order to achieve A-PNT in identified operational environments. The EAGLE-M upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, and evaluate candidate solutions to cover any identified gaps. The EGI program will support enhanced A-PNT for currently fielded EGIs through software insertions, such as RSAM. ***FY 2021 Plans:*** Continue EAGLE-M airworthiness qualification testing and Resiliency & Software Assurance Modification integration onto legacy GPS receivers. Continue EAGLE M-code development. ***FY 2022 Plans:*** Continue EAGLE-M development through safety of flight (SOF) qualification followed by full airworthiness testing/qualification. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increases in FY 2022 to complete the full airworthiness testing/qualification of EAGLE-M.			
Title: AN/ARC-220 High Frequency Radio Modernization ***FY 2021 Plans:*** Develop AN/ARC-220 HF Radio Modernization hardware, software and firmware to upgrade performance and capability. Develop an Airborne Radio Control Manager driver to enhance the modernization of the AN/ARC-220 HF Radio. Conduct technology insertion efforts to provide advanced radio frequency application, digital signal processor, fast analog digital converters, and automatic gain control to include cyber hardening. Develop microelectronics such as integrated circuits to handle more power than today's RF circuitry. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease in FY22 funding reflects that the only funding for HF Radio Modernization was a Congressional increase in FY21.	-	4.500	-
Accomplishments/Planned Programs Subtotals	4.734	6.357	5.807

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• AA0723: *Comms, Nav Surveillance*	164.315	101.355	58.117	-	58.117	-	-	-	-	-	-
• AA0704: *GATM - Rotary Wing Aircraft*	30.966	12.180	16.776	-	16.776	-	-	-	-	-	-
• A01006: *Aviation ASSURED PNT*	-	53.509	47.028	-	47.028	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• C97: *ACFT Avionics*	4.734	6.357	5.807	-	5.807	-	-	-	-	-	-

Remarks

APA funding associated with the Aircraft Avionics Project C97 RDT&E efforts is now in the Aviation Assured PNT line (SSN A01006) beginning in FY21. Aviation Assured PNT funding on the Comms, Nav Surveillance line (SSN AA0723) was realigned to A01006 beginning in FY21.

D. Acquisition Strategy

This project is comprised of multiple systems supporting aircraft avionics. While the detailed acquisition strategy varies from program to program, the general strategy is for each individual program to complete the development and testing efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, and utilize the United States Army Combat Capabilities Development Command Aviation & Missile Center for software development. This requires the use of various contract methods and types to accomplish the aircraft avionics development efforts. All required acquisition program documentation is prepared.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) C97 / *ACFT Avionics*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Services (DGNS Upgrade/ DGNS A-PNT)	Various	Development Command Aviation & Missiles Center SED : Redstone Arsenal, AL	1.122	-		-		-		-		-	0.000	1.122	-
PM Services (EAGLE)	Various	Development Command Aviation & Missiles Center : Redstone Arsenal, AL	0.499	0.037	Oct 2019	-		-		-		-	0.000	0.536	-
		Subtotal	1.621	0.037		-		-		-		-	0.000	1.658	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DGNS A-PNT Assessment and Upgrade	SS/CPFF	BAE Systems : Wayne, NJ	7.721	-		-		-		-		-	0.000	7.721	-
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	SS/CPFF	Honeywell : Clearwater, FL	16.218	4.697	Jan 2020	-		-		-		-	0.804	21.719	-
EGI/EAGLE M-Code	SS/CPIF	Honeywell International : Clearwater, FL	-	-		1.787	Jun 2021	5.807	Feb 2022	-		5.807	Continuing	Continuing	-
AN/ARC-220 High Frequency Radio Modernization	SS/CPFF	Defense Microelectronics Activity (DMEA) : San Francisco, CA	-	-		3.500	Jun 2021	-		-		-	0.000	3.500	-
Airborne Radio Control Manager Driver (AN/ ARC-220 HF Radio)	SS/CPFF	Georgia Tech Research Institute : Tucson, AZ	-	-		1.000	Jun 2021	-		-		-	0.000	1.000	-
		Subtotal	23.939	4.697		6.287		5.807		-		5.807	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) C97 / *ACFT Avionics*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EAGLE M-Code / EGI RSAM Flight Test Support	Various	Development Command Aviation & Missiles Center Engineering Directorate : Redstone Arsenal, AL	0.173	-		0.035	Jun 2021	-		-		-	0.000	0.208	-
		Subtotal	0.173	-		0.035		-		-		-	0.000	0.208	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EAGLE M-Code / EGI RSAM Airworthiness Qualification Testing	RO	Redstone Test Center : Redstone Arsenal, AL	0.146	-		0.035	Jun 2021	-		-		-	0.000	0.181	-
		Subtotal	0.146	-		0.035		-		-		-	0.000	0.181	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	25.879	4.734		6.357		5.807		-		5.807	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

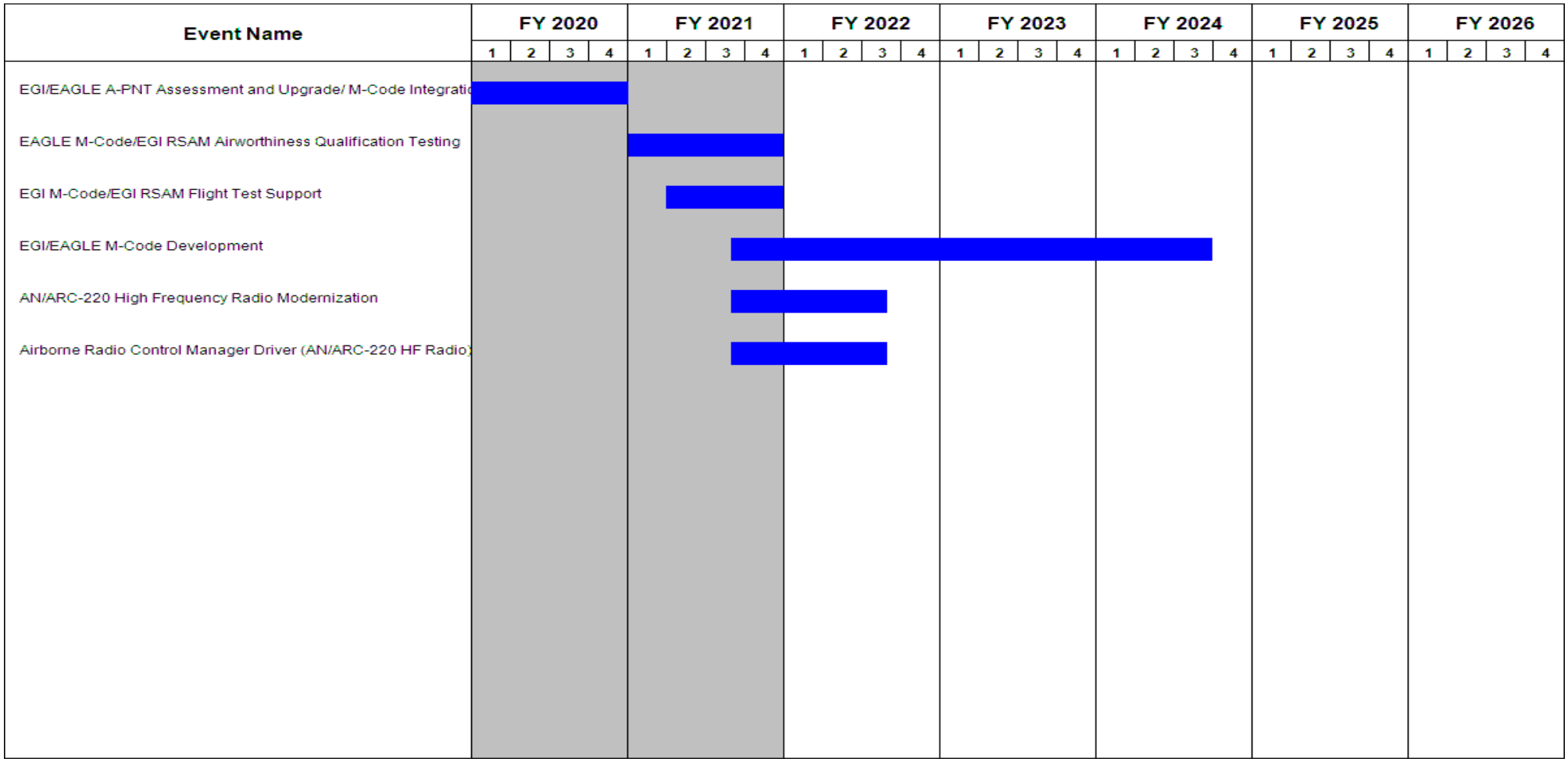


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** C97 / *ACFT Avionics*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DGNS Anti-Jam Antenna Development	4	2016	4	2019
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	2	2018	4	2020
EAGLE M-Code/EGI RSAM Airworthiness Qualification Testing	1	2021	4	2021
EGI M-Code/EGI RSAM Flight Test Support	2	2021	4	2021
EGI/EAGLE M-Code Development	3	2021	3	2024
AN/ARC-220 High Frequency Radio Modernization	3	2021	3	2022
Airborne Radio Control Manager Driver (AN/ARC-220 HF Radio)	3	2021	3	2022

Note

DGNS: Doppler Global Positioning System (GPS) Navigation Set
A-PNT: Assured-Position Navigation and Timing
RSAM: Resiliency & Software Assurance Modification
M-Code: Military-Code
EGI: Embedded GPS Inertial

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) EW7 / *Degraded Visual Environment*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EW7: *Degraded Visual Environment*	-	2.552	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EW7 Degraded Visual Environment (DVE) completed development and test efforts in Fiscal Year (FY) 2020 and awarded an Other Transaction Authority (OTA) Prototype agreement for the Aviation Mission Common Server (AMCS) and Environment Exploitation System (EES) Modular Capabilities Demonstration.

A. Mission Description and Budget Item Justification

The DVE EES focuses on active and passive sensor technology, synthetic vision, sensor and software data fusion, imagery processing, user interface, and multicore processing technologies to enable current and future capabilities and innovative technical solutions for the Army aviation fleet.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Degraded Visual Environment (DVE) ***Description:*** The DVE EES efforts focus on active and passive sensor technology, synthetic vision, sensor and software data fusion, imagery processing, user interface, and multicore processing technologies to enable current and future capabilities and innovative technical solutions for the current Army aviation fleet to safely operate in DVE.	2.552	-	-
Accomplishments/Planned Programs Subtotals	2.552	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• A00713: *Degraded Visual Environment*	49.450	1.916	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The DVE EES acquisition strategy for development leveraged a competitively awarded Other Transaction Authority (OTA) Prototype agreement to provide a technical approach for the development of a distributive processing capability hosted with an open systems architecture that provides processing capacity and throughput required to support highly intensive graphic and data processing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) EW7 / *Degraded Visual Environment*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support for EES	Various	Various : Various	1.067	-		-		-		-		-	0.000	1.067	-
		Subtotal	1.067	-		-		-		-		-	0.000	1.067	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop and qualify the software and hardware for EES	Various	Elbit; Mercury; POC : ACC-NJ	0.063	2.552	Aug 2020	-		-		-		-	0.000	2.615	-
Develop hardware configuration DVE EES	Various	various : various	4.436	-		-		-		-		-	0.000	4.436	-
		Subtotal	4.499	2.552		-		-		-		-	0.000	7.051	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering, Logistics and Technical Support for EES	MIPR	Combat Capabilities Devlopment Command : Redstone Arsenal, AL	0.487	-		-		-		-		-	0.000	0.487	-
		Subtotal	0.487	-		-		-		-		-	0.000	0.487	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.053	2.552		0.000		-		-		-	0.000	8.605	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** EW7 / *Degraded Visual Environment*

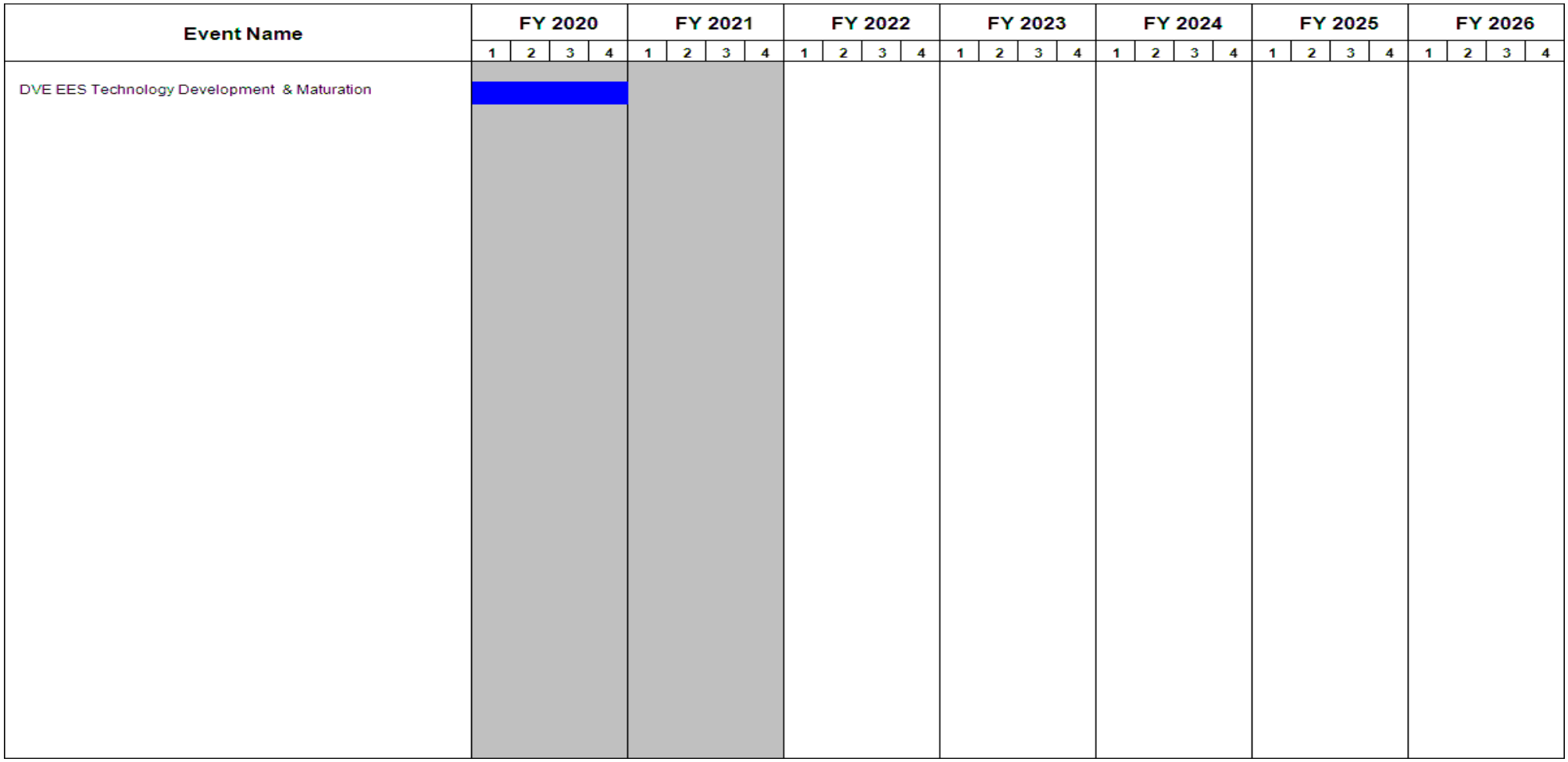


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** EW7 / *Degraded Visual Environment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Degraded Visual Environment Directed Requirement (DVE DR)	3	2017	4	2019
Critical Design Review	3	2018	3	2018
Operational Test	4	2019	4	2019
Production Decision	4	2019	4	2019
DVE EES Technology Development & Maturation	1	2018	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*				Project (Number/Name) VU3 / *Networking And Mission Planning*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
VU3: *Networking And Mission Planning*	-	0.783	0.654	0.847	-	0.847	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project VU3 Network and Mission Planning FY 2022 funding will be utilized to support the AMCS Modular Capabilities Demonstration OTA and other developmental activities in support of AMCS as a replacement and capability upgrade for the current Army IDM-401.

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2022 budget request funds the development of Networking and Mission Planning systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems.

The Improved Data Modem (IDM) is the common solution for digitizing Army Aviation and is fielded on every modernized, rotary-wing Army aircraft, including the CH-47 Chinook, AH-64 Apache and UH-60 Black Hawk. The IDM provides the Army rotary wing fleet with critical communication capabilities, enables connectivity to multiple radios used by rotary-wing aircraft and the Blue Force Tracking transceiver, and provides the means for rapid data transfer.

The Aviation Mission Common Server (AMCS) effort is a replacement and capability upgrade for the current Army IDM-401. The AMCS program will implement IDM and Common Operating Environment capabilities utilizing a flexible open systems architecture and distributed processing resources with the capacity and architecture to perform an array of additional non-flight critical computing, data processing, radio and communications management, and graphics generation functions for the enduring and future Army Aviation fleet and de-couple non-flight critical mission system technology integration from flight critical components. The AMCS provides the ability to rapidly integrate technology upgrades required to keep pace with evolving threats on Multi-Domain Battlefield. The AMCS enables the hosting of enhanced capabilities to communicate, navigate, sense and deploy weapon systems across the Joint Force and will be the center of the future Common Digital Backbone for the enduring and future Army Aviation fleets, and is a key enabler for Multi-Domain Operations.

The Aviation Mission Planning System (AMPS) is a system used to conduct pre-mission and aircraft performance planning. It receives data from multiple sources and provides that data digitally to the aircraft to support aviation missions. AMPS is used for automated mission planning, risk assessment, and transfer of mission data to aviation platforms within an Aviation unit. This includes route generation, performance planning, communications planning, terrain analysis, data transfer, and mission rehearsal. These efforts include development and testing of a new underlying architecture to support the move of Army Aviation Mission Planning from the current structure to one that supports synchronization both vertically and horizontally between Aviation and Ground forces. It will allow aircrews to continually plan and update route, threat, and performance data throughout all phases of an Aviation mission. Development of a mobile aircraft performance planning/weight and balance calculator is currently underway and will be the first migration of AMPS capabilities to a mobile hardware agnostic environment.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Aviation Mission Common Server (AMCS)	0.783	0.654	0.847
Description: AMCS is a capability upgrade and replacement for the IDM-401. ***FY 2021 Plans:*** Perform airworthiness assessments and develop airworthiness documentation, multicore testing documentation, assess airworthiness requirements compliance, provide closing memos, produce airworthiness releases, and provide airworthiness support to the demonstration and test of the AMCS capability. ***FY 2022 Plans:*** Perform and support production representative prototype assessments, testing, demonstration and qualification activities in support of the Aviation Mission Common Server (AMCS) Modular Capabilities Demonstration Qualification and Prototype Delivery Phase and developmental activities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increased funding is required to support testing and qualification requirements of the Aviation Mission Common Server Prototype effort required to inform the AMCS as a capability upgrade and replacement for the current Army IDM-401.			
Accomplishments/Planned Programs Subtotals	0.783	0.654	0.847

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• AA0712: *Network And Mission Plan*	98.236	77.432	29.206	-	29.206	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The AMCS will complete development, testing and qualification efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, and utilize the U.S. Army Combat Capabilities Development Command (CCDC) - Aviation & Missile Center (AvMC) for software development and integration at both the Line Replaceable Unit and platform level. The AMCS is leveraging a competitive Other Transaction Authority (OTA) prototype agreement to develop and demonstrate multiple AMCS Family of Systems (FoS) capabilities and hardware solutions with multiple industry vendors that will inform the Milestone Decision Authority's production decision.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) VU3 / *Networking And Mission Planning*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support (IDM)	MIPR	PdM A2E2 : Redstone Arsenal, AL	0.050	-		-		-		-		-	0.000	0.050	-
PM Support (AMCS)	Various	Combat Communications Development Command, Aviation & Missile Center : Redstone Arsenal, AL	-	0.010		0.009		0.141		-		0.141	Continuing	Continuing	-
		Subtotal	0.050	0.010		0.009		0.141		-		0.141	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop software for IDM	C/Various	Combat Communications Development Command, Aviation & Missile Center : Redstone Arsenal, AL	1.518	-		-		-		-		-	0.000	1.518	-
Hardware and Software Development/ Demonstration for the Aviation Mission Common Server (AMCS)	C/Various	Combat Communications Development Command, Aviation & Missile Center : Redstone Arsenal, AL	-	-		-		0.706	Dec 2021	-		0.706	0.000	0.706	-
AMCS Hardware and Software Prototype Development OTA	C/FFP	Physical Optics Corporation and Elbit : Fort Worth, Tx and Torrance, California	-	0.199	Aug 2020	-		-		-		-	0.000	0.199	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / *Aircraft Avionics*	Project (Number/Name) VU3 / *Networking And Mission Planning*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMCS Medical HUB Demonstration	MIPR	Combat Communications Development Command, Aviation & Missile Center : Redstone Arsenal, AL	-	0.086	Aug 2020	-		-		-		-	0.000	0.086	-
		Subtotal	1.518	0.285		-		0.706		-		0.706	0.000	2.509	N/A

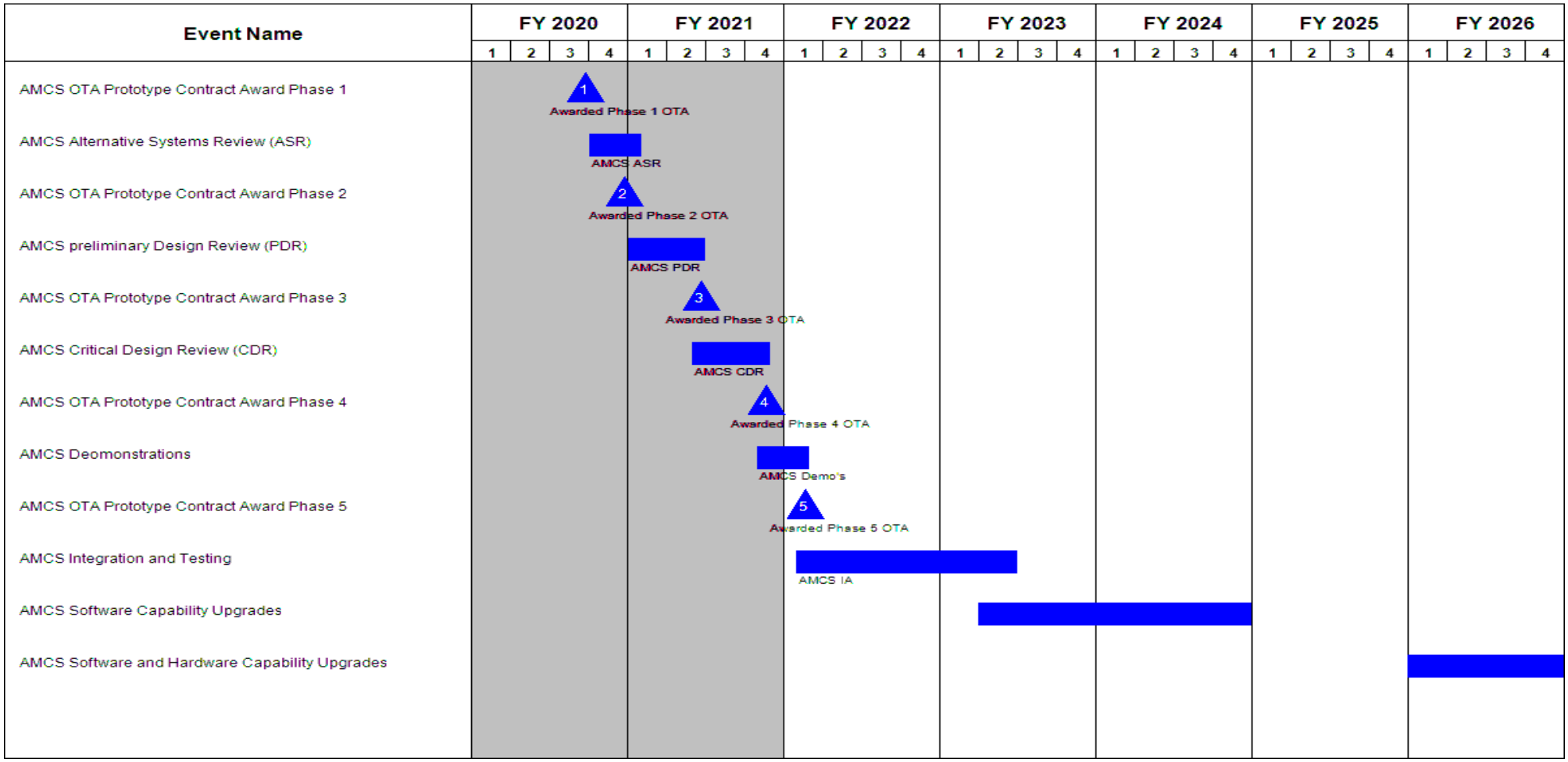
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aviation Mission Common Server (AMCS) Prototype C5 Consortium OTA Support	MIPR	C5 Consortium : APG MD	-	0.041	Jun 2020	-		-		-		-	0.000	0.041	-
Hardware and Software Development Support for the Aviation Mission Common Server (AMCS)	C/Various	Combat Communications Development Command, Aviation & Missile Center : Redstone Arsenal, AL	-	0.447	Nov 2020	0.645	Oct 2020	-		-		-	0.000	1.092	-
		Subtotal	-	0.488		0.645		-		-		-	0.000	1.133	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.568	0.783		0.654		0.847		-		0.847	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*



Note

The Aviation Mission Common Server Modular Capabilities Demonstration Other Transaction Authority awarded 24 June 20. The schedule depicts the OTA's 5 Individual phases and their associated award and effort duration.

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Qualify ADEC Hardware and Software	2	2011	2	2018
Milestone B (ADEC)	4	2016	4	2016
Develop hardware and software (ACN)	1	2012	4	2016
Develop AMPS Software	1	2018	4	2018
Develop IDM Software	4	2018	4	2018
AMCS Airworthiness Studies and Assessments	2	2019	2	2019
AMCS OTA Prototype Contract Award Phase 1	3	2020	3	2020
AMCS Alternative Systems Review (ASR)	4	2020	1	2021
AMCS OTA Prototype Contract Award Phase 2	4	2020	4	2020
AMCS preliminary Design Review (PDR)	1	2021	2	2021
AMCS OTA Prototype Contract Award Phase 3	2	2021	2	2021
AMCS Critical Design Review (CDR)	2	2021	4	2021
AMCS OTA Prototype Contract Award Phase 4	4	2021	4	2021
AMCS Deomonstrations	4	2021	1	2022
AMCS OTA Prototype Contract Award Phase 5	1	2022	1	2022
AMCS Integration and Testing	1	2022	2	2023
AMCS Software Capability Upgrades	2	2023	4	2024
AMCS Software and Hardware Capability Upgrades	1	2026	4	2026

Note

ACN: Aircraft Notebook
ADEC: Aviation Data Exploitation Capability
AMCS: Aviation Mission Common Server
AMPS: Aviation Mission Planning System
EES: Environment Exploitation System

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604201A / *Aircraft Avionics*	**Project (Number/Name)** VU3 / *Networking And Mission Planning*

IDM: Improved Data Modem

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	57.090	56.624	30.840	-	30.840	-	-	-	-	-	-
DX5: *Electronic Warfare And Management Tool*	-	22.547	13.095	16.813	-	16.813	-	-	-	-	-	-
DX6: *Multi-Function Electronic Warfare (MFEW)*	-	29.316	41.535	12.020	-	12.020	-	-	-	-	-	-
VS6: *Integrated Electronic Warfare Systems*	-	5.227	1.994	2.007	-	2.007	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element (PE) encompasses engineering and manufacturing development for tactical Electronic Warfare (EW). The Integrated Electronic Warfare System (IEWS) is a capability set that integrates electronic attack, protect and support functions to dramatically improve the ability to seize, retain, and exploit an advantage within the electromagnetic spectrum (EMS). It is based on a modular, scalable and open architecture to allow Army Brigade Combat Team (BCT) and Joint Force Commander's to tailor capability responses against a variety of EW threats/scenarios.

The IEWS capability set is structured along four program lines of effort: 1) Project DX5 Electronic Warfare Planning and Management Tools (EWPMT), 2) Project DX6 Multi-Function EW (MFEW), 3) Project VS6 Counter Radio-Controlled Improvised Explosive Devices (RCIED) Electronic Warfare (CREW) which provides current defensive electronic attack capability.

Project DX5 - The EWPMT is the Commander's tool to control, manage, and dominate the EMS and Cyber Domains. EWPMT will provide the ability to conduct remote control & management of EW assets to execute offensive and defensive Electronic Attack, EW targeting and enable maneuver by synchronizing EW and Spectrum Management Operations (SMO) across Intelligence, Operations, and Signals to successfully execute Multi-Domain Operations (MDO). As a Commander's tool, EWPMT is predominantly utilized by the Cyber Electromagnetic Activities (CEMA) element's Electronic Warfare Officers (EWO) and ESM for mission planning, access to national and strategic sensors and data repositories, as well as the synchronization of EW and SIGINT enabled platforms.

Project DX6 - The MFEW is a capability set that will provide BCT Commanders with an organic airborne offensive EW capability. MFEW variants empower Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. The MFEW Air Large system, when installed onto the Gray Eagle (GE) Unmanned Aerial System (UAS), will provide: 1) Offensive Electronic Attack (OEA) - Non-Kinetic Fires capability with the intent of denying, degrading, or disrupting enemy communications capability and non-communications emitters; 2) Electronic Warfare Support (ES) - Capability to search, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic (EM) energy for the purpose of immediate threat recognition, targeting, planning, and execution of future operations; 3) Dissemination of Military Information Support Operations (MISO) products; and 4) Support of Offensive Cyber Operations (OCO) and Multi-Domain Operations.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604270A *I Electronic Warfare Development*

Project VS6 - Counter RCIED CREW, provides protection of ground forces operating in vehicle convoys, single vehicles, and fixed locations in operational theaters, which enables freedom of movement across the depth and breadth of the operational environment. It is programmable with techniques to mitigate emerging threats. In order to keep pace with the threat evolution, development efforts will provide fielded CREW systems as well as other EW systems with techniques that mitigate the range of threats as required. These development efforts may include development of new techniques, integration of existing techniques, and hardware and software development and integration in order to pace the threat.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	59.539	62.426	28.229	-	28.229
Current President's Budget	57.090	56.624	30.840	-	30.840
Total Adjustments	-2.449	-5.802	2.611	-	2.611
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.524			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.449	-2.278			
• Adjustments to Budget Years	-	-	2.611	-	2.611

Change Summary Explanation

Fiscal Year (FY) 2022 funding increase of $2.611 is for MFEW that supports completion of the MFEW-AL Phase II OTA non-recurring engineering activities and an Operational Assessment in FY 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX5 / *Electronic Warfare And Management Tool*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
DX5: *Electronic Warfare And Management Tool*	-	22.547	13.095	16.813	-	16.813	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Electronic Warfare Planning and Management Tool (EWPMT) is the Commander's tool to control, manage, and dominate the Electromagnetic Spectrum (EMS) and Cyber Domains. EWPMT will provide the ability to conduct remote control & management of Electronic Warfare (EW) assets to execute offensive and defensive Electronic Attack, EW targeting and enable maneuver by synchronizing EW and Spectrum Management Operations (SMO) across Intelligence, Operations, and Signals to successfully execute Multi-Domain Operations (MDO). As a Commander's tool, EWPMT is predominantly utilized by the Cyber Electromagnetic Activities (CEMA) element's Electronic Warfare Officers (EWO) and Electromagnetic Spectrum Managers (ESM) for mission planning, access to national and strategic sensors and data repositories, as well as the synchronization of EW and SIGINT enabled platforms.

Justification:
Fiscal Year (FY) 2022 Base funds in the amount of $16.813 million will continue EWPMT Increment 1, provide for software relevancy updates, allow for user engagements to include but not limited to Soldier Touch Point (STP) events and evaluations, allow for integration with offensive/defensive EA ground and aerial based systems as well as other systems within the integrated EW/Signals Intelligence (SIGINT) capability set, and engineering/integration support activities for the EWPMT program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: EWPMT	22.547	13.095	16.813
Description: EWPMT is a Mission Command software application that enhances the CEMA element?s ability to plan, coordinate, integrate, and synchronize CEMA (Cyber, EW & ESM) with Mission Command Systems from Joint Task Force (JTF) to Battalion (BN). EWPMT Integrates the EA, EP, ES and SMO functions in support of BCT and EAB for Electronic Warfare and CEMA Planning.			
FY 2021 Plans: CD4 development and EWPMT Increment 1 Test and Evaluation Support (IOT&E) and Full Deployment Decision (FDD). Participate in Soldier Touch Points (STPs) events and evaluations. Development of Command Post (CP) relevancy.			
FY 2022 Plans: EWPMT Increment 1 relevancy to include, but not limited to, sensor, CP, network, and synthetic training environment relevancy. Participate in user engagements to include, but not limited to, STPs events and evaluations.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX5 / *Electronic Warfare And Management Tool*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Integration with offensive/defensive EA ground and aerial based systems as well as other systems within the integrated EW/ SIGINT capability set. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 Increase of $2.903 million funds Increment 1 requirements to include, but not limited to software relevancy updates, participation in user engagements, and integration with offensive/defensive EA ground and aerial based systems as well as other systems within the integrated EW/SIGINT capability set.			
Accomplishments/Planned Programs Subtotals	22.547	13.095	16.813

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• K00002: *EW Planning & Management Tools (EWPMT)*	7.568	7.849	0.783	-	0.783	-	-	-	-	-	-

Remarks

EWPMT Support which includes logistics and travel.

D. Acquisition Strategy

EWPMT is an Automated Information System (AIS) that will follow an evolutionary acquisition strategy using a Capability Drop (CD) construct for rapid development and integration of new EW and SMO capabilities to pace the near peer threats as well as provide for continuous product improvements in support of MDO. EWPMT is modeled primarily after the Incrementally Deployed Software Intensive Program approach found in the DoD Instruction 5000.02.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX5 / *Electronic Warfare And Management Tool*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Staff/Travel	Various	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	12.833	0.220	Nov 2019	0.155	Mar 2021	0.169	Mar 2022	-		0.169	Continuing	Continuing	-
		Subtotal	12.833	0.220		0.155		0.169		-		0.169	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD Contract - EWPMT CD1	C/IDIQ	Raytheon : Fort Wayne, IN	18.200	-		-		-		-		-	0.000	18.200	18.200
EMD Contract - EWPMT CD2	C/IDIQ	Raytheon : Fort Wayne, IN	24.359	-		-		-		-		-	0.000	24.359	24.359
EMD Contract - EWPMT CD3	C/IDIQ	Raytheon : Fort Wayne, IN	26.380	-		-		-		-		-	0.000	26.380	26.373
EMD Contract - EWPMT CD4	C/IDIQ	Raytheon : Fort Wayne, IN	5.330	17.598	Nov 2019	7.757	Nov 2020	-		-		-	0.000	30.685	30.576
EMD Contract- EWPMT system integration, relevancy, and user engagements	C/IDIQ	Raytheon : Fort Wayne, IN	-	-		0.674	Jan 2021	11.445	Dec 2021	-		11.445	0.000	12.119	14.953
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.604	-		-		-		-		-	0.000	0.604	-
		Subtotal	74.873	17.598		8.431		11.445		-		11.445	0.000	112.347	N/A

Remarks

EMD Contract- EWPMT system integration, relevancy, and User Engagements: W15P7T-14-D-C006 / TO: W56KGY-19-F-0016. Fiscal Year (FY) 2022 RDT&E funding of $11.595 million continues system integration with systems in the integrated EW/SIGINT capability set, software relevancy updates, and EWPMT user engagements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX5 / *Electronic Warfare And Management Tool*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Technical and Engineering Support	Option/ CPFF	Various : Various	29.738	4.264	Nov 2019	2.097	Dec 2020	4.428	Dec 2021	-		4.428	Continuing	Continuing	-
		Subtotal	29.738	4.264		2.097		4.428		-		4.428	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Test Support	MIPR	Various : Various	6.045	0.465	Jan 2020	2.412	Dec 2020	0.771	Dec 2021	-		0.771	Continuing	Continuing	Continuing
		Subtotal	6.045	0.465		2.412		0.771		-		0.771	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	123.489	22.547		13.095		16.813		-		16.813	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX5 / *Electronic Warfare And Management Tool*

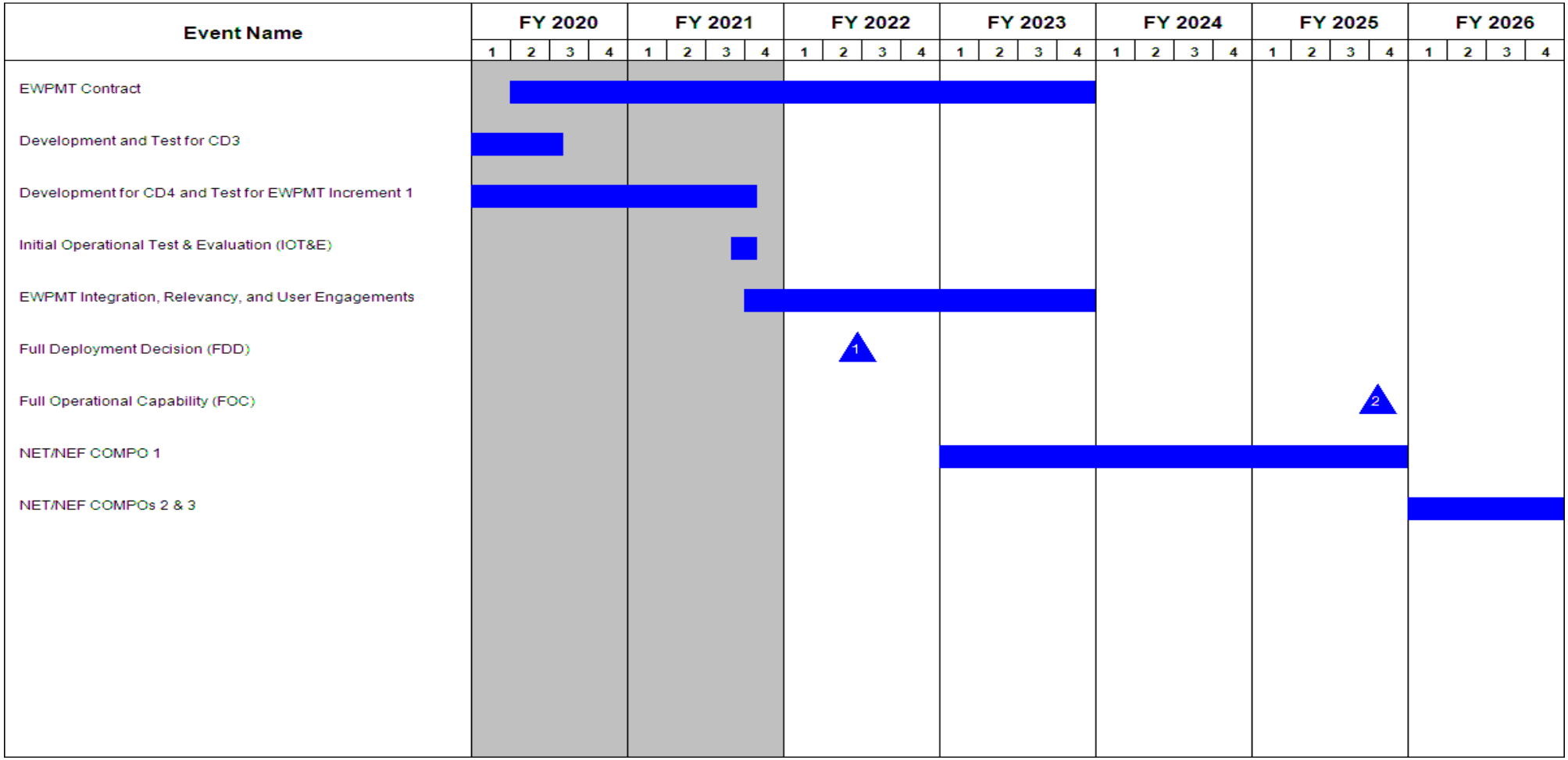


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX5 / *Electronic Warfare And Management Tool*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EWPMT Contract	1	2014	4	2023
Development and Test for CD1	4	2014	3	2016
Test CD1 (Government Confidence test)	2	2016	2	2016
Limited Deployment Decision for CD1	4	2016	4	2016
CD1 Fielding	4	2016	3	2018
Initial Operational Capability (IOC)	1	2017	1	2017
Development and Test for CD2	4	2016	4	2018
Development and Test for CD3	3	2018	3	2020
Development for CD4 and Test for EWPMT Increment 1	4	2019	4	2021
Initial Operational Test & Evaluation (IOT&E)	3	2021	4	2021
EWPMT Integration, Relevancy, and User Engagements	4	2021	4	2023
Full Deployment Decision (FDD)	2	2022	2	2022
Full Operational Capability (FOC)	4	2025	4	2025
NET/NEF COMPO 1	1	2023	4	2025
NET/NEF COMPOs 2 & 3	1	2026	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX6 / *Multi-Function Electronic Warfare (MFEW)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
DX6: *Multi-Function Electronic Warfare (MFEW)*	-	29.316	41.535	12.020	-	12.020	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multi-Function Electronic Warfare (MFEW) is a capability set that will provide Maneuver Commanders with an organic airborne offensive Electronic Warfare (EW) capability, which empowers Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. The MFEW Air Large system, when installed onto the Gray Eagle (GE) Unmanned Aerial System (UAS), will provide: 1) Offensive Electronic Attack (OEA) - Non-Kinetic Fires capability with the intent of denying, degrading, or disrupting enemy communications capability and non-communications emitters; 2) Electronic Warfare Support (ES) - Capability to search, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic (EM) energy for the purpose of immediate threat recognition, targeting, planning, and execution of future operations; 3) Dissemination of Military Information Support Operations (MISO) products; and 4) Support of Offensive Cyber Operations (OCO) and other activities to support Multi-Domain Operations.

Justification:

Fiscal Year (FY) 2022 Base funding in the amount of $12.02 million will support completion of MFEW Air Large non-recurring engineering activities to include contractor testing, test range and support, and Government Limited User Test (LUT).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Multi-Function Electronic Warfare (MFEW) Air Large	29.316	41.535	12.020
Description: MFEW-Air Large is an airborne Electronic Warfare payload to be integrated onto the Gray Eagle Unmanned Aerial Vehicle to provide offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability to the BCT. ***FY 2021 Plans:*** Continue Engineering and Manufacturing Development (EMD) activities, to include 4 EMD articles, and platform integration. ***FY 2022 Plans:*** Complete EMD activities, to include 4 EMD articles, conduct flight testing and a LUT. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease of funding reflects the completion of EMD in FY 2022 and conducting formal LUT.			
Accomplishments/Planned Programs Subtotals	29.316	41.535	12.020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX6 / *Multi-Function Electronic Warfare (MFEW)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• B05000: *Multi-Function Electronic Warfare (MFEW) Systems*	-	8.669	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

MFEW Air has employed a tailored acquisition approach to rapidly deliver capability to the field. The MFEW Air Large employed a competitive acquisition approach for the EMD phase of the program. The development is using a modular open-system approach to rapidly deliver an initial airborne EW capability to the Army using the Consortium for Command, Control, Communications, and Computer Technologies (C5) Other Transaction Agreement (OTA). Phase 1 will build two (2) MFEW-AL systems to demonstrate select OEA and ES capabilities. Phase 2 will build four (4) EMD systems for testing, evaluation, qualification and certification, verification of OEA, ES, MISO and OCO performance capabilities, and flight testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX6 / *Multi-Function Electronic Warfare (MFEW)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Support - MFEW Air	Various	PM Electronic Warfare & Cyber (PM EW&C) : Aberdeen Proving Ground, MD	1.696	0.008	Jan 2020	0.040	Jan 2021	0.200	Jan 2022	-		0.200	0.000	1.944	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.131		-		-		-		-	0.000	0.131	-
FY21 ABO Adjustment Pending	TBD	ABO : ABO	-	-		0.937	Feb 2021	-		-		-	0.000	0.937	-
		Subtotal	1.696	0.139		0.977		0.200		-		0.200	0.000	3.012	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MFEW OTA Prototype Design&Development Contract	C/FFP	C5 Consortium OTA : Acquisition Contracting Center-New Jersey	25.100	-		-		-		-		-	0.000	25.100	-
Command and Control Development Contract	C/CPFF	EWPMT / APP EW : Aberdeen Proving Ground, MD	0.457	-		-		-		-		-	0.000	0.457	-
MFEW Techniques and risk reduction activities	C/CPFF	Various (JHU, GTRI, MITRE, etc) : Aberdeen Proving Ground, MD	1.759	-		-		-		-		-	0.000	1.759	-
MFEW OTA EMD Contract	C/FFP	C5 Consortium OTA : Acquisition Contracting Center-New Jersey	7.927	24.439	Feb 2020	35.315	Feb 2021	5.367	Nov 2021	-		5.367	0.000	73.048	-
Gray Eagle Integration	Option/ CPFF	General Atomics : San Diego, CA	0.972	1.289	Jan 2020	-		-		-		-	0.000	2.261	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX6 / *Multi-Function Electronic Warfare (MFEW)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Logistics Development	SS/CPFF	Lockheed Martin Corporation : Owego, NY	-	-		3.907	Jan 2021	0.850	Jan 2022	-		0.850	0.000	4.757	-
		Subtotal	36.215	25.728		39.222		6.217		-		6.217	0.000	107.382	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering - MFEW Air	C/CPFF	Various : Aberdeen Proving Ground, MD	2.750	0.639	Dec 2019	0.307	Dec 2020	-		-		-	0.000	3.696	-
Matrix Engineering - MFEW Air	Various	Various : Aberdeen Proving Ground, MD	1.858	1.192	Dec 2019	1.029	Dec 2020	1.203	Dec 2021	-		1.203	0.000	5.282	-
		Subtotal	4.608	1.831		1.336		1.203		-		1.203	0.000	8.978	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test range and test support	Various	Yuma Proving Grounds : Yuma, AZ	0.628	1.618		-		1.900	Jan 2022	-		1.900	0.000	4.146	-
Modeling & Simulation / Test Infrastructure	Various	Various : Aberdeen Proving Ground, MD	10.790	-		-		-		-		-	0.000	10.790	-
Limited User Test	TBD	Army Test Command : Aberdeen Proving Ground, MD	-	-		-		2.500	Jan 2022	-		2.500	0.000	2.500	-
		Subtotal	11.418	1.618		-		4.400		-		4.400	0.000	17.436	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) DX6 / *Multi-Function Electronic Warfare (MFEW)*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.937	29.316		41.535		12.020		-		12.020	0.000	136.808	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX6 / *Multi-Function Electronic Warfare (MFEW)*

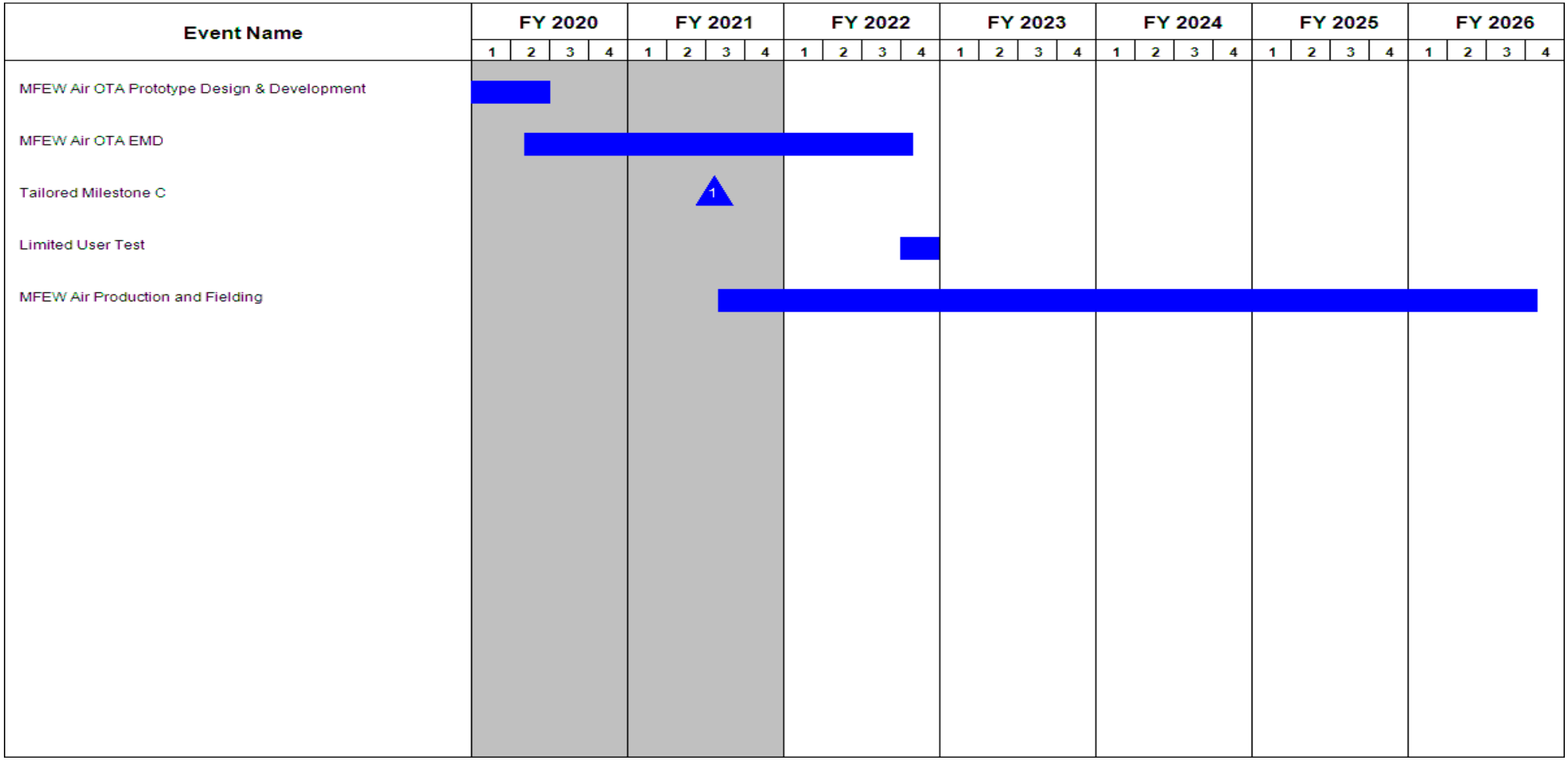


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** DX6 / *Multi-Function Electronic Warfare (MFEW)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Tailored Milestone B	3	2018	3	2018
MFEW Air OTA Award	4	2018	4	2018
MFEW Air OTA Prototype Design & Development	4	2018	2	2020
MFEW Air OTA EMD	2	2020	4	2022
Tailored Milestone C	3	2021	3	2021
Limited User Test	4	2022	4	2022
MFEW Air Production and Fielding	3	2021	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) VS6 / *Integrated Electronic Warfare Systems*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
VS6: *Integrated Electronic Warfare Systems*	-	5.227	1.994	2.007	-	2.007	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides protection of ground forces operating in vehicle convoys, single vehicles and fixed locations in operational theaters which enables freedom of movement across the depth and breadth of the operational environment. Current CREW systems are programmable with techniques to mitigate emerging threats. In order to keep pace with the threat evolution, development efforts will provide fielded CREW systems as well as other Electronic Warfare (EW) systems with techniques that mitigate the range of threats as required. These development efforts may include development of new techniques, integration of existing techniques, as well as hardware and software development and integration in order to pace the threat.

Justification:

Fiscal Year (FY) 2022 Base funding in the amount of $2.007 million funds the continued support of CREW systems as well as other EW systems with techniques that mitigate the range of threats as required. These efforts include development of new techniques, integration of existing techniques, as well as hardware and software enhancement and integration in order to pace the threat.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: IEWS - CREW	5.227	1.994	2.007
Description: The Integrated Electronic Warfare System (IEWS) will provide multiple capabilities, to include but not limited to, Electronic Warfare Planning and Management Tool (EWPMT), Multi-Function EW (MFEW), and Defensive Electronic Warfare (DEW). The Army's only current Defensive Electronic Warfare solution is Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW).			
FY 2021 Plans: Continue IEWS development of new techniques, integration of existing techniques, and hardware and software development and integration in order to pace the threat.			
FY 2022 Plans: Continue IEWS development of new techniques, integration of existing techniques, and hardware and software development and integration in order to pace the threat.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** VS6 / *Integrated Electronic Warfare Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding slightly increased to continue support of IEWS development of new techniques, integration of existing techniques, and hardware and software development and integration in order to pace the threat.			
Accomplishments/Planned Programs Subtotals	5.227	1.994	2.007

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

VS6 funding supports hardware and software enhancement and integration to pace the threat and will leverage Other Government Agencies' competitively awarded contracts and task orders.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) VS6 / *Integrated Electronic Warfare Systems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Staff/Travel for EWPMT	Allot	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	4.956	-		-		-		-		-	0.000	4.956	-
Program and Technical Assistance support	C/CPFF	TBD : Aberdeen Proving Ground, MD	3.789	-		-		-		-		-	0.000	3.789	-
PMO Staff/Travel for CREW	Allot	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	2.781	0.099	Dec 2019	0.020	Dec 2020	0.020	Dec 2021	-		0.020	0.000	2.920	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.023		-		-		-		-	0.000	0.023	-
		Subtotal	11.526	0.122		0.020		0.020		-		0.020	0.000	11.688	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD Contract - EWPMT	C/CPIF	SOTERA Defense Solutions Herndon, VA : RAYTHEON Fort Wayne, IN	38.318	-		-		-		-		-	0.000	38.318	-
IEWS Engineering and Development	MIPR	I2WD : Aberdeen Proving Ground, MD	5.557	-		1.974	Dec 2020	1.987	Dec 2021	-		1.987	0.000	9.518	-
Risk Reduction Studies for MFEW	MIPR	Various : Various	7.969	-		-		-		-		-	0.000	7.969	-
Develop CREW H/W and S/W solutions	C/CPFF	SRC, Inc. : Syracuse, NY	27.133	-		-		-		-		-	0.000	27.133	-
Development of H/W and S/W for CREW and other EW systems	SS/CPFF	Various : Various	-	4.118	Feb 2020	-		-		-		-	0.000	4.118	-
		Subtotal	78.977	4.118		1.974		1.987		-		1.987	0.000	87.056	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / *Electronic Warfare Development*	Project (Number/Name) VS6 / *Integrated Electronic Warfare Systems*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MFEW Technical/ Engineering Support - Contractor	C/CPFF	GTRI : Atlanta, GA	2.046	-		-		-		-		-	0.000	2.046	-
Matrix Engineering Support	MIPR	CERDEC : Aberdeen Proving Ground, MD	7.617	0.149	Dec 2019	-		-		-		-	0.000	7.766	-
EWPMT Architecture Study	MIPR	Various : Various	1.194	-		-		-		-		-	0.000	1.194	-
Engineering support	C/CPFF	Various : Various	3.207	0.838	Dec 2019	-		-		-		-	0.000	4.045	-
FY 2019 MDAP Tax	TBD	FY 2019 Pending Rescission : FY 2019 Pending Rescission	0.006	-		-		-		-		-	0.000	0.006	-
		Subtotal	14.070	0.987		-		-		-		-	0.000	15.057	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Test support	MIPR	Various : TBD	1.096	-		-		-		-		-	0.000	1.096	-
Operational Assessment (OA) of DV4 systems	MIPR	Yuma Proving Ground : Yuma, AZ	1.950	-		-		-		-		-	0.000	1.950	-
Continous evaluation of CREW Technologies	MIPR	Yuma Proving Ground Yuma, AZ : YPG, AZ	1.718	-		-		-		-		-	0.000	1.718	-
		Subtotal	4.764	-		-		-		-		-	0.000	4.764	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	109.337	5.227		1.994		2.007		-		2.007	0.000	118.565	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** VS6 / *Integrated Electronic Warfare Systems*

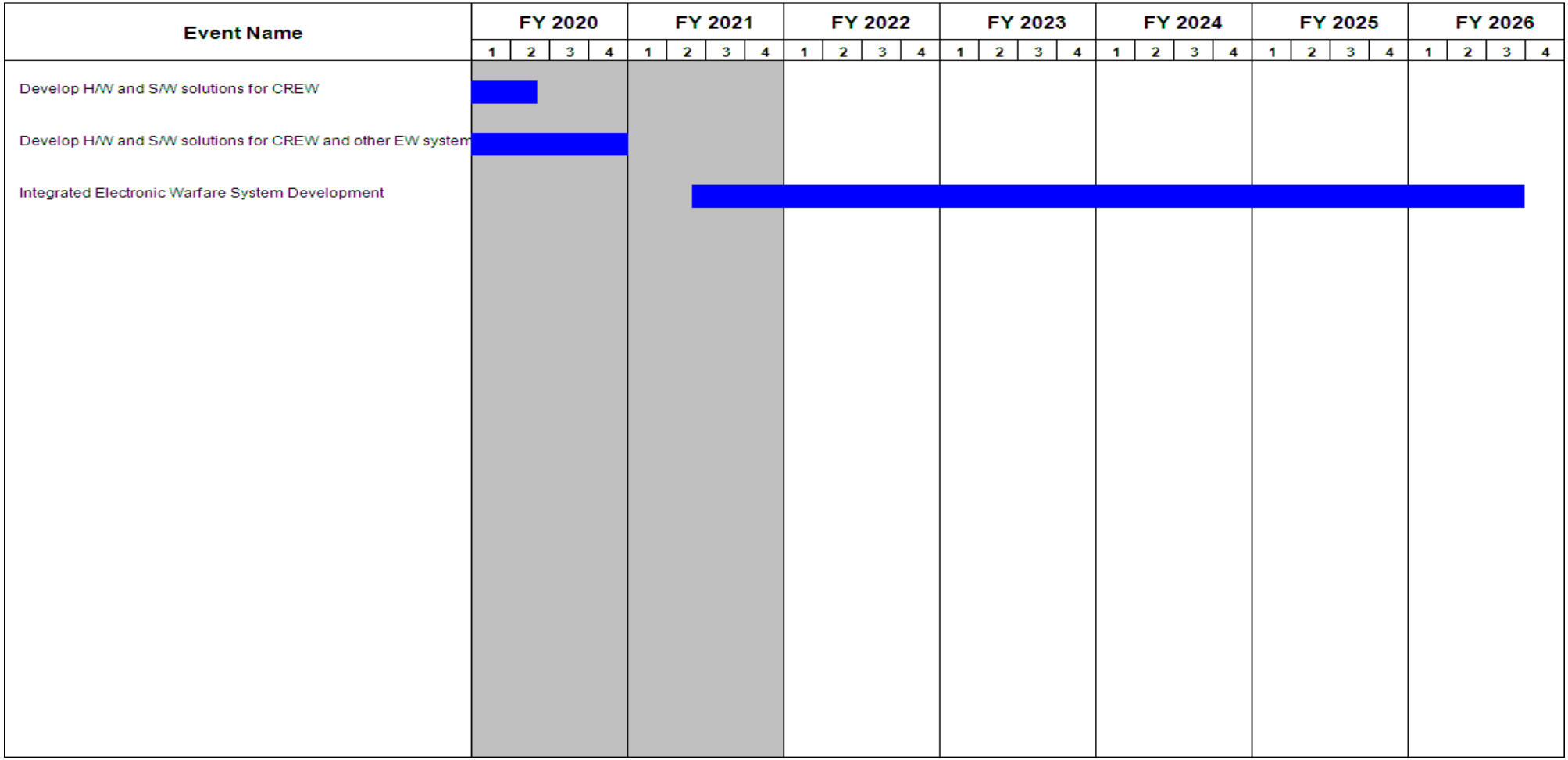


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604270A / *Electronic Warfare Development*	**Project (Number/Name)** VS6 / *Integrated Electronic Warfare Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Develop H/W and S/W solutions for CREW	2	2016	2	2020
Secondary Unit Development	3	2018	4	2019
Develop H/W and S/W solutions for CREW and other EW systems	4	2019	4	2020
Integrated Electronic Warfare System Development	2	2021	3	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	86.154	88.552	67.873	-	67.873	-	-	-	-	-	-
CF3: *Integrated Soldier Systems (SL CFT)*	-	6.818	4.429	4.371	-	4.371	-	-	-	-	-	-
ES9: *Advanced Tactical Parachute System*	-	6.345	1.761	2.705	-	2.705	-	-	-	-	-	-
EW4: *Crew Served Weapons Engineering Development*	-	3.982	9.608	2.443	-	2.443	-	-	-	-	-	-
FF2: *Small Arms Fire Control*	-	14.095	9.782	11.107	-	11.107	-	-	-	-	-	-
FI2: *Lightweight 30mm Cannon*	-	1.327	-	-	-	-	-	-	-	-	-	-
FL8: *84mm MAAWS Ammunition*	-	3.874	3.017	6.117	-	6.117	-	-	-	-	-	-
FM4: *Next Generation Squad Weapons*	-	31.719	32.001	13.599	-	13.599	-	-	-	-	-	-
S58: *Soldier Enhancement Program*	-	-	9.000	3.655	-	3.655	-	-	-	-	-	-
S60: *Clothing & Equipment*	-	6.188	6.472	5.393	-	5.393	-	-	-	-	-	-
S61: *Acis Engineering Development*	-	2.865	1.790	2.528	-	2.528	-	-	-	-	-	-
S63: *Individual Weapons Engineering Development*	-	2.586	4.214	3.651	-	3.651	-	-	-	-	-	-
S70: *Personnel Recovery Support System (PRSS)*	-	-	-	3.132	-	3.132	-	-	-	-	-	-
VS5: *Soldier Protective Equipment*	-	6.355	6.478	9.172	-	9.172	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) Engineering and Manufacturing Development (EMD) manages the Soldier as a system, with the goal of increasing Soldiers' combat effectiveness, increasing survivability, and improving the Soldiers' quality of life. It develops and tests prototypes of weapons, clothing, equipment, and other items useful to support the Soldier.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*

Project CF3 (Integrated Soldier Systems (SL CFT)) supports the Adaptive Soldier Architecture (ASA) effort that will develop a full system architecture for the Soldier and the Squad. The focus will be full integration of all mission-specific equipment into the ASA as well as full configuration management of the Configuration Database, Architecture Assessment Tool and Squad Performance Model.

Project ES9 (Advanced Tactical Parachute System) improves personnel parachute systems and associated equipment for low and high altitude operations to include canopy improvements based on integration of new technology with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.

Project EW4 (Crew Served Weapons Engineering Development) supports efforts to transition components or prototypes from Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) and other domestic and foreign sources of small arms weapons to demonstrate, test and evaluate capability near or at planned operational requirements.

Project FF2 (Small Arms Fire Control) supports the development of an advanced fire control for the Next Generation Automatic Rifle (NGSW-AR) and Rifle (NGSW-R). The Next Generation Fire Control will increase the probability of hit and decrease the time to engage through a variable powered direct view optic with integrated range finder, ballistic calculator, and digital display capable of providing an adjusted aim point.

Project FI2 (Lightweight 30mm Cannon) provides increased lethality modification to Product Directorate Counter-Rocket Artillery Mortars (PD C-RAM) under a JUONS. An upgraded medium caliber weapon will be developed, tested and evaluated for integration into a modified remote weapon station under an Urgent Materiel Release (UMR).

Project FL8 (84mm MAAWS Ammunition) supports test, evaluation and quality up to seven types of 84 millimeter (mm) munitions for the U.S. Army use with the M3/ M3A1 Multi-Role Anti-Personnel Weapon Systems (MAAWS).

Project FM4 (Next Generation Squad Weapons) supports the rapid prototyping and development of a NGSW-AR, NGSW-R and common cartridge to provide capability improvements in accuracy, range and lethality, in order to maintain overmatch and meet future warfighter requirements.

Project S58 (Soldier Enhancement Program) supports accelerated integration, modernization, and enhancement efforts of lighter, more lethal weapons, and improved Soldier items including lighter, more comfortable load-bearing equipment, field gear, survivability items, communications equipment, and navigational aids.

Project S60 (Clothing & Equipment) supports pre-production development of state-of-the-art individual clothing and equipment to improve the survivability, mobility and sustainment affecting the quality of life of the individual Soldier.

Project S61 (Acis Engineering Development) provides System Development programs with improved aviator safety, survivability, and human performance that amplify the warfighting effectiveness and facilitates full-spectrum dominance of the Army aircraft including the AH-64 Apache/Longbow, CH-47 Chinook, UH/HH-60 Blackhawk, Light Utility Helicopter, and Armed Reconnaissance Helicopter.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604601A *I Infantry Support Weapons*

Project S63 (Individual Weapons Engineering Development) demonstrates engineering development models or integrated commercial items designed to enhance lethality, target acquisition, fire control, training effectiveness, and reliability for small arms weapon systems and ammunition. Programs include Improved Weapons Coatings, Personal Defense Weapon, 30 Round 5.56mm Magazine, Modular Handgun System (MHS), Precision Sniper Rifle (PSR), Sub Compact, and Interim Combat Service Rifle (ICR).

Project S70 (Personnel Recovery Support System (PRSS)) provides system research, development and testing of the Personal Recovery Support System/Personnel Recovery Support Equipment supporting operations to report and locate isolated, missing, detained or captured Soldiers.

Project VS5 (Soldier Protective Equipment) supports engineering and manufacturing development of Individual Soldier Ballistic Protection equipment. It will leverage advancements in technology to continue incremental improvements to body armor (to include improved outer tactical vests, plate carriers, and helmets) and other personal protective equipment.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	87.179	91.574	61.328	-	61.328
Current President's Budget	86.154	88.552	67.873	-	67.873
Total Adjustments	-1.025	-3.022	6.545	-	6.545
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-14.236			
• Congressional Rescissions	-	-			
• Congressional Adds	-	14.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.500	-			
• SBIR/STTR Transfer	-3.525	-3.286			
• Adjustments to Budget Years	-	-	6.545	-	6.545

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: EW4: *Crew Served Weapons Engineering Development*		
Congressional Add: *FY 2020 Congressional Add: Cannon Life Extension Program*	1.500	1.500
Congressional Add: *Program increase - turret gunner survivability and simulation environment*	-	4.000
Congressional Add Subtotals for Project: EW4	1.500	5.500
Project: S58: *Soldier Enhancement Program*		
Congressional Add: *Program increase - soldier enhancement program*	-	9.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604601A *I Infantry Support Weapons*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add Subtotals for Project: S58	-	9.000
Congressional Add Totals for all Projects	1.500	14.500

Change Summary Explanation

$3.700 million of FY22 will be realigned to APE 654601S58, Soldier Enhancement Program due to subsequent to the DD1 decision to defund SEP, the AFC Commander has directed that SEP funding be restored in order to carry out both the CSA's as well as Congressional intent - reversing the DD1 defunding decision. The total increase of $6.970 million, is cumulated across several projects. The increase will support re-phasing to accelerate development and test of new waveforms and hardware for the PRSE system, project S70. Also, the increase supports anticipated FY22 requirements changes in project ES9. Finally, the increase will allow project FL8 to complete delayed delta testing of existing rounds, and complete production qualification testing.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) CF3 / *Integrated Soldier Systems (SL CFT)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
CF3: *Integrated Soldier Systems (SL CFT)*	-	6.818	4.429	4.371	-	4.371	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Adaptive Squad Architecture (ASA), Squad Performance Metrics (SPM) and Soldier Integration Facility (SIF) are Program Executive Office-Soldier (PEO-S) led efforts which will allow optimization of "Soldiers as Integrated Weapons Systems" and "Squad as an Integrated Combat Platform". The CF3 ASA focus will be the system-of-systems full virtual integration of all mission-specific equipment as well as full configuration management of the Configuration Database (CD), Architecture Assessment Tool (AAT) (ASA/SPM/SIF CF2 focuses on system level virtual, constructive and live prototyping integration). The SPM SF3 focus is adapting mature technologies and metrics at the Soldier and Squad levels to enhance human performance during training and operational events. The SIF CF3 focus is both team and squad level constructive and live experimentation to support ongoing PEO-S and Soldier Lethality Cross Functional Team optimization priorities. The ASA/SPM/SIF will develop a metric-based approach that will include virtual, constructive and live evaluations and tools across the Department of Defense (DoD), academia and industry which will be used for senior leaders to make deliberate decisions based on the analysis of Soldier/Squad performance. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Integrated Soldier Systems	6.818	4.429	4.371
Description: Test, maintain and evolve a Soldier/squad equipment configuration baseline and conduct configuration management at the system level. Physically integrate components, improve compatibility and interoperability across programs. Establish and maintain tools that provide Systems Engineering, Configuration Management and Evaluation in a virtual and physical environment. Conduct Squad Performance Metric (SPM) evaluations and integrate mission-specific equipment into the Adaptive Squad Architecture (ASA) with continued emphasis on development of ICDs, evaluations, and improved fidelity of the SPM. ***FY 2021 Plans:*** Continue the integration of mission-specific equipment with other combat platforms into initial version of ASA. Continue evaluations in support of the SPM. ***FY 2022 Plans:*** Continue to develop and integrate mission-specific equipment with other combat platforms into initial version of ASA. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY22 Decrease due to reduction in overall funding.			
Accomplishments/Planned Programs Subtotals	6.818	4.429	4.371

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** CF3 / *Integrated Soldier Systems (SL CFT)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• CF2: *Integrated Soldier Systems Prototyping (SL CFT)*	1.878	2.449	3.111	-	3.111	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

PEO Soldier will utilize available Adaptive Squad Architecture (ASA) and Squad Performance Metrics (SPM) tools plus exercise the SIF with Team level and Squad level experimentation to assess system-of-systems capabilities for evaluation and integration, using current Systems Engineering and Technical Assistance (SETA) contracts, Federally Funded Research and Development Center personnel (FFRDCs) as necessary, plus tools/deliverables built under project CF2. The ASA/SPM/SIF will develop a metric-based approach that will include virtual, constructive and live evaluations and tools across the Department of Defense (DoD), academia and industry which will be used for senior leaders to make deliberate decisions based on the analysis of Soldier/Squad performance. The PEO will utilize project CF3 to leverage any data, architectural products or designs from the IVAS program and other PEO-S and Soldier Lethality Cross Functional Team priorities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) CF3 / *Integrated Soldier Systems (SL CFT)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.219		-		0.219	0.000	0.219	-
		Subtotal	-	-		-		0.219		-		0.219	0.000	0.219	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASA and SPM Engineering, Manufacturing, Development	MIPR	TBD : Various	-	4.735	Jan 2020	1.711	Jan 2021	0.886	Jan 2022	-		0.886	0.000	7.332	-
		Subtotal	-	4.735		1.711		0.886		-		0.886	0.000	7.332	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASA/SPM/SIF evaluations	MIPR	Various : To Be Determined	-	2.083	Jan 2020	2.718	Jan 2021	3.266	Jan 2022	-		3.266	0.000	8.067	-
		Subtotal	-	2.083		2.718		3.266		-		3.266	0.000	8.067	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.818		4.429		4.371		-		4.371	0.000	15.618	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** CF3 / *Integrated Soldier Systems (SL CFT)*

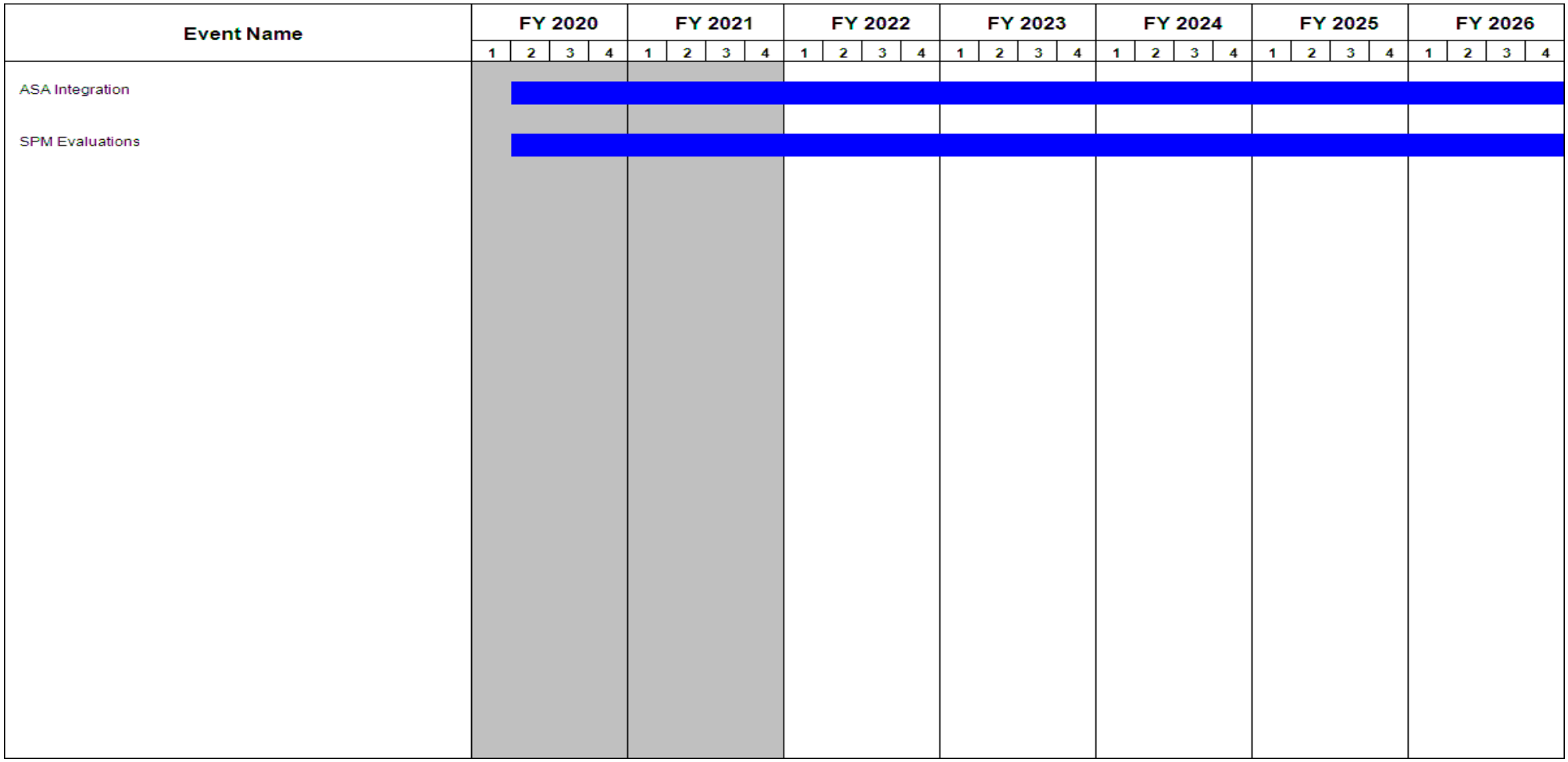


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** CF3 / *Integrated Soldier Systems (SL CFT)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ASA Integration	2	2020	4	2026
SPM Evaluations	2	2020	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*				Project (Number/Name) ES9 / *Advanced Tactical Parachute System*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
ES9: *Advanced Tactical Parachute System*	-	6.345	1.761	2.705	-	2.705	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. Advanced Tactical Parachute System funding improves Low Altitude and High Altitude personnel parachutes and associated equipment to include test and evaluation of items transitioning from Advanced Component Development and prototype (6.4) efforts, with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment. Funds improvements and testing/evaluation of personnel parachute systems includes integration and interface on the Soldier system. This project will continue to support cross-service initiatives to improve commonality.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Advanced Tactical Parachute System	6.345	1.761	2.705
Description: Advanced Tactical Parachute System funds improvements and testing/evaluation of personnel parachute systems. Project supports improved Low Altitude and High Altitude personnel parachute systems and associated equipment to include test and evaluation of items transitioning from Advance Component Development and prototype (6.4) efforts, with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.			
FY 2021 Plans: Complete Operational Testing (OT) for the Enhanced Electronic Automatic Activation Device (EEAAD) in support of MS C decision and Full Material Release (FMR). Initiate program to develop Parachutist Emergency Release System (PERS). Continue to conduct testing for service life extension for T-11 parachutes, automated parachute management tracking system integration for personnel parachute systems, and upgrades to support enhanced standoff parachute insertion capabilities. Continue software improvements for the Parachutist Navigation System (PARANAVSYS) and continue to conduct OT for Parachutist Flotation Device (PFD).			
FY 2022 Plans: Initiate Developmental Testing (DT) for PERS. Continue to conduct testing for service life extension for the T-11 parachute. Enhance high and low altitude insertion capabilities, software improvements for PARANAVSYS, and continue to support modernization initiatives to parachute systems and ancillary equipment.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** ES9 / *Advanced Tactical Parachute System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding increase in Advanced Tactical Parachute System portfolio is due to anticipated requirements changes in FY2022.			
Accomplishments/Planned Programs Subtotals	6.345	1.761	2.705

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• MA7801: *Advanced Tactical Parachute System*	42.622	53.021	38.159	-	38.159	-	-	-	-	-	-
• ET8: *Personnel Airdrop System Development*	0.285	1.219	1.155	-	1.155	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Acquisition strategies for these programs vary in methods, and range from: 1) Material Change programs that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of complexity and testing required.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) ES9 / *Advanced Tactical Parachute System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Contracts	C/FFP	Various : Various	8.571	2.240		0.455		0.823		-		0.823	6.335	18.424	Continuing
Dev Sys Engineering Spt	MIPR	Various : Various	0.600	0.450		0.700		0.348		-		0.348	1.190	3.288	Continuing
		Subtotal	9.171	2.690		1.155		1.171		-		1.171	7.525	21.712	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support Costs	MIPR	NSRDEC : Natick, MA	0.966	0.434		0.306		0.293		-		0.293	0.491	2.490	Continuing
		Subtotal	0.966	0.434		0.306		0.293		-		0.293	0.491	2.490	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT/OT	MIPR	various : various	4.149	3.221		0.300		1.241		-		1.241	4.913	13.824	Continuing
		Subtotal	4.149	3.221		0.300		1.241		-		1.241	4.913	13.824	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.286	6.345		1.761		2.705		-		2.705	12.929	38.026	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** ES9 / *Advanced Tactical Parachute System*

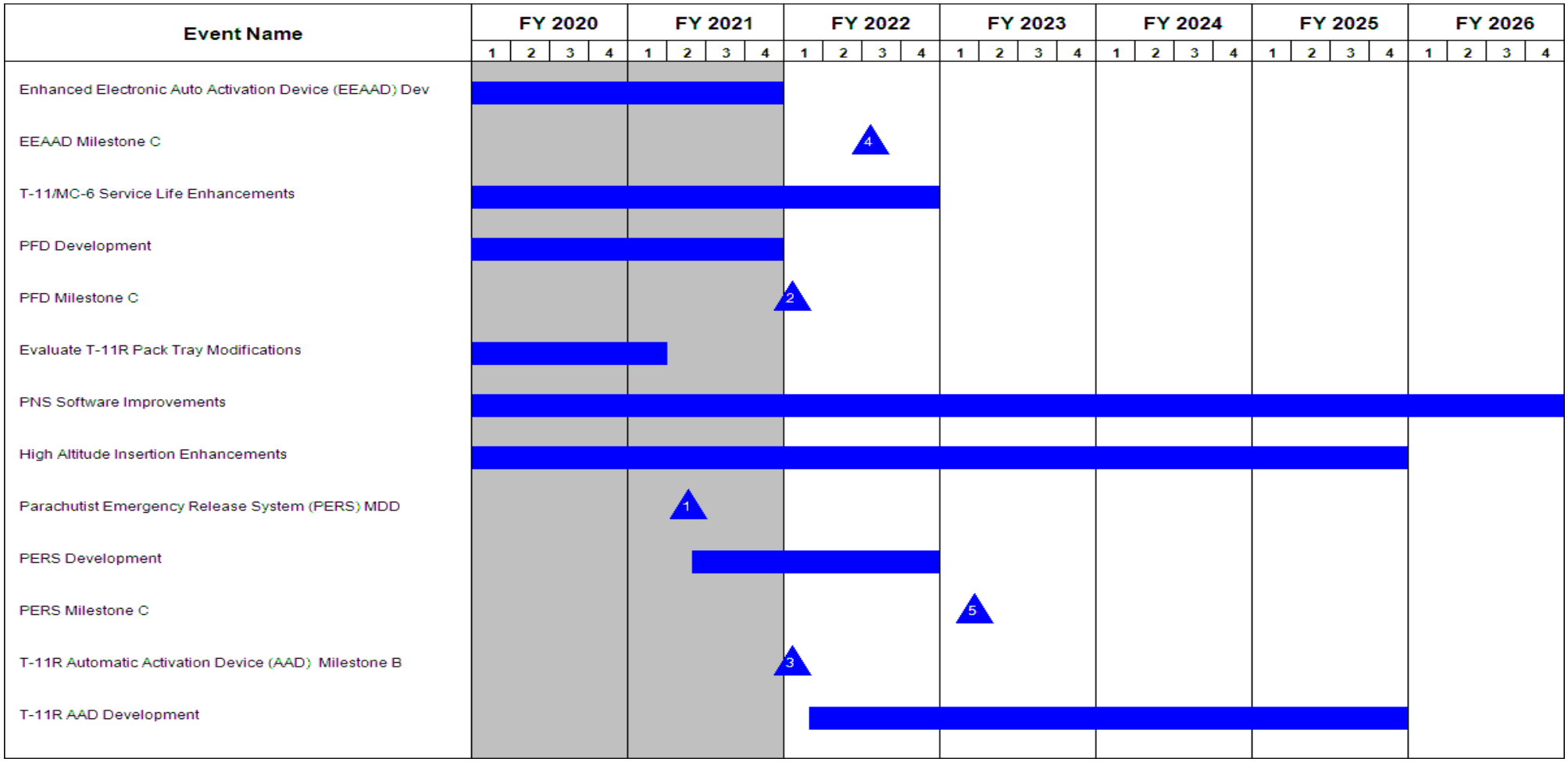


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** ES9 / *Advanced Tactical Parachute System*

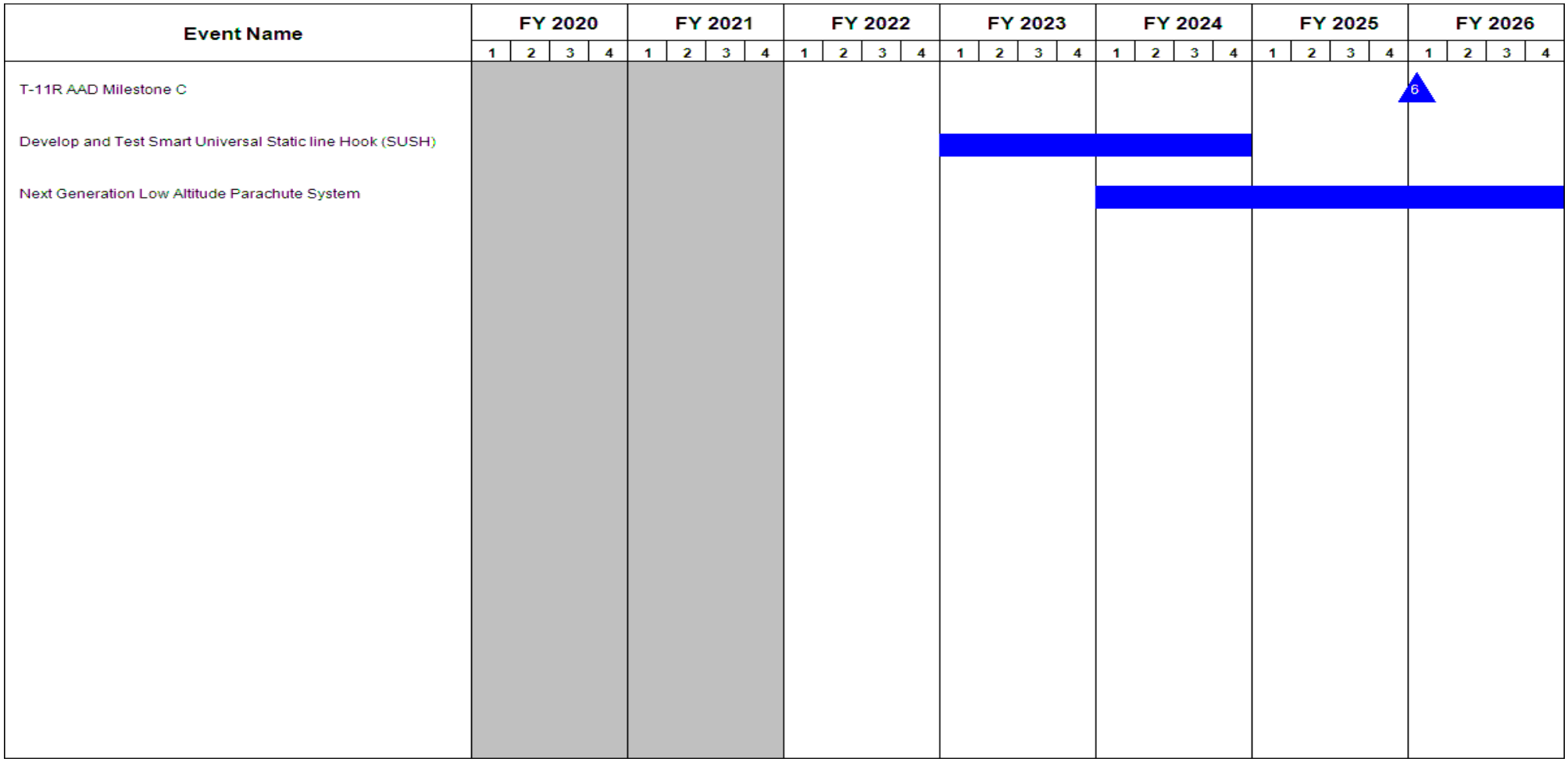


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** ES9 / *Advanced Tactical Parachute System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Enhanced Electronic Auto Activation Device (EEAAD) Dev	1	2019	4	2021
EEAAD Milestone C	3	2022	3	2022
T-11/MC-6 Service Life Enhancements	1	2019	4	2022
PFD Development	3	2019	4	2021
PFD Milestone C	1	2022	1	2022
Evaluate T-11R Pack Tray Modifications	1	2020	1	2021
PNS Software Improvements	1	2020	4	2026
High Altitude Insertion Enhancements	1	2019	4	2025
Parachutist Emergency Release System (PERS) MDD	2	2021	2	2021
PERS Development	2	2021	4	2022
PERS Milestone C	1	2023	1	2023
T-11R Automatic Activation Device (AAD) Milestone B	1	2022	1	2022
T-11R AAD Development	1	2022	4	2025
T-11R AAD Milestone C	1	2026	1	2026
Develop and Test Smart Universal Static line Hook (SUSH)	1	2023	4	2024
Next Generation Low Altitude Parachute System	1	2024	4	2026

Note

Note: Towed Jumper Retrieval System (TJRS) is now Parachutist Emergency Release System (PERS).

High Altitude Insertion Enhancements includes the following programs: Glide Augmentation, Situational Awareness Aids, High Altitude Combo Drops, GPS Denied Navaid, Glide Modulation, C-17 Over the Ramp (OTR), Riser Improvement, Above 25K Operations, Low Observables, and Reserve Deployment Bag.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) EW4 / *Crew Served Weapons Engineering Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EW4: *Crew Served Weapons Engineering Development*	-	3.982	9.608	2.443	-	2.443	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Crew Served Weapons Engineering and Manufacturing Development (EMD) program provides funds to transition components or prototypes from Budget Activity 4 (BA 4) Program Element (PE) 0603827A Soldier Systems - Advanced Development Project S54 Small Arms Improvement and other domestic and foreign sources of small arms weapon systems to demonstrate, test and evaluate capability near or at planned operational requirements. Crew Served Weapons systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on system improvements designed to enhance lethality, target acquisition, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include system development, integration (to include human-systems), demonstration, test and evaluate components, prototypes and operational system prototypes of small arms weapon systems and/or enhancements. Benefits include continuous improvements to small arms weapon systems, fire control equipment, optics, gun barrels, ancillary equipment, training devices, component mounts, weapon mounts, and weapon/ammunition interface of current small arms fleet or new weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Design and Development	-	1.813	1.193
FY 2021 Plans: M3/M3E1 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS): Start operational and qualification test efforts required to obtain Type Classification and Full Materiel Release (TC/FMR) of the M3E1 and Fire Control. Continue to evaluate, test and qualify selected capabilities and improvements for the M3E1 weapon and Fire Control systems to include Smart Rail integration and Fire Control thermal magnification efforts. Ammunition Upgrades: Continue to test, evaluate and analyze the effect of current and new ammunition on Crew Served Weapons. Specific focus on alignment of requirements between crew served fire control and 40 millimeter (mm) air burst munitions. Mounted Machinegun Optic (MMO): Utilized for qualification testing supporting Type Classification/Full Materiel Release (primarily Operational Testing and environmental requirement validation) and Test Integrated Product Team support. These funds will also go towards initiating the Pre-Planned Product Improvement for the Mk19 MMO Variant to integrate with the High Explosive Dual Purpose-Airburst (HEDP-AB) programmable round.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Advanced Combat Optics: Continue engineering evaluations, verification and validation of weapon optics performance requirements, covert target isolation and hand-off. New and Legacy Weapon Systems Design and Development: Continue to explore new technologies and perform initial evaluations and assessments required to facilitate rapid acquisition of increased capabilities where applicable. ***FY 2022 Plans:*** M3/M3E1 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS): Will complete all operational and qualification test efforts required to obtain Type Classification and Full Materiel Release (TC/FMR) of the M3E1 and Fire Control. Will continue to evaluate, test and qualify selected capabilities and improvements for the M3E1 weapon and Fire Control systems to include Smart Rail integration and Fire Control thermal magnification efforts. Mounted Machinegun Optic (MMO): Will continue MMO pre-planned product improvement (PPPI) R&D efforts for integration with High Explosive Dual Purpose (HEDP) airburst programmer ammo. Advanced Combat Optics: Will continue engineering evaluations, verification and validation of weapon optics performance requirements, covert target isolation and hand-off. New and Legacy Weapon Systems Design and Development: Will continue to explore new technologies and perform initial evaluations and assessments required to facilitate rapid acquisition of increased capabilities where applicable. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY22 Decrease due to reduction in overall funding.			
Title: Test and Evaluation ***FY 2021 Plans:*** New and Legacy Weapon Test and Evaluation: Continue to test and evaluation new technology that can lead to enhancements of current and legacy weapon systems or create new weapon systems, as well as advanced combat optics and improvement of small arms munitions. ***FY 2022 Plans:*** New and Legacy Weapon Test and Evaluation: Will continue to test and evaluation new technology that can lead to enhancements of current and legacy weapon systems or create new weapon systems, as well as advanced combat optics and improvement of small arms munitions. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	2.295	1.250

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY22 Decrease due to reduction in overall funding.			
Title: New Weapon Systems ***Description:*** Development of new crew served weapons	1.191	-	-
Title: Crew Served Weapons Enhancements ***Description:*** Enhancements and developments of Crew Served weapons	0.810	-	-
Title: Ammunition ***Description:*** Improvement of Crew Served Weapons Ammunition	0.025	-	-
Title: Combat Optics ***Description:*** Improvement of Combat Optics	0.421	-	-
Title: Research and Analysis ***Description:*** Market Research and Cost Benefit Analysis	0.035	-	-
Accomplishments/Planned Programs Subtotals	2.482	4.108	2.443

	FY 2020	FY 2021
Congressional Add: FY 2020 Congressional Add: Cannon Life Extension Program	1.500	1.500
FY 2020 Accomplishments: Develop a full length medium, and small caliber chromium free manufacturing process to extend the life of barrels, cut costs, and enhance the warfighter?s lethality requirements. Develop manufacturing technologies that enable the affordable production and sustainment of future weapon systems. Utilize an explosive cladding process to apply a tantalum tungsten alloy (Ta-10W) protective bore coating. ***FY 2021 Plans:*** Advance and optimize the explosive bonding process of tantalum-tungsten alloy liners to create improved, longer life small and medium caliber barrels. Investigate alternative rifling methods (i.e. pressure form, roller form, waterjet) for tantalum lined barrels. Develop manufacturing technologies that enable the affordable production and sustainment of future weapon systems.		
Congressional Add: Program increase - turret gunner survivability and simulation environment	-	4.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

	FY 2020	FY 2021
FY 2021 Plans: Develop smart, full-scale, virtual and augmented reality simulation environments for next-generation of Gunner protection kits that will significantly enhance the operational evaluation of turret designs in a secure, immersive, navigable, and interactive arena. Develop and install simulation environments that will lead to advanced and affordable engineered solutions while accelerating the development lifecycle through reduced design iterations and physical prototyping.		
Congressional Adds Subtotals	1.500	5.500

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• S54: *Small Arms Improvement*	13.956	15.495	6.911	-	6.911	-	-	-	-	-	-
• FL8: *84mm MAAWS Ammunition*	3.874	3.017	6.117	-	6.117	-	-	-	-	-	-
• FM4: *Next Generation Squad Weapons*	31.719	32.001	13.599	-	13.599	-	-	-	-	-	-
• GZ1500: *Sniper Rifles Modifications*	2.426	1.898	-	-	-	-	-	-	-	-	-
• GZ1300: *M240 Medium Machine Gun MODS*	6.400	6.385	-	-	-	-	-	-	-	-	-
• GB3000: *MK-19 Grenade Machine Gun MODS*	4.477	6.444	13.027	-	13.027	-	-	-	-	-	-
• GB4000: *M2 50 Cal Machine Gun MODS*	6.090	-	3.612	-	3.612	-	-	-	-	-	-
• GC0925: *Modifications Less Than $5.0m (WOCV-WTCV)*	5.187	2.604	-	-	-	-	-	-	-	-	-
• GL3200: *Items Less Than $5.0m (WOCV-WTCV)*	3.066	2.763	1.068	-	1.068	-	-	-	-	-	-
• G13000: *M240 Medium Machine Gun (7.62mm)*	12.500	12.500	-	-	-	-	-	-	-	-	-
• G01506: *Precision Sniper Rifle*	5.747	8.895	11.040	-	11.040	-	-	-	-	-	-
• G13101: *MULTI-ROLE ANTI-ARMOR ANTI-PERSONNEL WEAPON SYSTEM*	19.264	22.629	31.623	-	31.623	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

In support of Small Arms Requirements, components or prototypes developed in BA 4 PE 0603827A Soldier Systems - Advanced Development Project S54 Small Arms Improvement transition to BA 5 PE 0604601A Infantry Support Weapons Project EW4 Crew Served Weapons Engineering Development to conduct engineering and manufacturing development. Once the component, prototype or operational prototype achieves Milestone C and type classification the item transitions to small arms weapon systems production or modification programs.

In FY 2022, funding in the amount of $0.366 million for manpower was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

D. Acquisition Strategy

Primary strategy is to mature and finalize design efforts, award Research, Development, Test and Evaluation (RDT&E) Department of Defense Ordnance Technology Consortium (DOTC) and other OTA type hardware contracts. Test and evaluate systems that result in type classification, material release, and follow-on production contract awards.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) EW4 / *Crew Served Weapons Engineering Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Weapons, : Picatinny Arsenal	1.766	-		-		0.100		-		0.100	Continuing	Continuing	Continuing
Travel	MIPR	PM Soldier Weapons, : Picatinny Arsenal	0.355	0.010	Mar 2020	0.013	Mar 2021	0.010	Mar 2022	-		0.010	Continuing	Continuing	Continuing
FY2019 SBIR / STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	0.984	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	3.105	0.010		0.013		0.110		-		0.110	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fabrication	Various	Various : Multiple Contractors	4.934	0.285	Mar 2020	0.300	Mar 2021	0.100	Mar 2022	-		0.100	Continuing	Continuing	Continuing
Hardware Development	MIPR	Army Research Development Engineers Centers : Multiple	19.855	0.035	Mar 2020	4.245	Mar 2021	0.977	Mar 2022	-		0.977	Continuing	Continuing	Continuing
		Subtotal	24.789	0.320		4.545		1.077		-		1.077	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Army Research Development Engineering Centers : Multiple	8.018	0.996	Mar 2020	0.500	Mar 2021	0.106	Mar 2022	-		0.106	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Logistics	MIPR	Tank & Automotive Command (TACOM), : Warren	0.694	0.036	Mar 2020	0.050	Mar 2021	0.050	Mar 2022	-		0.050	Continuing	Continuing	Continuing
Human Research and Engineering	MIPR	Army Research Laboratory, : Aberdeen Proving Ground	0.734	0.036	Mar 2020	0.050	Mar 2021	0.050	Mar 2022	-		0.050	Continuing	Continuing	Continuing
		Subtotal	9.446	1.068		0.600		0.206		-		0.206	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Army Developmental Test Command, : Aberdeen Proving Ground	4.083	2.485	Mar 2020	2.200	Mar 2021	0.500	Mar 2022	-		0.500	Continuing	Continuing	Continuing
Operational Testing	MIPR	Army Test and Evaluation Command, : Aberdeen Proving Ground	3.568	0.065	Mar 2020	2.200	Mar 2021	0.500	Mar 2022	-		0.500	Continuing	Continuing	Continuing
Validation Testing	MIPR	Army Test and Evaluation Centers, : Multiple	0.774	0.034	Mar 2020	0.050	Mar 2021	0.050	Mar 2022	-		0.050	Continuing	Continuing	Continuing
		Subtotal	8.425	2.584		4.450		1.050		-		1.050	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	45.765	3.982		9.608		2.443		-		2.443	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

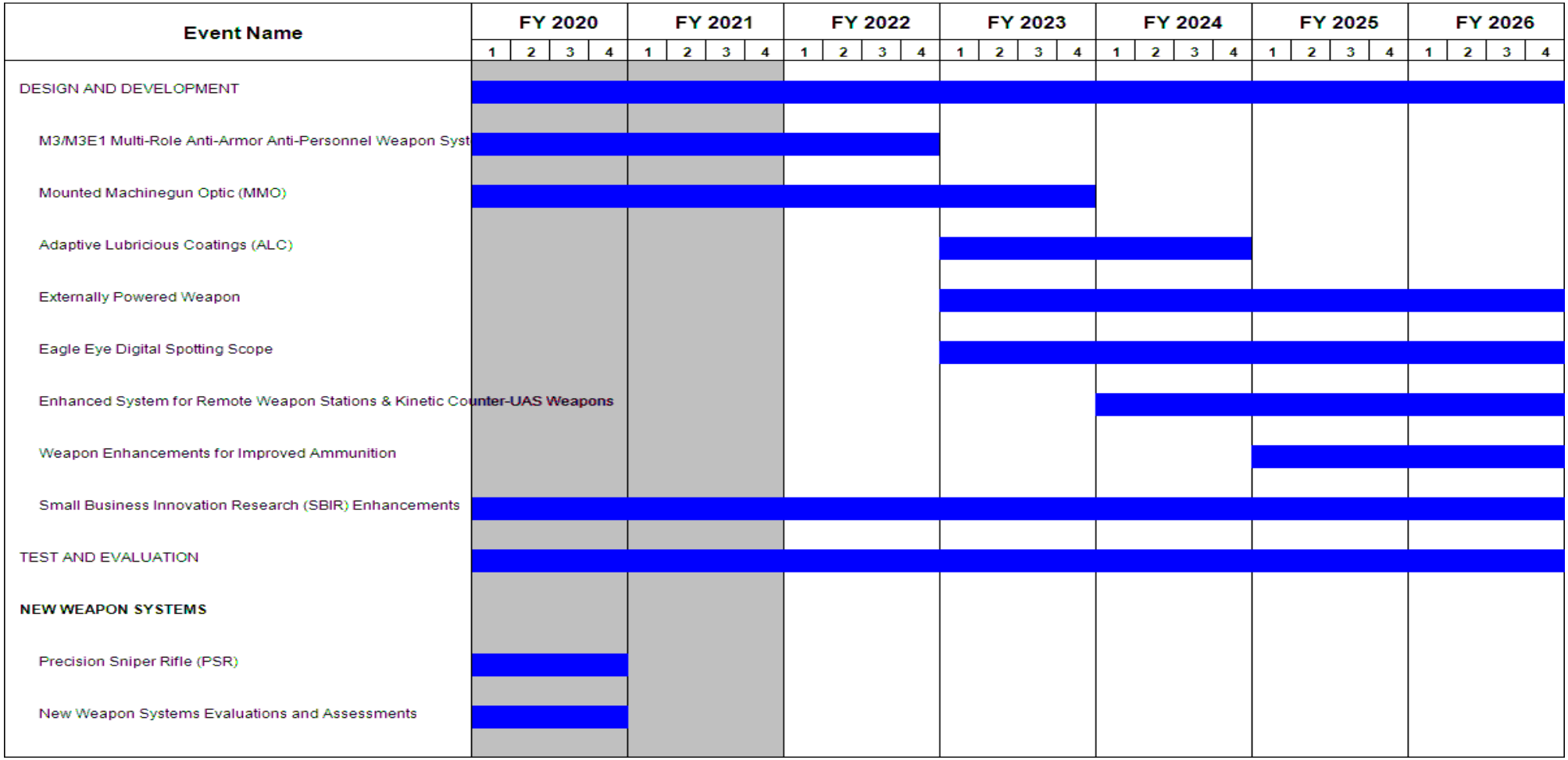


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

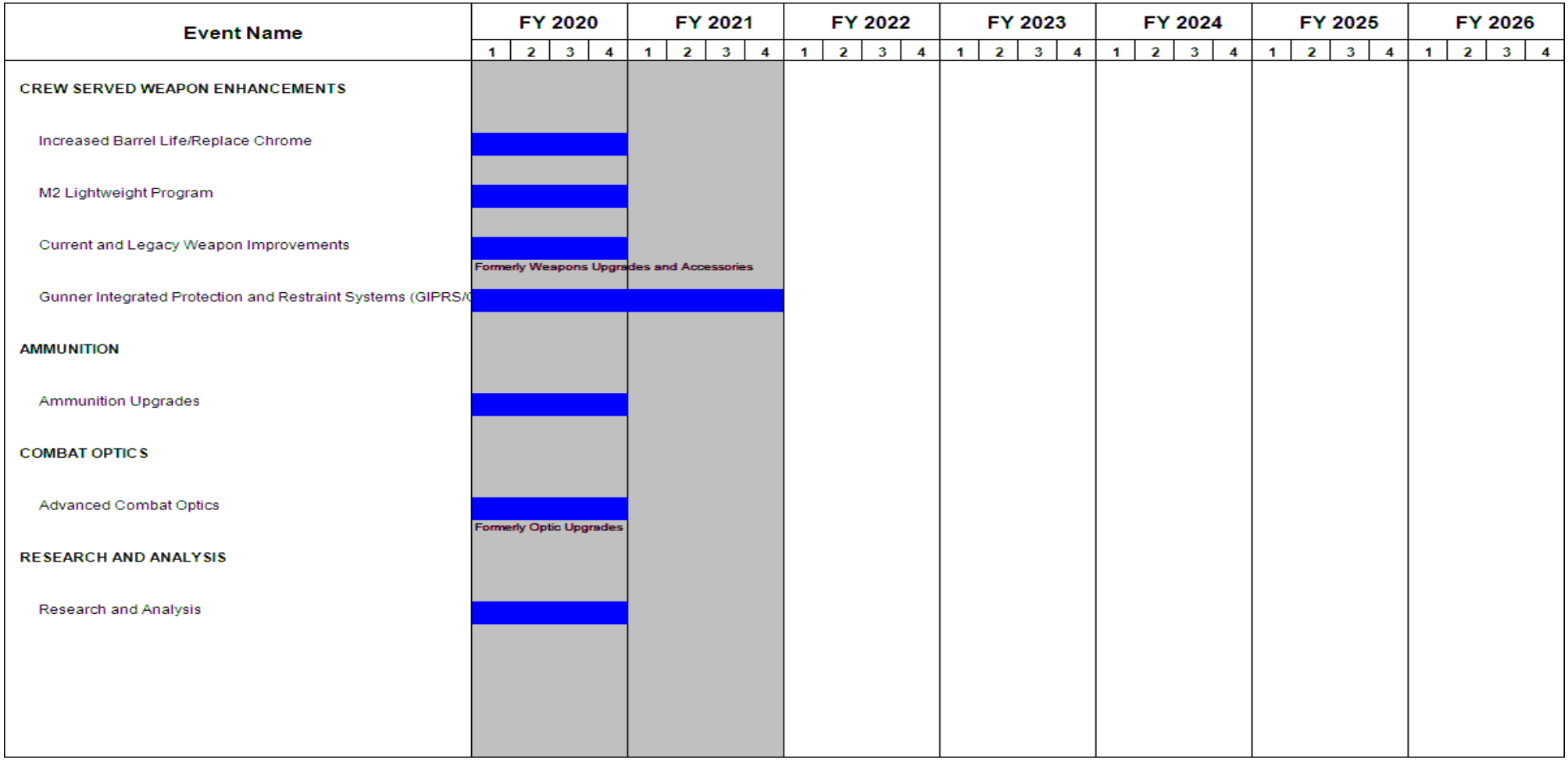


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DESIGN AND DEVELOPMENT	1	2020	4	2027
M3/M3E1 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS)	1	2017	4	2022
Mounted Machinegun Optic (MMO)	1	2020	4	2023
Adaptive Lubricious Coatings (ALC)	1	2023	4	2024
Externally Powered Weapon	1	2023	4	2027
Eagle Eye Digital Spotting Scope	1	2023	4	2027
Enhanced System for Remote Weapon Stations & Kinetic Counter-UAS Weapons	1	2024	4	2027
Weapon Enhancements for Improved Ammunition	1	2025	4	2027
Small Business Innovation Research (SBIR) Enhancements	1	2017	4	2027
TEST AND EVALUATION	1	2020	4	2027
NEW WEAPON SYSTEMS	1	2017	4	2026
Next Generation Squad Weapon-Automatic Rifle	1	2019	4	2019
Precision Sniper Rifle (PSR)	1	2017	4	2020
New Weapon Systems Evaluations and Assessments	1	2018	4	2020
CREW SERVED WEAPON ENHANCEMENTS	1	2017	4	2020
Compact Semi-Automatic Sniper System (CSASS)	1	2017	4	2019
Increased Barrel Life/Replace Chrome	1	2019	4	2020
M2 Lightweight Program	1	2018	4	2020
Weapons Upgrades and Accessories	1	2017	4	2019
Current and Legacy Weapon Improvements	1	2020	4	2020
Gunner Integrated Protection and Restraint Systems (GIPRS/OGPK)	1	2017	4	2021
AMMUNITION	1	2017	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** EW4 / *Crew Served Weapons Engineering Development*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Ammunition Upgrades	1	2017	4	2020
COMBAT OPTICS	1	2017	4	2020
Optic Upgrades	1	2017	4	2019
Advanced Combat Optics	1	2020	4	2020
FIRE CONTROL	1	2017	4	2017
Advanced Fire Control with Hyperspectral Target	1	2017	4	2017
Advanced Fire Control with Precision Projectile/Dynamic	1	2017	4	2017
Fire Control Upgrades	1	2017	4	2017
RESEARCH AND ANALYSIS	1	2017	4	2020
Research and Analysis	1	2017	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*				Project (Number/Name) FF2 / *Small Arms Fire Control*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
FF2: *Small Arms Fire Control*	-	14.095	9.782	11.107	-	11.107	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Next Generation Squad Weapon - Fire Control (NGSW-FC) is an advanced fire control device to support the Next Generation Squad Weapons. NGSW-FC increases the probability of hit and decreases the time to engage through a variable powered direct view optic with integrated range finder, ballistic calculator, and digital display capable of providing an adjusted aim point. The NGSW-FC will utilize open architecture to deliver the initial increased core capability followed by increasing increments of capability/enhancements over time as technology matures and evolves.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Design, Develop and Fabricate	11.400	1.727	5.796
Description: Includes contract awards for iterative prototyping of all Fire Control configurations, enhancements, and hand held devices. ***FY 2021 Plans:*** Continue to conduct iterative prototype efforts to design, develop, and fabricate enhancements to the NGSW-FC, conduct technical system engineering reviews, and implementation plans for iterative prototype components. Will award agreements or contracts to conduct iterative prototype efforts. ***FY 2022 Plans:*** Will continue to conduct iterative prototype efforts to design, develop, and fabricate enhancements to the NGSW-FC, conduct technical system engineering reviews, and implementation plans for iterative prototype components. Will award agreements or contracts to conduct iterative prototype efforts. Capability enhancements to be developed through iterative prototyping that may include technology such as advanced camera based capabilities; optical augmentation; aim augmentation; weapon stabilization; wind sensing; optimization of size, weight, and power; advanced network lethality; advanced ruggedization; and augmented reality. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase due to additional iterative prototype efforts in FY22 to optimize the base NGSW-FC configuration and increase capabilities related to aim augmentation, target tracking, networked lethality, and wind sensing.			
Title: Engineering Support	1.892	3.456	2.556
Description: Government engineering support, providing oversight of design development and contractor performance. ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FF2 / *Small Arms Fire Control*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue to provide government engineering support at laboratories and engineering centers, providing design, limited testing and oversight of development and contractor performance. Begin planning and documentation required for iterative prototyping for system enhancements. ***FY 2022 Plans:*** Will continue to provide government engineering support at laboratories and engineering centers; providing design, limited testing and oversight of development and contractor performance. Continues planning and documentation required for iterative prototyping for system enhancements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase due to additional engineering support for various iterative prototyping technologies.			
Title: Test and Evaluation ***Description:*** Government testing and evaluation of prototypes, articles and improvements. Includes Soldier Touch Point evaluations. ***FY 2021 Plans:*** NGSW-FC prototype systems continue to undergo technical optical lab testing, environmental testing, electromagnetic environment effects (E3) testing, and soldier touch point user evaluations. Continue to conduct all required testing and analysis to support source selection along with production and fielding decision. ***FY 2022 Plans:*** NGSW-FC will test and evaluate proposed additional capability upgrades resulting from iterative prototyping. Prototypes will undergo technical testing and soldier touch point user evaluations. Conduct Operational Testing to determine the Fire Control Systems' ability to accomplish its designed mission when used by representative personnel as well as to ensure the system can be placed and sustained satisfactorily in the field. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase due to additional testing required to characterize performance of iterative prototyping efforts vs the baseline system.	0.612	4.330	2.555
Title: Program Management ***Description:*** Program management office non-labor activities, to include travel and other indirect costs. ***FY 2021 Plans:***	0.191	0.269	0.200

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FF2 / *Small Arms Fire Control*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue to provide for administrative costs incurred by the Program Management office, to include travel, contractor service support, and other requirements to support the program. ***FY 2022 Plans:*** Will continue to provide for administrative costs incurred by the Program Management office, to include travel, contractor service support, and other requirements to support the program. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Engineering Support increase is due to additional personnel required in FY22 to support the Fire control prototype testing and evaluation efforts. Program Management increase is due to additional non labor requirements such as travel, shipment and tools supporting FY22 testing phase.			
Accomplishments/Planned Programs Subtotals	14.095	9.782	11.107

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• S54: *Small Arms Improvement*	13.956	15.495	6.911	-	6.911	-	-	-	-	-	-
• G14513: *Next Generation Squad Weapon - Fire Control*	-	35.822	72.595	-	72.595	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The NGSW-FC program is a Middle Tier Acquisition (MTA) program utilizing Rapid Prototyping authority under Section 804 of the FY 2016 National Defense Authorization Act (NDAA). A full and open competition selected two vendors for fixed amount Other Transaction Authority (OTA) awards to mature and finalize system designs and conduct test and evaluation. Upon successful completion of the prototyping effort, the Government will award follow on production contract(s) for the NGSW-FC without further competition. Iterative prototyping RDT&E efforts will continue to support increased capability sets to the NGSW-FC.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FF2 / *Small Arms Fire Control*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 Rescission (0604601A/S62)	Allot	Army Budget Office : Pentagon	0.104	-		-		-		-		-	0.000	0.104	-
		Subtotal	0.104	-		-		-		-		-	0.000	0.104	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Fire Control - Rapid Prototyping OTA	C/TBD	Vortex Optics Army Contracting Command - New Jersey (ACC-NJ) : Picatinny Arsenal, NJ	-	5.700	Apr 2020	0.917	Nov 2021	-		-		-	0.000	6.617	-
Next Generation Fire Control - Rapid Prototyping OTA	C/TBD	L3 Harris: Army Contracting Command - New Jersey (ACC-NJ) : Picatinny Arsenal, NJ	-	5.700	Apr 2020	0.810	Nov 2021	-		-		-	0.000	6.510	-
Next Generation Fire Control - Iterative Prototyping OTA	C/TBD	VENDOR TBD : ACC-NJ, Picatinny Arsenal, NJ	-	-		-		5.796	Apr 2022	-		5.796	Continuing	Continuing	-
		Subtotal	-	11.400		1.727		5.796		-		5.796	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	Combat Capability Development Command - Armaments Center (CCDC-AC) : Picatinny Arsenal, NJ	0.570	1.892	Nov 2019	3.456	Nov 2020	2.556	Nov 2021	-		2.556	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FF2 / *Small Arms Fire Control*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management (Non-Labor)	Allot	Project Manager Soldier Weapons (PMSW) /Non-Labor : Picatinny Arsenal, NJ	0.032	0.191	Nov 2019	0.269	Nov 2020	0.200	Nov 2021	-		0.200	Continuing	Continuing	-
		Subtotal	0.602	2.083		3.725		2.756		-		2.756	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	US Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.131	0.612	Mar 2020	4.330	Mar 2021	2.555	Mar 2022	-		2.555	Continuing	Continuing	-
		Subtotal	0.131	0.612		4.330		2.555		-		2.555	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.837	14.095		9.782		11.107		-		11.107	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FF2 / *Small Arms Fire Control*

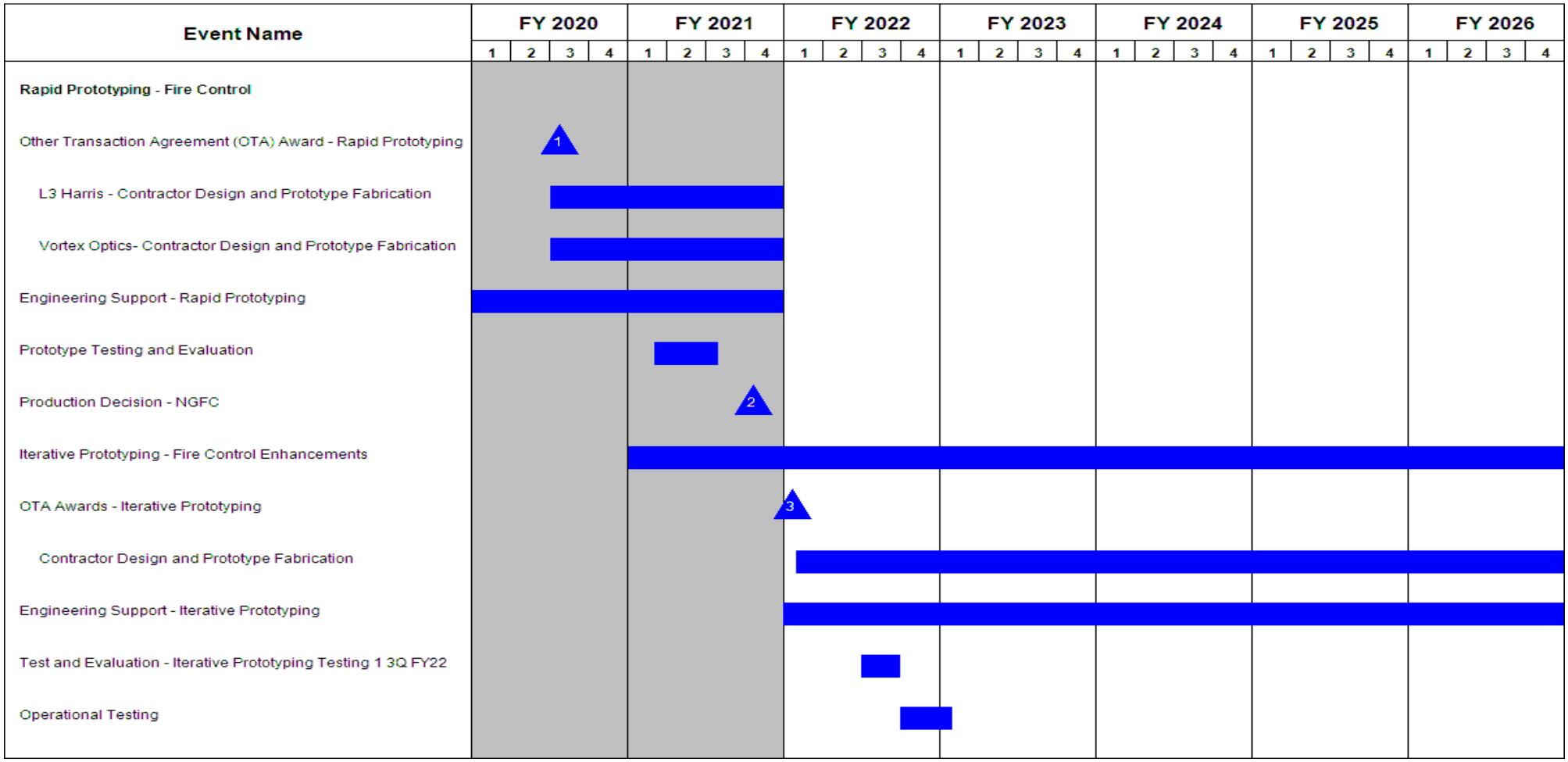


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FF2 / *Small Arms Fire Control*

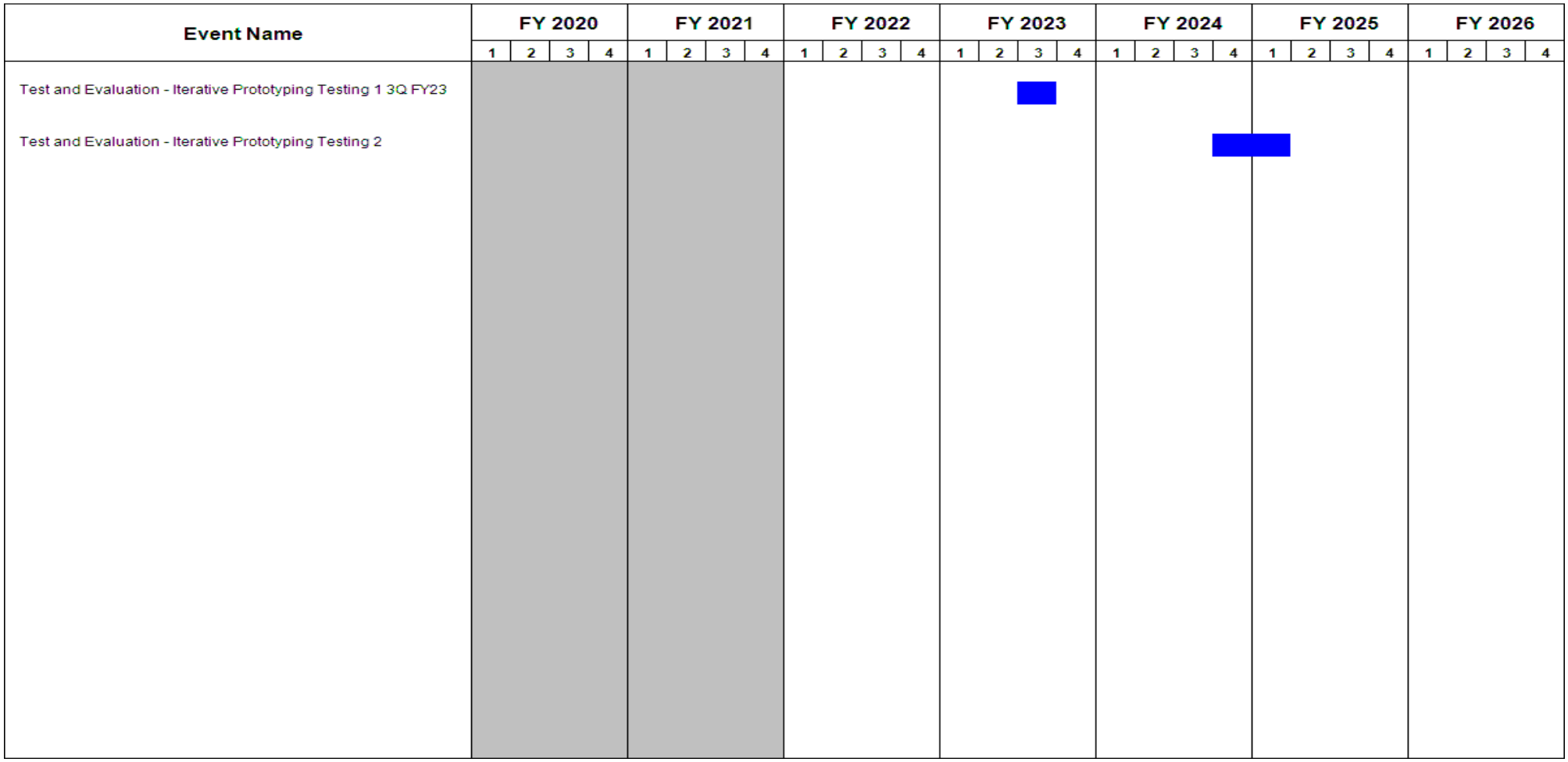


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FF2 / *Small Arms Fire Control*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Rapid Prototyping - Fire Control	1	2019	4	2021
Prototype Opportunity Notice	3	2019	3	2019
Other Transaction Agreement (OTA) Award - Rapid Prototyping	3	2020	3	2020
L3 Harris - Contractor Design and Prototype Fabrication	3	2020	4	2021
Vortex Optics- Contractor Design and Prototype Fabrication	3	2020	4	2021
Engineering Support - Rapid Prototyping	1	2019	4	2021
Prototype Testing and Evaluation	1	2021	3	2021
Production Decision - NGFC	4	2021	4	2021
Iterative Prototyping - Fire Control Enhancements	1	2021	4	2026
OTA Awards - Iterative Prototyping	1	2022	1	2022
Contractor Design and Prototype Fabrication	1	2022	4	2026
Engineering Support - Iterative Prototyping	1	2022	4	2026
Test and Evaluation - Iterative Prototyping Testing 1 3Q FY22	3	2022	3	2022
Operational Testing	4	2022	1	2023
Test and Evaluation - Iterative Prototyping Testing 1 3Q FY23	3	2023	3	2023
Test and Evaluation - Iterative Prototyping Testing 2	4	2024	1	2025

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FI2 / *Lightweight 30mm Cannon*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
FI2: *Lightweight 30mm Cannon*	-	1.327	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project FI2 Lightweight 30 millimeter (mm) Cannon provides increased lethality modifications to Product Directorate Counter-Rockets, Artillery and Mortar (PD C-RAM) on their mine-resistant ambush-protected (MRAP) All-Terrain Vehicle, Mine Counter Measure- Low-slow-small Integrated Defense System (MCM-LIDS) Platforms, and United States Marine Corps (USMC). Funds will provide safety qualification and characterization testing of the percussion primed XM914 to include weapon modifications for future procurements and integration testing on various remote weapon stations. Funds may also be used to procure percussion primed ammunition for testing purposes.

This program is in support of an USMC Joint Urgent Operational Need Statement (JUONS) CC-0558 to provide an increased lethality modification for Product Directorate Counter Rocket Artillery Mortars (PD C-RAM) and any future requirement that requires 30mm increased lethality.

The XM914 is an upgraded and modified version of the M230 cannon currently equipped on the AH-64 Apache advanced attack helicopter. The XM914 is a link fed, externally powered and electrically primed 30mm chain gun, capable of firing two hundred rounds per minute. The gun incorporates an anti-hangfire system and an extended barrel for enhanced muzzle velocity. The XM914 provides significant lethality improvements over the current M2 .50 caliber machine gun and MK19 grenade machine gun and provides the capability required for Soldiers in a combat environment to engage enemy personnel and light armored targets.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Contractor Design and Prototype Fabrication ***Description:*** Includes contractor design, development and prototype fabrication for engineering and manufacturing development of the XM914 30 millimeter (mm) autocannon.	0.625	-	-
Title: Engineering Support ***Description:*** Government engineering support at lab/center, providing design, limited testing and oversight of development and contractor performance.	0.200	-	-
Title: Test and Evaluation ***Description:*** Government testing and evaluation of weapon prototype, articles and system improvements.	0.425	-	-
Title: Program Management ***Description:*** Program management office provides oversight of contract actions, engineering support and test activities.	0.077	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FI2 / *Lightweight 30mm Cannon*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Accomplishments/Planned Programs Subtotals	1.327	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

This program supported the Army's Modernization priorities (Build a More Lethal Force) through enhancement of Joint Lethality in contested environments by minimizing and eliminating erosion of close combat capability relative to peer competitors in complex terrain as outlined in the NDS. There is no funding request for FY 2021.

D. Acquisition Strategy

The XM914 is considered a non-standard weapon that is being sold commercially to foreign customers by the vendor. As a modified version of the M230 30mm chain gun for the AH-64 Apache advanced attack helicopter, the XM914 requires safety confirmation/safety release and weapon qualification for vehicle mounted platforms. A long term, Indefinite Delivery/Indefinite Quantity (ID/IQ) Requirements type contact will be pursued once a production requirement is finalized. The contract may also include contract options for remote weapon station procurements to allow vehicle/platform PMs to procure the total weapon system. A sole source contract was awarded on 7 May 2020 to Northrop Grumman for the procurement of ten XM914 weapons for USMC in support of JUONS CC-0558.

The program supported new and emerging urgent requirements and has supported integration with ground vehicle platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FI2 / *Lightweight 30mm Cannon*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PM Soldier Weapons : Picatinny Arsenal, NJ	0.080	0.077	Oct 2019	-		-		-		-	0.000	0.157	-
		Subtotal	0.080	0.077		-		-		-		-	0.000	0.157	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Design and Prototype Fabrication	SS/FFP	Northrop Grumman : Mesa, AZ	5.200	0.625	Nov 2019	-		-		-		-	0.000	5.825	-
		Subtotal	5.200	0.625		-		-		-		-	0.000	5.825	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	Multiple Other Government Agencies : Multiple	1.350	0.200	Oct 2019	-		-		-		-	0.000	1.550	-
		Subtotal	1.350	0.200		-		-		-		-	0.000	1.550	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	1.650	0.425	Jul 2021	-		-		-		-	0.000	2.075	-
		Subtotal	1.650	0.425		-		-		-		-	0.000	2.075	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FI2 / *Lightweight 30mm Cannon*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.280	1.327		0.000		-		-		-	0.000	9.607	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FI2 / *Lightweight 30mm Cannon*

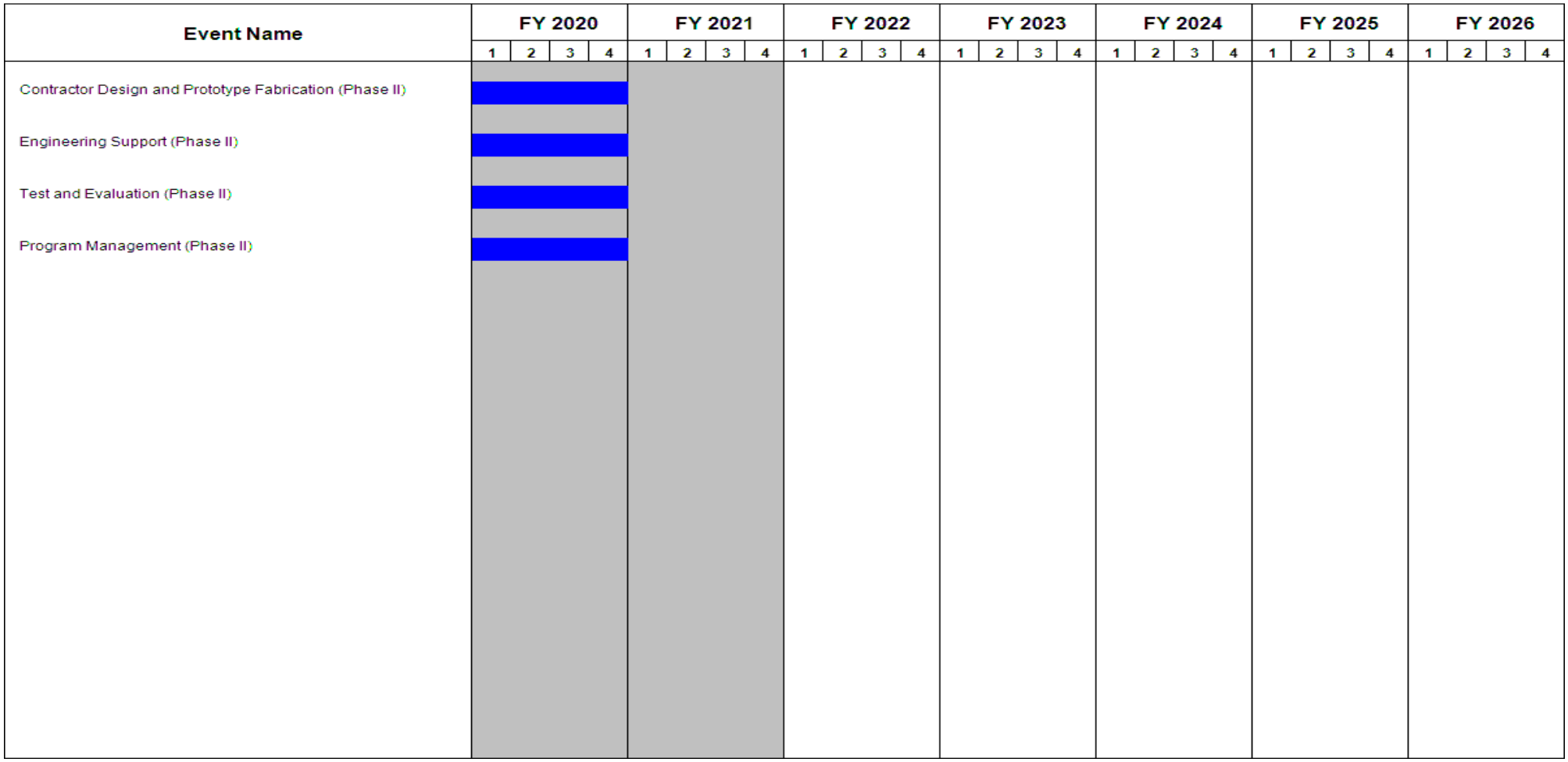


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FI2 / *Lightweight 30mm Cannon*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Contractor Design and Prototype Fabrication (Phase I)	1	2018	4	2018
Engineering Support (Phase I)	1	2018	4	2018
Test and Evaluation (Phase I)	1	2018	4	2018
Program Management (Phase I)	1	2018	4	2018
Contractor Design and Prototype Fabrication (Phase II)	1	2020	4	2020
Engineering Support (Phase II)	1	2020	4	2020
Test and Evaluation (Phase II)	1	2020	4	2020
Program Management (Phase II)	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army										Date: May 2021		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*				Project (Number/Name) FL8 / *84mm MAAWS Ammunition*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
FL8: *84mm MAAWS Ammunition*	-	3.874	3.017	6.117	-	6.117	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project FL8 84mm MAAWS Ammunition will test, evaluate and qualify up to seven types of 84 millimeters (mm) munitions for United States (U.S.) Army use with the M3/ M3A1 Multi-Role Anti-Armor Anti-Personnel Weapon Systems (MAAWS). In addition to type classifying existing rounds, funds will also provide for the evaluation and qualification of the new High Explosive Programmable Airbursting Round. These rounds will provide improved lethality and a higher probability of hit in defilade positions for close combat forces against varying target sets and increased ranges in support of Infantry Squad formations. The M3/M3A1 is a HQDA G8 directed requirement scheduled for Type Classification 4th Quarter (Q) Fiscal Year (FY) 2022.

FY 2022 funding in the amount of $6.639 million will be used to complete type classification efforts for the new programmable round.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Munition Prototype Development & Demonstration ***Description:*** Includes ammunition engineering and manufacturing, contract awards for prototypes, development and demonstration. ***FY 2021 Plans:*** To complete development and design reviews of the High Explosive (HE) programmable round for Type Classification and Full Material Release (TC-FMR), currently scheduled for FY 2022- 2023. ***FY 2022 Plans:*** Complete development and design reviews of the High Explosive (HE) programmable round for Type Classification (TC-STD), currently scheduled for FY 2022.	1.842	2.435	2.435
Title: Engineering Support ***Description:*** Government engineering support, providing oversight of design development and contractor performance. ***FY 2021 Plans:*** To provide engineering support and oversight of ammunition design and function. Participate in IPT, technical reviews and T&E efforts. ***FY 2022 Plans:***	0.500	0.130	1.089

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FL8 / *84mm MAAWS Ammunition*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will continue to provide engineering support and oversight of ammunition design and function. Will continue to participate in IPT, technical reviews and T&E efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Additional funds are required in FY22 to complete oversight of ammunition design improvements requiring additional Integrated Product Team (IPT) members for TC-STD efforts leading to FMR.			
Title: Test and Evaluation ***Description:*** Funds will support the following efforts: ***FY 2021 Plans:*** Complete developmental test and evaluation efforts of the programmable round and begin production qualification testing. ***FY 2022 Plans:*** Will complete delta testing of existing rounds, along with developmental test and evaluation efforts of the programmable round. Complete production qualification testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Additional funds required to complete delayed delta testing of existing rounds and to complete production qualification testing.	1.032	0.250	1.239
Title: Program Management ***Description:*** Funds will support the following efforts: ***FY 2021 Plans:*** Continue to provide project oversight, program management, non-labor operations, and contractor support. ***FY 2022 Plans:*** Will continue to provide project oversight, program management, non-labor operations, and contractor support. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funds to pay 100% of contractor support vs. 50% in the past, will also provide for other non-labor PM activities.	0.500	0.202	0.645
Title: TC-STD Efforts ***Description:*** Type Classification efforts for Full Material Release of the programmable round. ***FY 2022 Plans:*** Complete Type Classification efforts for Full Material Release of the programmable round. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	-	0.709

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FL8 / *84mm MAAWS Ammunition*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Increase as this cost element was not included in the FY21 submission			
Accomplishments/Planned Programs Subtotals	3.874	3.017	6.117

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• EW4: *Crew Served Weapons Engineering Development*	3.982	9.608	2.443	-	2.443	-	-	-	-	-	-
• G13101: *MULTI-ROLE ANTI-ARMOR ANTI-PERSONNEL WEAPON SYSTEM*	19.264	22.629	31.623	-	31.623	-	-	-	-	-	-
• OMA - 137010000: *RESET*	-	-	0.707	-	0.707	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Used Other Transaction Authority (OTA) via the DoD Ordnance Technology Consortium (DOTC) to obtain commercially available 84mm ammunition for test and evaluation purposes.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FL8 / *84mm MAAWS Ammunition*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PMSW : Picatinny Arsenal, NJ	-	0.500	Jun 2020	0.202	Oct 2020	0.645	Oct 2021	-		0.645	0.000	1.347	Continuing
		Subtotal	-	0.500		0.202		0.645		-		0.645	0.000	1.347	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Munitions Prototype	SS/CPFF	SAAB : Sweden	-	1.842	Feb 2020	2.435	Nov 2020	2.435	Nov 2021	-		2.435	0.000	6.712	Continuing
		Subtotal	-	1.842		2.435		2.435		-		2.435	0.000	6.712	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	CCDC : Picatinny Arsenal, NJ	-	0.500	Jun 2020	0.130	Oct 2020	1.089	Mar 2022	-		1.089	0.000	1.719	Continuing
TC-STD Efforts	MIPR	CCDC : Picatinny Arsenal, New Jersey	-	-		-		0.709	Apr 2022	-		0.709	0.000	0.709	-
		Subtotal	-	0.500		0.130		1.798		-		1.798	0.000	2.428	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	MIPR	ATEC : Aberdeen, MD	-	1.032	Mar 2020	0.250	Oct 2020	1.239	Apr 2022	-		1.239	0.000	2.521	Continuing
		Subtotal	-	1.032		0.250		1.239		-		1.239	0.000	2.521	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FL8 / *84mm MAAWS Ammunition*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.874		3.017		6.117		-		6.117	0.000	13.008	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FL8 / *84mm MAAWS Ammunition*

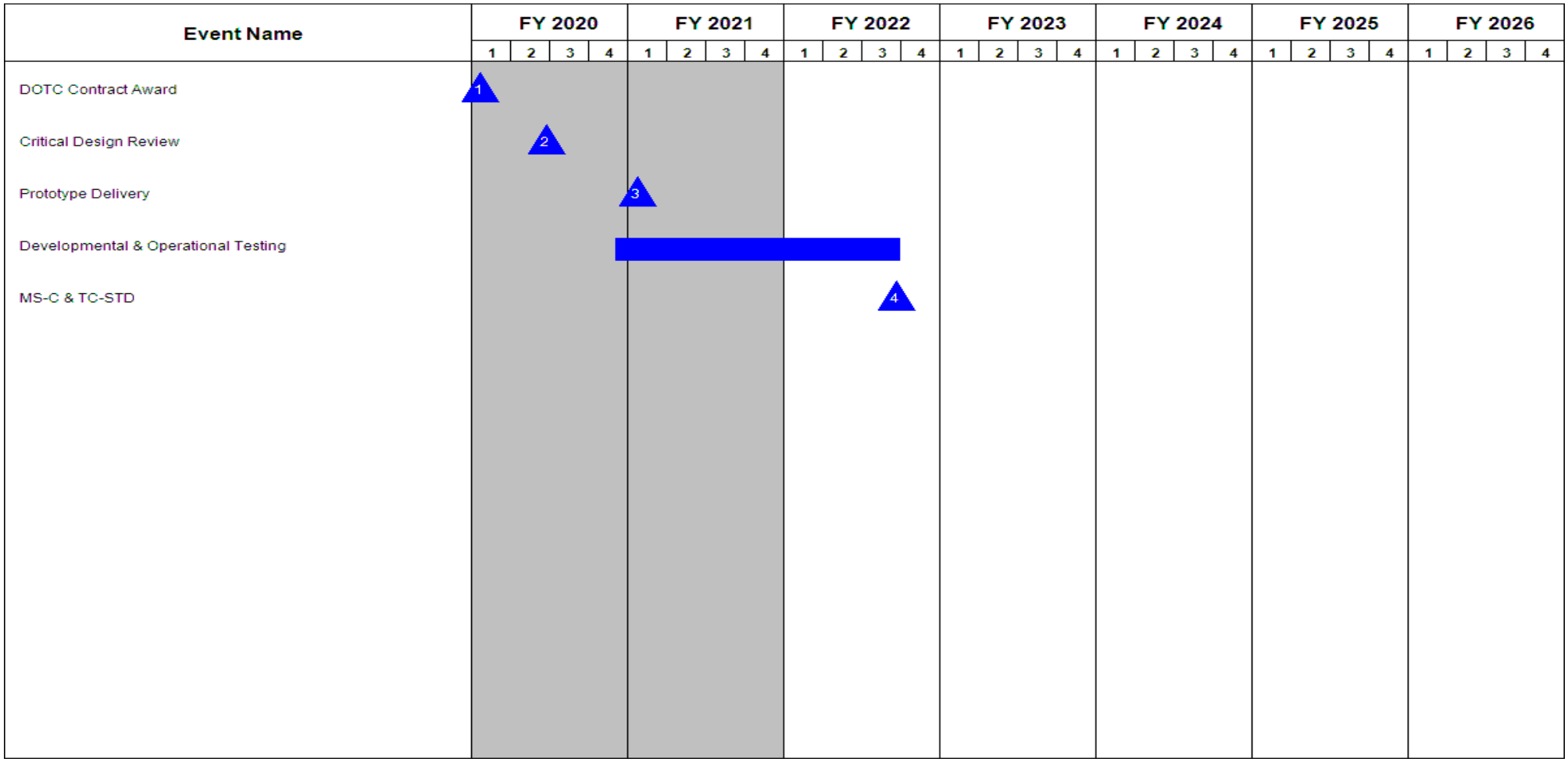


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FL8 / *84mm MAAWS Ammunition*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Materiel Development Decision	4	2019	4	2019
DOTC Contract Award	1	2020	1	2020
Critical Design Review	2	2020	2	2020
Prototype Delivery	1	2021	1	2021
Developmental & Operational Testing	4	2020	3	2022
MS-C & TC-STD	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FM4 / *Next Generation Squad Weapons*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
FM4: *Next Generation Squad Weapons*	-	31.719	32.001	13.599	-	13.599	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Next Generation Squad Weapons (NGSW) program will develop weapon systems and common 6.8mm cartridge to maintain overmatch and meet future force warfighter needs.

The Next Generation Squad Weapon-Rifle (NGSW-R) is the planned replacement for the M4A1 Carbine in the close combat force and select support units. The NGSW-R will provide capability improvements in accuracy, range, and lethality.

The Next Generation Squad Weapon-Automatic Rifle (NGSW-AR) is the planned replacement for the M249 Squad Automatic Weapon (SAW) in the close combat force and select support units. The NGSW-AR combines the firepower and range of a machine gun with the precision and ergonomics of a carbine, yielding capability improvements in accuracy, range, and lethality.

The NGSW-R and NGSW-AR will use a common 6.8mm cartridge in a variety of ammunition types including but not limited to general purpose (GP), special purpose (SP), reduced range, and blank.

Development efforts for additional NGSW variants may follow to replace other legacy systems or provide additional enhanced capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Contractor Design and Prototype Fabrication	27.186	6.960	5.919
Description: Contractor design, development and fabrication of prototypes.			
FY 2021 Plans: Includes the second iteration of contractor design, development and prototype fabrication evaluated in Prototype Test II for rapid prototyping of the Next Generation Squad Weapon - Rifle and Automatic Rifle. Each of the three contractors are set to deliver thirty-eight (38) prototype rifles, twenty-eight (28) prototype automatic rifles and six hundred sixty thousand (660,000) surrogate and general purpose rounds of ammunition for government testing and soldier touch point evaluations. Contractors are working to develop and deliver the Technical Data Packages (TDP) to support final design configuration of the rifle, automatic rifle, and ammunition.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will begin the next phase of iterative prototyping with the selected rifle and automatic rifle, in order to develop capability enhancements and design improvements. Effort will include the integration of additional cartridge and ammunition types, integration of new technologies and training systems, enhanced smart rail capabilities, and weapon system performance increases. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Competitive rapid prototyping with three vendors will conclude in early FY22 with the production selection. Ongoing improvements and enhancement will be conducted with one vendor, reducing the required funding.			
Title: Engineering Support ***Description:*** Government engineering support, providing oversight of design, development and contractor performance. ***FY 2021 Plans:*** Continue to provide government engineering support at laboratories and engineering centers, providing design, limited testing and oversight of development and contractor performance. Supporting the second phase of Prototype Test II (PT2) and several Soldier Touch Point events. Development of the plans and documentation in support of down-selection and production scope. ***FY 2022 Plans:*** Will continue government engineering support to provide design, limited testing and oversight of development and contractor performance for capability enhancement and design improvements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The second phase of prototype testing (PT2) and Soldier Touch Point events will be completed in FY21, which will decrease the amount of engineering support required in FY22.	2.258	6.336	1.680
Title: Test and Evaluation ***Description:*** Testing and evaluation at government ranges and facilities. ***FY 2021 Plans:*** Government testing and evaluation of the second design iteration of prototype rifle, automatic rifle and associated ammunition. Prototype Test II continues to assess the final prototype configuration and support the production award decision in the first quarter (1Q) of FY 2022. ***FY 2022 Plans:***	1.856	5.984	3.200

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Government testing and evaluation will include safety confirmation for the reduced range cartridge integration and for multiple ammunition variants with the weapons. Will also begin Live Fire Test and Evaluation (LFT&E) and Initial Operational Test and Evaluation (IOT&E) of production representative weapons. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Less funding will be required in FY22 due to the conclusion of the second phase of prototype testing (PT2) and Soldier Touch Point events in FY21.			
Title: Program Management ***Description:*** Program office management and oversight of government and contractor efforts. ***FY 2021 Plans:*** Program management office continued to provide oversight of contract actions, engineering support and test activities. ***FY 2022 Plans:*** Program management office will continue to provide oversight of contract actions, engineering support and test activities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in FY22 is due to main RDTE events prior to production phase like PT2 and STPs are expected to be completed in FY21.	0.419	1.136	0.250
Title: Blank Cartridge and Blank Firing Weapon Adaption Kit Development ***FY 2021 Plans:*** Continue rapid prototyping of a blank cartridge and weapon adaption kit for the NGSW-R and NGSW-AR. Initial testing efforts in progress to obtain a Safety Release for blank ammunition and modification use during the Soldier Touch Points. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Complete Blank cartridge integration and blank firing weapon adaption kit assessments in FY22.	-	3.786	-
Title: Reduced Range Cartridge Development and Integration ***FY 2021 Plans:*** Begin work with the selected vendor to finalize design and manufacturing development of a reduced range cartridge and integration with the Next Generation Squad Weapon (NGSW) Rifle and Automatic Rifle. ***FY 2022 Plans:*** Will continue work with the selected vendor to finalize design and manufacturing development of a reduced range cartridge and integration with the Next Generation Squad Weapon (NGSW) Rifle and Automatic Rifle. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	7.799	1.500

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Required fund decrease is due to the bulk of the effort being paid with FY21 funding.			
Title: Special Purpose Cartridge Development and Integration	-	-	1.050
FY 2022 Plans: Will continue work with the selected vendor to finalize design and manufacturing development of the SP cartridge and integration with the NGSW Rifle and Automatic Rifle.			
FY 2021 to FY 2022 Increase/Decrease Statement: Slight funds increase although the bulk of the effort being paid with FY21 funding.			
Accomplishments/Planned Programs Subtotals	31.719	32.001	13.599

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• S54: *Small Arms Improvement*	13.956	15.495	6.911	-	6.911	-	-	-	-	-	-
• EW4: *Crew Served Weapons Engineering Development*	3.982	9.608	2.443	-	2.443	-	-	-	-	-	-
• S63: *Individual Weapons Engineering Development*	2.586	4.214	3.651	-	3.651	-	-	-	-	-	-
• FL4: *Small Caliber Ammo for Next Gen Squad Weapons*	17.432	26.483	28.372	-	28.372	-	-	-	-	-	-
• G14511: *Next Generation Squad Weapon-Automatic Rifle*	-	-	3.630	-	3.630	-	-	-	-	-	-
• G14512: *NEXT GENERATION SQUAD WEAPON-RIFLE*	-	-	20.862	-	20.862	-	-	-	-	-	-
• E06001: *NEXT GENERATION SQUAD WEAPON AMMUNITION*	-	11.988	76.794	-	76.794	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The NGSW program is a Middle Tier Acquisition (MTA) program utilizing Rapid Prototyping authority under Section 804 of the FY 2016 National Defense Authorization Act (NDAA). A full and open competition selected three vendors for fixed amount Other Transaction Authority (OTA) awards to mature and finalize system designs and conduct test and evaluation. Upon successful completion of the prototyping effort, the Government will award follow on production contract(s) for the NGSW-R, the NGSW-AR, and 6.8mm common ammunition, without further competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FM4 / *Next Generation Squad Weapons*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Weapons : Picatinny Arsenal, NJ	-	0.419		1.136	Oct 2020	0.250	Oct 2021	-		0.250	0.000	1.805	-
		Subtotal	-	0.419		1.136		0.250		-		0.250	0.000	1.805	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Opportunity Notice	C/TBD	SIG Sauer Inc. : Newington, NH	-	1.188	Jan 2020	1.212	Oct 2020	-		-		-	0.000	2.400	-
Prototype Opportunity Notice	C/TBD	General Dynamics-OTS, Inc. : Williston, VT	-	13.980	Jan 2020	2.997	Oct 2020	-		-		-	0.000	16.977	-
Prototype Opportunity Notice	C/TBD	AAI Corp Textron Systems : Hunt Valley, MD	-	12.018	Jan 2020	2.751	Oct 2020	-		-		-	0.000	14.769	-
Blank Cartridge and Blank Firing Weapon Adaptation Kit Development	C/TBD	VENDOR TBD : ACC-NJ, Picatinny Arsenal, NJ	-	-		3.786	Sep 2021	-		-		-	0.000	3.786	-
Reduced Range Cartridge Development and Integration	C/TBD	VENDOR TBD : ACC-NJ, Picatinny Arsenal, NJ	-	-		7.799	Sep 2021	1.500	Jan 2022	-		1.500	0.000	9.299	-
Special Purpose Cartridge Development and Integration	C/TBD	VENDOR TBD : ACC-NJ, Picatinny Arsenal, NJ	-	-		-		1.050	Jan 2022	-		1.050	0.000	1.050	-
Iterative Prototyping / Design Improvements	C/TBD	VENDOR TBD : ACC-NJ, Picatinny Arsenal, NJ	-	-		-		5.919	Jan 2022	-		5.919	0.000	5.919	-
		Subtotal	-	27.186		18.545		8.469		-		8.469	0.000	54.200	N/A

Remarks

Blank Cartridge and Blank Firing Weapon Adaptation Kit Development, Reduced Range Cartridge Development and Integration, and Special Purpose Cartridge Development and Integration will be vendor efforts awarded to the company selected for production of the NGSW Rifle and Automatic Rifle.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) FM4 / *Next Generation Squad Weapons*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	Combat Capability Development Center - Armament Center (CCDC-AC) : Picatinny Arsneal, NJ	-	2.258	Oct 2019	6.336	Oct 2020	1.680	Oct 2021	-		1.680	0.000	10.274	-
		Subtotal	-	2.258		6.336		1.680		-		1.680	0.000	10.274	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, ND	-	1.856	Apr 2020	5.984	Dec 2020	3.200	Dec 2021	-		3.200	0.000	11.040	-
		Subtotal	-	1.856		5.984		3.200		-		3.200	0.000	11.040	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	31.719		32.001		13.599		-		13.599	0.000	77.319	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

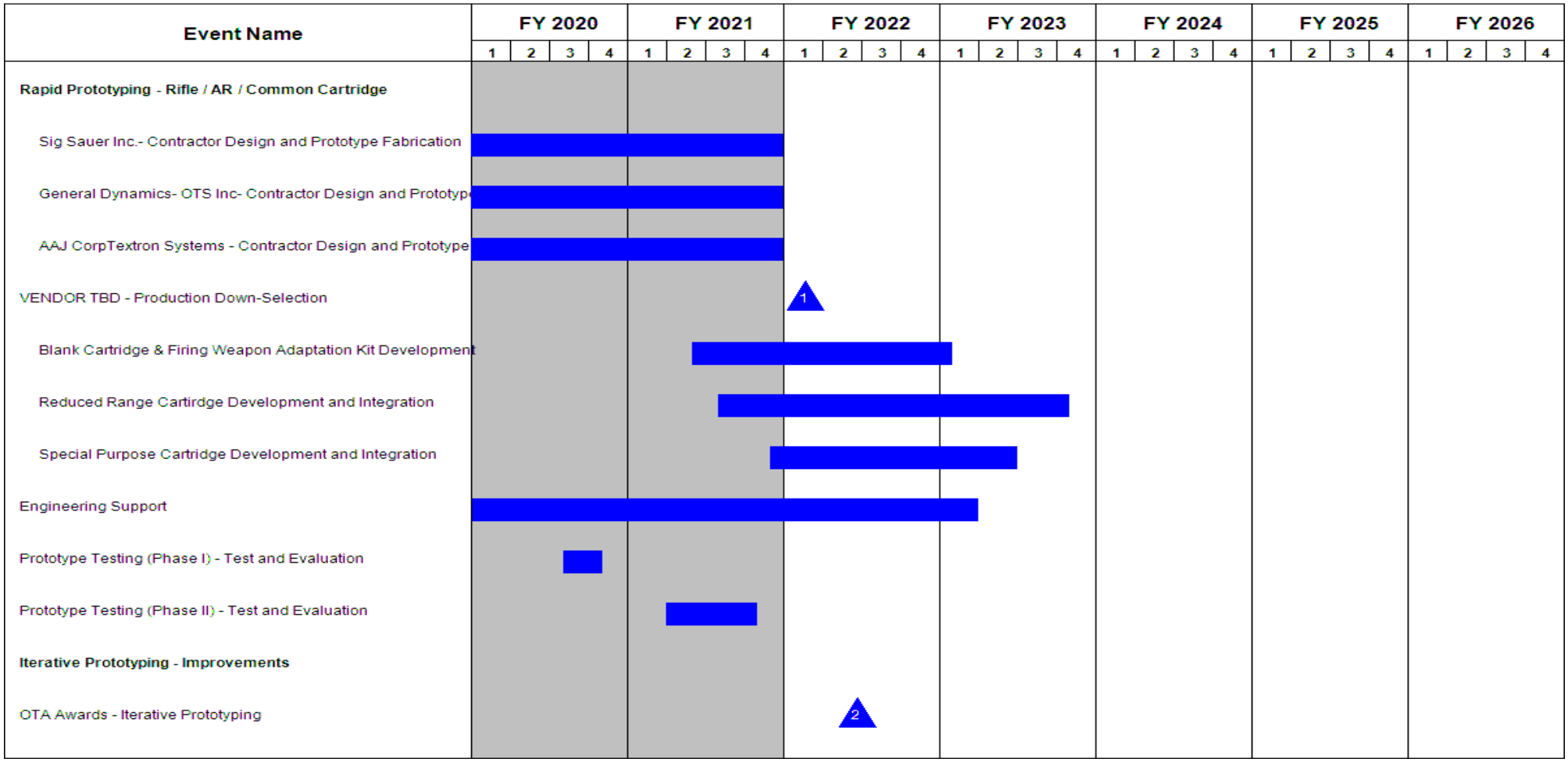


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

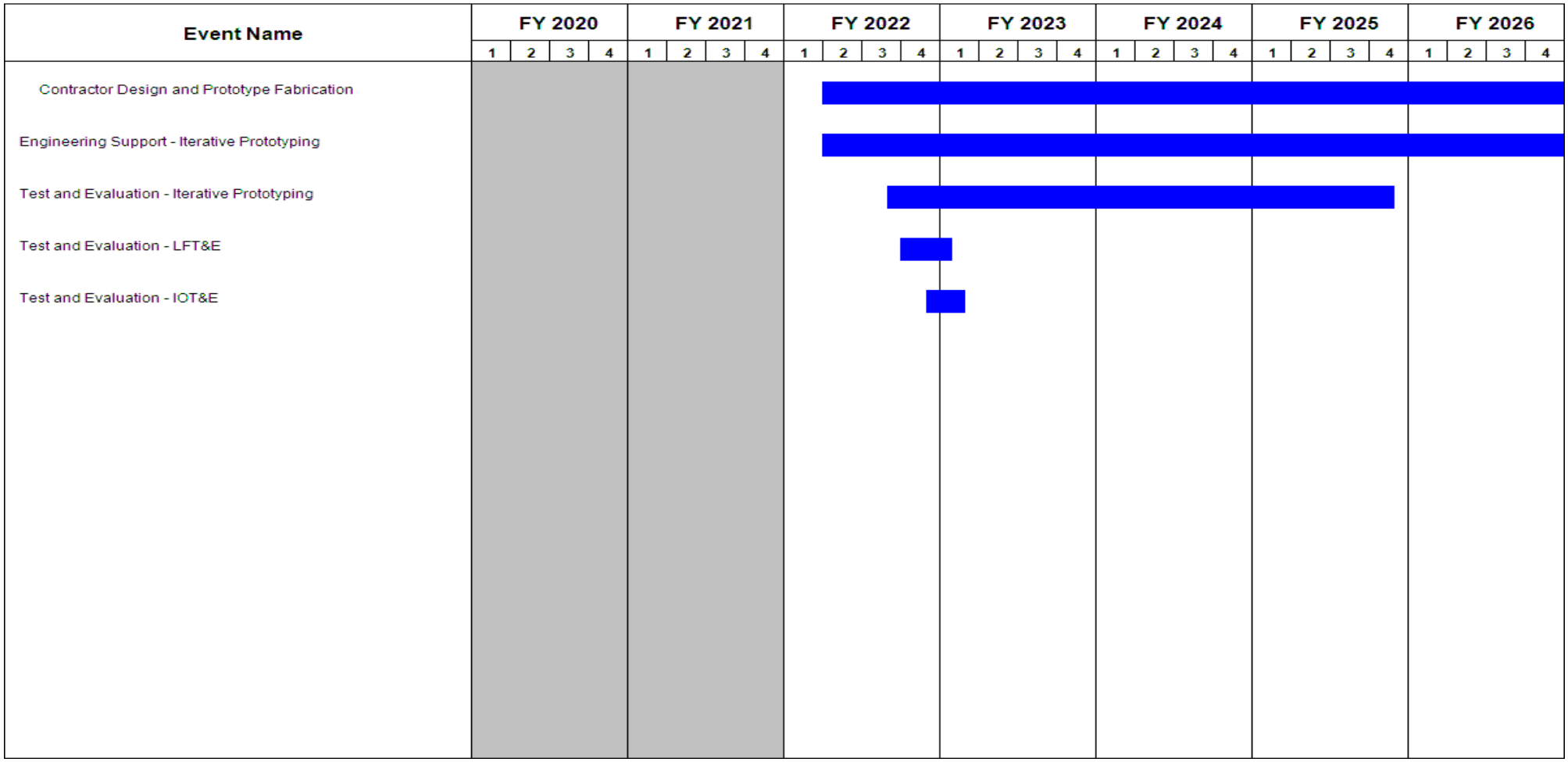


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** FM4 / *Next Generation Squad Weapons*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Rapid Prototyping - Rifle / AR / Common Cartridge	4	2019	4	2021
Prototype Opportunity Notice	2	2019	2	2019
Other Transaction Agreements (OTA) Award - Rapid Prototyping	4	2019	4	2019
Sig Sauer Inc.- Contractor Design and Prototype Fabrication	4	2019	4	2021
General Dynamics- OTS Inc- Contractor Design and Prototype Fabrication	4	2019	4	2021
AAJ CorpTextron Systems - Contractor Design and Prototype Fabrication	4	2019	4	2021
VENDOR TBD - Production Down-Selection	1	2022	1	2022
Blank Cartridge & Firing Weapon Adaptation Kit Development	2	2021	1	2023
Reduced Range Cartirdge Development and Integration	3	2021	4	2023
Special Purpose Cartridge Development and Integration	4	2021	2	2023
Engineering Support	1	2019	1	2023
Prototype Testing (Phase I) - Test and Evaluation	3	2020	4	2020
Prototype Testing (Phase II) - Test and Evaluation	2	2021	4	2021
Iterative Prototyping - Improvements	1	2022	4	2025
OTA Awards - Iterative Prototyping	2	2022	2	2022
Contractor Design and Prototype Fabrication	2	2022	4	2026
Engineering Support - Iterative Prototyping	2	2022	4	2026
Test and Evaluation - Iterative Prototyping	3	2022	4	2025
Test and Evaluation - LFT&E	4	2022	1	2023
Test and Evaluation - IOT&E	4	2022	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S58 / *Soldier Enhancement Program*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
S58: *Soldier Enhancement Program*	-	-	9.000	3.655	-	3.655	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Enhancement Program (SEP) was established in the Fiscal Year (FY) 1990 National Defense Authorization Act (NDAA). SEP provides an innovative rapid approach that includes procurement and evaluation of Commercial Off the Shelf (COTS)/Non Developmental Item (NDI)/Government Off the Shelf (GOTS) items that have the potential to enhance an Army Infantryman and Soldiers' ability to execute their combat mission. SEP provides significant savings and acceleration in the evaluation of items. The SEP program is managed jointly by Program Executive Office (PEO) Soldier and the Maneuver Center of Excellence. SEP suggestions are submitted by individual Soldiers, Field Commanders, commercial manufacturers, and others via the Program Executive Office (PEO) Soldier SEP website. Viable suggestions are vetted by a Council of Colonels (CoC) and validated as SEP initiatives by Department of the Army, Deputy Chief of Staff, G8, Force Development. A limited number of validated SEP initiatives are procured and evaluated by Soldiers for feasibility and suitability. Based on the evaluation findings, the SEP CoC provides one or more of the following courses of action: (1) inform deliberate or urgent/emerging requirements generation, (2) initiate a new Program of Record (POR), (3) improve an existing POR, (4) transition to the Rapid Equipping Force or (5) add to the Rapid Fielding Initiative list, (6) provide a national stock number (NSN) for unit procurement or (7) the item did not meet objectives and no further action is necessary.

Justification: FY2022 RDT&E funding supports SEP evaluations and documentation of results.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Evaluate COTS/GOTS/NDI equipment that have the potential to enhance Soldier combat effectiveness. ***FY 2022 Plans:*** Funding will support evaluation of SEP Council of Colonels approved and validated initiatives. Evaluations will include safety testing, collection, and analysis of user feedback and documentation of results. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Congressional Add in FY21.	-	-	3.655
Accomplishments/Planned Programs Subtotals	-	-	3.655

	FY 2020	FY 2021
Congressional Add: Program increase - soldier enhancement program	-	9.000
FY 2021 Plans: Funding will support evaluation of SEP Council of Colonels approved and validated initiatives. Coordinate with industry and Army to ensure submitted proposals satisfy Army needs. Manage and distribute		

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S58 / *Soldier Enhancement Program*

	FY 2020	FY 2021
funding for SEP evaluations. Evaluations will include safety testing, collection, and analysis of user feedback and documentation of results for close-out.		
Congressional Adds Subtotals	-	9.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• MA6800: *Soldier Enhancement*	-	-	1.286	-	1.286	-	-	-	-	-	-

Remarks

Other

D. Acquisition Strategy

SEP focuses on COTS/GOTS/NDI initiatives submitted by Soldiers and industry. SEP proposals are reviewed and approved semiannually. Procurement funds SEP COTS/GOTS/NDI items in quantities sufficient for Soldier evaluation. Research, Development, Test and Evaluation is used to conduct product evaluations which includes safety testing, data collection, analysis of Soldier feedback/results and documentation of results. Product Managers responsible for portfolio in which the SEP initiative falls develops the procurement and evaluation strategy and procures the items using a variety of means from Government purchase card to full contracts. Soldiers evaluations are performed by various means from Battle Lab surveys to full scale Army Test and Evaluation testing depending on the item.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S58 / *Soldier Enhancement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	MIPR	PEO SOLDIER : Ft. Belvoir, VA	14.825	-		0.361	Sep 2021	-		-		-	0.000	15.186	-
		Subtotal	14.825	-		0.361		-		-		-	0.000	15.186	N/A

Remarks

Systems Engineering and Program Management includes engineering support, conducting technical evaluations, market research and program reviews.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	MIPR	Various : Various	39.573	-		-		-		-		-	0.000	39.573	-
		Subtotal	39.573	-		-		-		-		-	0.000	39.573	N/A

Remarks

Candidates for the Soldier Enhancement Program are received, reviewed, and approved semi-annually. Contractual efforts are focused on procuring prototypes for testing.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	MIPR	PEO Soldier : Ft. Belvoir, VA	6.424	-		-		-		-		-	0.000	6.424	-
		Subtotal	6.424	-		-		-		-		-	0.000	6.424	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	MIPR	Various : Various	57.533	-		8.639		3.655		-		3.655	0.000	69.827	-
		Subtotal	57.533	-		8.639		3.655		-		3.655	0.000	69.827	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S58 / *Soldier Enhancement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
Testing costs vary annually depending on number and type of items being evaluated.															
Project Cost Totals			118.355	-		9.000		3.655		-		3.655	0.000	131.010	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S58 / *Soldier Enhancement Program*

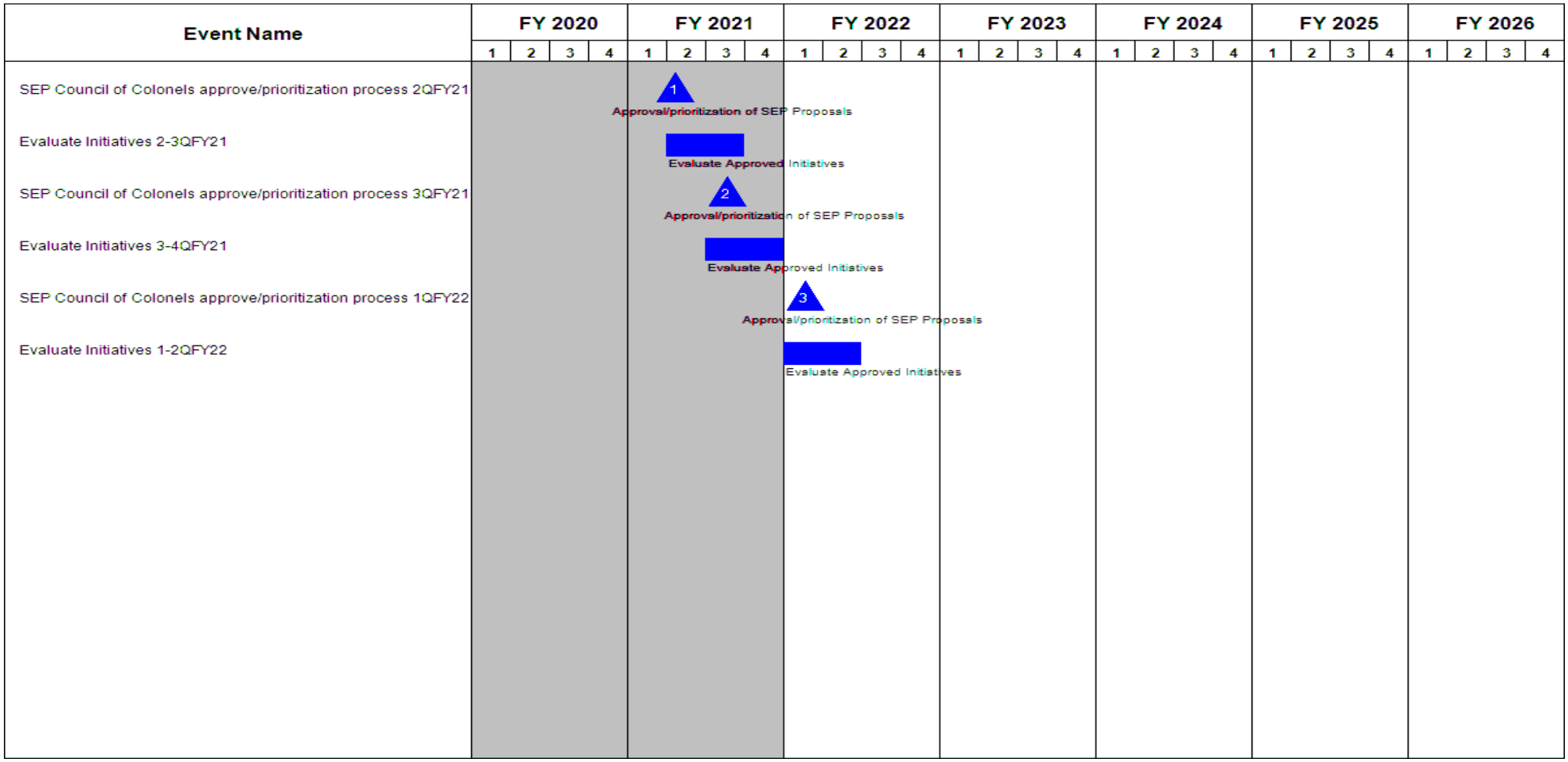


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S58 / *Soldier Enhancement Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SEP Council of Colonels approve/prioritization process 2QFY21	2	2021	2	2021
Evaluate Initiatives 2-3QFY21	2	2021	3	2021
SEP Council of Colonels approve/prioritization process 3QFY21	3	2021	3	2021
Evaluate Initiatives 3-4QFY21	3	2021	4	2021
SEP Council of Colonels approve/prioritization process 1QFY22	1	2022	1	2022
Evaluate Initiatives 1-2QFY22	1	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S60 / *Clothing & Equipment*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
S60: *Clothing & Equipment*	-	6.188	6.472	5.393	-	5.393	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. It supports engineering and manufacturing development tasks related to individual clothing and equipment with the goal of enhancing the lethality, survivability, and mobility as well as the quality of life of the individual Soldier. It funds formal Developmental Testing/Operational Testing of preproduction and production representative systems leveraging advancements in materials, fabrication techniques, moisture management, flame resistant, insect protection, extreme environmental protection and camouflage, to include evaluation, test, and conduct of Soldier evaluations of Organizational Clothing and Individual Equipment appropriate for use in extreme or multi-climate environments; not to preclude other climates and environments. Goal is to increase the capabilities and durability of tactical and non-tactical clothing and individual equipment. Includes integration and interface on the Soldier system. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and equipment. It will continue to support cross-service initiatives to increase commonality.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Soldier Uniforms and Clothing	4.910	3.432	2.725
Description: Evaluate superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.			
FY 2021 Plans: Continue fabric and Flame Resistant upgrades. Continue Clothing Bag Upgrades and Evaluations. Conduct ensemble level evaluations of novel materials and fabrics in clothing and equipment in all climates. Continue user evaluations of modernized Cold Weather clothing items and fabrics that support improved protection against extreme cold weather. Continue design considerations for female garments, items such as sports bra, maternity uniforms, A2CU female, etc. Continue athletic shoe certification efforts.			
FY 2022 Plans: Perform technical testing, user evaluations, and qualify new fabrics with appropriate level of Flame Resistant (FR) protection for combat clothing and Cold Weather/Extreme Cold Weather Clothing. Continue clothing improvements and multi-service commonality efforts. Conduct user evaluations to support material changes to enhance tactical and environmental Soldier clothing. Procure test assets and perform Developmental tests/Operational Tests (DT/OT) on uniforms produced with microwave protective materials to defeat emerging threats and on uniforms designed to mitigate Ground Surveillance Radar (GSR) detection. Annual evaluation of domestic material solution submissions to support the Athletic Footwear program providing Soldiers a greater variety of athletic footwear from which to choose. Continue Clothing Bag Upgrades and Evaluations. Conduct ensemble level			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S60 / *Clothing & Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
evaluations of novel materials and fabrics in clothing, footwear and equipment in all climates. Support the Secretary of the Army's directive to identify opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines, Coast Guard). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease from FY 2021 to FY 2022 due to anticipated changes in requirements.			
Title: Individual Equipment ***Description:*** Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment. ***FY 2021 Plans:*** Procure sufficient Individual Water Treatment Device (IWTD) quantities to complete large scale Operational Test (OT). Complete evaluation of the USMC water hydration system, evaluate it to determine applicability to Army requirements in support of cross-service initiatives to improve commonality. Begin testing on Cold Weather Mobility items. Complete redesign of load carriage equipment in support of weapon modernization. Continue testing of load carriage equipment to address interoperability with improved Army capabilities. Support athletic shoe certification. ***FY 2022 Plans:*** Development of the Welding Individual Protection System (WIPS) ensemble. WIPS will provide welders with Occupational Safety Health Act (OSHA) compliant Personal Protective Equipment (PPE); and will enable units with a capability to execute mission essential welding tasks. Procure test assets and perform Developmental tests/Operational Tests (DT/OT) as required for GEN II Individual Water Treatment Device for Toxic Industrial Chemicals and Toxic Industrial Materials (TICs/TIMs) and desalinization. Procure test assets and perform DT/OT as required for Cold Weather Gear. Procure and test assets and perform DT/OT for survival blanket for use in Zone 7 environments. Procure and test skin paint to camouflage and reduce thermal signature on exposed skin (face, neck, hands, etc) and to temporarily camouflage individual equipment. Validation of load carriage equipment in support of weapon modernization. Continue athletic shoe certification. Continue testing of load carriage equipment to address interoperability with improved Army capabilities. Support the Secretary of the Army's directive to identify opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines, Coast Guard). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease from FY 2021 to FY 2022 due to anticipated changes in requirements.	1.278	3.040	2.668
Accomplishments/Planned Programs Subtotals	6.188	6.472	5.393

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S60 / *Clothing & Equipment*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• S53: *Clothing And Equipment*	6.365	1.742	2.004	-	2.004	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Acquisition strategies for these programs vary in methods, and range from: 1) Materiel Change Proposals that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of complexity and testing required.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S60 / *Clothing & Equipment*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Allot	PM SCIE : Ft Belvoir	11.123	0.768		0.812		0.749		-		0.749	Continuing	Continuing	Continuing
		Subtotal	11.123	0.768		0.812		0.749		-		0.749	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	Various	NSRDEC : Natick, MA	16.785	0.531		0.608		0.623		-		0.623	Continuing	Continuing	Continuing
Development Contracts	Various	Various : Various	51.526	2.625		2.690		1.997		-		1.997	Continuing	Continuing	Continuing
		Subtotal	68.311	3.156		3.298		2.620		-		2.620	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support Costs	Various	Natick, MA : Natick, MA	18.506	0.445		0.465		0.469		-		0.469	Continuing	Continuing	Continuing
		Subtotal	18.506	0.445		0.465		0.469		-		0.469	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Various : Various	30.922	1.819		1.897		1.555		-		1.555	Continuing	Continuing	Continuing
		Subtotal	30.922	1.819		1.897		1.555		-		1.555	Continuing	Continuing	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	128.862	6.188		6.472		5.393		-		5.393	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S60 / *Clothing & Equipment*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S60 / *Clothing & Equipment*

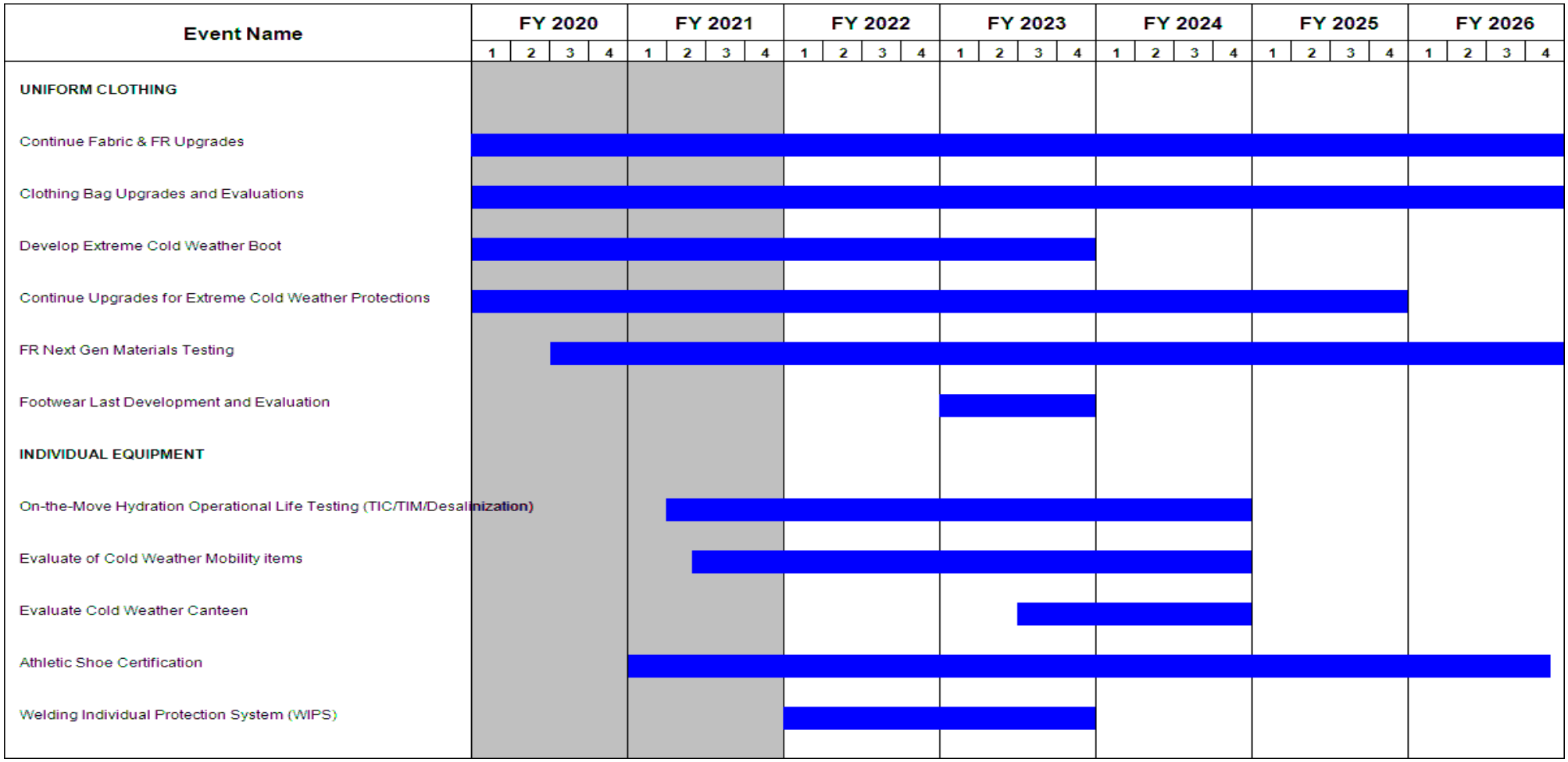


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S60 / *Clothing & Equipment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UNIFORM CLOTHING	1	2011	4	2026
Continue Fabric & FR Upgrades	3	2009	4	2026
Clothing Bag Upgrades and Evaluations	1	2013	4	2026
Develop Extreme Cold Weather Boot	1	2020	4	2023
Continue Upgrades for Extreme Cold Weather Protections	1	2020	4	2025
FR Next Gen Materials Testing	3	2020	4	2026
Footwear Last Development and Evaluation	1	2023	4	2023
INDIVIDUAL EQUIPMENT	2	2008	4	2025
On-the-Move Hydration Operational Life Testing (TIC/TIM/Desalinization)	2	2021	4	2024
Evaluate of Cold Weather Mobility items	2	2021	4	2024
Evaluate Cold Weather Canteen	3	2023	4	2024
Athletic Shoe Certification	1	2021	4	2026
Welding Individual Protection System (WIPS)	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S61 / *Acis Engineering Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
S61: *Acis Engineering Development*	-	2.865	1.790	2.528	-	2.528	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project conducts development, integration, and qualification activities in support of the Air Soldier System (Air SS). The Air SS is Army aircrew survival and mission equipment that improves safety, survivability, and mission performance. The Air SS addresses capability gaps identified during combat operations as well as emerging challenges to Army aircrew safety and performance caused by the bulk and weight of body-worn equipment, limited Situational Awareness (SA), lack of protection from emerging threats, and a lack functionally integrated mission electronics and protective/survival equipment. Air SS delivers improved aircrew survivability, SA, interoperability, and mission performance. The Air SS provides enhanced mission planning and execution, connectivity between aircrew members, other aircraft, and ground assets; improved terrain, threat, and obstacle avoidance information thorough improved heads up display (HUD) technologies; the capability to perform extended missions in extreme environmental and chemical/biological threat conditions; a digital replacement for paper-based DoD Flight Information Publications; and the Aircrew Combat Equipment (ACE), a replacement for the legacy survival vest with integral Modular Scalable Vest body armor. These enhanced capabilities support the enduring fleet as well as Future Vertical Lift (FVL) aircraft.

This project also funds the development and test of deferred Capability Development Document (CDD) capabilities as enablers to meet current and Multi-Domain Operation (MDO) gaps in protection, survivability, and SA. These include: improved laser eye protection to counter and defeat current and future threats; next generation Heads-Up Display for FVL platforms; power output improvement and weight and bulk reductions to aircrew-worn Personal Electronics; secure enhanced wireless audio capabilities aimed at further enhancement of crewmember mobility; and, aircrew helmet ballistic protection. This program does not duplicate any aircraft platform program efforts. Includes integration and interface of products on Soldiers and aircraft platforms.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Air Soldier System	2.865	1.790	2.528
Description: This project conducts development, integration and qualification activities in support of the Air Soldier System (Air SS) program. The Air SS addresses capability gaps identified during combat operations in Iraq and Afghanistan. Including crew station compatibility challenges caused by the burden of excessive equipment bulk and weight; impacts to safety resulting from excessive pilot workload and limited aircrew situational awareness (SA); and inadequate aircrew protection from environmental extremes, hostile threats, and induced threats resulting from aircraft mishaps or crashes.			
FY 2021 Plans: Completes Operational Testing of fully integrated Aircrew Combat Equipment (ACE) vest on each Army rotary wing platform to inform a production decision for FY 2022. Begins evaluation, development, and testing of candidate technologies for an improved laser eye protection (LEP) solution providing protection better aligned with today?s threat. Future focus (beyond FY 2021) is on			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S61 / *Acis Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
additional deferred capabilities including, but not limited to, development and testing of an obsolescence replacement for the Encrypted Aircraft Wireless Intercom System (EAWIS) leveraging Voice over Internet Protocol (VoIP) or ultra-wideband (UWB) technologies, and development and testing of aircrew helmet ballistic protection.			
FY 2022 Plans: Completes development and testing of improved laser eye protection (LEP) solution in order to provide enhanced protection better aligned for current and future MDO threats. Begins development of additional deferred capabilities and candidate technologies for use on current and future fleet (e.g. Future Vertical Lift) including, but not limited to: development and initial flight qualification of Helmet Sub-System (HSS); development of Combat Survivor/Evader Locator (CSEL) battery eliminator; and, obsolescence replacement for the Encrypted Aircraft Wireless Intercom System (EAWIS) leveraging Voice over Internet Protocol (VoIP) or ultra-wideband (UWB) technologies.			
FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 increase is due to re-phasing in order to prioritize and speed up development of LEP solution, which is a known safety and protection capability gap.			
Accomplishments/Planned Programs Subtotals	2.865	1.790	2.528

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• AZ3110: *Aircrew Integrated Systems*	48.610	54.793	41.425	-	41.425	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Air Soldier System Milestone C was conducted in April 2019 for initial capabilities to include: Aircraft-mounted hardware and helmet worn displays that provide integrated helmet capabilities and increase aircrew situational awareness; and, Protective and Survival Soldier Kit items that reduce equipment weight and bulk and improve aircrew mission effectiveness and survivability. Air SS capabilities are being phased into production over time. Efforts for the Air SS program include development, integration, test, and airworthiness qualification of aviator flight display symbology technologies that will increase crew member situational awareness, and aircrew protective and survival equipment that reduces bulk and weight and improves crew station compatibility and mission effectiveness. Air SS includes improvements to the current flight helmet; improvements to the survival gear carriage system; lightweight body armor; environmental protective clothing and personal survival equipment; and a day/night helmet-mounted flight symbology display for UH-60 and CH-47 aviators. Efforts continue to develop deferred capabilities as defined within the Capability Development Document (CDD) to include Aviation Multi-Domain Operation (MDO) enablers and modernization initiatives for protection and situational awareness. These efforts migrate from program/platform-unique hardware and software solutions to common integrated air/ground solutions that align with Network, Soldier Lethality, and FVL modernization priorities

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S61 / *Acis Engineering Development*

Development efforts are conducted using a mix of both Cost and Firm Fixed Price Contracts with industry utilizing full and open competition. Each development effort is individually evaluated and the appropriate contract type is selected in order to appropriately share risk between industry and the government. Risk reduction, developmental, and operational testing are conducted utilizing Reimbursable orders placed with Other Government Agencies under either Project Order Law, Title 41, United States Code, section 6307 or the Economy Act, Title 31, United States Code, section 1535.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S61 / *Acis Engineering Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Administration	Allot	Various Government : Huntsville, Alabama	4.196	0.163		0.050		0.064		-		0.064	Continuing	Continuing	Continuing
		Subtotal	4.196	0.163		0.050		0.064		-		0.064	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Warrior and Air Soldier System Development	C/CPFF	Various Government : Various Locations	63.576	0.704		0.683		2.106		-		2.106	Continuing	Continuing	Continuing
		Subtotal	63.576	0.704		0.683		2.106		-		2.106	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	RO	Various Government : Various Locations	4.454	0.021		0.057		0.058		-		0.058	Continuing	Continuing	Continuing
		Subtotal	4.454	0.021		0.057		0.058		-		0.058	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental and Operational Testing	RO	Various Activities : Various Locations	17.279	1.977		1.000		0.300		-		0.300	Continuing	Continuing	Continuing
		Subtotal	17.279	1.977		1.000		0.300		-		0.300	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S61 / *Acis Engineering Development*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	89.505	2.865		1.790		2.528		-		2.528	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S61 / *Acis Engineering Development*

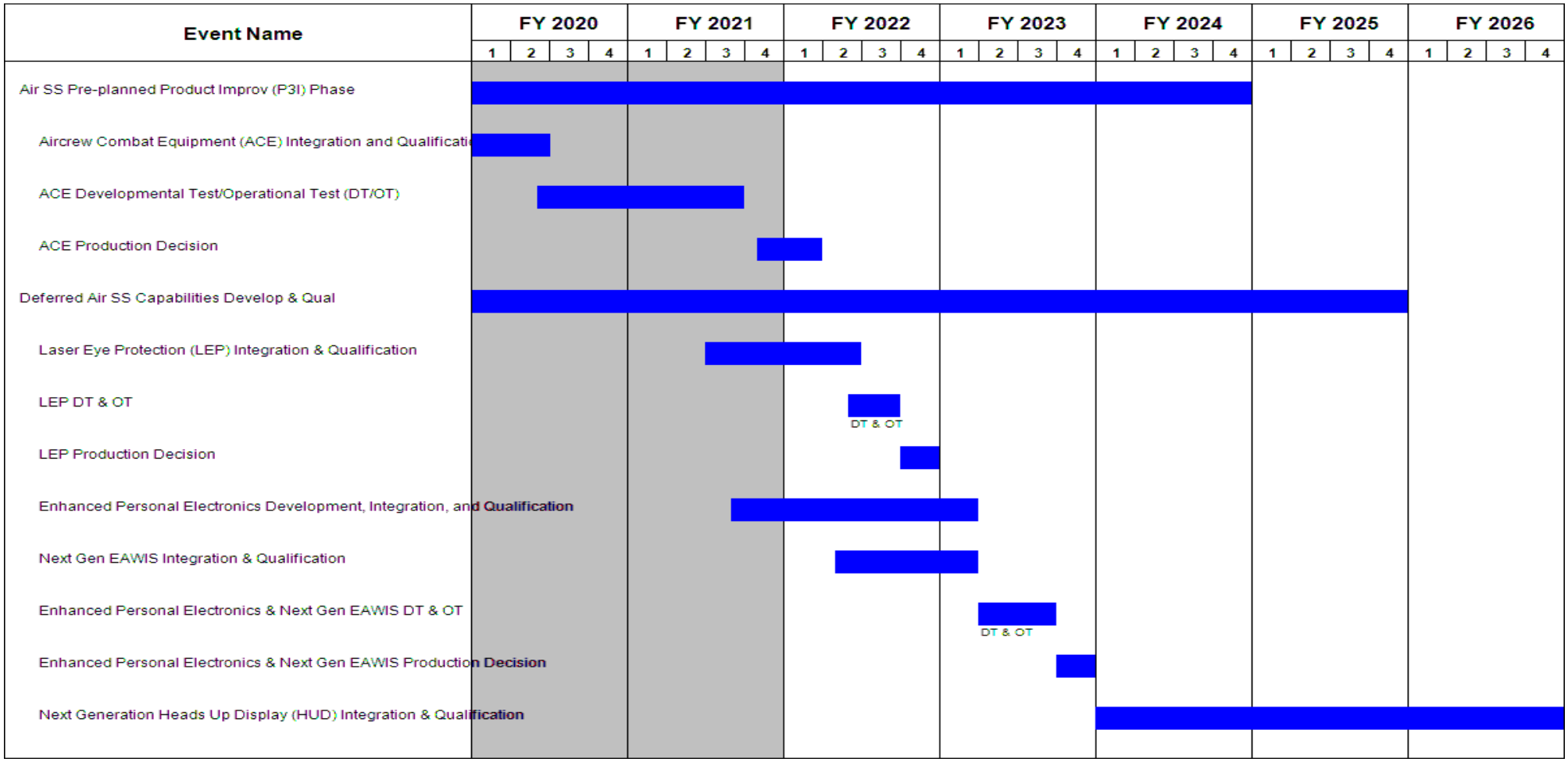


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S61 / *Acis Engineering Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Air SS Pre-planned Product Improv (P3I) Phase	1	2016	4	2024
Aircrew Combat Equipment (ACE) Integration and Qualification	1	2017	2	2020
ACE Developmental Test/Operational Test (DT/OT)	2	2020	3	2021
ACE Production Decision	4	2021	1	2022
Deferred Air SS Capabilities Develop & Qual	1	2019	4	2025
Laser Eye Protection (LEP) Integration & Qualification	3	2021	2	2022
LEP DT & OT	2	2022	3	2022
LEP Production Decision	4	2022	4	2022
Enhanced Personal Electronics Development, Integration, and Qualification	3	2021	1	2023
Next Gen EAWIS Integration & Qualification	2	2022	1	2023
Enhanced Personal Electronics & Next Gen EAWIS DT & OT	2	2023	3	2023
Enhanced Personal Electronics & Next Gen EAWIS Production Decision	4	2023	4	2023
Next Generation Heads Up Display (HUD) Integration & Qualification	1	2024	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S63 / *Individual Weapons Engineering Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
S63: *Individual Weapons Engineering Development*	-	2.586	4.214	3.651	-	3.651	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Individual Weapons Engineering Development program provides funds to transition components or prototypes from Budget Activity 4 (BA 4) Element (PE) 0603827A Soldier Systems - Advanced Development Project S54 Small Arms Improvement Program and other domestic and foreign sources of small arms weapon systems to demonstrate, test and evaluate capability near or at planned operational requirements. The Maneuver Center of Excellence (MCoE), Fort Benning, GA (User Community) identifies the Individual Weapons Engineering Development as a critical capability gap for our Soldiers in combat and Soldier Lethality Cross Functional Team (CFT) has assumed this need as a task. Small arms systems include weapons up to 40 millimeter (mm) in caliber. Current and future efforts focus on system improvements designed to enhance lethality, target acquisition, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include system development, integration (to include human-systems), demonstration, test and evaluate components, prototypes and operational system prototypes of small arms weapon systems and/or enhancements. Benefits include continuous improvements to small arms weapon systems, fire control equipment, optics, gun barrels, ancillary equipment, training devices, component mounts, weapon mounts, and weapon/ammunition interface of current small arms fleet or new weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Design and Development	-	3.202	2.713
FY 2021 Plans: New and Legacy Weapon Design and Product Development: Continue to focus on weapon design and development utilizing current state-of-the-art technologies and integration of those technologies for individual weapons across the spectrum of small arms from pistols through rifles and grenade launchers. Evaluation will focus on terminal effects and those technologies utilized to achieve on-target effects, as well as increase sustainability, reliability, and producibility and will include advanced combat optics and improvement of small arms munitions.			
FY 2022 Plans: New and Legacy Weapon Assessment and Product Development: Will continue to focus on weapon design and development utilizing current state-of-the-art technologies and integration of those technologies for individual weapons across the spectrum of small arms from pistols through rifles and grenade launchers. Evaluation will focus on terminal effects and those technologies utilized to achieve on-target effects, as well as increase sustainability, reliability, and producibility and will include advanced combat optics and improvement of small arms munitions.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY22 Decrease due to reduction in overall funding.			
Title: Testing and Evaluation ***FY 2021 Plans:*** New and Legacy Weapon Testing and Evaluation: Continue to test and evaluate new technology that can lead to enhancements of current and legacy weapon systems or create new weapon systems, as well as advanced combat optics and improvement of small arms munitions. ***FY 2022 Plans:*** New and Legacy Weapon Testing and Evaluation: Will continue to test and evaluate new technology that can lead to enhancements of current and legacy weapon systems or create new weapon systems, as well as advanced combat optics and improvement of small arms munitions. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY22 Decrease due to reduction in overall funding.	-	1.012	0.938
Title: Small Arms Weapon Systems Enhancements ***Description:*** Enhancements and development of small arms weapon systems	2.466	-	-
Title: Ammunition ***Description:*** Improvement of small arms ammunition	0.050	-	-
Title: Combat Optics ***Description:*** Improvement of combat optics	0.020	-	-
Title: Research and Analysis ***Description:*** Market Research and Cost Benefit Analysis	0.050	-	-
Accomplishments/Planned Programs Subtotals	2.586	4.214	3.651

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• S54: *Small Arms Improvement*	13.956	15.495	6.911	-	6.911	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• G01507: *COMPACT SEMI-AUTOMATIC SNIPER SYSTEM*	9.860	0.999	-	-	-	-	-	-	-	-	-
• G13503: *M4A1 CARBINE*	31.514	5.411	4.434	-	4.434	-	-	-	-	-	-
• GB3007: *M4 Carbine Mods*	17.595	4.824	-	-	-	-	-	-	-	-	-
• G01501: *XM320 Grenade Launcher Module (GLM)*	0.717	5.969	8.666	-	8.666	-	-	-	-	-	-
• G15325: *Handgun*	6.422	4.662	4.930	-	4.930	-	-	-	-	-	-
• GL3200: *Items Less Than $5.0m (WOCV-WTCV)*	3.066	2.763	1.068	-	1.068	-	-	-	-	-	-
• GC0925: *Modifications Less Than $5.0m (WOCV-WTCV)*	5.187	2.604	-	-	-	-	-	-	-	-	-

Remarks

In support of Small Arms Requirements, components or prototypes developed in BA 4 PE 0603827A Soldier Systems - Advanced Development Project S54 Small Arms Improvement Program is transitioned to BA 5 PE 0604601A Infantry Support Weapons Project S63 Individual Weapons Engineering Development to conduct engineering and manufacturing development. Once the component, prototype or operational prototype achieves Milestone C and type classification the item transitions to small arms weapon systems production or modification program.

In FY 2022, funding in the amount of $0.366 million for manpower was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

D. Acquisition Strategy

Primary strategy is to mature and finalize design efforts, award Research, Development, Test and Evaluation (RDT&E) Defense Ordnance Technology Consortium (DOTC) and Other Transaction Authority (OTA) type hardware contracts. Test and evaluate systems that result in type classification, material release, and follow-on production contract awards.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Weapons, : Picatinny Arsenal	10.531	0.035	Mar 2020	0.050	Mar 2021	0.050	Mar 2022	-		0.050	Continuing	Continuing	Continuing
Travel	MIPR	PM Soldier Weapons, : Picatinny Arsenal	1.537	0.047	Mar 2020	0.062	Mar 2021	0.010	Mar 2022	-		0.010	Continuing	Continuing	Continuing
FY2019 SBIR / STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	0.211	-		-		-		-		-	Continuing	Continuing	Continuing
FY 2019 Rescission	TBD	Army Budget Office : Pentagon	0.910	-		-		-		-		-	0.000	0.910	-
		Subtotal	13.189	0.082		0.112		0.060		-		0.060	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fabrication	Various	Various : Multiple Contractors	4.120	-		1.220	Apr 2021	1.050	Apr 2022	-		1.050	Continuing	Continuing	Continuing
Hardware Development	MIPR	Army Research Development Engineering Centers, : Multiple	17.240	-		1.220	Apr 2021	1.050	Apr 2022	-		1.050	Continuing	Continuing	Continuing
		Subtotal	21.360	-		2.440		2.100		-		2.100	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Army Research Development	68.021	0.273	Mar 2020	0.400	Mar 2021	0.391	Mar 2022	-		0.391	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S63 / *Individual Weapons Engineering Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Engineering Centers, : Multiple													
Logistics	MIPR	TACOM, : Warren	5.070	0.108	Mar 2020	0.125	Mar 2021	0.100	Mar 2022	-		0.100	Continuing	Continuing	Continuing
Human Research and Engineering	MIPR	Army Research Laboratory, : Aberdeen Proving Ground	3.995	0.108	Mar 2020	0.125	Mar 2021	0.100	Mar 2022	-		0.100	Continuing	Continuing	Continuing
		Subtotal	77.086	0.489		0.650		0.591		-		0.591	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Army Developmental Test Command, : Aberdeen Proving Ground	26.579	0.685	Mar 2020	0.360	Mar 2021	0.300	Mar 2022	-		0.300	Continuing	Continuing	Continuing
Operational Testing	MIPR	Army Test and Evaluation Command, : Aberdeen Proving Ground	17.000	0.995	Mar 2020	0.350	Mar 2021	0.300	Mar 2022	-		0.300	Continuing	Continuing	Continuing
Validation Testing	MIPR	Army Test and Evaluation Centers, : Multiple	9.972	0.335	Mar 2020	0.302	Mar 2021	0.300	Mar 2022	-		0.300	Continuing	Continuing	Continuing
		Subtotal	53.551	2.015		1.012		0.900		-		0.900	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	165.186	2.586		4.214		3.651		-		3.651	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

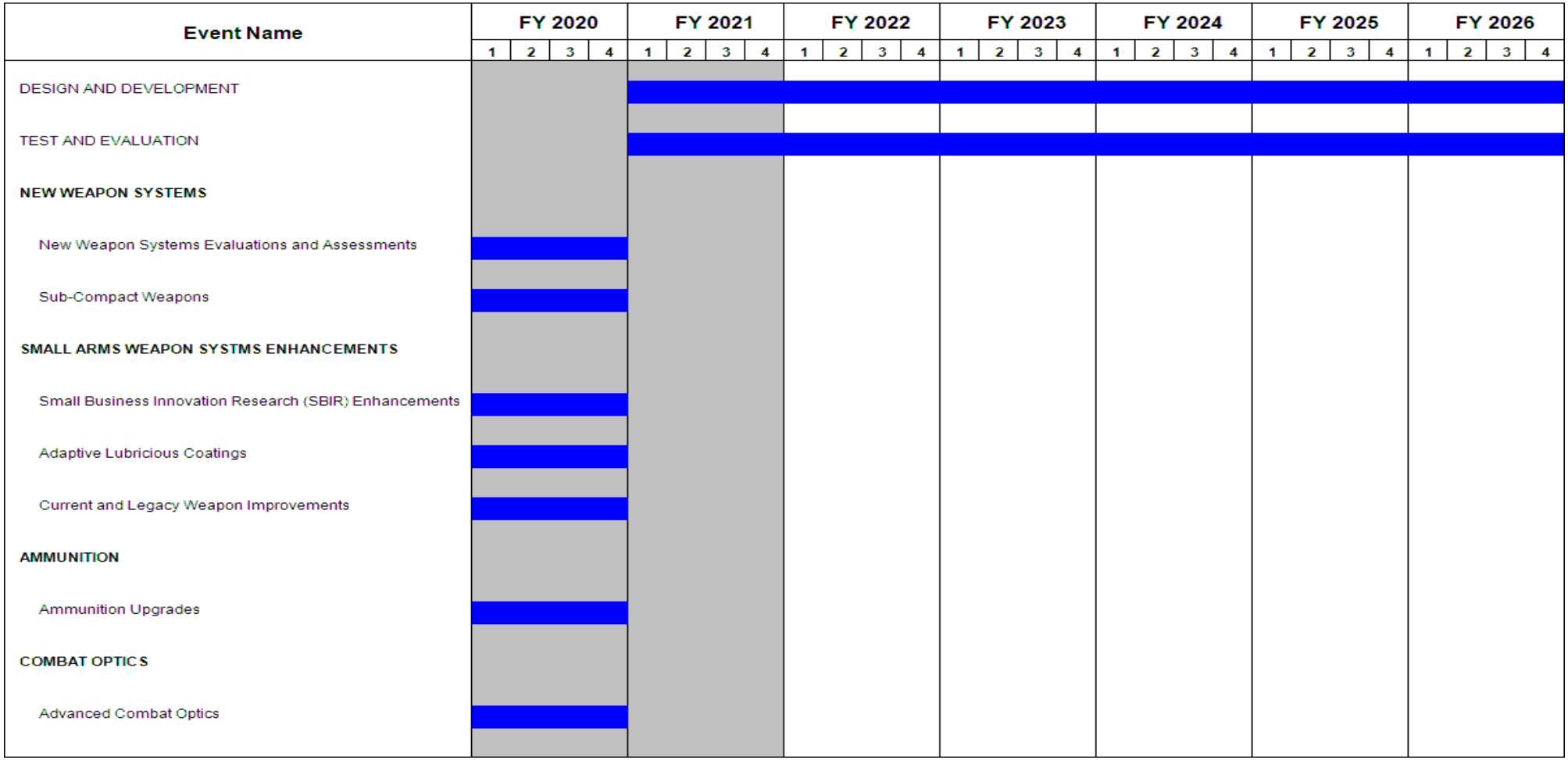


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

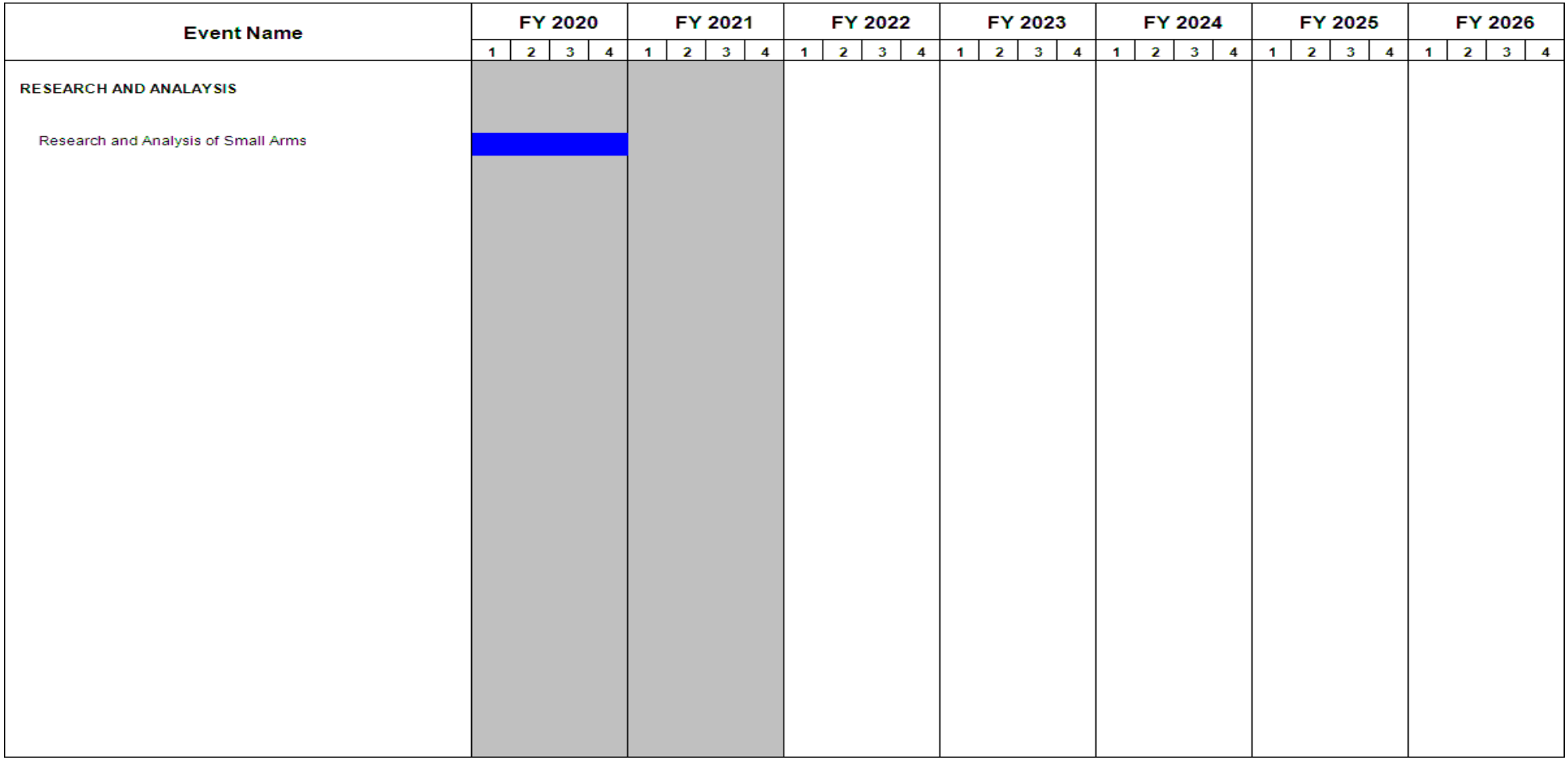


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DESIGN AND DEVELOPMENT	1	2021	4	2026
TEST AND EVALUATION	1	2021	4	2026
NEW WEAPON SYSTEMS	1	2007	4	2026
New Weapon Systems Evaluations and Assessments	1	2018	4	2020
Sub-Compact Weapons	1	2018	4	2020
Squad Designated Marksman Rifle (SDMR)	1	2014	4	2019
Individual Carbine Competition	1	2010	4	2013
Modular Handgun System (MHS)	1	2012	4	2018
Precision Sniper Rifle (PSR)	1	2015	4	2016
SMALL ARMS WEAPON SYSTMS ENHANCEMENTS	1	2008	4	2020
Small Business Innovation Research (SBIR) Enhancements	1	2017	4	2020
Weapon Systems and Accessories Enhancements	1	2017	4	2019
Compact Semi-Automatic Sniper System (CSASS)	1	2015	4	2016
Powered Rail now known as Intelligent Rail	1	2013	4	2016
Adaptive Lubricious Coatings	1	2018	4	2020
Current and Legacy Weapon Improvements	1	2020	4	2020
AMMUNITION	1	2008	4	2020
XM1112 40MM Airburst Non-Lethal Munitions	1	2010	4	2016
Ammunition Upgrades	1	2008	4	2020
COMBAT OPTICS	1	2008	4	2020
Advanced Combat Optics	1	2020	4	2020
Mounted Machine Gun Optics (MMO)	1	2015	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S63 / *Individual Weapons Engineering Development*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Squad Fire Control Optic	1	2014	4	2015
Grenadier Sighting System (GSS) for the M320 Grenade Launcher	1	2009	4	2019
Rifle Combat Optic (RCO Technology Refresh	1	2017	4	2019
Intelligent Rail	1	2017	4	2018
Optics Upgrades	1	2018	4	2019
RESEARCH AND ANALAYSIS	1	2012	4	2020
Research and Analysis of Small Arms	1	2015	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S70 / *Personnel Recovery Support System (PRSS)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
S70: *Personnel Recovery Support System (PRSS)*	-	-	-	3.132	-	3.132	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2022.

A. Mission Description and Budget Item Justification

Provides system research, development and testing of the Personal Recovery Support System (PRSS)/Personnel Recovery Support Equipment (PRSE) supporting operations to report and locate isolated, missing, detained or captured (IMDC) Soldiers.This project provides the continued maturation of PRSS products that enable operations to report and locate isolated Soldiers. The PRSS program consists of the enhancement of existing products to ensure continued successful interoperability within the relevant theater of operations and the Continental United States (CONUS), and testing of the devices that provide Low Probability of Intercept (LPI)/Low Probability of Detection (LPD).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Personnel Recovery Systems	-	-	3.132
FY 2022 Plans: Begins evaluation, development, and testing of of component replacements, enhancements, and operational security measures for Classified Personnel Recovery Support Equipment (PRSE).			
FY 2021 to FY 2022 Increase/Decrease Statement: FY2021 to FY2022 increase is due to program re-phasing to accelerate development and test of new waveforms and hardware for the Classified PRSE system in order to ensure interoperability, mitigate potential security compromises, and address obsolescence.			
Accomplishments/Planned Programs Subtotals	-	-	3.132

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• G01101: *Personnel Recovery Support System (PRSS)*	9.382	8.346	9.741	-	9.741	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S70 / *Personnel Recovery Support System (PRSS)*

D. Acquisition Strategy

Execute Personnel Recovery program development efforts for performance optimization through contracts with industry and reimbursable support agreements with other Governmental agencies, labs, and Federally Funded Research and Development Centers. Perform continuing development and test of new waveforms and hardware to ensure successful interoperability for personnel recovery, and to mitigate potential security compromises to the Personnel Recovery Support Equipment and Personnel Recovery Support System programs.

Future program strategy is to adapt and test Personnel Recovery program products for integration onto various Army and sister service aerial platforms in order to increase coverage beyond current theaters of operation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S70 / *Personnel Recovery Support System (PRSS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Adminstration	Allot	Various Government : Huntsville, Alabama	0.988	-		-		0.060		-		0.060	Continuing	Continuing	Continuing
		Subtotal	0.988	-		-		0.060		-		0.060	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Personnel Recovery System Development Systems Engineering	MIPR	Various Organizations : Various Locations	8.788	-		-		3.002		-		3.002	Continuing	Continuing	Continuing
		Subtotal	8.788	-		-		3.002		-		3.002	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various Organizations : Various Locations	2.348	-		-		0.070		-		0.070	Continuing	Continuing	Continuing
		Subtotal	2.348	-		-		0.070		-		0.070	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing/ Operational Testing	MIPR	Various Organizations : Various Locations	3.509	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	3.509	-		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) S70 / *Personnel Recovery Support System (PRSS)*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.633	-		0.000		3.132		-		3.132	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S70 / *Personnel Recovery Support System (PRSS)*

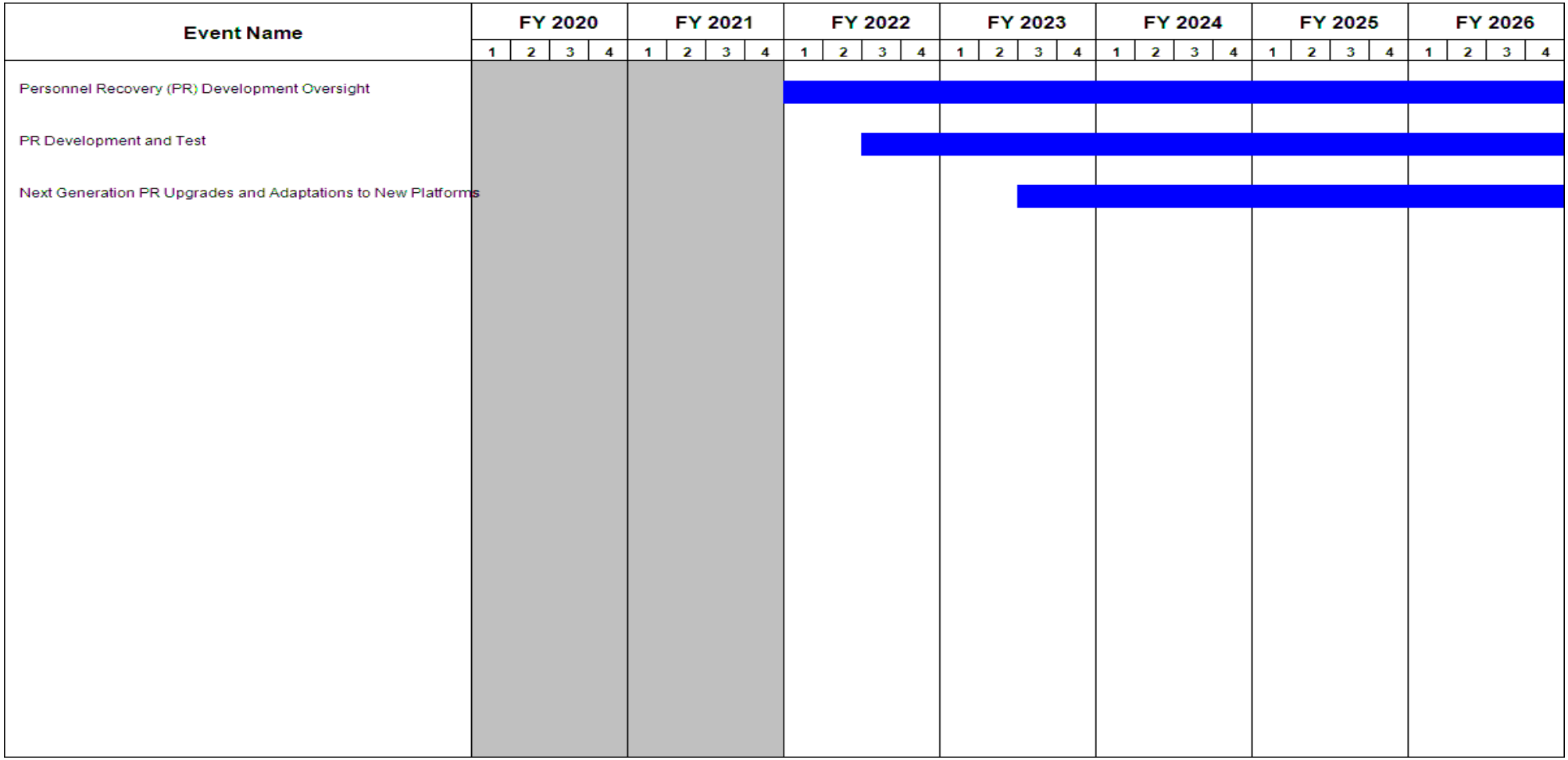


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** S70 / *Personnel Recovery Support System (PRSS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Personnel Recovery (PR) Development Oversight	1	2022	4	2026
PR Development and Test	3	2022	4	2026
Next Generation PR Upgrades and Adaptations to New Platforms	3	2023	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) VS5 / *Soldier Protective Equipment*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
VS5: *Soldier Protective Equipment*	-	6.355	6.478	9.172	-	9.172	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. It supports Engineering and Manufacturing Development (EMD) and full rate production decision reviews of Soldier Protective Equipment. It leverages advancements in technology to continue improvements to the Army's Personal Protective Equipment (PPE) portfolio to include hard and soft body armor components (Vital Torso Protection (VTP) and Torso and Extremity Protection (TEP) respectfully), helmets (Integrated Head Protection System (IHPS) and Next Generation (NG) IHPS, Military Protective Eyewear systems and other personal protective equipment to include female specific design and development. This project will continue to support cross-service initiatives to increase commonality.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Soldier Protective Equipment	6.355	6.478	9.172
Description: Project VS5 (Soldier Protective Equipment) supports engineering and manufacturing development of Individual Soldier Ballistic Protection equipment. It will leverage advancements in technology to continue incremental improvements to Personal Protective Equipment (PPE).			
FY 2021 Plans: Continue to evaluate and develop system and subsystem technologies across the PPE portfolio from emerging ballistic/blast threats. Continue to test ballistic properties of current PPE after exposure to extreme storage conditions for better shelf and service life predictions. Continue Soldier Protection System (SPS) system human factors and environmental/exposure testing, including Cold & Tropical regions, durability, etc. Refine planning for introducing advanced Technology and materials into production processes as these technologies mature.			
FY 2022 Plans: Evaluate and develop system and subsystem technologies across the PPE portfolio from emerging ballistic/blast threats. Continue to test ballistic properties of current PPE after exposure to extreme storage condition for better shelf and service life predictions. Continue Soldier Protection System (SPS) gender focused human factor evaluations and environmental/exposure testing, including Cold & Tropical regions, and durability testing. Refine planning for introducing advanced Technology and materials into production processes as these technologies mature and enable expanded opportunities associated with gender specific PPE. Improve the PPE test methodologies such as updating and enhancing the Non-Destructive Test Equipment (NDTE) methodology and investigate Transparent Range Increase efforts supporting the Secretary of the Army's directive to identify opportunities for commonality across all Services (Army, Navy, Air Force, Marines, and Coast Guard).			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** VS5 / *Soldier Protective Equipment*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding increase in Soldier Protective Equipment portfolio is due to anticipated requirement changes in FY22.			
Accomplishments/Planned Programs Subtotals	6.355	6.478	9.172

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• VS4: *Soldier Protective Equipment*	2.720	2.279	4.278	-	4.278	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Acquisition strategies for these programs vary in methods, and range from: 1) Material Change programs that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of design complexity and testing required.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) VS5 / *Soldier Protective Equipment*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Allot	Various SSV : Various	1.016	1.337		0.645		0.496		-		0.496	Continuing	Continuing	Continuing
		Subtotal	1.016	1.337		0.645		0.496		-		0.496	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Contracts	Various	Various : Various	34.785	0.926		0.381		0.751		-		0.751	Continuing	Continuing	Continuing
Prod Sys Engineering Spt	MIPR	Various : Various	8.109	1.551		1.875		2.831		-		2.831	Continuing	Continuing	Continuing
		Subtotal	42.894	2.477		2.256		3.582		-		3.582	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Engineering Spt	MIPR	Various : Various	3.729	1.025		1.585		1.435		-		1.435	Continuing	Continuing	Continuing
		Subtotal	3.729	1.025		1.585		1.435		-		1.435	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Environmental/HFE	MIPR	Various DTC & OTC : Various DTC & OTC	12.917	0.926		-		1.114		-		1.114	Continuing	Continuing	Continuing
Surveillance Testing - Base Threat/Emerging Threat	TBD	TBD : TBD	-	0.590		1.992		2.545		-		2.545	Continuing	Continuing	Continuing
		Subtotal	12.917	1.516		1.992		3.659		-		3.659	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / *Infantry Support Weapons*	Project (Number/Name) VS5 / *Soldier Protective Equipment*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	60.556	6.355		6.478		9.172		-		9.172	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** VS5 / *Soldier Protective Equipment*

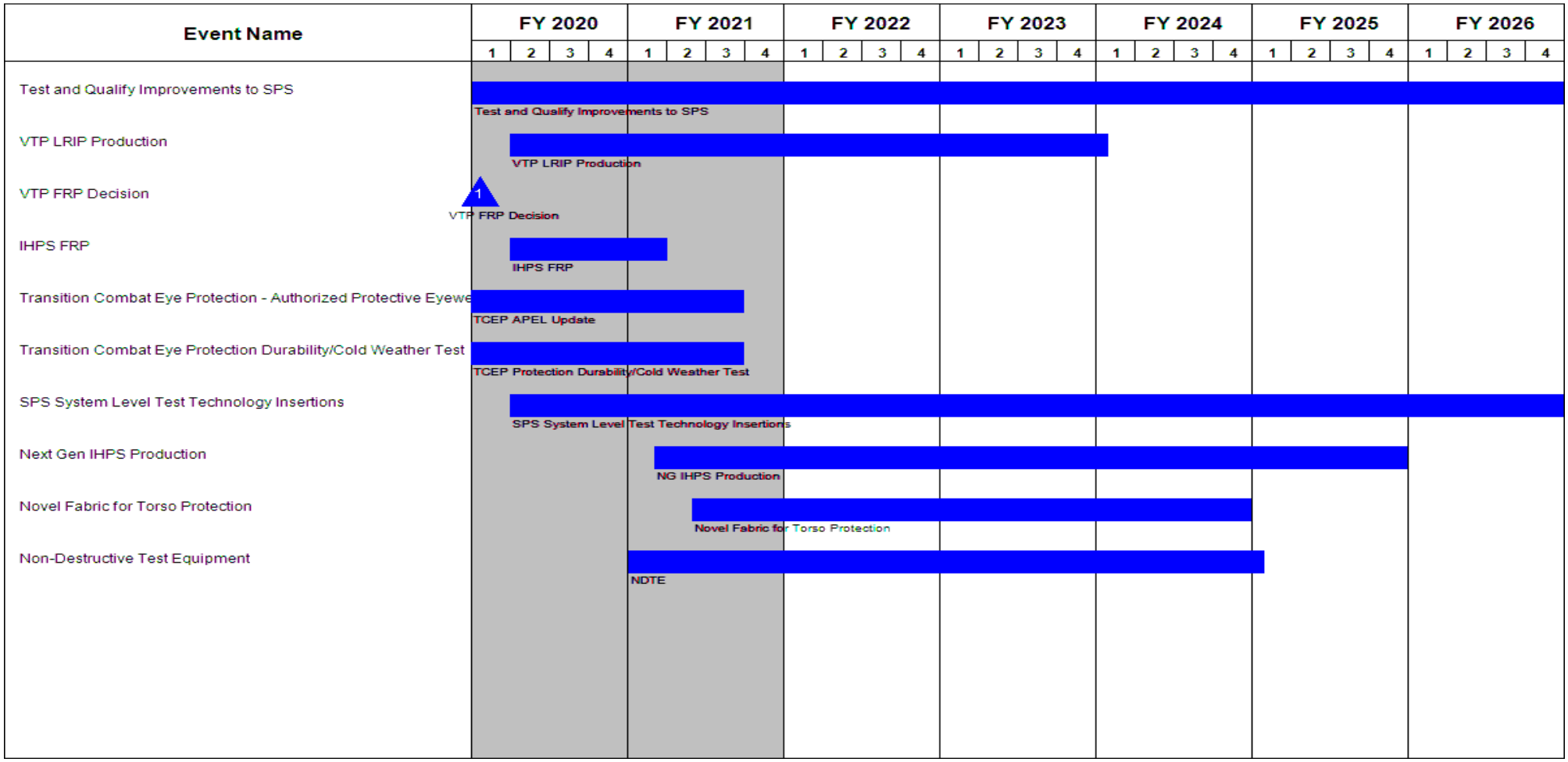


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604601A / *Infantry Support Weapons*	**Project (Number/Name)** VS5 / *Soldier Protective Equipment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Test and Qualify Improvements to SPS	1	2015	4	2026
VTP LRIP Production	1	2017	1	2024
VTP FRP Decision	1	2020	1	2020
IHPS FRP	1	2019	1	2021
Transition Combat Eye Protection - Authorized Protective Eyewear (APEL) Update	3	2019	3	2021
Transition Combat Eye Protection Durability/Cold Weather Test	2	2019	3	2021
SPS System Level Test Technology Insertions	1	2017	4	2026
Next Gen IHPS Production	1	2021	4	2025
Novel Fabric for Torso Protection	2	2021	4	2024
Non-Destructive Test Equipment	1	2021	1	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	-	8.213	11.374	-	11.374	-	-	-	-	-	-
BX8: *Cold Weather All-Terrain Vehicle (CATV)*	-	-	6.065	1.825	-	1.825	-	-	-	-	-	-
H07: *Family Of Med Tac Veh*	-	-	2.148	9.549	-	9.549	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) supports continued modernization of the Army's Medium Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: prognostics & preventative maintenance, vetronics, vehicle electrification, Victory Architecture, autonomous operations and other emerging technologies. Furthermore, the PE supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

The Family of Medium Tactical Vehicles (FMTV) includes Cargo, Tractor, Load Handling System (LHS), Wrecker, Expandible Van, Shop Van, and Dump variants with payloads ranging from 3-tons to 10-tons and associated companion trailers. FMTV trucks perform over 55 percent of the Army's local haul, line haul, and unit resupply missions. It operates throughout theater as multi-purpose transportation vehicles in combat, combat support, and combat service support units.

Funding from this Program Element will be used to support the continued evolution of the future FMTV fleet as well as tech insertion opportunities to keep the current FMTV fleet relevant on today's battlefield. This includes upgrades in survivability and crew protection, improved safety by leveraging advancements in commercial active safety technologies, modernizing the aging Low Velocity Air Drop (LVAD) fleet of vehicles, improved utilization through modularity, integration of advanced high efficiency powertrains and fuel saving technologies, and insertion of autonomous vehicle capabilities that will change the way transportation missions are conducted around the world.

FY 2022 Project H07 Base funds in the amount of $3.071 million will be used for Improved Vehicle Safety Technologies and FMTV A2 Operational Testing and Adversarial Assessment.

FY 2022 Project H07 Base funds in the amount of $6.478 million will be used for the LVAD Next Generation Analysis STS Work Directive, Test Assets, and Live Fire Testing. Updates to the LVAD are needed to address obsolescence issues and modernize the fleet.

The Cold-weather All-Terrain Vehicle (CATV) is a tracked vehicle that will provide transportation for up to a 10-Soldier element, emergency medical evacuation, command and control capability, and general cargo transportation on- and off-road in an Arctic environment under a wide range of otherwise impassable terrain, to include frozen ice, and extreme cold weather conditions to support year-round training as well as to conduct Homeland Defense (HD), Homeland Security (HS), and Defense support of Civil Authorities (DSCA) mission. The CATV will employ two carrier variants: General-purpose carrier variant capable of providing transport for not less than 9 Soldiers, plus the driver within a cab/enclosure (10 Soldiers) with equipment and supplies to sustain three days of combat operations. The General

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*

Purpose variant will be reconfigurable to a casualty evacuation (CASEVAC) variant capable of transporting medical equipment, two caregivers, and not less than two litter patients or four ambulatory patients in addition to the driver within a cab/enclosure. The General Purpose variant will also be reconfigurable to a Command and Control (C2) variant providing the space weight and power to hosting standard Joint communications and common operating picture (COP) platforms. The C2 and COP equipment should be able to be used enroute or with minimal setup upon halt by six Soldiers in addition to the driver within a cab/enclosure. Cargo/flatbed capable of carrying outsized equipment and cargo. The cargo variant should allow for loading cargo with a forklift from either side (i.e. dropside or flatbed configuration) and have a cab/enclosure for two Soldiers (driver and vehicle commander).

FY 2022 CATV Project BX8 budget activities in the amount of $1.825 million include System Engineering and Management Support, and Test and Evaluation.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	8.523	6.448	-	6.448
Current President's Budget	0.000	8.213	11.374	-	11.374
Total Adjustments	0.000	-0.310	4.926	-	4.926
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-0.310			
• Adjustments to Budget Years	-	-	4.926	-	4.926

Change Summary Explanation

FY 2022 increase is for Project H07 LVAD Next Generation Model.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*	Project (Number/Name) BX8 / *Cold Weather All-Terrain Vehicle (CATV)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
BX8: *Cold Weather All-Terrain Vehicle (CATV)*	-	-	6.065	1.825	-	1.825	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Cold-weather All-Terrain Vehicle (CATV) is a tracked vehicle that will provide transportation for up to a 10-Soldier element, emergency medical evacuation, command and control capability, and general cargo transportation on- and off-road in an Arctic environment under a wide range of otherwise impassable terrain, to include frozen ice, and extreme cold weather conditions to support year-round training as well as to conduct Homeland Defense (HD), Homeland Security (HS), and Defense support of Civil Authorities (DSCA) mission. The CATV will employ two carrier variants: General-purpose carrier variant capable of providing transport for not less than 9 Soldiers, plus the driver within a cab/enclosure (10 Soldiers) with equipment and supplies to sustain three days of combat operations. The General Purpose variant will be reconfigurable to a casualty evacuation (CASEVAC) variant capable of transporting medical equipment, two caregivers, and not less than two litter patients or four ambulatory patients in addition to the driver within a cab/enclosure. The General Purpose variant will also be reconfigurable to a Command and Control (C2) variant providing the space weight and power to hosting standard Joint communications and common operating picture (COP) platforms. The C2 and COP equipment should be able to be used enroute or with minimal setup upon halt by six Soldiers in addition to the driver within a cab/enclosure. Cargo/flatbed capable of carrying outsized equipment and cargo. The cargo variant should allow for loading cargo with a forklift from either side (i.e. dropside or flatbed configuration) and have a cab/enclosure for two Soldiers (driver and vehicle commander).

Testing in ECW is necessary to prove the adequacy to the requirements with timing necessary to support planned Field Unit Equipped (FUE) in FY23. FUE is needed as soon as possible to replace the current capability that is reaching the end of life due to obsolescence

FY 2022 CATV budget activities in the amount of $1.825 million include System Engineering and Management Support, and Test and Evaluation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: CATV Prototype	-	4.271	-
Description: Funding provided for the procurement of the CATV Prototypes.			
FY 2021 Plans: Funding provided for the procurement of the CATV Prototypes.			
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease due to reduction in testing.			
Title: CATV Systems Engineering/Management Support	-	0.794	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** BX8 / *Cold Weather All-Terrain Vehicle (CATV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Funding provided for Matrix personnel and Program Management (PM) support of the CATV program. ***FY 2021 Plans:*** Funding provided for Matrix personnel and Program Management (PM) support of the CATV program. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increased to be used for System Engineering, management support and Test and Evaluation.			
Title: CATV Test and Evaluation ***Description:*** Funding provided for endurance, performance, transportability testing and production verification testing for CATV. ***FY 2021 Plans:*** Funding provided for endurance, performance, and production verification testing for CATV. ***FY 2022 Plans:*** Funding provided for endurance, performance, and sling load testing on down selected prototype variants for CATV. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to adding Transportability testing.	-	1.000	1.825
Accomplishments/Planned Programs Subtotals	-	6.065	1.825

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• D15620: *Family of Cold Weather All-Terrain Vehicle (CATV)*	-	9.249	16.450	-	16.450	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Acquisition Strategy supports a two-step acquisition approach with an OTA based Prototype contract in 2QFY21 to two vendors for the prototype phase and a down select to one vendor on a Production contract in 3QFY22 that will support the production phase. The Army Procurement Objective (APO) is 110 Cold-weather All-Terrain Vehicles (CATV).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*	Project (Number/Name) BX8 / *Cold Weather All-Terrain Vehicle (CATV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CATV Prototypes	C/CS	Oshkosh Defense and BAE : Oshkosh, WI & York, PA	-	-		4.271	Mar 2021	-		-		-	0.000	4.271	-
		Subtotal	-	-		4.271		-		-		-	0.000	4.271	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CATV Engineering and Management Support	Various	Various : Various	-	-		0.794	Dec 2020	-		-		-	0.000	0.794	-
		Subtotal	-	-		0.794		-		-		-	0.000	0.794	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CATV Test and Evalution	MIPR	Various : Various	-	-		1.000	Jun 2021	1.825	Mar 2022	-		1.825	0.000	2.825	-
		Subtotal	-	-		1.000		1.825		-		1.825	0.000	2.825	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		6.065		1.825		-		1.825	0.000	7.890	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** BX8 / *Cold Weather All-Terrain Vehicle (CATV)*

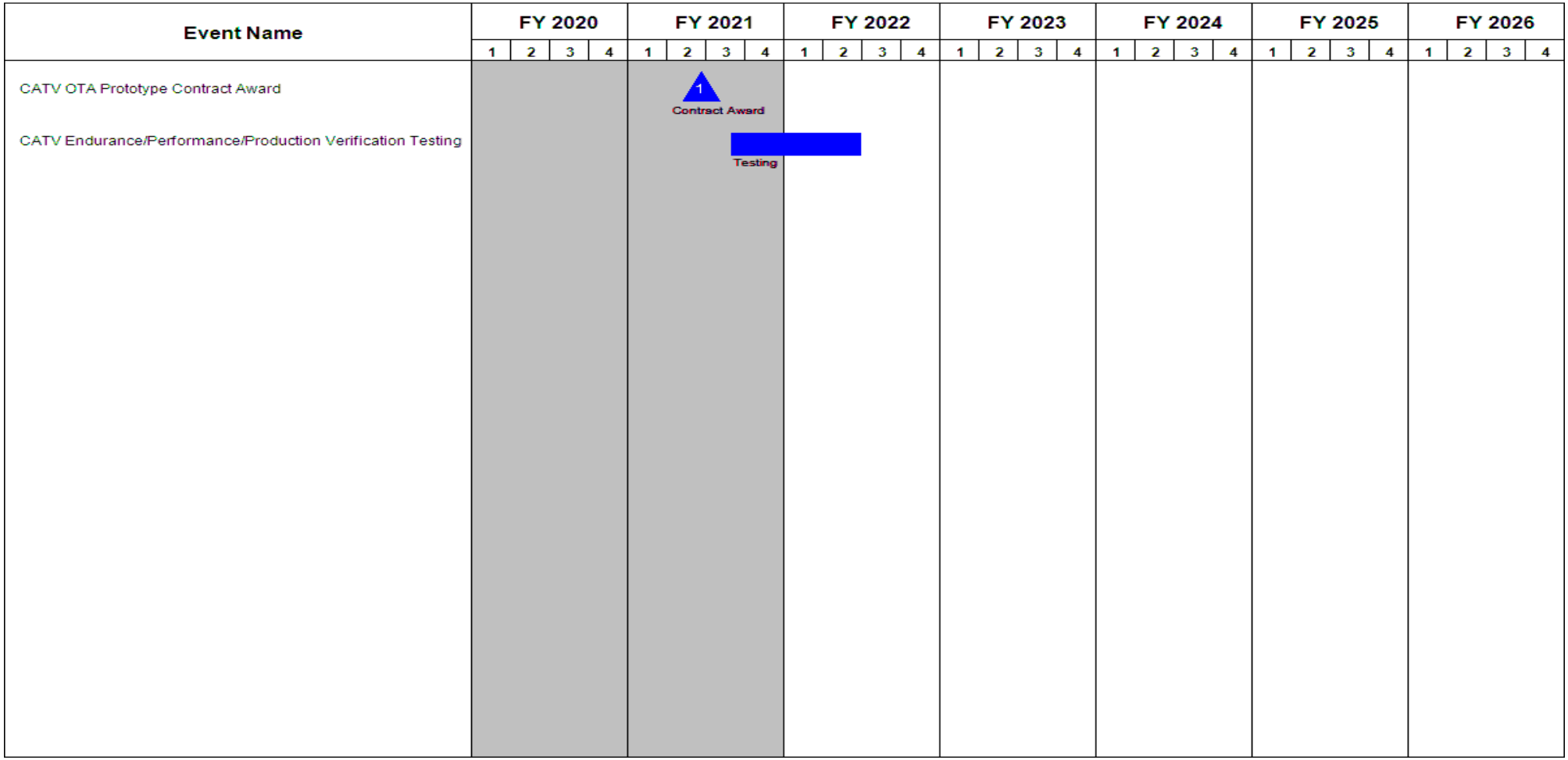


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** BX8 / *Cold Weather All-Terrain Vehicle (CATV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CATV OTA Prototype Contract Award	2	2021	2	2021
CATV Endurance/Performance/Production Verification Testing	3	2021	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*	Project (Number/Name) H07 / *Family Of Med Tac Veh*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
H07: *Family Of Med Tac Veh*	-	-	2.148	9.549	-	9.549	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FMTVA2 production and ECP modernization effort restores vehicle performance that was lost due to the addition of armor protection kits as the threat to tactical vehicles and the FMTV has increased. The FMTVA2 also addresses Space, Weight, Power, and Cooling (SWaP-C) constraints from having to host an increasing amount of C4ISR and Counter-IED equipment. PD MTV is executing the FMTVA2 effort documented in a signed Acquisition Decision Memorandum by the AAE on 16 November 2015.

FY 2022 Project H07 Base funds in the amount of $3.071 million will be used for the Improved Vehicle Safety Technologies and FMTVA2 Operational Testing and Adversarial Assessment .

The three FMTV LVAD models (M1081, M1093, M1094) ended production in 2009 and represent the oldest vehicles in the FMTV fleet. Updates to the LVAD are needed to address obsolescence issues and modernize the fleet.

FY 2022 Project H07 Base funds in the amount of $6.478 million will be used for the FMTV Low-velocity Air Drop (LVAD) Next Generation STS Work Directive, prototype LVAD conversion kits and procurement of test assets to support Live Fire and airdrop certification.

The FMTVA1P2 ended production in 2021 and represents the highest density FMTV model with over 40,000 vehicles fielded to date. The FMTVA1P2 will remain in the tactical vehicle fleet until 2040 and beyond. To keep the A1P2 fleet viable into the future and able to perform its mission in austere environments, upgrades to Survivability and Crew Protection Kits will be required as the threat on the battlefield evolves.

To ensure supportability of the FMTVA1P2 through FY 2040 and beyond, the PD MTV, as lifecycle managers for the system, shall address potential obsolescence issues with the powertrain and Material Handling Equipment used on the FMTV.

Increasing survivability and crew protection of the FMTVA1P2 comes at the expense of decreased vehicle mobility and performance in soft soil and winter environments. The A1P2 is being asked to carry more weight than what it was originally designed for. Low risk, highly commercial improvements to the A1P2 driveline, suspension, and tires can be made to minimize the loss in mobility performance.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: prognostics & preventative maintenance, vetronics, Victory 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.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** H07 / *Family Of Med Tac Veh*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: FMTVA2 Production and ECP Modernization Effort ***Description:*** Funding used to support the continued evolution of the future FMTV fleet as well as tech insertion opportunities to keep the current FMTV fleet relevant on today's battlefield.The FMTVA2 production and ECP modernization effort restores vehicle performance that was lost due to the addition of armor protection kits as the threat to tactical vehicles and the FMTV has increased. Live Fire test assets are needed to support Live Fire Testing required per Chapter 139, Title 10 USC. Operational Testing required per Chapter 141, Title 10 USC. ***FY 2021 Plans:*** Funding for Operational Testing of FMTVA2 truck. ***FY 2022 Plans:*** FY 2022 planned projects are Improved Vehicle Safety Technologies and FMTVA2 Operational Testing and Adversarial Assessment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funds increased due to increased testing requirements.	-	1.850	3.071
Title: FMTV LVAD Technical Demonstrator Vehicle Design and Build ***Description:*** Updates to the Low Velocity Air Drop (LVAD) are needed to address obsolescence issues and to modernize the fleet. ***FY 2021 Plans:*** Funding used for design and development of the FMTV LVAD technical demonstrator. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to completion of Technical Demonstrator effort.	-	0.298	-
Title: FMTV LVAD Next Generation Model ***Description:*** Updates to the FMTV Low Velocity Air Drop (LVAD) are needed to address obsolescence issues and to modernize the fleet. ***FY 2022 Plans:*** FY 2022 budget activities include the LVAD STS Work Directive, conversion of nine prototype test assets (M1081 and M1093), production of four Live Fire trucks along with Live Fire testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	-	6.478

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** H07 / *Family Of Med Tac Veh*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 increase due to the procurement of test assets and testing for the FMTV LVAD Next Generation Model.			
Accomplishments/Planned Programs Subtotals	-	2.148	9.549

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• D15500: *Family Of Medium Tactical Veh (FMTV)*	138.057	181.092	36.885	-	36.885	-	-	-	-	-	-
• D04016: *MEDIUM TACTICAL VEHICLE PROTECTION KITS*	60.531	44.593	11.709	-	11.709	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The strategy for the FMTVA2 Production and ECP Modernization Effort led to award of a Firm-Fixed Price Requirements contract that will have a base award of five years (two years for vehicle testing and three production years) with two, one-year option production periods and to conduct FMTVA2 Live Fire and Operational Testing. These efforts will utilize Government test facilities.

The strategy for the Next Generation FMTV LVAD Model Configuration is to address obsolescence issues and bring the configuration up to today's standards. This effort will utilize a System Technical Support (STS) contract with the current FMTV Original Equipment Manufacturer (OEM).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*	Project (Number/Name) H07 / *Family Of Med Tac Veh*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FMTV LVAD Next Generation Development	SS/FFP	Oshkosh Defense : Oshkosh, WI	0.750	-		-		0.671	Feb 2022	-		0.671	0.000	1.421	-
Improved Vehicle Safety Technologies	MIPR	ATEC : ABERDEEN PROVING GROUNDS, MD	2.700	-		-		0.221	Jul 2022	-		0.221	0.000	2.921	-
		Subtotal	3.450	-		-		0.892		-		0.892	0.000	4.342	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FMTVA2 Operational Testing	MIPR	ATC : Aberdeen Proving Ground, MD	-	-		-		2.850	Jan 2022	-		2.850	0.000	2.850	-
FMTV LVAD Technical Demonstrator Testing	SS/FFP	NATC : Stagecoach, NV	-	-		0.298	Mar 2021	-		-		-	0.000	0.298	-
FMTV LVAD Prototypes	SS/FFP	Oshkosh Defense : Oshkosh, WI	-	-		1.850	Mar 2021	2.342	Nov 2021	-		2.342	0.000	4.192	-
FMTV LVAD Live Fire Vehicle Test Assets	SS/FFP	Oshkosh Defense : Oshkosh, WI	-	-		-		1.810	May 2022	-		1.810	0.000	1.810	-
FMTV LVAD Live Fire Underbody Armor Test Assets	SS/FFP	Oshkosh Defense : Oshkosh, WI	-	-		-		0.200	May 2022	-		0.200	0.000	0.200	-
FMTV LVAD Live Fire B-Kit Test Assets	Option/ FFP	O'Gara Armoring : Fairfield, OH	-	-		-		0.200	May 2022	-		0.200	0.000	0.200	-
FMTV LVAD Live Fire Testing	MIPR	Army Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		-		0.838	Jun 2022	-		0.838	0.000	0.838	-
ESC Tuning	SS/FFP	OshKosh Defense : Oshkosh, WI	-	-		-		0.417	Feb 2022	-		0.417	0.000	0.417	-
		Subtotal	-	-		2.148		8.657		-		8.657	0.000	10.805	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / *Medium Tactical Vehicles*	Project (Number/Name) H07 / *Family Of Med Tac Veh*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.450	-		2.148		9.549		-		9.549	0.000	15.147	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** H07 / *Family Of Med Tac Veh*

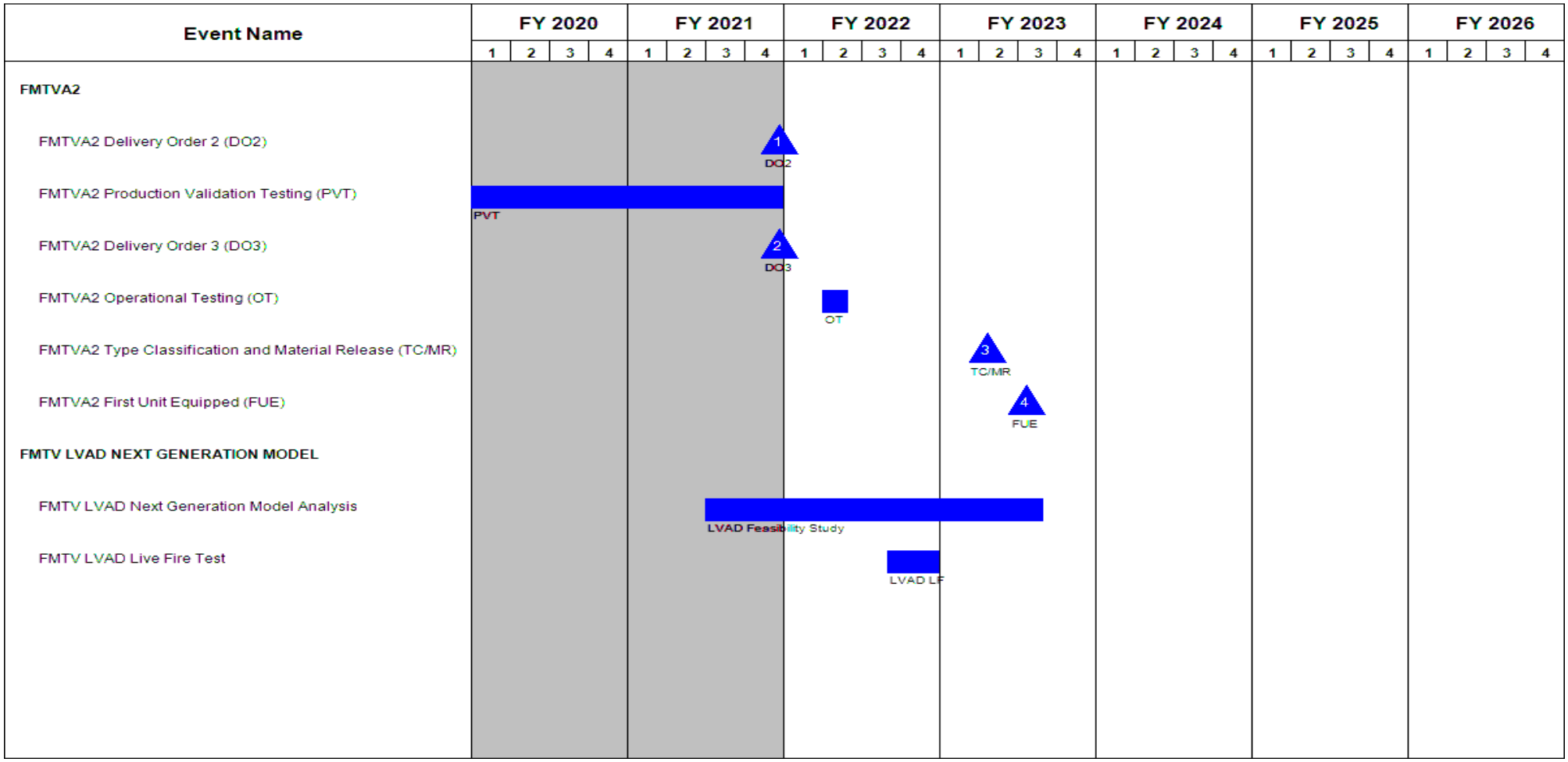


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604604A / *Medium Tactical Vehicles*	**Project (Number/Name)** H07 / *Family Of Med Tac Veh*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FMTVA2	1	2019	4	2024
FMTVA2 Contract Award/Delivery Order 1	2	2018	2	2018
FMTVA2 Allocated Baseline Review (ABR)	3	2018	3	2018
FMTVA2 Product Baseline Review (PBR)	4	2018	4	2018
FMTVA2 Delivery Order 2 (DO2)	4	2021	4	2021
FMTVA2 Production Validation Testing (PVT)	3	2019	4	2021
FMTVA2 Live Fire Test & Evaluation (LFT&E)	3	2019	4	2019
FMTVA2 Delivery Order 3 (DO3)	4	2021	4	2021
FMTVA2 Operational Testing (OT)	2	2022	2	2022
FMTVA2 Type Classification and Material Release (TC/MR)	2	2023	2	2023
FMTVA2 First Unit Equipped (FUE)	3	2023	3	2023
FMTVA1P2	1	2019	4	2019
FMTVA1P2 FY 2018 Vehicle Delivery	4	2018	4	2019
FMTV LVAD NEXT GENERATION MODEL	3	2020	2	2025
FMTV LVAD Next Generation Model Analysis	3	2021	3	2023
FMTV LVAD Live Fire Test	3	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604611A / *JAVELIN*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	14.377	5.983	7.094	-	7.094	-	-	-	-	-	-
499: *Javelin (AAWS-M)*	-	14.377	5.983	7.094	-	7.094	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Javelin is a man-portable, fire-and-forget, medium-range missile with enhanced situational awareness and precision direct-fire effects to defeat armored vehicles, fortifications, and soft targets in a range of military operations. The Javelin Weapon System consists of a re-usable Command Launch Unit (CLU) and a modular missile encased in a disposable launch tube assembly. Javelin has a high kill rate against a variety of targets at extended ranges under day/night, battlefield obscurants, adverse weather and multiple counter-measure conditions. Research, Development, Test & Evaluation (RDT&E) funding provides for system improvements in accordance with the Javelin Capabilities Production Document Objectives and User priorities for future development.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	14.997	7.493	7.493	-	7.493
Current President's Budget	14.377	5.983	7.094	-	7.094
Total Adjustments	-0.620	-1.510	-0.399	-	-0.399
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.236			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.003	-			
• SBIR/STTR Transfer	-0.617	-0.274			
• Adjustments to Budget Years	-	-	-0.399	-	-0.399

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604611A / *JAVELIN*	Project (Number/Name) 499 / *Javelin (AAWS-M)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
499: *Javelin (AAWS-M)*	-	14.377	5.983	7.094	-	7.094	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Javelin is a man-portable, fire-and-forget, medium-range missile with enhanced situational awareness and precision direct-fire effects to defeat armored vehicles, fortifications, and soft targets in a range of military operations. The Javelin Weapon System consists of a re-usable Command Launch Unit (CLU) and a modular missile encased in a disposable launch tube assembly. Javelin has a high kill rate against a variety of targets at extended ranges under day/night, battlefield obscurants, adverse weather and multiple counter-measure conditions. Research, Development, Test & Evaluation (RDT&E) funding provides for system improvements in accordance with the Javelin Capabilities Production Document Objectives and User priorities for future development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Javelin System Improvements	14.377	5.983	0.923
Description: Development of a new CLU will improve capability over the currently fielded Block 1 CLU by doubling target identification range and increasing system engagement range from 2.5 kilometers (km) to 4 km. Lightweight CLU reduces Soldier burden by providing a minimum of 25% reduction in weight and 30% reduction in size. Javelin Lightweight CLU is a result of user feedback on weight and bulk, and addresses the Close Combat Missile System - Medium Capability Production Document objective system weight requirement. ***FY 2021 Plans:*** Complete design/build of qualification units. Begin to perform qualification tests to include portability, maintenance and logistics demonstrations. ***FY 2022 Plans:*** Complete qualification testing. Begin Lightweight CLU operational testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease from FY21 to FY22 due to completion of the Lightweight CLU qualification.			
Title: Auto-Gate/Fast-Launch	-	-	6.061
Description: Auto-Gate capability uses advanced video processing to automatically apply track gates to a target, eliminating manual gate adjustments and significantly reducing time for target acquisition. Fast-Launch capability correlates missile seeker view with CLU view to present the gunner with a composite image, eliminating the need to switch between CLU and missile view thus reducing target engagement time by 30-50% when combined with Auto-Gate. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604611A / *JAVELIN*	**Project (Number/Name)** 499 / *Javelin (AAWS-M)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Begin development of Auto-Gate/Fast-Launch software controls and tracking algorithms to improve engagement timeline. Integrate new capabilities and features; identify and develop new features; create software builds; provide integration Subject Matter Expert support and Systems Engineering support. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase from FY21 to FY22 due to start of system software improvements for Auto-Gate/Fast-Launch.			
Title: Integration and Counter Measure/Threat management ***Description:*** The Javelin Product Office and OGA's will prepare technical assessments, concept studies, documentation and perform demonstrations and risk mitigation efforts to address emerging threats. ***FY 2022 Plans:*** The Javelin Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase from FY21 to FY22 due to new requirements for concept studies and government testing.	-	-	0.110
Accomplishments/Planned Programs Subtotals	14.377	5.983	7.094

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• H06102: *JAVELIN (AAWS-M)*	142.794	165.355	76.648	-	76.648	-	-	-	-	-	-
• H06103: *Javelin Lightweight Command Launch Unit (CLU)*	-	15.970	44.194	-	44.194	-	-	-	-	-	-

Remarks

FY 2020 procurement funds procure missiles and CLU retrofits only. FY 2021-2026 procurement funds procure missiles and Lightweight CLUs.

D. Acquisition Strategy

The Javelin weapon system is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) that has joint interest with the U.S. Marine Corps, U.S. Navy, and U.S. Air Force. Javelin was approved for Full Rate Production (FRP) in 1997 and achieved Full Operational Capability (FOC) in 2014. Javelin is currently in the Production and Deployment phase.

Current Acquisition Strategy addresses improvements/software upgrades to the Javelin system. The Javelin Lightweight Command Launch Unit (CLU) addresses the Close Combat Missile System - Medium Capability Production Document objective system weight requirement and was initiated as a result of user feedback on weight and bulk. Development effort utilizes prime contractor, Javelin Joint Venture (Raytheon, Tucson, AZ, and Lockheed Martin, Orlando, FL) and will be accomplished

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604611A / *JAVELIN*	**Project (Number/Name)** 499 / *Javelin (AAWS-M)*

via an existing sole source, Cost-Plus-Fixed-Fee contract. The Javelin Joint Venture has invested Independent Research and Development in the Lightweight CLU. Competition will be used for major sub-assemblies which are the primary cost drivers. Development and testing will occur through FY 2023 with Low-Rate Initial Production (LRIP) beginning in FY 2021. Army Acquisition Objective (AAO) is 4,979. Current plan is to field to priority Infantry and Stryker Brigade Combat Teams and Special Forces.

Auto-Gate/Fast-Launch is a software upgrade for the Lightweight CLU that will take approximately 3 years to develop from FY22-24. Development efforts will be accomplished via an existing sole-source, Cost-Plus-Fixed-Fee contract with the Javelin Joint Venture. Development completion lines up with production of the first full rate build of Lightweight CLUs, so that the Auto-Gate/Fast-Launch upgrade can be implemented prior to Lightweight CLU Full-Rate Production fielding.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604611A / *JAVELIN*	Project (Number/Name) 499 / *Javelin (AAWS-M)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering/ Program Management, Govt	Allot	Multiple : Redstone Arsenal, AL	4.273	0.729	Oct 2019	0.228	Apr 2021	0.216	Nov 2021	-		0.216	0.000	5.446	-
		Subtotal	4.273	0.729		0.228		0.216		-		0.216	0.000	5.446	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Lightweight CLU Development	SS/CPFF	JJV/Raytheon/ Lockheed Martin : Orlando, FL/ Tucson,AZ	42.241	13.648	Nov 2019	0.871	Mar 2021	-		-		-	0.000	56.760	-
Auto-Gate/Fast-Launch Software Development	SS/CPFF	JJV/Raytheon/ Lockheed Martin : Orlando, FL/Tucson, AZ	-	-		-		5.845	Jan 2022	-		5.845	0.000	5.845	-
Integration and Counter Measure/Threat management	SS/ Various	TBD : TBD	-	-		-		0.110	Dec 2021	-		0.110	0.000	0.110	-
		Subtotal	42.241	13.648		0.871		5.955		-		5.955	0.000	62.715	N/A

Remarks

JJV - Javelin Joint Venture
SS CPFF - Sole Source Cost Plus Fixed Fee
CLU - Command Launch Unit
MIPR - Military Interdepartmental Purchase Request

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Lightweight CLU Qualification	SS/CPFF	JJV/Raytheon/ Lockheed Martin :	-	-		3.836	Mar 2021	-		-		-	0.000	3.836	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604611A / *JAVELIN*	Project (Number/Name) 499 / *Javelin (AAWS-M)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Orlando, FL/Tucson, AZ													
Lightweight CLU Qualification	MIPR	Redstone Test Center : Redstone Arsenal, AL	-	-		1.048	Apr 2021	-		-		-	0.000	1.048	-
Lightweight CLU Operational Testing	MIPR	Operational Test Command : Ft. Hood, TX	-	-		-		0.923	Nov 2021	-		0.923	0.154	1.077	-
		Subtotal	-	-		4.884		0.923		-		0.923	0.154	5.961	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	46.514	14.377		5.983		7.094		-		7.094	0.154	74.122	N/A

Remarks

Low-Rate Initial Procurement decision will be made upon completion of critical qualification test events but prior to Operational Test.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604611A / *JAVELIN*	**Project (Number/Name)** 499 / *Javelin (AAWS-M)*

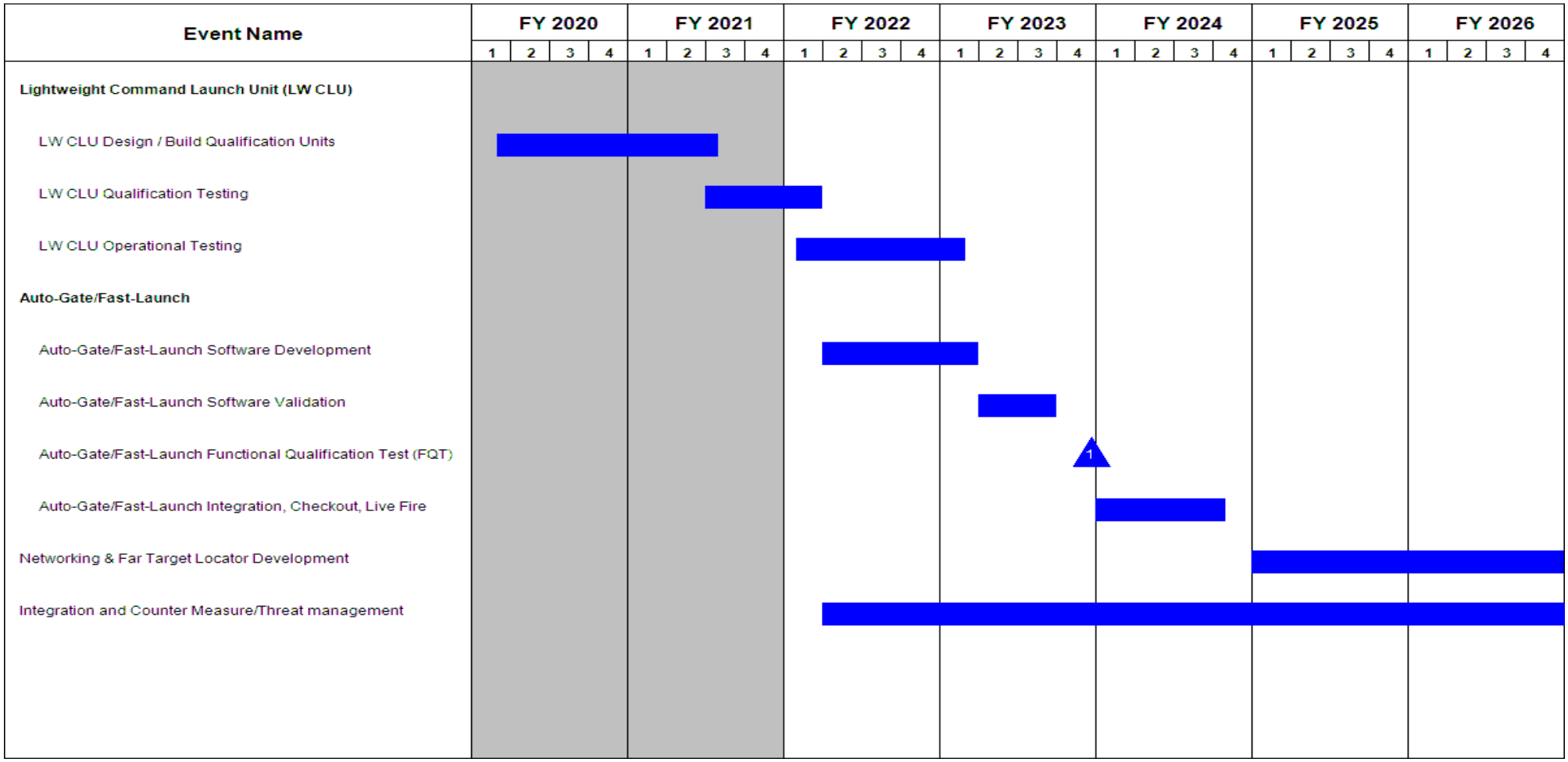


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604611A / *JAVELIN*	**Project (Number/Name)** 499 / *Javelin (AAWS-M)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Lightweight Command Launch Unit (LW CLU)	1	2020	4	2024
LW CLU Design / Build Qualification Units	1	2020	3	2021
LW CLU Qualification Testing	3	2021	1	2022
LW CLU Operational Testing	1	2022	1	2023
Auto-Gate/Fast-Launch	2	2022	4	2023
Auto-Gate/Fast-Launch Software Development	2	2022	1	2023
Auto-Gate/Fast-Launch Software Validation	2	2023	3	2023
Auto-Gate/Fast-Launch Functional Qualification Test (FQT)	4	2023	4	2023
Auto-Gate/Fast-Launch Integration, Checkout, Live Fire	1	2024	4	2024
Networking & Far Target Locator Development	1	2025	4	2026
Integration and Counter Measure/Threat management	2	2022	1	2028

Note

LWCLU Operational Testing schedule incorporates requirement to provide funding to Operational Test Command 6-8 months prior to execution of test event. Funding reduction in FY21 delays the cold-environment OT live fire event from 1QFY22 to 1QFY23.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604622A *I Family of Heavy Tactical Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	12.085	22.254	31.602	-	31.602	-	-	-	-	-	-
659: *Family Of Hvy Tac Veh*	-	5.407	3.795	6.714	-	6.714	-	-	-	-	-	-
E50: *TRAILER DEVELOPMENT*	-	-	6.669	2.970	-	2.970	-	-	-	-	-	-
EZ8: *Leader/Follower*	-	4.294	10.249	21.918	-	21.918	-	-	-	-	-	-
VR5: *TWV Protection Kits*	-	2.384	1.541	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) aligns system development and demonstration of Heavy Tactical Vehicles (HTV) with Multi-Domain Operations (MDO) requirements to support combat and combat support missions to include line haul, local haul, and unit resupply. HTV trucks transport water, ammunition, and general cargo over all terrains and throughout the battle-space. Systems include the Heavy Expanded Mobility Tactical Truck (HEMTT), Palletized Load System (PLS), Heavy Equipment Transporter System (HETS), Enhanced Heavy Equipment Transporter System (EHETS), Line Haul, Heavy Dump Truck (HDT), medium tactical trailers including the Medium Equipment Trailer (MET), the family of flatbed semitrailers to include but not limited to the 40-Ton M870, 34-Ton M872 and the 25-Ton M172 that support multiple Army missions and the development and demonstration of enablers. Recovery systems such as the Modular Catastrophic Recovery System (MCRS) that rescue large wheeled vehicle platforms in severe off-road conditions are also included. The Common Tactical Truck (CTT) is the next generation of tactical trucks to meet the Army's Tactical Wheeled Vehicle (TWV) Modernization Strategy to take full advantage of economies of scale and commonality with the objective to procure a commercial based Family of Vehicles to replace HEMTT, PLS and Line Haul tractors and leverage best commercial practices at lower procurement costs that are autonomy ready. Periodic evolutionary upgrade of survivability and crew protection as described in the Long Term Protection Strategy (LTPS) is supported by this PE for both the HTV family of vehicles and the Family of Medium Tactical Vehicles (FMTV).

The Tactical Wheeled Vehicle - Leader Follower (TWV-LF) program provides transportation units with the capability for Tactical Wheeled Vehicles (TWVs) to operate in an unmanned mode, initially for the Palletized Loading System (PLS) vehicles, while operating in a convoy. This is accomplished by integrating technology to the PLS vehicles which enables them to follow a manned leader or unmanned follower vehicle. This is done in a March Unit of up to (10 - squad length) TWVs, with (1) manned Lead vehicle and up to (9) unmanned Follower vehicles. This capability provides increased Soldier Force Protection and increased convoy logistics throughput by giving Commanders more options on Soldier utilization, removing Soldiers from threat zones and/or utilizing vehicle operators for convoy security, and allowing supply convoys to run more often. The PLSA1 is the initial tactical vehicle used to support By-Wire Active Safety which provides the foundation for autonomous capabilities such as Leader/Follower taking Soldiers out of harm's way.

Funding also supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: predictive based maintenance, vetronics, Victory Architecture, vehicle electrification, 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604622A *I Family of Heavy Tactical Vehicles*

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	13.125	24.792	12.494	-	12.494
Current President's Budget	12.085	22.254	31.602	-	31.602
Total Adjustments	-1.040	-2.538	19.108	-	19.108
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.635			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.500	-			
• SBIR/STTR Transfer	-0.540	-0.903			
• Adjustments to Budget Years	-	-	19.108	-	19.108

Change Summary Explanation

FY 2022 increase of $19.108 million covers EHETS Developmental and Operational Test requirements and test of MET prototypes between two vendors. It also starts acquisition planning and analysis for the Common Tactical Truck modernization effort. Additionally, the TWF-LF program effort is continued through extension of Operational Technology Demonstration (OTD) to further mature software and design. These efforts align program requirements with Army modernization priorities in support of the National Defense Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) 659 / *Family Of Hvy Tac Veh*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
659: *Family Of Hvy Tac Veh*	-	5.407	3.795	6.714	-	6.714	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Heavy Equipment Transporter System (EHETS) will replace the Heavy Equipment Transporter System (HETS) and consists of an M1300 tractor (M1070A1 modified to reduce and relocate weight to achieve European road permits) and an eight-axle commercially based trailer capable of worldwide transport. The EHETS primary mission is to transport an M1 series Main Battle Tank (MBT) and other tracked vehicles weighing up a minimum of 82 tons and up to 85 tons. It is able to self-load/unload disabled vehicular cargo for evacuation purposes. The system will provide line haul, local haul, and maintenance evacuation of heavy tracked vehicles during tactical operations on primary and secondary roads worldwide.

The Common Tactical Truck (CTT) is a Family of Vehicles (FoV) modernization effort to replace the HEMTT, PLS, and Line Haul vehicles by leveraging best commercial practices, lower procurement cost (commercial economies of scale) and technology to include Prognostics & Preventative Maintenance, Advanced Driver Assistance Systems (ADAS), and autonomy ready without significantly degrading the performance from current platforms.

The Medium Equipment Trailer (MET) supports critical layered, agile and responsive sustainment capability required for Large Scale Combat Operations and is capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT) and Infantry Brigade Combat Team (IBCT). MET directly supports Multi-Domain Operations and provides the capability to transport the tallest combat platforms (i.e. Paladin and Bradley) under 4 meter underpasses which are common in OCONUS. It will also be capable of transporting 20 foot International Organization for Standardization (ISO) containers and general cargo when the situation requires.

FY 2022 Project 659 Base funds in the amount of $6.714 million supports developmental and operational testing of the Enhanced Heavy Equipment Transporter System (EHETS) new production trailers. Funds also support the acquisition planning and document development for the Common Tactical Truck (CTT) and analysis of commercially-based attainability of the latest technologies available in the commercial market through an Analysis of Alternatives (AoA). The AoA output will provide analytic insight of the CTT Abbreviated Capability Development Document (A-CDD) and will be used to inform the Capability Development Document (CDD) development. The EHETS supports the National Defense Strategy for modernization with an increased payload that provides the ability for transport, recovery and evacuation of heavy, oversized combat equipment such as the M1A2 Abrams main battle tank (MBT) and M88 recovery vehicle to support flexible theater postures and enhance the ability to compete and provide the transport for freedom of maneuver of the largest track combat weapon systems.). The CTT supports the National Defense Strategy for modernization by providing the warfighter the updated transportation technologies that are aligned with what is available in the marketplace.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), these items are necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Medium Equipment Trailer (MET) Prototype Manufacturing ***Description:*** MET is a trailer capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT). MET will provide flexible capability that reduces duplicative systems. ***FY 2021 Plans:*** Competitive acquisition of Medium Equipment Trailer prototypes in preparation for test and down-select. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decrease is due to the completion of MET Prototype Manufacturing	-	3.795	-
Title: HETS M1070A1 Tractor Modifications & System-Level Testing ***Description:*** HETS M1070A1 tractor modifications and system-level testing were required to develop a near term interim solution in response to the USAREUR ONS for a transportation system capable of carrying 78.5 Tons of payload while achieving host country road permits at a reduced weight of 75 tons with an ultimate carrying capacity of 85 tons.	3.449	-	-
Title: 25T STLB Test ***Description:*** Feasibility testing required to evaluate prototype semitrailers from two vendors produced under the OT project agreement award.	1.958	-	-
Title: Enhanced Heavy Equipment Transporter System (EHETS) Developmental/Operational Test ***Description:*** Replacement system for the legacy Heavy Equipment Transporter System (HETS) to transport, deploy, and evacuate payloads up to 85 tons. ***FY 2022 Plans:*** Developmental and Operational testing of the EHETS Trailers to ensure that the design process is complete and meets specs with minimal risks. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to EHETS Developmental/Operational testing.	-	-	1.632
Title: Common Tactical Truck (CTT) Acqusition Planning and Documentation Development ***Description:*** Acquisition planning and documentation development includes matrix personnel program support for the development of contracting/acquisition milestone documentation and systems engineering plans for the Common Tactical Truck. ***FY 2022 Plans:***	-	-	2.248

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Preparation of documentation to release Request Project Proposal (RPP) to obtain prototypes. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to the start of the CTT Modernization Program.			
Title: Common Tactical Truck (CTT) Analysis of Alternatives (AoA) ***Description:*** The Common Tactical Truck (CTT) is projected to be an ACAT I program, and as such, an AoA will be required. The AoA will provide an analytic insight of the CTT Abbreviated Capability Development Document (A-CDD) by exploring trade space in operational effectives, performance, schedule, cost, and risk across a full range of options for replacement of the aging fleet of the M915/M1088 Tractor, HEMTT, and PLS. The output of the AoA can be used to inform the CTT Capability Development Document (CDD) development as well as the Milestone Decision that will ultimately bring the CTT into production. ***FY 2022 Plans:*** Start of the AoA for an analytical comparison of the operational effectiveness, suitability and life-cycle cost of potential materiel solutions for the CTT. Output of the AoA will inform the Capability Development Document development and Milestone Decision to ultimately bring the CTT into production. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to the start of the AoA for CTT.	-	-	2.834
Accomplishments/Planned Programs Subtotals	5.407	3.795	6.714

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DA0924: *Modification Of In Svc Equip*	73.627	56.112	29.349	-	29.349	-	-	-	-	-	-
• DA0500: *Family Of Heavy Tactical Vehicles (FHTV)*	38.718	6.500	64.282	-	64.282	-	-	-	-	-	-
• D16506: *PLS ESP*	25.543	33.146	16.943	-	16.943	-	-	-	-	-	-
• DV0021: *Hvy Expanded Mobile Tactical Truck Ext Serv*	95.683	92.619	-	-	-	-	-	-	-	-	-
• D01650: *SEMITRAILER LOW BED 25 TON, M172*	0.768	5.348	1.864	-	1.864	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

DA0924 - Modification Of In Svc Equip is a shared funding line with other product offices.

D. Acquisition Strategy

The Acquisition Strategy for the Medium Equipment Trailer (MET) is to execute as a competitive Other Transaction Agreement (OTA) awarded to two Original Equipment Manufacturers (OEMs) to procure three prototypes per vendor in preparation to test and down-select to one vendor for follow-on production.

The Common Tactical Truck Family of Vehicles (CTT FoVs) is a modernization effort to replace the HEMTT, PLS, and Line Haul vehicles. The CTT is planning a Middle Tier Acquisition once approved to proceed with an Abbreviated Capability Development Document (A-CDD) to award three Other Transaction Agreements (OTAs) that will produce 5 prototypes each for rapid prototyping and to leverage innovative technologies from industry.

The Enhanced Heavy Equipment Transporter System (EHETS) is the replacement system for the Heavy Equipment Transporter System (HETS). The strategy is to determine the best value through a Source Selection for Low Rate Initial Production award in preparation for Developmental/Operational test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) 659 / *Family Of Hvy Tac Veh*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Medium Equipment Trailer Prototypes	C/IDDQ	TBD : TBD	-	-		3.795	Sep 2021	-		-		-	0.000	3.795	-
CTT AoA	MIPR	The Research and Analysis Center : Ft. Leavenworth, KS	-	-		-		2.834	Mar 2022	-		2.834	0.000	2.834	-
		Subtotal	-	-		3.795		2.834		-		2.834	0.000	6.629	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CTT Acquisition Planning and Document Development	MIPR	TACOM LCMC : Warren, MI	-	-		-		2.248	Dec 2021	-		2.248	0.000	2.248	-
		Subtotal	-	-		-		2.248		-		2.248	0.000	2.248	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USAREUR HETS ONS System Level Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	3.449	Jun 2020	-		-		-		-	0.000	3.449	-
25T STLB Prototype Test and Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	1.958	May 2020	-		-		-		-	0.000	1.958	-
EHETS Operational/ Developmental Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	-		-		1.632	Sep 2022	-		1.632	0.000	1.632	-
		Subtotal	-	5.407		-		1.632		-		1.632	0.000	7.039	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) 659 / *Family Of Hvy Tac Veh*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.407		3.795		6.714		-		6.714	0.000	15.916	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

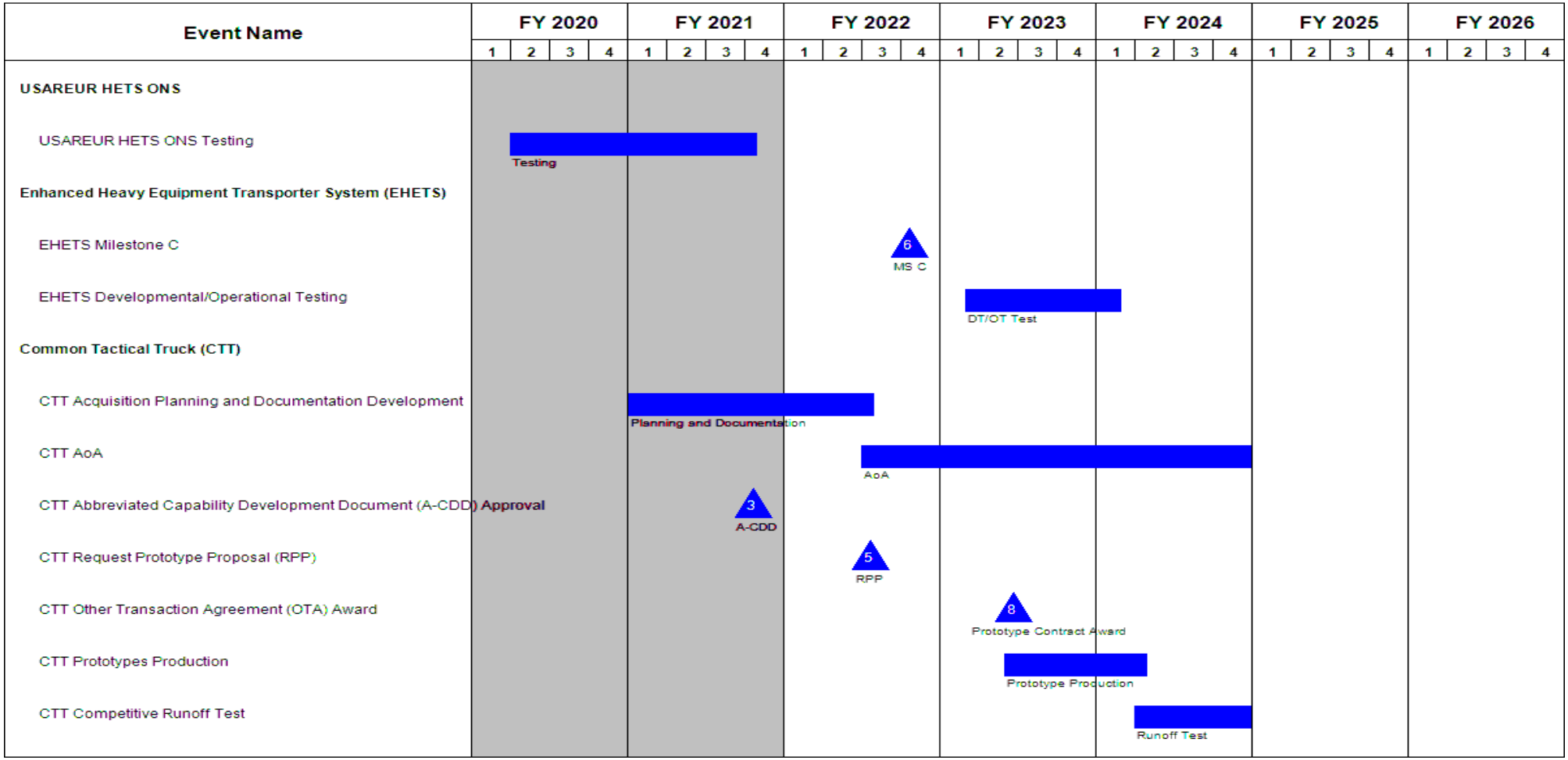


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

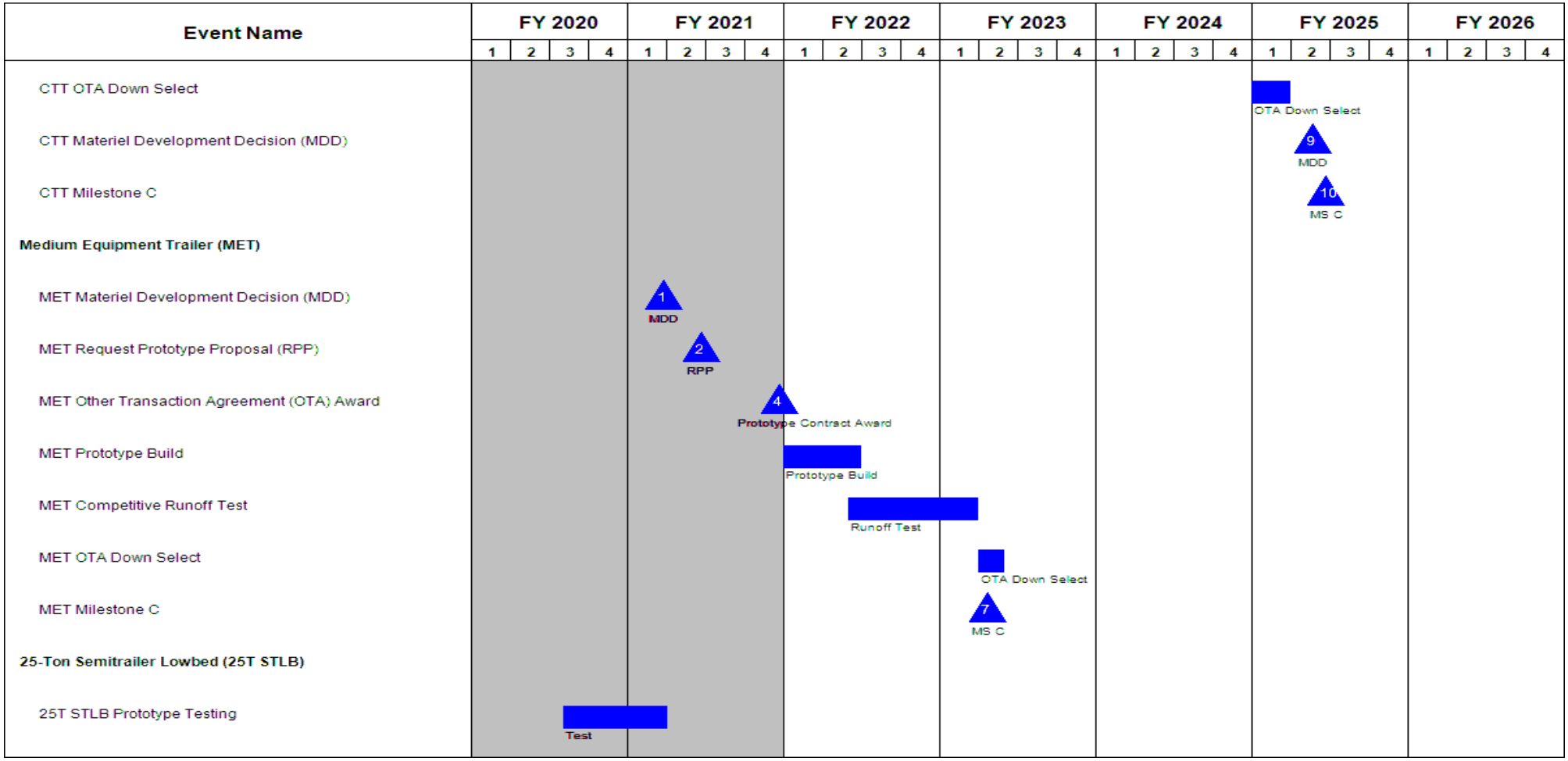


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical Vehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
USAREUR HETS ONS	1	2018	4	2022
USAREUR HETS ONS Testing	1	2019	4	2021
Enhanced Heavy Equipment Transporter System (EHETS)	1	2017	1	2024
EHETS Milestone C	4	2022	4	2022
EHETS Developmental/Operational Testing	1	2023	1	2024
Common Tactical Truck (CTT)	1	2021	4	2027
CTT Acquisition Planning and Documentation Development	1	2021	3	2022
CTT AoA	3	2022	4	2024
CTT Abbreviated Capability Development Document (A-CDD) Approval	4	2021	4	2021
CTT Request Prototype Proposal (RPP)	3	2022	3	2022
CTT Other Transaction Agreement (OTA) Award	2	2023	2	2023
CTT Prototypes Production	2	2023	2	2024
CTT Competitive Runoff Test	2	2024	4	2024
CTT OTA Down Select	1	2025	1	2025
CTT Materiel Development Decision (MDD)	2	2025	2	2025
CTT Milestone C	2	2025	2	2025
Medium Equipment Trailer (MET)	1	2022	2	2023
MET Materiel Development Decision (MDD)	1	2021	1	2021
MET Request Prototype Proposal (RPP)	2	2021	2	2021
MET Other Transaction Agreement (OTA) Award	4	2021	4	2021
MET Prototype Build	1	2022	2	2022
MET Competitive Runoff Test	2	2022	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical Vehicles*	**Project (Number/Name)** 659 / *Family Of Hvy Tac Veh*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MET OTA Down Select	2	2023	2	2023
MET Milestone C	2	2023	2	2023
25-Ton Semitrailer Lowbed (25T STLB)	2	2020	1	2021
25T STLB Prototype Testing	3	2020	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical V ehicles*	Project (Number/Name) E50 / *TRAILER DEVELOPMENT*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
E50: *TRAILER DEVELOPMENT*	-	-	6.669	2.970	-	2.970	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medium Equipment Trailer (MET) supports critical layered, agile and responsive sustainment capability required for Large Scale Combat Operations and is capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT) and Infantry Brigade Combat Team (IBCT). MET directly supports Multi-Domain Operations and provides the capability to transport the tallest combat platforms (i.e. Paladin and Bradley) under 4 meter underpasses which are common in OCONUS.

FY 2022 Project E50 Base funds in the amount of $2.970 million supports MET Prototype Testing and Soldier Assessment to determine the best value to the Government and down-select to one vendor for a follow-on production award. The MET supports the National Defense Strategy for modernization with a 60 ton payload that provides the capability for transport of two thirds of the tracked combat platforms to include over height combat platforms to support flexible theater postures and enhance the ability to compete and provide freedom of maneuver.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Medium Equipment Trailer (MET) Prototype Manufacturing	-	6.669	-
Description: MET is a trailer capable of transporting track combat platforms weighing 60 tons or less in an Armored Brigade Combat Team (ABCT). MET will provide flexible capability that reduces duplicative systems. ***FY 2021 Plans:*** Competitive acquisition of Medium Equipment Trailer prototypes through an Other Transaction Agreement in preparation for test and down-select to one vendor for production award. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decrease is due to the completion of the MET prototype manufacturing and the start of prototype testing.			
Title: Medium Equipment Trailer (MET) Prototype Testing and Soldier Assessment	-	-	2.970
Description: MET prototypes will be tested to determine which trailer provides the best value to the Government while meeting the MET requirement. To assist in determining the best value to the Government, a soldier touch point will also be a part of the evaluation. The best value determination will be used to support a follow on production contract.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** E50 / *TRAILER DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 Plans: MET Prototype Competitive Run-off Testing and Soldier Assessment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to the start of the MET Prototype Competitive Run-off Testing and Soldier Assessment			
Accomplishments/Planned Programs Subtotals	-	6.669	2.970

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DA0926: *MODIFICATION APPLICATION*	11.582	21.227	11.710	-	11.710	-	-	-	-	-	-
• D08921: *MEDIUM EQUIPMENT TRAILER (MET)*	-	-	-	-	-	-	-	-	-		
• D01650: *SEMITRAILER LOW BED 25 TON, M172*	0.768	5.348	1.864	-	1.864	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Acquisition Strategy is to execute the MET as a competitive Other Transaction Agreement (OTA) awarded to two Original Equipment Manufacturers (OEMs). The plan is to procure three prototypes per vendor in preparation to test and down-select to one vendor for follow-on production. The award of the OTA has been delayed from June to September 2021 due to a required Capabilities Development Document (CDD) update and approval. The update supports a cost avoidance of design and material for the platform. The updated CDD was approved April 2021 followed by the release of the Request for Prototype Proposal (RPP).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical V ehicles*	Project (Number/Name) E50 / *TRAILER DEVELOPMENT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MET Prototype Manufacturing	C/TBD	TBD : TBD	-	-		6.669	Sep 2021	-		-		-	0.000	6.669	-
		Subtotal	-	-		6.669		-		-		-	0.000	6.669	N/A

Remarks

The award of the MET OTA for prototypes has been delayed from June to September 2021 due to a required Capabilities Development Document (CDD) update and approval. The update supports a cost avoidance of design and material for the platform. The updated CDD was approved April 2021 and the release of the Request for Prototype Proposal (RPP) immediately followed.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MET Prototype Testing	MIPR	Aberdeen Test Center (ATC) : Abderdeen, MD	-	-		-		2.970	Mar 2022	-		2.970	0.000	2.970	-
		Subtotal	-	-		-		2.970		-		2.970	0.000	2.970	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		6.669		2.970		-		2.970	0.000	9.639	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** E50 / *TRAILER DEVELOPMENT*

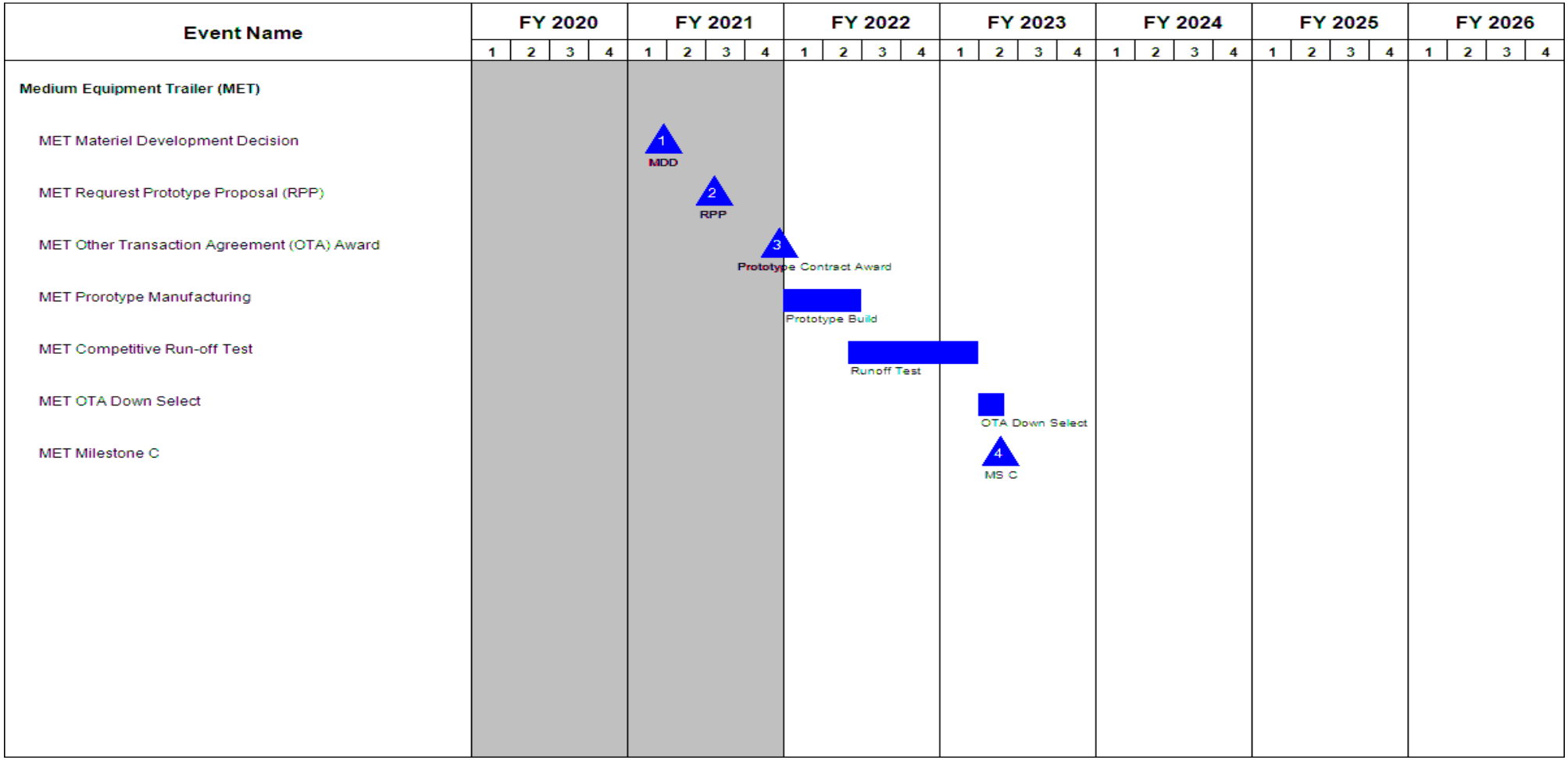


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical Vehicles*	**Project (Number/Name)** E50 / *TRAILER DEVELOPMENT*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Medium Equipment Trailer (MET)	1	2022	2	2023
MET Materiel Development Decision	1	2021	1	2021
MET Requrest Prototype Proposal (RPP)	3	2021	3	2021
MET Other Transaction Agreement (OTA) Award	4	2021	4	2021
MET Prorotype Manufacturing	1	2022	2	2022
MET Competitive Run-off Test	2	2022	1	2023
MET OTA Down Select	2	2023	2	2023
MET Milestone C	2	2023	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) EZ8 / *Leader/Follower*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EZ8: *Leader/Follower*	-	4.294	10.249	21.918	-	21.918	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Wheeled Vehicle (TWV() - Leader Follower (LF) automated capability through Manned Unmanned Teaming gives the convoy commander the option to run either manned or unmanned vehicles. Unmanned operation allows TWV convoys to be led by a manned lead vehicle and followed autonomously by four LF equipped TWVs. This capability reduces Soldier exposure to hostile effects by four drivers when the commander chooses the unmanned option. Additionally, L-F enables delivery to be more Soldier efficient allowing at least as many ton-miles or more to be delivered per transportation unit as current capabilities, with less Soldier exposure to hostile effects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Tactical Wheeled Vehicle Leader Follower	4.294	10.249	21.918

Description: Leader Follower program enables a single operator to control 5 vehicles in a convoy reducing the number of Soldier at risk while increasing convoy throughput.

FY 2021 Plans:

FY 2021 funding for Leader Follower will support follow-on testing of the Leader Follower configuration fielded assets. It will fund a competitive run-off of multiple vendors during FY 2021 for a down-select of (1) Leader Follower autonomy solution. Funding includes delivery of vendor prototypes, field service representatives, early logistics and product support analysis, independent testing, data analysis, source selection activities, contracting support, and program documentation to support the follow-on production decision. In addition, Project EZ8 Base funds exploration and development of the Expedient Leader Follower (ExLF) Applique on additional systems (Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicles (FMTV), and 915 truck fleets) beyond the Palletized Load System (PLS).

FY 2022 Plans:

FY22 funds support extension of FY21 existing Operational Technology Demonstration (OTD) [Note: Previously described in PB21 as follow-on testing of the Leader Follower configuration fielded assets] to mature the Leader Follower design solution under Middle Tier of Acquisition (MTA) [Note: revised from PB22 planned ?down-select? strategy]. Funding supports maturation of OTD design, By-Wire Active Safety development and test, development of MTA ADM documentation, contract development and award of production representative test assets.

FY 2021 to FY 2022 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** EZ8 / *Leader/Follower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY2022 funding supports maturation of OTD design, development of MTA ADM documentation, contract development and award of production representative test assets for FY23 testing.			
Accomplishments/Planned Programs Subtotals	4.294	10.249	21.918

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• FD9: *Robotics Systems*	2.926	2.948	2.748	-	2.748	-	-	-	-	-	-
• R06806: *Leader/ Follower Applique (L/F)*	-	7.624	-	-	-	-	-	-	-	-	-

Remarks

Prior to FY 2020, PM LF efforts were funded under the Robotics Development 6.4 line along with United States Army Combat Capabilities Development Command Ground Vehicle Systems Center, formerly TARDEC, who had most of the funding.

D. Acquisition Strategy

The TWV LF Acquisition Strategy, where appropriate, leverages prior developed and demonstrated technology, developed under a HQDA G-8 Directed Requirement effort by Ground Vehicle Systems Center (GVSC), and transitions to the Program Manager Force Projection, PdM Robotic and Autonomous Systems (RAS) in FY 2021. PdM RAS will use the Operational Technology Demonstration (OTD) to develop a finalized production representative asset; ensure safe and suitable operation, develop the appropriate logistics products, and supportability strategy, and field an enduring unmanned, robotic, autonomous PLS convoy capability to Soldiers.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical V ehicles*	Project (Number/Name) EZ8 / *Leader/Follower*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LF Program Management	Allot	PM FP : Warren, MI; Harrison Twp, MI	-	0.874	Oct 2019	1.205	Oct 2020	1.450	Oct 2021	-		1.450	0.000	3.529	-
		Subtotal	-	0.874		1.205		1.450		-		1.450	0.000	3.529	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LF Operational Technology Demonstration	C/CPFF	TBD : TBD	-	-		5.681	Dec 2020	-		-		-	0.000	5.681	-
LF Software Development	C/CPFF	To be Determined : Various	-	-		1.496	Dec 2020	-		-		-	0.000	1.496	-
LF Operational Technology Demonstration Maturation	C/CPFF	To be Determined : To be Determined	-	-		-		18.152	Feb 2022	-		18.152	0.000	18.152	-
		Subtotal	-	-		7.177		18.152		-		18.152	0.000	25.329	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LF Tech Support	MIPR	TARDEC, TACOM : Warren, MI	-	1.334	Oct 2019	0.300	Oct 2020	0.791	Oct 2021	-		0.791	0.000	2.425	-
		Subtotal	-	1.334		0.300		0.791		-		0.791	0.000	2.425	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LF Test Support	MIPR	ATEC : Aberdeen, MD	-	2.086	Oct 2019	1.567	Oct 2020	1.525	Apr 2022	-		1.525	0.000	5.178	-
		Subtotal	-	2.086		1.567		1.525		-		1.525	0.000	5.178	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) EZ8 / *Leader/Follower*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.294		10.249		21.918		-		21.918	0.000	36.461	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** EZ8 / *Leader/Follower*

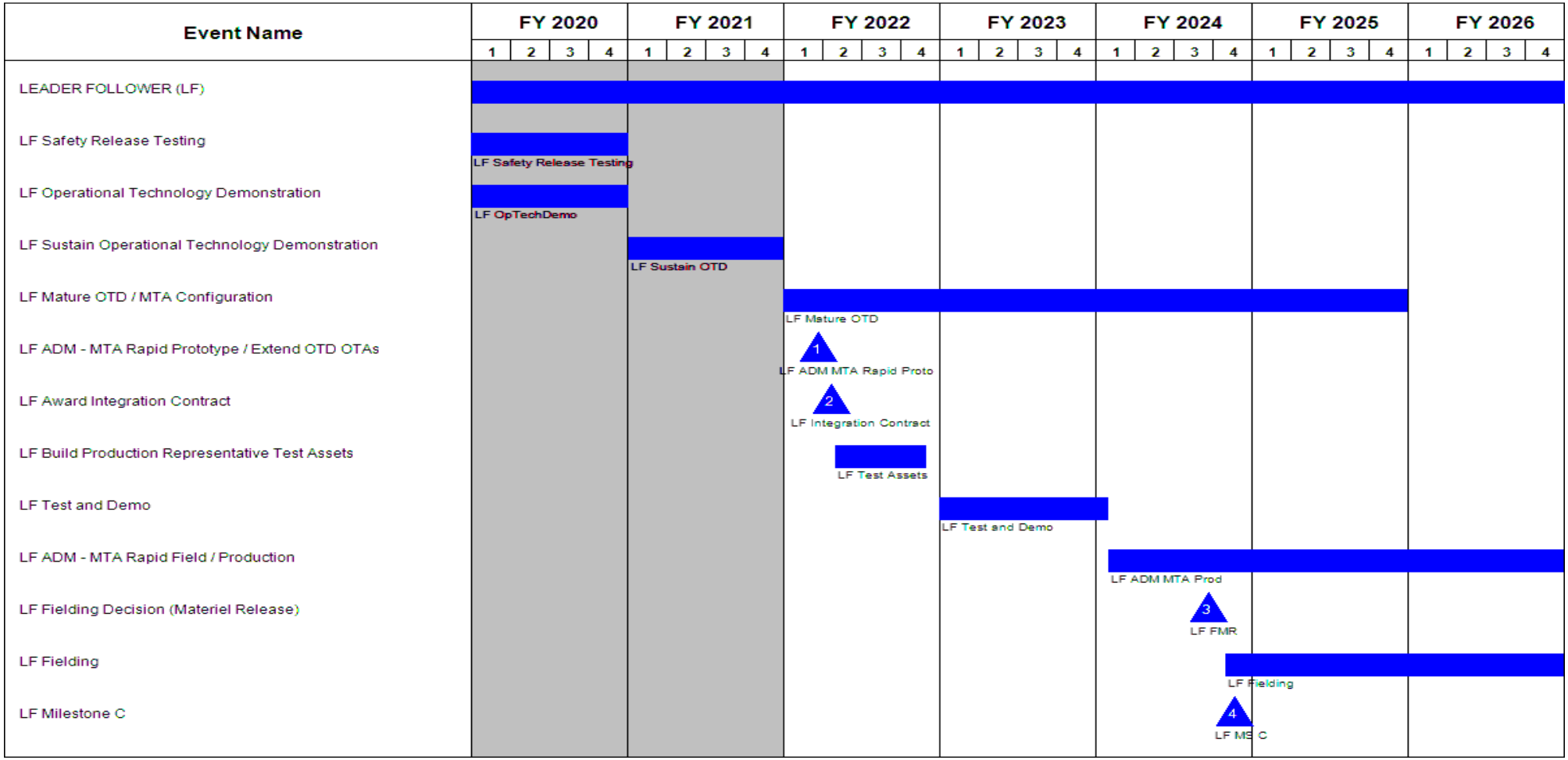


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** EZ8 / *Leader/Follower*

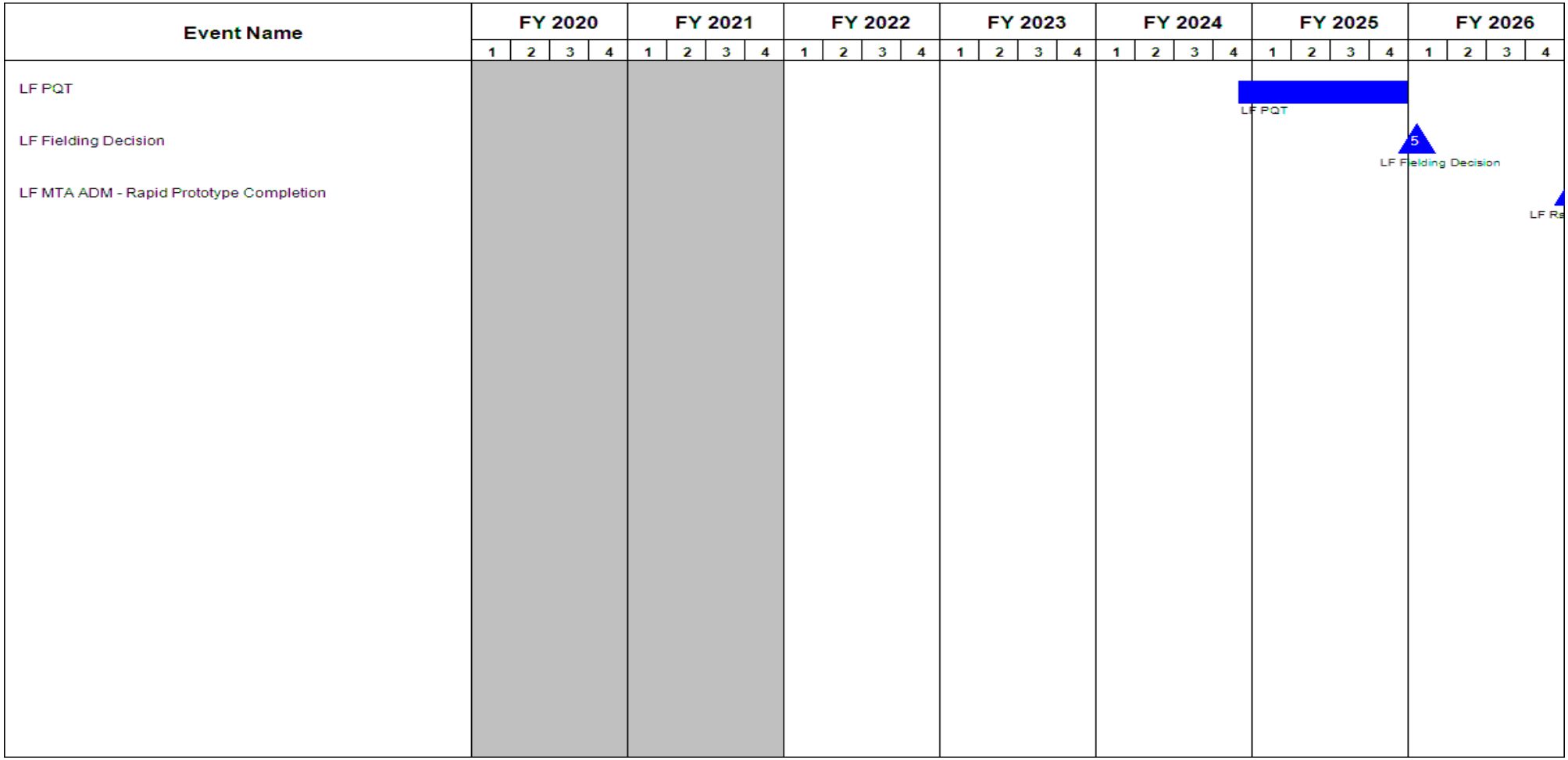


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** EZ8 / *Leader/Follower*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LEADER FOLLOWER (LF)	1	2020	4	2027
LF Safety Release Testing	4	2019	4	2020
LF Operational Technology Demonstration	1	2020	4	2020
LF Sustain Operational Technology Demonstration	1	2021	4	2021
LF Mature OTD / MTA Configuration	1	2022	4	2025
LF ADM - MTA Rapid Prototype / Extend OTD OTAs	1	2022	1	2022
LF Award Integration Contract	2	2022	2	2022
LF Build Production Representative Test Assets	2	2022	4	2022
LF Test and Demo	1	2023	1	2024
LF ADM - MTA Rapid Field / Production	1	2024	4	2026
LF Fielding Decision (Materiel Release)	3	2024	3	2024
LF Fielding	4	2024	4	2026
LF Milestone C	4	2024	4	2024
LF PQT	4	2024	4	2025
LF Fielding Decision	1	2026	1	2026
LF MTA ADM - Rapid Prototype Completion	1	2027	1	2027

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical V ehicles*	Project (Number/Name) VR5 / *TWV Protection Kits*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
VR5: *TWV Protection Kits*	-	2.384	1.541	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project VR5 Tactical Wheeled Vehicle (TWV) Protection Kits completes test efforts in Fiscal Year (FY) 2021.

A. Mission Description and Budget Item Justification

The Heavy Dump Truck (HDT) supports construction projects by loading, transporting and dumping payloads of sand and gravel aggregates, crushed rock, hot asphalt mixes, earth, clay, rubble, large boulders and other materials up to gross vehicle weight rating to job sites under world-wide climatic conditions. The HDT also serves as a quarry truck for the quick transport of bulk raw earth materials to and from the crushing, screening and washing plant and the asphalt mixing plant. The HDT also serves as a transportation asset for organization equipment. The HDT is Long Term Armor Strategy (LTAS) compliant with MRAP 1.1 underbody protection. The armor solution is developed concurrently with the production of armor capable HDTs.

There are no FY 2022 Project VR5 Base or OCO funding requirements.

In accordance with Section 1815 of the FY 2008 National Defense Authorization Act (P.L. 110-181), this item is necessary for use by the active and reserve components of the Armed Forces for homeland defense missions, domestic emergency responses, and providing military support to civil authorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Heavy Dump Truck (HDT) Testing	1.552	0.338	-
Description: Reliability, Availability, and Maintainability (RAM) testing and system performance testing / evaluation of the armored HDTs. Developmental Test, Operational Test and Live Fire Test of armored vehicle. ***FY 2021 Plans:*** Continuation of Live Fire Testing of HDT armored prototypes. Developmental and Operational Testing for HDT armored vehicles. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funds decreased due to the completion of the Heavy Dump Truck Testing			
Title: HETS M1070A1 Tractor Modifications & System-Level Testing	0.717	-	-
Description: HETS M1070A1 tractor modifications and system-level testing were required to develop a near term interim solution in response to the USAREUR ONS for a transportation system capable of carrying 78.5 Tons of payload while achieving host country road permits at a reduced weight of 75 tons with an ultimate carrying capacity of 85 tons.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** VR5 / *TWV Protection Kits*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: HEMTT Characterization Testing ***Description:*** Testing of two HEMTT variants, up-armored and up-weighted to represent unarmored weapon station/CROWs was conducted to provide physical test data and identify limitations of the system with additional weight.	0.115	-	-
Title: Prognostics and Predictive Maintenance (PPMx) Development ***Description:*** Development of a maintenance process that includes self-diagnosis and alerts regarding operational status and maintenance needs of tactical vehicles. ***FY 2021 Plans:*** Start of PPMx development for Heavy Tactical Vehicles ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decrease is due to the completion of PPMx development efforts.	-	1.000	-
Title: DS Viper Development ***Description:*** DS Viper is a diagnostic framework that will maintain accurate synchronization between Technical Manuals and diagnostic equipment. ***FY 2021 Plans:*** FY 2021 funds will be used for Heavy Tactical Vehicles DS Viper Development ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funds decrease is due to the completion of the DS Viper Development	-	0.203	-
Accomplishments/Planned Programs Subtotals	2.384	1.541	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• D16001: *TRUCK, DUMP, 20T (CCE)*	13.006	29.368	9.882	-	9.882	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical Vehicles*	**Project (Number/Name)** VR5 / *TWV Protection Kits*

D. Acquisition Strategy

The Heavy Dump Truck (HDT) entered the acquisition cycle pre-Milestone C, based on a competitive source selection process that resulted in the award of a five year plus two option years firm-fixed price (FFP) indefinite delivery indefinite quantity (IDIQ) contract. The contract award was for one Original Equipment Manufacturer (OEM) to develop an armor solution for a commercially-based dump truck. The commercially-based dump truck will be armor-capable and will be produced concurrently with the development of the armor solution, which will ensure that the armor solution correctly interfaces with the commercially-based dump truck.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical V ehicles*	Project (Number/Name) VR5 / *TWV Protection Kits*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prognostics and Preventative Maintenance Program Development	MIPR	Washington Headquarters Services : Washington, DC	-	0.200	Oct 2020	1.000	Feb 2021	-		-		-	0.000	1.200	-
DS Viper Development	MIPR	Data and Analysis Center : Redstone Arsenal, AL	-	-		0.203	Feb 2021	-		-		-	0.000	0.203	-
		Subtotal	-	0.200		1.203		-		-		-	0.000	1.403	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HDT - Live Fire Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	0.260	1.045	Jun 2020	0.070	Feb 2021	-		-		-	0.000	1.375	-
HDT - Familiarization Training	C/IDIQ	Mack Defense : Allentown, PA	-	0.007	Nov 2020	-		-		-		-	0.000	0.007	-
HDT - DT/OT	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	0.203	0.300	Oct 2020	0.268	Mar 2021	-		-		-	0.000	0.771	-
HEMTT Characterization Testing	SS/FFP	Michigan Tech, Keweenaw Research Center : Calumet, MI	-	0.115	Aug 2020	-		-		-		-	0.000	0.115	-
USAREUR HETS ONS - Test Support	SS/FFP	Oshkosh Defense : Oshkosh, WI	-	0.358	Jul 2020	-		-		-		-	0.000	0.358	-
USAREUR HETS ONS - Testing	MIPR	Ground Vehicle Systems Center : Warren, MI	-	0.359	Nov 2020	-		-		-		-	0.000	0.359	-
		Subtotal	0.463	2.184		0.338		-		-		-	0.000	2.985	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / *Family of Heavy Tactical Vehicles*	Project (Number/Name) VR5 / *TWV Protection Kits*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.463	2.384		1.541		-		-		-	0.000	4.388	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** VR5 / *TWV Protection Kits*

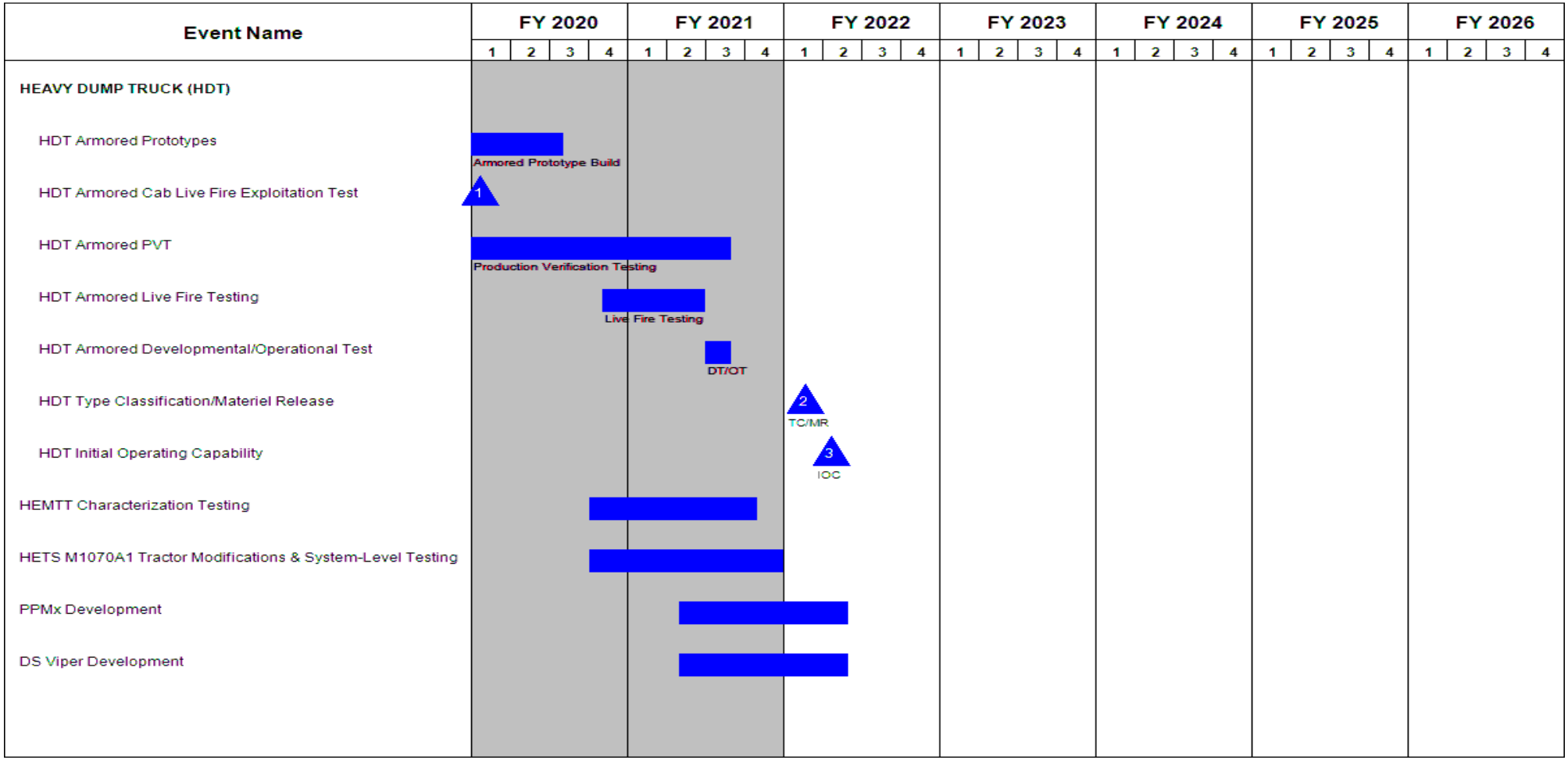


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604622A / *Family of Heavy Tactical V ehicles*	**Project (Number/Name)** VR5 / *TWV Protection Kits*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
HEAVY DUMP TRUCK (HDT)	1	2017	4	2021
HDT Armor Development	3	2019	4	2019
HDT Armored Prototypes	4	2019	3	2020
HDT Armored Cab Live Fire Exploitation Test	1	2020	1	2020
HDT Armored PVT	4	2019	3	2021
HDT Armored Live Fire Testing	4	2020	2	2021
HDT Armored Developmental/Operational Test	3	2021	3	2021
HDT Type Classification/Materiel Release	1	2022	1	2022
HDT Initial Operating Capability	2	2022	2	2022
HEMTT Characterization Testing	4	2020	4	2021
HETS M1070A1 Tractor Modifications & System-Level Testing	4	2020	4	2021
PPMx Development	2	2021	2	2022
DS Viper Development	2	2021	2	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604633A *I Air Traffic Control*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.543	3.383	4.405	-	4.405	-	-	-	-	-	-
586: *Air Traffic Control*	-	5.543	3.383	4.405	-	4.405	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Program Element (PE) 0604633A Air Traffic Control funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements.

The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new software for Air Traffic Control and Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System and coalition partners. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments. TAIS will evolve through Common Operating Environment (COE) convergence to facilitate Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) and Joint All Domain Command and Control (JADC2).

The Air Traffic Navigation Integration and Coordination System (ATNAVICS) is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the Interrogation Identification Friend-or-Foe (IFF) system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army					Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604633A / *Air Traffic Control*		
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	5.781	3.511	9.823	-	9.823
Current President's Budget	5.543	3.383	4.405	-	4.405
Total Adjustments	-0.238	-0.128	-5.418	-	-5.418
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.238	-0.128			
• Adjustments to Budget Years	-	-	-5.418	-	-5.418

Change Summary Explanation

Fiscal Year 2022 reflects a decrease in funding to better align with Army Air Traffic Control requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / *Air Traffic Control*	Project (Number/Name) 586 / *Air Traffic Control*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
586: *Air Traffic Control*	-	5.543	3.383	4.405	-	4.405	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 586 Air Traffic Control funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements.

The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new software for Air Traffic Control and Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System and coalition partners. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments. TAIS will evolve through Common Operating Environment (COE) convergence to facilitate Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) and Joint All Domain Command and Control (JADC2).

The Air Traffic Navigation Integration and Coordination System (ATNAVICS) is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the Interrogation Identification Friend-or-Foe system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Tactical Airspace Integration System (TAIS)	2.810	2.418	4.405
Description: TAIS is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new software for Air Traffic Control and Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System and coalition partners. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments. TAIS will evolve through Common Operating Environment (COE) convergence to facilitate Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) and Joint All Domain Command and Control (JADC2).			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604633A / *Air Traffic Control*	**Project (Number/Name)** 586 / *Air Traffic Control*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: Develop Joint All Domain Command and Control Airspace Control (AC) capabilities and AC service extension using Mission Command Information System and Tactical Assault Kit frameworks, plugins, and services. Develop a solution to utilize common and enterprise services in all Computing Environments. Begin development for integration and direct machine interfaces to emerging Artificial Intelligence assisted decision making aids. ***FY 2022 Plans:*** Develop Airspace Control embedded operator training capability. Continue development of Joint All Domain Command and Control AC capabilities and AC service extension using Mission Command Information System and Tactical Assault Kit frameworks and plugins services. Continue development of a solution to utilize common and enterprise services in all Computing Environments. Continue development for integration and direct machine interfaces to emerging Artificial Intelligence assisted decision making aids. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY2022 funding increases to develop embedded Airspace Control operator training capability, ASTARTE and JADC2.			
Title: Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization ***Description:*** The ATNAVICS is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the IFF system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture. ***FY 2021 Plans:*** Complete RMF compliance efforts and product support analysis efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreases in FY 2022 due to completion of RMF compliance efforts.	2.733	0.965	-
Accomplishments/Planned Programs Subtotals	5.543	3.383	4.405

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• AA0050: *Air Traffic Control*	32.738	26.408	21.759	-	21.759	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604633A / *Air Traffic Control*	**Project (Number/Name)** 586 / *Air Traffic Control*

D. Acquisition Strategy

This project is comprised of multiple systems supporting ATC development and test efforts. While the detailed acquisition strategy varies by program, the general strategy for each program is to complete development and testing efforts through contract modifications, engineering service tasks, and new/follow-on contracts. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international air traffic control and upcoming Next Gen requirements and mandates as well as current aircraft self-reporting transponders.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / *Air Traffic Control*	Project (Number/Name) 586 / *Air Traffic Control*	

Product Development ($ in Millions)

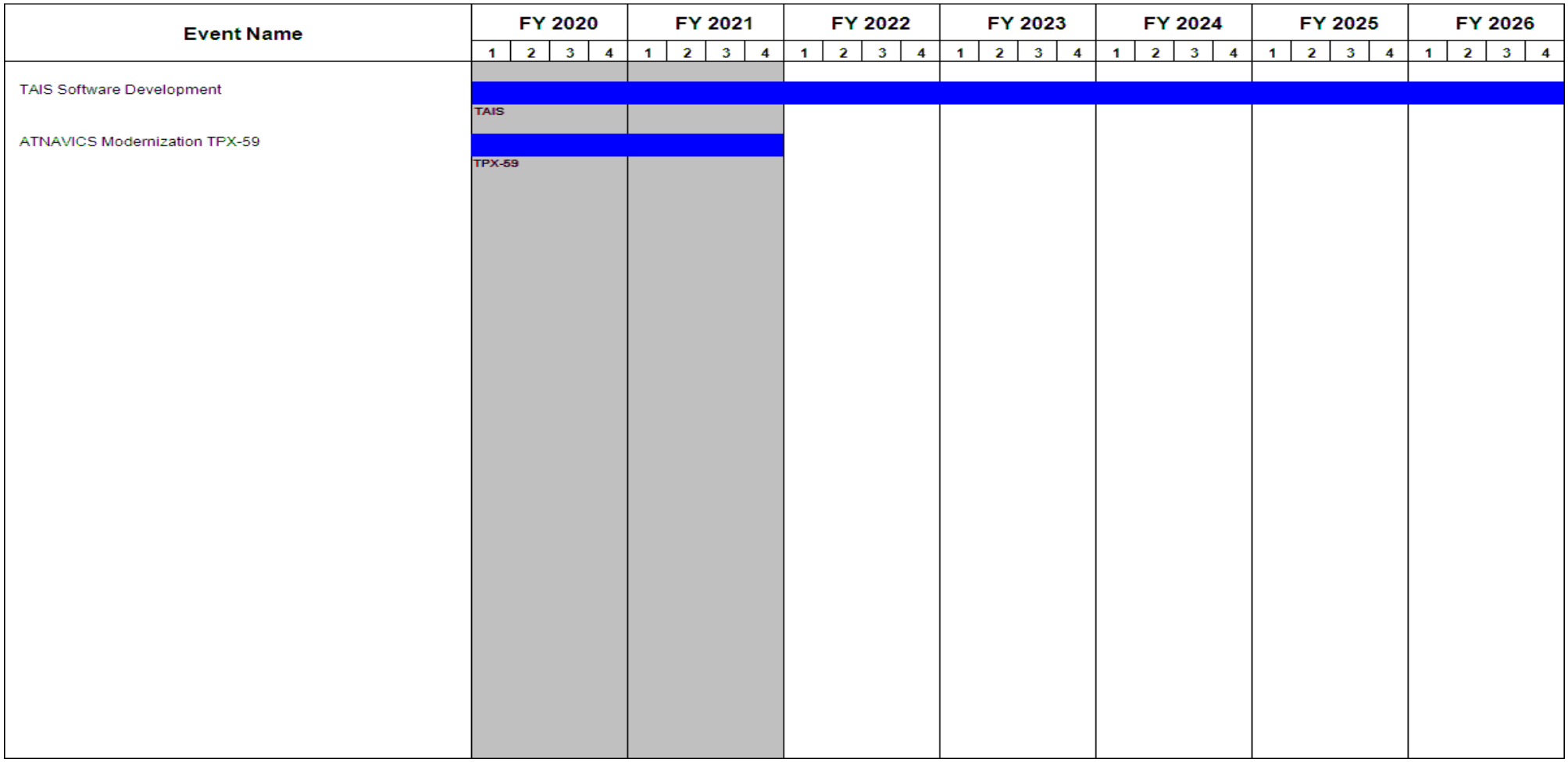
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TAIS Software Development (TTS/ ASTARTE/JADC2)	SS/T&M	General Dynamics C4S : Huntsville, AL	37.832	2.810	May 2020	2.418	May 2021	2.910	Jan 2022	-		2.910	Continuing	Continuing	Continuing
TAIS EASI Software Development	MIPR	S3I : Redstone Arsenal, AL	-	-		-		1.334	Feb 2022	-		1.334	Continuing	Continuing	Continuing
TAIS Cyber/JITC Testing	MIPR	Redstone Test Center/CCDC : Redstone Arsenal, AL	-	-		-		0.161	Jan 2022	-		0.161	Continuing	Continuing	Continuing
ATNAVICS Modernization, TPX-59	Various	Various : Various	24.600	2.733	Jan 2020	0.965	Jan 2021	-		-		-	0.000	28.298	-
		Subtotal	62.432	5.543		3.383		4.405		-		4.405	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.432	5.543		3.383		4.405		-		4.405	Continuing	Continuing	N/A

Remarks

PM: Program Management
TAIS: Tactical Airspace Integration System
ATNAVICS: Air Traffic Navigation Integration and Coordination System

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604633A / *Air Traffic Control*	**Project (Number/Name)** 586 / *Air Traffic Control*



Note

TAIS: Tactical Airspace Integration System
ATNAVICS: Air Traffic Navigation Integration and Coordination System

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604633A / *Air Traffic Control*	**Project (Number/Name)** 586 / *Air Traffic Control*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TAIS Software Development	1	2015	4	2026
ATNAVICS Modernization TPX-59	3	2017	4	2021

Note

TAIS: Tactical Airspace Integration System

ATNAVICS: Air Traffic Navigation Integration and Coordination System

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604642A *I Light Tactical Wheeled Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.843	4.193	2.055	-	2.055	-	-	-	-	-	-
E40: *LTV Prototype*	-	2.843	4.193	2.055	-	2.055	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Army Ground Mobility Vehicle (GMV) provides Infantry Battalions with motorized expeditionary mobility platforms to provide needed operational mobility for the infantry squad with their associated equipment to move quickly around the battlefield. This capability is required across the range of military operations facing Infantry Brigade Combat Team (IBCT) units conducting crises response, initial entry, and selected decisive action missions. GMV deploys worldwide by sea, air, and land modes to support strategic deployment and operational maneuver in accordance with Army and Joint doctrine. This capability provides flexibility for entry operations (permissive and non-permissive) to counter threat anti-access strategies by using multiple austere entry points to bring in combined arms configured units.

The electric Light Reconnaissance Vehicle (eLRV) platform through electrification will provide commanders a substantial competitive advantage in the Multi-Domain Operational (MDO) Environment against threat capabilities through reduction in acoustic and thermal signature, silent mobility, increased dash speed, extended range, increased reliability and reduction in CL III requirements. These attributes will enhance lethality and survivability of the mounted reconnaissance squad, platoon and troop.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory 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.

FY 2022 GMV budget activities in the amount of $2.055 million includes the continuation of ISV performance, operational, and qualification testing. PL GMV will investigate and analyze current industry capabilities for electrification of tactical vehicles and recharging of electric vehicles via market research and industry engagements to inform the eLRV. Product Lead Ground Mobility Vehicle (PL GMV) will procure eLRV Prototypes, conduct developmental testing, and conduct Soldier touch points.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604642A *I Light Tactical Wheeled Vehicles*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	2.965	1.976	1.974	-	1.974
Current President's Budget	2.843	4.193	2.055	-	2.055
Total Adjustments	-0.122	2.217	0.081	-	0.081
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.289			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.122	-0.072			
• Adjustments to Budget Years	-	-	0.081	-	0.081

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: E40: *LTV Prototype*		
Congressional Add: *Infantry Squad Vehicle - Army requested transfer from OP.A line 5*	-	2.289
Congressional Add Subtotals for Project: E40	-	2.289
Congressional Add Totals for all Projects	-	2.289

Change Summary Explanation

FY21 Increase of $2.289M for ISV IOT&E testing.
FY22 Increase of $.257M for eLRV.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / *Light Tactical Wheeled Vehicles*	Project (Number/Name) E40 / *LTV Prototype*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
E40: *LTV Prototype*	-	2.843	4.193	2.055	-	2.055	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project includes GMV (AGMV1.1), Infantry Squad Vehicle (ISV), SOCOM GMV1.1), & electric Light Reconnaissance Vehicle (eLRV) . Accomplishment eLRV is a new start in FY22.

A. Mission Description and Budget Item Justification

The Army Ground Mobility Vehicle (GMV) provides Infantry Battalions with motorized expeditionary mobility platforms to provide needed operational mobility for the infantry squad with their associated equipment to move quickly around the battlefield. This capability is required across the range of military operations facing Infantry Brigade Combat Team (IBCT) units conducting crises response, initial entry, and selected decisive action missions. GMV deploys worldwide by sea, air, and land modes to support strategic deployment and operational maneuver in accordance with Army and Joint doctrine. This capability provides flexibility for entry operations (permissive and non-permissive) to counter threat anti-access strategies by using multiple austere entry points to bring in combined arms configured units.

The electric Light Reconnaissance Vehicle (eLRV) platform through electrification will provide commanders a substantial competitive advantage in the Multi-Domain Operational (MDO) Environment against threat capabilities through reduction in acoustic and thermal signature, silent mobility, increased dash speed, extended range, increased reliability and reduction in CL III requirements. These attributes will enhance lethality and survivability of the mounted reconnaissance squad, platoon and troop.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory 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.

FY 2022 GMV budget activities in the amount of $2.055 million includes the continuation of ISV performance, operational, and qualification testing. PL GMV will investigate and analyze current industry capabilities for electrification of tactical vehicles and recharging of electric vehicles via market research and industry engagements to inform the eLRV. Product Lead Ground Mobility Vehicle (PL GMV) will procure eLRV Prototypes, conduct developmental testing, and conduct Soldier touch points.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: GMV Contract Test Support	0.447	0.273	0.280
Description: Funding is provided for Ground Mobility Vehicle (GMV) contractor test support.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continuation of ISV GMV contractor test support. ***FY 2022 Plans:*** Completion of ISV GMV contractor test support. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding due to inflation.			
Title: GMV Test and Evaluation ***Description:*** Funding is provided for Ground Mobility Vehicle (GMV) testing events in the support of Full Rate Production (FRP) decision. ***FY 2021 Plans:*** Continuation of ISV GMV testing which include Production Qualification Testing (PQT), Low Velocity Air Drop (LVAD), and operational testing. ***FY 2022 Plans:*** Completion of ISV GMV testing which include Low Velocity Air Drop (LVAD), maintenance evaluation, and operational testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in funding due to ramp down of ISV testing.	2.030	1.631	1.002
Title: GMV (ISV) Test Assets ***Description:*** Funding is provided for GMV Test Assets.	0.366	-	-
Title: eLRV Prototypes ***Description:*** Funding is provided for the support of electric Light Reconnaissance Vehicle (eLRV) Prototypes. ***FY 2022 Plans:*** Funding is provided for the support of electric Light Reconnaissance Vehicle (eLRV) Prototypes. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding is due to initial procurement of eLRV Prototypes.	-	-	0.545
Title: eLRV Test and Evaluation ***Description:*** Funding is provided for electric Light Reconnaissance Vehicle (eLRV) testing events. ***FY 2022 Plans:***	-	-	0.228

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding is provided for electric Light Reconnaissance Vehicle (eLRV) safety testing, developmental testing, and Soldier touch point events. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding is due to initiation of eLRV testing.			
Accomplishments/Planned Programs Subtotals	2.843	1.904	2.055

	FY 2020	FY 2021
Congressional Add: Infantry Squad Vehicle - Army requested transfer from OP.A line 5	-	2.289
FY 2021 Plans: Funding was a recolor of FY21 GMV OPA D15501 for ISV GMV Operational Testing.		
Congressional Adds Subtotals	-	2.289

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• D15505: *Ground Mobility Vehicles (Light) GMV (L)*	37.038	29.247	29.807	-	29.807	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Ground Mobility Vehicle (GMV) Phase I: Per AROC on 10 August 2018 following the Army's funding reprioritization, the Army's direction was to procure 127 vehicles for USASOC, and 170 for Army GMV 1.1 for 3 Airborne IBCTs.
GMV Phase II: A firm fixed priced production contract was awarded to General Motors (GMV) Defense on 26 June 2020 following successful prototype determination and findings from the ISV OTA. Per AROC on 08 February 2019, the Vice Chief Secretary of Army (VCSA) approved the procurement objective of 11 IBCT sets at 59 vehicles per IBCT (649 vehicles) to be completed by FY 2024. During a follow on AROC on 22 February 2019, the VCSA approved the ISV annex to the approved SOCOM GMV1.1 Capabilities Production Document which approved the total requirement for the ISV program.

electric Light Reconnaissance Vehicle (eLRV) :

PL GMV will conduct market research and Industry coordination to assess industry capabilities and verify maturity of integration in support of an Army Requirements Oversight Council in April 2021. PL GMV will utilize a two-phased acquisition strategy for eLRV.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

Phase I: Award Other Transaction Agreements to multiple vendors to procure prototype hardware for limited safety/performance testing and Soldier Touch Point that will inform down select to final prototype phase and eventual production contract competition. Down selected OTA vendors provide test vehicles for additional safety/ performance testing and Soldier Touch Point to physically demonstrate maturity of current industry vehicle capabilities and gain Soldier feedback.

Phase II: Utilize Soldier Feedback and test data obtained in Phase I to achieve Milestone C and award production contract to down-selected vendor. Utilize Low Rate Initial Production vehicles to conduct Production Qualification Testing and Initial Operational Test prior to gaining Full Rate Production approval. Field initially under Conditional Materiel Release until logistics development completion where the program will transition to Full Materiel Release with organic support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / *Light Tactical Wheeled Vehicles*	Project (Number/Name) E40 / *LTV Prototype*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GMV Contractor Test Support	Various	General Motor Defense (GM-D) : Various	0.009	0.447	Nov 2020	0.273	Feb 2021	0.280	Oct 2021	-		0.280	0.000	1.009	-
GMV Test Assets	Various	General Motor Defense (GM-D) : Various	-	0.366	Jun 2020	-		-		-		-	0.000	0.366	-
GMV Prototypes	Various	Various : Various	3.143	-		-		-		-		-	0.000	3.143	-
eLRV Prototypes	TBD	TBD : TBD	-	-		-		0.545	Apr 2022	-		0.545	0.000	0.545	-
		Subtotal	3.152	0.813		0.273		0.825		-		0.825	0.000	5.063	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GMV Program Management Support	Various	PM Office : Selfridge ANG	0.337	-		-		-		-		-	0.000	0.337	-
		Subtotal	0.337	-		-		-		-		-	0.000	0.337	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GMV performance and qualification testing	MIPR	Various : Various	1.606	2.030	Aug 2020	3.920	Nov 2020	1.002	Oct 2021	-		1.002	0.000	8.558	-
eLRV developmental testing	MIPR	Various : Various	-	-		-		0.228	Jul 2022	-		0.228	0.000	0.228	-
		Subtotal	1.606	2.030		3.920		1.230		-		1.230	0.000	8.786	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.095	2.843		4.193		2.055		-		2.055	0.000	14.186	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / *Light Tactical Wheeled Vehicles*	Project (Number/Name) E40 / *LTV Prototype*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

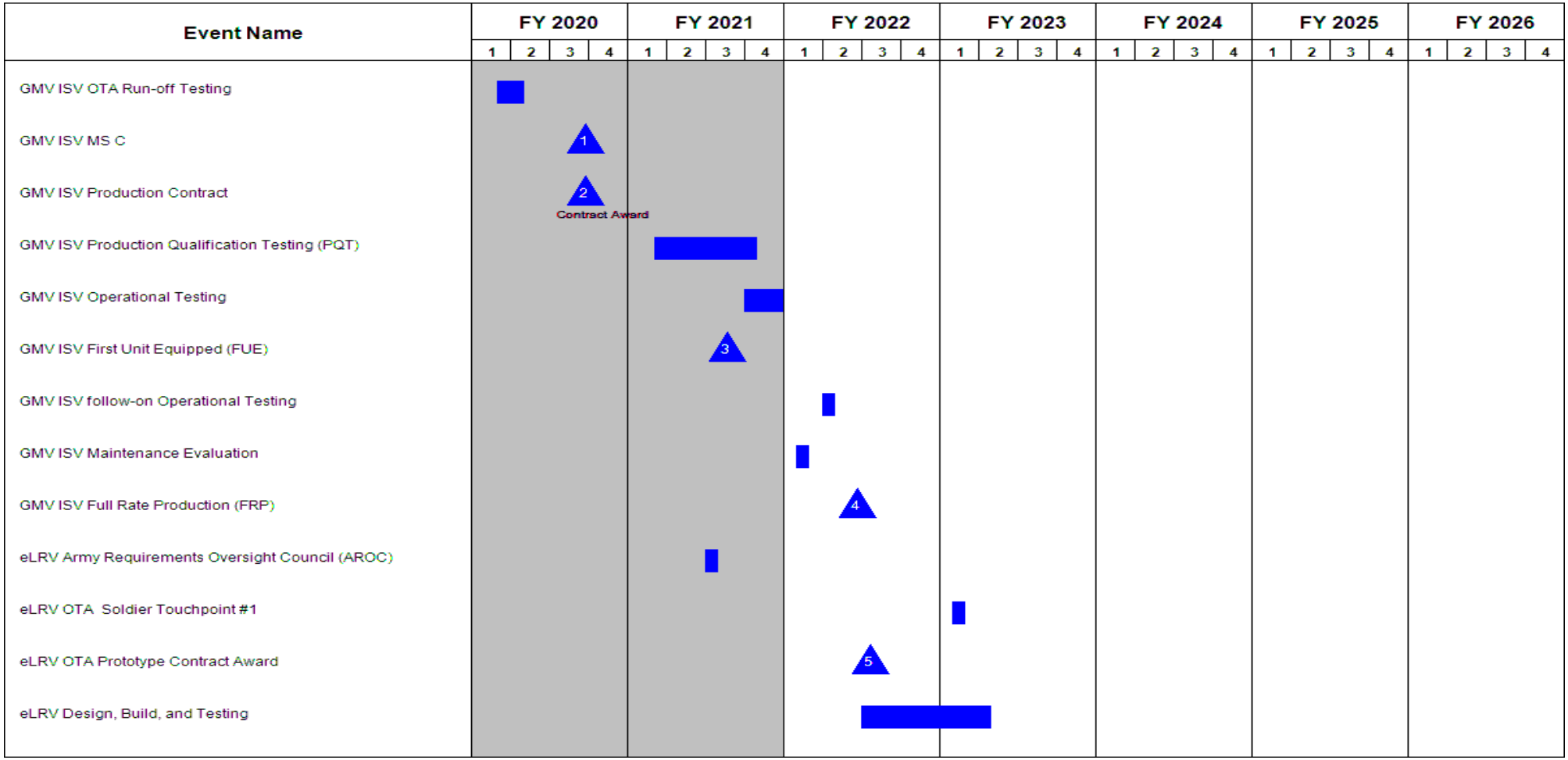


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

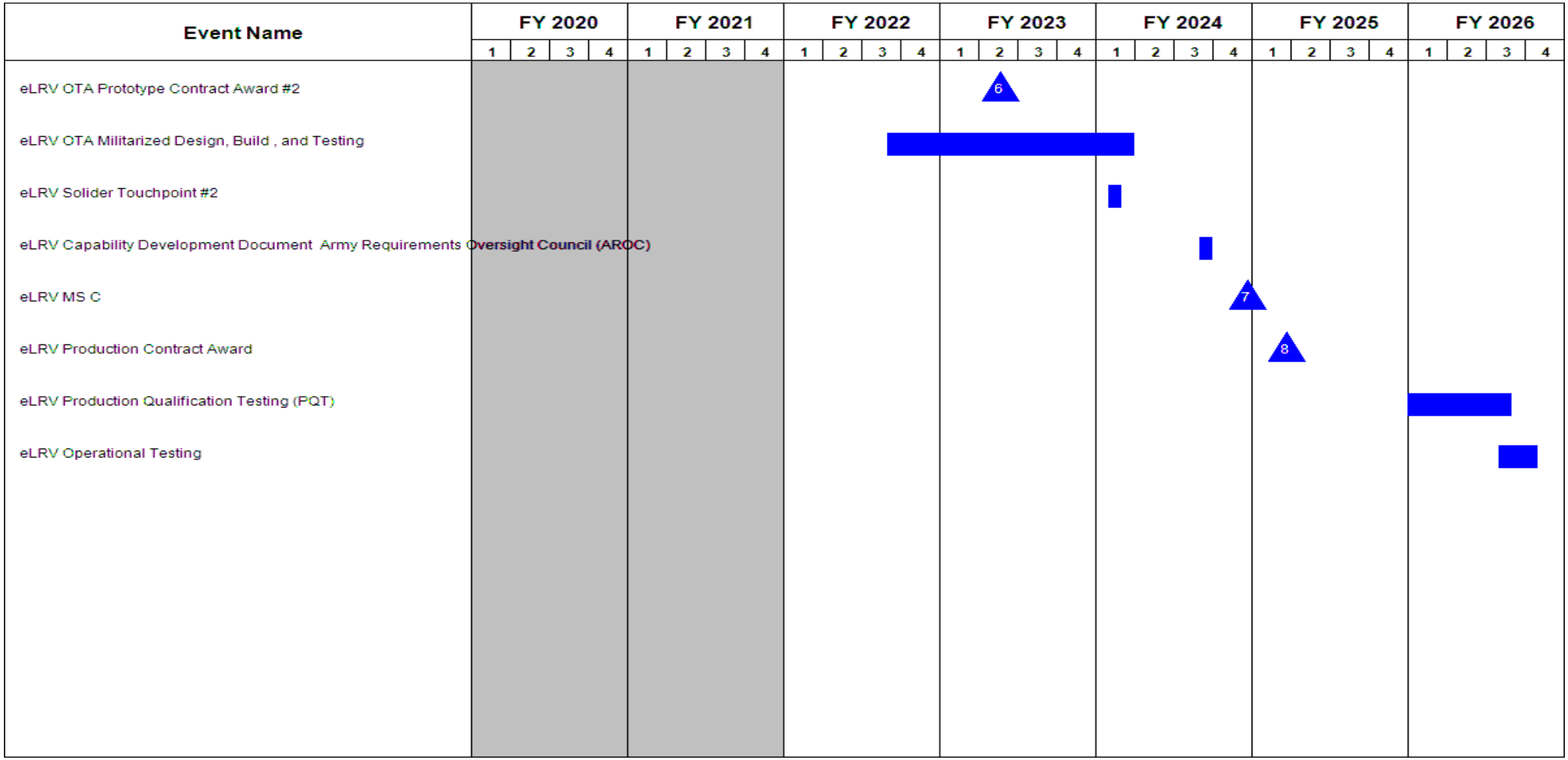


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604642A / *Light Tactical Wheeled Vehicles*	**Project (Number/Name)** E40 / *LTV Prototype*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GMV ISV OTA Run-off Testing	1	2020	2	2020
GMV ISV MS C	3	2020	3	2020
GMV ISV Production Contract	3	2020	3	2020
GMV ISV Production Qualification Testing (PQT)	1	2021	4	2021
GMV ISV Operational Testing	4	2021	4	2021
GMV ISV First Unit Equipped (FUE)	3	2021	3	2021
GMV ISV follow-on Operational Testing	2	2022	2	2022
GMV ISV Maintenance Evaluation	1	2022	1	2022
GMV ISV Full Rate Production (FRP)	2	2022	2	2022
eLRV Army Requirements Oversight Council (AROC)	3	2021	3	2021
eLRV OTA Soldier Touchpoint #1	1	2023	1	2023
eLRV OTA Prototype Contract Award	3	2022	3	2022
eLRV Design, Build, and Testing	3	2022	2	2023
eLRV OTA Prototype Contract Award #2	2	2023	2	2023
eLRV OTA Militarized Design, Build , and Testing	3	2022	1	2024
eLRV Solider Touchpoint #2	1	2024	1	2024
eLRV Capability Development Document Army Requirements Oversight Council (AROC)	3	2024	3	2024
eLRV MS C	4	2024	4	2024
eLRV Production Contract Award	1	2025	1	2025
eLRV Production Qualification Testing (PQT)	1	2026	3	2026
eLRV Operational Testing	3	2026	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604645A *I Armored Systems Modernization (ASM) - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	273.433	123.992	137.256	-	137.256	-	-	-	-	-	-
EV8: *Mobile Protected Firepower*	-	273.433	123.992	137.256	-	137.256	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Infantry Brigade Combat Teams (IBCTs) lack the mobile, protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement during offensive operations and defeat attacking enemy during defensive operations. This program supports the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	285.136	135.488	123.143	-	123.143
Current President's Budget	273.433	123.992	137.256	-	137.256
Total Adjustments	-11.703	-11.496	14.113	-	14.113
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.550			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-11.703	-4.946			
• Adjustments to Budget Years	-	-	14.113	-	14.113

Change Summary Explanation

FY 2022 RDT&E funding was increased by $14.113 million due to the realignment of Low Rate Initial Production (LRIP) phase logistics products development activities from WTCV (SSN G80820 - Mobile Protected Firepower) to RDT&E.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	Project (Number/Name) EV8 / *Mobile Protected Firepower*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EV8: *Mobile Protected Firepower*	-	273.433	123.992	137.256	-	137.256	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Infantry Brigade Combat Teams (IBCTs) lack the mobile, protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement during offensive operations and defeat attacking enemy during defensive operations. This program supports the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Product Development	249.276	83.804	27.718
Description: MPF Middle Tier Acquisition (MTA) Rapid Prototyping, to include integration engineering, prototype builds, technical support to government test, and logistics products development efforts contracted to BAE Systems and General Dynamics Land Systems (GDLS). ***FY 2021 Plans:*** Continuation of MTA Rapid Prototyping efforts, to include Technical Manual (TM) and Training Support Package (TSP) development, spare parts provisioning, Repair Parts and Special Tools List (RPSTL) creation, and development of plans to enable execution of the FY 2022 MPF Supportability Assessment. FY 2021 product development actions will also include manufacturing readiness maturation efforts, engineering and logistics support to integrate emerging, mature technologies to meet system requirements, and test failure root cause analysis, corrective action application, user training, and test asset maintenance for Pre-Production Testing (PPT), the Soldier Vehicle Assessment (SVA), and Limited User Testing (LUT). ***FY 2022 Plans:*** Completion of MTA Rapid Prototyping efforts, to include TM and TSP validation and updates, spare parts provisioning, RPSTL updates, and execution of the MPF Supportability Assessment. FY 2022 product development actions will also include vehicle design updates and logistics product revisions to address failures that emerge from PPT. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is due to reduced levels of engineering and logistics support required to support USG developmental and operational testing.			
Title: Product Development - LRIP Phase	-	-	29.930

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: MPF Low Rate Initial Production (LRIP) phase efforts, to include logistics product development, TM and TSP updates, LRIP test planning, purchase of the System Support Package (SSP) for LRIP phase testing, and contractor technical support to test. ***FY 2022 Plans:*** FY 2022 activities include the continued development of logistics products such as the Operator, Field Maintenance, and Battle Damage and Repair (BDAR) Manuals, continued supportability analysis such as Level of Repair Analysis (LORA), Reliability and Maintainability (R&M) Analysis, development of National/Depot Maintenance Work Requirements (NMWR/DMWR), and continued development of products to support operator, field level maintenance, and instructor training. FY 2022 will also fund LRIP test planning, long lead spare parts procurement to enable start of product quality testing (PQT) in FY 2024, and concept development to inform the integration of future ammunition. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** LRIP phase efforts initiate at FY 2022 Milestone C.			
Title: Prototype Upgrade to LRIP Configuration ***Description:*** After a successful Milestone C, eight (8) vehicles will be retrofitted to LRIP configuration to support LRIP phase survivability testing, logistics products development, and implementation of corrective design changes driven by failures that arise during Production Qualification Testing (PQT) and Initial Operational Test and Evaluation (IOT&E). Upgrading MPF prototypes to LRIP configuration will result in substantial cost avoidance compared with producing additional LRIP vehicles to support test requirements. ***FY 2022 Plans:*** Eight (8) vehicles will be retrofitted to LRIP configuration to support performance and survivability testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** LRIP phase efforts initiate at FY 2022 Milestone C.	-	-	15.922
Title: LRIP Vehicles for Full-Up System-Level (FUSL) Live Fire ***Description:*** New production of MPF LRIP vehicles for use in FUSL Live fire testing. ***FY 2022 Plans:*** Three (3) vehicles produced in the LRIP configuration will be used in MPF destructive FUSL live fire testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	-	35.709

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
LRIP phase efforts initiate at FY 2022 Milestone C.			
Title: Government Test and Evaluation (Performance Testing)	8.274	13.852	6.532
Description: During the Rapid Prototyping phase, the Government will execute performance testing on 16 prototypes (eight per contractor) and four BH&T assets (two per contractor). Performance testing during the Rapid Prototyping phase will include Ballistic Hull & Turret (BH&T) survivability testing and Pre-Production Testing (PPT), which consists of vehicle-level lethality, Reliability, Availability, and Maintainability (RAM), and electromagnetic compatibility and interference testing. PPT will also contain an initial cybersecurity evaluation. BH&T testing will provide Force Protection and vehicle-level survivability data while PPT will provide vehicle-level automotive, lethality, and RAM performance data. The results of Rapid Prototyping performance testing will inform the planned FY 2022 Milestone C decision. During the LRIP phase, the Government will execute performance testing on 17 vehicles (inclusive of eight (8) prototype vehicles retrofitted to LRIP configuration). Performance testing during the LRIP phase will include survivability testing and Product Quality Testing (PQT), which consists of vehicle-level lethality, RAM, and electromagnetic compatibility and interference testing, and cybersecurity testing. ***FY 2021 Plans:*** PPT will be continued in FY 2021, to include safety, automotive performance, fire control, lethality, RAM, electromagnetic environmental effects (E3) testing, and an initial cybersecurity assessment. Safety testing will assess automotive, weapon, and software safety, while automotive testing will assess system weight, center of gravity, human factors, transportability, acceleration, maximum speed, fuel consumption, and ability to traverse slopes, obstacles, and water. Fire control and lethality testing will assess accuracy, frequency response, sight performance, target handoff, and control and communications. RAM testing will evaluate system reliability, availability, and maintainability metrics while E3 testing will measure system electromagnetic compatibility, interference, and safety. The initial cybersecurity assessment will evaluate system cybersecurity and resilience. Government test activities necessary to perform FY 2021 PPT include the integration and installation of instrumentation, execution of test events, collection and storage of data, processing of Test Incident Reports (TIR), and Failure Analysis and Corrective Action (FACAR) resolution. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Activities include completion of MTA Rapid Prototyping phase testing, to include PPT and draft test reports to inform the down-select Source Selection Evaluation Board (SSEB) and the Milestone C decision. Additionally, finite element analysis, failure modes effects analysis, ballistic modeling and simulation, crew casualty and prototype damage assessments, and controlled damage experiments will be completed to inform detail planning for LRIP phase performance and survivability testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease is due to reduced performance testing requirements from FY 2021 to FY 2022.			
Title: Government Test and Evaluation (Operational Testing) ***Description:*** During the Rapid Prototyping phase, the Government will execute operational testing on eight prototypes (four per contractor) through a Limited User Test (LUT). The LUT will provide early data regarding the operational effectiveness and suitability of the MPF. During LRIP phase, the Government will execute a thirteen (13) vehicle Company-Level Initial Operational Test and Evaluation (IOT&E). The IOT&E is planned for FY 2024. ***FY 2021 Plans:*** The Government will initiate a LUT in 4th Quarter, FY 2021 to assess the MPF system?s operational effectiveness and suitability. The LUT will include ten prototype systems (five per contractor) and will be conducted at Ft. Bragg, NC and Ft. Stewart, GA. Government activities necessary to complete the LUT include test planning, system instrumentation, test execution, maintenance of opposing force vehicles, and test report development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2021 funds will complete the MPF LUT.	-	9.658	-
Title: Soldier Vehicle Assessment (SVA) ***Description:*** The SVA will place eight prototype vehicles (four per contractor) into the hands of soldiers to develop MPF Tactics, Techniques, and Procedures (TTPs), assess Doctrine, Organization, Training materiel Leadership and educational Personal Facilities and Policy (DOTmLPF-P) domains, collect data to support preparations for the LUT, and inform future MPF Product Improvements. SVA force-on-force and maneuver exercises will be conducted at Ft. Bragg, NC while SVA gunnery events will be at Ft. Stewart, GA. ***FY 2021 Plans:***	0.193	2.916	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
In FY 2021, the Government will complete the MPF SVA, to include contractor-led soldier training on the MPF, force-on-force training missions, Platoon and Section Gunnery events, and maneuver Live Fire exercises to assess MPF TTPs and DOTmLPF-P domains. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is due to completion of the SVA in FY 2021.			
Title: Training Aids and Devices Development ***Description:*** Development of aids and devices to facilitate institutional training for MPF operators and maintainers. MPF training aids and devices will include Hands on Trainers (HOT), Diagnostic/Troubleshooting Trainers (DTT), Part Task Trainers (PTT), an Advanced Gunnery Training System (AGTS), and an MPF Combat Vehicle Tactical Engagement Simulation System (CVTESS). MPF aids and devices will be interoperable/compatible with the Army?s current live Tactical Engagement Simulation (TES) systems; instrumentation systems; Common Training Instrumentation Architecture (CTIA); Live, Virtual Constructive-Integrated Architecture (LVC-IA) training enablers; and the future Synthetic Training Environment (STE). ***FY 2021 Plans:*** FY 2021 efforts include continued development of contract performance specifications for gunnery and maintenance training devices. ***FY 2022 Plans:*** In FY 2022 MPF gunnery and maintenance training device development performance specifications will be completed, requests for proposal will be released, and contracts will be awarded. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to award of training device development contracts at FY 2022 Milestone C.	0.147	0.150	2.175
Title: Government Engineering and Project Management ***Description:*** Government program management and system engineering support, to include salaries, travel, training, supplies, facilities, equipment, and support contractors necessary to manage development efforts during the MPF MTA Rapid Prototyping and LRIP phases. ***FY 2021 Plans:*** Continue the engineering, logistics, product assurance and test, financial management, and operations support for the MPF MTA Rapid Prototyping activities from November 2020 through October 2021. Will include salaries, training, travel, supplies, facilities, and equipment to manage MPF test and evaluation, logistics products development, Soldier touch-point feedback collection and	12.982	12.548	11.354

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
analysis, system vulnerability and environmental impact assessments, and future capability enhancement acquisition strategy development. ***FY 2022 Plans:*** Continue the engineering, logistics, product assurance and test, financial management, and operations support for the MPF MTA Rapid Prototyping and LRIP development activities from November 2021 through October 2022. Will include salaries, training, travel, supplies, facilities, and equipment to manage MPF test and evaluation, logistics products development, system vulnerability and environmental impact assessments, and future capability enhancement acquisition strategy development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is due to reduced levels of support as the program transitions from Rapid Prototyping to LRIP in the 3rd Quarter of FY 2022.			
Title: Government Support to Product Development ***Description:*** Government support to MPF MTA Rapid Prototyping efforts, to include Source Selection activities, and Large Caliber Weapon System development. ***FY 2021 Plans:*** Completion of Large Caliber Weapon System Safety Confirmation testing to secure safety release for SVA and inform the approval of material release to enable system fielding to Army IBCTs. ***FY 2022 Plans:*** Engineering, logistics, product assurance and test, financial management, acquisition, legal, and operations support for a November 2021 through June 2022 MPF Source Selection Evaluation Board (SSEB) to down-select to a single vendor for Low Rate Initial Production (LRIP). SSEB expenditures will include salaries, training, travel, supplies, facilities, and equipment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 due to execution of SSEB in FY 2022.	2.561	1.064	7.916
Accomplishments/Planned Programs Subtotals	273.433	123.992	137.256

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• G80820: *Mobile Protected Firepower*	-	-	286.977	-	286.977	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

Standard Serial Number (SSN) G80820 resources production of MPF. FY 2022 - FY 2024 resourcing supports MPF Low Rate Initial Production (LRIP). Resourcing in FY 2025 and beyond supports MPF Full Rate Production (FRP).

In FY 2022, funding in the amount of $0.046 million for manpower was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

D. Acquisition Strategy

The MPF RFP was issued on 21 November 2017 as a full and open, best value competitive action. On 25 September 2018, the Army Acquisition Executive (AAE) approved the execution of MPF Rapid Prototyping activities under Section 804 of the 2016 National Defense Authorization Act (NDAA) (Public Law 114-92), Middle Tier Acquisition (Rapid Prototyping). The competitive selection process for MPF Rapid Prototyping contracts included the evaluation of written proposals and optional bid samples to provide additional substantiating data for Source Selection Evaluation. On 17 December 2018, two MPF Rapid Prototyping contracts were awarded, one to BAE Systems and the other to General Dynamics Land Systems (GDLS). A Source Selection Evaluation will be finalized to down-select to a single contractor for a Fixed Price Incentive (FPI) Low Rate Initial Production (LRIP) effort upon AAE Milestone C approval in 3rd Quarter, FY 2022. An MPF Full Rate Production (FRP) decision is targeted for 3rd Quarter, FY 2025.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	Project (Number/Name) EV8 / *Mobile Protected Firepower*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering and Project Management	MIPR	Various : Warren, MI; Picatinny, NJ	25.169	12.982	Dec 2019	12.548	Oct 2020	11.354	Nov 2021	-		11.354	20.808	82.861	-
		Subtotal	25.169	12.982		12.548		11.354		-		11.354	20.808	82.861	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development - Middle Tier Acquisition (MTA) Rapid Prototyping Contracts	C/FFP	BAE Systems; General Dynamics Land Systems (GDLS) : Sterling Heights, MI; Sterling Heights, MI	360.874	249.276	Dec 2019	83.804	Oct 2020	27.718	Dec 2021	-		27.718	0.000	721.672	905.941
Product Development - Government Furnished Material (GFM) Procurement	Various	Various : Various	2.130	-		-		-		-		-	0.000	2.130	-
Product Development - LRIP Phase - LRIP Log Development and Contractor Support to Test	C/FFP	TBD : TBD	-	-		-		29.930	Jun 2022	-		29.930	120.106	150.036	-
Prototype Upgrade to LRIP Configuration	C/FFP	TBD : TBD	-	-		-		15.922	Jun 2022	-		15.922	0.000	15.922	-
LRIP Vehicles for Full-Up System-Level (FUSL) Live Fire	C/FPIF	TBD : TBD	-	-		-		35.709	Jun 2022	-		35.709	0.000	35.709	-
		Subtotal	363.004	249.276		83.804		109.279		-		109.279	120.106	925.469	N/A

Remarks

Product Development - Middle Tier Acquisition (MTA) Rapid Prototyping Contracts Remark: MTA Rapid Prototyping contract costs are inclusive of both competitors during the Mobile Protected Firepower (MPF) MTA Rapid Prototyping Phase (1st Quarter FY 2019 to 3rd Quarter FY 2022). Product Development reflects contract costs of a single vendor after Low Rate Initial Production (LRIP) down-select at Milestone C (3rd Quarter FY 2022).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support to Product Development - Large Caliber Weapon System Development	PO	Armament Research, Development and Engineering Center (ARDEC); Watervliet Arsenal (WVA); Rock Island Arsenal (RIA) : Picatinny, NJ; Watervliet, NY; Rock Island, IL	7.963	2.561	Jan 2020	1.064	Dec 2020	-		-		-	0.000	11.588	-
Government Support to Product Development - Source Selection Evaluation Board (SSEB)	Various	Various : Various	5.002	-		-		7.916	Oct 2021	-		7.916	0.000	12.918	-
Training Aids and Devices Development	Various	Program Executive Office Simulation, Training and Instrumentation (PEO STRI) : Orlando, FL	0.005	0.147	Mar 2020	0.150	Apr 2021	2.175	Apr 2022	-		2.175	13.726	16.203	-
		Subtotal	12.970	2.708		1.214		10.091		-		10.091	13.726	40.709	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test and Evaluation (Performance Test, Operational Test, Soldier Vehicle Assessment)	PO	Aberdeen Test Center (ATC); Yuma Test Center (YTC) : Aberdeen, MD; Yuma, AZ	9.307	8.467	Jan 2020	26.426	Nov 2020	6.532	Nov 2021	-		6.532	47.763	98.495	-
		Subtotal	9.307	8.467		26.426		6.532		-		6.532	47.763	98.495	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	Project (Number/Name) EV8 / *Mobile Protected Firepower*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	410.450	273.433		123.992		137.256		-		137.256	202.403	1,147.534	N/A

Remarks

Fiscal Year (FY) 2019 funding supported the award of two Rapid Prototyping contracts to design and build 24 total Mobile Protected Firepower (MPF) prototypes (12 per vendor) and four Ballistic Hull & Turrets (two per vendor), the execution of armor coupon testing, and the completion of planning for FY 2020 Pre-Production Test (PPT). FY 2020 funding supported final assembly and delivery of MPF prototypes and BH&T assets, PPT, and development of MPF Technical Manuals (TM) and Training Support Packages (TSP). FY 2021 funding supported the continuation of PPT, completion of Limited User Testing (LUT), and continued development of MPF Logistics Products (Technical Manuals, Training Support Package, Repair Parts and Special Tools List). FY 2022 funding will complete Rapid Prototyping, execute Low Rate Initial Production (LRIP) source selection, and award LRIP phase contracts to continue logistics products development and procure long lead spares for Performance Qualification Test (PQT) and Initial Operational Test & Evaluation (IOT&E)

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

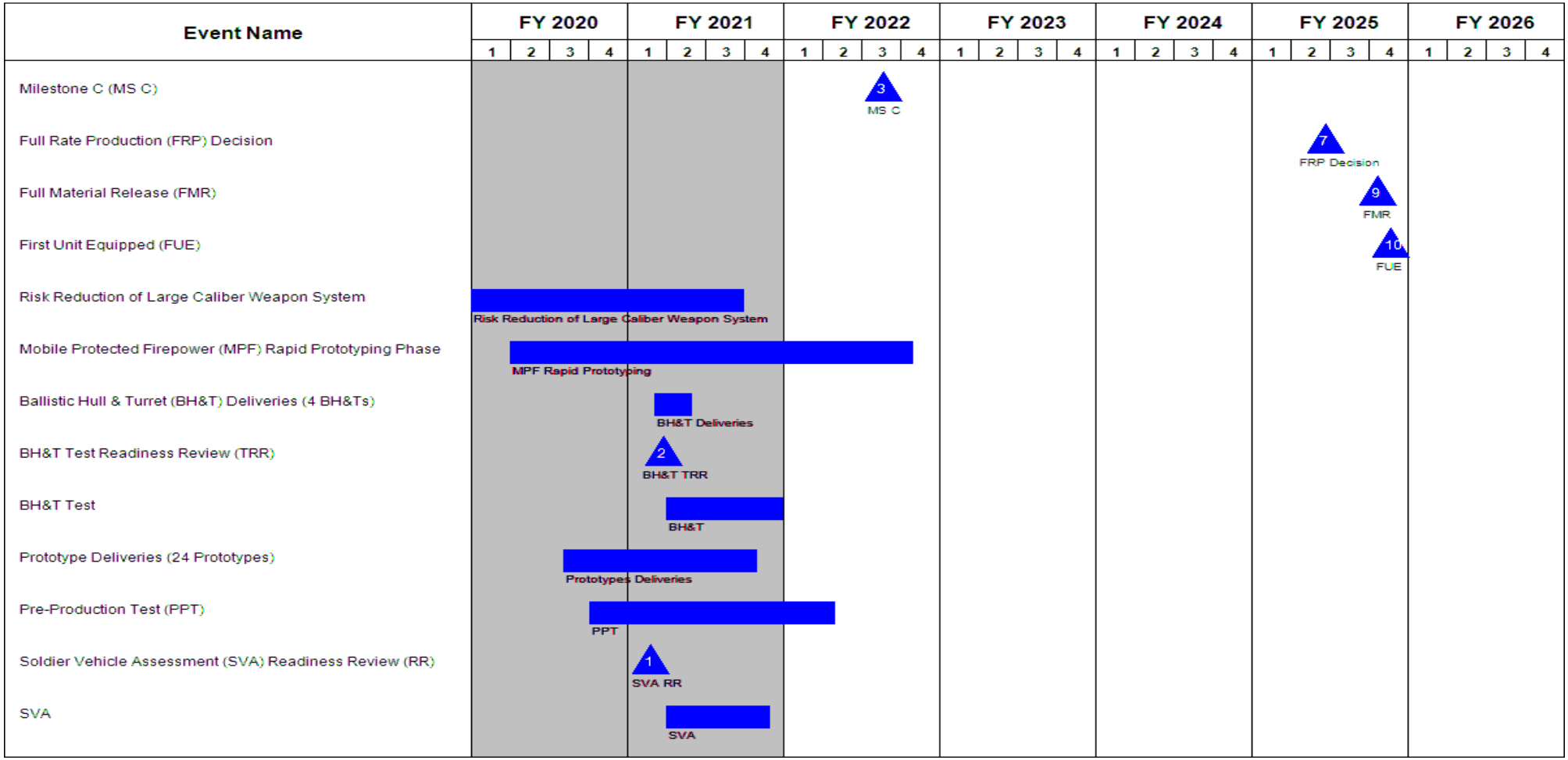


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

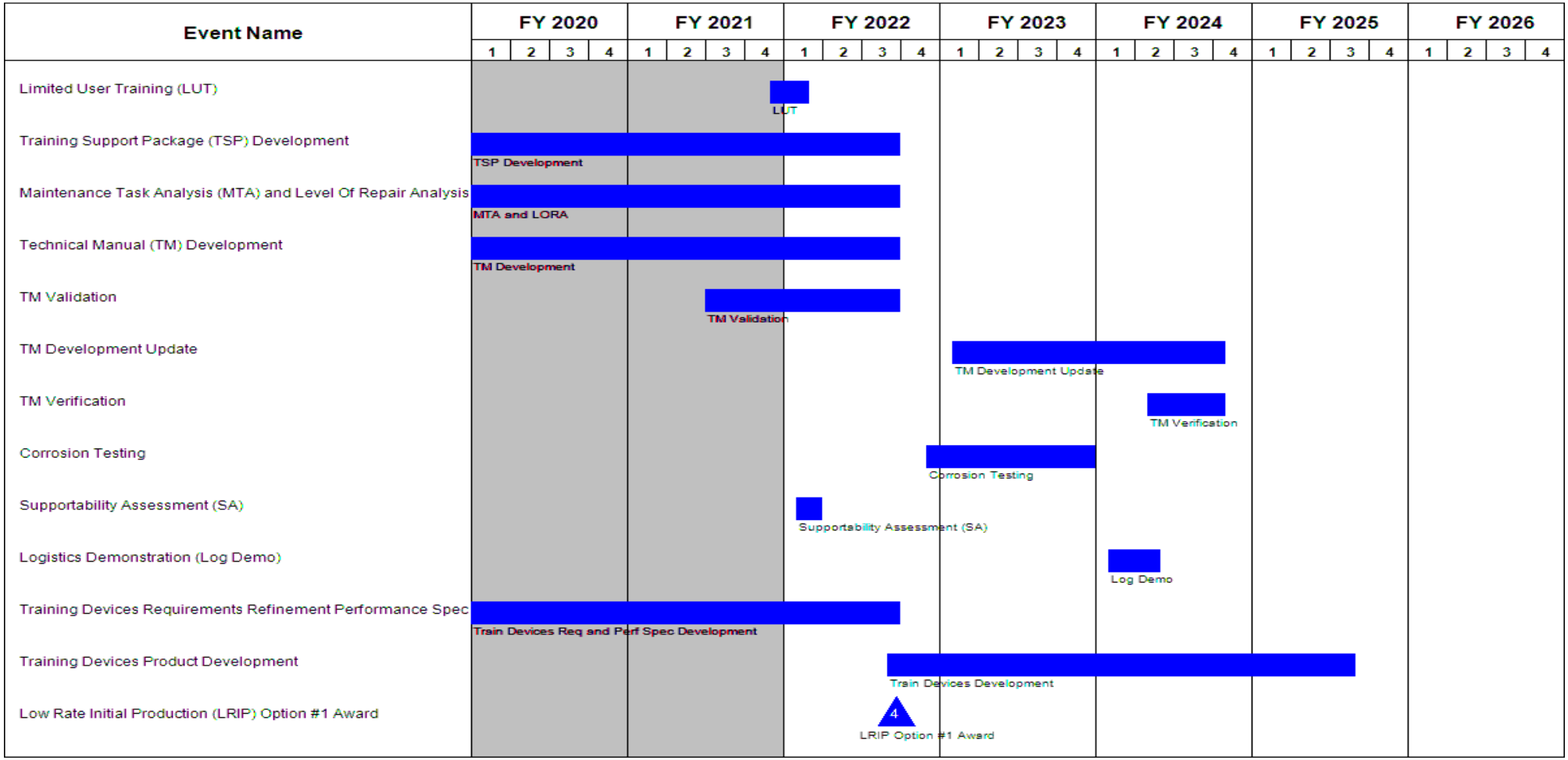


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

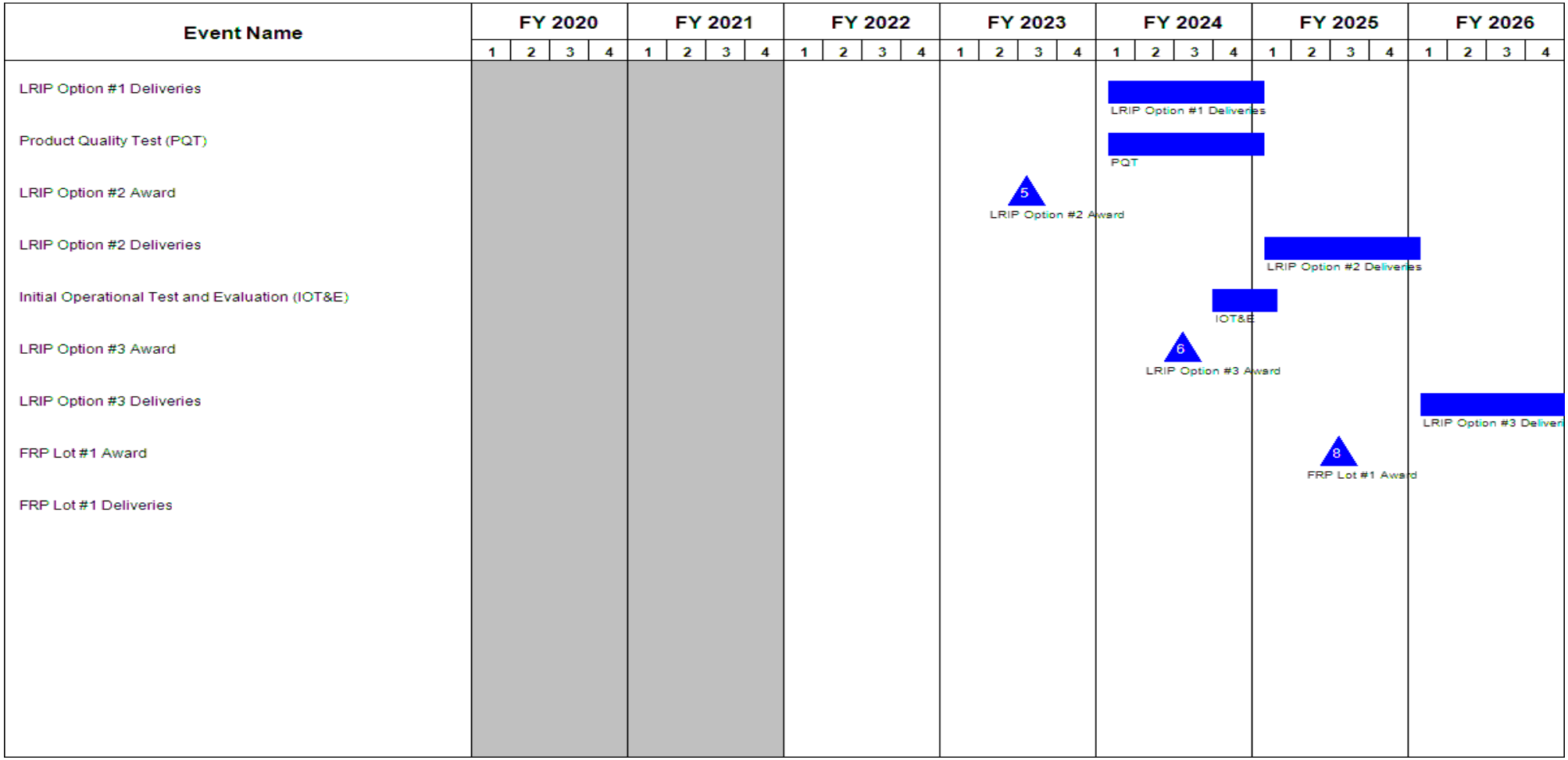


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Section 804 MTA Rapid Prototyping Designation	4	2018	4	2018
Milestone C (MS C)	3	2022	3	2022
Full Rate Production (FRP) Decision	2	2025	2	2025
Full Material Release (FMR)	4	2025	4	2025
First Unit Equipped (FUE)	4	2025	4	2025
Request for Proposal (RFP) Release	1	2018	1	2018
Risk Reduction of Large Caliber Weapon System	3	2017	3	2021
Middle Tier Acquisition (MTA) Source Selection Evaluation Board (SSEB)	2	2018	1	2019
Rapid Prototyping Contract Awards	1	2019	1	2019
Mobile Protected Firepower (MPF) Rapid Prototyping Phase	1	2019	4	2022
Design Maturity Review (DMR)	3	2019	3	2019
Ballistic Hull & Turret (BH&T) Deliveries (4 BH&Ts)	1	2021	2	2021
BH&T Test Readiness Review (TRR)	1	2021	1	2021
BH&T Test	2	2021	4	2021
Prototype Deliveries (24 Prototypes)	3	2020	4	2021
Pre-Production Test (PPT)	4	2020	2	2022
Soldier Vehicle Assessment (SVA) Readiness Review (RR)	1	2021	1	2021
SVA	2	2021	4	2021
Limited User Training (LUT)	4	2021	1	2022
Training Support Package (TSP) Development	2	2019	3	2022
Maintenance Task Analysis (MTA) and Level Of Repair Analysis (LORA)	2	2019	3	2022
Technical Manual (TM) Development	2	2019	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604645A / *Armored Systems Modernization (ASM) - Eng Dev*	**Project (Number/Name)** EV8 / *Mobile Protected Firepower*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TM Validation	3	2021	3	2022
TM Development Update	1	2023	4	2024
TM Verification	2	2024	4	2024
Corrosion Testing	4	2022	4	2023
Supportability Assessment (SA)	1	2022	1	2022
Logistics Demonstration (Log Demo)	1	2024	2	2024
Training Devices Requirements Refinement Performance Spec Development	2	2019	3	2022
Training Devices Product Development	3	2022	3	2025
Low Rate Initial Production (LRIP) Option #1 Award	3	2022	3	2022
LRIP Option #1 Deliveries	1	2024	1	2025
Product Quality Test (PQT)	1	2024	1	2025
LRIP Option #2 Award	3	2023	3	2023
LRIP Option #2 Deliveries	1	2025	1	2026
Initial Operational Test and Evaluation (IOT&E)	4	2024	1	2025
LRIP Option #3 Award	3	2024	3	2024
LRIP Option #3 Deliveries	1	2026	1	2027
FRP Lot #1 Award	3	2025	3	2025
FRP Lot #1 Deliveries	1	2027	1	2028

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	135.283	54.234	62.690	-	62.690	-	-	-	-	-	-
BQ6: *Visual Augmentation System Eng Dev*	-	60.599	7.495	4.934	-	4.934	-	-	-	-	-	-
L67: *Soldier Night Vision Devices*	-	31.118	12.318	32.747	-	32.747	-	-	-	-	-	-
L70: *Night Vision Dev Ed*	-	37.420	29.058	19.893	-	19.893	-	-	-	-	-	-
L79: *Joint Effects Targeting Systems (JETS)*	-	6.146	5.363	5.116	-	5.116	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element provides night vision/reconnaissance, surveillance and target acquisition technologies required for United States defense forces to engage enemy forces twenty-four hours a day under conditions of degraded visibility due to darkness, adverse weather, battlefield obscurants, foliage and man-made structures. These developments and improvements to high performance night vision electro-optics, radar, laser, and thermal systems and integration of related multi-sensor suites will enable near to long range target acquisition, identification and engagement to include significant fratricide reduction, which will improve battlefield command and control in "around-the-clock" combat operations.

Project BQ6 This project focuses on transitioning demonstrated technologies that bring improvements to the dismounted Soldier's augmented vision and situational awareness system and provide Soldiers with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the implementation of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package and advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. This is a priority of the Secretary's Close Combat Lethality Task Force. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team.

Project L67 project develops, improves and miniaturizes high performance electro-optics, thermal and laser systems. It also provides for systems integration of related multi-sensor suites to enable near to long-range target acquisition and engagement as well as improved battlefield command and control in around-the-clock combat operations. It focuses on adapting demonstrated technologies that bring improvements to the dismounted Soldiers' equipment. This project develops or enhances equipment that provides the individual Soldier's day/night situational awareness and individual targeting capability. This project includes cost associated with efforts

for the development, integration and interface of products on Soldiers head, body and weapons. Funding in this project supports the Army's Soldier Lethality Cross Functional Teams (SL CFT) initiatives. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

Project L70 focuses on night vision, reconnaissance, surveillance and target acquisition (RSTA) sensor and suites of sensors to provide well-defined surveillance and targeting capabilities for a variety of Current, Modular, and Future Force platforms. This project includes: 3rd Generation Forward Looking Infra-Red (3GEN FLIR) B-Kit development activities, the 3GEN Long Range Advanced Scout Surveillance System (LRAS3) Modification Work Order (MWO) to integrate 3GEN FLIR B-Kit, and the Assistant Secretary of the Army for Acquisition, Logistics, and Technology ASA(ALT) Common Operating Environment (COE) effort to meet sensor interoperability requirements and improve the soldier-machine interface of the Program of Record (POR).

Project L79 is an Army program with joint information (Air Force and Marine Corps). JETS addresses the one-man, hand-held precision targeting gap identified by the Fires Center of Excellence (FCoE). JETS is a light-weight, handheld system that will provide the single dismounted observer with a common, enhanced day and night thermal capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets. JETS Target Location and Designation System (TLDS) will be able to interface with existing and future Forward Entry Systems (FESs) and operate in environments where global positioning system (GPS) capabilities are degraded or denied including the integration of military GPS user equipment (M-Code) GPS receivers, when they become available. This project will address continued development and integration of improved precision targeting components to reduce size, weight, power, and cost of systems for dismounted precisions Fires mission. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	143.696	61.445	38.094	-	38.094
Current President's Budget	135.283	54.234	62.690	-	62.690
Total Adjustments	-8.413	-7.211	24.596	-	24.596
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-4.968			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.500	-			
• SBIR/STTR Transfer	-5.913	-2.243			
• Adjustments to Budget Years	-	-	24.596	-	24.596

Change Summary Explanation

The funding increase supports the developmental efforts for the Night Vision Goggle Modernization Strategy

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) BQ6 / *Visual Augmentation System Eng Dev*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
BQ6: *Visual Augmentation System Eng Dev*	-	60.599	7.495	4.934	-	4.934	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project focuses on transitioning demonstrated technologies that bring improvements to the dismounted Soldier's augmented vision and situational awareness system and provide Soldiers with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the implementation of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package and advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. This is a priority of the Secretary's Close Combat Lethality Task Force. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Heads Up Display (HUD)	60.599	7.495	4.685
Description: Integrated Visual Augmentation System (IVAS) HUD provides a first generation single platform for Soldier/Marines to fight, rehearse, and train in day and night that provides increased lethality, mobility, and situational awareness necessary to achieve overmatch against our current and future adversaries.			
FY 2021 Plans: Completed Cold Weather Test, Tropic Weather Test, and Soldier Touch Point 4 (30 April 2021). Will complete all Developmental Testing and preparations for Initial Operational Test and Evaluation (August 2021).			
FY 2022 Plans: Perform Systems Engineering/Program Management and integration to implement engineering changes to higher resolution thermal sensors, and app development to enhance mission planning and mission execution based on Soldier centered design input. These tools will extend IVAS capabilities and be driven by Soldier Centered Design activities. Conduct testing to verify operational performance of all production changes.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** BQ6 / *Visual Augmentation System Eng Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding decreased as IVAS transitions to its first year of full rate production and fielding.			
Title: SBIR/STTR Transfer	-	-	0.249
Description: Funding transferred in accordance with Title 15 USC 638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals	60.599	7.495	4.934

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• K36402: *IVAS/Heads Up Display*	-	670.476	853.864	-	853.864	-	-	-	-	-	-
• BQ5: *Visual Augmentation System Advanced Development*	185.328	5.475	11.699	-	11.699	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project utilizes competitively awarded contracts using best value source selection procedures.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) BQ6 / *Visual Augmentation System Eng Dev*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Various	-	16.561	Feb 2020	0.774	Nov 2020	-		-		-	Continuing	Continuing	-
		Subtotal	-	16.561		0.774		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Heads Up Display (HUD)	Various	Various : Various	-	27.710	Mar 2020	-		2.334	Mar 2022	-		2.334	Continuing	Continuing	-
		Subtotal	-	27.710		-		2.334		-		2.334	Continuing	Continuing	N/A

Remarks

For FY 2022, Product Development implements an engineering change to higher resolution thermal sensors, and app development to enhance mission planning.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various : Various	-	11.823	Feb 2020	-		0.600	Nov 2021	-		0.600	Continuing	Continuing	-
		Subtotal	-	11.823		-		0.600		-		0.600	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IVAS HUD Testing	MIPR	Various : Various	-	4.505	Mar 2020	6.721	Jan 2021	2.000	Mar 2022	-		2.000	Continuing	Continuing	-
		Subtotal	-	4.505		6.721		2.000		-		2.000	Continuing	Continuing	N/A

Remarks

For FY 2022, Test & Evaluation conducts testing to verify operational performance of all production changes.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) BQ6 / *Visual Augmentation System Eng Dev*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	60.599		7.495		4.934		-		4.934	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** BQ6 / *Visual Augmentation System Eng Dev*

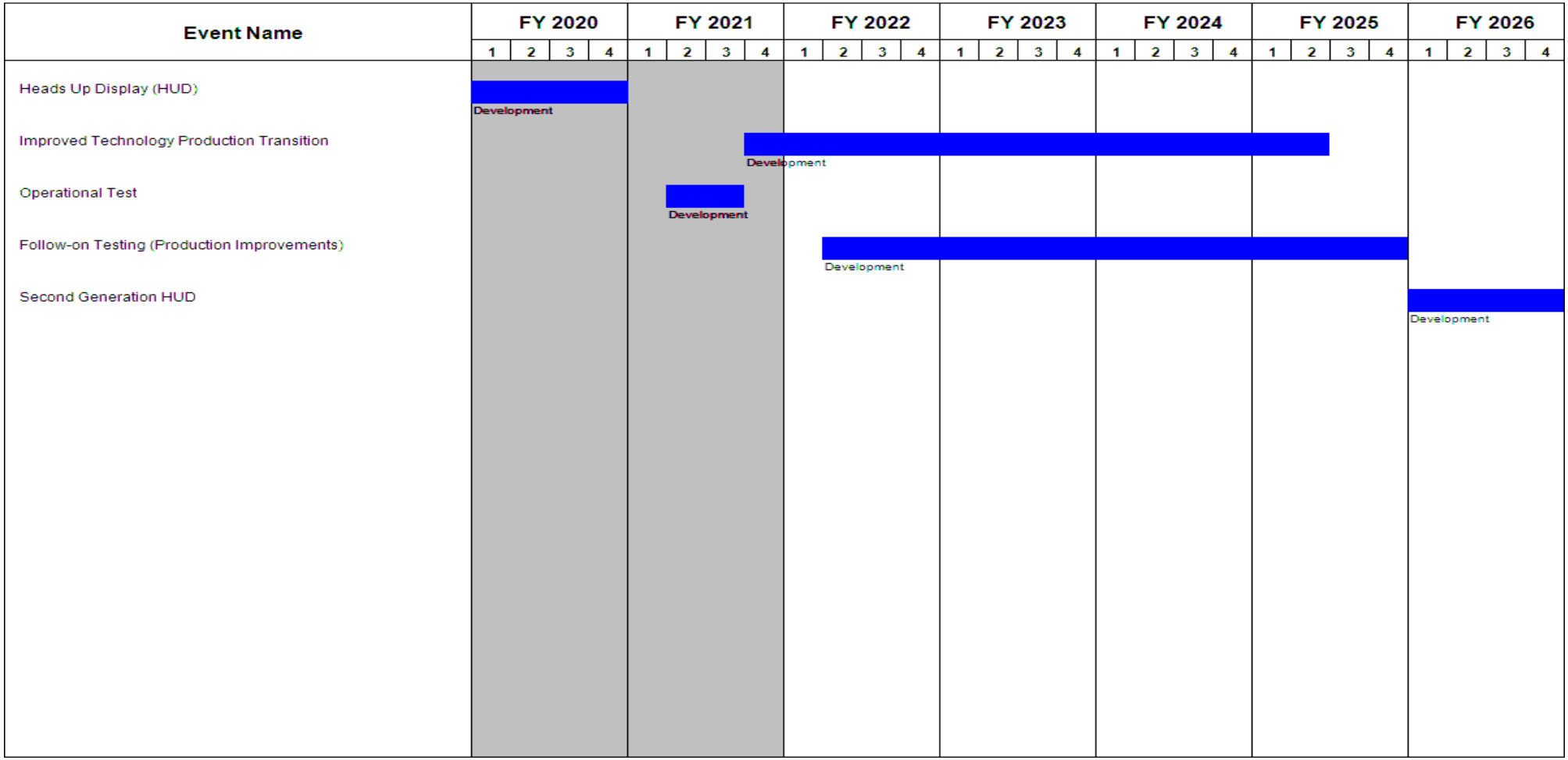


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** BQ6 / *Visual Augmentation System Eng Dev*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Heads Up Display (HUD)	4	2018	4	2020
Improved Technology Production Transition	4	2021	2	2025
Operational Test	2	2021	3	2021
Follow-on Testing (Production Improvements)	2	2022	4	2025
Second Generation HUD	1	2026	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) L67 / *Soldier Night Vision Devices*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
L67: *Soldier Night Vision Devices*	-	31.118	12.318	32.747	-	32.747	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, improves and miniaturizes high performance electro-optics, thermal and laser systems. It also provides for systems integration of related multi-sensor suites to enable near to long-range target acquisition and engagement as well as improved battlefield command and control in around-the-clock combat operations. It focuses on adapting demonstrated technologies that bring improvements to the dismounted Soldiers' equipment. This project develops or enhances equipment that provides the individual Soldier's day/night situational awareness and individual targeting capability and supports the Night Vision Goggles Modernization Strategy. This project includes cost associated with efforts for the development, integration and interface of products on Soldiers head, body and weapons. Funding in this project supports the Army's Soldier Lethality Cross Functional Teams (SL CFT) initiatives. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Family of Weapon Sights (FWS)	20.646	5.546	6.561

Description: There are three variants in the Family of Weapon Sights: FWS-Individual (FWS-I), FWS-Crew Served (FWS-CS) and FWS-Sniper (FWS-S). These sights enable combat forces to acquire and engage targets with small arms and conduct surveillance and fire control under day/night obscurants, no-light, and adverse weather conditions. The FWS utilizes advancements in thermal and low light level sensors to produce sights operable in-line with a day optic or in stand-alone mode. This RDT&E project integrates smaller pixel thermal detectors/imagers in high definition formats with improved sensitivity, clarity, and range, while simultaneously reducing the size, weight and power consumption for all FWS variants and provides a minimum of a 20% overmatch for each of the weapon platforms they are intended.

The FWS-I variant is a weapon mounted thermal sensor that enables Soldiers to fire quickly and accurately from any carry position and with significantly reduced exposure to enemy fire by providing a wirelessly transmitted zeroed weapon aimpoint in the Soldier's Enhanced Night Vision Goggle, helmet mounted display, or Integrated Visual Augmentation System. FWS-I requires RDT&E in FY 2022-2025 to qualify a second vendor in production, but additional capacity is required due to AAO increasing from 36K to 120K.

The FWS-CS variant leverages the success of the FWS-I development effort, and will be the primary sight for the MK19, M240B and M2. The FWS-CS system integrates High Definition (HD) Thermal and Day Color imagers, an Integrated Laser Range Finder (ILRF) and ballistic calculator to provide Soldiers with an accurate aimpoint that adjusts automatically for range, ammunition

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L67 / *Soldier Night Vision Devices*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
characteristics, vertical angle, and weapon cant. The FWS-CS includes a wireless HD Helmet Mounted Display (HMD) that receives weapon sight imagery allowing the Soldier to utilize the weapon sight without requiring them to look through the weapon sights eyepiece. This wireless HMD provides the opportunity for the Solder to stay in a protected, unexposed posture while still accurately detecting and engaging targets. Additionally, the FWS-CS will integrate into Adaptive Squad Architecture and wirelessly share video and data with the Night Vision Systems (NVS) and the Nett Warrior End User Device (EUD). All wireless communication will be through the Intra Soldier Wireless (ISW) Network. The FWS-S variant utilizes a HD thermal sensor and mounts in-line with the Sniper's direct view optic providing a thermal capability without the need to remove or re-boresight the current direct view optic. The FWS-S provides Snipers a large format display with increased pixel density that enables accurate long range engagements in all battlefield conditions while utilizing the direct view optic?s aiming features, extending lethality and providing exceptional observation. ***FY 2021 Plans:*** In FY 2021, FWS-CS utilizes RDT&E funding to continue the Intra-Soldier Wireless (ISW) requirement to incorporate the 256-bit encryption technology. The end state is for all production FWS-CS systems to be ISW 256-bit encryption compliant. Also during FY 2021 FWS-CS will conduct operational testing. In FY2021, based on User feedback, a FWS-S stop work order was issued and the Army's focus may be redirected towards pursuing a Government Off The Shelf (GOTS) solution through a potential Directed Requirement (DR). GOTS systems may be procured to conduct a Limited Users Test (LUT) in conjunction with Growth Reliability Testing during the 4QFY2021. ***FY 2022 Plans:*** In FY 2022, FWS-I requires RDT&E funding to complete design work and execute Government qualification testing for a second vendor. In FY 2022, FWS-CS will continue operational testing during LRIP including PQT-G, RGT-2, and Airborne testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2021 to FY 2022 increase is due to RDT&E FWS-I requirement to qualify a second vendor for production.			
Title: Enhanced Night Vision Goggle - Binocular (ENVG-B) ***Description:*** The ENVG-B system is a modular helmet-mounted, passive electro-optical fused sensor imaging device in a binocular configuration. The system integrates dual Image Intensification (I2) sensors with the thermal sensor imagery into a single viewing display. The thermal sensor provides the Soldier with the capability to rapidly detect and recognize human-sized targets in adverse weather, obscurants and in varying light conditions. The dual I2 sensors provide the Soldier with depth	4.600	3.000	3.884

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
perception for ease of low-light level maneuvers and the ability to detect rifle-mounted aiming lights to engage targets. The ENVG-B can also be operated in a monocular configuration by moving one of the two individually rotating monoculars. The ENVG- B has a near infrared (NIR) emitting light source that provides illumination for close-up viewing. The ENVG-B mounts on current Soldier equipment, including the Advanced Combat Helmet (ACH), the Enhanced Combat Helmet (ECH) and Integrated Head Protection System (IHPS). The ENVG-B has a multi-point wireless interface to the FWS-I and Nett Warrior in order to support augmented reality requirements. The ENVG-B wirelessly operates with the FWS-I to provide Rapid Target Acquisition (RTA) capability. RTA is the capability to view the boresighted/zeroed weapon sight reticle in the ENVG- B display, enabling the Soldier to accurately engage targets without having to bring the weapon to eye level and without the use of active lasers, all while remaining in defilade. ***FY 2021 Plans:*** Funding will allow for continuing Phase III LRIP with Production Qualification Testing, Reliability Growth Test, and First Article Test. ***FY 2022 Plans:*** Complete LRIP and accomplish Full Materiel Release and First Unit Equipped. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2021 to FY 2022 increase due to qualification testing to complete LRIP and accomplish Full Materiel Release and First Unit Equipped.			
Title: Night Vison Goggle - Next (NVG-N) ***Description:*** NVG-N provides the capability to engage threat personnel at night or in low light conditions with greater clarity, depth perception, and increased recognition range for engagements. NVG-N systems will replace Soldiers? legacy monocular AN/PVS-14s and bi-ocular AN/PVS-7s increasing the Soldiers? situational awareness, mobility, speed, and effectiveness to support an increased operational tempo. ***FY 2022 Plans:*** Initiate the development of the NVG-N product, supporting the Night Vision Goggle Modernization Strategy. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase reflects initial development funding for NVG-N.	-	-	19.273
Title: Small Tactical Optical Rifle Mounted (STORM) ***Description:*** The STORM Micro-Laser Range Finder (MLRF) is a weapon-mounted multi-function laser system. It provides an eye safe laser range finder, digital compass, Infrared (IR) and visible aiming lights, and an IR illuminator for far target location with continuous range, accuracy, weight and power performance enhanced capabilities. Funding supports qualifying smaller,	2.931	0.415	1.029

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
lighter, and a less expensive STORM variant for Soldiers. Funding also supports integrating ballistics calculator and in-line display capabilities into the STORM as well as a power/data rail interface to support the sharing of laser range finder (LRF) data to other enablers on the weapon. ***FY 2021 Plans:*** Fund the integration of technology to support wireless transmission of STORM data to other systems. Continue the integration of a power/data rail interface to support the sharing of LRF data to other enablers on the weapon. ***FY 2022 Plans:*** Funding will continue the integration of the STORM into the Adaptive Squad Architecture to support wireless transmission of STORM data to other systems. Continue the integration and qualification efforts of a power/data rail interface to support the sharing of LRF data to other enablers on the weapon. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase due to the continued integration efforts for the Adaptive Squad Architecture wireless technology and the qualification of these technologies.			
Title: Laser Target Locator Module (LTLM) ***Description:*** LTLM is a Lightweight, Handheld Laser Target Locator with a direct view optic, un-cooled thermal camera, eye-safe laser range finder, digital magnetic compass, and an internal SAASM GPS receiver, which provides the dismounted observer or Scout a fully digital, handheld system to accurately determine target location and the ability to call for fire during all weather and light conditions. ***FY 2021 Plans:*** Initiate integration and evaluation of technology to support sharing of LTLM data to other systems to support inclusion of LTLM with the Adaptive Squad Architecture. ***FY 2022 Plans:*** FY22 funding supports the integration and qualification of the Congressionally mandated M-Code GPS into the LTLM system. Continue the integration and evaluation of technology to support sharing of LTLM data to other systems to support inclusion of LTLM with the Adaptive Squad Architecture. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding decrease reflects shift to the M-Code GPS integration which is only incrementally funded in FY 2022.	-	3.357	2.000
Title: Squad Architechtural Integration	2.941	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: The Soldier and Squad Integration effort strives to eliminate redundancies, and identify opportunities for greater capabilities by leveraging features of companion systems.			
Accomplishments/Planned Programs Subtotals	31.118	12.318	32.747

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• VT7: *Soldier Maneuver Sensors - Adv Dev*	5.780	7.289	3.777	-	3.777	-	-	-	-	-	-
• K22002: *FWS-INDIVIDUAL*	81.541	83.820	147.271	-	147.271	-	-	-	-	-	-
• K35110: *Small Tactical Optical Rifle Mounted MLRF*	22.623	7.715	21.103	-	21.103	-	-	-	-	-	-
• B53800: *Laser Target Locator Systems*	30.382	14.347	20.571	-	20.571	-	-	-	-	-	-
• K22003: *FWS-CREW SERVED*	-	-	25.673	-	25.673	-	-	-	-	-	-
• K22004: *FWS-SNIPER*	-	2.569	11.201	-	11.201	-	-	-	-	-	-
• K36401: *Night Vision AN/PVS-14 Mods*	4.188	-	-	-	-	-	-	-	-	-	-
• K36402: *IVAS/Heads Up Display*	-	670.476	853.864	-	853.864	-	-	-	-	-	-
• BQ5: *Visual Augmentation System Advanced Development*	185.328	5.475	11.699	-	11.699	-	-	-	-	-	-
• BQ6: *Visual Augmentation System Eng Dev*	60.599	7.495	4.934	-	4.934	-	-	-	-	-	-
• K36400: *Helmet Mounted Enhanced Vision Devices*	50.632	183.000	217.906	-	217.906	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The various developmental programs in this project continue to exercise competitively awarded contracts using best value source selection procedures.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MGMT	MIPR	Various : Various	21.612	1.522	Mar 2020	0.875	Sep 2021	0.804	Nov 2021	-		0.804	Continuing	Continuing	-
		Subtotal	21.612	1.522		0.875		0.804		-		0.804	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of Weapon Sights-Individual (FWS-I)	C/FFP	TBD : TBD	-	-		-		5.061	Nov 2021	-		5.061	Continuing	Continuing	-
Family of Weapon Sights-Crew Served (FWS-CS)	C/FFP	DRS RSTA, Inc : Dallas, TX/Nashua, NH	47.783	5.750	Jan 2020	0.550	Apr 2021	-		-		-	0.000	54.083	-
Family of Weapon Sights-Sniper (FWS-S)	C/FFP	Knights Armament Titusville; N2 Imaging Irvine : FL; CA	13.622	11.614	Jun 2020	-		-		-		-	0.000	25.236	-
Enhanced Night Vision Goggle - Binocular (ENVG-B)	C/FFP	L3Harris Corporation: : Londonderry, NH	14.127	1.690	Dec 2020	0.612	Mar 2021	1.442	Mar 2022	-		1.442	Continuing	Continuing	-
Enhanced Night Vision Goggle - Binocular (ENVG-B)	C/FFP	Elbit Systems of America : Roanoke, VA	10.277	1.690	Dec 2020	0.612	Mar 2021	1.442	Mar 2022	-		1.442	Continuing	Continuing	-
Night Vision Goggles - Next	C/TBD	TBD : TBD	-	-		-		16.718	Jan 2022	-		16.718	Continuing	Continuing	-
STORM II - Wireless Integration & SWAP C (L3)	C/CPFF	L3H : Londonderry, NH	-	1.843	Sep 2020	0.166	Mar 2021	0.587	Jan 2022	-		0.587	Continuing	Continuing	-
Laser Target Location Module (Optics 1)	C/CPFF	Optics 1 : Bedford, NH	1.986	-		2.365	Feb 2021	1.244	Jan 2022	-		1.244	Continuing	Continuing	-
Laser Target Location Module - Intra Soldier Wireless (ISW)	C/FFP	Various : Various	-	-		0.769	Apr 2021	-		-		-	0.000	0.769	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SQUAD Architechtural Integration	SS/ Various	Various : Various	-	2.941	Jul 2020	-		-		-		-	0.000	2.941	-
		Subtotal	87.795	25.528		5.074		26.494		-		26.494	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	NVESD : Ft Belvoir, VA	27.808	1.678	Jan 2020	0.815	Dec 2020	0.810	Dec 2021	-		0.810	Continuing	Continuing	-
		Subtotal	27.808	1.678		0.815		0.810		-		0.810	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test Support Activity	MIPR	Army Test and Evaluation Command : Various	59.777	2.390	Mar 2020	5.554	Jun 2021	4.639	Mar 2022	-		4.639	Continuing	Continuing	-
		Subtotal	59.777	2.390		5.554		4.639		-		4.639	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	196.992	31.118		12.318		32.747		-		32.747	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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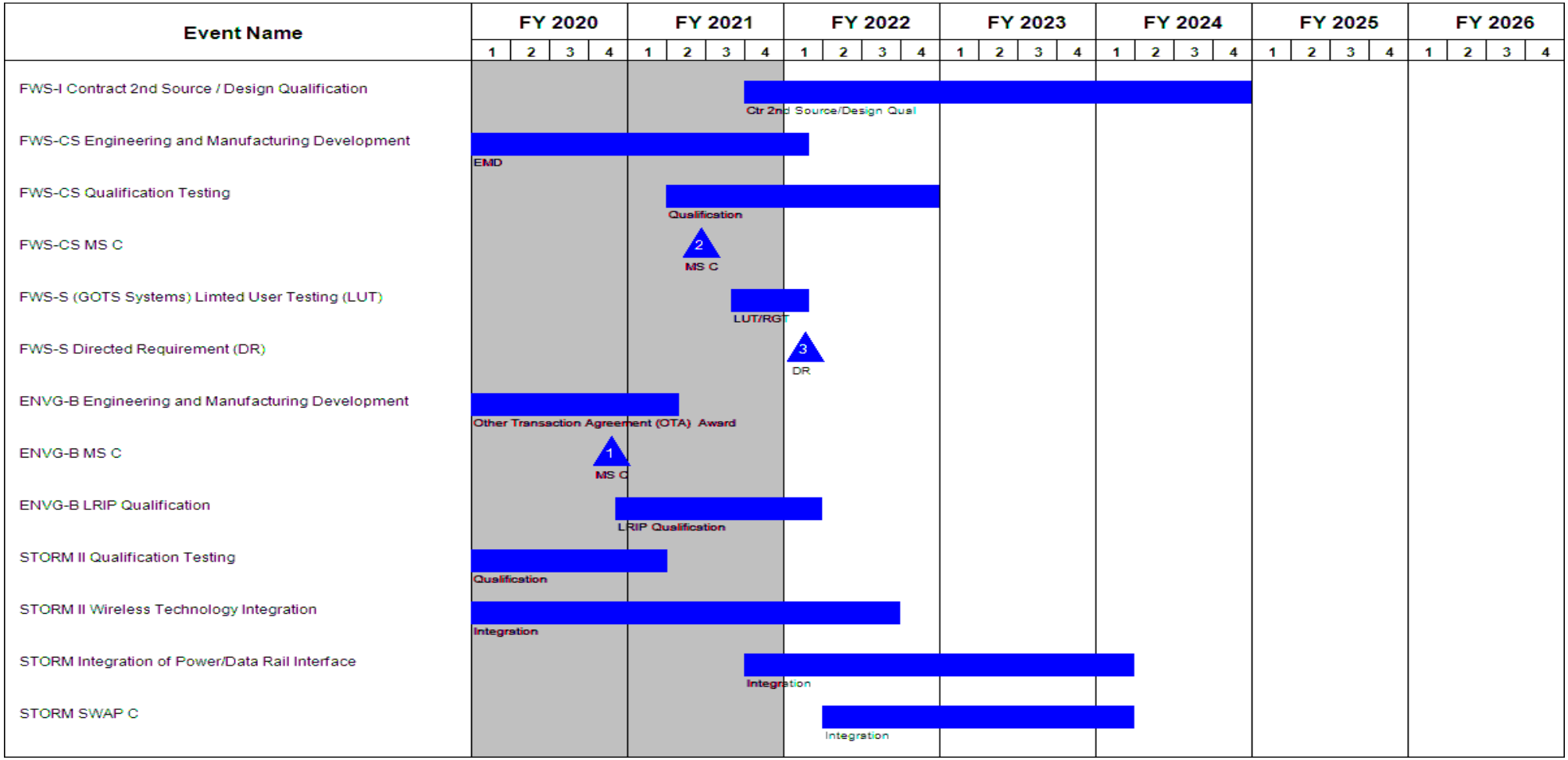

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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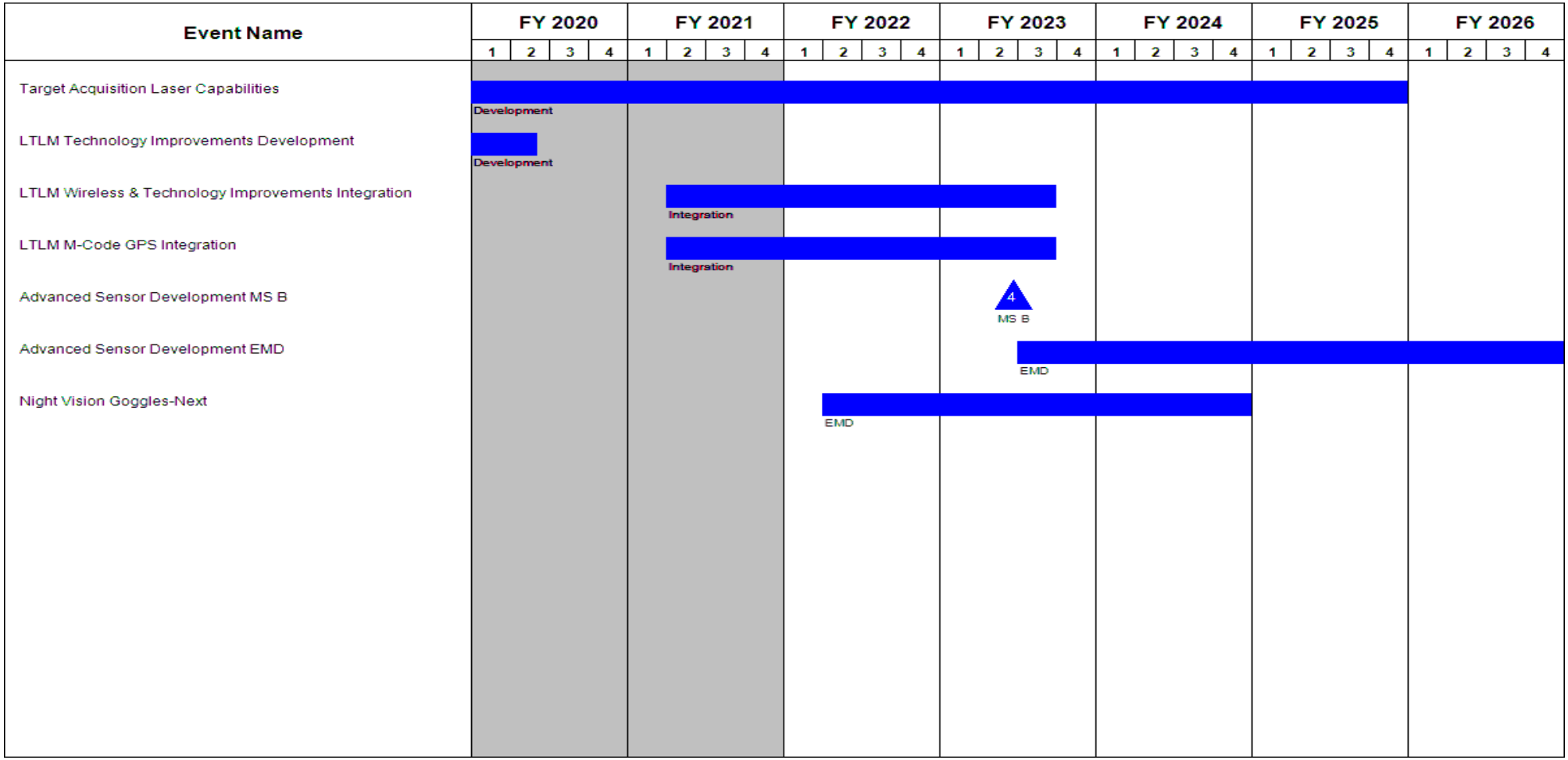

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FWS-I Contract 2nd Source / Design Qualification	4	2021	4	2024
FWS-CS Engineering and Manufacturing Development	3	2016	1	2022
FWS-CS Qualification Testing	2	2021	4	2022
FWS-CS MS C	2	2021	2	2021
FWS-S (GOTS Systems) Limted User Testing (LUT)	3	2021	1	2022
FWS-S Directed Requirement (DR)	1	2022	1	2022
ENVG-B Engineering and Manufacturing Development	3	2019	2	2021
ENVG-B MS C	4	2020	4	2020
ENVG-B LRIP Qualification	4	2020	1	2022
STORM II Qualification Testing	2	2019	1	2021
STORM II Wireless Technology Integration	2	2019	3	2022
STORM Integration of Power/Data Rail Interface	4	2021	1	2024
STORM SWAP C	2	2022	1	2024
Target Acquisition Laser Capabilities	2	2019	4	2025
LTLM Technology Improvements Development	2	2019	2	2020
LTLM Wireless & Technology Improvements Integration	2	2021	3	2023
LTLM M-Code GPS Integration	2	2021	3	2023
Advanced Sensor Development MS B	2	2023	2	2023
Advanced Sensor Development EMD	3	2023	4	2026
Night Vision Goggles-Next	2	2022	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
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COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
L70: *Night Vision Dev Ed*	-	37.420	29.058	19.893	-	19.893	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project performs Engineering and Manufacturing Development (EMD) on high performance night vision, Reconnaissance, Surveillance, and Target Acquisition (RSTA) systems and other related systems that allow forces to locate and track enemy units in day, night, and all battlefield conditions, and through natural and man-made structures and obscurants. It also develops and integrates suites of these sensors to provide well-defined surveillance and targeting capabilities, as well as architectures for these sensors to communicate automatically. These efforts focus on meeting the requisite night vision and RSTA capabilities required for evolving Current Force, Modular Force, and Future Force systems.

The project supports the 3rd Generation Forward Looking Infrared (3GEN FLIR) B-Kit program, which incorporates the next generation of forward looking infrared technologies. The 3GEN FLIR program will develop a common 3GEN FLIR B-Kit for integration into US Army FLIR sensor systems in accordance with the approved Improved Forward Looking Infrared (I-FLIR) Capability Development Document (CDD). The common 3GEN FLIR B-Kit prescribed by the I-FLIR CDD will allow the Army to achieve economies of scale and avoid duplicative engineering and development costs. As a result, 3GEN FLIR capabilities can be delivered at a lower cost to the Abrams and Next Generation Combat Vehicle / Optionally Manned Fighting Vehicle (NGCV/OMFV) platforms, while potentially leveraging 3GEN FLIR components for airborne applications. The 3GEN FLIR B-Kit provides Mid Wave Infrared and Long Wave Infrared digital video and the electronic interfaces required to integrate the 3GEN FLIR technology with the host platform sensor. When integrated in platform sensor packages, 3GEN FLIR technology enhances the war-fighters' survivability and lethality through increased identification range performance, while enabling the detection of difficult or obscured targets and faster threat detection through automated processes. The 3GEN FLIR B-Kit program is also a key element in maintaining the Army's FLIR industrial base.

FY 2022 Base funding in the amount of $19.893 million supports the 3GEN FLIR B-Kit program activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: 3GEN FLIR B-Kit EMD	37.420	29.058	19.893
Description: 3GEN FLIR EMD requirements and contract awards.			
FY 2021 Plans: FY 2021 Base funding supports 3GEN FLIR B-Kit delivery of hardware to the Abrams and Next Generation Combat Vehicle (NGCV) / Optionally Manned Fighting Vehicle (OMFV) platforms for integration and developmental testing, enables integration of automation and artificial intelligence/machine learning, execution of critical component warm lines in preparation for Low Rate Initial Production (LRIP), and promote competition for full rate production.			
FY 2022 Plans:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 Base funding supports 3GEN FLIR B-Kit hardware integration with the Abrams M1A2 SEPv4 Modernization (Lethality ECP) effort for developmental testing, execution of critical component warm lines, continues integration of automation and artificial intelligence/machine learning, and supports Detect, Recognize, and Identify (DRI) operational testing in support of the 3GEN FLIR B-Kit Milestone C (MS C) in FY22, and promote competition for full rate production. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease is due the completion of 3GEN FLIR B-Kit delivery of hardware in FY21 to Abrams and NGCV/OMFV.			
Accomplishments/Planned Programs Subtotals	37.420	29.058	19.893

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 330: *Abrams Tank Improve Prog*	114.723	61.039	50.331	-	50.331	-	-	-	-	-	-
• CF6: *Next Generation Combat Vehicle (OMFV)*	197.304	171.890	225.106	-	225.106	-	-	-	-	-	-
• KA4511: *Improved Forward Looking Infrared (IFLIR) B-Kit*	-	-	11.929	-	11.929	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

3GEN FLIR: Materiel Development Decision (MDD) was received from the Army Acquisition Executive (AAE) and the Acquisition Decision Memorandum (ADM) was signed on 22-Dec-2014. Per the ADM, 3GEN FLIR entered the acquisition lifecycle at Milestone B (MS B) in 2Q FY 2016. After a successful MS B decision, competitive EMD contracts were awarded to design, develop, integrate and test the 3GEN FLIR B-Kit prior to production and mitigate the industrial base risk. The host platforms are responsible for integration of the 3GEN FLIR B-Kit. 3GEN FLIR product improvement efforts will continue to focus on the integration and refinement of the artificial intelligence/machine learning capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	MIPR	PM TS : Ft. Belvoir, VA	16.867	-		0.697	Jan 2021	0.518	Jan 2022	-		0.518	Continuing	Continuing	-
FY 2019 NDAA SEC 825 MDAP Cost Overruns	Various	HQDA : HQDA	0.051	-		-		-		-		-	0.000	0.051	-
		Subtotal	16.918	-		0.697		0.518		-		0.518	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2012-FY 2013: Develop, Fab, and Qual of a common Ground Platform Engine with Block II EOCCM	C/Various	Various : Various	0.049	-		-		-		-		-	0.000	0.049	-
3GEN FLIR B-Kit Engineering/Document Prep	C/Various	Various : Various	21.685	-		-		-		-		-	0.000	21.685	-
3GEN FLIR B-Kit EMD	C/CPIF	Various : Various	151.015	35.174	Nov 2019	26.433	Nov 2020	15.491	Nov 2021	-		15.491	Continuing	Continuing	-
3GEN LRAS3: Tech Trade Studies	C/TBD	Various : Various	1.611	-		-		-		-		-	0.000	1.611	-
3GEN LRAS3: ECP Integration	C/TBD	Various : Various	0.313	-		-		-		-		-	0.000	0.313	-
PSS P3I: CE COE	C/FP	Various : Various	19.162	-		-		-		-		-	0.000	19.162	-
		Subtotal	193.835	35.174		26.433		15.491		-		15.491	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
3GEN FLIR B-Kit Support	C/TBD	Various : Various	38.715	2.246	Feb 2020	1.928	Feb 2021	0.822	Feb 2022	-		0.822	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
3GEN LRAS3 - Spec development and acquisition documentation	C/TBD	Various : Various	1.145	-		-		-		-		-	0.000	1.145	-
COE Support	C/CPFF	Various : Various	1.394	-		-		-		-		-	0.000	1.394	-
		Subtotal	41.254	2.246		1.928		0.822		-		0.822	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Test Support	MIPR	Various : Various	15.850	-		-		3.062	Jan 2022	-		3.062	0.000	18.912	15.850
		Subtotal	15.850	-		-		3.062		-		3.062	0.000	18.912	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	267.857	37.420		29.058		19.893		-		19.893	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L70 / *Night Vision Dev Ed*

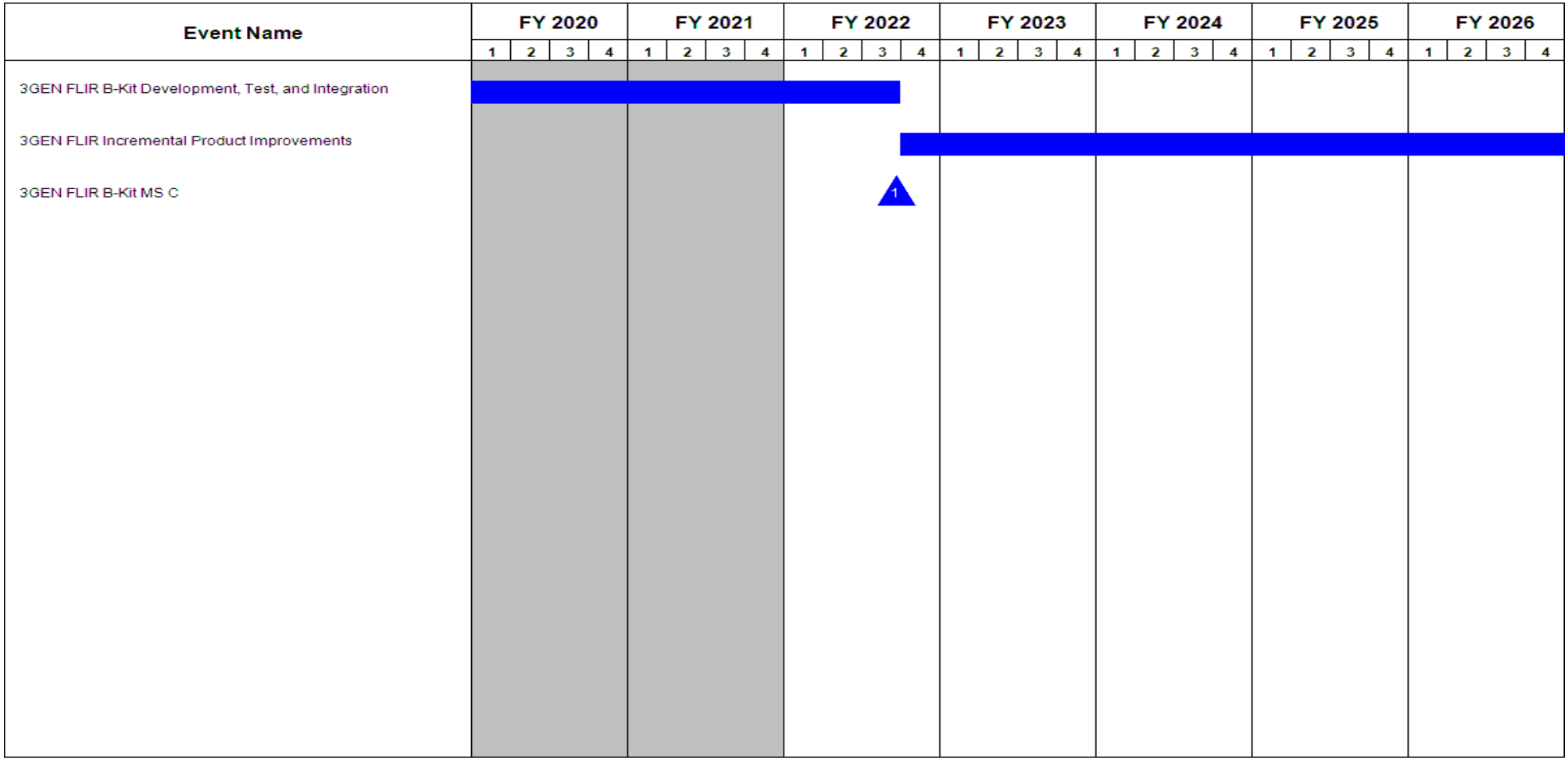

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L70 / *Night Vision Dev Ed*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
3GEN FLIR Materiel Development Decision (MDD)	1	2015	1	2015
3GEN FLIR Development Request For Proposal Release Review (DRFPRR)	3	2015	3	2015
3GEN FLIR B-Kit MS B	2	2016	2	2016
3GEN FLIR B-Kit Development, Test, and Integration	2	2016	3	2022
3GEN FLIR Incremental Product Improvements	4	2022	4	2027
3GEN FLIR B-Kit MS C	3	2022	3	2022
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: Spec Development & Documentation	1	2018	4	2019
Common Operating Environment, Development	2	2012	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) L79 / *Joint Effects Targeting Systems (JETS)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
L79: *Joint Effects Targeting Systems (JETS)*	-	6.146	5.363	5.116	-	5.116	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Effects Targeting System (JETS) is an Army Joint Information Program. JETS addresses the one-man, hand-held precision targeting gap identified by the Fires Center of Excellence (FCoE). JETS is a light-weight, handheld system that will provide the single dismounted observer with a common, enhanced day and night thermal capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets. JETS Target Location and Designation System (TLDS) is able to interface with existing and future Forward Entry Systems (FESs) and will be able to operate in environments where global positioning system (GPS) capabilities are degraded or denied including the integration of military GPS user equipment (M-Code) GPS receivers, when they become available. This project will address the development and integration of improved precision targeting components to reduce size, weight, power, and cost of systems for dismounted precision Fires mission. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Joint Effects Targeting System (JETS) Low-Rate Initial Production (LRIP) Qualification Testing	0.161	0.317	-
Description: This projects supports the LRIP Qualification Testing. ***FY 2021 Plans:*** Conduct additional reliability testing with Soldiers. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decreased funding supports an increase to Precision Targeting and Target Acquisition Development.			
Title: Precision Azimuth and Vertical Angle Module (PAVAM) Development	-	1.096	0.158
Description: Focuses on developments to improve Size, Weight, Power and Cost (SWAP-C) for inertial navigation PAVAM solutions which provide a 24/7 precision targeting capability. Develop improvements to celestial navigation and PAVAM solutions to improve availability of precision measurements over a wider range of environments. ***FY 2021 Plans:*** Continue development of reduced SWAP-C of PAVAM architecture. ***FY 2022 Plans:*** Continue development of reduced SWAP-C for PAVAM architecture. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L79 / *Joint Effects Targeting Systems (JETS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 decreased funding supports an increase to Precision Targeting and Target Acquisition Development.			
Title: Joint Effects Targeting System (JETS) Threat Mitigation Development and Integration ***Description:*** Focuses on developing and integrating technologies to counter battlefield threats to the system and the Soldier. This includes technologies and techniques to allow JETS to operate in GPS contested environments, and improved targeting sensor technologies, to include passive targeting, that will reduce the Soldier?s signature on the battlefield. ***FY 2022 Plans:*** Continue integration of technologies and techniques into JETS to allow it to operate in GPS contested environments. In FY22 program will transition 3D Point Cloud applications for GPS contested operations to existing platforms. These apps will reside on the Nett Warrior End User Device and will provide the hooks necessary for the JETS to accurately determine its self-location in a GPS denied environment. Initiate development of image-based self-location and target location efforts for targeting in GPS contested environments. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increased funding reflects initiation of additional GPS contested efforts and integration of ongoing efforts.	0.963	-	0.356
Title: Precision Targeting and Target Acquisition Development ***Description:*** This project develops prototype precision targeting systems incorporating improved target acquisition sensors and optics, improved targeting sensors, and updated targeting algorithms while reducing size, weight, and power requirements. Incorporates JETS into the Adaptive Squad Architecture (ASA) and integrates the Intra Soldier Wireless (ISW) capability. ***FY 2021 Plans:*** Conduct development and component integration of improved precision targeting prototypes. ***FY 2022 Plans:*** Continue development and component integration of improved precision targeting prototypes. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase reflects the higher prioritization of integrating improved Precision Targeting and Target Acquisition technologies into the JETS system.	5.022	3.950	4.602
Accomplishments/Planned Programs Subtotals	6.146	5.363	5.116

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L79 / *Joint Effects Targeting Systems (JETS)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• VT8: *SOLDIER PRECISION TARGETING DEVICES - ADV DEV*	1.422	2.665	2.524	-	2.524	-	-	-	-	-	-
• K32101: *JOINT EFFECTS TARGETING SYSTEM (JETS)*	25.330	54.206	62.082	-	62.082	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project continues to exercise competitively awarded contracts using best value source selection procedures.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) L79 / *Joint Effects Targeting Systems (JETS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	PM-SMPT : Ft Belvoir, VA 22060	4.335	0.398	Dec 2019	0.532	Dec 2020	0.418	Dec 2021	-		0.418	Continuing	Continuing	Continuing
		Subtotal	4.335	0.398		0.532		0.418		-		0.418	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PAVAM 2 Development	C/FFP	Various : Various	12.781	-		0.800	Apr 2021	0.117	Jan 2022	-		0.117	Continuing	Continuing	Continuing
Threat Mitigation Development	C/FFP	Various : Various	4.087	0.750	Apr 2020	-		0.264	Feb 2022	-		0.264	Continuing	Continuing	Continuing
Precision Targeting & Target Acquisition Development	C/FFP	Elbit : Merrimack, NH	2.368	3.910	Dec 2019	2.881	Nov 2020	3.417	Jan 2022	-		3.417	Continuing	Continuing	Continuing
		Subtotal	19.236	4.660		3.681		3.798		-		3.798	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Night Vision Electronics Sensors Directorate : Ft. Belvoir, VA	12.897	0.357	Jan 2020	0.278	Dec 2020	0.225	Dec 2021	-		0.225	Continuing	Continuing	-
Science and Engineering Support	SS/CPFF	Johns Hopkins University : Laurel, MD	7.327	0.606	Sep 2020	0.555	Jan 2021	0.550	Jan 2022	-		0.550	Continuing	Continuing	-
		Subtotal	20.224	0.963		0.833		0.775		-		0.775	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / *Night Vision Systems - Eng Dev*	Project (Number/Name) L79 / *Joint Effects Targeting Systems (JETS)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	MIPR	Various : Various	5.563	0.125	Aug 2020	0.317	Feb 2021	0.125	Jan 2022	-		0.125	Continuing	Continuing	-
		Subtotal	5.563	0.125		0.317		0.125		-		0.125	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.358	6.146		5.363		5.116		-		5.116	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L79 / *Joint Effects Targeting Systems (JETS)*

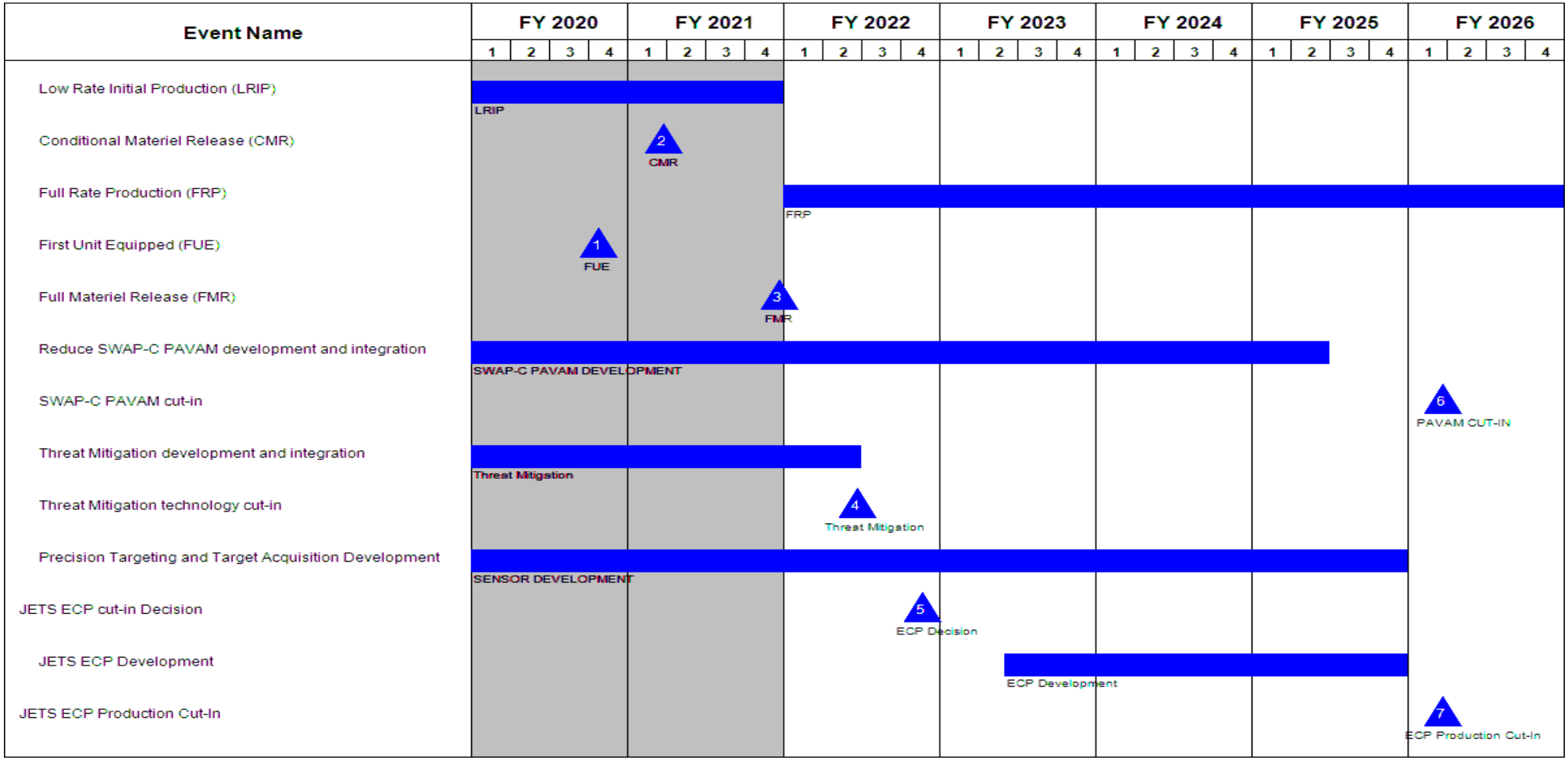

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604710A / *Night Vision Systems - Eng Dev*	**Project (Number/Name)** L79 / *Joint Effects Targeting Systems (JETS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Low Rate Initial Production (LRIP)	1	2017	4	2021
Conditional Materiel Release (CMR)	1	2021	1	2021
Full Rate Production (FRP)	1	2022	4	2026
First Unit Equipped (FUE)	4	2020	4	2020
Full Materiel Release (FMR)	4	2021	4	2021
Reduce SWAP-C PAVAM development and integration	3	2016	2	2025
SWAP-C PAVAM cut-in	1	2026	1	2026
Threat Mitigation development and integration	2	2017	2	2022
Threat Mitigation technology cut-in	2	2022	2	2022
Precision Targeting and Target Acquisition Development	2	2019	4	2025
JETS ECP cut-in Decision	4	2022	4	2022
JETS ECP Development	2	2023	4	2025
JETS ECP Production Cut-In	1	2026	1	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604713A / *Combat Feeding, Clothing, and Equipment*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	7.295	2.734	1.658	-	1.658	-	-	-	-	-	-
548: *Mil Subsistence Sys*	-	2.295	2.734	1.658	-	1.658	-	-	-	-	-	-
EL2: *Army Field Feeding Equipment*	-	5.000	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Projects under this Program Element support the development, demonstration and Non-Developmental Item (NDI) Commercial Off The Shelf (COTS) evaluation of combat feeding equipment to enhance soldier efficiency, improve soldier survivability, and reduce food service logistics requirements for all four services. These Projects support multi-fuel, rapidly deployable field food service equipment initiatives. Efforts also support the Engineering and Manufacturing Development (EMD) phase of programs to improve equipment, enhance safety in food service, and decrease fuel and water requirements. The Projects develop critical enablers that support the Joint Future Capabilities and Joint Expeditionary mindset, by maintaining readiness through integrating new equipment, enhancing the field soldier's well-being, and providing soldiers usable equipment. The Projects also reduce sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, the combat zone footprint, and costs for logistical support.

This PE/Project supports Field Feeding programs for all the services.

B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	7.393	2.814	1.815	-	1.815
Current President's Budget	7.295	2.734	1.658	-	1.658
Total Adjustments	-0.098	-0.080	-0.157	-	-0.157
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.098	-0.080			
• Adjustments to Budget Years	-	-	-0.157	-	-0.157

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / *Combat Feeding, Clothing, and Equipment*	Project (Number/Name) 548 / *Mil Subsistence Sys*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
548: *Mil Subsistence Sys*	-	2.295	2.734	1.658	-	1.658	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project enables system development and demonstration of Joint Service combat rations and field feeding equipment/systems designed to improve warfighter performance and reduce the logistics burden of subsistence support. Efforts funded in this Project support all four Services, the Special Operations Command, and the Defense Logistics Agency (DLA). The Army serves as the Executive Agent for this Department of Defense (DoD) program, with oversight and coordination provided by the DoD Combat Feeding Research and Engineering Board (CFREB) as required by DoD Directive (DoDD) 3235.02E. Centralized execution of the DoD Combat Feeding Research and Engineering Program (CFREP) with Joint Service review and approval eliminates unnecessary duplication of efforts across the Services and maximizes use of common materiel solutions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Joint Service Combat Ration System Development	1.331	1.687	0.917
Description: This effort integrates and demonstrates mature Joint Service combat ration systems that enable warfighter maneuver, readiness and effectiveness during highly mobile, dispersed operations. Prototypes are transitioned from PE 0603747A Project 610 to develop individual and group combat rations with improved capabilities including improved warfighter physical and cognitive performance through optimized nutrition and reduced logistics burden through weight and cube reduction. This effort completes operational test and evaluation (OT&E) to confirm system level performance, and develops ration specifications for transition to Defense Logistics Agency - Troop Support (DLA - Troop Support) for procurement.			
FY 2021 Plans: For existing ration platforms (Meal, Ready-to-Eat; First Strike Ration; Meal, Cold Weather, Modular Operational Ration Enhancement; Unitized Group Rations - A/M/H&S), integrate prototype components/technologies into menu systems and ration assembly processes to improve quality, optimize nutritional content, decrease weight/cube/cost and/or improve modularity and field utility; conduct OT&E on ration systems to validate system level performance; present recommendations to the JSORF for Milestone C approval; finalize procurement documents and initiate transition to DLA-Troop Support; obtain US Army, Surgeon General approval of revised menus; execute production testing with industry to ensure consistent ration quality, validate PCRs, and resolve vendor/supplier technical production issues; and conduct confirmatory sensory, chemical, physical and shelf life testing. For developmental Close Combat Assault Ration (CCAR), complete OT&E of capabilities/systems successfully demonstrated in 6.4 that provide Warfighters with lower weight, lower volume, more calorically dense, higher quality, commercially producible ration components; complete validation of system level performance of prototype CCARs in the context of providing			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** 548 / *Mil Subsistence Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Warfighters with viable nutrition options for a 7-day period without resupply; will present CCAR to the JSORF for Milestone C approval and obtain US Army, Surgeon General approval of initial CCAR menus. ***FY 2022 Plans:*** For existing ration platforms (Meal, Ready-to-Eat; First Strike Ration; Meal, Cold Weather, Modular Operational Ration Enhancement; Unitized Group Rations - A/M/H&S), will continue to integrate prototype components/technologies into menu systems and ration assembly processes to improve quality, optimize nutritional content, decrease weight/cube/cost and/or improve modularity and field utility; will continue to conduct OT&E on ration systems to validate system level performance; will present recommendations to the Joint Services for Milestone C approval; will finalize procurement documents and initiate transition to DLA-Troop Support; will obtain US Army, Surgeon General approval of revised menus; will execute production testing with industry to ensure consistent ration quality, validate documents, and resolve vendor/supplier technical production issues; and conduct confirmatory sensory, chemical, physical and shelf life testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in funding supports completion of accelerated OT&E for Close Combat Assault Ration (CCAR).			
Title: Joint Service Field Feeding Systems Development ***Description:*** This effort integrates and demonstrates field feeding equipment systems in support of the Navy (USN), Air Force (USAF), and Marine Corps (USMC) that reduce the logistics burden, improve efficiency, and decrease operation and support costs as directed by the DoD CFREB and Joint Service partners. Validated systems, specifications, and technical data packages are transitioned to the appropriate Service partner for procurement and fielding. Service partners include Product Manager Combat Support Equipment (PdM-CSE), Naval Sea Systems Command (NAVSEA), Naval Supply Systems Command (NAVSUP), Navy Expeditionary Combat Command (NECC) and USAF Basic Expeditionary Airfield Resources (BEAR) Program Office. ***FY 2021 Plans:*** Conduct OT&E of Inflatable Refrigerated Space (IRefS) and complete aerial delivery certification; will complete OT&E of equipment production models with embedded sense and respond technology to track reliability, maintenance, and current health of equipment assets; develop reports, Engineering Change Proposals (ECPs) and logistical data to reduce overall fuel and water consumption in support of the USMC; and transition validated prototype equipment and technical data to USN, USMC and USAF. ***FY 2022 Plans:*** Will complete OT&E of Inflatable Refrigerated Space (IRefS); will complete OT&E of expeditionary equipment with embedded sense and respond technology to track reliability, maintenance, and current health of equipment assets; will develop reports,	0.964	1.047	0.741

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** 548 / *Mil Subsistence Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Engineering Change Proposals (ECPs) and logistical data to reduce overall fuel and water consumption in support of the USMC; and will transition validated prototype equipment and technical data to USN, USMC and USAF. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in funding supports changes in OT&E for Joint Services.			
Accomplishments/Planned Programs Subtotals	2.295	2.734	1.658

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 610: *Food Adv Development*	3.568	3.028	2.897	-	2.897	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Complete Engineering and Manufacturing Development (EMD) and Demonstration of food items and equipment for transition into competitive procurement contract. Complete advanced research efforts to support Engineering Change Proposals for previously developed equipment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / *Combat Feeding, Clothing, and Equipment*	Project (Number/Name) 548 / *Mil Subsistence Sys*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Combat Feeding Program Management	C/FP	CCDC Soldier Center : Natick, MA	3.376	0.487	Oct 2019	0.601	Oct 2020	0.388	Oct 2021	-		0.388	Continuing	Continuing	Continuing
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	N/A : N/A	0.002	-		-		-		-		-	0.000	0.002	-
		Subtotal	3.378	0.487		0.601		0.388		-		0.388	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Service Rations and Combat Feeding Equipment	Various	Various : Various	6.654	0.177	Oct 2019	0.240	Oct 2020	0.163	Oct 2021	-		0.163	Continuing	Continuing	Continuing
		Subtotal	6.654	0.177		0.240		0.163		-		0.163	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Service Rations and Combat Feeding Equipment	Allot	CCDC Soldier Center : Natick, MA	0.450	1.631	Oct 2019	1.893	Oct 2020	1.107	Oct 2021	-		1.107	Continuing	Continuing	Continuing
		Subtotal	0.450	1.631		1.893		1.107		-		1.107	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.482	2.295		2.734		1.658		-		1.658	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** 548 / *Mil Subsistence Sys*

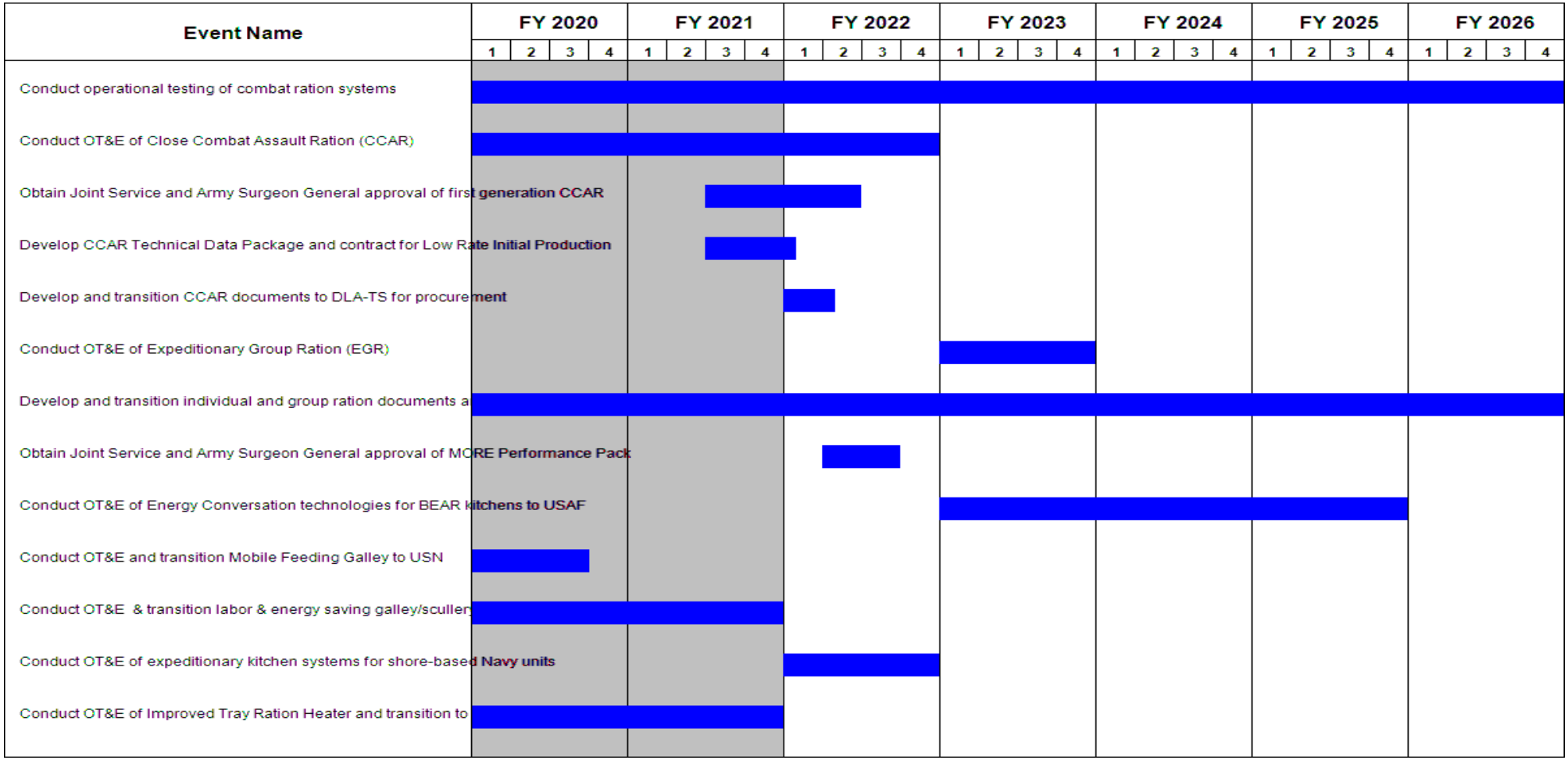

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** 548 / *Mil Subsistence Sys*

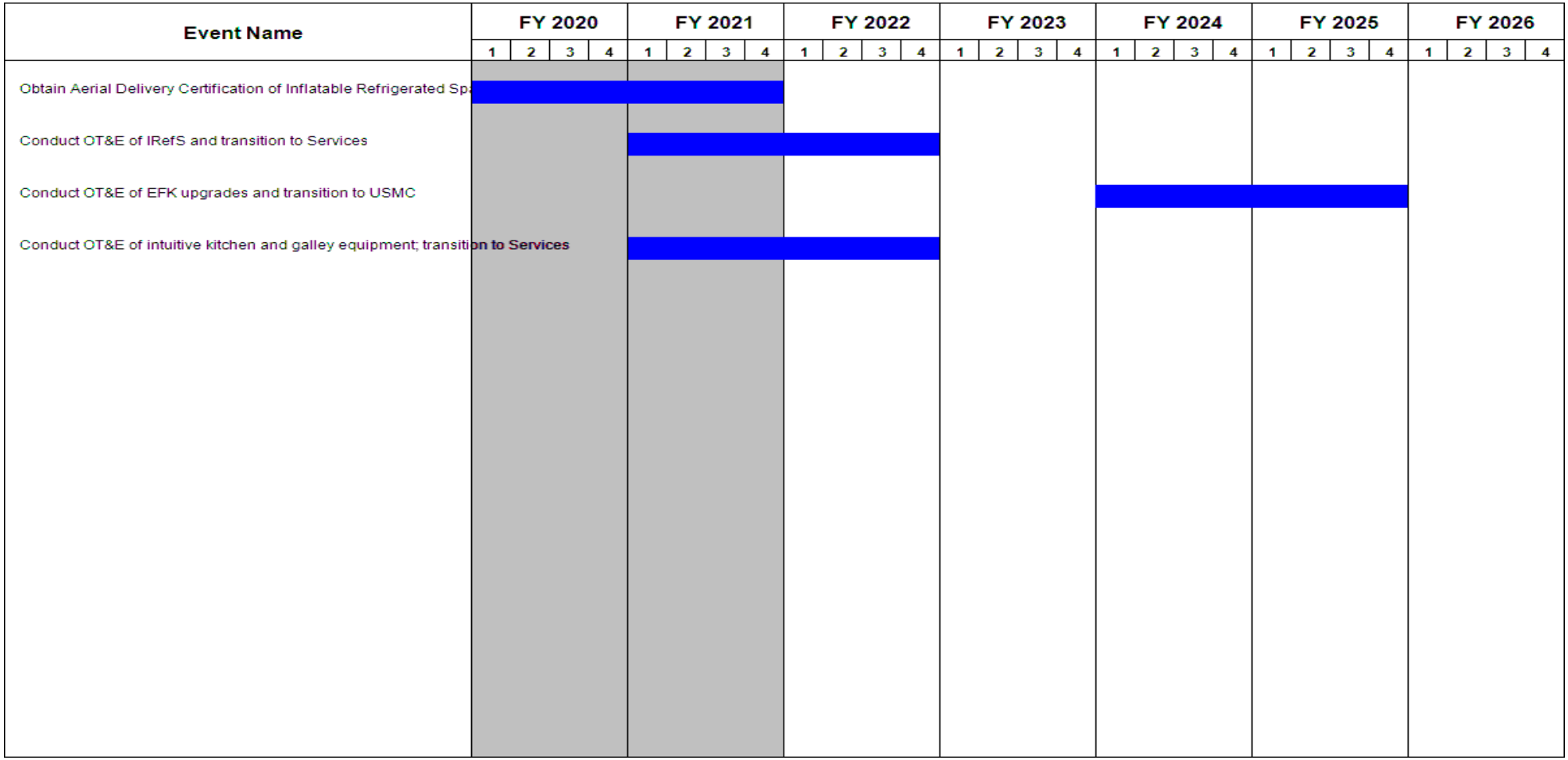

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** 548 / *Mil Subsistence Sys*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Conduct operational testing of combat ration systems	1	2018	4	2026
Conduct OT&E of Close Combat Assault Ration (CCAR)	1	2020	4	2022
Obtain Joint Service and Army Surgeon General approval of first generation CCAR	3	2021	2	2022
Develop CCAR Technical Data Package and contract for Low Rate Initial Production	3	2021	1	2022
Develop and transition CCAR documents to DLA-TS for procurement	1	2022	2	2022
Conduct OT&E of Expeditionary Group Ration (EGR)	1	2023	4	2023
Develop and transition individual and group ration documents annually to DLA-TS	1	2018	4	2026
Obtain Joint Service and Army Surgeon General approval of MORE Performance Pack	2	2022	3	2022
Refine heat recovery prototype for integration and conduct OT&E.	1	2018	3	2019
Develop and transition TDP for the EMS, JSERCS, and heat recovery system to USAF	3	2019	4	2019
Conduct OT&E of BEAR Type II kitchen system and transition to USAF	3	2018	4	2019
Conduct OT&E of Energy Conversation technologies for BEAR kitchens to USAF	1	2023	4	2025
Conduct land-based user evaluation of MIKS and transition data to USN	2	2019	4	2019
Conduct OT&E and transition Mobile Feeding Galley to USN	1	2020	3	2020
Conduct OT&E & transition labor & energy saving galley/scullery upgrades to USN	1	2020	4	2021
Conduct OT&E of expeditionary kitchen systems for shore-based Navy units	1	2022	4	2022
Conduct OT&E of Improved Tray Ration Heater and transition to USMC	1	2020	4	2021
Obtain Aerial Delivery Certification of Inflatable Refrigerated Space (IRefS)	1	2020	4	2021
Conduct OT&E of IRefS and transition to Services	1	2021	4	2022
Conduct OT&E of EFK upgrades and transition to USMC	1	2024	4	2025
Conduct OT&E of intuitive kitchen and galley equipment; transition to Services	1	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / *Combat Feeding, Clothing, and Equipment*	Project (Number/Name) EL2 / *Army Field Feeding Equipment*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EL2: *Army Field Feeding Equipment*	-	5.000	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the development, demonstration and Non-Developmental Item (NDI) Commercial Off The Shelf (COTS) evaluation of combat feeding equipment to enhance Soldier efficiency, improve Soldier survivability, and reduce food service logistics requirements for the Army. The Project supports multi-fuel, rapidly deployable field food service equipment initiatives. Efforts also support the Engineering and Manufacturing Development (EMD) phase of programs to improve equipment, enhance safety in food service, reduce environmental impact, and decrease fuel and water requirements. The Projects develop critical enablers that support the Army's Strategic Planning Guidance by developing and integrating critical expeditionary capabilities that maintain readiness, providing effective solutions that reduce the resource and operational energy footprint, providing modernized deployable kitchen equipment for ReARRM, and enhancing the field Soldier's well-being. This project reduces sustainment requirements, related Combat Support/ Combat Service Support (CS/CSS) demands on lift, the combat zone footprint, and costs for logistical support.

This PE/Project supports Field Feeding programs for the Army.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Containerized Ice Making System	5.000	-	-
Description: Develops an add-on ice making capability that automatically dispenses and seals 10 pound (lb) bags of ice at a minimum rate of 3,600 lbs of ice per day. Based on Army current operational requirements for ice of four lbs per soldier per day, this capability enables support for up to 900 personnel. Current operations require external support to provide personnel with ice for cooling drinking water in extremely arid environments. This capability will reduce the sustainment risk and cost associated with transporting this commodity from external sources.			
Accomplishments/Planned Programs Subtotals	5.000	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• M65801: *REFRIGERATED CONTAINER SYSTEMS*	15.973	2.279	2.321	-	2.321	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** EL2 / *Army Field Feeding Equipment*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Complete Engineering Manufacturing Development (EMD) of food service items and equipment for transition into competitive procurement contract. Complete advanced research efforts to support Engineer Change Proposals for previously developed equipment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / *Combat Feeding, Clothing, and Equipment*	Project (Number/Name) EL2 / *Army Field Feeding Equipment*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support	Various	PMFSS : Natick, MA	1.915	1.004		-		-		-		-	0.000	2.919	-
		Subtotal	1.915	1.004		-		-		-		-	0.000	2.919	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Containerized Ice Making System	Various	Various : Various	0.424	3.396		-		-		-		-	0.000	3.820	-
		Subtotal	0.424	3.396		-		-		-		-	0.000	3.820	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Containerized Ice Making System	Various	ATC/Ft Lee : Virginia	0.205	0.600		-		-		-		-	0.000	0.805	-
		Subtotal	0.205	0.600		-		-		-		-	0.000	0.805	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.544	5.000		0.000		-		-		-	0.000	7.544	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** EL2 / *Army Field Feeding Equipment*

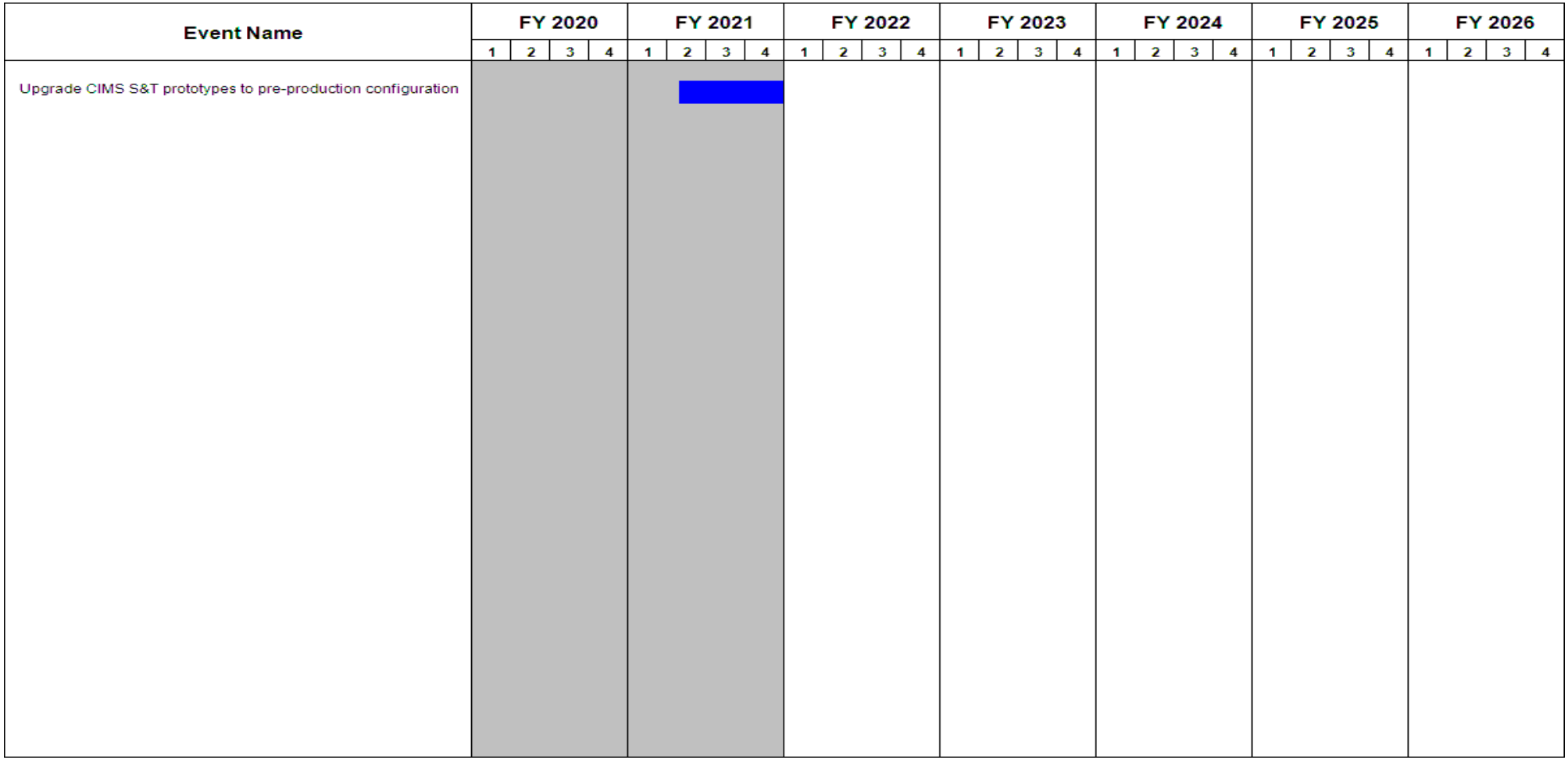

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604713A / *Combat Feeding, Clothing, and Equipment*	**Project (Number/Name)** EL2 / *Army Field Feeding Equipment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Upgrade CIMS S&T prototypes to pre-production configuration	2	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	29.785	27.013	26.540	-	26.540	-	-	-	-	-	-
241: *Nstd Combined Arms*	-	29.785	27.013	26.540	-	26.540	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Program Element funds development of Non-System Training Devices to support force-on-force training at the Combat Training Centers (CTC), general military training, and training on more than one item/system, as compared with system devices which are developed in support of a specific item/weapon system. Army training devices and training simulations contribute to the modernization of the forces by enabling readiness and strengthening combat effectiveness through realistic training solutions for the Warfighter. Training devices maximize the transfer of knowledge, skills, and experience from the training situation to a combat situation. Force-on-force training at the National Training Center (NTC), Ft. Irwin, CA; Joint Readiness Training Center (JRTC), Ft. Polk, LA, and Joint Multinational Readiness Center (JMRC), formerly the Combat Maneuver Training Center (CMTC), Hohenfels, Germany; and battle staff training in Battle Command Training Program (BCTP) provide increased combat readiness through realistic collective training in low, mid, and high intensity scenarios. Project 241, Non-System Training Devices-Combined Arms, develops simulation training devices for Army-wide use, including the CTCs.

FY 2022 Project 241 funds significant development efforts in support of U.S. Army Training and Readiness on the Combat Training Center Instrumentation Systems (CTC-IS), Instrumentable-Multiple Integrated Laser Engagement System (I-MILES), Home Station Instrumentation Training System (HITS), Common Training Instrumentation Architecture (CTIA), OPFOR Integrated Air Defense System (IADS), Digital Range Training System (DRTS), the Future Army System of Integrated Targets (FASIT), Medical Simulation Training Center (MSTC), Unmanned Aerial Systems (UAS) Swarm new start, and the Live, Virtual, Constructive Integrating Architecture (LVC-IA).

B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	30.912	28.036	26.753	-	26.753
Current President's Budget	29.785	27.013	26.540	-	26.540
Total Adjustments	-1.127	-1.023	-0.213	-	-0.213
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.001	-			
• SBIR/STTR Transfer	-1.128	-1.023			
• Adjustments to Budget Years	-	-	-0.213	-	-0.213

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604715A *I Non-System Training Devices - Eng Dev*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 241: *Nstd Combined Arms*		
Congressional Add: *Radio Frequency Emitters*	3.500	-
Congressional Add Subtotals for Project: 241	3.500	-
Congressional Add Totals for all Projects	3.500	-

Change Summary Explanation

No explanation needed.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*				Project (Number/Name) 241 / *Nstd Combined Arms*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
241: *Nstd Combined Arms*	-	29.785	27.013	26.540	-	26.540	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Training Instrumentation Architecture (CTIA) program is the foundation architecture of the Live Training Transformation Family of Training Systems (LT2-FTS). The program contains critical core product-line architecture which provides commonality across training instrumentation systems and interoperability across Live, Virtual, Constructive Integrated Training Environment (LVC-ITE) and joint training systems. CTIA includes Army owned software components, architecture services, standards, protocols and governance used by domain-specific Live Training Transformation (LT2) and Live Training Systems (LTS) to include instrumented Force-On-Force (FOF) and Force-On-Target (FOT) training requirements. The CTIA also provides Post Deployment Software Support (PDSS) and technology refresh for the LT2 family of LTS supporting over 22 live instrumented training products which are fielded at over 200 CONUS and OCONUS sites across the Army.

Combat Training Center Instrumentation System (CTC-IS) funds the continued development of the existing Instrumentation Systems (IS) at the National Training Center (NTC), Joint Readiness Training Center (JRTC) and Joint Multinational Readiness Center (JMRC). CTC-IS funds the continued development of the Range Communication System at the NTC and JRTC, to provide high-fidelity live, virtual, and constructive brigade training rotations which prepare Brigade Combat Teams (BCTs), Joint partners, and supporting units to deploy in support of the Army Sustainable Readiness Model (SRM). The CTCs primary goal is to develop agile and adaptive leaders at the tactical, operational and strategic levels while providing BCTs the core training necessary to conduct decisive action in a dynamic operating environment.

The Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) program provides realistic, real-time casualty effects for force-on-force tactical engagement training scenarios. Its ability to integrate into training instrumentation systems provides for high fidelity combined arms combat exercises supporting the Chief of the Staff of the Army's priority of "Readiness" and closely aligns with the Modernization priority of Soldier Lethality. I-MILES is required for use at Home Stations, the Combat Training Centers (CTCs) and in theater of operations to meet force-on-force training requirements. I-MILES program funding provides for the Development and Integration of new vehicle and dismount weapon systems meeting the Common Operating Environment (COE) requirements, as well as embedded Tactical Engagement Simulation (TES) development. This includes development efforts of the Live Training Engagement Composition (LTEC), increasing simulation by updating the Probability of Kill (Pk) tables for increased training realism and improved integration on new weapon platforms (i.e. Joint Light Tactical Vehicle (JLTV), Armored Multi-Purpose Vehicle (AMPV), Next Generation Combat vehicle, and Stryker Engineering Change Proposal (ECP) with 30mm Gun).

The Home Station Instrumentation Training System (HITS) currently provides a high-fidelity deployable instrumented training capability to support platoon thru battalion ground based Soldiers and vehicles in Force-on-Force Training. HITS tracks location of soldiers and vehicles and simulates weapons' effects and engagements, allowing units to "Train as they Fight" against live opponents. HITS provides accurate feedback to training units. HITS consists of light deployable components that can be rapidly assembled/disassembled and transported to support deployed training. HITS is a member of the Live Training Transformation (LT2) product line of training systems implementing hardware and software reuse with other Instrumentation Systems (IS). HITS provides the only Live training component for the large scale Live-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604715A / *Non-System Training Devices - Eng Dev*	**Project (Number/Name)** 241 / *Nstd Combined Arms*

Virtual-Constructive (LVC) military training exercises. HITS begins US Army aviation vehicle integration with Home Station instrumentation to cover comprehensive training engagements between ground and air forces.

The Medical Simulation Training Center (MSTC) provides realistic medical training to both medical and non-medical Soldiers in the Active, Reserve, and National Guard. MSTCs provide hands-on instruction on the latest battlefield trauma and critical care techniques based on Army Medical Center of Excellence (MEDCoE) approved performance oriented Program of Instruction (POI). Medical treatment validation exercises simulate the high stress of performing medical interventions in combat. MSTC supports Unit Medical Readiness by validating Combat Medic (68W) Emergency Medical Technician (EMT) biennial recertification requirements and provides Combat Lifesaver (CLS) training to non-medical Soldiers. The Tactical Combat Casualty Care Exportable (TC3X) Soldier System provides an exportable capability to train Soldiers on medical Warrior skills at the individual, leader, and collective levels. The TC3X system will consist of Training Aides, Devices, Simulators, and/or Simulations (TADSS); utilized by Soldier medics to provide realistic, hands-on training in a "train the trainer" fashion to all Soldiers at home stations, initial training centers, and combat training centers.

The Basic Electronics Maintenance Trainer (BEMT) provides the essential modernized electronic system maintenance training capability for the Army, Army National Guard, and the Army Reserve to achieve Military Occupational Specialty-Qualification (MOS-Q) for 40 Military Occupational Specialties (MOS) at 24 Active, National Guard, and Army Reserve camps, posts, and stations. Soldiers utilizing the BEMT system receive highly realistic training using scenarios which require performing basic electronic tasks in a virtual environment including tests, diagnosis, and repair while saving institutions significant expenses over live training alternatives. The BEMT consists of an Instructor Operator Station (IOS), Student Training Station(s) (STS), associated test equipment, COTS computer, electronics console(s), supporting experiment cards, soldering station, and content server as applicable.

The Live, Virtual, Constructive Integrating Architecture (LVC-IA) provides a net-centric linkage that collects, retrieves and exchanges data among LVC Training Aids, Devices, Simulations, and Simulators (TADSS) to include: Aviation Combined Arms Tactical Trainer (AVCATT), Close Combat Tactical Trainer (CCTT), Games For Training (GFT), Home Station Instrumentation Training System (HITS), Joint Land Component Constructive Training Capability (JLCCTC) and Synthetic Environment Core (SE Core) and Mission Command Systems. The LVC-IA defines "how" information is exchanged among the different LVC domains and the Mission Command Systems. The LVC-IA provides enterprise level tools for exercise control, after action review, and system information assurance. It develops hardware and software to interface the different Live, Virtual, Constructive and Gaming communication protocols and to provide a correlated common operating picture for the training audience on their organic Mission Command equipment. The integration of the LVC TADSS with the Mission Command equipment will enable larger and more robust training events, to better prepare U.S. Soldiers for their missions at an overall reduced cost. The end-state goal is to enable an LVC Integrated Training Environment that can replicate Operational Environments in a cost effective manner to provide a high level of value-added training and mission rehearsal opportunities to Army Commanders and their Soldiers. In FY 2019, the LVC-IA program commence design and developmental activities for Version 4, which allowed for Web-based optimization; inclusion of new simulations to the architecture; and concurrency with core system TADSS and Army Mission Command Information Systems through FY 2022. FY 2022 request will complete Version 4 developmental and integration activities (Web-based optimization and Synthetic Training Environment (STE) compatibility), and continues concurrency with Mission Command Information Systems.

The Army identified an operational gap in the training strategy for the OPFOR Integrated Air Defense System (IADS). It is a collection of enemy weapons systems that engages Army aviation assets. Training Aircraft Survivability Equipment (ASE) Simulation Suite (TASS) is a live training system consisting of aircraft components

and ground emitters that replicates current and emerging enemy Air Defense systems. Its fidelity supports individual pilot training as well as the collective training requirements of the Brigade Combat Team to fully plan, prepare, execute and react against an enemy air defense weapons at the Combat Training Centers (CTC).

FASIT provides Live Fire training systems and software capable of supporting all Army automated ranges and it's Installations around the world. The FASIT training systems include: A single, universal target control software for all automated ranges (ground and aviation) identified in TC 25-8, providing users a controller with a common look and feel; downrange stationary and moving infantry and armor Presentation Devices (PDs) that interact with the control software to present targets and provide scoring feedback; battlefield/weapons effects devices that simulate combat situations, visuals, and sounds; and targets that provide visual, I2 and thermal representations of friendly/threat engagements. The FASIT systems enable trainers to develop scenarios to simulate wartime mission tasks in a stressful battlefield environment.

The Digital Range Training System (DRTS) provides modern digital technology ranges capable of training, evaluating and stressing today's Soldiers and their equipment. DRTS systems score various weapons and records data and video for utilization in an After Action Review (AAR). DRTS supports qualification gunnery tables for Armor (Abrams), Infantry (Bradley & Stryker mounted & dismounted), and Aviation platforms. The five standard training ranges identified utilize all available combat systems capabilities and digitally integrate them to manage all forces undergoing individual and collective live-fire training and qualification: Digital Multi-Purpose Range Complex (DMPRC) supports all gunnery tables and Combined Arms Live fire Exercise (CALFEX) for Abrams, Bradley, and limited Aviation; Digital Multi-Purpose Training Range (DMPTR) supports crew and section qualification for Armor and Infantry; Battle Area Complex (BAX) supports Stryker gunnery tables plus infantry centric Platoon / Company CALFEX; Digital Air Ground Integration Range (DAGIR) supports all gunnery tables and CALFEX for Abrams, Bradley, and Aviation platforms (including diving fire); and Aerial Gunnery Range (AGR) supports training/test manned/unmanned aviation platforms and convoy live fire crew/platoon/company.

OPFOR Surrogate Wheeled Vehicles (OSWV) provides a collection of wheeled vehicles, used as training aids to portray threat vehicles including tactical vehicles, technical vehicles, and Civilian on the Battlefield vehicles (COB-V). The program supports the CTC OPFOR/COE Pillar capability through technical vehicles, unique VISMODs, and COB-Vs. This capability provides for an accurate replication of OPFOR and COB-Vs environment that rotational units must train against.

Unmanned Aerial Systems (UAS) Swarm provides integrated, multi-domain threat representative UAS platforms through custom UAS components and payloads that challenge training communities' execution of UAS Tactics, Techniques and Procedures (TTPs), use of current and evolving UAS technologies (i.e., Drone buster), and gives feedback on their vulnerabilities to UAS-enabled Intelligence, Surveillance, and Reconnaissance, Cyber, Electronic Warfare, Dynamic Targeting and Swarm operations.

FY 2022 Project 241 funds significant development efforts in support of U.S. Army Training and Readiness on the Combat Training Center Instrumentation Systems (CTC-IS), Instrumentable-Multiple Integrated Laser Engagement System (I-MILES), Home Station Instrumentation Training System (HITS), Common Training Instrumentation Architecture (CTIA), OPFOR Integrated Air Defense System (IADS), Digital Range Training System (DRTS), the Future Army System of Integrated Targets (FASIT), Medical Simulation Training Center (MSTC), Unmanned Aerial Systems (UAS) Swarm new start, and the Live, Virtual, Constructive Integrating Architecture (LVC-IA).

FY 2020 funding for Suicide Prevention was realigned to PE 0605013A project FL9.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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FY 2020 funding for Soldier/Squad Virtual Trainer Program (S/SVT) was realigned to PE 0604121A, Project SV1.

On 21 April 2019, the Future Army System of Integrated Targets (FASIT) Capability Production Document was approved. The FASIT program is not a new start program, but is the continuation of requirements and formal update to the New Generation Army Targetry System (NGATS) Operational Requirements Document (ORD) that was approved 11 Jun 96. FASIT will subsume the following programs: Combat Training Center Live Fire Modernization (CTC Live Fire Mod), Target Modernization, and Army Targetry Systems (ATS) into one ACAT II program of record.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Common Training Instrumentation Architecture (CTIA) program. ***Description:*** Continue EMD phase contract activities for the CTIA program to provide common architecture capabilities. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $2.417 million will fund the continued development of CTIA to provide the common architecture capabilities that are essential for development, fielding, technology and capability insertion for 22 live training systems at 200+ training locations worldwide, to include the Combat Training Centers-Instrumentation System utilized at the National Training Center, the Joint Readiness Training Center, and at the Joint Multinational Readiness Center; the Home Station Instrumentation System; the Digital Ranges Training System, and the Live, Virtual, Constructive-Integrated Training Environment interoperability initiatives. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $2.550 million will fund the continued development of CTIA to provide the common architecture capabilities that are essential for development, fielding, technology and capability insertion for 22 live training systems at 200+ training locations worldwide, to include the Combat Training Centers-Instrumentation System utilized at the National Training Center, the Joint Readiness Training Center, and at the Joint Multinational Readiness Center; the Home Station Instrumentation System; the Digital Ranges Training System, and future modernization efforts including emerging Army and joint architectures. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to inflation.	2.420	2.417	2.550
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Combat Training Center Instrumentation System (CTC-IS). ***Description:*** Continue EMD phase contract activities for the CTC-IS. ***FY 2021 Plans:***	4.090	3.386	3.886

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Base RDTE dollars in the amount of $.329 million will fund post deployment software support to integrate sensor, GPS and radar jamming and UAS counter measures into the training at the CTCs. The effort will stimulate and simulate GPS and radar jamming and UAS counter measures in Brigade Combat Team (BCT) Force-on-Force training. The results will be available in the CTC-IS for After Action Review (AAR). FY 2021 Base RDTE dollars in the amount of $.750 million will fund the development of a Digital Tactical Monitoring (DTM) solution for the CTCs. The DTM capability will allow Combat Training Center Observers Controllers Trainers (OCTs) to monitor, collect, and record Rotational Training Unit (RTU) Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) communications and provide performance feedback during Combat Training Center Brigade Combat Team(BCT) FoF/FoT training events, this is valuable feedback in the AAR process increasing BCT readiness. FY 2021 Base RDTE dollars in the amount of $1.813 million will fund the Life Cycle Management (LCM) of Live Training Family of Systems, developing the architecture framework for future Life Cycle Efforts for the Hardware Product Line Framework. FY 2021 Base RDTE dollars in the amount of $.494 million will fund the JOC DESIGN ANALYSIS study to determine the layout of the JRTC-IS systems/subsystem within the new JOC. The study will also look at current and future technologies for implementing the installation of the JRTC-IS systems/subsystems in the new JOC to ensure the architecture remains current with the latest technology improvements and effectiveness and to improve the life cycle footprint. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $1.948 million will fund the initial design of the NTC Western Training Area extension for the NTC Instrumentation System. Tracking, Observer Controller / Trainer (OC/T) Situational Awareness, OC/T Voice. Army Aviation, Voice Tactical Monitoring, Spectrum Monitoring, video and AAR support will be extended into the Western Training area. Network, antenna site, antenna tower, fiber optics and power generation must be designed for this effort. FY 2022 Base RDTE dollars in the amount of $.541 million will fund post deployment software support to implement software to support the next Integrated Player Unit (IPU) being developed. Improvements to increase battery life and reduce data plan usage include decentralized indirect fire, minefields and sleep functions. FY 2022 Base RDTE dollars in the amount of $1.397 million will fund the Life Cycle Management (LCM) of Live Training Family of Systems, continuing the development of the architecture framework for future Life Cycle Efforts for the Hardware Product Line Framework. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 increase due to starting the initial design of the NTC Western Training Area extension for the NTC Instrumentation System.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Instrumentable-Multiple Integrated Laser Engagement System (I-MILES). ***Description:*** EMD phase contract activities for the I-MILES program. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $2.700 million RDTE funding will analyze, develop, test and implement the Live Training Engagement Composition (LTEC) through Post Deployment Software Support efforts. Funding will ensure that baseline relevancy is maintained. Funding will also ensure that there is development and integration of new functionality to maintain concurrency. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $2.990 million RDTE funding will analyze, develop, test and implement the Live Training Engagement Composition (LTEC) through Post Deployment Software Support efforts. Funding will ensure that baseline relevancy is maintained. Funding will also ensure that there is development and integration of new functionality to maintain concurrency. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 increase is due to the additional requirement for Electronic Proving Ground testing.	2.519	2.700	2.990
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Home Station Instrumentation Training System (HITS) program. ***Description:*** EMD phase contract activities for the HITS program. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $1.810 million will continue HITS US Army aviation vehicle integration with Home Station instrumentation to provide comprehensive training engagements between ground and air forces. Efforts will add aviation specific interfaces, visual indicators, and required messaging for HITS and Live, Virtual and Constructive Integrating Architecture (LVC-IA) interoperability. LVC-IA and HITS encompass simulated combined arms, collective training. This will create a cloud based HITS After Action Review capability so that distributed unit leaders can readily have on demand and point-of-need access. The cloud based access will allow the unit leader to reinforce training of over 1,000 Soldiers after training with HITS. ***FY 2022 Plans:***	3.485	1.810	4.153

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 Base RDTE dollars in the amount of $4.153 million will continue efforts for Home-Station Instrumentation Training Systems (HITS) to incorporate a new network that will enable Observer, Controller/Trainer (OC/T) interoperability using a tablet computer. This new network shall be in addition to the HITS network which is a closed loop system. HITS will develop a Voice Tactical Monitoring and Recording capability to interface with new tactical radios being fielded to the Army for After Action Reviews in home station training exercises. In addition, HITS maintains concurrency with the Combat Training Centers by developing software/hardware updates so that HITS has similar training capabilities found at the Combat Training Centers. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in RDTE due to development of improved capability to provide distributed situational awareness to Observer, Controller/Trainer (OC/T) through portable tablet devices. This capability will allow more efficient execution of smaller scale unit exercises as well as improved training feedback. Funding will also provide a new Voice Tactical Monitoring and Recording capability for new tactical radios, improving feedback of battlefield communication.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Medical Simulation Training Center (MSTC). ***Description:*** EMD phase contract activities for the MSTC program to support the Virtual Patient System technologies. The approved MSTC Capability Production Document (CPD), Inc 1, Rev 1, dtd 6 MAR 2019 Capabilities has significant unfulfilled requirements, without which are enabling negative medical trauma training. The MSTC CPD requires and states that ALL GENDERS shall be represented within the medical training simulations and scenarios. The FEMALE GENDER is neither wholly, adequately, nor accurately represented in the MSTC at this time. The CPD also states that realistic medical scenarios are required. Realistic combat trauma training is not represented in the MSTC due to the inaccurate simulation of the Human Physiology and absence of representative battlefield wounds. These requirements align with near-peer competition over-match. ***FY 2021 Plans:*** Instructor Support System (ISS) combat training scenarios will be improved in a Synthetic Training Environment (STE) via Virtual Reality and Reconfigurable Virtual Trainers. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $.502 million will allow Instructor Support System (ISS) combat training scenarios to continue to be improved in a Synthetic Training Environment (STE) utilizing the hardware and software solutions developed by Industry in FY 2021, FEMALE trauma mannequin, Human Physiology software, and dynamic wound patterns shall continue to be modified through contract action to represent Army requirements. RDT&E funding is required for the Virtual Prototype Patient System (VPS) line of effort for FY 2022 for the integration and validation of a relevant and realistic GENDER-specific FEMALE mannequin/trauma simulator. RDT&E funding is required for the Virtual Prototype Patient System (VPS) line of effort for FY 2022 for the verification, validation, and accreditation (VV&A) of software that simulates, for each GENDER of mannequin, the dynamics	0.473	0.432	0.502

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
of the Human Physiology to assess medical interventions and the verification, validation, and accreditation of hardware that represents the morphing wound patterns from gunshot, heat, chemical, electrical, biological, and nuclear events. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 RDTE increase required to enable the development, integration, and verification, validation, and accreditation (VV&A) of the GENDER specific Female trauma mannequin, the Human Physiology software model, and the hardware that represents the morphing wound patterns. Without increase in FY 2022 RDTE, the approved requirement will not be accomplished.			
Title: Live, Virtual, Constructive Integrating Architecture (LVC-IA) Engineering and Manufacturing Development (EMD) phase contract activity. ***Description:*** Continue EMD phase contract activities for the LVC-IA program. ***FY 2021 Plans:*** Live, Virtual, and Constructive-Integrating Architecture (LVC-IA) program will continue system development, integration and demonstration of the LVC-IA Version 4 capability which includes the developmental activities for Web-based optimization, Synthetic Training Environment (STE) compatibility, and concurrency with core system TADSS and Army Mission Command Information Systems. ***FY 2022 Plans:*** Live, Virtual, and Constructive-Integrating Architecture (LVC-IA) program will complete system development, integration and demonstration of the LVC-IA Version 4 capability which includes the developmental activities for Web-based optimization, Synthetic Training Environment (STE) compatibility, and concurrency with core system TADSS and Army Mission Command Information Systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY2021 to FY2022 is due to completion of Version 4 Development efforts.	3.794	4.345	2.642
Title: Live, Virtual, Constructive Integrating Architecture (LVC-IA) Program Government System Test and Evaluation. ***Description:*** Government System Test and Evaluation for the LVC-IA Program. ***FY 2021 Plans:*** LVC-IA will continue Federation Integration and System Measurement of Performance (SMP) events, and continue Functional Verification, Test Readiness Review (TRR) and Government Acceptance Testing for Version 4. Additionally, LVC-IA will continue integration testing and evaluation activities in support of LVC-IA interoperability with TADSS and other Mission Command Information Systems. ***FY 2022 Plans:***	1.130	1.277	0.631

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
LVC-IA will complete Federation Integration and System Measurement of Performance (SMP) events, Functional Verification, Test Readiness Review (TRR) and Government Acceptance Testing for Version 4. Additionally, LVC-IA will continue integration, testing and evaluation activities in support of LVC-IA interoperability with TADSS and other Mission Command Information Systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY2021 to FY2022 is due to completion of testing and evaluation activities in support of Version 4 Development efforts.			
Title: Government Program Management for the Live, Virtual, Constructive Integrating Architecture (LVC-IA) Program. ***Description:*** Government Program Management for the LVC-IA Program. ***FY 2021 Plans:*** Will provide program management, engineering and technical oversight, contract support, and travel for the LVC-IA Program. ***FY 2022 Plans:*** Will provide program management, engineering and technical oversight, contract support, and travel for the LVC-IA Program. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY2021 to FY2022 is due to the additional engineering and technical oversight, and travel to support program activities.	0.162	0.153	0.225
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Combat Training Center Live Fire Modernization (CTC Live Fire Mod) ***Description:*** Combat Training Center Live Fire Modernization (CTC Live Fire Mod) provides Future Army System of Integrated Targets (FASIT) qualified live-fire capable targets which includes Stationary Armor Targets (SAT) with accompanying Battlefield Effects Simulators (BES), Stationary Infantry Targets (SIT), Human Urban Targets (HUT), Double-Arm SITs, Moving Infantry Targets (MIT), and non-FASIT qualified Aviation 3-D and Unattended Aerial Systems (UAS) targets. These provide a capability for the CTCs to support the transition from Mission Rehearsal Exercise/Situational Training Exercise (MRE/ST) rotations to Unified Land Operations (ULO) against a hybrid threat. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $2.409 million provides for development of the new Battlefield Effects Devices. These devices will focus on enhancing and simulating a hostile tank's main gun fire signature from a target device, tracer round shootback signature, and small arms hostile fire via pyrotechnic solutions. The pyrotechnic battlefield effect device effort will	-	2.409	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
provide for inexpensive and ruggedized systems that can be used to create a more realistic training environment for Soldiers to train with in a live fire environment. The pyrotechnic solutions will align with the defined OPTEMPO in the FASIT CPD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** There is no funding in FY 2022. Program was subsumed into the Future Army System of Integrated Targets (FASIT) program.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Target Modernization program. ***Description:*** The Target Modernization program?s primary innovation goals are the development of trackless moving target systems, advanced non-contact ballistic hit detection and recognition system, high fidelity dynamic infrared threat representations, advanced human type targets, non-pyrotechnic battlefield effects replication systems, and augmented reality on live fire ranges; all aimed at increasing training realism, enhancing Soldier resiliency, and lowering life cycle costs. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $3.650 million provides for the incremental funding of the Non-Contact Hit Sensor (NCHS) research and development aimed at the completion and obtainment of TRL 7/8 for the advanced non-contact ballistic hit detection and recognition system, to include environmental verification and performance testing. Funding will also initiate the Phase III SBIR contract for the non-pyrotechnic battlefield effects replication technologies. The Non-pyrotechnic battle field effects effort will focus on hostile shot replication, machine gun fire replication, black smoke generation, and sound effects simulators via non-pyrotechnic solutions. The Non-pyrotechnic battle field effects effort will provide for an inexpensive and ruggedized system that can be utilized to create accurate training environment realism enhancement. Current pyrotechnic solutions require specialized training, handling, and procurement of effects, and can effect training throughput by requiring the ranges to shut down during reloading. The non-pryo solutions will align with the defined OPTEMPO in the FASIT CPD. Funding will also support the 14 year old TRACR software baseline from a CORBA based CTIA v3.x based solution to a fully realized Service orchestrated HTML5.0 based CTIA v4.x compliant solution to ensure supportability, cybersecurity protections, and viability for the next ten years. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** There is no funding in FY 2022. Program was subsumed into the Future Army System of Integrated Targets (FASIT) program.	1.989	3.650	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Future Army System of Integrated Targets (FASIT). ***Description:*** The FASIT program's primary innovation goals are the development of trackless moving target systems, advanced non-contact ballistic hit detection and recognition system, high fidelity dynamic infrared threat representations, advanced human type targets, non-pyrotechnic battlefield effects replication systems, and augmented reality on live fire ranges; all aimed at increasing training realism, enhancing Soldier resiliency, and lowering life cycle costs.	-	-	5.859

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
The FASIT also provides qualified live-fire capable targets which includes Stationary Armor Targets (SAT) with accompanying Battlefield Effects Devices (BED), Stationary Infantry Targets (SIT), Human Urban Targets (HUT), Double-Arm SITs, Moving Infantry Targets (MIT), and non-FASIT qualified Aviation 3-D and Unattended Aerial Systems (UAS) targets. These provide a capability for the CTCs to support the transition from Mission Rehearsal Exercise/Situational Training Exercise (MRE/ST) rotations to Unified Land Operations (ULO) against a hybrid threat. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $5.859 million provides for the incremental funding of the Dynamic Infrared Projection research and development aimed at the completion and obtainment of a Technology Readiness Level of 8/9 for the system to be able to portray realistic thermal images onto target presentation devices, to include environmental verification and performance testing. Funding will also incrementally fund the Phase III SBIR contract for the non-pyrotechnic battlefield effects replication technologies. The Non-pyrotechnic battle field effects effort will focus on hostile shot replication, machine gun fire replication, black smoke generation, and sound effects simulators via non-pyrotechnic solutions. The Non-pyrotechnic battle field effects effort will provide for an inexpensive and ruggedized system that can be utilized to create accurate training environment realism enhancement. Current pyrotechnic solutions require specialized training, handling, and procurement of effects, and can effect training throughput by requiring the ranges to shut down during reloading. The nonpryo solutions will align with the defined OPTEMPO in the FASIT CPD. It also provides for incremental funding of the new Battlefield Effects Devices. These devices will focus on enhancing and simulating a hostile tank's main gun fire signature from a target device, tracer round shootback signature, and small arms hostile fire via pyrotechnic solutions. The pyrotechnic battlefield effect device effort will provide for an inexpensive and rugged systems that can be used to create a more realistic training environment for Soldiers to train with in a live fire environment. The pyrotechnic solutions will align with the defined OPTEMPO in the FASIT CPD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** There is no increase from FY 2021 to FY 2022. The FASIT program is not a new start program, but is the continuation of requirements and formal update to the New Generation Army Targetry System (NGATS) Operational Requirements Document (ORD) that was approved 11 Jun 96. FASIT will subsume the following programs: Combat Training Center Live Fire Modernization (CTC Live Fire Mod), Target Modernization, and Army Targetry Systems (ATS) into one ACAT II program of record.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Digital Range Training System (DRTS)	1.532	1.445	1.184
Description: Conduct development of a government-owned Technical Data Package (TDP) for the DRTS program to enable competitive acquisitions for targets. ***FY 2021 Plans:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
RDTE of $1.445 million will continue the development of a government-owned and managed Technical Data Package (TDP) for the target lifter devices utilized on the DRTS and other home station ranges. The funding will be used to complete the design efforts, build prototype units, and perform the developmental testing to validate that the TDP works as required and can be used for the future production of the target lifters. ***FY 2022 Plans:*** RDTE of $1.184 million will continue the development of a Government-owned and managed Technical Data Package (TDP) for the presentation devices utilized on the DRTS and Future Army Systems of Integrated Targets (FASIT). The funding will be used to complete the design efforts, build prototype units, and perform the developmental testing to validate that the TDP works as required and the presentation devices can be used to support the technology refresh and modernization efforts on all Army ranges. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to the estimated cost of development.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for Integrated Military Operations in Urban Terrain (MOUT) Training System (IMTS) ***Description:*** Conduct research into the development of an Army Data Center "cloud" migration strategy to assist in understanding the risks and technical challenges associated with taking software that is run at numerous (70+) IMTS standalone sites, connecting them to communications infrastructure, and managing the software and cybersecurity aspects through shared Information Technology (IT).	0.958	-	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for OPFOR Surrogate Wheeled Vehicles (OSWV) ***Description:*** EMD phase contract activities for the OSWV program.	3.560	-	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the OPFOR Integrated Air Defense System (IADS) ***Description:*** EMD phase contract activities for the IADS Program ***FY 2021 Plans:*** FY 2021 RDT&E funding for $2.566 million is to integrate the Tactical Engagement Simulation System (TESS) hardware onto the CH-47 platform, and integrate the Aircraft Survivability Equipment (ASE) training simulation into the CH-47F operational flight	-	2.566	0.575

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
program. Integration is followed by validation through analysis, demonstration, and testing in the CH-47F system integration laboratory, and ground and flight testing for airworthiness qualification conducted at Redstone Test Center. ***FY 2022 Plans:*** FY 2022 RDTE funding of $0.575 million will be used to start development of weapon processor software, integration with the training instrumentation systems at the Combat Training Centers (CTCs), and validate the solution through testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease is due to the estimated cost of development.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for Basic Electronics Maintenance Trainer (BEMT) ***Description:*** BEMT provides the essential modernized electronic system maintenance training capability for the Army, Army National Guard, and the Army Reserve to achieve Military Occupational Specialty-Qualification (MOS-Q) for 40 MOS at 24 Active, National Guard, and Army Reserve camps, posts, and stations. BEMT will be modernizing the electronics maintenance training. BEMT provides training in basic electronics, while saving institutions significant administrative expenses over live training alternatives. ***FY 2021 Plans:*** FY 2021 Base RDTE dollars in the amount of $.229 million will fund the enhancement of the Learning Management System courseware. Developing solutions to improve Army Enterprise server capability. ***FY 2022 Plans:*** FY 2022 Base RDTE dollars in the amount of $.306 million will continue to fund the enhancement of the Learning Management System courseware. Developing solutions to improve Army Enterprise server capability. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to estimate to complete enhancements of the Learning Management System courseware.	0.173	0.229	0.306
Title: Engineering and Manufacturing Development (EMD) phase contract activity for OPFOR Attack Aircraft Shoot-back Capability (OA2SBC) program ***Description:*** EMD phase contract activities for the OPFOR Attack Aircraft Shoot-back Capability (OA2SBC) program. ***FY 2021 Plans:***	-	0.194	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Base RDTE dollars in the amount of $.194 million will be used to develop weapon processor software, integrate with the training instrumentation systems at the Combat Training Centers (CTCs), then validate the solution through testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** OA2SBC reached FOC in FY 2018 and is receiving a scheduled technology refresh in FY 2021. It will have another scheduled technology refresh in FY 2025.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Unmanned Aerial System (UAS) Swarm ***FY 2022 Plans:*** FY 2022 RDTE of $1.037 million provides for the incremental funding for development of UAS Swarm software and integration with 4G/LTE networks, development of payload and integration, initial operational assessments, and will support hardware development for charging stations, tablets, and manual/remote deployment systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** This is a new start in FY 2022.	-	-	1.037
Accomplishments/Planned Programs Subtotals	26.285	27.013	26.540

	FY 2020	FY 2021
Congressional Add: Radio Frequency Emitters ***FY 2020 Accomplishments:*** Provide Radio Frequency Threat Emitters for Army Combat Training Centers.	3.500	-
Congressional Adds Subtotals	3.500	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• MA6600: *Combat Training Centers Support*	125.411	90.580	79.565	-	79.565	-	-	-	-	-	-
• NA0100: *Training Devices, Nonsystem*	215.453	161.814	174.644	-	174.644	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Competitive development efforts based on performance specifications.

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1. In FY 2019 - 2022, Combat Training Center Instrumentation Systems (CTC-IS) RDTE will be used to fund a Life Cycle Product-line Management (LCPM) contract structured as a 5 year Single Award Indefinite-Delivery/Indefinite-Quantity (IDIQ) for the implementation of a Hardware Product Line (HPL), the contractor was selected. The strategy is to establish a deliberate approach to Life Cycle Management (LCM) of Live Training Family of Systems, providing the framework for future Life Cycle Efforts for the Hardware Product Line Framework.

2. In FY 2020, a new competitive IDIQ contract with a 1-year base and 7 single-year option periods was awarded to General Dynamics Mission Systems - CTIA will be executed under this contract.

3. The LVC-IA Enhanced Capability contract is the competitively awarded follow-on effort awarded in 3rd Quarter FY 2016. This contract has a two-year base and four single-year option periods to provide the additional capabilities for Versions 3, 4 and beyond. The contract was awarded to Cole Engineering and Science, Inc. (CESI) to provide for the development, fielding and training of each version capability for the designated Basis of Issue Plan (BOIP) sites and provide Post-Deployment Software Support (PDSS) for all currently fielded versions. In FY 2021, the program will commence competitive action to award the LVC-IA contract in the 2nd Quarter FY 2022; this follow-on award will continue concurrency effort through program completion slated for FY2035.

4. In FY 2022, FASIT will award the first year of a projected three-year Phase III SBIR for the maturation and product development of the Dynamic Infrared Projection capability. In FY 2022, the program will incrementally fund year 2 of a three-year the Phase III SBIR contract for the maturation and product development of the nonpyrotechnic battlefield effects replication technologies. FASIT will also incrementally fund year 2 of a Research and Development contract for the maturation and product development of the non-pyrotechnic battlefield effects replication technologies.

5. In FY2022, the Digital Range Training System (DRTS) will fund a new Delivery Order under the Life Cycle Product-line Management (LCPM) IDIQ contract, which will finalize the development and testing of the target Technical Data Package (TDP).

6. In FY 2019, OPFOR Surrogate Wheeled Vehicles (OSWV) pursued an organic solution to develop, integrate and test Visual Modifications for Tactical and Technical Vehicles.

7. In FY 2022, Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) will leverage the General Dynamics contract vehicle and competitive OTA approaches to address EUL / relevancy challenges as product lines reach those trigger points in their life cycle or changes to weapon system configurations drive those actions. This effort would enable a wide range of industry partners to integrate LTEC/LPAN into existing systems and execute Tech Refresh activities as required until Live STE capabilities are introduced.

8. In FY 2021, Home Station Instrumentation Training System (HITS) awarded a new delivery order on the General Dynamics contract.

9. In FY 2022, OPFOR Integrated Air Defense System (IADS) will start development of weapon processor software, integration with the training instrumentation systems at the Combat Training Centers (CTCs), and validate the solution through testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OneTESS Program Management	Various	PEO STRI : Orlando, FL	8.046	-		-		-		-		-	0.000	8.046	8.046
OneTESS Program Management	Various	PEO STRI, : Orlando, FL	2.040	-		-		-		-		-	0.000	2.040	2.040
HITS Program Management	Various	PEO STRI : Orlando, FL	1.348	-		-		-		-		-	0.000	1.348	1.348
CTC-IS Program Management	Various	PEO STRI : Orlando, FL	9.018	-		-		-		-		-	0.000	9.018	9.018
MSTC Program Management	Various	PEO STRI : Orlando, FL	0.952	-		-		-		-		-	0.000	0.952	0.952
I-MILES Program Management	Various	PEO STRI : Orlando, FL	0.511	-		-		-		-		-	0.000	0.511	0.511
EST Program Management	Various	PEO STRI : Orlando, FL	0.214	-		-		-		-		-	0.000	0.214	0.214
LVC-IA Program Management	Various	PEO STRI : Orlando, FL	10.865	0.162	Nov 2019	0.153	Nov 2020	0.225	Nov 2021	-		0.225	Continuing	Continuing	Continuing
Target Modernization	Various	PEO STRI : Orlando, FL	0.614	-		-		-		-		-	0.000	0.614	0.614
ETC-IS Program Management	Various	PEO STRI : Orlando, FL	0.164	-		-		-		-		-	0.000	0.164	0.164
CTIA	Various	PEO STRI : ORLANDO, FL	0.876	-		-		-		-		-	0.000	0.876	0.876
Soldier Fitness Program	TBD	Mulitple : Various	2.100	-		-		-		-		-	0.000	2.100	2.100
Suicide Prevention	TBD	Multiple : Various	4.313	-		-		-		-		-	0.000	4.313	4.313
SVT Program Management	Various	PEO STRI : Orlando, FL	0.049	-		-		-		-		-	0.000	0.049	0.049
OPFOR Integrated Air Defense System (IADS) Program Management	Various	PEO STRI : Orlando, FL	0.742	-		-		-		-		-	0.000	0.742	0.742
Congressional Add for Combined Arms Center	Various	PEO STRI : Huntsville, AL	0.177	-		-		-		-		-	0.000	0.177	0.177

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*	Project (Number/Name) 241 / *Nstd Combined Arms*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Integrated Air Defense System															
		Subtotal	42.029	0.162		0.153		0.225		-		0.225	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
I-MILES	Option/ IDIQ	General Dynamics Mission Systems : Orlando, FL	1.481	1.304	Oct 2019	2.700	Mar 2021	2.828	Dec 2021	-		2.828	Continuing	Continuing	Continuing
I-MILES RELEVANCY	SS/IDIQ	Lockheed Martin : Orlando, FL	3.922	1.215	May 2020	-		-		-		-	0.000	5.137	5.137
HITS	C/FFP	Riptide : Orlando, FL	1.379	-		-		-		-		-	0.000	1.379	1.379
HITS	C/IDIQ	General Dynamics Mission Systems : Orlando, FL 32826	4.009	2.427	Jul 2020	1.180	Jul 2021	-		-		-	0.000	7.616	7.616
HITS	Option/ IDIQ	General Dynamics Mission Systems (GDMS) : Orlando, FL 32826	3.154	1.058	Jan 2020	0.630	Jan 2021	4.153	Mar 2022	-		4.153	Continuing	Continuing	Continuing
MSTC Development	C/FP	Multiple : Various	5.128	0.473	Jul 2020	0.432	Jul 2021	0.502	Jul 2022	-		0.502	Continuing	Continuing	Continuing
LVC-IA Development	C/CPFF	Cole Engineering Services, Inc : Orlando, FL	29.822	-		-		-		-		-	0.000	29.822	29.822
LVC-IA Enhanced Capability	C/CPFF	Cole Engineering Services, Inc (CESI) : Orlando, FL	5.706	-		-		-		-		-	0.000	5.706	5.706
LVC-IA Enhanced Capability	Option/ CPFF	Cole Engineering Services, Inc (CESI) : Orlando, FL	9.769	3.794	Nov 2019	4.345	Nov 2020	0.661	Nov 2021	-		0.661	0.000	18.569	18.569
LVC-IA Follow-On Contract	C/TBD	TBD : TBD	-	-		-		1.981	Feb 2022	-		1.981	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*	Project (Number/Name) 241 / *Nstd Combined Arms*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OneTESS	SS/CPFF	General Dynamics C4 Systems : Orlando, FL 32826	10.430	-		-		-		-		-	0.000	10.430	10.430
EST Development	C/FP	Cubic Simulation Systems, Inc. : Orlando, FL 32809-3813	1.528	-		-		-		-		-	0.000	1.528	1.528
OneTESS	SS/CPFF	General Dynamics : Fairfax, VA	124.769	-		-		-		-		-	0.000	124.769	124.769
CTIA	C/CPFF	General Dynamics Mission Systems, Inc (GDMS) : Orlando, FL	-	2.420	Jan 2020	2.417	Jan 2021	2.550	Jan 2022	-		2.550	Continuing	Continuing	Continuing
Target Modernization	SS/CPFF	Digital Solid State Propulsion, Inc. : Reno, NV	-	-		2.163	Feb 2021	-		-		-	0.000	2.163	2.163
CTC-IS	C/IDIQ	General Dynamics Mission Systems : Orlando, Fl	42.586	2.519	Feb 2020	1.573	Mar 2021	0.541	May 2022	-		0.541	Continuing	Continuing	Continuing
Target Modernization	SS/CPFF	SensorMetrix : San Diego, CA	-	1.989	Jan 2020	1.487	Jan 2021	-		-		-	0.000	3.476	3.476
EST Enhanced Capabilities	C/FFP	Meggitt Training Systems, Inc. : Suwanee, GA 30024-1247	2.075	-		-		-		-		-	0.000	2.075	2.075
EST	C/FP	Nova Technologies : Panama City, FL 32404-6747	0.609	-		-		-		-		-	0.000	0.609	0.609
CTC IS	Option/ IDIQ	GENERAL DYMAMICS ONE SOURCE : ORLANDO, FL	-	-		-		1.948	Feb 2022	-		1.948	Continuing	Continuing	Continuing
Target Modernization	C/CPFF	JRM Technologies : Orlando	1.149	-		-		-		-		-	0.000	1.149	1.149

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Future Army System of Integrated Targets (FASIT) Battlefield Effects Devices	C/CPFF	General Dynamics One Source, LLC : Fairfax, VA	-	-		-		2.137	Feb 2022	-		2.137	Continuing	Continuing	Continuing
Future Army System of Integrated Targets (FASIT) Dynamic Infrared Projection	SS/CPFF	JRM Technologies : Orlando, FL	-	-		-		1.600	Jan 2022	-		1.600	Continuing	Continuing	Continuing
Future Army System of Integrated Targets (FASIT) Non-Pyro Effects	SS/CPFF	Digital Solid State Propulsion, Inc. : Reno, NV	-	-		-		2.122	Feb 2022	-		2.122	Continuing	Continuing	Continuing
Digital Range Training System (DRTS)	C/CPFF	General Dynamics Mission Systems : Orlando, FL	1.539	1.532	Jan 2020	-		-		-		-	0.000	3.071	3.071
Digital Range Training System (DRTS)	Option/ CPFF	General Dynamics One Source, LLC : Fairfax, VA	-	-		1.445	Jan 2021	1.184	Jan 2022	-		1.184	Continuing	Continuing	Continuing
OPFOR Integrated Air Defense System (IADS)	MIPR	PEO IEWS, PM Aircraft Survivability Equipment (ASE) : Huntsville, AL	21.371	-		-		-		-		-	0.000	21.371	21.371
OPFOR Integrated Air Defense System (IADS)	MIPR	Target Systems Management Office, PEO STRI, PEO STRI : Huntsville, AL	0.915	-		-		-		-		-	0.000	0.915	0.915
OPFOR Integrated Air Defense System (IADS) MANPADS	TBD	TBS : Orlando, FL	-	-		-		0.575	Dec 2021	-		0.575	Continuing	Continuing	Continuing
Radar Signal Emulator Development for IADS	C/TBD	To Be Determined : Orlando, FL	9.520	-		-		-		-		-	0.000	9.520	9.520
OPFOR Surrogate Wheeled Vehicles (OSWV)	IA	Tank Automotive Research Development and Engineering Center : Warren, MI	2.783	3.560	Mar 2020	-		-		-		-	0.000	6.343	6.343

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*	Project (Number/Name) 241 / *Nstd Combined Arms*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Unmanned Aerial System Swarm	Option/ CPFF	Colsa : Huntsville, AL	-	-		-		1.037	Jan 2022	-		1.037	Continuing	Continuing	Continuing
Congressional Add for Radio Frequency Emitters	C/TBD	ACC, Orlando : Orlando, Florida	-	3.500	Mar 2020	-		-		-		-	0.000	3.500	3.500
EST Enhanced Capabilities Adaptive Marksmanship and Intelligent Tutoring	C/FFP	Dignitas Technologies : Orlando, FL 32817	0.776	-		-		-		-		-	0.000	0.776	0.776
Integrated Military Operations in Urban Terrain (MOUT) Training System (IMTS)	C/CPFF	General Dynamcis Mission Systems : Orlando, FL	-	0.958	Jan 2020	-		-		-		-	0.000	0.958	0.958
Congressional Add for Combined Arms Center Threat Integrated Air Defense System	C/CPFF	Scientific Research Corporation : Huntsville, AL	9.823	-		-		-		-		-	0.000	9.823	9.823
Combat Training Center Live Fire Modernization (CTC Live Fire Mod)	C/CPFF	General Dynamics One Source, LLC : Fairfax, VA	-	-		2.409	Feb 2021	-		-		-	0.000	2.409	2.409
ETC-IS	SS/CPFF	General Dynamics C4 Systems : Orlando, FL 32826	4.836	-		-		-		-		-	0.000	4.836	4.836
CTIA	Option/ IDIQ	General Dynamics Mission Systems : Orlando, FL	20.808	-		-		-		-		-	0.000	20.808	20.808
Target Modernization	C/IDIQ	Pratt and Miller Engineering : Orlando, FL	6.600	-		-		-		-		-	0.000	6.600	6.600
CTC-IS	C/IDIQ	GENERAL DYMAMICS ONE SOURCE : Orlando, FL	4.436	1.571	Aug 2020	1.813	Aug 2021	1.397	Oct 2021	-		1.397	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604715A / *Non-System Training Devices - Eng Dev*	**Project (Number/Name)** 241 / *Nstd Combined Arms*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Target Modernization	Option/ CPFF	Pratt and Miller Engineering (P&M) : Orlando, FL	4.714	-		-		-		-		-	0.000	4.714	4.714
CFFT Enhanced Joint Fires Observer (JFO) Training and Certification Requirements	C/IDIQ	Nova Technologies : Panama City, FL 32404-6747	1.242	-		-		-		-		-	0.000	1.242	1.242
Congressional Add Center of Excellence for Military Operations in Urban Terrain and Cultural Trn	C/FP	Multiple : Various	2.996	-		-		-		-		-	0.000	2.996	2.996
Soldier/Squad Virtual Trainer (S/SVT) Program	C/CR	OTA - CUBIC and MEGGITT : Orlando, FL	5.534	-		-		-		-		-	0.000	5.534	5.534
Basic Electronics Maintenance Trainer (BEMT)	SS/FFP	Nida Corp : Melbourne, FL	-	0.173	Jan 2020	0.229	Nov 2020	0.306	Nov 2021	-		0.306	0.000	0.708	0.708
OPFOR Attack Aircraft Shoot-back Capability	C/TBD	TBS : Orlando, FL	-	-		0.194	Mar 2021	-		-		-	0.000	0.194	0.194
		Subtotal	345.409	28.493		23.017		25.522		-		25.522	Continuing	Continuing	N/A

Remarks

1. The Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) - FY22 is the final phase of the LTEC integration into VTESS and TVS. Consequently the effort is ramping down in terms of burn rate per month from FY21.
2. The LVC-IA program plans to award its follow-on contract in the 2nd quarter of FY 2022. This follow-on award will continues their concurrency efforts with the Synthetic Training Environment (STE) and Mission Command Information Systems (MCIS) through program completion slated for FY 2035.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CTIA	Various	Various : Various	12.844	-		-		-		-		-	0.000	12.844	12.844
OneTESS	Various	Various : Orlando, FL	6.596	-		-		-		-		-	0.000	6.596	6.596

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / *Non-System Training Devices - Eng Dev*	Project (Number/Name) 241 / *Nstd Combined Arms*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OneTESS	Various	Various : Various	0.262	-		-		-		-		-	0.000	0.262	0.262
Target Modernization	Various	Various : Various	0.192	-		-		-		-		-	0.000	0.192	0.192
		Subtotal	19.894	-		-		-		-		-	0.000	19.894	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OneTESS Development & Test	Various	Multiple : Orlando, FL	4.162	-		-		-		-		-	0.000	4.162	4.162
OneTESS Test Support	Various	Multiple : Orlando, FL	1.280	-		-		-		-		-	0.000	1.280	1.280
HITS	Various	Various : Orlando, FL	0.740	-		-		-		-		-	0.000	0.740	0.740
LVC-IA Test Support	Various	Multiple : Orlando, FL	11.233	1.130	Nov 2019	1.277	Nov 2020	0.631	Nov 2021	-		0.631	Continuing	Continuing	Continuing
IEDES	Various	Multiple : Orlando, FL	0.519	-		-		-		-		-	0.000	0.519	0.519
OPFOR Integrated Air Defense System (IADS)	SS/CPFF	Inter-Coastal Electronics, Inc. : Mesa, AZ	6.120	-		2.566	Mar 2021	-		-		-	0.000	8.686	8.686
I-MILES EPG Testing	MIPR	ATEC : FT Huachuca, AZ	0.162	-		-		0.162	Mar 2022	-		0.162	Continuing	Continuing	Continuing
		Subtotal	24.216	1.130		3.843		0.793		-		0.793	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	431.548	29.785		27.013		26.540		-		26.540	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604715A / *Non-System Training Devices - Eng Dev*	**Project (Number/Name)** 241 / *Nstd Combined Arms*

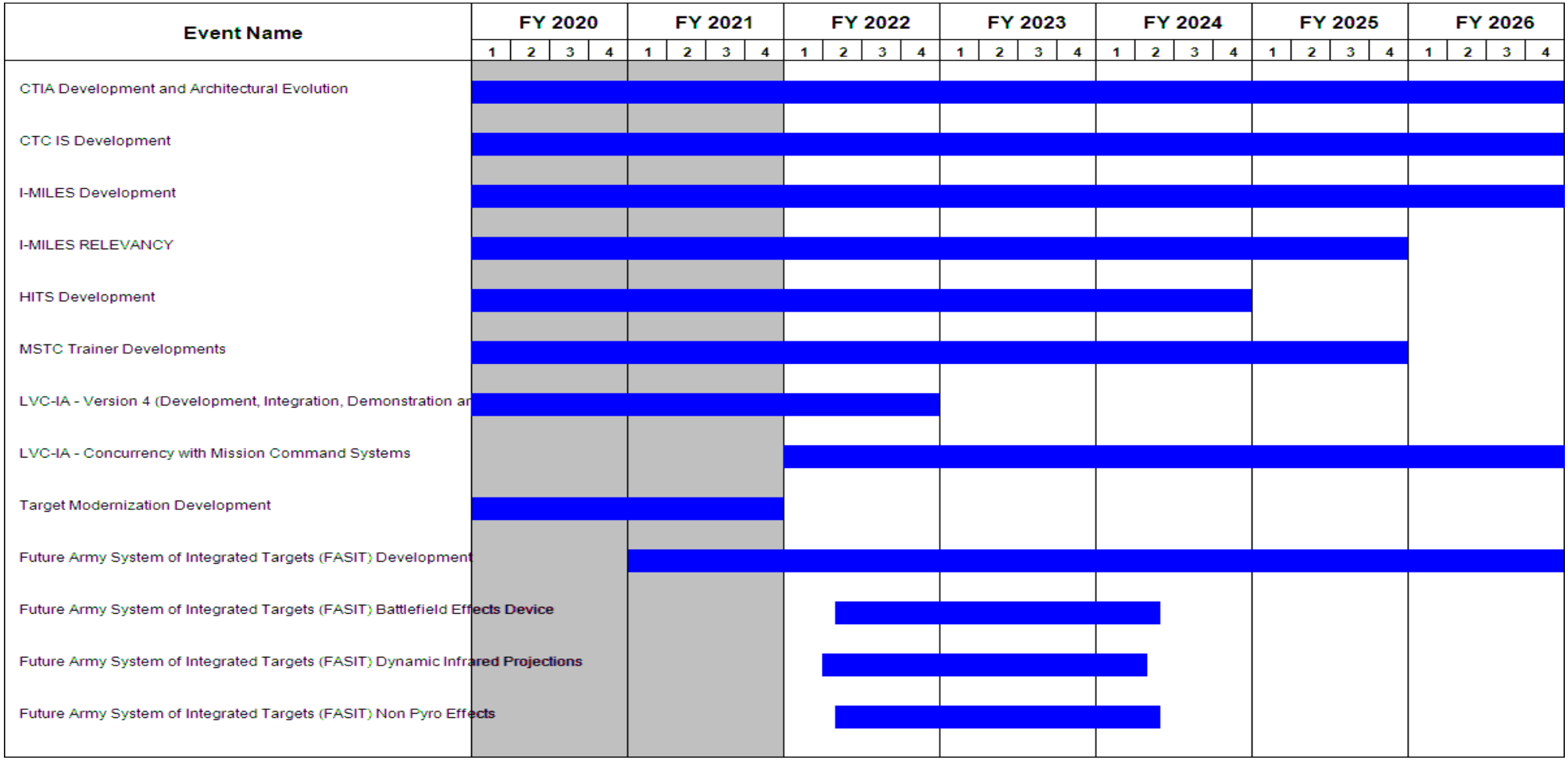

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604715A / *Non-System Training Devices - Eng Dev*	**Project (Number/Name)** 241 / *Nstd Combined Arms*

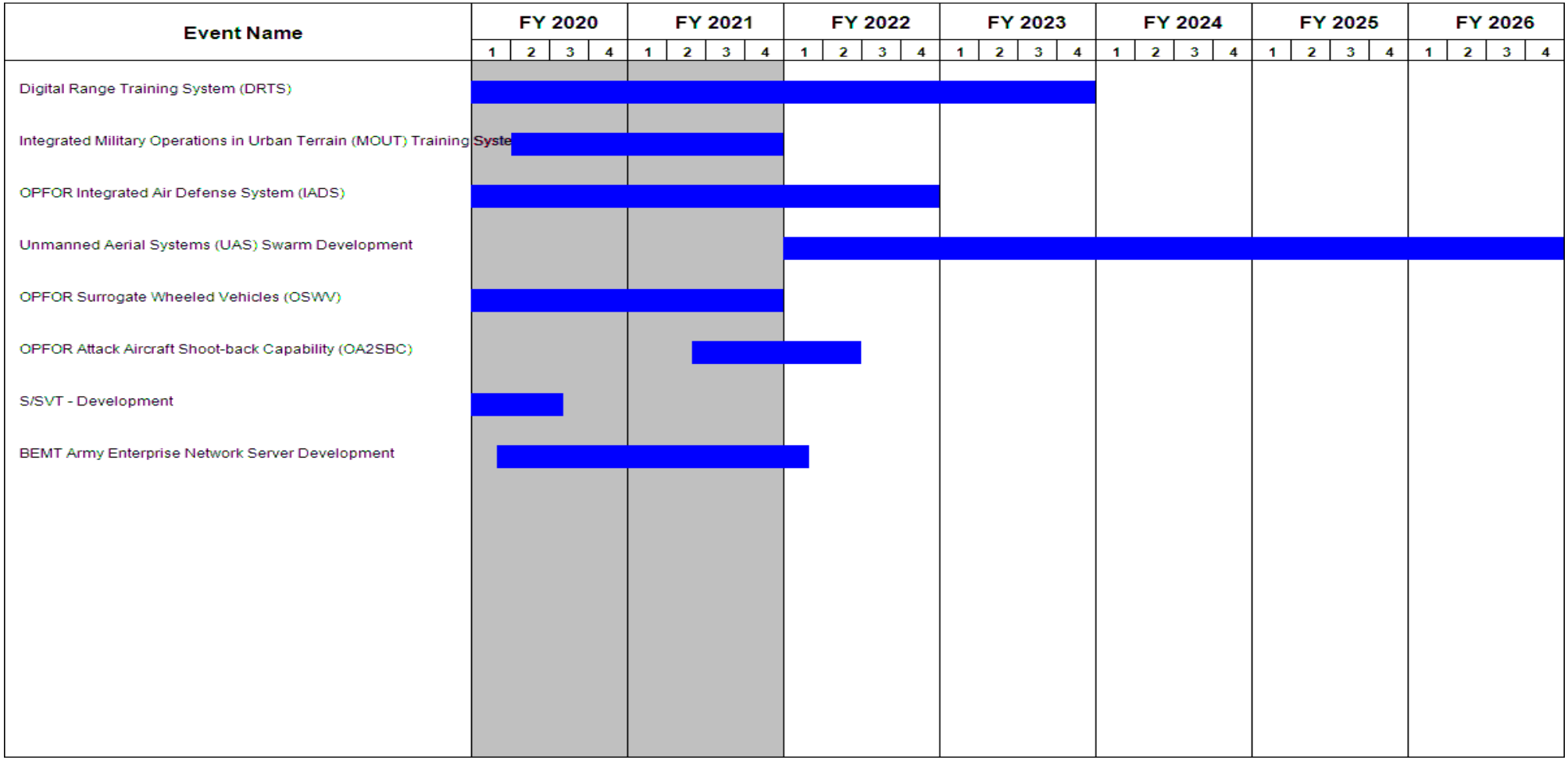

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604715A / *Non-System Training Devices - Eng Dev*	**Project (Number/Name)** 241 / *Nstd Combined Arms*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CTIA Development and Architectural Evolution	1	2012	4	2026
CTC IS Development	1	2010	4	2026
I-MILES Development	2	2017	3	2027
I-MILES RELEVANCY	2	2018	4	2025
HITS Development	3	2012	4	2024
MSTC Trainer Developments	2	2017	4	2025
LVC-IA - Version 3 (Development, Integration, Demonstration and Testing)	4	2016	3	2018
LVC-IA - Version 4 (Development, Integration, Demonstration and Testing)	4	2018	4	2022
LVC-IA - Concurrency with Mission Command Systems	1	2022	4	2035
Target Modernization Development	1	2016	4	2021
Future Army System of Integrated Targets (FASIT) Development	1	2021	4	2026
Future Army System of Integrated Targets (FASIT) Battlefield Effects Device	2	2022	2	2024
Future Army System of Integrated Targets (FASIT) Dynamic Infrared Projections	2	2022	2	2024
Future Army System of Integrated Targets (FASIT) Non Pyro Effects	2	2022	2	2024
Digital Range Training System (DRTS)	2	2018	4	2023
Integrated Military Operations in Urban Terrain (MOUT) Training System (IMTS)	2	2020	4	2021
OPFOR Integrated Air Defense System (IADS)	4	2017	4	2022
Unmanned Aerial Systems (UAS) Swarm Development	1	2022	4	2026
OPFOR Surrogate Wheeled Vehicles (OSWV)	2	2019	4	2021
OPFOR Attack Aircraft Shoot-back Capability (OA2SBC)	2	2021	2	2022
S/SVT - Development	3	2019	3	2020
BEMT Army Enterprise Network Server Development	1	2020	1	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604741A *I Air Defense Command, Control and Intelligence - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	70.279	62.058	59.518	-	59.518	-	-	-	-	-	-
126: *PEO Electronic Protect*	-	14.110	15.049	3.827	-	3.827	-	-	-	-	-	-
146: *Air & Msl Defense Planning Control Sys*	-	12.135	8.085	2.877	-	2.877	-	-	-	-	-	-
149: *Counter-Rockets, Artillery & Mortar*	-	6.084	0.875	-	-	-	-	-	-	-	-	-
FG5: *Counter Unmanned Aerial Systems (UAS)*	-	37.950	38.049	52.814	-	52.814	-	-	-	-	-	-

Note

Decrease in Fiscal Year (FY) 2022 as a result of Forward Area Air Defense Command and Control (FAAD C2) transitioning to sustainment.

A. Mission Description and Budget Item Justification

The FY 2022 Direct War/Enduring Operations dollars in the amount of $0.494 million in Project 126 will continue to support the Army Long-Range Persistent Surveillance (ALPS), which is a passive sensor that provides long range surveillance against Cruise Missile (CM), Fixed Wing (FW), Rotary Wing (RW), and Unmanned Aircraft System (UAS) threats. Prototype systems will be provided to meet EUCOM, INDOPACOM, and CENTCOM (JUON-CC-0576) identified operational needs and to conduct an assessment via a report by the combatant commander(s). The objectives of this effort are to provide component and subsystem maturity in a system-of-systems environment and to reduce subsequent integration risk into Joint and Army Command and Control systems.

The Air Missile Defense Planning and Control System (AMDPCS) provides integration of air and missile defense operations at all echelons. Specifically, the Air and Missile Defense Work Station (AMDWS) provides a correlated air picture using local radars, allowing the Commander the visibility and situational understanding of the airspace; automated defense design and staff planning tools in AMDWS afford soldiers horizontal and vertical collaborative planning with adjacent units. Air Defense System Integrator (ADSI) serves as a joint tactical data link gateway/air picture, and when correlated by FAAD C2 and displayed on AMDWS, provides a near real time, three dimensional air picture for the Commander. Joint Tactical Terminal (JTT) provides soldiers Theater Ballistic Missile (TBM) early warning, allowing them to take appropriate actions. AMDPCS is fielded to Army Air and Missile Defense Commands (AAMDC), Air Defense Artillery Brigades (ADA BDE), Air and Missile Defense Battalions (AMD BN), and Terminal High Altitude Area Air Defense Batteries (THAAD BTRY). Air Defense Airspace Management (ADAM), a variant of AMDPCS with similar capabilities, is fielded to Corps, Divisions, Brigade Combat Teams (BCT), and multi-functional support brigades. As part of the capability and technology reuse, AMDWS and FAAD C2 are core components of the Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems currently deployed in multiple areas of operation.

The C-RAM system-of-systems is an evolutionary program that detects RAM launches, provides localized warning to the defended area, intercepts rounds in flight, and enhances response to and defeat of enemy forces. C-RAM combines multi-service fielded and non-developmental item sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System [LPWS]), all connected via a wireless local area

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604741A *I Air Defense Command, Control and Intelligence - Eng Dev*

network. The FAAD C2 system has been enhanced to integrate the sensors, weapons, and warning systems to provide C2 for the C-RAM system-of-systems. FAAD C2 software correlates the RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. FAAD C2 employs an agile software development, maintenance, and sustainment strategy, with Urgent Materiel Releases (UMR) every six (6) months and Full Materiel Releases (FMR) every 15-18 months to keep pace with rapidly fielding integrated systems to meet operational needs. C-RAM capability in theater is supported through the Overseas Contingency Operations (OCO) process. Base RDT&E supports FAAD C2 basic Air Defense functionality as well as directed enhancements to the C-RAM system-of-systems capability, such as development and integration of C-RAM network security enhancements and development of all-digital radar technology to address emerging threats.

The FY 2022 Direct War/Enduring Operations dollars in the amount of $35.177 million in Project FG5 will continue to support the Counter-small Unmanned Aircraft System (C-sUAS) efforts will provide forces at all echelons with cross domain capabilities, while supporting joint operational requirements. These combined arms solutions will support the full kill-chain and result in solutions addressing Fixed/Semi Fixed Site, Mobile platform, and Dismounted missions. Development efforts are aligned with Joint Requirements Oversight Council Memorandum (JROCM) 078-20, which codifies the threshold and objective capability requirements for C-sUAS development and focuses on technologies which increase capabilities to identify, classify, track, and defeat Group 1 through 3 UAS threats.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	33.502	70.651	49.051	-	49.051
Current President's Budget	70.279	62.058	59.518	-	59.518
Total Adjustments	36.777	-8.593	10.467	-	10.467
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	37.950	-			
• SBIR/STTR Transfer	-1.173	-1.593			
• Adjustments to Budget Years	-	-	10.467	-	10.467

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 149: *Counter-Rockets, Artillery & Mortar*		
Congressional Add: *Multi-Layered Tactical Protection System*	5.000	-
Congressional Add Subtotals for Project: 149	5.000	-
Congressional Add Totals for all Projects	5.000	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604741A *I Air Defense Command, Control and Intelligence - Eng Dev*

Change Summary Explanation

FY 2022 Base increase of $10.467 million provided for increased interoperability and usability across multi-Service Counter-Unmanned Aircraft Systems (C-UAS) enduring solutions, to successfully execute Multi-Domain Operations, and for technological development of C-UAS capabilities supporting deployed systems, to keep pace with evolving threats in response to existing JUON CC-0558.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 126 / *PEO Electronic Protect*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
126: *PEO Electronic Protect*	-	14.110	15.049	3.827	-	3.827	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Army Long-Range Persistent Surveillance (ALPS) is a passive sensor that provides long range surveillance against Cruise Missile (CM), Fixed Wing (FW), Rotary Wing (RW), and Unmanned Aircraft System (UAS) threats. Prototype systems will be provided to meet EUCOM, INDOPACOM, and CENTCOM (JUON-CC-0576) identified operational needs and to conduct an assessment via a report by the combatant commander(s). The objectives of this effort are to provide component and subsystem maturity in a system-of-systems environment and to reduce subsequent integration risk into Joint and Army Command and Control systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: ALPS Development and Integration	14.110	15.049	3.827
Description: Provide ALPS systems to meet multiple Combatant Command (COCOM) operational needs and integrate ALPS into the Army Integrated Air and Missile Defense (AIAMD) architecture. Prototype systems are being provided to meet multiple Combatant Command operational needs and to conduct an assessment. The objectives of this effort are to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent integration risk. ALPS will also be integrated into the AIAMD architecture. ***FY 2021 Plans:*** Integrate, procure, deploy, and install ALPS Prototype systems to meet the urgent operational requirements of multiple combatant commands, specifically EUCOM, INDOPACOM, and CENTCOM. Site survey and operational activities will be supporting efforts to ensure mission success. ***FY 2022 Plans:*** Deploy and install ALPS prototype systems to meet the urgent operational requirements of multiple combatant commands, specifically EUCOM, INDOPACOM, and CENTCOM. Site survey and operational activities will support efforts to ensure mission success. Complete the combatant commander assessment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY22 funding has decreased because prototype production was completed in FY21. Program funds will exhaust at the end of FY22.			
Accomplishments/Planned Programs Subtotals	14.110	15.049	3.827

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 126 / *PEO Electronic Protect*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• EF9: *System Integration and Test*	93.743	-	0.182	-	0.182	-	-	-	-	-	-
• EX2: *Lower Tier Air Missile Defense (LTAMD) Capability*	364.154	308.805	327.690	-	327.690	-	-	-	-	-	-
• C50016: *System Integration and Test Procurement*	107.157	-	-	-	-	-	-	-	-	-	-
• FM3: *Future Interceptor*	1.918	-	7.895	-	7.895	-	-	-	-	-	-
• C53101: *MSE Missile*	702.437	678.148	776.696	-	776.696	-	-	-	-	-	-
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	9.337	62.461	25.253	-	25.253	-	-	-	-	-	-
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	41.690	4.813	39.376	-	39.376	-	-	-	-	-	-
• C14300: *M-SHORAD - Procurement*	233.300	517.287	331.575	-	331.575	-	-	-	-	-	-
• 0604820A: *Radar Development*	91.782	105.271	127.919	-	127.919	-	-	-	-	-	-
• S40: *Army Integrated Air and Missile Defense*	211.634	206.850	157.873	-	157.873	-	-	-	-	-	-
• BZ5075: *IAMD Battle Command System*	29.629	198.587	301.872	-	301.872	-	-	-	-	-	-
• 0604741A: *Air Defense Command, Control and Intelligence - Eng Dev*	70.279	62.058	59.518	-	59.518	-	-	-	-	-	-
• AD5070: *AIR & MSL Defense Planning & Control Sys*	39.061	62.517	67.193	-	67.193	-	-	-	-	-	-
• 0605052A: *Indirect Fire Protection Capability Inc 2 - Block 1*	186.369	153.362	233.512	-	233.512	-	-	-	-	-	-
• 149: *Counter-Rockets, Artillery & Mortar*	6.084	0.875	-	-	-	-	-	-	-	-	-
• 146: *Air & Msl Defense Planning Control Sys*	12.135	8.085	2.877	-	2.877	-	-	-	-	-	-

Remarks

ALPS was previously funded under PE 0603327A.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

D. Acquisition Strategy

ALPS utilizes an existing Defense Ordnance Technology Consortium (DOTC) Other Transaction Authority (OTA) to develop and integrate prototype systems to meet multiple Combatant Command operational needs. An assessment of the prototype systems, provided in response to Combatant Command operational needs, will be used to refine requirements and assess the Army's longer-term strategy.

ALPS is executing an acquisition strategy to rapidly deliver commercial off-the-shelf (COTS)-based prototypes to COCOMs based on urgent, operational requirements. ASA(ALT) designated PEO MS as the office of primary responsibility (OPR) for ALPS (19 Jan 2018 memo).

The ALPS Acquisition Strategy consists of rapid integration and deployment activities. Site survey, procurement of prototype systems, deployment of those systems, and contractor logistics support are the primary subordinate tasks within the ALPS efforts to rapidly integrate and deploy systems. These tasks will end by fourth quarter FY22 due to the conclusion of Urgent Need. ALPS will seek Operations and Maintenance, Army (OMA) Other Contingency Operations (OCO) for contractor logistics support of the systems after the end of funding, assuming COCOMs continued need for ALPS capability. ALPS will participate yearly in an integration event at the PEO MS level to integrate with current C2 and Air and Missile Defense (AMD) systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies & Government Program Management	Various	Various : Various	-	1.161		1.461		1.200		-		1.200	Continuing	Continuing	Continuing
		Subtotal	-	1.161		1.461		1.200		-		1.200	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALPS Development, Integration, and Installation	Various	Various : Various	-	12.949	May 2020	13.588	May 2021	2.627	May 2022	-		2.627	0.000	29.164	-
		Subtotal	-	12.949		13.588		2.627		-		2.627	0.000	29.164	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.110		15.049		3.827		-		3.827	Continuing	Continuing	N/A

Remarks

ALPS was previously funded under PE 0603327A.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

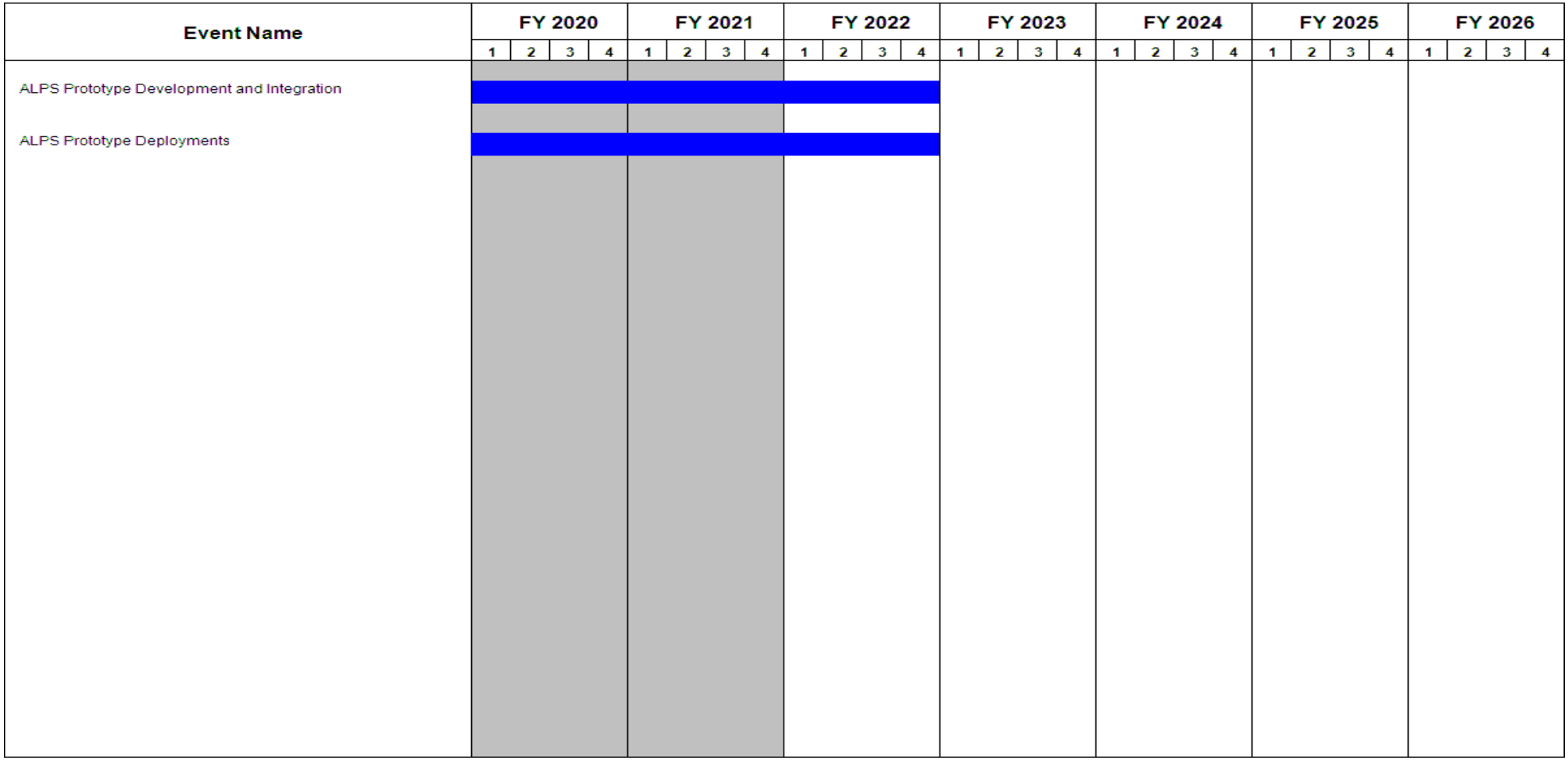

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALPS Prototype Development and Integration	1	2017	4	2022
ALPS Prototype Deployments	3	2019	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 146 / *Air & Msl Defense Planning Control Sys*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
146: *Air & Msl Defense Planning Control Sys*	-	12.135	8.085	2.877	-	2.877	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Missile Defense Planning and Control System (AMDPCS) provides integration of air and missile defense operations at all echelons. AMDPCS is comprised of the following major subsystems: Air Missile Defense Work Station (AMDWS) provides a correlated air picture using local radars, allowing the Commander the visibility and situational understanding of the airspace; tools in AMDWS afford Soldiers horizontal and vertical collaborative planning with adjacent units. Air Defense System Integrator (ADSI) serves as a joint tactical datalink gateway/air picture. Forward Area Air Defense Command and Control (FAAD C2), correlates the joint and local air picture and when displayed on AMDWS, provides a near real time, three dimensional air picture for the Commander. Joint Tactical Terminal (JTT) provides Soldiers Theater Ballistic Missile (TBM) early warning allowing them to take appropriate actions. AMDPCS are currently fielded to Army Air and Missile Defense Commands (AAMDC), Air Defense Artillery Brigades, (ADA BDE), Air and Missile Defense Battalions (AMD BN) and Terminal High Altitude Area Defense Batteries (THAAD BTRY). Air Defense Airspace Management (ADAM), a variant of AMDPCS, are fielded to Corps, Divisions, Brigade Combat Teams (BCTs) and multi-functional support brigades. AMDPCS is also being procured to support Interim Maneuver Short Range Air Defense (IM-SHORAD), European Deterrence Initiative (EDI), and Grow the Army (GTA) initiative. As part of the capability and technology reuse, AMDWS external interfaces are being leveraged by Integrated Battle Command System (IBCS) to avoid redevelopment of existing capabilities. AMDWS and FAAD C2 are core components of the Counter, Rocket, Artillery, Mortar (C-RAM) system-of-systems currently deployed in combat zones.

FY 2022 Base dollars in the amount of $2.887 million fund engineering, development, testing, and certification of AMDWS software, as well as accreditation of AMDPCS family-of-systems shelters and software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: AMDWS Software Development	10.373	7.305	2.202
Description: Supports LandWarNet, Common Operating Environments (COE), and Defense Information Systems Agency (DISA) architecture framework. AMDWS software engineering and development ensures interoperability and integration with maneuver battle command elements. AMDWS will interface with Integrated Air and Missile Defense (IAMD) and serves as a planning tool for the system-of-systems, as well as providing external interfaces.			
FY 2021 Plans: Maintain interoperability with COE, Integrated Tactical Network (ITN), and DISA requirements. Enhance capabilities, ensure continued interoperability with Army, Joint, and Coalition planning systems in order to support warfighter functions, and maintain cyber compliance. Support engineering and improvements to threat sets and weapon platform capabilities for C-UAS planning			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
and defense design, and provide expanded integration with Integrated Air and Missile Defense Battle Command System (IBCS). Provide the ability to employ a non-tactical workstation connected to a distant server in order to receive and disseminate air tracks. ***FY 2022 Plans:*** Funding maintains cyber security compliance and interoperability updates. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 adjustment due to program progression through life cycle.			
Title: Engineering, Development, Test and Evaluation ***Description:*** Ensure interoperability and cyber compliance through engineering, development, test, and evaluation of the AMDPCS family-of-systems shelter objective configurations; execute evaluation and finalization of the AMDPCS tactical communications, data processing, and vehicle/shelter/power generation/environmental system block upgrade program for fielded systems. ***FY 2021 Plans:*** Continue evaluations and development of emerging technologies and hardware to ensure network and cyber compliance. Continue support, development, and evaluation of IBCS-ADAM COE configurations, ensuring equipment meets Army requirements IAW command post-directed requirement, 14 December 2017. ***FY 2022 Plans:*** Support updates to the AMDPCS family-of-systems shelter objective configurations and migration to Integrated Battle Command System (IBCS) configuration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decrease due to program convergence with IBCS.	1.005	0.529	0.424
Title: Software System Certification Testing, Accreditation, and Approval of Authority-to-Operate (ATO) ***Description:*** Accomplish software system certification testing, accreditation, and approval of ATOs for the various software systems; BitLocker encryption and other authorized/approved G6 software implementation; Army and joint integration and interoperability assessments. ***FY 2021 Plans:***	0.757	0.251	0.251

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Conduct one Army Interoperability Certification (AIC) for each of the AMDPCS software sub-systems (AMDWS, ADSI, and CDS3), leading to ATO re-accreditation and Full Material Release (FMR), ensuring Army, joint, and coalition integration and interoperability compliance. ***FY 2022 Plans:*** Conduct one Army Interoperability Certification (AIC) test and test activities required to maintain Authority to Operate (ATO).			
Accomplishments/Planned Programs Subtotals	12.135	8.085	2.877

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• AD5070: *AIR & MSL Defense Planning & Control Sys*	39.061	62.517	67.193	-	67.193	-	-	-	-	-	-
• 0605457A: *Army Integrated Air and Missile Defense (AIAMD)*	211.634	206.850	157.873	-	157.873	-	-	-	-	-	-
• BZ5075: *IAMD Battle Command System*	29.629	198.587	301.872	-	301.872	-	-	-	-	-	-
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	41.690	4.813	39.376	-	39.376	-	-	-	-	-	-
• C14300: *M-SHORAD - Procurement*	233.300	517.287	331.575	-	331.575	-	-	-	-	-	-

Remarks

This program is an integral part of the Army Integrated Fires Mission Command (IFMC) convergence capability for Integrated Battle Command System (IBCS) architecture.

D. Acquisition Strategy

The acquisition strategy relies on non-development items (NDI) and evolutionary software development to rapidly meet the demands of air defense battle management command, control, communications, computers, and intelligence (BM/C4I) requirements and to keep pace with automated information technologies. The concept of evolutionary software development will be accomplished in a series of AMDWS block releases and upgrades. AMDPCS is being developed and fielded to both the Army's Active and Reserve components.

The AMDWS software development contract is sole source (SS)/cost plus fixed fee (CPFF) to Northrop Grumman.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 146 / *Air & Msl Defense Planning Control Sys*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	33.269	0.757	Dec 2019	0.839	Dec 2020	0.291	Dec 2021	-		0.291	Continuing	Continuing	Continuing
		Subtotal	33.269	0.757		0.839		0.291		-		0.291	Continuing	Continuing	N/A

Remarks

Not Applicable

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMDWS Software Development and Engineering	SS/CPFF	Northrop Grumman : Huntsville AL	168.321	10.373	Oct 2019	6.432	Oct 2020	2.142	Oct 2021	-		2.142	Continuing	Continuing	Continuing
PIFF Development Engineering	C/FFP	Telephonics : Farmingdale NY	14.340	-		-		-		-		-	0.000	14.340	-
ADSI Software Development and Engineering	SS/T&M	Ultra Electronics : Austin, TX	6.859	-		-		-		-		-	0.000	6.859	-
Developmental Engineering	Various	Various : Various	46.454	0.885	Dec 2019	0.755	Dec 2020	0.383	Dec 2021	-		0.383	Continuing	Continuing	Continuing
		Subtotal	235.974	11.258		7.187		2.525		-		2.525	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Certification/Testing	Various	JITC : Ft Huachuca, AZ	1.433	0.051	Feb 2020	0.025	Feb 2021	0.026	Feb 2022	-		0.026	Continuing	Continuing	Continuing
Interoperability Assessment	Various	CTSF : Ft Hood, TX	1.861	0.069	May 2020	0.034	May 2021	0.035	May 2022	-		0.035	Continuing	Continuing	Continuing
		Subtotal	3.294	0.120		0.059		0.061		-		0.061	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 146 / *Air & Msl Defense Planning Control Sys*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	272.537	12.135		8.085		2.877		-		2.877	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

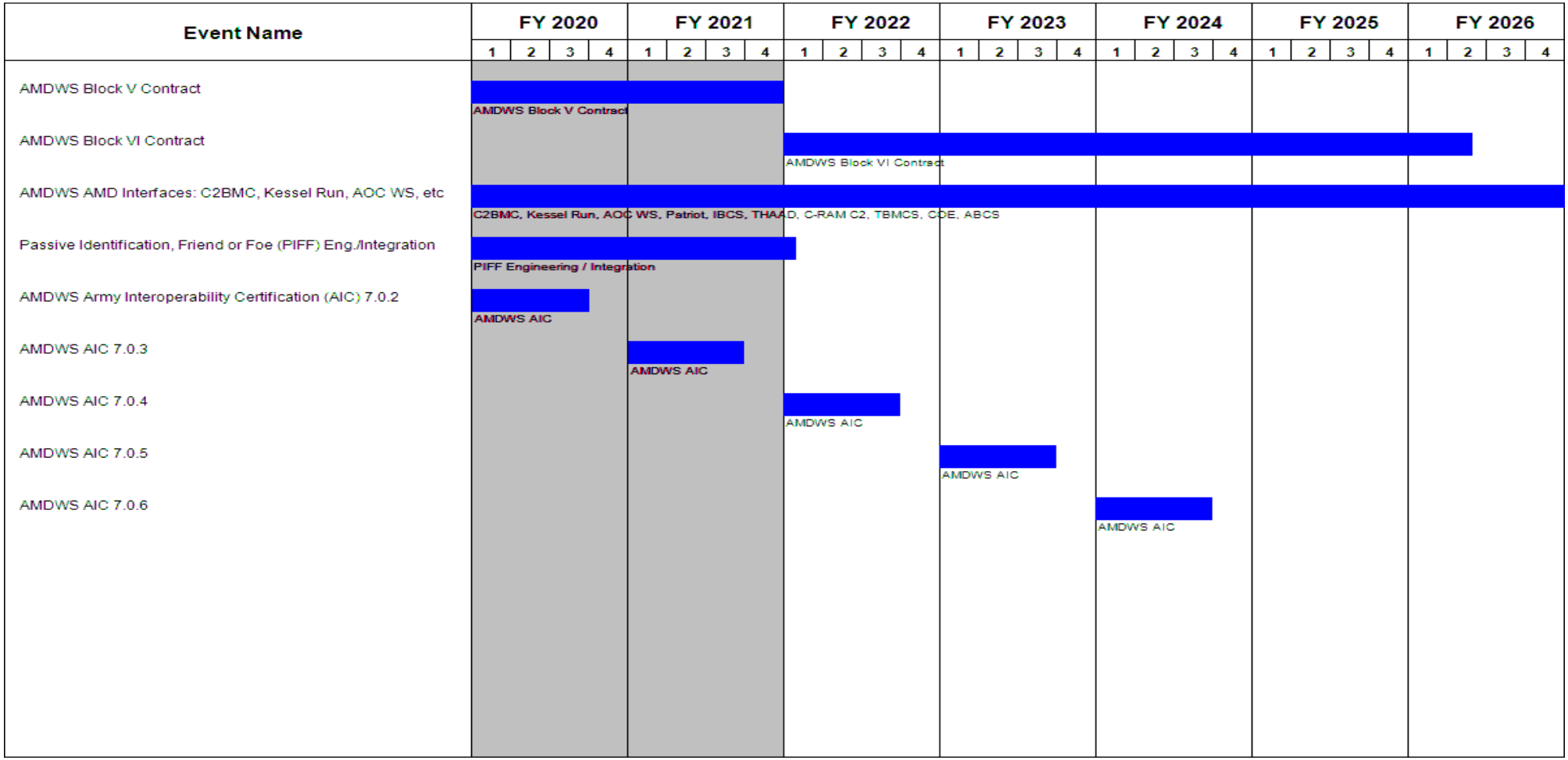

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AMDWS Block V Contract	2	2011	4	2021
AMDWS Block VI Contract	1	2022	2	2026
AMDWS AMD Interfaces: C2BMC, Kessel Run, AOC WS, etc	4	2012	4	2030
Passive Identification, Friend or Foe (PIFF) Eng./Integration	4	2018	1	2022
ADSI Software Engineering Development and Test	1	2006	4	2017
AWA 16.1 (COE ADAM) DOTMLPF Eval / NIE 16.2	4	2015	4	2017
Army Warfighting Assessment (AWA) 17.1 / NIE 17.2	4	2016	3	2017
Army Warfighting Assess. 18.1 / Network Integration Eval. 18.2	4	2017	3	2018
AMDWS Software Certification Test (SCT) 7.0.2	3	2019	4	2019
AMDWS Army Interoperability Certification (AIC) 7.0.2	1	2020	3	2020
AMDWS AIC 7.0.3	1	2021	3	2021
AMDWS AIC 7.0.4	1	2022	3	2022
AMDWS AIC 7.0.5	1	2023	3	2023
AMDWS AIC 7.0.6	1	2024	3	2024

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 149 / *Counter-Rockets, Artillery & Mortar*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
149: *Counter-Rockets, Artillery & Mortar*	-	6.084	0.875	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease in Fiscal Year (FY) 2022 as a result of Forward Area Air Defense Command and Control (FAAD C2) transitioning to sustainment.

A. Mission Description and Budget Item Justification

The Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems detects RAM launches, provides localized warning to the defended area, intercepts rounds in flight, and enhances response to and defeat of enemy forces. C-RAM combines multi-service fielded and non-developmental item sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System [LPWS]), all connected via a wireless local area network. The FAAD C2 system integrates the sensors, weapons, and warning systems to provide C2 for the CRAM system-of-systems. FAAD C2 software correlates the RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. FAAD C2 employs an agile software development strategy, with Urgent Materiel Releases (UMR) every six months and Full Materiel Releases (FMR) every 15-18 months. Base RDT&E supports FAAD C2 basic Air Defense functionality and incorporation of new Link-16 messaging.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: FAAD C2 Software Development and Enhancements	1.084	0.875	-
Description: Funds system-of-systems development and upgrades based on the bi-annual release of the Integrated Air and Missile Defense (IAMD) Validated Online Lifecycle Threat (VOLT) and changes in threat, integration of emerging requirements from external PMs (Mission Command) and other services/agencies, technology insertions (Internet Protocol-based communications), and interoperability requirements (joint interoperability, military standard, information assurance compliance, external interface updates). Provides development and regression testing to ensure C-RAM C2 enhancements do not negatively impact the performance of the C-RAM system-of-systems. Includes continued development of electronic warfare capabilities to counter evolving threats. Includes product assurance and further incorporation of new Link-16 messaging.			
FY 2021 Plans: Support FAAD C2 development and enhancements based on changes in threat (e.g., air track algorithm and battle manager improvements) and incorporate Link-16 Military Standard updates.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Decrease in FY 2022 is a result of FAAD C2 transitioning to sustainment. In FY 2020 FAAD C2 was selected as an interim joint command and control solution for the Department of Defense counter-Unmanned Aircraft System (c-UAS) mission.			
Accomplishments/Planned Programs Subtotals	1.084	0.875	-

	FY 2020	FY 2021
Congressional Add: Multi-Layered Tactical Protection System	5.000	-
FY 2020 Accomplishments: Multi-Layered Tactical Protection System		
Congressional Adds Subtotals	5.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• H30504: *C-RAM Enhancements*	9.127	20.069	6.153	-	6.153	-	-	-	-	-	-
• 146: *Air & Msl Defense Planning Control Sys*	12.135	8.085	2.877	-	2.877	-	-	-	-	-	-
• AD5070: *AIR & MSL Defense Planning & Control Sys*	39.061	62.517	67.193	-	67.193	-	-	-	-	-	-
• S40: *Army Integrated Air and Missile Defense*	211.634	206.850	157.873	-	157.873	-	-	-	-	-	-
• BZ5075: *IAMD Battle Command System*	29.629	198.587	301.872	-	301.872	-	-	-	-	-	-
• E10: *Sentinel*	91.782	105.271	127.919	-	127.919	-	-	-	-	-	-
• L86: *LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)*	4.711	5.179	-	-	-	-	-	-	-	-	-
• L88: *Enhanced AN/TPQ 36*	11.872	13.099	-	-	-	-	-	-	-	-	-
• B05201: *Lightweight Counter Mortar Radar*	5.400	5.332	-	-	-	-	-	-	-	-	-
• B05310: *AN/TPQ-53 Counterfire Target Acquisition Radar*	16.416	71.404	-	-	-	-	-	-	-	-	-
• FG5: *Counter Unmanned Aerial Systems (UAS)*	37.950	38.049	52.814	-	52.814	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• H30505: *Counter Unmanned Aerial Systems (C-UAS) Efforts*	20.000	41.000	-	-	-	-	-	-	-	-	-
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	41.690	4.813	39.376	-	39.376	-	-	-	-	-	-

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

The C-RAM program is following an evolutionary acquisition strategy for rapid fielding of mature technology to the user. The objective of the strategy is to balance needs, available technology, and resources to quickly provide a robust capability to engage RAM threats. Multiple C-RAM systems have transitioned to acquisition programs, including C-RAM Intercept, which fields existing LPWS guns to two Indirect Fire Protection Capability/Avenger battalions, and RAM Warn, which provides early, localized warning to all maneuver brigade combat teams. Development and upgrade of FAAD/C-RAM C2 software, to include enhanced capability to support emerging mission command requirements, technology insertion, and interoperability, is accomplished through a five-year CPIF contract awarded to Northrop Grumman Mission Systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 149 / *Counter-Rockets, Artillery & Mortar*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	26.751	0.078	Nov 2019	0.073	Nov 2019	-		-		-	Continuing	Continuing	Continuing
		Subtotal	26.751	0.078		0.073		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-RAM C2 Development and Enhancements	C/CPIF	Northrop Grumman : Redondo Beach, CA	107.489	1.006	Apr 2020	0.802	Apr 2021	-		-		-	Continuing	Continuing	Continuing
Secure Communications	SS/CPFF	Northrop Grumman : Huntsville, AL	9.578	-		-		-		-		-	0.000	9.578	-
Secure Communications (Next Gen)	C/CPFF	Northrop Grumman : Huntsville, AL	15.000	-		-		-		-		-	0.000	15.000	-
All-Digital Radar Development	C/FFP	Raytheon Company : Andover, MA	16.000	-		-		-		-		-	Continuing	Continuing	Continuing
LPWS Enhancements	C/CPIF	Raytheon Company : Tucson, AZ	10.307	-		-		-		-		-	0.000	10.307	-
Multi-Layered Tactical Protection System	SS/FFP	DOTC Kord - Rocky Research : Huntsville, AL	-	5.000	Sep 2020	-		-		-		-	0.000	5.000	-
		Subtotal	158.374	6.006		0.802		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Miscellaneous Test Support	Various	Various : Various	24.210	-		-		-		-		-	Continuing	Continuing	Continuing
End-to-End Modeling & Simulation	SS/CPFF	Northrop Grumman : Redondo Beach, CA	14.615	-		-		-		-		-	0.000	14.615	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 149 / *Counter-Rockets, Artillery & Mortar*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	38.825	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	223.950	6.084		0.875		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

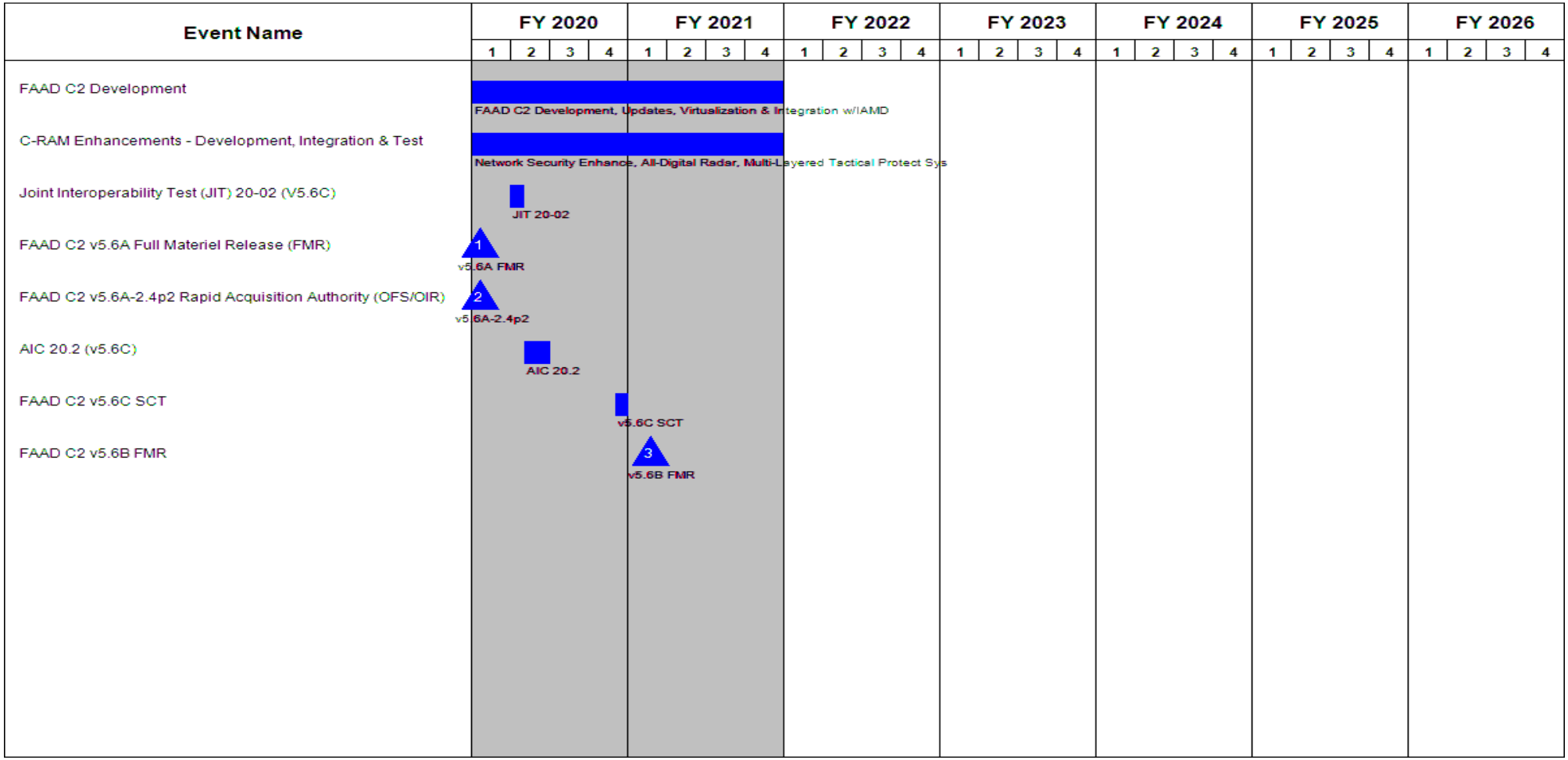

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-RAM C2 v5.5C-2.0 Full Material Release (FMR)	2	2016	2	2016
FAAD C2 Development	1	2013	4	2021
C-RAM Directed Enhancements - Integration & Test	1	2012	4	2017
C-RAM Enhancements - Development, Integration & Test	1	2016	4	2021
LPWS Sp. 6.4.1 Urgent Materiel Release (UMR)	4	2017	4	2017
C-RAM C2 v5.5C-2.2p3 Full Software Release	3	2018	3	2018
C-RAM C2 v5.6A-1.0p1.1 and v5.6A-1.0p3 Urgent Materiel Release (UMR)	4	2018	4	2018
LPWS Sp. 6.4.3.1 and FAAD C2 v5.6A-2.2 UMR	2	2019	2	2019
FAAD C2 v5.6A-2.4 UMR	3	2019	3	2019
FAAD C2 v5.6B System Certification Test (SCT)	3	2019	3	2019
Army Interoperability Certification (AIC) T11.24 (v5.6B)	4	2019	4	2019
Joint Interoperability Test (JIT) 20-02 (V5.6C)	1	2020	2	2020
FAAD C2 v5.6A Full Materiel Release (FMR)	1	2020	1	2020
C-RAM C2 v5.5C-2.0 Full Materiel Release (FMR)	2	2016	2	2016
C-RAM Intercept Operational Assessment (OA)	2	2015	2	2015
C-RAM Intercept (LPWS Spiral 6.0) Materiel Release	3	2016	3	2016
FAAD C2 v5.6A-2.4p2 Rapid Acquisition Authority (OFS/OIR)	1	2020	1	2020
AIC 20.2 (v5.6C)	2	2020	2	2020
FAAD C2 v5.6C SCT	4	2020	4	2020
FAAD C2 v5.6B FMR	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) FG5 / *Counter Unmanned Aerial Systems (UAS)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
FG5: *Counter Unmanned Aerial Systems (UAS)*	-	37.950	38.049	52.814	-	52.814	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Counter-small Unmanned Aircraft System (C-sUAS) efforts will provide forces at all echelons with cross domain capabilities, while supporting joint operational requirements. These combined arms solutions will support the full kill-chain and result in solutions addressing Fixed/Semi Fixed Site, Mobile platform, and Dismounted missions. Development efforts are aligned with Joint Requirements Oversight Council Memorandum (JROCM) 078-20, which codifies the threshold and objective capability requirements for C-sUAS development and focuses on technologies which increase capabilities to identify, classify, track, and defeat Group 1 through 3 UAS threats. Funding supports:

Fixed/Mobile System Development

FY 2022 Base dollars in the amount of $15.965 million will support development, integration, and testing of C-UAS solutions.

Tech Refresh for Army JUON/JEON Efforts:

FY 2022 Base dollars in the amount $1.690 million provide technology refreshes in support of existing Army JEON system improvements in response to ST-0008, to provide Army priority fixed sites with the ability to detect, engage and defeat group 1 and 2 UAS (managed by PEO Intelligence, Electronic Warfare and Sensors (IEWS)).

FY 2022 Base dollars in the amount of $5.050 million support technological development of C-UAS capabilities supporting deployed systems, to keep pace with evolving threats in response to existing JUON CC-0558 (managed by PEO MS).

FY 2022 Base dollars in the amount of $30.234 million JUON CC-0558 support prototype development, evaluation and test of a UAS detection system with Man-Out-of-the-Loop (MOTL) operations providing passive UAS search, target interrogation and verification.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: JCO OMNIBUS Funding ***Description:*** FY20 OMNIBUS reprogramming approved by Congress.	37.950	-	-
Title: Fixed/Mobile System Development	-	9.673	15.965

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Development, integration, and testing of incremental improvements to existing Counter-Unmanned Aircraft Systems (C-UAS) solutions, including test planning to support an annual PEO MS-led Multi-Domain Operations test/demonstration event beginning in FY23, to include biennial Survivability Resiliency/Cyber-Electromagnetic Activities exercises with an event planned in FY22. ***FY 2021 Plans:*** FY 2021 Base funding will support software and firmware enhancements to the Low, slow, small-UAS Integrated Defeat System (LIDS) Position Navigation and Timing (PNT) kit, to improve detection of mid- and high-band threats, and development of a LIDS cognitive radio frequency machine learning/artificial intelligence application able to adapt to electromagnetic environment conditions and discriminate signals of interest in cluttered environments. Also supports twice-yearly C-UAS System of Systems integration/record tests for new and enhanced components, systems, and subsystems. ***FY 2022 Plans:*** FY 2022 Base funding will support efforts aligned with JROCM 078-20 and Army Requirements, including hardware and software development for a small, flat-panel fire control radar to provide Fixed Site LIDS (FS-LIDS) and mounted systems with an enhanced air surveillance capability against fixed wing, rotary wing, and Groups 1-3 UASs. Also supports twice-yearly CUAS System of Systems integration/record tests for new and enhanced components, systems, and subsystems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 Base funds increase due to continuing C-UAS mission requirements.			
Title: OSD Universal C2 Demonstration Support ***Description:*** Development, integration, testing, and demonstration of C-sUAS C2 interoperability improvements for multi-domain C-UAS engagements. ***FY 2021 Plans:*** FY 2021 Base funding will support a demonstration of Universal C2 protocols and interfaces into the existing C-sUAS C2 system. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decrease due to completion of demonstration.	-	8.376	-
Title: Tech Refresh for Army JUON/JEON Efforts ***Description:*** This effort provides technology refreshes in response to ST-0008 and continues technological development of C-UAS capabilities supporting deployed systems in response to JUON CC-0558. ***FY 2021 Plans:***	-	5.000	6.722

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 OCO funding will support technological development of C-UAS systems, to keep pace with evolving threats in response to existing JUON CC-0558. ***FY 2022 Plans:*** FY 2022 Base funding will provide technology refreshes in support of existing Army JEON system improvements in response to ST-0008 to provide Army priority fixed sites with the ability to detect, engage and defeat group 1 and 2 UAS. This funding will also support technological development of C-UAS systems deployed under existing JUON CC-0558, to include improvements to electronic warfare effectiveness against current and future threats. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 Base funds increase due to continuing C-UAS mission requirements.			
Title: Family of Counter UAS Systems (FoCUS) ***Description:*** This effort continues work started under C-UAS Capability Development. FoCUS is a passive, platform agnostic, medium-range, day/night, modular UAS detection prototype system with Man-Out-of-the-Loop (MOTL) operations that provides passive UAS search, target interrogation and verification. ***FY 2021 Plans:*** FY 2021 funding provides next evolution SIM revisions, advanced component development, safety improvements, vehicle integration, component MIL STD testing, user evaluations, prototype operation, independent testing, and delivery of two Inc 1A prototypes. ***FY 2022 Plans:*** FY 2022 Base funding continues software development efforts increasing Artificial Intelligence and Machine Learning Algorithms used by JCO-identified "C2 Decision Aids" solutions, integrates additional passive sensor capabilities (e.g., passive radar and DRVID), and increases other prototype user interfaces. Continues to integrate advanced sensor input devices and output capabilities needed for a passive capability. Delivers two Inc 1B prototypes, resets Inc 1A prototypes, and provides sparing for transition of the prototypes to ARSOF for sustainment and CONOPS/TTP development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 Base funds increase due to continuing C-UAS mission requirements and completing development of Inc 1B prototypes.	-	15.000	30.127
Accomplishments/Planned Programs Subtotals	37.950	38.049	52.814

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• H30505: *Counter Unmanned Aerial Systems (C-UAS) Efforts*	20.000	41.000	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The C-UAS program is transitioning from rapid deployment of interim capabilities, in response to Joint Urgent Operational Need (JUON) CC-0558 and ST-0008, to a formalized acquisition approach. Technical refreshes will enable the JUONs capabilities to remain current, and incremental improvements will mitigate gaps created by threat sUAS Groups 1-3 until they can be acquired using a formal Program of Record based on a Capabilities Development Document (CDD). An Abbreviated-Capabilities Development Document (A-CDD) will address future C-sUAS requirements, creating enduring next generation C-UAS solutions. The C-UAS program will leverage the flexibility of the Adaptive Acquisition Framework by pursuing a combination of acquisition pathways, including Middle Tier of Acquisition (i.e., rapid prototyping and rapid fielding) and Major Capability Acquisition, where appropriate.

The C-UAS program incorporates development and test for survivability and resiliency in denied environments and will incorporate emerging technologies as they mature.

C-UAS efforts utilize multiple contract vehicles, types, and vendors.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) FG5 / *Counter Unmanned Aerial Systems (UAS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management - JUON CC-0558	Various	Various : Various	31.800	-		0.769	Dec 2020	1.928	Nov 2021	-		1.928	Continuing	Continuing	-
Program Management - FoCUS	Various	Various : Various	-	-		-		3.050	Nov 2021	-		3.050	0.000	3.050	-
		Subtotal	31.800	-		0.769		4.978		-		4.978	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fixed/Mobile System Development	Various	Various : Various	85.149	-		7.717	Mar 2021	12.776	Mar 2022	-		12.776	Continuing	Continuing	-
Kinetic Defeat Development	Various	Various : Various	138.953	-		-		-		-		-	0.000	138.953	-
Sensor Development	Various	Various : Various	94.439	-		-		-		-		-	0.000	94.439	-
C-UAS C2 Software Development	C/CPIF	Northrop Grumman : Redondo Beach, CA	30.490	-		8.376	Apr 2021	-		-		-	Continuing	Continuing	-
Dismounted/Handheld Systems Development	Various	Various : Various	19.022	-		-		-		-		-	0.000	19.022	-
Family of Counter UAS Systems (FoCUS)	Various	Various : Various	-	-		15.000	Jan 2022	23.077	Jan 2022	-		23.077	Continuing	Continuing	-
FY20 OMNIBUS Funding	Various	Various : Various	-	37.950		-		-		-		-	0.000	37.950	-
Tech Refresh for Army JUON/JEON Efforts	TBD	Various : Various	-	-		5.000	Mar 2021	6.722	Mar 2022	-		6.722	Continuing	Continuing	-
		Subtotal	368.053	37.950		36.093		42.575		-		42.575	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support - JUON CC-0558	Various	Various : Various	64.622	-		1.187		1.261	Dec 2021	-		1.261	Continuing	Continuing	-
Test Support - FoCUS	Various	Various : Various	-	-		-		4.000	Dec 2021	-		4.000	0.000	4.000	-
		Subtotal	64.622	-		1.187		5.261		-		5.261	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	464.475	37.950		38.049		52.814		-		52.814	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

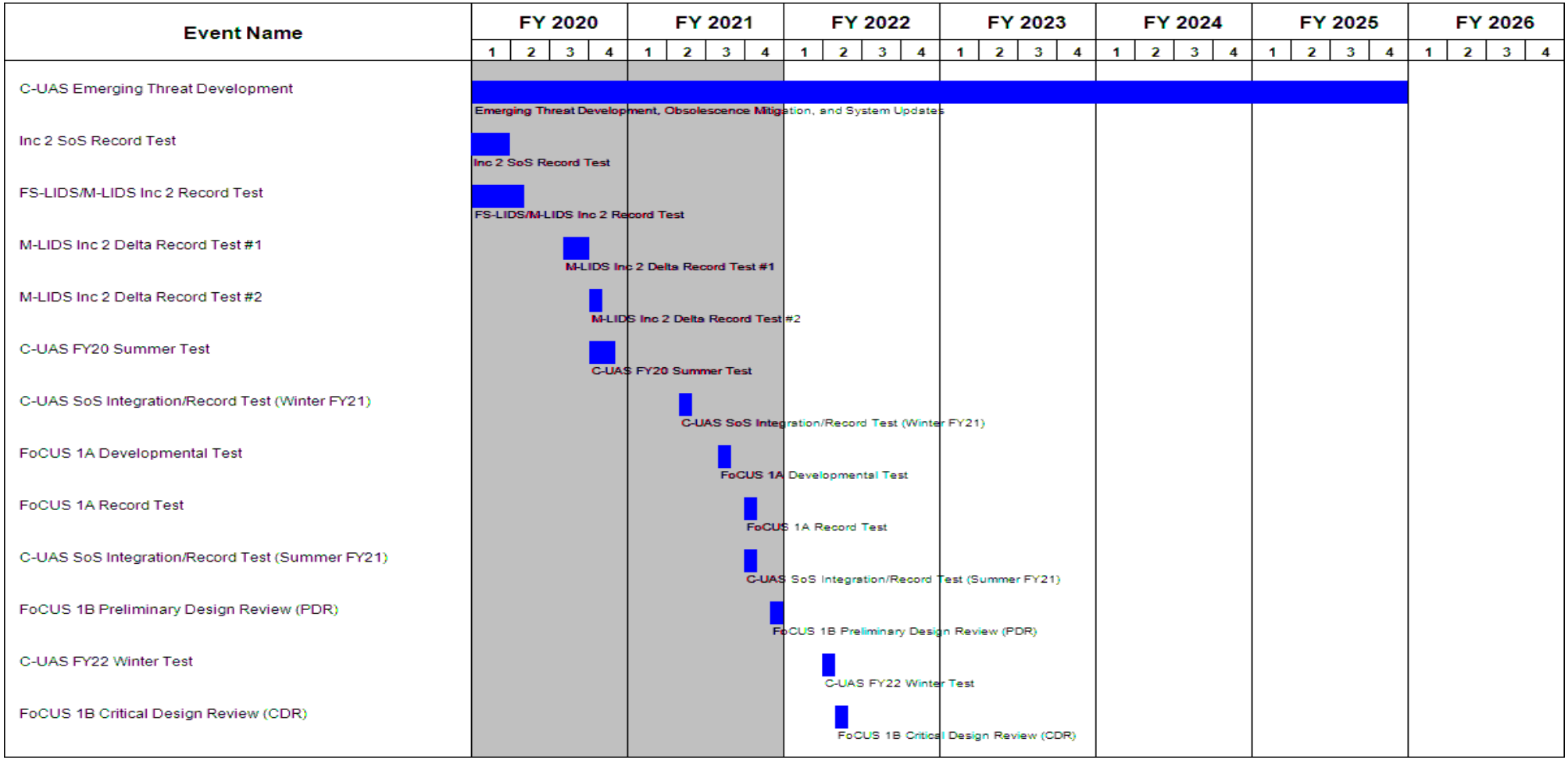

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

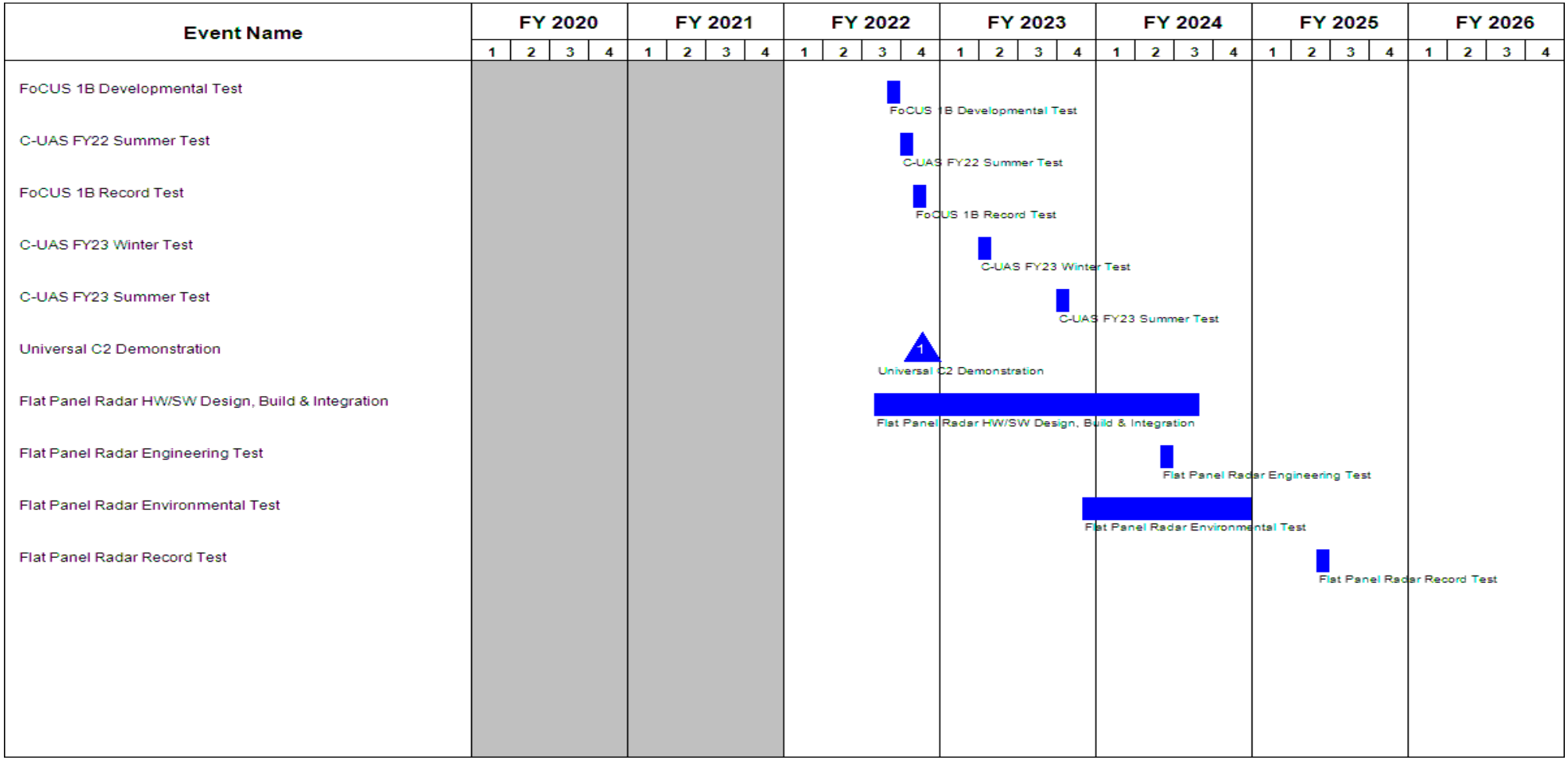

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-UAS Emerging Threat Development	1	2017	4	2025
Mobile LIDS (M-LIDS) Inc 1 Testing and Downselect	1	2018	1	2018
Expeditionary LIDS (E-LIDS) Engineering and Record Test	2	2018	2	2018
M-LIDS Inc 1 Engineering and Record Test	3	2018	4	2018
LIDS System-of-Systems (SoS) Record Test	4	2018	1	2019
E-LIDS/M-LIDS Inc 1 Engineering Test	3	2019	3	2019
LIDS Advanced Position, Navigation & Timing (PNT) Test	4	2019	4	2019
Inc 2 SoS Record Test	1	2020	1	2020
FS-LIDS/M-LIDS Inc 2 Record Test	1	2020	2	2020
M-LIDS Inc 2 Delta Record Test #1	3	2020	3	2020
M-LIDS Inc 2 Delta Record Test #2	4	2020	4	2020
C-UAS FY20 Summer Test	4	2020	4	2020
C-UAS SoS Integration/Record Test (Winter FY21)	2	2021	2	2021
FoCUS 1A Developmental Test	3	2021	3	2021
FoCUS 1A Record Test	4	2021	4	2021
C-UAS SoS Integration/Record Test (Summer FY21)	4	2021	4	2021
FoCUS 1B Preliminary Design Review (PDR)	4	2021	4	2021
C-UAS FY22 Winter Test	2	2022	2	2022
FoCUS 1B Critical Design Review (CDR)	2	2022	2	2022
FoCUS 1B Developmental Test	3	2022	3	2022
C-UAS FY22 Summer Test	4	2022	4	2022
FoCUS 1B Record Test	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-UAS FY23 Winter Test	2	2023	2	2023
C-UAS FY23 Summer Test	4	2023	4	2023
Universal C2 Demonstration	4	2022	4	2022
Flat Panel Radar HW/SW Design, Build & Integration	3	2022	3	2024
Flat Panel Radar Engineering Test	2	2024	2	2024
Flat Panel Radar Environmental Test	4	2023	4	2024
Flat Panel Radar Record Test	2	2025	2	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604742A *I Constructive Simulation Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	11.158	9.779	22.331	-	22.331	-	-	-	-	-	-
361: *Intelligence Simulation Systems*	-	2.902	1.950	5.525	-	5.525	-	-	-	-	-	-
362: *Jnt Land Component Constructive Trng*	-	8.256	7.829	16.806	-	16.806	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Program Element funds the development of constructive and wargame simulations used to realistically train commanders and their battle staffs on today's complex battlefield conditions.

Project 361 funds the development of the Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT). IEWTPT is a Non-System Training Device (NSTD) which supports home-station training by simulating and stimulating Military Intelligence (MI) organic or surrogate equipment. It enables sustainment of critical individual and collective MI tasks/skills and is the core of the U.S. Army Intelligence Center of Excellence (USAICoE) Military Intelligence (MI) holistic training strategy supporting mission command, targeting, and MI Soldier readiness. IEWTPT provides a realistic simulation intelligence target environment for multi-intelligence disciplines such as All Source Analysis, Signals Intelligence (SIGINT), Imagery Intelligence (IMINT), Human Intelligence (HUMINT), Geospatial Intelligence (GEOINT) and emerging electronic warfare (EW) systems. IEWTPT provides training for analyst and system operators to exploit intelligence data during training, just as they would in "Real World" operations. The IEWTPT Technical Control Cell (TCC) is composed of two components: the Lower Enclave (LE) which supports exercise planning and development and drives the All Source and GEOINT (and emerging EW) training tasks and the Upper Enclave (UE) which supports all SIGINT related training and operates at the Top Secret / Sensitive Compartmented Information (TS/SCI) classification level.

Project 362, Joint Land Component Constructive Training Capability (JLCCTC) supports Army Title X training worldwide for Army Commanders and their staff at Mission Training Complexes (MTCs), Training and Doctrine Command (TRADOC) facilities, and other customer locations. JLCCTC trains Commanders and their staff in Decisive Actions to include offensive, defensive, stability, and civil support operations. JLCCTC is a software modeling and simulation capability that contributes to Army Training Mission Area by providing appropriate levels of modeling and simulation resolution and fidelity to support unit collective and combined arms training. JLCCTC provides a composable federation configurable to any combination of models and simulations, as required by training exercise intent/design. JLCCTC provides accurate representations of tactically and operationally relevant land warfare operations executed in a contemporary Joint operating environment/context and in support of Army Training and Readiness.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army					Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*		
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	11.636	10.150	11.758	-	11.758
Current President's Budget	11.158	9.779	22.331	-	22.331
Total Adjustments	-0.478	-0.371	10.573	-	10.573
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.478	-0.371			
• Adjustments to Budget Years	-	-	10.573	-	10.573

Change Summary Explanation

The Fiscal Year 2022 (FY22) increase of $10.573 million is due to a $5.525 million increase for Project 361 to support Increment 2 validated requirements for multi-intelligence discipline and electronic warfare individual, crew, and collective training for military intelligence unit certification and Soldier readiness and an $5.048 million increase for Project 362 to support interfacing the Army ground model with the Joint simulation capability and for SE Core No Fail Activities and One World Terrain (OWT) Data to JLCCTC Runtime translation tool Development.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 361 / *Intelligence Simulation Systems*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
361: *Intelligence Simulation Systems*	-	2.902	1.950	5.525	-	5.525	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 361 funds the development of the Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT). IEWTPT is a Non-System Training Device (NSTD) which supports home-station training and multi-domain operations by simulating and stimulating Military Intelligence (MI) organic or surrogate equipment. It enables sustainment of critical individual and collective MI tasks/skills and is the core of the U.S. Army Intelligence Center of Excellence (USAICoE) Military Intelligence (MI) holistic training strategy supporting mission command, targeting, and MI Soldier readiness. IEWTPT provides a realistic simulation intelligence target environment for multi-intelligence disciplines such as All Source Analysis, Signals Intelligence (SIGINT), Imagery Intelligence (IMINT), Human Intelligence (HUMINT), Geospatial Intelligence (GEOINT) and emerging electronic warfare (EW) systems. IEWTPT provides training for analyst and system operators to exploit intelligence data during training, just as they would in "Real World" operations. The IEWTPT Technical Control Cell (TCC) is composed of two components: the Lower Enclave (LE) which supports exercise planning and development and drives the All Source and GEOINT (and emerging EW) training tasks and the Upper Enclave (UE) which supports all SIGINT related training and operates at the Top Secret / Sensitive Compartmented Information (TS/SCI) classification level.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: IEWTPT development, integration and support.	2.902	1.950	-
Description: Continue IEWTPT development, integration and support to the user community. ***FY 2021 Plans:*** Supports V11.0 Security Accreditation, Version 11.01 release and incremental baseline improvements of detailed simulation interface capabilities for Intelligence, Surveillance, Reconnaissance (ISR) platform systems in the PEO Intelligence Electronic Warfare & Sensors (PEO IEW&S) portfolio to support home-station intelligence training. Develop prototype cloud ready baseline for the TCC transition to Increment 2, multi-intelligence training improvements that includes but not limited to: distributed/federated construct simulation environment, expand All Source, SIGINT baselines and begin detailed electronic warfare and cyber support task analysis in support of the Army's Multi Domain Operation strategy. Expand EW/SIGINT integration and cloud ready, point of need training capabilities. Expand SIGINT scenario development tools for cloud employment; sensor emulation effects modeling as well as theater and national level intelligence replication for the simulation /user environment. Will execute technology development and integration supporting product deliverables needed			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 361 / *Intelligence Simulation Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
to meet Intelligence Center of Excellence (ICoE) and Army G2 training and modernization strategies. Develop and maintain appropriate linkages to ISR platform programs/systems to meet the Army's multi-domain intelligence training requirements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project 361 funding decrease from FY 2021 to FY 2022 in IEWTPT Development, Integration and Support and moved to Software Engineering, Development, Integration, and Testing to align with program requirements.			
Title: Software Engineering, Development, Integration and Testing ***FY 2022 Plans:*** Supports Increment 2 validated requirements for multi-intelligence discipline and electronic warfare individual, crew, and collective training for military intelligence unit certification and Soldier readiness. The Information Systems-Capability Development Document (IS-CDD) sets the conditions for program entry into the software acquisition pathway for development as a software intensive system facilitating rapid and iterative delivery of intelligence training capabilities. Supports Intelligence Requirements and Configuration Control Board (RC2B) priorities for development engineering, integration, and testing. Supports RC2B General Officer priorities for simulation interface development supporting the Terrestrial Layer System (TLS) and Signals Intelligence Electronic Warfare (SIGINT/EW) integration for home-station training. Funding supports a cloud ready baseline architecture for the Technical Control Cell (TCC)transition from stand-alone to point of need. Continues baseline improvements for the distributed/ federated constructive simulation environment and a baseline architecture that is cloud ready for point of need delivery; develop improved All Source intelligence messaging, and continue detailed support of the Electronic Warfare Program Management Tool (EWPMT) Integration into IEWTPT in support of multi domain capable training requirements. Expands SIGINT scenario development tools for cloud employment; sensor emulation effects modeling as well as theater and National level intelligence replication for the simulation/user environment. Will execute technology development and integration supporting product deliverables needed to meet Intelligence Center of Excellence (ICoE) and Army G2 training and modernization strategies. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project 361 has a $5.525 million funding increase from FY 2021 to FY 2022 to support Increment 2 validated requirements for multi-intelligence discipline and electronic warfare individual, crew, and collective training for military intelligence unit certification and Soldier readiness.	-	-	5.525
Accomplishments/Planned Programs Subtotals	2.902	1.950	5.525

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 361 / *Intelligence Simulation Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• NA0102: *NSTD INTELLIGENCE*	6.081	1.607	3.680	-	3.680	-	-	-	-	-	-

Remarks

NA0102= Other Procurement Army (OPA)

D. Acquisition Strategy

The current IEWTPT Increment I/Block II contract, including a 12 month bridge, will provide continued program support through 2nd QTR FY2023, at which the next full and open contract solicitation will occur. The FY 2022 funds will provide continued support for Increment 2 transition to a software strategy supporting incremental development, integration, testing in an agile acquisition and development environment to meet the Information Systems-Capability Development Document (IS-CDD) Military Intelligence Corps requirements and the Requirements and Configuration Control Board (RC2B) priorities. FY 2022 funding will provide the ability to support the planned full and open competitive acquisition of the IEWTPT contract. A ten-year Indefinite Delivery/Indefinite Quantity (IDIQ) contract is planned for IEWTPT Increment 2 not later than 15 February 2023. This competitive acquisition will ensure future training capabilities meet IS-CDD requirements that are nested with the Intelligence Corps modernization priorities for multifunctional intelligence support to maneuver commanders.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 361 / *Intelligence Simulation Systems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PEO STRI : Orlando, FL	11.018	-		-		-		-		-	0.000	11.018	-
		Subtotal	11.018	-		-		-		-		-	0.000	11.018	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TCC Technology	C/CPFF	General Dynamics C4 Systems : Orlando, Florida	7.900	-		-		-		-		-	0.000	7.900	-
TCC Technology	C/CPFF	General Dynamics Mission Systems : Orlando, Florida	9.745	1.928	Feb 2020	1.895	Nov 2020	-		-		-	0.000	13.568	-
Eng & Manufacturing Dev. (Cloud Environment)	Option/ CPFF	General Dynamics C4 Systems : Orlando, FL	63.825	0.974	Feb 2020	0.055	Jul 2021	-		-		-	0.000	64.854	29.003
Increment 2 Software Eng, Development, Integration and Test	C/IDIQ	TBD : Orlando, FL	-	-		-		3.797	Feb 2022	-		3.797	Continuing	Continuing	Continuing
TCC Cloud Ready Architecture	C/IDIQ	TBD : Orlando, FL	-	-		-		1.728	Feb 2022	-		1.728	Continuing	Continuing	Continuing
		Subtotal	81.470	2.902		1.950		5.525		-		5.525	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Technical Support	Various	Various : Various	2.743	-		-		-		-		-	0.000	2.743	2.743
		Subtotal	2.743	-		-		-		-		-	0.000	2.743	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 361 / *Intelligence Simulation Systems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TEMP Support	Various	Multiple : Various	0.319	-		-		-		-		-	0.000	0.319	0.319
Test Engineering Support	Various	Multiple : Various	1.313	-		-		-		-		-	0.000	1.313	1.313
		Subtotal	1.632	-		-		-		-		-	0.000	1.632	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	96.863	2.902		1.950		5.525		-		5.525	Continuing	Continuing	N/A

Remarks

FY 2022 marks the close out of the period of performance for the Increment 1 contract and the transition to Increment 2 and the software acquisition pathway for development as a software intensive system supporting detailed version builds for intelligence, electronic warfare training lines of effort. FY 2022 funding will provide the ability to quickly transition and support the planned full and open competitive acquisition of the IEWTPT Increment 2 contract.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 361 / *Intelligence Simulation Systems*

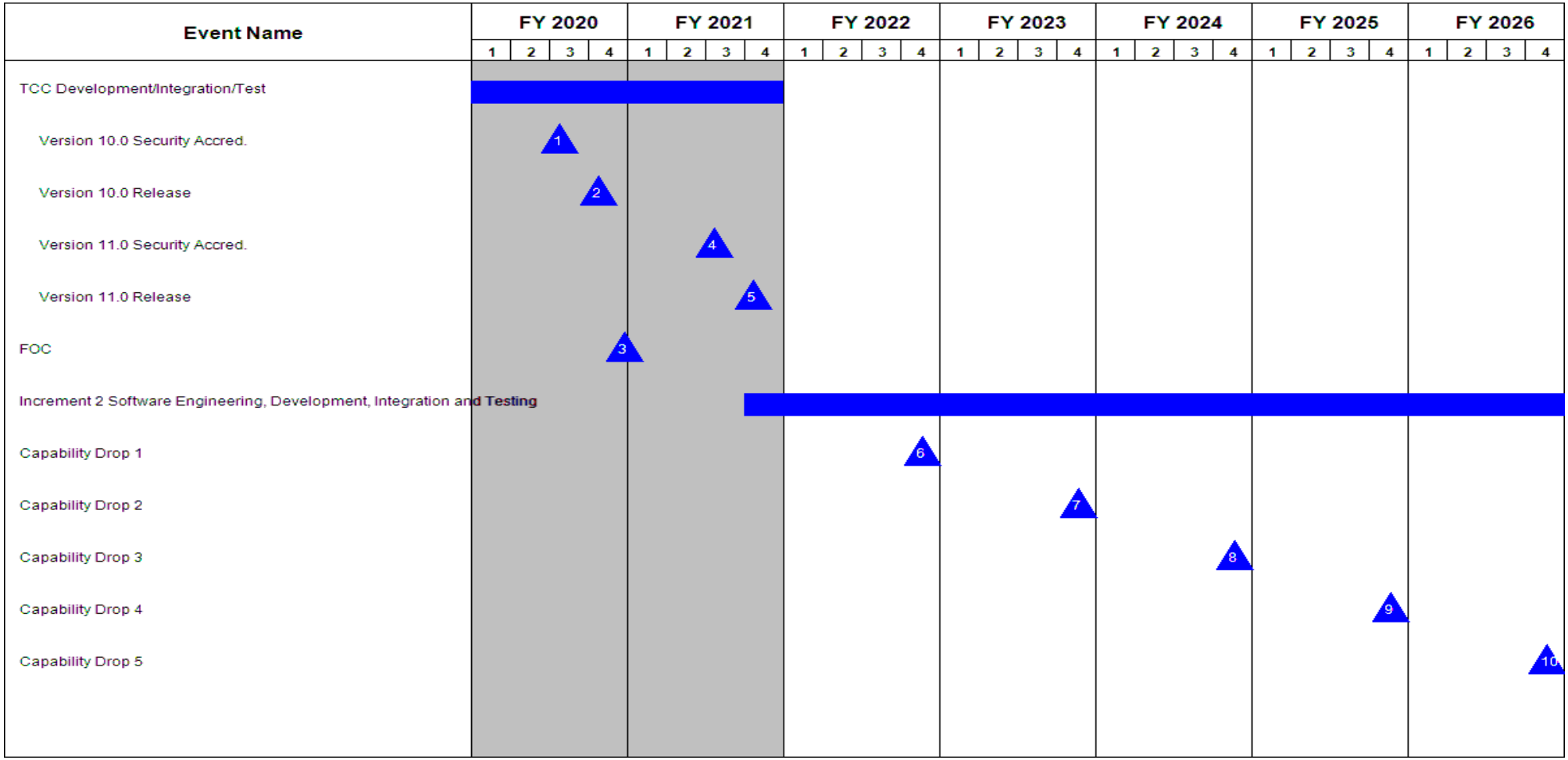

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 361 / *Intelligence Simulation Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TCC Development/Integration/Test	4	2007	4	2021
Version 4.0 Security Accred.	3	2014	3	2014
Version 4.0 Release	4	2014	4	2014
Version 5.0 Security Accred.	3	2015	3	2015
Version 5.0 Release	4	2015	4	2015
Version 6.0 Security Accred.	3	2016	3	2016
Version 6.0 Release	4	2016	4	2016
Version 7.0 Security Accred.	2	2017	2	2017
Version 7.0 Release	3	2017	3	2017
Version 8.0 Security Accred.	3	2018	3	2018
Version 8.0 Release	4	2018	4	2018
Version 9.0 Security Accred.	3	2019	3	2019
Version 9.0 Release	4	2019	4	2019
Version 10.0 Security Accred.	3	2020	3	2020
Version 10.0 Release	4	2020	4	2020
Version 11.0 Security Accred.	3	2021	3	2021
Version 11.0 Release	4	2021	4	2021
FOC	4	2020	4	2020
Increment 2 Software Engineering, Development, Integration and Testing	4	2021	2	2028
Capability Drop 1	4	2022	4	2022
Capability Drop 2	4	2023	4	2023
Capability Drop 3	4	2024	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 361 / *Intelligence Simulation Systems*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Capability Drop 4	4	2025	4	2025
Capability Drop 5	4	2026	4	2026
Capability Drop 6	4	2027	4	2027
Capability Drop 7	4	2028	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 362 / *Jnt Land Component Constructive Trng*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
362: *Jnt Land Component Constructive Trng*	-	8.256	7.829	16.806	-	16.806	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Land Component Constructive Training Capability (JLCCTC) supports Army Title X training worldwide for Army Commanders and their staff at Mission Training Complexes (MTCs), Training and Doctrine Command (TRADOC) facilities, and other customer locations. JLCCTC trains Commanders and their staff in Decisive Actions to include offensive, defensive, stability, and civil support operations. JLCCTC is a software modeling and simulation capability that contributes to Army Training Mission Area by providing appropriate levels of modeling and simulation resolution and fidelity to support unit collective and combined arms training. JLCCTC provides a composable federation configurable to any combination of models and simulations, as required by training exercise intent/design. JLCCTC provides accurate representations of tactically and operationally relevant land warfare operations executed in a contemporary Joint operating environment/context and in support of Army Training and Readiness.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Improve JLCCTC software models to comply with emerging Common Operating Environment (COE)/Computing Environment (CE) requirements. ***Description:*** Improve JLCCTC software models to comply with emerging COE/CE requirements. ***FY 2021 Plans:*** Will continue improvements of JLCCTC software models to include common overlay development/modifications in support of COE compliance/standards. ***FY 2022 Plans:*** Will continue improvements of JLCCTC software models to include common overlay development/modifications in support of COE compliance/standards.	0.672	0.650	0.650
Title: Improve JLCCTC software models to meet emerging Mission Command (MC) stimulation and Cyber Security requirements. ***Description:*** Improve JLCCTC software models to meet emerging Mission Command (MC) stimulation and Risk Management Framework (RMF)/Cyber Security requirements. ***FY 2021 Plans:***	0.800	0.800	0.800

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 362 / *Jnt Land Component Constructive Trng*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue to evolve JLCCTC to support emerging Mission Command requirements and fully comply with the Cyber Security/Risk Management Framework (RMF) requirement. ***FY 2022 Plans:*** Continue to evolve JLCCTC to support emerging Mission Command requirements and fully comply with the Cyber Security/Risk Management Framework (RMF) requirement.			
Title: Improve JLCCTC software models to meet emerging warfighter requirements for Concurrency of Commander and staff training (Battalion thru Theater Level). ***Description:*** Improve JLCCTC software models to meet emerging warfighter requirements for Concurrency of Commander and staff training (Brigade through Theater Level). ***FY 2021 Plans:*** Continue to evolve JLCCTC software models to support additional emerging requirements in support of Commander and staff warfighter training exercises through Theater level. ***FY 2022 Plans:*** Continue to evolve JLCCTC software models to support additional emerging requirements in support of Commander and staff warfighter training exercises through Theater level ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease from FY 2021 to FY 2022 is because of less emerging requirements.	4.531	2.834	2.321
Title: Government System Test and Evaluation for the Joint Land Component Constructive Training Capability (JLCCTC) Program. ***Description:*** Government System Test and Evaluation for the Joint Land Component Constructive Training Capability (JLCCTC). ***FY 2021 Plans:*** Conduct the v9.0 validation event (VE) and conduct system test events (Integration and Testing) in support of the JLCCTC v10.0 validation event (VE). ***FY 2022 Plans:*** Continue conducting JLCCTC v10.0 system test events (Integration and Testing) and verification. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase from FY 2021 to FY 2022 is due to additional integration events to test v10.0 capabilities.	1.731	1.651	1.701
Title: Government Program Management for the Joint Land Component Constructive Training Capability (JLCCTC) Program.	0.522	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 362 / *Jnt Land Component Constructive Trng*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Supports Government program management, engineering, logistics, contracting support and continues operational evaluation support for JLCCTC.			
Title: Conduct Army Ground Model Analysis of Alternative ***FY 2021 Plans:*** Start conducting Army ground model Analysis of Alternative (AoA) to interface with Joint simulation capability. ***FY 2022 Plans:*** Begin interfacing the Army ground model with the Joint simulation capability . ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding from FY 2021 to FY 2022 is due to beginning interfacing the Army ground model with the Joint simulation capability.	-	1.894	6.090
Title: Constructive Terrain and Tools Development ***FY 2022 Plans:*** Plan is to execute SE Core No Fail Activities and development of tools to transform One World Terrain (OWT) data into JLCCTC compliant runtime formats. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding from FY 2021 to FY 2022 is to execute SE Core No Fail Activities and integrate One World Terrain (OWT) data into JLCCTC runtime formats.	-	-	5.244
Accomplishments/Planned Programs Subtotals	8.256	7.829	16.806

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• NA0103: *NSTD COMMAND & CONTROL*	35.313	35.038	37.147	-	37.147	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Proposals for new competitive contract were received on 14 August 2019 and proposals evaluation activities were completed by the team during February 2020. The new JLCCTC contract (with Base contract of 4 years and two-three year options) was awarded to Phoenix Logistics Inc. (PLI) (now Phoenix Defense) on 17 March 2020. Transition activities from incumbent Lockheed Martin) to new prime (Phoenix Logistics) have been completed. (Phoenix Defense) is progressing with activities under

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 362 / *Jnt Land Component Constructive Trng*

new contract. Activities under the current new contract and follow-on contracts include System Engineering, Software Development, Integration and Test, support to validation events and PDSS/P3I support.

JLCCTC produces a major software release/version every three years which is then distributed/fielded to over 40 MTCs worldwide in support of Army Command and Staff Training.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 362 / *Jnt Land Component Constructive Trng*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various : Various	68.332	0.522	Oct 2019	-		-		-		-	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	PEO STRI : Orlando, FL	0.843	-		-		-		-		-	0.000	0.843	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.000		-		0.000	-	-	-
		Subtotal	69.175	0.522		-		0.000		-		0.000	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Constructive Strategy Implementation	C/CPFF	Lockheed Martin : Orlando, FL	9.869	-		-		-		-		-	Continuing	Continuing	Continuing
Integration of JLCCTC	SS/FFP	Various : Various	56.851	-		-		-		-		-	0.000	56.851	-
Improve JLCCTC to meet emerging warfighter requirements.	C/CPFF	Phoenix Logistics, Inc. : Orlando, FL	6.887	4.531	Jan 2020	2.834	Dec 2020	2.321	Dec 2021	-		2.321	Continuing	Continuing	Continuing
MC Systems Stimulation and Cyber Security	C/CPFF	Phoenix Logistics, Inc. : Orlando, FL	7.532	0.800	Jan 2020	0.800	Dec 2020	0.800	Dec 2021	-		0.800	Continuing	Continuing	Continuing
COE Compliance	C/CPFF	Phoenix Logistics, Inc. : Orlando, FL	5.068	0.672	Jan 2020	0.650	Dec 2020	0.650	Dec 2021	-		0.650	Continuing	Continuing	Continuing
JLCCTC mission command training program simulation upgrades	C/CPFF	Lockheed Martin : Orlando, FL	7.397	-		-		-		-		-	Continuing	Continuing	Continuing
Conduct Army ground Model AoA	C/CPFF	TBD : Orlando, FL	-	-		1.894	Dec 2020	6.090	Dec 2021	-		6.090	Continuing	Continuing	Continuing
Constructive Terrain and Tools Development	C/CPFF	TBD : Orlando, FL	-	-		-		5.244	Dec 2021	-		5.244	Continuing	Continuing	Continuing
		Subtotal	93.604	6.003		6.178		15.105		-		15.105	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / *Constructive Simulation Systems Development*	Project (Number/Name) 362 / *Jnt Land Component Constructive Trng*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System T&E (I&T, VE, ORE)	Various	Various : Various	24.859	1.731	Jan 2020	1.651	Dec 2020	1.701	Dec 2021	-		1.701	Continuing	Continuing	Continuing
		Subtotal	24.859	1.731		1.651		1.701		-		1.701	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	187.638	8.256		7.829		16.806		-		16.806	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 362 / *Jnt Land Component Constructive Trng*

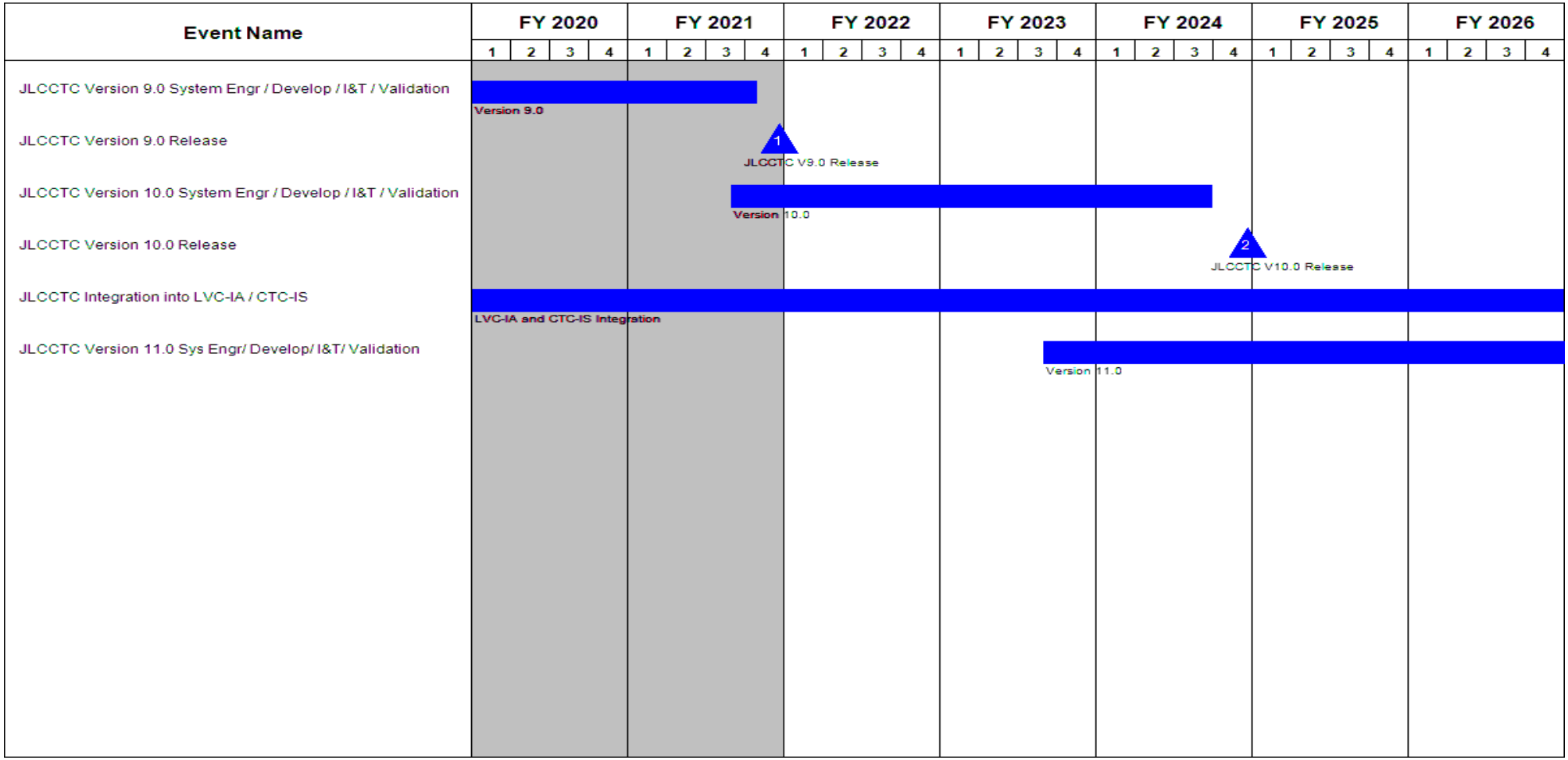

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604742A / *Constructive Simulation Systems Development*	**Project (Number/Name)** 362 / *Jnt Land Component Constructive Trng*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JLCCTC Version 9.0 System Engr / Develop / I&T / Validation	1	2018	4	2021
JLCCTC Version 9.0 Release	4	2021	4	2021
JLCCTC Version 10.0 System Engr / Develop / I&T / Validation	3	2021	3	2024
JLCCTC Version 10.0 Release	4	2024	4	2024
JLCCTC Integration into LVC-IA / CTC-IS	1	2014	4	2026
JLCCTC Version 11.0 Sys Engr/ Develop/ I&T/ Validation	3	2023	3	2027
JLCCTC Version 11.0 Release	4	2027	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604746A *I Automatic Test Equipment Development*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	10.466	5.375	8.807	-	8.807	-	-	-	-	-	-
L59: *Diagnost/Expert Sys*	-	6.107	3.885	5.574	-	5.574	-	-	-	-	-	-
L65: *Test Equipment Development*	-	4.359	1.490	3.233	-	3.233	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element (PE) provides for development and testing of automatic test equipment, precision calibration instruments, general-purpose test equipment, state-of-the-art diagnostics and prognostics technologies, and software and systems to support the increasingly complex electronic components of the Army's new and upgraded weapon systems focused on joint operations in a sophisticated multi-domain area of operation. It focuses on implementation of commercial test and diagnostic technologies across multiple weapon platforms to minimize the cost of troubleshooting and maintenance of Army equipment in the field. Funding supports modernization of the test equipment fleets by investigating technology insertions including, but not limited to, condition-based maintenance, instrument reduction/miniaturization, electro-mechanical, electro-optics (EO), radio frequency (RF), physical, radiological, chemical, and biological warfare sensor calibration support capabilities, and other emerging technologies. Funding also supports development of initial prototypes to enable refinement of Operational Requirements documented by Combatant Commands (COCOM), Program Executive Offices (PEO), Army Futures Command (AFC), Army Staff, US Army Training and Doctrine Command (TRADOC), and early user feedback to support future sustainment and testing capabilities required for emerging weapons platforms . This PE also provides for continued development and improvement of general-purpose test equipment and calibration standards with emphasis on the incorporation of digital electronics and tailoring of configurations to improve deployability, mobility and survivability of the support equipment. It includes development, demonstration and testing of calibration standards and techniques to support new Army test equipment requirements; and, it provides for feasibility studies, market research, inventory analyses, bid sample testing and prototyping to support acquisition of calibration systems and general-purpose test and diagnostics equipment.

The Department of Defense (DoD) has designated the Next Generation Automatic Test System (NGATS) being developed under this PE as the Army's standard off-platform Automatic Test System (ATS) for field and sustainment maintenance. The NGATS provides general-purpose state-of-the-art test and diagnostic capabilities, reducing cost and logistics footprint while providing the Warfighter fix-forward capability for current and future weapon systems in Multi-Domain Operations (MDO). NGATS is designed to support the Cross-Functional Teams (CFT) in the Army Futures Command (AFC) as they mature in accordance with the DoD ATS Strategy. Current NGATS capabilities support Abrams, Bradley, Common Remotely Operated Weapons Station (CROWS), Crew-Duke, Husky Mounted Detection System (HMDS), and Mounted Family of Computer Systems (MFoCS), with developments ongoing for Blackhawk, M777, Long Range Precision Fires (LRPF) Paladin Extended Range Cannon-Artillery (ERC-A), and Armored Multi-Purpose Vehicle (AMPV) in the Next Generation Combat Vehicle (NGCV) CFT.

FY 2022 Base funding for this PE continues incremental development of the Army's standard NGATS which will improve deployability and mobility of test and diagnostic equipment. The NGATS provides state-of-the-art test and diagnostic capabilities and a means for reducing the Army's test equipment operating and support costs and the costs for supporting a number of the Army's vital warfighting systems. The FY 2022 funding will develop or significantly modify test equipment to satisfy modular force and homeland security support requirements that cannot be accommodated with test equipment currently available in the commercial marketplace such as RF

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604746A *I Automatic Test Equipment Development*

and EO testing capability. It will also provide for technology insertions to modernize the Army's standard at-system tester to meet test and diagnostic requirements of the supported weapon systems, develop/redesign test program sets and hardware for support of legacy and emerging weapon systems, develop a network centric software framework for NGATS, develop and test general-purpose test equipment and calibration standards to meet Army weapon system support requirements, and initiate development of enhanced diagnostic software and interfaces to support emerging maintenance concepts for Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift and Air and Missile Defense. The funding will provide prototype test and evaluation of field level calibration and repair support for the Radiation Detection System (RDS) fielded in FY 2020-2021 in response to Operational Needs Statement ONS 17-22580. The project resolves significant radiation measurement accuracy gaps throughout the Department of the Army operational areas and CONUS. This funding also provides for analysis of courses of action to incorporate additional intrinsic calibration instruments and general-purpose test equipment to reduce the maintenance hierarchy, increase calibration intervals, extend lifecycle reliability, and increase supportability across generational changes in weapon systems and weapon support systems technology.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	10.915	5.578	4.051	-	4.051
Current President's Budget	10.466	5.375	8.807	-	8.807
Total Adjustments	-0.449	-0.203	4.756	-	4.756
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.449	-0.203			
• Adjustments to Budget Years	-	-	4.756	-	4.756

Change Summary Explanation

FY 2022 - Increase of $4.756 million to allow continuation of high priority automatic test equipment development efforts to support current and future Army weapons and combat support systems.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L59 / *Diagnost/Expert Sys*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
L59: *Diagnost/Expert Sys*	-	6.107	3.885	5.574	-	5.574	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds development of and system enhancements for the Next Generation Automatic Test System (NGATS) and the Maintenance Support Device (MSD). The NGATS is a general-purpose automatic test system (ATS) that provides test and diagnostic capabilities required to support current and future weapons and combat support systems across the Cross-Functional Teams (CFT) in the Army Futures Command (AFC) and will facilitate retirement of aging and obsolete test equipment that is imposing increasing logistics and operations and support cost burdens. It is the platform for transitioning Agile Rapid Global Combat Support System (ARGCS) Advanced Concept Technology Demonstration (ACTD) technologies into the Army weapon system support structure. The ARGCS ACTD initiative was sponsored by the Department of Defense, and all Services are expected to transition demonstrated technologies into their ATS programs. The MSD is the Army's standard at-system tester and requires continuing technology insertions to support modernization of the supported weapon systems. This Project funds development efforts to insert the most current relevant technology into the next generation MSD, supports capability enhancement of wireless at-platform test set (WATS) connectivity, develops capabilities to minimize or eliminate Army dependency on expensive proprietary software to support tactical vehicles, and maintains compatibility with emerging platform hardware bus technology and software interface requirements. This Project also provides for continuing efforts in the development and testing of common procedures utilizing existing test program sets and software applications, and market surveys of commercially available test equipment, methods and procedures to determine applicability to Army requirements. The test and diagnostic systems and procedures developed under this Project are essential for ensuring the operational readiness, accuracy and effectiveness of the Army's warfighting systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Next Generation Automatic Test System (NGATS) Radio Frequency (RF) Test Capability ***Description:*** Develop and integrate NGATS RF test capability	0.221	-	-
Title: NGATS Increment 2 ***Description:*** Develop and test hardware and software for NGATS Increment 2 support capability ***FY 2021 Plans:*** Continue development and testing of state-of-the-art hardware and software for support of emerging required capabilities to support the Armored Brigade Combat Teams (ABCTs). New ABCT requirements include high-speed digital, fiber channel, high-speed Ethernet and serial busses, and high power test (600V). Develop new software libraries to utilize instrument functions. ***FY 2022 Plans:***	0.371	0.300	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Develop and test state-of-the-art hardware and software for support of emerging required capabilities to support Cross-Functional Teams (CFT) such as Peripheral Component Interconnect (PCI) Extensions for Instrumentation (PXI) based instrument solutions providing increased readiness and smaller logistics footprint. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase required to complete this effort according to schedule.			
Title: NGATS Electro-Optics (EO) Subsystem ***Description:*** Develop and test hardware and software for NGATS electro-optics (EO) subsystem (to include the capability to support new ground and aerial sensors for unmanned air and ground vehicles) ***FY 2021 Plans:*** Develop model production EO subsystem to achieve cost savings of production. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No funding required for this effort In FY 2022.	0.021	0.200	-
Title: Additional Software Capabilities for Use with NGATS ***Description:*** Develop software capabilities to incorporate common logistics operating environment/netcentric and embedded diagnostics data collection and analysis for closed loop diagnostic maintenance in support of condition-based maintenance ***FY 2021 Plans:*** Develop software to enhance performance of health monitoring of NGATS system. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No funding required for this effort in FY 2022.	0.171	0.200	-
Title: NGATS Performance Enhancement ***Description:*** NGATS core instrument/software modifications to increase NGATS performance ***FY 2021 Plans:*** Develop and test NGATS shelter modification to allow addition of electro-optics and radio frequency subsystems. ***FY 2022 Plans:*** Improve system software and libraries to take advantage of WIN10 processing structure and new Application Program Interface (API) which will increase system processing and throughput. Use of instrument vendor WIN10 drivers will increase	0.621	0.700	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
measurement accuracy and reliability. Improvements in architecture will allow faster remote system updates and provide enhanced communication channels for support of Condition Based Maintenance Plus (CBM+). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Additional funding allocated to this effort in FY 2021 to meet scheduled support requirements reduced the funding required in FY 2022.			
Title: Abrams/Bradley Test Program Set (TPS) Design ***Description:*** Design, test and evaluate Abrams/Bradley TPSs to utilize modern core NGATS instrumentation vice continuing to execute on single-purpose instrumentation specifically developed to emulate Abrams/Bradley legacy test equipment (i.e., Direct Support Electrical System Test Set (DSESTS)) ***FY 2021 Plans:*** Continue redesign of Abrams/Bradley TPSs to execute on core commercial NGATS instrumentation versus continuing to execute on single-purpose instrumentation specifically developed for testing Abrams/Bradley LRUs. Continue redesign of ICDs to incorporate printed circuit boards and ribbon cables to reduce cost and maintenance. ***FY 2022 Plans:*** Continue redesign of Abrams/Bradley TPSs to execute on core commercial NGATS instrumentation vice single-purpose NGATS instrumentation. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding required to allow fielding of redesigned TPSs as scheduled.	2.372	0.700	2.612
Title: Electro-Optic (EO) TPS Development ***Description:*** Develop Increment 2 and 3 EO TPSs for use with NGATS EO asset to utilize (Army standard) core NGATS instrumentation vice legacy automatic test systems such as DSESTS and Base Shop Test Facility (BSTF)(V)5	0.271	-	-
Title: NGATS Logistics Support Products ***Description:*** Develop NGATS initial logistics support products (including provisioning, technical manuals and calibration) ***FY 2021 Plans:*** Develop updates to technical manuals and technical bulletins to support organic calibration of NGATS. ***FY 2022 Plans:***	1.248	0.853	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Develop updates to technical manuals, technical data packages, depot maintenance work requirements and provisioning as NGATS system and TPS changes occur. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding requirement adjusted to meet projected need for documentation changes.			
Title: Maintenance Support Device (MSD) Technology Enhancements ***Description:*** Modernizes the current MSD fleet by investigating and Incorporating relevant technology into the next-generation MSD and supporting capability enhancement of the Wireless At-platform Test Set (WATS). Develops diagnostic capabilities to minimize or eliminate Army dependency on proprietary software to support tactical vehicles and maintain compatibility with emerging platform hardware bus technology and software interface requirements. Provides a data processing capability to enable Condition Based Maintenance Plus (CBM+) on weapon systems. ***FY 2021 Plans:*** Complete next-generation MSD market research. Incorporate greater range of supported weapons system diagnostic code fault detection into diagnostic software to support tactical vehicle sustainment concepts and ensure data bus compatibility and readability. Develop software to complete transition to the Army's emerging single IETM viewer/authoring environment for use with future generation MSD and diagnostic software. ***FY 2022 Plans:*** Continue to incorporate greater range of supported weapons system diagnostic code fault detection into Diagnostic Software to minimize dependency on proprietary software, support tactical system sustainment concepts, and ensure data bus compatibility and readability. Evaluate emerging technology for insertion into next generation At-Platform Automatic Test System (APATS) to support evolving weapon system diagnostic testing concepts. Complete and test software that enables transition to the Army's emerging single interactive electronic technical manual (IETM) viewer/authoring environment for use with future generation APATS and Diagnostic Software. Continue market research, feasibility assessment, and interaction with supported weapon systems to determine best methodology to collect and aggregate weapon system CBM+ information. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding required to meet needs for support of emerging weapon system improvements.	0.604	0.633	0.962
Title: TPS Development Environment ***Description:*** Develop a standardized TPS development environment for NGATS ***FY 2021 Plans:***	-	0.299	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Develop the C-Oriented Test Executive (COTE) TPS development software for NGATS. Develop test executive that is standard and compliant with DoD initiatives, framework working group and the Automatic Test Equipment Management Board (AMB). Standardized test executive will promote long-term maintainability of TPSs. ***FY 2022 Plans:*** Continue development of COTE TPS development software for NGATS to be used for emerging systems including those planned for CFTs. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increased funding required to maintain scheduled completion of this effort.			
Title: Anti-Tamper/Cyber Security ***Description:*** Develop an Anti-Tamper/Cyber Security (AT/CS) software capability for NGATS	0.207	-	-
Accomplishments/Planned Programs Subtotals	6.107	3.885	5.574

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• MB4000: *Integrated Family Of Test Equipment (IFTE)*	81.058	77.214	42.934	-	42.934	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This developmental Project consists of organic and contractual actions. When the necessary expertise and capability are available within the Department of Defense, services required for the individual development projects are ordered from the government source; otherwise, commercial contracts are used. Equipment required for developmental projects is obtained by contract from the commercial supplier. Developmental efforts for the Next Generation Automatic Test System (NGATS) are being completed under a number of contracts awarded to the prime contractor for the Integrated Family of Test Equipment off-platform testers and other contractors with automatic test equipment (ATE) and test program set development capabilities. NGATS is following an evolutionary acquisition strategy using incremental development to satisfy Army depot and field testing requirements for new and existing systems. It will replace existing legacy Army ATE (i.e., Base Shop Test Facility (BSTF)(V)3, BSTF(V)5, and Direct Support Electrical System Test Set) as well as Army depot system-specific ATE.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L59 / *Diagnost/Expert Sys*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	Various	Various : Various	0.849	-		-		-		-		-	0.000	0.849	-
		Subtotal	0.849	-		-		-		-		-	0.000	0.849	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development/ Verification/Validation	Various	Various, : Various	41.417	3.361	Feb 2020	1.646	Feb 2021	2.676	Jan 2022	-		2.676	0.000	49.100	-
Hardware/Support Items Development	Various	Various, : Various	73.031	2.260	Jan 2020	1.839	Jan 2021	2.348	Jan 2022	-		2.348	0.000	79.478	-
		Subtotal	114.448	5.621		3.485		5.024		-		5.024	0.000	128.578	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	Various	Various, : Various	51.475	0.388	Jan 2020	0.300	Dec 2020	0.450	Dec 2021	-		0.450	0.000	52.613	-
Other Direct	Various	Various, : Various	6.130	0.098	Jan 2020	0.100	Dec 2020	0.100	Dec 2021	-		0.100	0.000	6.428	-
		Subtotal	57.605	0.486		0.400		0.550		-		0.550	0.000	59.041	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental/ Operational Testing	Various	Various, : Various	3.096	-		-		-		-		-	0.000	3.096	-
		Subtotal	3.096	-		-		-		-		-	0.000	3.096	N/A

Remarks

Test program set (TPS) and contractor developmental test and evaluation are included in the product development cost.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L59 / *Diagnost/Expert Sys*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	175.998	6.107		3.885		5.574		-		5.574	0.000	191.564	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

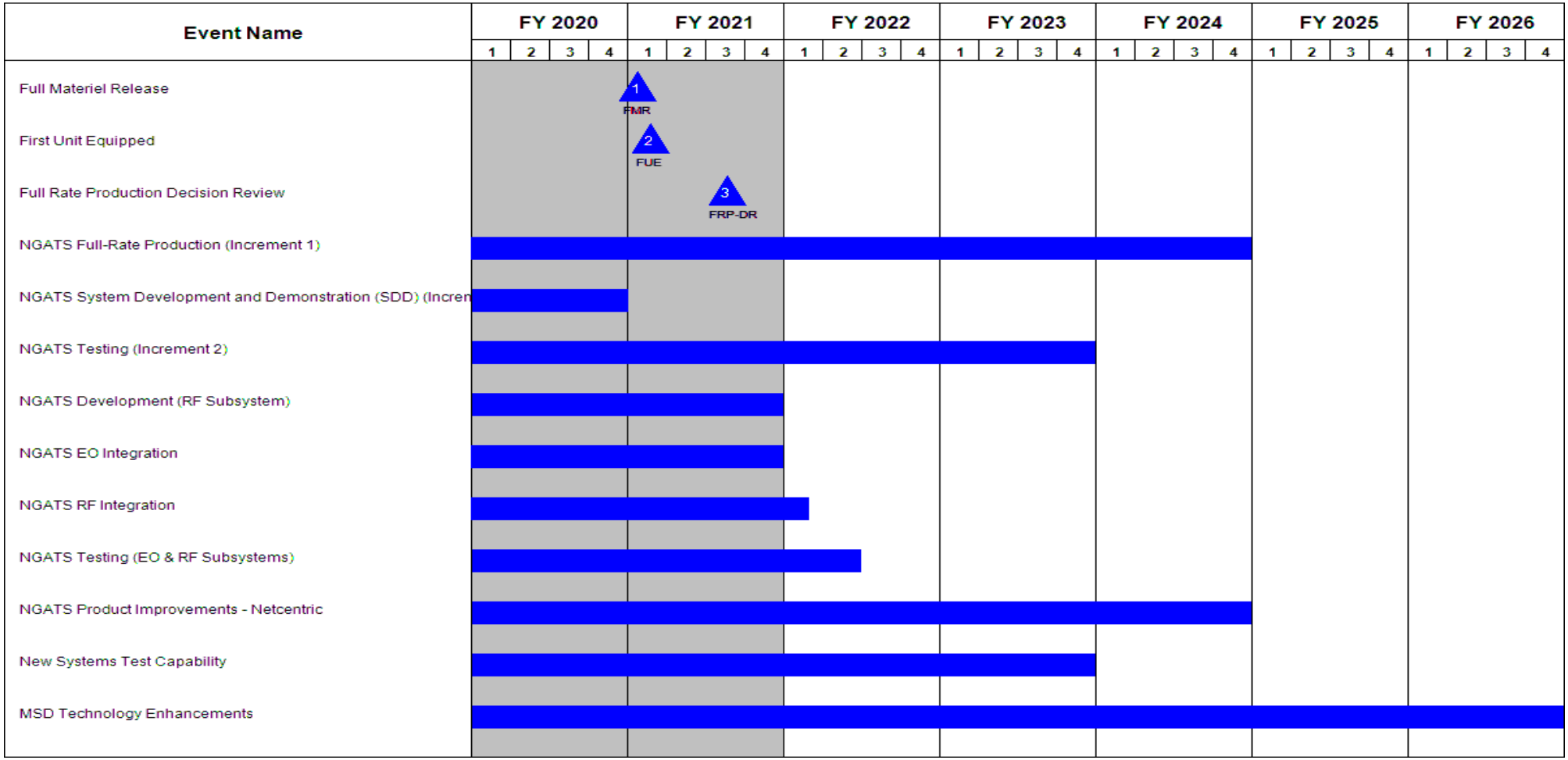

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L59 / *Diagnost/Expert Sys*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
NGATS Testing (Increment 1)	1	2011	1	2012
Production for First Article	1	2015	2	2017
Training Materiel Release	4	2019	4	2019
Full Materiel Release	1	2021	1	2021
First Unit Equipped	1	2021	1	2021
Full Rate Production Decision Review	3	2021	3	2021
NGATS Testing (Increment 1 Follow-On DT/OT)	1	2016	3	2016
NGATS Full-Rate Production (Increment 1)	2	2019	4	2024
NGATS System Development and Demonstration (SDD) (Increment 2)	1	2016	4	2020
NGATS Testing (Increment 2)	1	2016	4	2023
FOT&E Completed (DT)	3	2018	3	2018
NGATS Development (EO Subsystem)	4	2010	4	2015
NGATS Development (RF Subsystem)	1	2016	4	2021
NGATS EO Integration	3	2016	4	2021
NGATS RF Integration	3	2017	1	2022
NGATS Testing (EO & RF Subsystems)	1	2016	2	2022
NGATS Product Improvements - Netcentric	1	2016	4	2024
New Systems Test Capability	1	2016	4	2023
MSD Technology Enhancements	1	2016	4	2026

Note

Test program set (TPS) compatibility testing runs continually throughout the product development process.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L65 / *Test Equipment Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
L65: *Test Equipment Development*	-	4.359	1.490	3.233	-	3.233	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports Program Executive Office (PEO) and Army Futures Command (AFC) system support requirements with modernization of calibration instruments, techniques, and existing Army calibration systems by investigating technology insertions including automated and autonomous operations and other emerging technologies. Funding also supports development of initial prototypes to enable refinement of Operational Requirements and early user feedback to support future calibration systems and general-purpose test, measurement and diagnostic equipment (TMDE) acquisitions. This Project develops calibration software and calibration capability for electro-optical, chemical, biological agent, radiation sourcing and detection systems, signal measurement from direct current to microwave ranges, physical and mechanical measurements such as torque, pressure, and temperature, and improvements in test and measurement performance envelopes. It provides for product improvements and development/evaluation of advanced technologies to increase reliability of calibration systems and general-purpose TMDE. The product improvements eliminate gaps in existing organic capabilities and ensure operational readiness and safety of Army weapons and combat support systems. These improvements employ reconfigurable open-electronics architecture and computer-based instrumentation where feasible and focus on reduced test equipment footprints to improve deployability and mobility in complex multi-domain areas of operation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Calibration Sets (CALSETS) Software Environment and Calibration Procedures	0.461	0.356	0.617
Description: Develop and test Version 3.0 of an Army automated calibration environment and develop calibration procedures. Develop and test an enterprise data system to capture management and test data for reporting, metrics, and dashboard to inform management and leader decisions in acquisition and operations. Test and evaluate automated calibration equipment software efforts in support of the Army risk management framework (RMF).			
FY 2021 Plans: Test and evaluate Army calibration enterprise data collection and benchmark leading indicators for obsolescence planning gaps and TMDE readiness.			
FY 2022 Plans: Develop calibration software and test/update cyber security to accelerate the program and develop support for a wider range of Army test, measurement and diagnostic equipment (TMDE); populate the enterprise database with historical information and begin collection of new data to test the agility of the enterprise under load from global imports. Develop metrics and dashboard for managers and leaders to inform decisions in acquisition and operations.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L65 / *Test Equipment Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 increases investment in CALSETS Army Calibration Environment (ACE) software to develop, test, and evaluate automated calibration procedures and the global enterprise database before materiel fielding.			
Title: Physical Instruments ***Description:*** Research, develop, and test physical parameter calibration instrumentation to support areas such as intrinsic high reliability physical and dimensional standards. Modernize force and torque calibration capability. Develop radiological, chemical and biological agent detection systems, small arms gage calibration, pneumatic pressure systems, and temperature radiometer calibration related to target detection in the infrared spectrum. ***FY 2021 Plans:*** Test infrared emissivity corrections for infrared systems calibration; develop neutron radiation sources for NexGen radiation detector calibration; test and evaluate Army's flow transfer system. ***FY 2022 Plans:*** Complete existing projects in small arms gage calibration, infrared systems calibration, and radiation sources to support on-system calibration of radiation detection sensors. Initiate projects in chemical and biological agent defense systems calibration and develop performance requirements for Army primary level measurement in pressure, temperature, and mass for increased reliability and extended periods between scheduled maintenance actions and calibration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Additional funding required in FY 2022 to meet schedules of planned projects.	0.944	0.433	1.837
Title: Electrical Instruments ***Description:*** Research, develop, and test electrical parameter calibration instrumentation to support modernization and replacement of aged and obsolete test instruments in areas such as intrinsic electrical standards, electrical transport standards and electro-optic standards. Develop calibration support for advanced capability in spectral and vector dense signal analysis in complex Multi-Domain areas of operation. ***FY 2021 Plans:*** Test precision DC volt standards; test and evaluate TMDE prototypes for ultraviolent irradiance and fiber-optic source stabilization. ***FY 2022 Plans:*** Develop solutions to meet expanding gaps in measurement capability for optical time domain reflectometry. Continue development of fiber optic power source calibration, Army-wide alternating current/direct current (AC/DC) voltage measurement modernization, and replacement of 30+ year old microwave power sensor calibration to national standards meeting Army Futures	0.469	0.306	0.554

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L65 / *Test Equipment Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Command support requirements for Multi-Domain secured signal send and receive capability with integrated antenna functionality advancements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** High priority projects to meet emerging system support requirements increase the need for FY 2022 funding.			
Title: Test Equipment Modernization (TEMOD) ***Description:*** Perform market research, bid sample testing and evaluation of commercial general-purpose electronic test equipment (GPETE), and develop performance specifications for TEMOD acquisitions. ***FY 2021 Plans:*** Perform market research and evaluation of commercial GPETE and validate performance specifications for improved test equipment. The market research will be expanded to cover emerging synthetic instrumentation to potentially replace multiple pieces of GPETE within one platform. Conduct bid sample testing to support acquisition program. The GPETE will support numerous Army weapon systems to include multiple Cross Functional Teams (CFT). ***FY 2022 Plans:*** Perform market research and evaluation of commercial GPETE and validate performance specifications for improved test equipment. Conduct bid sample testing to support acquisition program. The GPETE will support numerous Army weapon systems to include multiple CFT?s. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding requirement for FY 2022 is associated with the initiation of new acquisition projects.	2.485	0.395	0.225
Accomplishments/Planned Programs Subtotals	4.359	1.490	3.233

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• N10000: *Calibration Sets Equipment*	3.030	2.511	-	-	-	-	-	-	-	-	-
• N11000: *Test Equipment Modernization (TEMOD)*	10.732	14.941	-	-	-	-	-	-	-	-	-
• G02510: *Test Equipment Modernization (TEMOD)*	-	-	24.304	-	24.304	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L65 / *Test Equipment Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

Funds in SSNs N10000 and N11000 for FY 2022 through FY 2026 have been realigned to Test Equipment Modernization, SSN G02510.

D. Acquisition Strategy

Projects focus on commercial and nondevelopmental item technologies. Department of Defense services provide programmatic, engineering expertise and capability for individual development projects; otherwise, commercial service contracts are used to obtain required capabilities. Equipment required for development projects is obtained from commercial suppliers. Candidate commercial equipment and nondevelopmental items are identified and evaluated through market research and government test and evaluation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L65 / *Test Equipment Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Engineering	SS/ Various	Various : Various	6.667	-		-		-		-		-	0.000	6.667	-
		Subtotal	6.667	-		-		-		-		-	0.000	6.667	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALSETS Software Environment and Calibration	Various	Various : Various	7.674	0.150	Feb 2020	0.119	Feb 2021	0.318	Apr 2022	-		0.318	Continuing	Continuing	-
Physical Instruments	Various	Various : Various	9.116	0.442	Feb 2020	0.166	Apr 2021	1.050	Feb 2022	-		1.050	Continuing	Continuing	-
Electrical Instruments	Various	Various : Various	10.860	0.155	Mar 2020	0.089	Feb 2021	0.280	Mar 2022	-		0.280	Continuing	Continuing	-
Test Equipment Modernization	Various	Various : Various	2.256	1.491	Feb 2020	0.237	Feb 2021	0.135	Feb 2022	-		0.135	Continuing	Continuing	-
		Subtotal	29.906	2.238		0.611		1.783		-		1.783	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering	C/FFP	Various : Various	2.833	0.629	Feb 2020	0.473	Feb 2021	0.260	Jan 2022	-		0.260	Continuing	Continuing	-
		Subtotal	2.833	0.629		0.473		0.260		-		0.260	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALSETS Software Environment and Calibration	Various	Various : Various	1.968	0.100	Feb 2020	0.079	Feb 2021	0.212	Apr 2022	-		0.212	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / *Automatic Test Equipment Development*	Project (Number/Name) L65 / *Test Equipment Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Physical Instruments	Various	Various : Various	3.358	0.295	Feb 2020	0.110	Apr 2021	0.701	Feb 2022	-		0.701	Continuing	Continuing	-
Electrical Instruments	Various	Various : Various	2.709	0.103	Mar 2020	0.059	Feb 2021	0.187	Mar 2022	-		0.187	Continuing	Continuing	-
Test Equipment Modernization	Various	Various : Various	1.736	0.994	Feb 2020	0.158	Feb 2021	0.090	Feb 2022	-		0.090	Continuing	Continuing	-
		Subtotal	9.771	1.492		0.406		1.190		-		1.190	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.177	4.359		1.490		3.233		-		3.233	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L65 / *Test Equipment Development*

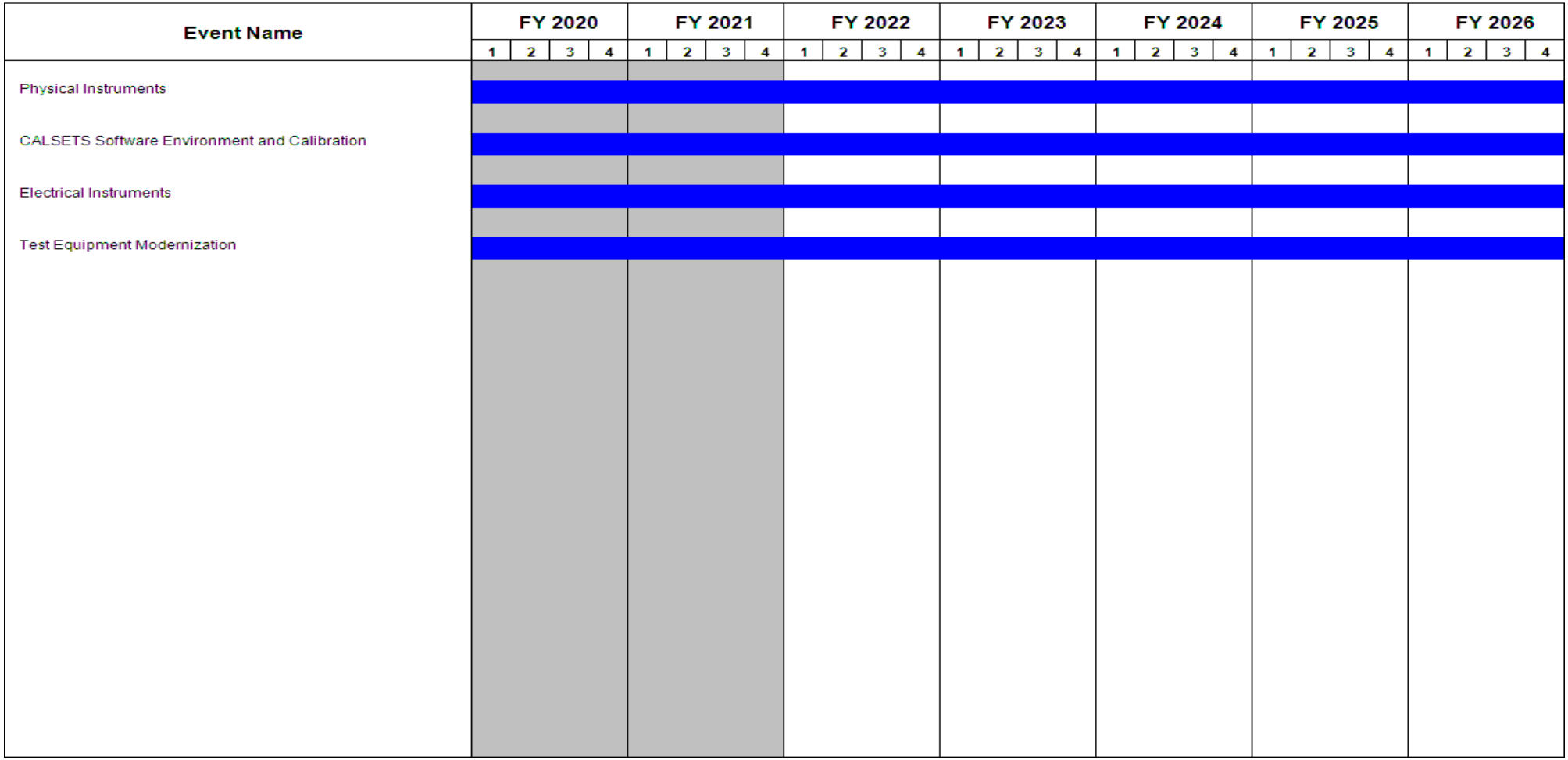

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604746A / *Automatic Test Equipment Development*	**Project (Number/Name)** L65 / *Test Equipment Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AN/GSM-421(V2) User Testing	2	2007	4	2012
Physical Instruments	1	2016	4	2026
CALSETS Software Environment and Calibration	1	2016	4	2026
Electrical Instruments	1	2016	4	2026
Test Equipment Modernization	1	2016	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604760A *I Distributive Interactive Simulations (DIS) - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	7.480	7.605	7.453	-	7.453	-	-	-	-	-	-
C74: *Devel Simulation Tech*	-	0.959	0.963	0.945	-	0.945	-	-	-	-	-	-
C77: *Army Geospatial Data Master Plan*	-	0.735	0.703	0.540	-	0.540	-	-	-	-	-	-
C78: *One Semi-Automated Forces*	-	5.786	5.939	5.968	-	5.968	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The program element "Distributive Interactive Simulations - Engineering Development" applies to the Army's Advanced Simulation Program, which enables operational readiness and the development of concepts and systems for the Future Force through the application of new simulation technology and techniques. The development and application of simulation technology will provide the means to link electronically a range of various simulation tools in a manner that is transparent to the user. The amalgam of simulations and tools is linked together to enable execution of an event; to verify the scenarios, tactics/techniques and procedures; to train testers on new hardware/software; and to conduct trial test runs before costly live field tests. The tools developed are available for reuse by developers and users of simulations throughout the Army.

Project C74 funds the HQDA-chartered mission of the Simulation-to-Mission Command Interoperability (SIMCI) Overarching Integrated Product Team (OIPT) in support of Army Training and Readiness. The SIMCI OIPT mission is to provide policy recommendations to Army senior leadership to improve organizations by allowing Soldiers to fight in the same manner in which they train. This is accomplished by interoperability between Mission Command (MC) systems and the Modeling and Simulation (M&S) systems the Army uses to stimulate MC systems for training Soldiers and their Leaders. SIMCI also invests in targeted solutions to critical problem areas that exist between MC and Simulations. The SIMCI OIPT, led by Program Executive Office (PEO) Simulation, Training, and Instrumentation (STRI) and PEO Command Control Communications-Tactical (C3T), uses focused collaborative processes among its 30+ Army organizations to identify key/critical interoperability shortfalls and the required materiel solutions.

Project C77, Army Geospatial Data Master Plan, focuses on activities that start with data acquisition from multiple sources and culminate in (1) accurate, robust and timely geospatial data and data management and (2) integration and conversion tools that support multiple battle command, training and mission-rehearsal applications. Project C77 continues development efforts associated with the Ground-Warfighter Geospatial Data Model (GGDM) and Geospatial Data Standards.

One Semi-Automated Forces (OneSAF) Project C78 develops and delivers a software application that represents activities of units and forces in simulation to support Army Training and Readiness. The application is used by Army agencies to support the concept evaluation, experimentation, materiel acquisition and training throughout the communities. The focus of this project is systems/software engineering and design for development and evolution of the architecture and software tools for a universal system of Army computer-generated forces -- OneSAF. OneSAF is a high fidelity brigade-and-below SAF that represents a full range of operations, systems and control processes in support of stand-alone and embedded training and Research, Development and Acquisition (RDA) simulation applications. OneSAF is fully

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*

interoperable with the Army's emerging virtual, live, and division-and-above constructive simulations and provides next-generation simulation products. OneSAF replaces a variety of legacy simulations used within the Army to support analytic and training simulation activities.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	7.801	7.892	7.888	-	7.888
Current President's Budget	7.480	7.605	7.453	-	7.453
Total Adjustments	-0.321	-0.287	-0.435	-	-0.435
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.321	-0.287			
• Adjustments to Budget Years	-	-	-0.435	-	-0.435

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C74 / *Devel Simulation Tech*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C74: *Devel Simulation Tech*	-	0.959	0.963	0.945	-	0.945	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C74 funds the HQDA-chartered mission of the Simulation-to-Mission Command Interoperability (SIMCI) Overarching Integrated Product Team (OIPT) in support of Army Training and Readiness. The SIMCI OIPT mission is to provide policy recommendations to Army senior leadership to improve organizations by allowing Soldiers to fight in the same manner in which they train. This is accomplished by interoperability between Mission Command (MC) systems and the Modeling and Simulation (M&S) systems the Army uses to stimulate MC systems for training Soldiers and their Leaders. SIMCI also invests in targeted solutions to critical problem areas that exist between MC and Simulations. The SIMCI OIPT, led by Program Executive Office (PEO) Simulation, Training, and Instrumentation (STRI) and PEO Command Control Communications-Tactical (C3T), uses focused collaborative processes among its 30+ Army organizations to identify key/critical interoperability shortfalls and the required materiel solutions.

The SIMCI OIPT provides the following: (1) Advisor to Army Leadership--improve MC and M&S interoperability programs, policies, directives, resourcing, and procedures; (2) Technical Investment--sponsor/support initiatives that seek common solutions to critical interoperability issues surrounding MC and M&S systems; (3) Outreach--conduct & participate in interoperability outreach activities. SIMCI investments consist primarily of cost-sharing initiatives, leveraging initial system solutions of acquisition programs to enhance the interoperability of multiple systems in the Joint Operational Environment. SIMCI investments accelerate implementation within MC and M&S systems, of common data models and information exchanges that are used by other Services and coalition nations, thus enhancing the inherent ability of Army systems to interoperate seamlessly in a Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment.

FY 2022 base funding in the amount of $0.945 million continues progress with embedding simulation into Mission Command Systems via the Ozone Widget Framework, continues management of the SIMCI OIPT's Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. It is focused first on reducing costs and improving capabilities in the areas of automating Operational Plans, Orders, and Reports in support of Army, Joint, and Coalition operations. Objectives are: identify and articulate to HQDA senior leadership specific standards that require Army-wide implementation; co-develop data standards, architecture standards, implementation specifications and Joint/Coalition products; continue transition of SIMCI knowledge and proof-of-principle products to Army and Joint acquisition programs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Program Management for the SIMCI Overarching Integrated Product Team (OIPT) Projects.	0.959	0.963	0.945
Description: Program Management of the SIMCI OIPT's Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. The OIPT consists of a Product Director, engineers, and finance personnel.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C74 / *Devel Simulation Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: Will continue management and support of the SIMCI OIPT'S Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. Will continue focus on gap-analysis of the current model and simulation programs and capabilities in the areas of Live, Virtual, and Constructive (LVC) simulations. This will support the Vice Chief of Staff of the Army's request to find redundancy within the Modeling and Simulation (M&S) community and reduce it. Objectives are to compare the current M&S capabilities with what will be required in the upcoming LVC-Information Assurance (LVC-IA) and Integrated Training Environment (ITE) environments, which will eventually become the Simulated Training Environment (STE) in 2021. This will be Army-wide, as well as, Joint combined interagency products. Focus on ITE with the creation of the blueprint for STE, which is slated to be implemented in FY 2021. ***FY 2022 Plans:*** Will continue management and support of the SIMCI OIPT'S Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. Will continue focus on gap-analysis of the current model and simulation programs and capabilities in the areas of Live, Virtual, and Constructive (LVC) simulations. This will support the Vice Chief of Staff of the Army's request to find redundancy within the Modeling and Simulation (M&S) community and reduce it. Objectives are to compare the current M&S capabilities with what will be required in the upcoming LVC-Information Assurance (LVC-IA) and Synthetic Environment (SE) environments. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY21 to FY22 decrease in funding due to budget constraints.			
Accomplishments/Planned Programs Subtotals	0.959	0.963	0.945

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

SIMCI uses other contract vehicles (internal/external) and awards money to work on specific technical projects. This provides the opportunity to leverage technical expertise from different agencies. SIMCI chooses projects that enhance current capabilities, closes the gaps of existing capabilities, and makes the determination for future projects that affect both the Mission Command and Live, Virtual, Constructive simulations environment. SIMCI only chooses those projects that meet specific requirements and criteria as stated above. It is one of SIMCI's missions to locate, utilize, or upgrade those projects or specific products that do just that.

D. Acquisition Strategy

SIMCI Overarching Integrated Product Team (OIPT) resources are allocated to multiple organizations in both the Mission Command (MC) and Modeling and Simulation (M&S) Communities. The funds are contracted to execute approved functions and to projects that advance the efforts of SIMCI and components-based architecture alignment. Products developed transition to the lead or sponsor's program which then maintains the product for the cost savings of itself and other programs in both

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C74 / *Devel Simulation Tech*

Communities. The primary focus for these projects are the following: Embedded simulations with current Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems, gap-analysis for current simulations, and the proper implementation of Next-Generation modeling and simulation capabilities in regards to the Synthetic Training Environment (STE).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C74 / *Devel Simulation Tech*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PEO STRI : Orlando, FL	10.423	0.140	Jan 2020	0.140	Jan 2021	0.140	Jan 2022	-		0.140	Continuing	Continuing	Continuing
SBIR/STTR	TBD	PEO STRI : Orlando, FL	0.326	-		-		-		-		-	0.000	0.326	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.000		-		0.000	-	-	-
		Subtotal	10.749	0.140		0.140		0.140		-		0.140	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Transition of simulation initialization capability	Various	TBD : TBD	3.134	-		-		-		-		-	Continuing	Continuing	Continuing
Geospatial Initiative	Various	TBD : TBD	1.388	-		-		-		-		-	Continuing	Continuing	Continuing
Data Model applications and reference implementations	Various	TBD : TBD	2.363	-		-		-		-		-	Continuing	Continuing	Continuing
Implementation of Initialization Products	Various	TBD : TBD	2.255	-		-		-		-		-	Continuing	Continuing	Continuing
Initialization Study Implementation	Various	TBD : TBD	1.038	-		-		-		-		-	Continuing	Continuing	Continuing
Mission Comand systems data mediation/web services	Various	TBD : TBD	2.910	-		-		-		-		-	Continuing	Continuing	Continuing
Expanding MTOE System Architecture (SA) Data	Various	TBD : TBD	1.821	-		-		-		-		-	Continuing	Continuing	Continuing
C2 Adapter Web Services and Tools	Various	TBD : TBD	2.660	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	17.569	-		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C74 / *Devel Simulation Tech*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SIMCI Program/OIPT Support	Various	Various : Various	6.927	0.809	Jan 2020	0.798	Jan 2021	0.780	Jan 2022	-		0.780	Continuing	Continuing	Continuing
Army Initialization Program and Technical Work Groups (TWG)	Various	Various : Various	0.731	0.010	Jan 2020	0.025	Jan 2021	0.025	Jan 2022	-		0.025	Continuing	Continuing	Continuing
		Subtotal	7.658	0.819		0.823		0.805		-		0.805	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.976	0.959		0.963		0.945		-		0.945	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C74 / *Devel Simulation Tech*

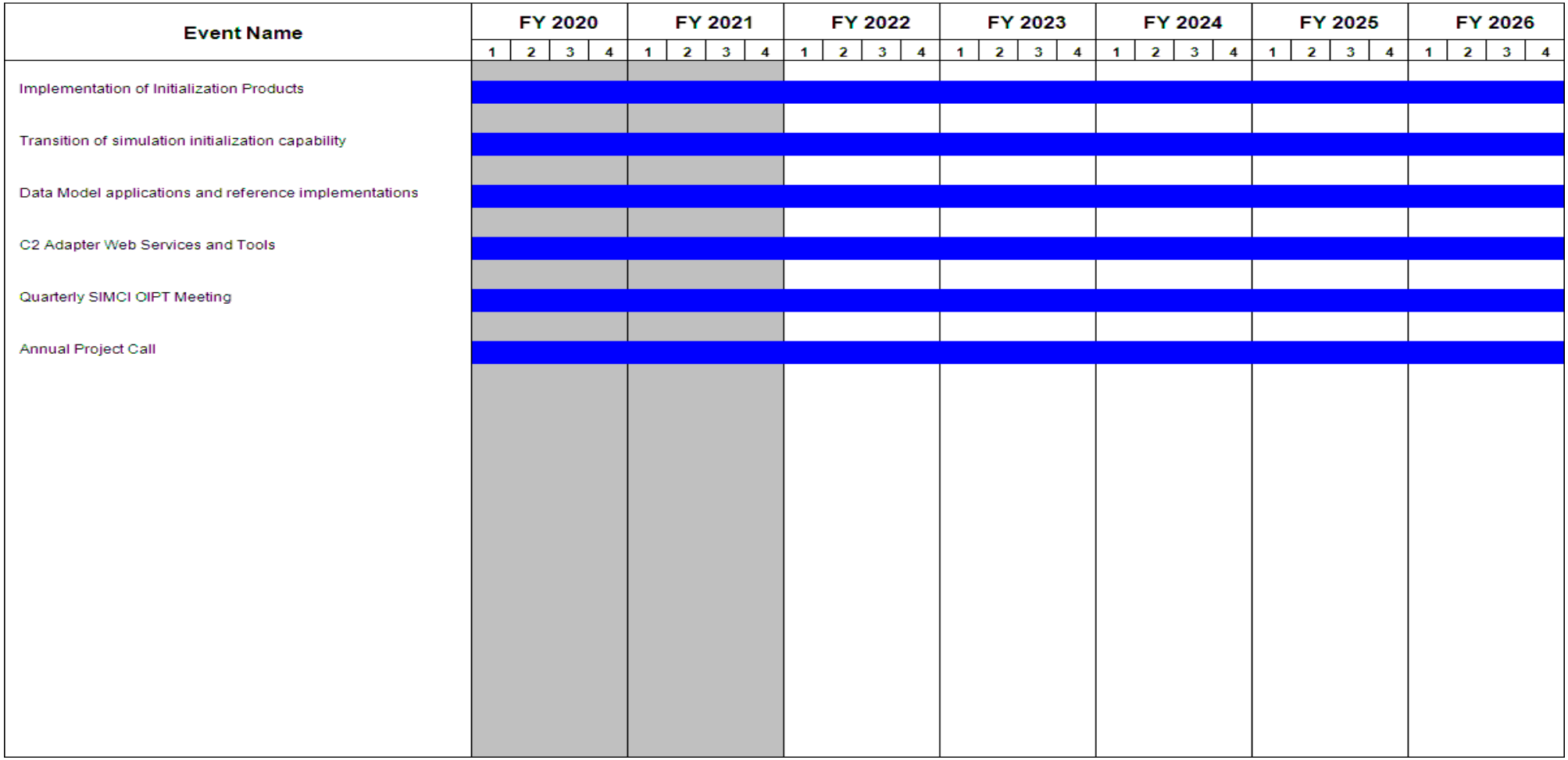

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C74 / *Devel Simulation Tech*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Implementation of Initialization Products	1	2010	4	2026
Transition of simulation initialization capability	1	2010	4	2026
Data Model applications and reference implementations	1	2010	4	2026
C2 Adapter Web Services and Tools	1	2010	4	2026
Quarterly SIMCI OIPT Meeting	1	2010	4	2026
Annual Project Call	1	2010	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C77 / *Army Geospatial Data Master Plan*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C77: *Army Geospatial Data Master Plan*	-	0.735	0.703	0.540	-	0.540	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This effort provides a geospatial/GEOINT standards-based framework that enables the management, dissemination, and update of 2D and 3D geospatial data and services within the Army Geospatial Enterprise (AGE) across Mission Command, Cross-Functional Team (CFT) initiatives, and with our National and UAP partners ensuring a common operational picture enhancing soldier situational awareness and increasing mission success. Establishes a geospatial enterprise architecture framed around geospatial standards that enable address geospatial/GEOINT data, services, and application interoperability from National to tactical as required by as Department of Defense Instruction (DoDI) 5000.56, AR 115-11 - Geospatial Information and Services, Geospatial Annex to COE IP, Net-Enabled Mission Command ICD, OMB-Circular A-119 and A-130, the FY17 NDAA (National Defense Authorization Act), section 875, 10 U.S. Code § 2223, Public Law 108-237, Standards Development Organization Advancement Action of 2004 and Public Law 108-113, National Technology Transfer and Advancement Act of 1995 and Public Law 82-436.

The Army Geospatial Enterprise (AGE) provides the geospatial foundation, consisting of accurate, robust, and timely 2D and 3D geospatial data, robust tools and services, in support of mission command, intelligence, training, mission-rehearsal and other mission-applications. It addresses the implementation and acceleration of Army modernization objectives focused on enhancing situational awareness to the warfighter.

Key lines of effort include Ground-Warfighter Geospatial Data Model (GGDM), development and maintenance of geospatial Standards, and integration with the Army Modelling and Simulation Enterprise. FY 2021 funding continues development efforts associated with the Ground-Warfighter Geospatial Data Model (GGDM) and integration with the Army Modelling and Simulation Enterprise.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Ground-Warfighter Geospatial Data Model (GGDM)	0.130	0.130	0.110
Description: The GGDM incorporates common data elements that conform to standards mandated by the Department of Defense Information Technology Standards Registry (DISR) for the National System for Geospatial Intelligence (NSG). Incorporating common geospatial data standards into the GGDM makes the Programs of Record (POR) consistent with new DISR-mandated geospatial intelligence standards for the NSG. The implementation of GGDM across the Army increases system-interoperability at the geospatial data level.			
FY 2021 Plans: Initiate development of the next version of GGDM based upon new information and revisions to the National System for Geospatial-Intelligence (NSG) Application Schema (NAS) as well as new requires from the US Army, USMC, and ABCANZ Allies.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C77 / *Army Geospatial Data Master Plan*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Provide GGDM training classes to Army and USMC personnel. Ensure major Army PORs are implementing the GGDM (I.E. DCGS-A and SECORE). ***FY 2022 Plans:*** Initiate development of the next version of GGDM based upon revisions to the National System for Geospatial-Intelligence (NSG) Application Schema (NAS) as well as new requirements from the US Army, especially as result from HQDA EXORD 154-20 (Army 3D Geospatial Data Integration Strategy), USMC, and ABCANZ Allies. Provide GGDM training classes to Army and USMC personnel. Ensure major Army PORs are implementing the GGDM (I.E. DCGS-A and SECORE). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease level of support to align with programmed funding.			
Title: Geospatial Data Standards ***Description:*** Army Geospatial Standards including data standards and standards for services to manage, process and disseminate and utilize geospatial data. Alignment of industry and Open geospatial standards from organizations such as the Open Geospatial Consortium (OGC) and others into the Army Geospatial Enterprise (AGE). ***FY 2021 Plans:*** Will initiate work in collaboration with industry and other agencies to develop new geospatial data and services standards, DOD Profiles of these standards, and technology implementations of these standards. Focus on standards to support 2D raster tiled maps, 3D globe standards, and initial assessment about vector tile maps. Additionally, cont. to develop modifications/ updates elevation data formats and services. Maintain Geospatial Standards compliance matrix, Std-V1, in alignment with quarterly updated NSG standards and DoD Information Technology Standards and Profile Registry (DISR) cycle updates of GeoINT standards and coordinate results with Army CIO/G6 and ASA(ALT) Programs. Will continue to provide SME support on geospatial data and technology standards to Army PORs. Utilize the AGDIMP resource to perform integration of multiple geospatial standards (both 2d and 3d). Specifically in support of extending the One World Terrain (OWT) capabilities into non-training like applications, such as mission planning, mission rehearsal, and Army operations. The integration of the geographic 2D world and the capabilities of the polygon based 3D world will provide the soldier with cutting-edge geospatial capabilities and over match moving forward. Increased support to Army Futures Command is anticipated to drive increased funding requirements starting in FY 2021 and an increase in programming starting in FY 2022. ***FY 2022 Plans:*** Will initiate work in collaboration with industry and other agencies to develop new geospatial data and services standards, DOD Profiles of these standards, and technology implementations of these standards. Focus on standards to support 2D raster tiled maps, 3D globe standards, and initial assessment about vector tile maps. Additionally, cont. to develop modifications/updates elevation data formats and services. Maintain Geospatial Standards compliance matrix, Std-V1, in alignment with	0.605	0.573	0.430

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C77 / *Army Geospatial Data Master Plan*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
quarterly updated NSG standards and DoD Information Technology Standards and Profile Registry (DISR) cycle updates of GEOINT standards and coordinate results with Army CIO/G6 and ASA(ALT) Programs. Will continue to provide SME support on geospatial data and technology standards to Army PORs. Utilize the AGDIMP resource to perform integration of multiple geospatial standards (both 2d and 3d). Specifically in support of extending the One World Terrain (OWT) capabilities into non-training-like applications, such as mission planning, mission rehearsal, and Army operations. The integration of the geographic 2D world and the capabilities of the polygon based 3D world will provide the soldier with cutting-edge geospatial capabilities and over match moving forward. Increased support to Army Futures Command is anticipated to drive increased funding requirements starting in FY 2021 and an increase in programming starting in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease level of support to align with programmed funding.			
Accomplishments/Planned Programs Subtotals	0.735	0.703	0.540

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Resources are allocated to several critical geospatial projects in support of the Army Geospatial Data Integrated Master Plan (AGDIMP) and the Army Geospatial Enterprise (AGE).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C77 / *Army Geospatial Data Master Plan*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.000		-		0.000	-	-	-
		Subtotal	-	-		-		0.000		-		0.000	-	-	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Geospatial Model and Data Standards	Various	TBD : TBD	7.043	0.735	Nov 2019	0.703	Nov 2020	0.540	Nov 2021	-		0.540	0.000	9.021	Continuing
		Subtotal	7.043	0.735		0.703		0.540		-		0.540	0.000	9.021	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.043	0.735		0.703		0.540		-		0.540	0.000	9.021	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C77 / *Army Geospatial Data Master Plan*

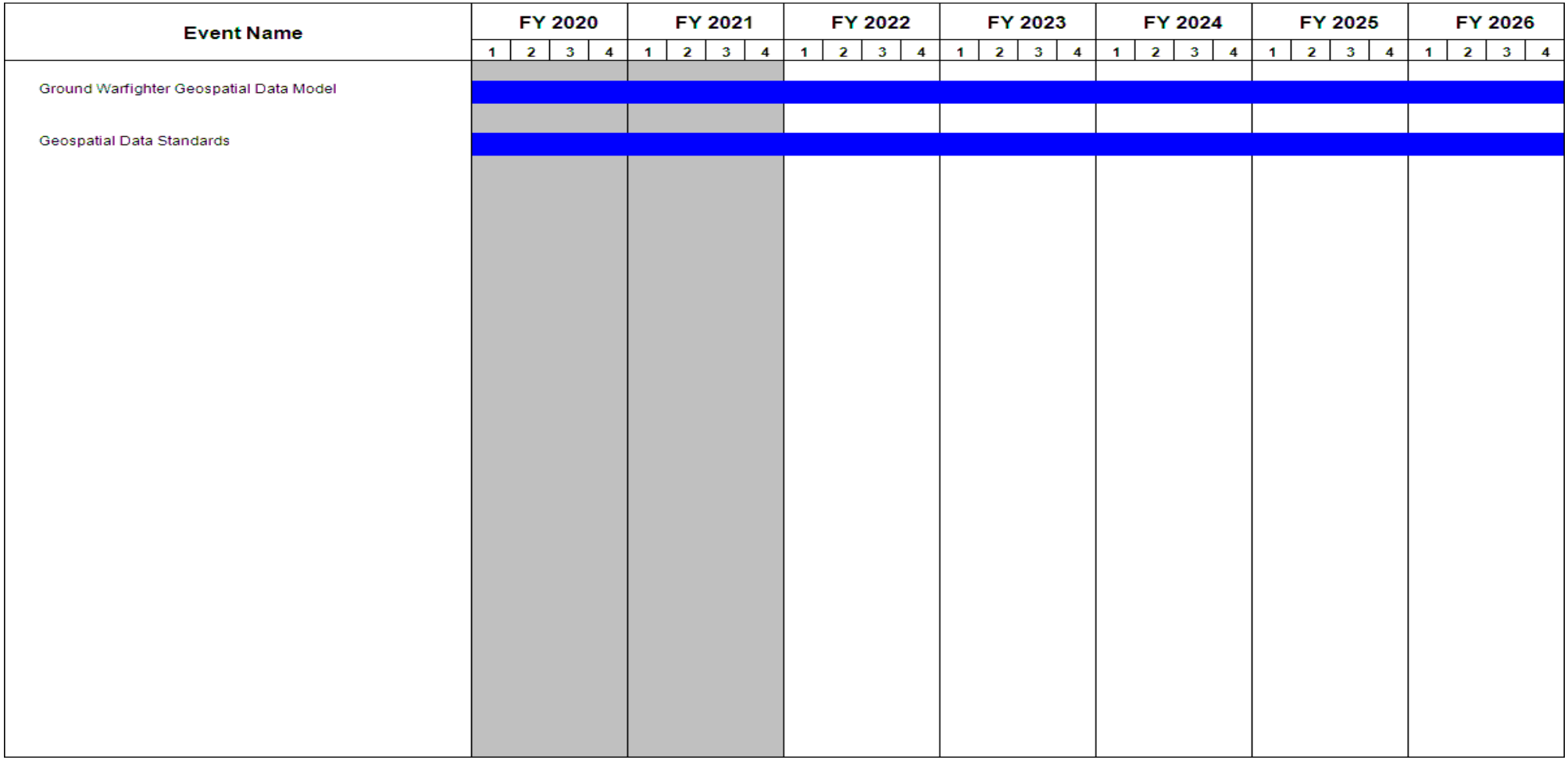

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C77 / *Army Geospatial Data Master Plan*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Ground Warfighter Geospatial Data Model	1	2010	4	2026
Geospatial Data Standards	1	2010	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C78 / *One Semi-Automated Forces*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C78: *One Semi-Automated Forces*	-	5.786	5.939	5.968	-	5.968	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

One Semi-Automated Forces (OneSAF) develops and delivers a software application that represents activities of units and forces in simulation to support Army Training and Readiness. The application is used by Army agencies to support the concept evaluation, experimentation, materiel acquisition and training throughout the communities. The focus of this project is systems/software engineering and design for development and evolution of the architecture and software tools for a universal system of Army computer-generated forces -- OneSAF. OneSAF is a high fidelity brigade-and-below SAF that represents a full range of operations, systems and control processes in support of stand-alone and embedded training and Research, Development and Acquisition (RDA) simulation applications. OneSAF is fully interoperable with the Army's emerging virtual, live, and division-and-above constructive simulations and provides next-generation simulation products. OneSAF replaces a variety of legacy simulations used within the Army to support Acquisition, Analysis, Experimentation, Intelligence, Test & Evaluation, and Training simulation activities.

FY 2022 base funding in the amount of $5.968 million allows for continued development of the software product line by addressing OneSAF Pre-Planned Product Improvements (P3Is) as prioritized and approved by the Training and Doctrine Command (TRADOC). This funding also provides for the management of the infrastructure, equipment, laboratories, and processes needed to develop, test, and release the required product baseline.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Engineering and Manufacturing Development (EMD) phase contract activities for the One Semi-Automated Forces program.	4.518	4.589	4.618
Description: Continue EMD phase contract activities for the OneSAF program. ***FY 2021 Plans:*** Will continue the development of software capabilities based on OneSAF P3Is as prioritized and approved by TRADOC. Will continue the software development of functionality that enhances architectural services, components, synthetic environment and infrastructure of the OneSAF Product Line and will provide for software integration, test and release of required software refreshes and Version 10.0. ***FY 2022 Plans:*** Will continue the development of software capabilities based on OneSAF P3Is as prioritized and approved by TRADOC. Will continue the software development of functionality that enhances architectural services, components, synthetic environment and infrastructure of the OneSAF Product Line and will provide for software integration, test and release of required software refreshes and Version 11.0. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C78 / *One Semi-Automated Forces*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Increase from FY2021 to FY2022 funding is a result of incorporating additional P3I capabilities into OneSAF Software Baseline Version 11.0.			
Title: Government System Test and Evaluation for the One Semi-Automated Forces (OneSAF) program. ***Description:*** Government System Test and Evaluation for the OneSAF program. ***FY 2021 Plans:*** Will provide for the conducting of software, test, integration and release for Version 10.0. Will provide support to the user community in conducting experiments, analyses, and validation events for integration into the Home Station Training Federation, Network Integration Events (NIE), Battle Lab Collaborative Simulation Environment (BLCSE), Entity Simulation Service (ESS) in support of Joint Land Component Constructive Training Capability (JLCCTC), and other LVC applications. ***FY 2022 Plans:*** Will provide for the conducting of software, test, integration and release for Version 11.0. Will provide support to the user community in conducting experiments, analyses, and validation events for integration into the Home Station Training Federation, Network Integration Events (NIE), Battle Lab Collaborative Simulation Environment (BLCSE), Entity Simulation Service (ESS) in support of Joint Land Component Constructive Training Capability (JLCCTC), and other Live, Virtual and Constructive (LVC) applications.	1.009	1.050	1.050
Title: Government Program Management for the One Semi-Automated Forces (OneSAF) program. ***Description:*** Government Program Management for the One Semi-Automated Forces (OneSAF) program. ***FY 2021 Plans:*** Will provide a portion of program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of OneSAF. ***FY 2022 Plans:*** Will provide a portion of program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of OneSAF.	0.259	0.300	0.300
Accomplishments/Planned Programs Subtotals	5.786	5.939	5.968

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C78 / *One Semi-Automated Forces*

D. Acquisition Strategy

OneSAF continues to manage two Task Orders under one ID/IQ Production and Support contract. The Task Order for support includes Program Management; Development and Customer support; Training; Travel and ODCs. The Task Order for Production includes Capability P3I; Tailored Product Baseline Release; Capability Concurrence; and Integration, Test, and Release. The OneSAF Production and Support contract is tailored to fully serve the current and evolving needs of the user community.

The enhancements will be executed within the development line as modifications to the released baseline via Engineering Change Proposals (ECPs); Change Requests (CRs): Pre-Planned Product Improvements (P3I); and correction of deficiencies identified as Problem Test Reports (PTRs) and Deficiency Reports (DRs) by the user community.

In FY 2022, the program will continue with yearly releases of the OneSAF Software versions containing performance enhancements resulting from the development and integration of Pre-Planned Product Improvements (P3I), concurrency enhancements, user feedback, corrections of deficiencies identified as Problem Test Reports (PTR) and Deficiency Reports (DR) and Co-Developers handovers. The OneSAF program will continue to manage the single award contract for the continuing development and maintenance of the software baseline as well as continue to manage the Integrated Development Environment (IDE).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C78 / *One Semi-Automated Forces*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PEO STRI, Orlando, FL : Various	28.882	0.330	Oct 2019	0.300	Oct 2020	0.300	Oct 2021	-		0.300	Continuing	Continuing	Continuing
SBIR/STTR	TBD	PEO STRI : Orlando, FL	0.460	-		-		-		-		-	0.000	0.460	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.000		-		0.000	-	-	-
		Subtotal	29.342	0.330		0.300		0.300		-		0.300	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration, Interoperability, and Support (I2S) & Logical Follow On (LFO)	C/CPFF	Cole Engineering Services, Inc. : Orlando, FL	7.290	-		-		-		-		-	Continuing	Continuing	Continuing
Software Development & Production Logical Follow On (LFO)	C/CPFF	Leidos : Orlando, FL	19.985	-		-		-		-		-	Continuing	Continuing	Continuing
Software Development	C/CPFF	Riptide : Orlando, FL	11.196	4.079	Dec 2019	4.164	Dec 2020	4.193	Dec 2021	-		4.193	Continuing	Continuing	Continuing
		Subtotal	38.471	4.079		4.164		4.193		-		4.193	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Analysis	Various	Various : Various	6.597	-		-		-		-		-	Continuing	Continuing	Continuing
Domain Analysis	Various	Various : Various	6.435	0.104	Dec 2019	0.125	Dec 2020	0.125	Dec 2021	-		0.125	Continuing	Continuing	Continuing
Integrated Development Environment	Various	Various : Various	9.936	-		-		-		-		-	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	Project (Number/Name) C78 / *One Semi-Automated Forces*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Architecture Engr & Tech Spt	SS/FP	MITRE FFRDC : Aberdeen Proving Ground, MD	6.059	0.264	Dec 2019	0.300	Dec 2020	0.300	Dec 2021	-		0.300	Continuing	Continuing	Continuing
		Subtotal	29.027	0.368		0.425		0.425		-		0.425	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OneSAF integration, evaluation and test	Various	Various : Various	14.629	0.855	Dec 2019	0.875	Dec 2020	0.875	Dec 2021	-		0.875	Continuing	Continuing	Continuing
OneSAF Verification, Validation & Accreditation	Various	Various : Various	7.647	0.154	Dec 2019	0.175	Dec 2020	0.175	Dec 2021	-		0.175	Continuing	Continuing	Continuing
		Subtotal	22.276	1.009		1.050		1.050		-		1.050	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	119.116	5.786		5.939		5.968		-		5.968	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C78 / *One Semi-Automated Forces*

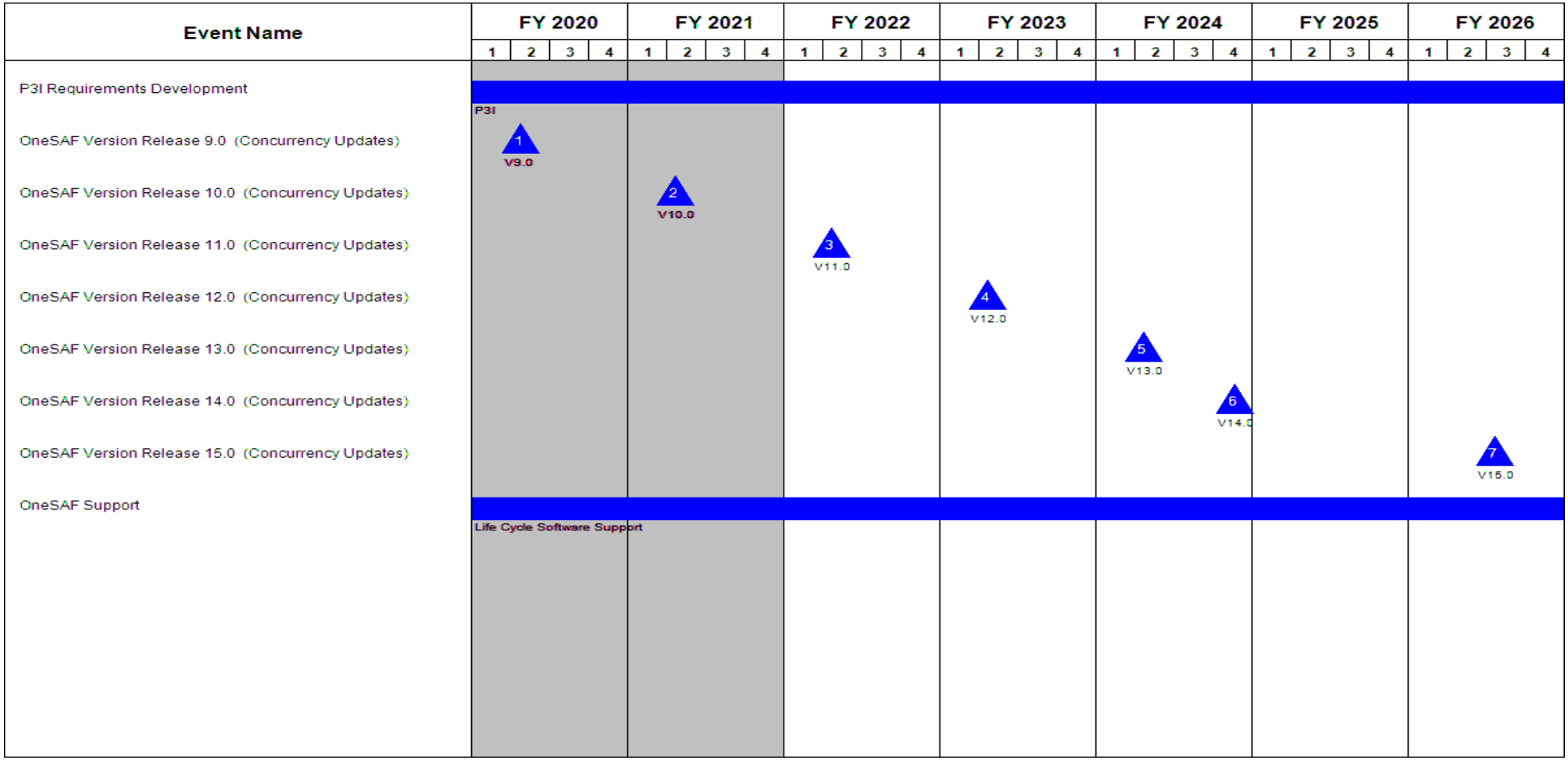

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604760A / *Distributive Interactive Simulations (DIS) - Eng Dev*	**Project (Number/Name)** C78 / *One Semi-Automated Forces*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
P3I Requirements Development	1	2006	4	2026
OneSAF Version Release 9.0 (Concurrency Updates)	2	2020	2	2020
OneSAF Version Release 10.0 (Concurrency Updates)	2	2021	2	2021
OneSAF Version Release 11.0 (Concurrency Updates)	2	2022	2	2022
OneSAF Version Release 12.0 (Concurrency Updates)	2	2023	2	2023
OneSAF Version Release 13.0 (Concurrency Updates)	2	2024	2	2024
OneSAF Version Release 14.0 (Concurrency Updates)	4	2024	4	2024
OneSAF Version Release 15.0 (Concurrency Updates)	3	2026	3	2026
OneSAF Support	1	2006	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604768A *I Brilliant Anti-Armor Submunition (BAT)*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	19.177	24.064	-	-	-	-	-	-	-	-	-
688: *ATACMS BLK II*	-	19.177	24.064	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element was for Army Tactical Missile System Block II (ATACMS BLK II) missile system Brilliant Anti-Armor (BAT) submunition. In FY18, it was repurposed for BREAKER and in FY19, CD ATACMS was added. BREAKER ended in FY19 and CD ATACMS was moved to a different program element. In FY20 and beyond, this program element funds only PFAL (Palletized Field Artillery Launcher).

Project P01. Multi-Mode Seeker began integration of Strategic Capabilities Office (SCO) STRIKE-X program demonstrated capabilities into ATACMS. This effort focused on providing integration of a seeker to search, detect, acquire, and engage moving maritime/land-based targets. There is no funding in FY2021.

Project 688 is a developmental effort for the Palletized Field Artillery Launcher (PFAL). Previously, PFAL was STRIKE-X capability 1 of the SCO Demonstration program and CD ATACMS was STRIKE X capability 3. PFAL is a palletized erectable launcher that provides alternatives to deliver near-term innovative long-range strike capabilities to improve operational effectiveness for Combatant Commanders. The PFAL launcher consists of an erectable palletized mechanical structure, Fire Control System (FCS), and Power Management System (PMS). PFAL is capable of firing all current Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) rockets and missiles, to include the Guided Multiple Launch Rocket System (GMLRS), the Army Tactical Missile System (ATACMS), and future munitions such as the Precision Strike Missile (PrSM) and Extended Range GMLRS (ER GMLRS). PFAL is capable of carrying two launch pods each containing either six GMLRS / MLRS rockets or one ATACMS missile. The PFAL launcher is capable of firing from a fixed ground position, Palletized Load System (PLS) trailer, or maritime vessel.

In FY2020 and FY2021, the Army will procure the kits to build 1 prototype to replace the 3 SCO prototypes that were dispositioned to an Army unit in FY2020. In FY2021, the Army will design and develop upgrades to the baseline design based upon the directed requirement.

Justification:
There is no FY22 funding request.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army					Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604768A *I Brilliant Anti-Armor Submunition (BAT)*		
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	20.000	24.975	32.769	-	32.769
Current President's Budget	19.177	24.064	0.000	-	0.000
Total Adjustments	-0.823	-0.911	-32.769	-	-32.769
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.823	-0.911			
• Adjustments to Budget Years	-	-	-32.769	-	-32.769

Change Summary Explanation

FY22 funding is being reallocated to other Army priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	Project (Number/Name) 688 / *ATACMS BLK II*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
688: *ATACMS BLK II*	-	19.177	24.064	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element was for Army Tactical Missile System Block II (ATACMS BLK II) missile system Brilliant Anti-Armor (BAT) submunition. In FY18, it was repurposed for BREAKER and in FY19, CD ATACMS was added. BREAKER ended in FY19 and CD ATACMS was moved to a different program element. In FY20 and beyond, this program element funds only PFAL (Palletized Field Artillery Launcher).

Project P01. Multi-Mode Seeker began integration of Strategic Capabilities Office (SCO) STRIKE-X program demonstrated capabilities into ATACMS. This effort focused on providing integration of a seeker to search, detect, acquire, and engage moving maritime/land-based targets. There is no funding in FY2021.

Project 688 is a developmental effort for the Palletized Field Artillery Launcher (PFAL). Previously, PFAL was STRIKE-X capability 1 of the SCO Demonstration program and CD ATACMS was STRIKE X capability 3. PFAL is a palletized erectable launcher that provides alternatives to deliver near-term innovative long-range strike capabilities to improve operational effectiveness for Combatant Commanders. The PFAL launcher consists of an erectable palletized mechanical structure, Fire Control System (FCS), and Power Management System (PMS). PFAL is capable of firing all current Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) rockets and missiles, to include the Guided Multiple Launch Rocket System (GMLRS), the Army Tactical Missile System (ATACMS), and future munitions such as the Precision Strike Missile (PrSM) and Extended Range GMLRS (ER GMLRS). PFAL is capable of carrying two launch pods each containing either six GMLRS / MLRS rockets or one ATACMS missile. The PFAL launcher is capable of firing from a fixed ground position, Palletized Load System (PLS) trailer, or maritime vessel.

In FY2020 and FY2021, the Army will procure the kits to build 1 prototype to replace the 3 SCO prototypes that were dispositioned to an Army unit in FY2020. In FY2021, the Army will design and develop upgrades to the baseline design based upon the directed requirement.

There is no FY22 funding request.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Palletized Field Artillery Launcher (PFAL)	19.177	24.064	-
Description: The Palletized Field Artillery Launcher (PFAL) Program provides a palletized erectable launcher capable of firing the Multiple Launched Rocket System (MLRS) Family of Munitions (MFOM). This effort will refine prototypes against Combatant Commanders specific requirements to support a continuous user evaluation.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	**Project (Number/Name)** 688 / *ATACMS BLK II*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Base year funding allows for continued design, development, and integration to ensure the safe and effective deployment of operational prototypes in a continuous user evaluation. Procure and receive hardware/materials to implement design improvements to the mechanical structure, FCS, and/or PMS subsystems of existing prototypes transitioned from the SCO. Support component-level and system-level qualification and integration. Conduct flight tests of existing munitions with existing prototypes to evaluate readiness for supporting a user evaluation. Procure long lead-time hardware/materials necessary to start the fabrication of up to 7 additional prototypes. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** There is no FY22 funding request.			
Accomplishments/Planned Programs Subtotals	19.177	24.064	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Palletized Field Artillery Launcher (PFAL) transitions from a Strategic Capabilities Office (SCO) managed effort to management by the Precision Fires Rocket and Missile Systems Project Office. The PFAL program performs development efforts required to refine prototypes against Combatant Commander's specific requirements to support a user evaluation. The PFAL program will conduct analysis and implement design improvements to demonstrate safe and effective design to enable deployment of prototypes as part of a continuous user evaluation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	Project (Number/Name) 688 / *ATACMS BLK II*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : RSA	1.688	-		0.872	Nov 2020	-		-		-	0.000	2.560	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.908		-		-		-		-	0.000	0.908	-
		Subtotal	1.688	0.908		0.872		-		-		-	0.000	3.468	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.159	-		-		-		-		-	0.000	0.159	-
BREAKER Warhead Development	C/CPFF	LMMFC : Dallas, TX	2.300	-		-		-		-		-	0.000	2.300	-
BREAKER System Analysis, Requirement & Spec Dev	MIPR	AMRDEC : Redstone Arsenal, AL	1.477	-		-		-		-		-	0.000	1.477	-
PFAL Development Engineering	MIPR	CCDC AvMC : Redstone Arsenal	-	18.269	Jan 2020	7.738	Dec 2020	-		-		-	0.000	26.007	-
PFAL Prototype Development	C/CPIF	AMTC : Redstone Arsenal, AL	-	-		3.259	Dec 2020	-		-		-	0.000	3.259	-
Prototype Fabrication	TBD	TBD : TBD	-	-		10.649	Dec 2020	-		-		-	0.000	10.649	-
		Subtotal	3.936	18.269		21.646		-		-		-	0.000	43.851	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Quality, Safety, Systems Engineering, and Analysis	TBD	Various : Redstone Arsenal, AL	-	-		0.457	Dec 2020	-		-		-	0.000	0.457	-
		Subtotal	-	-		0.457		-		-		-	0.000	0.457	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	Project (Number/Name) 688 / *ATACMS BLK II*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	Various : Various	-	-		1.089	Dec 2020	-		-		-	0.000	1.089	-
		Subtotal	-	-		1.089		-		-		-	0.000	1.089	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.624	19.177		24.064		-		-		-	0.000	48.865	N/A

Remarks

Acronyms:
AvMC: Aviation and Missile Center;
AMTC: Aviation & Missile Technology Consortium;
CCDC: Combat Capabilities Development Command;
AMRDEC: Aviation and Missile Research, Development and Engineering Command;
LMMFC: Lockheed Martin Missiles and Fire Control;
RSA: Redstone Arsenal, Alabama;
CD: Cross Domain
STORM - Strategic and Operational Rockets and Missiles

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	**Project (Number/Name)** 688 / *ATACMS BLK II*

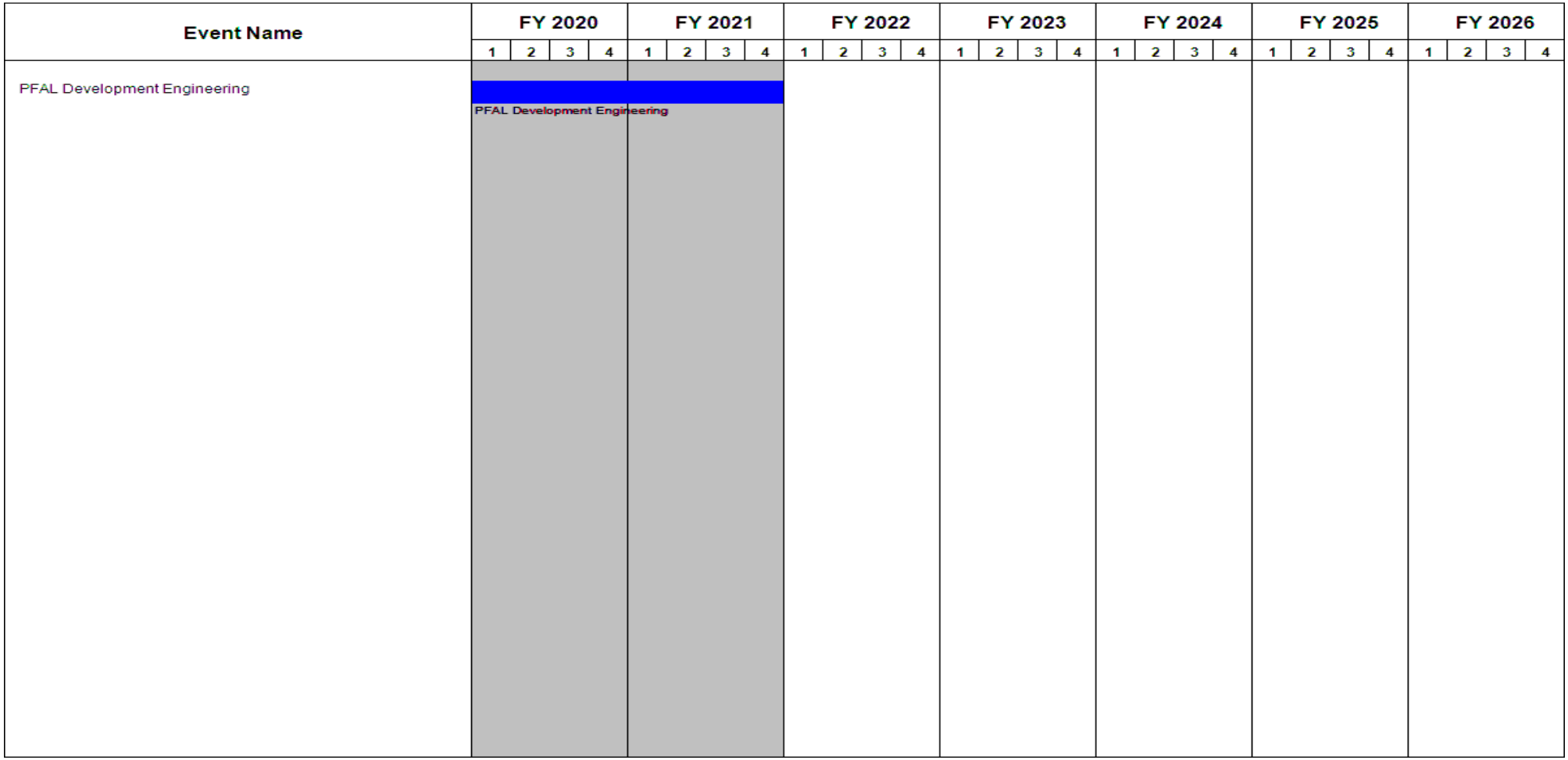

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604768A / *Brilliant Anti-Armor Submunition (BAT)*	**Project (Number/Name)** 688 / *ATACMS BLK II*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
System Analysis, Requirement & Spec Development	1	2018	4	2019
Warhead Development	1	2019	4	2019
Contract Requirements Package Development	1	2018	4	2019
PFAL Development Engineering	1	2020	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.861	3.438	-	-	-	-	-	-	-	-	-
582: *Synthetic Envir Core*	-	8.861	3.438	-	-	-	-	-	-	-	-	-

Note

The research and development effort for Project 582 - Synthetic Environment Core, has completed and the program will not request funding in FY 2022.

A. Mission Description and Budget Item Justification

The Combined Arms Tactical Trainers (CATT) represent a family of combined arms simulation systems designed to support the Army's simulation-based, Combined Arms Training Strategy. The CATT program portfolio directly supports the Army's Training Strategy and progressive training model by providing realistic training events and comprehensive After Action Reviews (AAR). CATT enables units, from crew to the battalion task force level, to conduct a wide variety of combat tasks on a realistic, interactive, synthetic battlefield. CATT's combination of manned simulators and staff officer workstations enables units to train as a combined arms team in a cost effective manner. The primary CATT system is the Close Combat Tactical Trainer (CCTT) which provides the underlying baseline architecture and AAR for CATT expansions, Pre-Planned Product Improvements (P3I) and system enhancements. The Reconfigurable Vehicle Simulator (RVS) supports combat convoy operations and Improvised Explosive Devices (IED) tasks. Synthetic Environment (SE) Core provides for the expansion of the synthetic environment baseline to include enhanced interoperability and the products and infrastructure to support current and future combat operations and mission rehearsal. The first synthetic environments expanded were in the Aviation Combined Arms Tactical Trainer (AVCATT) and the CCTT for both the Active and Reserve components. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, ground-air coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. Soldiers can train in a common environment on geotypical or geospecific virtual terrain. It is also possible to link Gaming technology to actual communication, command, control, computer, and intelligence (C4I) systems and other CATT simulation systems to increase the utility and realism of the training. By practicing skills in CATT, units are able to effectively prepare for costly live fire and maneuver exercises, as well as training tasks deemed too hazardous to conduct in a live training environment. Fielded in both fixed site and mobile versions, CATT enables both Active and Reserve component units to prepare for real world contingency missions. By being able to use a wide array of training terrain databases and modify the behavior of the computer generated opposing forces, CATT offers an unlimited array of training options to support the Army's many regional combat missions. The combination of tough field and live fire training, and realistic simulation training in CATT, is the formula to prepare Soldiers and their Leaders for the uncertainties they face in combat operations.

The research and development effort for Project 582 - Synthetic Environment Core, has completed and the program will not request funding in FY 2022.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army					Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604780A *I Combined Arms Tactical Trainer (CATT) Core*		
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	9.241	3.568	2.753	-	2.753
Current President's Budget	8.861	3.438	0.000	-	0.000
Total Adjustments	-0.380	-0.130	-2.753	-	-2.753
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.380	-0.130			
• Adjustments to Budget Years	-	-	-2.753	-	-2.753

Change Summary Explanation

Fiscal Year 2022 (FY22) decrease is a result of Project 582 Synthetic Envir Core completing at the end of FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	Project (Number/Name) 582 / *Synthetic Envir Core*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
582: *Synthetic Envir Core*	-	8.861	3.438	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The research and development effort for Project 582 - Synthetic Environment Core, has completed and the program will not request funding in FY 2022.

A. Mission Description and Budget Item Justification

This project supports the Synthetic Environment Core (SE Core) Program. The SE Core Program is a foundational element and the only provider of correlated terrain for the Army's Live, Virtual, Constructive Integrated Training Environment (LVC ITE) that links Army training systems and simulators into an integrated and interoperable environment. SE Core's mission is to ensure that Army systems and simulators support U.S. Army Readiness by providing visual models (buildings and vehicles), terrain (over which the simulator moves), and entity behaviors (models performing realistic and appropriate actions such as movement and weapon effects) that are relevant and realistic in support of Multi-Domain Operations (MDO) 2028. As the exclusive provider of correlated terrain, SE Core ensures that all Army simulators/ operators receive terrain that allows for a "Fair Fight" capability; that is, no one will have an inherent advantage over another because training did not occur on a "level playing field". Fair Fight allows air and ground forces to hold coordinated and integrated training events that accurately replicate combat operations for a train-as-we-fight capability.

A major component of the program is the SE Core-developed Standard Terrain Database Generation Capability (STDGC), the process used to build the terrain and models that the simulators and simulations employ. The Army Geospatial Center (AGC) gave SE Core its highest rating, the "Gold Standard", based on the quality of the STDGC process and the geospatial data generated by it. The program has been a certified, AGC co-producer of geospatial data since 2014. In addition to the correlated terrain databases and common visual models, SE Core components include Virtual One Semi-Automated Forces (Virtual OneSAF) (the computer generated force behaviors for virtual systems); the virtual systems architecture; and mission command development.

The research and development effort for Project 582 - Synthetic Environment Core, has completed and the program will not request funding in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Synthetic Environment Core (SE Core) program.	8.657	3.079	-
Description: Continue EMD phase contract activities for the SE Core program.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 / *Synthetic Envir Core*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continues to fulfill requirements of Increment 3. Efforts will refine the terrain generation capability (STDGC) to ensure it remains concurrent in meeting the demand for synthetic terrain for constructive simulations. In addition, funds are required to ensure the SE Core development environment remains compliant with Risk Management Framework mandates. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease for FY 2021 to FY 2022 is due to completion of the research and development effort associated with the program.			
Title: Government Program Management for the Synthetic Environment Core (SE Core) program. ***Description:*** Government Program Management for the SE Core program. ***FY 2021 Plans:*** Will provide funding for the Subject Matter Experts providing technical input into the development of the SE Core terrain generation capability. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease for FY 2021 to FY 2022 is due to completion of the research and development effort associated with the program.	0.204	0.359	-
Accomplishments/Planned Programs Subtotals	8.861	3.438	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The SE Core program is post Milestone B and will remain in the Engineering and Manufacturing Development phase for the remainder of its lifecycle. SE Core is a "software only" program that continuously develops terrain, virtual models and other software products for integration into existing training systems. It does not field products to the end user, therefore the program will not require a Milestone C decision or go into the Production phase. The SE Core program is developing the software tools and processes to develop the Army's common virtual environment to link simulation devices [to include: Close Combat Tactical Trainer (CCTT), Aviation Close Combat tactical Trainer (AVCATT) , Games for Training (GFT), Live, Virtual, Constructive Integrating Architecture (LVC-IA), Homestation Instrumentation Training System (HITS), Joint Land Component Constructive Training Capability (JLCCTC), Fires Simulation (FIRESIM), One Semi-Automated Forces (OneSAF)] into an interoperable environment and maintaining the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

The government awarded Increment 2 as a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Leidos in August 2011 with a period of performance start date of December 2011. Leidos was formerly known as Science Applications International Corporation (SAIC). This contract has a one-year base with four one-year options. The government exercised the first option in December 2012, the second option in December 2013, the third option in December 2014

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 / *Synthetic Envir Core*

and the fourth option in December 2015. The government awarded a final delivery order in December 2016 that extended the period of performance of the Increment 2 contract into December 2017. The contract was extended an additional six months to June 2018 while the Increment 3 contract was competed.

In April 2018, in keeping with the original SE Core acquisition strategy of continuous development, the government awarded the Increment 3 contract as a single award, CPFF, IDIQ with a one year base and four one-year options and a target end date of FY 2023.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	Project (Number/Name) 582 / *Synthetic Envir Core*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Various	3.622	-		-		-		-		-	0.000	3.622	3.622
Government Program Management Support	Various	PEO STRI : Orlando, FL	26.522	0.204	Oct 2019	0.359	Feb 2021	-		-		-	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.419		-		-		-		-	0.000	0.419	-
		Subtotal	30.144	0.623		0.359		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Architecture and Integration	C/CPFF	SAIC : Orlando, FL	6.946	-		-		-		-		-	0.000	6.946	6.946
Technology Development -Architecture and Integration	C/CPFF	SAIC : Orlando, FL	50.785	-		-		-		-		-	0.000	50.785	50.785
Technology Development -Database Virtual Environment Development	C/CPFF	CAE, USA : Orlando, FL	56.179	-		-		-		-		-	0.000	56.179	56.179
Technology Development-Common Virtual Environment & Management	C/Various	Leidos : Orlando, FL	80.284	-		-		-		-		-	0.000	80.284	80.284
Technology Development-Common Virtual Environment & Management INC III	C/Various	Leidos, Inc. : Orlando, FL	10.525	-		-		-		-		-	0.000	10.525	Continuing
Technology Development-Common Virtual Environment & Management INC III	Option/ Various	Leidos : Orlando, FL	4.940	8.238	Nov 2019	3.079	Nov 2020	-		-		-	Continuing	Continuing	Continuing
		Subtotal	209.659	8.238		3.079		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	Project (Number/Name) 582 / *Synthetic Envir Core*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

FY 2020 award in Nov 2019 of $8.238 million funds remaining option year 1 period and awards option year 2 period. FY 2021 award of $3.079 million in Nov 2020 fully funds option year 2 period and awards option year 3 period.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Test Support	Various	Test Community : Various	0.125	-		-		-		-		-	0.000	0.125	0.125
		Subtotal	0.125	-		-		-		-		-	0.000	0.125	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	239.928	8.861		3.438		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 / *Synthetic Envir Core*

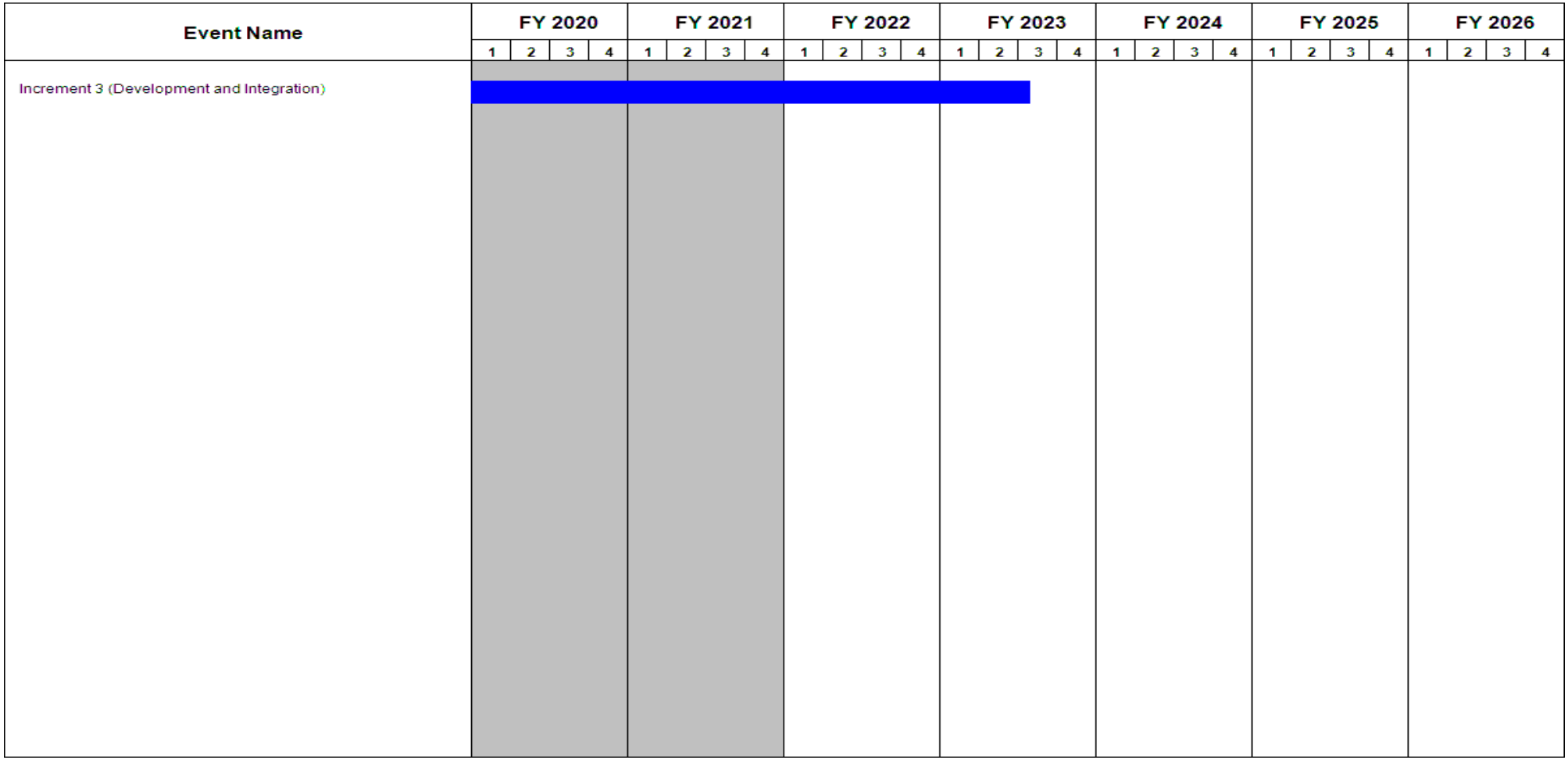

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604780A / *Combined Arms Tactical Trainer (CATT) Core*	**Project (Number/Name)** 582 / *Synthetic Envir Core*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Increment 2 (Development and Integration)	4	2013	3	2018
Increment 3 (Development and Integration)	3	2018	3	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604798A *I Brigade Analysis, Integration and Evaluation*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	29.852	18.737	21.534	-	21.534	-	-	-	-	-	-
DY3: *NIE Test & Evaluation*	-	6.390	-	-	-	-	-	-	-	-	-	-
DY5: *Production/Field Coordination for Capability Sets*	-	0.929	1.035	-	-	-	-	-	-	-	-	-
DY7: *Army Systems Engineering, Architecture & Analysis*	-	16.740	17.702	21.534	-	21.534	-	-	-	-	-	-
DZ6: *Army Integration Management & Coordination*	-	5.793	-	-	-	-	-	-	-	-	-	-

Note

The remaining funding in Project DY5 / Production/Field Coordination for Capability Sets is tied to OCSE core manpower authorizations which are realigned to Project DY7 / Army Systems Engineering, Architecture & Analysis in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

This program element is comprised of four projects: Enduring Assessments (Joint Warfighter Assessment (JWA); Production/Field Coordination for Capability Sets; Army Systems Engineering, Architecture & Analysis; Army Integration Management & Coordination; and Emerging Technology Initiatives. The specific evaluation requirements will support Mission Command Network (MCN) 2020, the Force 2025 objectives, and emerging technology insertion.

Project DY3: Enduring Assessments Test & Evaluation, synchronizes, integrates, and manages system and System of Systems (SoS) network capability evaluations in laboratory and operational environments in order to inform Army force modernization decisions that impact network improvements, interoperability compliance, operational readiness, and exploitable technology opportunities. This project was realigned to the Army Future Command's PE 0605326A (Concepts Experimentation Program) in FY 2021

Project DY5: Production/Fielding Coordination for Capability Sets, provides for the development of a synchronized Brigade/Division level plan for the Production equipment delivery and Fielding (hand-off logistics and new equipment training) of Capability Set (CS) components (both hardware/software in A and/or B Kits) upon completion of Network Integration Evaluation (NIE), Army Interoperability Certification (AIC) and Army CS fielding decision. The remaining funding is tied to OCSE core manpower authorizations which are realigned to Project DY7 in FY 2022 and beyond.

Project DY7: Provides the Army's leadership and materiel developers with the necessary modernization planning, System of Systems (SoS) engineering and analysis, technical risk analysis, architectural products, critical path analysis, cybersecurity and interoperability risk analysis and the associated mitigation planning for the Army's materiel portfolio. This project develops process, products, and policies that ensure a solid Army Systems Engineering construct across Army Program Executive and

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604798A *I Brigade Analysis, Integration and Evaluation*

Management Offices. This includes efforts in support of Common Operating Environment (COE) governance, the Army Futures Command's emerging development of concepts, requirements generation, resource allocation, experimentation, acquisition, logistics, and technology components of the Army Future Force Modernization Enterprise (FFME). Focus areas includes the integration of key elements of a system into one overall system engineering construct and managing it through major system engineering activities to ensure the fielding of integrated capabilities meet the mission needs of the force against any potential adversaries. Key system engineering functions include, engineering and technical analysis, integrated System of Systems (SoS) architecture products, SoS risk analysis and mitigation planning to influence the Army's materiel portfolio. This project also includes the establishment of Army systems engineering policy and implementation standards, requirements decomposition and alignment, and resource and acquisition synchronization to address cross-portfolio issues. Key tasks are the development of integrated Architecture products; Engineering Analysis and Design; Portfolio Analysis; Systems Security Engineering process, interoperability assessments, independent technical risk assessments, Cybersecurity requirements analysis, compliance, Cyber policy assessments, and coordinates the ASA(ALT) community's Data activities including Data Steward and Functional Data Manager in Army Data Governance Forums.

Project DZ6: Army Integration Management & Coordination funds resources that support the technical and management (i.e. headquarters, resource management, acquisition, human resources, and operations) aspects of the Army Rapid Capabilities Office (RCO). This project was realigned to PE 0605054A (Emerging Technologies Initiatives) in FY 2021 for greater transparency of the Army RCO efforts, now called Rapid Capabilities and Critical Technologies Office (RCCTO).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	38.303	19.268	19.271	-	19.271
Current President's Budget	29.852	18.737	21.534	-	21.534
Total Adjustments	-8.451	-0.531	2.263	-	2.263
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-7.500	-			
• SBIR/STTR Transfer	-0.951	-0.531			
• Adjustments to Budget Years	-	-	2.263	-	2.263

Change Summary Explanation

The increase reflects the funding for OCSE civilian positions in all four PE 0604798A projects, being realigned to support requirements in project DY7 moving forward. Transfers FY22 funding $2.3M from SAG 432 612 Service Wide Communications and SAG 435 212 Other Service Support, and OPA B88801 to RDTE PE 0604798A / Brigade Analysis, Integration and Evaluation, Project DY7, to align resources for the Office of Chief Systems Engineer to the RDT&E appropriation.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DY3 / *NIE Test & Evaluation*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
DY3: *NIE Test & Evaluation*	-	6.390	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project DY3:

Enduring Assessments Test & Evaluation funding enables the Assistant Secretary of the Army (Acquisition Logistics and Technology) to support Army Futures Command concept and capability assessments with materiel system support and integration for Joint Warfighter Assessments (JWA). This effort synchronizes, integrates, and manages system and System of Systems (SoS) capability assessments in unit training exercise environments in order to inform Army force modernization decisions that impact system requirements, interoperability compliance, operational readiness, and exploitable technology opportunities aligned with Army modernization priorities and Army/Coalition interoperability.

Mission Engineering Assessments Directorate (MEAD), acting as lead agency for Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA (ALT)), Office of Chief Systems Engineer (OCSE), leads and coordinates ASA (ALT)'s participation in Warfighter Assessment events to enable informal and formal evaluation of new material solutions and concepts within an integrated multi-domain and multi-national environment. With support from appropriate Program Offices, provides the design, engineering, systems integration, program management functions and expertise required to integrate networked and stand-alone systems into the event architecture; and conduct technical system of system architecture assessments.

Note:
This projects funding was realigned to the Army Future Command's PE 0605326A (Concepts Experimentation Program) in FY 2021.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Integrated Evaluations ***Description:*** These funds enable assessments of capabilities in laboratory and operational environments across the Army battlespace to assess the systems, SoS, and inform system development and fielding decisions. These funds support event planning, preparation, execution, and close-out.	6.263	-	-
Title: Infrastructure and other support ***Description:*** Title: Infrastructure and other support Description: Provides for setup, utilities, furniture, equipment and maintenance (of all equipment and facilities) used by OCSE core personnel.	0.127	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY3 / *NIE Test & Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Accomplishments/Planned Programs Subtotals	6.390	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DY5: *Production/Field Coordination for Capability Sets*	0.929	1.035	-	-	-	-	-	-	-	-	-
• DY7: *Army Systems Engineering, Architecture & Analysis*	16.740	17.702	21.534	-	21.534	-	-	-	-	-	-
• DZ6: *Army Integration Management & Coordination*	5.793	-	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project includes competitive contracts for test support services.
This project does not have any requirement for direct procurement of hardware or software.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY3 / *NIE Test & Evaluation*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Government Labor	Allot	SoSE&I : Various	8.634	4.144	Nov 2019	-		-		-		-	Continuing	Continuing	-
Matrix Government Labor	MIPR	SoSE&I : Various	4.796	0.386	Nov 2019	-		-		-		-	Continuing	Continuing	-
MITRE Labor	FFRDC	MITRE : Various	2.730	-		-		-		-		-	Continuing	Continuing	-
Contractor SETA Labor	C/CPFF	TBD : Various	6.487	1.090	Nov 2019	-		-		-		-	Continuing	Continuing	-
Temporary Duty (TDY)	Allot	SoSE&I : Various	1.827	-		-		-		-		-	Continuing	Continuing	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.671		-		-		-		-	0.000	0.671	-
		Subtotal	24.474	6.291		-		-		-		-	Continuing	Continuing	N/A

Remarks

- Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Other NIE/JWA subject matter expertise support provided using existing Army contracts managed by PEO C3T, ATEC, and CERDEC.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Evaluations	Various	Various : TBD	39.000	-		-		-		-		-	0.000	39.000	-
FY 2019 SBIR / STTR Transfer	TBD	Various : None	0.703	-		-		-		-		-	0.000	0.703	-
		Subtotal	39.703	-		-		-		-		-	0.000	39.703	N/A

Remarks

- Program Activities performed, Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Vehicle Integration performed under contract W56HZV-15-D-ER03 by BRTRC and other NIE/JWA support provided using existing Army contracts managed by PEO C3T, ATEC, and CERDEC.
- Includes support services from DISA (for satellite time) and other governments agencies

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DY3 / *NIE Test & Evaluation*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Integration	C/CPFF	BRTRC : Various	7.825	-		-		-		-		-	Continuing	Continuing	Continuing
Network Integration and Baseline Systems	MIPR	PEO C3T : Various	7.647	-		-		-		-		-	Continuing	Continuing	Continuing
Infrastructure and other support	TBD	TBD : Various	9.020	0.099	Mar 2019	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	24.492	0.099		-		-		-		-	Continuing	Continuing	N/A

Remarks

- Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Vehicle Integration performed under contract W56HZV-15-D-ER03 by BRTRC.
- Network Integration and Baseline Systems subject matter expertise support provided using existing Army contracts managed by PEO C3T and its subordinate Program Managers (PMs).

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC Test and Evaluation Support	MIPR	ATEC : Various	22.317	-		-		-		-		-	Continuing	Continuing	Continuing
Lab Based Risk Reduction (LBRR)	MIPR	CERDEC : APG, MD	5.300	-		-		-		-		-	Continuing	Continuing	Continuing
Satellite Region Hub Node (RHN) Technical Support	MIPR	Cyber Battle Lab : Ft. Gordon, GA	2.139	-		-		-		-		-	Continuing	Continuing	Continuing
Satellite Transponder Bandwidth	MIPR	DISA : Various	2.500	-		-		-		-		-	Continuing	Continuing	Continuing
Cyber Vulnerability/Risk Assessments	MIPR	Army Research Laboratory : Various	0.975	-		-		-		-		-	Continuing	Continuing	Continuing
Systems Under Evaluation (SUEs)	C/Various	TBD : Various	1.229	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	34.460	-		-		-		-		-	Continuing	Continuing	N/A

Remarks

- Program Test support through ATEC, Lab Based Risk Reduction through CERDEC, and Cyber Vulnerability/Risk Assessments through Army Research Laboratory (ARL).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DY3 / *NIE Test & Evaluation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
- Satellite RHN Technical Support provided by the Cyber Battle Lab at Fort Gordon, GA and Satellite Transponder Bandwidth contracted through DISA. - Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.															

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	123.129	6.390		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY3 / *NIE Test & Evaluation*

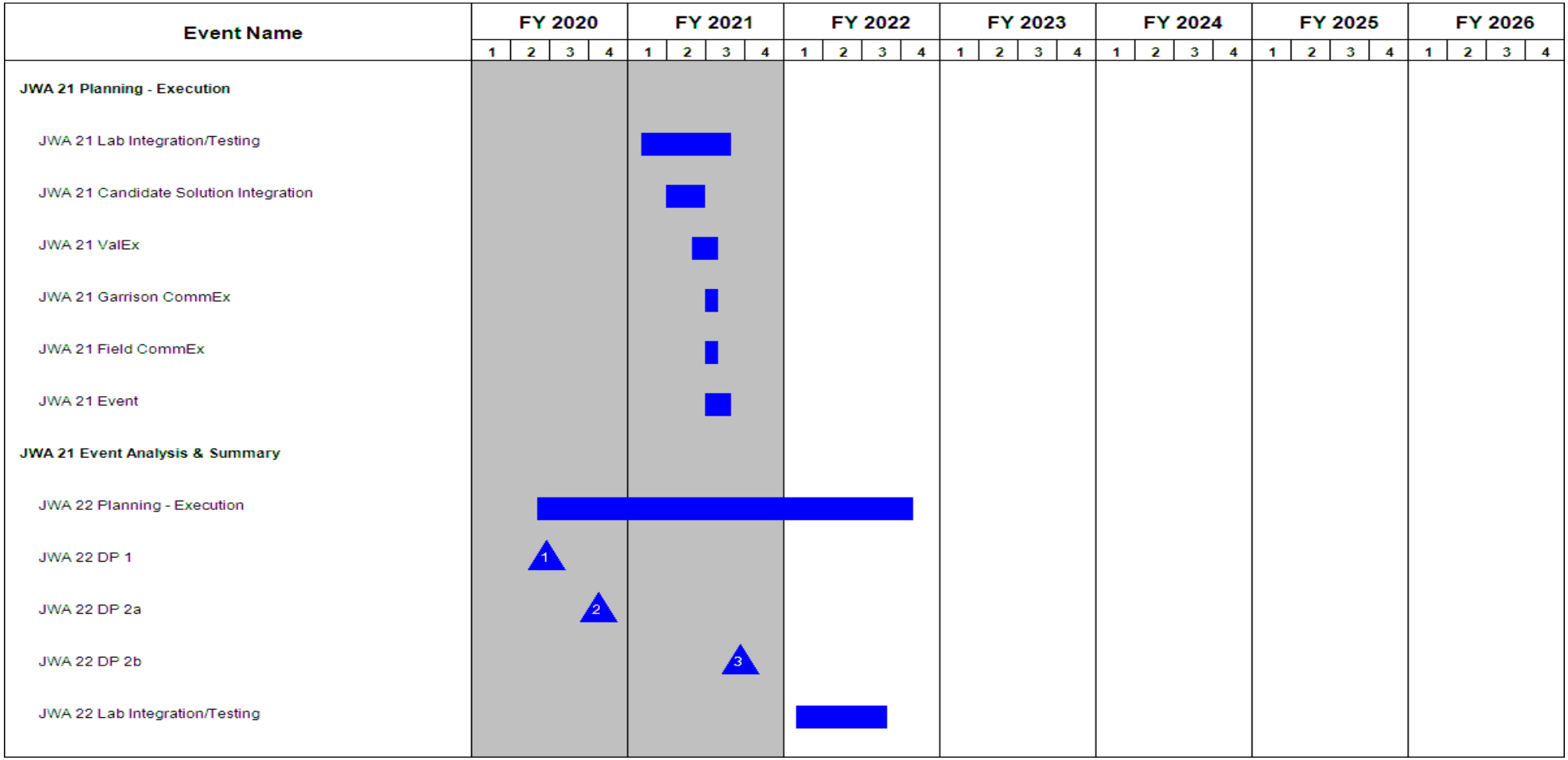

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY3 / *NIE Test & Evaluation*

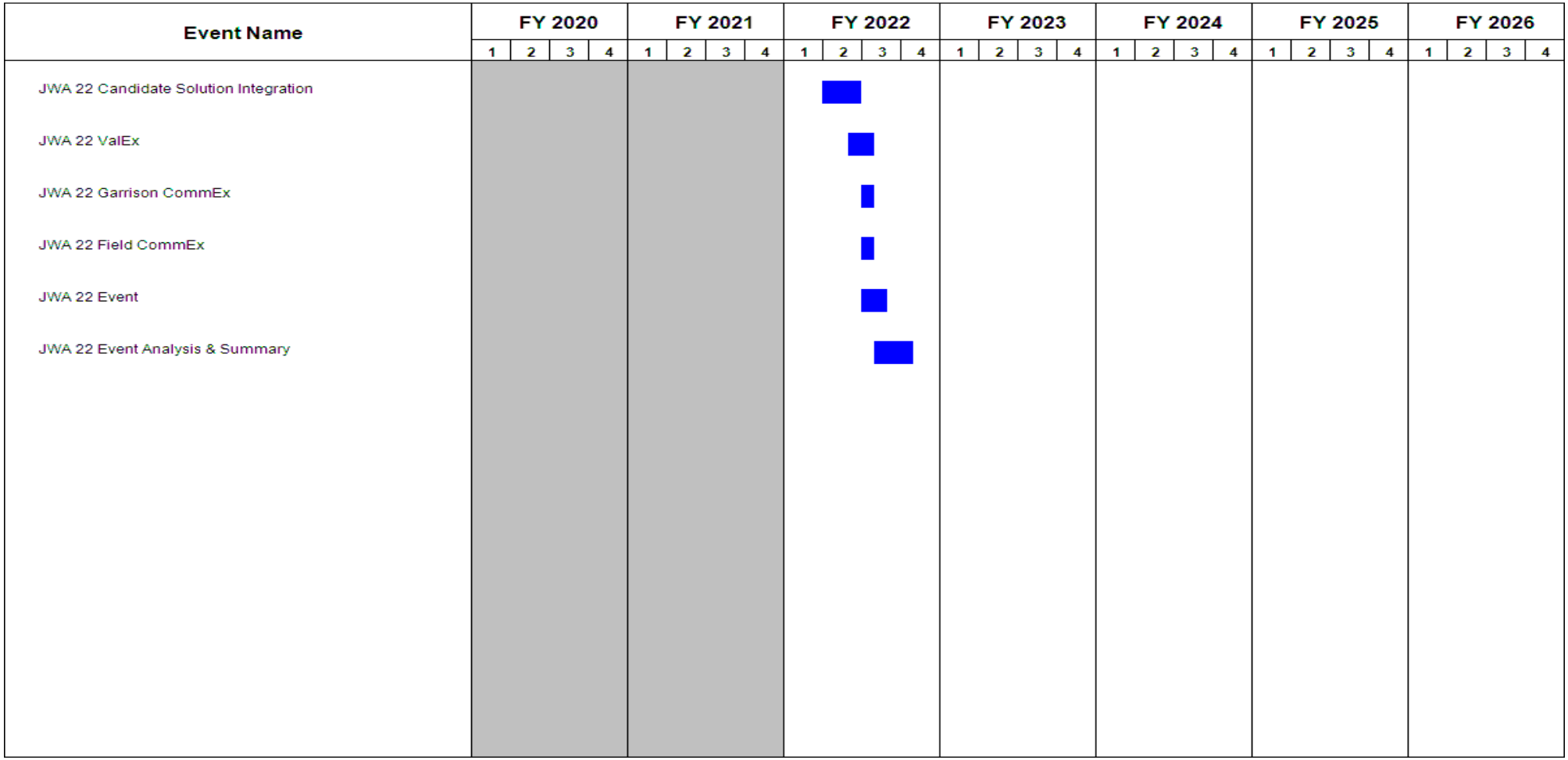

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY3 / *NIE Test & Evaluation*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JWA 21 Planning - Execution	2	2019	4	2021
JWA 21 Lab Integration/Testing	1	2021	3	2021
JWA 21 Candidate Solution Integration	2	2021	2	2021
JWA 21 ValEx	2	2021	3	2021
JWA 21 Garrison CommEx	3	2021	3	2021
JWA 21 Field CommEx	3	2021	3	2021
JWA 21 Event	3	2021	3	2021
JWA 21 Event Analysis & Summary	3	2021	4	2021
JWA 22 Planning - Execution	2	2020	4	2022
JWA 22 DP 1	2	2020	2	2020
JWA 22 DP 2a	4	2020	4	2020
JWA 22 DP 2b	3	2021	3	2021
JWA 22 Lab Integration/Testing	1	2022	3	2022
JWA 22 Candidate Solution Integration	2	2022	2	2022
JWA 22 ValEx	2	2022	3	2022
JWA 22 Garrison CommEx	3	2022	3	2022
JWA 22 Field CommEx	3	2022	3	2022
JWA 22 Event	3	2022	3	2022
JWA 22 Event Analysis & Summary	3	2022	4	2022

Note

-With the loss of a dedicated unit (2/1 Armored Division) after AWA 17.1, NIE/JWA event planning and a unit requirements determination has to be made earlier than in previous FYs to allow Forces Command (FORSCOM) time to select the unit participating in the test events.
-NIEs eliminated after NIE 18.2

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DY5 / *Production/Field Coordination for Capability Sets*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
DY5: *Production/Field Coordination for Capability Sets*	-	0.929	1.035	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The remaining funding in Project DY5 / Production/Field Coordination for Capability Sets is tied to OCSE core manpower authorizations which are realigned to Project DY7 / Army Systems Engineering, Architecture & Analysis in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

This project provides for the development of a synchronized Brigade/Division level plan for the Production equipment delivery and Fielding (hand-off logistics and new equipment training) of Capability Set (CS) components (both hardware/software in A and/or B Kits) upon completion of design, Type Classification and Material Release, Army Interoperability Certification (AIC) and Army CS fielding decision. It provides for the synchronized plan for production equipment delivery and fielding for the Integrated Tactical Network and the Security Force Advisory Brigades.

This project includes the following efforts: Synchronization and direct coordination between participating Program Executive Offices (PEOs), Program Managers (PMs), Research, Development and Engineering Commands (RDECOMs) and the Army's Brigade Combat Teams (BCT) throughout the CS Vehicle Integration and Synchronized Fielding process to ensure that a CS package is received, integrated, trained, and handed-off to the unit in a synchronized and efficient manner. Identification and assessment of available capabilities for inclusion into a CS, ITN and SFAB network modernization package. Alignment of the CS, ITN and SFAB requirement with the appropriate Programs of Record (PoR) and the recipient unit to define the unit's Network Basis of Issue (NBOI)/ Architecture by type of BCT. Coordination with PEOs, PMs, Army G-staff to ensure CS products are Materiel Released/Type Classified, fully resourced and synchronized by a single Integrated Master Schedule for design integration, testing, production, kitting, platform integration, training and fielding. Direct support during each of the unit's "New Equipment Training" and "New Equipment Fielding", along with the preparation for the BCT's rotation through one of the Army's Combat Training Centers, (Joint Readiness Training Center (JRTC) or National Training Center (NTC)). Ensuring that all training assets are reset and moved to the follow-on BCT. Manage all After Action activities.

This project does not fund the actual production, integration, nor fielding costs associated with the CS, ITN nor SFAB.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Production/Fielding Coordination for Capability Sets (CS)	0.929	1.035	-
Description: This project provides for the development of a synchronized Brigade/Division level plan for the Production equipment delivery and Fielding (hand-off logistics and new equipment training) of Capability Set (CS) components (both hardware/software in A and/or B Kits) upon completion of design, Type Classification and Material Release, Army Interoperability			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY5 / *Production/Field Coordination for Capability Sets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Certification (AIC) and Army CS fielding decision. It provides for the synchronized plan for production equipment delivery and fielding for the Integrated Tactical Network and the Security Force Advisory Brigades. This project includes the following efforts: Synchronization and direct coordination between participating Program Executive Offices (PEOs), Program Managers (PMs), Research, Development and Engineering Commands (RDECOMs) and the Army's Brigade Combat Teams (BCT) throughout the CS Vehicle Integration and Synchronized Fielding process to ensure that a CS package is received, integrated, trained, and handed-off to the unit in a synchronized and efficient manner. Identification and assessment of available capabilities for inclusion into a CS, ITN and SFAB network modernization package. Alignment of the CS, ITN and SFAB requirement with the appropriate Programs of Record (PoR) and the recipient unit to define the unit's Network Basis of Issue (NBOI)/ Architecture by type of BCT. Coordination with PEOs, PMs, Army G-staff to ensure CS products are Materiel Released/Type Classified, fully resourced and synchronized by a single Integrated Master Schedule for design integration, testing, production, kitting, platform integration, training and fielding. Direct support during each of the unit's "New Equipment Training" and "New Equipment Fielding", along with the preparation for the BCT's rotation through one of the Army's Combat Training Centers, (Joint Readiness Training Center (JRTC) or National Training Center (NTC)). Ensuring that all training assets are reset and moved to the follow-on BCT. Manage all After Action activities. This project does not fund the actual production, integration, nor fielding costs associated with the CS, ITN nor SFAB. ***FY 2021 Plans:*** Conduct initial planning for Fielding and Integration Coordination CS21, FY 2021 ITN Support and FY 2021 SFAB Vehicle Integration/CS21 Event Fielding Support: Synchronize and coordinate the execution of CS fieldings for the following CS 20 Units: Two (2) SBCTs with CS equipment. This effort includes conducting Synchronization Conference, NMIBs, IPRs and developing a consolidating schedule of all NET/ NEF and Integration events for the supported BCTs. Synchronize and coordinate the execution of integration of automotive upgrades, mission command and tactical radios into tactical vehicles for one (1) Security Force Advisory Brigades during FY21. This effort includes developing a consolidated integration schedule, inventorying tactical vehicles, developing integration trackers, conducting IPRs through the execution of the integration, providing on-site management and providing integration status and feedback from the integration sites. Synchronize and coordinate the execution of four (4) Integrated Tactical Network (ITN) Experimental IBCT during FY 2021. This effort includes developing a consolidated integration schedule, inventorying tactical vehicles, developing integration trackers, conducting IPRs through the execution of the integration, providing on-site status and feedback and managing operations at the integration site. Conduct planning and scheduling of CS Fielding for the following CS22 Units: two (2) SBCTs with CS equipment. Conduct Synchronization Conference, NMIBs and IPRs for each SBCT leading up to the execution of the CS NET/NEF effort. Develop a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY5 / *Production/Field Coordination for Capability Sets*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
CS22 to all gaining units. Begin CS22 NET/NEF requirements definition finalization and development of the NET/NEF integrated master schedule. Conduct planning and scheduling of automotive upgrades, mission command and tactical radios into tactical vehicles for full MTOE FY 2022 Security Force Advisory Brigades. This effort includes planning and developing an initial consolidated integration schedule, conducting Synchronization Conference and follow-on IPRs. Conduct planning and scheduling of automotive upgrades, mission command and tactical radios into tactical vehicles for of five (5) Integrated Tactical Network (ITN) Experimental IBCTs. This effort includes developing a consolidated integration schedule, conducting IPRs through the execution of the integration, providing on-site status and feedback and managing operations at the integration site. This includes scheduling Program of Record unique NET, System of Systems NET (Capability Set holistic classes), and property accountability handoffs as an integrated process to enhance efficiency of the brigade modernization events. Engineering and Integration coordination/planning efforts to develop and maintain CS unit-specific Network Basis of Issue (NBOI) architecture and Integrated Master Schedule (IMS): Develop and maintain unit-specific NBOI and IMS for the FY 2021 Capability Set, SFAB and ITN units. Post integration, update the unit-specific NBOI to an "as-built" NBOI. This effort includes four (4) ITN and one (1) SFAB units. Update the final IMS for units fielded during FY 2020, maintained unit-specific NBOI and IMS for units designated to undergo CS integration in FY 2021, and develop initial (draft-level) NBOI and IMS for planned units in FY 2022 thru FY 2023. There are currently five (5) ITN BCTs planned for FY 2022. Organize, prepare, and conduct incremental technical reviews to examine and assess key/crucial planning activities and associated data product development supporting CS, ITN and SFAB integration at specific fielded locations. Collect and analyzed sub-schedule performance against the baseline IMS to identify schedule risks for the CS, ITN and SFAB integration efforts. Validate that established incremental integration points were achievable and, if not, identified the risk to schedule. Analyze schedule and cost performance against schedule established baselines, identify variances and their causes, and identify risks and/or impacts to critical path. Perform "what if" schedule and cost analyses of alternative program courses of action to determine impact on schedule critical path and mission requirements. Update and poste schedules on SharePoint for visibility and increased collaboration across the CS, LTI and SFAB communities. Lead or participate in other key technical reviews to include: After Action Reviews, Lessons Learned, Network Modernization and Fielding Synchronization Meetings (formerly known as Synchronized Fielding Technical Exchange Meetings (TEMs) and mini-TEMs). Provide reports and briefings to key stakeholders to support mutual programmatic goals and objectives and to help resolve issues and concerns affecting the affected			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
communities. Identify key program risks as well as specific risk mitigation plans. Coordinate, prepare, and publish a synchronized New Equipment Training / New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for CS, ITN and SFAB units. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease reflects the funding for the remaining authorized OCSE core positions, previously aligned to this project, that are now realigned to project DY7 in FY 2022.			
Accomplishments/Planned Programs Subtotals	0.929	1.035	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DY3: *NIE Test & Evaluation*	6.390	-	-	-	-	-	-	-	-	-	-
• DY7: *Army Systems Engineering, Architecture & Analysis*	16.740	17.702	21.534	-	21.534	-	-	-	-	-	-
• DZ6: *Army Integration Management & Coordination*	5.793	-	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.019		-		-		-		-	0.000	0.019	-
		Subtotal	-	0.019		-		-		-		-	0.000	0.019	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Production/Fielding Coordination for Capability Sets	TBD	Various Note: 1 : TBD	20.825	0.910	Nov 2019	1.035	Nov 2019	-		-		-	Continuing	Continuing	Continuing
		Subtotal	20.825	0.910		1.035		-		-		-	Continuing	Continuing	N/A

Remarks

Note: 1
- Program Activities performed at TACOM (Warren MI) and CS units location receiving fielding.
- Program Integration support through various PMs, PEOs, RDECOM.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities and IT Support	TBD	Various Note:1 : TBD	0.694	-		-		-		-		-	0.000	0.694	-
		Subtotal	0.694	-		-		-		-		-	0.000	0.694	N/A

Remarks

Note: 1
- Program Activities performed at TACOM (Warren MI) and CS units location receiving fielding.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.519	0.929		1.035		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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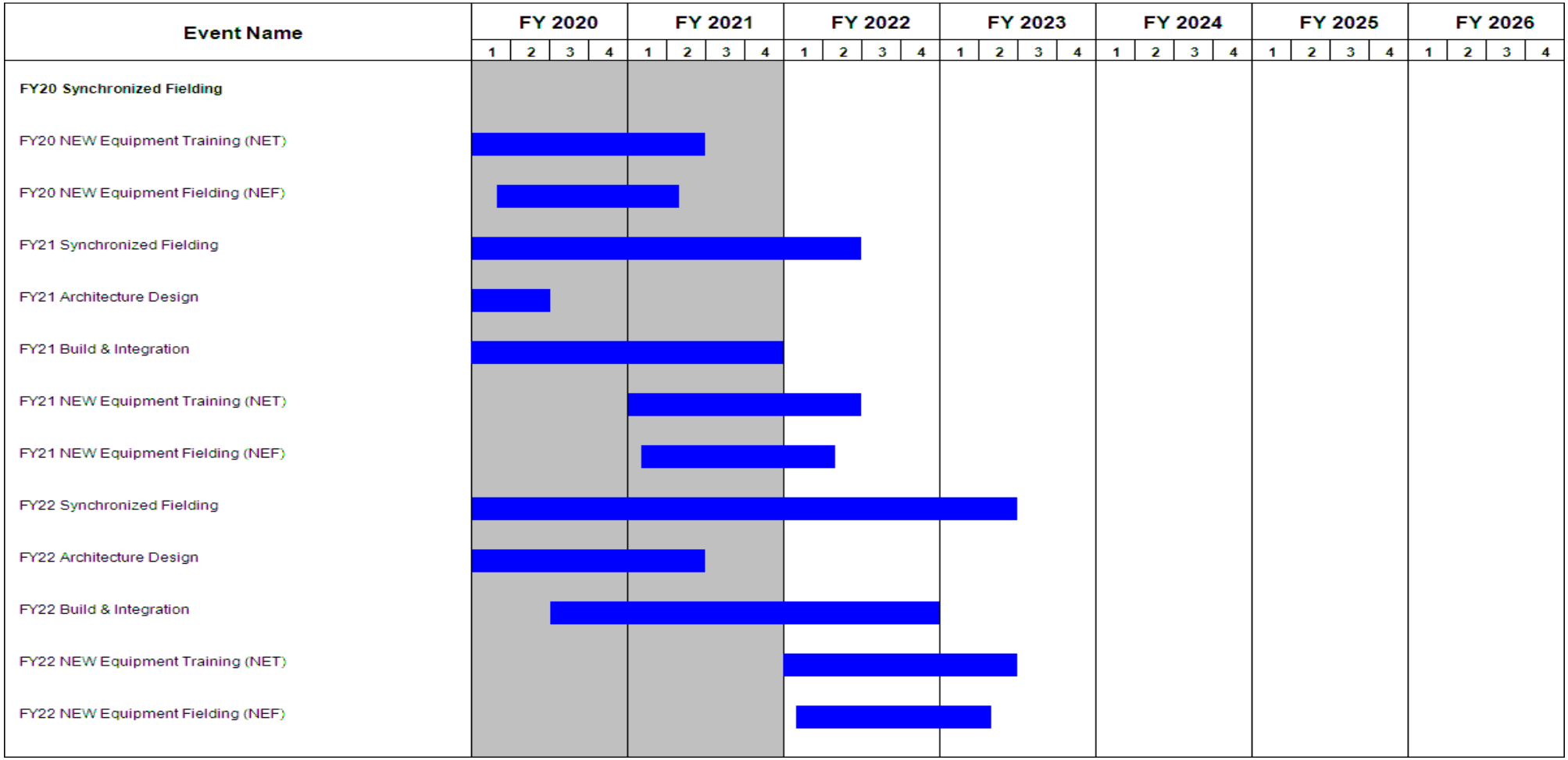

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY5 / *Production/Field Coordination for Capability Sets*

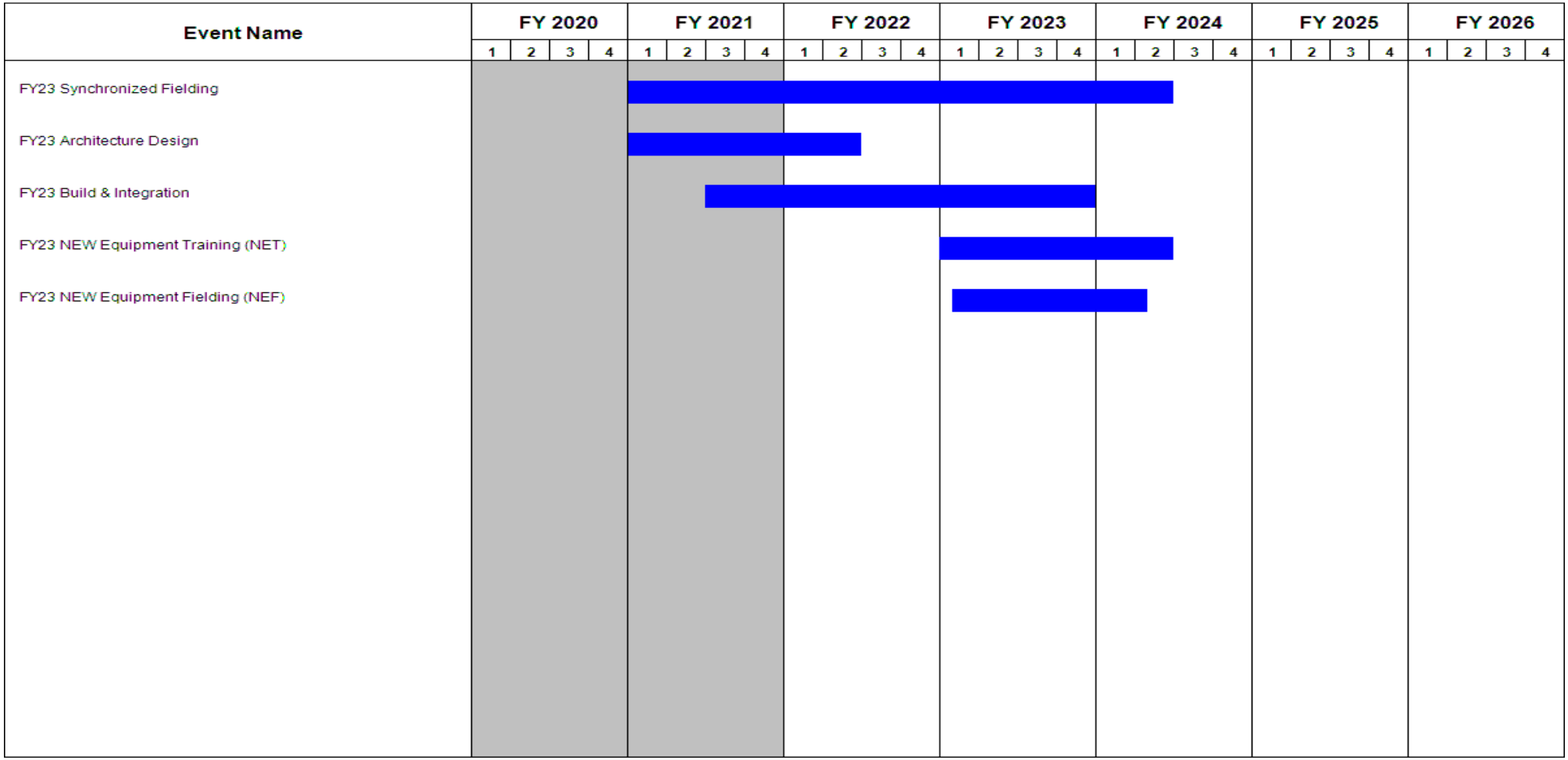

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FY20 Synchronized Fielding	1	2018	2	2021
FY20 NEW Equipment Training (NET)	1	2020	2	2021
FY20 NEW Equipment Fielding (NEF)	1	2020	2	2021
FY21 Synchronized Fielding	1	2019	2	2022
FY21 Architecture Design	1	2019	2	2020
FY21 Build & Integration	3	2019	4	2021
FY21 NEW Equipment Training (NET)	1	2021	2	2022
FY21 NEW Equipment Fielding (NEF)	1	2021	2	2022
FY22 Synchronized Fielding	1	2020	2	2023
FY22 Architecture Design	1	2020	2	2021
FY22 Build & Integration	3	2020	4	2022
FY22 NEW Equipment Training (NET)	1	2022	2	2023
FY22 NEW Equipment Fielding (NEF)	1	2022	2	2023
FY23 Synchronized Fielding	1	2021	2	2024
FY23 Architecture Design	1	2021	2	2022
FY23 Build & Integration	3	2021	4	2023
FY23 NEW Equipment Training (NET)	1	2023	2	2024
FY23 NEW Equipment Fielding (NEF)	1	2023	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*				Project (Number/Name) DY7 / *Army Systems Engineering, Architecture & Analysis*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
DY7: *Army Systems Engineering, Architecture & Analysis*	-	16.740	17.702	21.534	-	21.534	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The remaining funding in Project DY5 / Production/Field Coordination for Capability Sets is tied to OCSE core manpower authorizations which are realigned to Project DY7 / Army Systems Engineering, Architecture & Analysis in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

Synthesizing Systems Engineering Governance across the PEOs in support of the Assistant Secretary of the Army (Acquisition, Logistics and Technology)'s Mission.

This project provides the Army's leadership and materiel developers with the necessary modernization planning, System of Systems (SoS) engineering and analysis, technical risk analysis, architectural products, critical path analysis, cybersecurity and interoperability risk analysis and the associated mitigation planning for the Army's materiel portfolio. This project develops process, products, and policies that ensure a solid Army Systems Engineering construct across Army Program Executive and Management Offices.

This includes efforts in support of Common Operating Environment (COE) governance, the Army Futures Command's emerging development of concepts, requirements generation, resource allocation, experimentation, acquisition, logistics, and technology components of the Army Future Force Modernization Enterprise (FFME). Focus areas includes the integration of key elements of a system into one overall system engineering construct and managing it through major system engineering activities to ensure the fielding of integrated capabilities meet the mission needs of the force against any potential adversaries. Key system engineering functions include, engineering and technical analysis, integrated System of Systems (SoS) architecture products, SoS risk analysis and mitigation planning to influence the Army's materiel portfolio. This project also includes the establishment of Army systems engineering policy and implementation standards, requirements decomposition and alignment, and resource and acquisition synchronization to address cross-portfolio issues. Key tasks are the development of integrated Architecture products; Engineering Analysis and Design; Portfolio Analysis; Systems Security Engineering process, interoperability assessments, independent technical risk assessments, Cybersecurity requirements analysis, compliance, Cyber policy assessments, and coordinates the ASA(ALT) community's Data activities including Data Steward and Functional Data Manager in Army Data Governance Forums.

The effort includes costs for labor (Government and contractor), support services, travel, training, supplies, facilities, and Information Technology (IT) support for Office of Chief Systems Engineer (OCSE). This project also includes support to other Department of Defense (DOD) and international agencies for joint programs and collaboration effort.
Under this Project we have four efforts: Army System of Systems Engineering and Analysis, Cyber, Data Initiatives.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Army System of Systems Engineering and Analysis	13.051	13.875	15.663

Description: Provided coordinated SoS engineering, architectures, and analysis products for integrating new technologies with existing capabilities to stakeholders (e.g. materiel developers, TRADOC Capability Manager (TCM), Army Capabilities Integration Center (ARCIC), etc.) to deliver integrated solutions to Army formations.

FY 2021 Plans:

Architecture and Analysis:

Develop reference architecture products to support Capability Set (CS) 23 Integrated Tactical Network fielding, the CS 25 Integrated Tactical Network engineering design, and other fielding and integration planning as required. CS fielding activities occur every year, with biannual baseline updates, and provide network modernization upgrades to entire brigades in a single fielding event. These supporting architecture products enabled the ASA (ALT) community to determine integrated Basis of Issue planning, subnet design, spectrum allocation, network initialization, logistics planning for fielding activity, and non-recurring engineering planning and design as part of the overall ASA(ALT) engineering design, integration and fielding of the Army Capability Sets.

Using a Model Based Systems Engineering (MBSE) data-driven approach to Digital Engineering (DE) inside the Architecture Development Kit (ADK) Environment, architects capture system data in the system of systems integrated architecture to include systems? unique requirements, capabilities, performance, interfaces, standards, dependences, and data flows, within the context of their operational employment and provide visual representation of key system from an operational, functional and network perspective. This modeling allows for requirements traceability, reporting, analysis, and visualization. The ADK will be expanded to include the breadth of architecture being developed by ASA (ALT). The expanded toolsets will provide a standardized virtual interface for improved usability and increased commonality so that all users will have the same access to libraries, lexicon, nomenclature and style guides. User will be able to develop architecture products useful for their own acquisition process while being able to access other system data to improve their understanding of interoperability. Data from all systems will be easily aggregated to develop and analyze system of systems architecture. The resultant fully integrated systems of systems model, maintained with up-to-date system data, will allow leadership to quickly answer ?what if? system of systems architecture questions and improve the efficiency of the Request For Information (RFI) processes.

Develop a Critical Criteria Checklist (C3L) tool designed to enhance system of systems engineering rigor for Multi Domain Operations (MDO) designated capabilities. The C3L provides a set of criteria categories when provided with some basic inputs on system type, intended purpose, and intended environment. These considerations need to be considered to more accurately determine if a system meets the overmatch, OE2040, and procurement outcomes outlined in the VCSA. The tool is designed to be tailorable, flexible, reusable, and intuitive for a user to navigate with the possibility for automated aspects.

Provide continued Mission Engineering, JADC2, and MDO analysis as it pertains to system development and ASA (ALT) equities. Continue to analyze JADC2 impact on Army modernization strategy and the Army?s role in MDO supporting ASA (ALT) with

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
quick turn, independent, first-order engineering analysis to support leadership decision making to enable the Army Modernization Enterprise (AME). Develop a reference network architecture supporting several priorities (i.e. Sensor to Shooter (S2S), Joint interoperability, Manned-Unmanned Teaming) efforts across Army. This reference architecture lays out a plan, through identifying common, relevant, and well used standards and protocols, in new and existing systems for how the Army can achieve these goals. All solutions will be virtually modeled on a software testbed for verification. Continued updates to the network architecture includes support as new challenges arise. Lead for Army Systems Engineering Program Support: Leads the Army?s development of policy and best practices to ensure systems engineering rigor in Army Acquisition. Primary advisor to the Chief Systems Engineer Army Acquisition Executive regarding the sufficiency of systems engineering rigor in programs. Collaborates with the Army?s systems engineering community to identify systemic systems engineering challenges and issues and their solutions, as well as identifying and sharing best practices. OCSE leads the immediate Army response to NDAA statutory requirements that involve systems engineering, as well as identifying and facilitating the best means to institutionalize those requirements. Additionally, OCSE will collaborate with OSD, Industry and the Joint community in developing synchronized approaches to NDAA Systems Engineering related statutes. As the National Defense Strategy and Army Senior Leadership have emphasized increased speed of delivery of capabilities to the Warfighter, OCSE will work with PEOs/PMs, along with the Army Futures Command (AFC) on enabling processes and tools in order to accelerate the Army?s acquisition process, from requirements development through delivery of capability to the field and rapid technology insertion or upgrades. OCSE will continue to implement the modular open system approaches by refining and developing implementation guidance and supporting PM development of MOSA architectures. Elements will include identifying and prioritizing key system attributes into functional, modular components that provide the greatest operational effects on the battlefield, and support the fielding of an MDO-capable force by 2028 and an MDO-ready force by 2035. These efforts will encompass the development planning process to rapidly identify and refine requirements and speed development from concept to solution. OCSE will also work to assist the Army in assessing what emerging capabilities should be transitioned into programs of record, and facilitate the rapid integration of the technology through modular open systems approaches. A key element of this will be advancing the state of practice of Digital Engineering (DE) across the Army Modernization Enterprise. This work will also seek to streamline communications between Government and Industry by identification of technical data and emphasis of appropriate implementation of technical data rights. Through the implementation of Digital Engineering, OCSE will work with the PMs to institutionalize modern engineering processes and integrate those processes through the engineering			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
data they produce in order to establish and maintain traceability from the activities that drive system concept development through system acquisition, fielding, and sustainment to the decision to divest. The Army?s Digital Engineering implementation will establish a workforce equipped with the necessary skills and infrastructure to achieve this goal. To further the Army?s modernization efforts, OCSE synchronizes the Army's Modeling and Simulation Strategy with OSD's Digital Engineering Strategy to focus current and emerging efforts on the efficient development and use of M&S and Model Based Systems Engineering capabilities in order to advance the Army's system development efforts. In order to promote program success, OCSE will continue to assist programs in the identification and mitigation of risk (i.e. Independent Technical Risk Assessments (ITRA), PDR/CDR sufficiency assessments, SEP, LCSP, and SVR reviews, etc.) and develop processes to support the necessary rigor and consistency across the Army, in support of any/all key milestone events. For ACAT 1C programs the Army will lead these efforts, and support USD(R&E) for ACAT 1D. Provides guidance and support to programs for development of systems engineering documentation required for milestone decisions and certification. Serves as the Army level concurrence authority on System Engineering Plans (SEPs) and provides systems engineering expertise for Program Protection Plans (PPPs) for all Army Major Defense Acquisition Programs. OCSE will also provide the AAE with an assessment of the MOSA implementation for ACAT 1C programs and will review and recommend approval for the PEO?s approach to implementing MOSA across their responsible portfolio. OCSE will serve as the Army focal point for matters of hardware and software assurance, microelectronics, planning and countermeasures, and systems engineering focal point for program protection, anti-tamper, and program protection plans. Army Representative for the FY 2014 NDAA Section 937 Congressional requirement to stand up a Joint Federated Assurance Center (JFAC) to develop work plans, manage funding, track progress and report regular status to Army Leadership and OSD Leadership. In addition, also maintains direct collaboration and communication with Combat Capabilities Development Commands (CCDCs), Army Research Labs, and specifically the Software, Hardware and Cyber Subject Matter Experts and Communities of Practice, to define, federate, maintain and evolve, Army Cyber, System Security Engineering, and allow access to available Hardware/Software Assurance capabilities to meet today's threats and emerging threats. Provide systems engineering expertise, oversight, review, and development assistance for PPPs to determine/review risks/identify vulnerabilities associated with Security. Provide advice and experience to influence system design considerations in support of developing effective and resilient program protection strategies. Conduct client advocacy and education forums (Road Show presentations/Army Systems Engineering Forums) amongst Army PEOs/Chief Systems Engineers, DASD(SE), other agencies and joint service stakeholders, to promulgate best practices to the acquisition community. Interface as an executive agent on matters of Anti-Tamper with program personnel, systems security engineers and service providers. OCSE serves as the primary responsibility for Software Assurance and Anti-Tamper. Provide alternate assurance options for critical DoD unique parts as part of the US Microelectronic Strategy. Advance the Army's capability to perform hardware analysis of critical components and transition to a new microelectronics trust model that leverages commercial state of the art practices. Provide systems engineering advice on Critical Intelligence Parameter Breach recommendations through emerging Acquisition, Intelligence, Requirements (AIR) policy directives. IAW FY 2017 NDAA Sec			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
807 Responsible for the conduct and execution of Post-Preliminary and Critical Design Review (PDR/CDR) and Independent Technical Risk Assessments (ITRA) for all Army ACAT I and II programs where the Army Acquisition Executive serves as the Milestone Decision Authority. The reviews will provide recommendations on Technical Risk and PDR/CDR sufficiency will be included in the Milestone Decision Authority (MDA) package for the Milestone Review, approval, and certification. OCSE will continue in the development of Modular Open Systems Approach (MOSA) policy and implementation guidance, in accordance with NDAA FY 2017 2466a/b/c/, that leads to the certification of MOSA in MDAPS. Other responsibilities include confirming that Army programs proceeding to Milestone B have incorporated clearly defined major subsystem interfaces between the major system platform and major system components, between major system components, and between major system platforms, and that these major system interfaces are consistent with the widely supported and consensus-based standards. Leads the assessment of Reliability, Availability, and Maintainability (RAM) efforts of Army programs of record through a cross functional IPT that emphasizes lessons learned and best practices for RAM. Assist programs in the research for root causes of reliability issues and provide detailed assessment along with recommendation to senior leadership. As the Army implements the Army?s People Strategy, OCSE supports the functional lead for Engineering by identifying skills gaps and recommending the needed training. OCSE will also promotes workforce development efforts to improve the level of systems engineering competency through credentials that provide focused enhanced skills in Digital Engineering, Cyber, Data engineering. This will include engineering support to OSD and the Army to oversee the growth of civilian talent to support Assistant Secretary of the Army (Acquisition, Logistics and Technology) Systems Engineering requirements. This includes recommending improvements in Training, Education, Rotational Assignments, and Mentoring for a Systems Engineering (SE) work force across the Army. SEPS will support ASA(ALT) in the development of the Human Capital Strategic Plan (HCSP) and refinement of the System Engineering Functions with OSD. Standards & Interoperability: OCSE will support Common Operating Environment Systems Engineering Governance by continuing to host ASA(ALT) monthly governance forums to promote convergence of legacy combat systems towards a common software and hardware infrastructure, effective migration of Army sensing capabilities towards common data sharing interface standards, and alignment of enterprise capabilities with tactical level services. This includes continuing to host a bi-weekly ASA(ALT) Configuration Control Board to optimize System of Systems risk reduction and preparatory actions prior to execution of HQDA G-6 independent Title 40 Army Interoperability Certification (AIC) test events. Secondly, OCSE will continue hosting the Standards IPT, Digital Engineering (DE) IPT, Software Baseline IPT, and the Technical Advisory Board (TAB) to create, modify, or maintain a system of system engineering approach for Army interoperability. This includes configuration management of ASA(ALT) System of Systems technical bassline artifacts in support of achieving Full Operational Capability (FOC) of the Common Operating Environment (COE) in 2025, as well as, continue maintenance of the enterprise level Fielded Software Tracker Database via data curation, user requested functionality enhancements, systems administration, and user help desk support.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
OCSE will serve as the ASA(ALT) staff lead for Joint All Domain Command & Control (JADC2) / Multi Partner Environment (MPE) Technical Standards by providing ASA(ALT) technical representation on Joint Staff J6 and Army Joint All-Doman Command & Control (JADC2) technical governance forums. Additionally, OCSE will continue ASA(ALT) technical representation on the DoD CIO Information Technology Standards Steering Group (ITSSG) and review of Interoperability Standards Technical Packages (ITSP) in support of pre-coordination, review, and staffing of Communities of Practice (CoP) and Change Requests (CRs) to the DoD Information Technology Standards Repository (DISR) baseline IAW DoDI 8310.01. Lastly, OCSE will continue to provide ASA(ALT) technical representation for Army pre-ratification review and staffing of American, British, Canadian, Australian, and New Zealand (ABACANZ) Technical Statement of Requirements (TSOR) in support of the Army Interoperability Campaign Plan and Mission Partner Environment (MPE) Concept of Operations (CONOPS). OCSE will serve as the Army Acquisition Executive (AAE) designated ASA(ALT) Standardization Executive to lead policy development and exercise independent technical review authority intended to optimize Army compliance with statutory guidance focused on increasing the use of commercial and non-governmental standards and specifications in Army acquisition programs. Additionally, the effort includes publishing a common desktop reference for ASA(ALT) Program Managers and Chief Engineers detailing statutory and regulatory mandates, best practices, tools, and training. Mission Engineering, Integration, Requirements and Feasibility Analysis: Perform pre-Materiel Development Decision (MDD) activities, to include risk assessments to address program uncertainty and influence decision making to promote development of a mature capability and successful delivery of a program within cost, schedule, and performance criteria. Develop and execute a process to ensure that appropriate systems of systems integrations, design for supportability, cyber resilience, and other important design characteristics are addressed in new system designs. Continue prioritization of AME modernization efforts and ensure that appropriate metrics are developed and used to confirm that materiel developed meets warfighter needs. Support AME modernization efforts in order to achieve persistent modernization.			
FY 2022 Plans: Architecture and Analysis: Develop reference architecture products to support Capability Set (CS) 23 Integrated Tactical Network fielding, the CS 25 Integrated Tactical Network engineering design, and other fielding and integration planning as required. CS fielding activities occur every year, with biannual baseline updates, and provide network modernization upgrades to entire brigades in a single fielding event. These supporting architecture products enabled the ASA (ALT) community to determine integrated Basis of Issue planning, subnet design, spectrum allocation, network initialization, logistics planning for fielding activity, and non-recurring engineering planning and design as part of the overall ASA(ALT) engineering design, integration and fielding of the Army Capability Sets.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Using a Model Based Systems Engineering (MBSE) data-driven approach to Digital Engineering (DE) inside the Architecture Development Kit (ADK) Environment, architects capture system data in the system of systems integrated architecture to include systems? unique requirements, capabilities, performance, interfaces, standards, dependences, and data flows, within the context of their operational employment and provide visual representation of key system from an operational, functional and network perspective. This modeling allows for requirements traceability, reporting, analysis, and visualization. The ADK will be expanded to include the breadth of architecture being developed by ASA (ALT). The expanded toolsets will provide a standardized virtual interface for improved usability and increased commonality so that all users will have the same access to libraries, lexicon, nomenclature and style guides. User will be able to develop architecture products useful for their own acquisition process while being able to access other system data to improve their understanding of interoperability. Data from all systems will be easily aggregated to develop and analyze system of systems architecture. The resultant fully integrated systems of systems model, maintained with up-to-date system data, will allow leadership to quickly answer ?what if? system of systems architecture questions and improve the efficiency of the Request For Information (RFI) processes. Develop a Critical Criteria Checklist (C3L) tool designed to enhance system of systems engineering rigor for Multi Domain Operations (MDO) designated capabilities. The C3L provides a set of criteria categories when provided with some basic inputs on system type, intended purpose, and intended environment. These considerations need to be considered to more accurately determine if a system meets the overmatch, OE2040, and procurement outcomes outlined in the VCSA. The tool is designed to be tailorable, flexible, reusable, and intuitive for a user to navigate with the possibility for automated aspects. Provide continued Mission Engineering, JADC2, and MDO analysis as it pertains to system development and ASA (ALT) equities. Continue to analyze JADC2 impact on Army modernization strategy and the Army?s role in MDO supporting ASA (ALT) with quick turn, independent, first-order engineering analysis to support leadership decision making to enable the Army Modernization Enterprise (AME). Develop a reference network architecture supporting several priorities (i.e. Sensor to Shooter (S2S), Joint interoperability, Manned-Unmanned Teaming) efforts across Army. This reference architecture lays out a plan, through identifying common, relevant, and well used standards and protocols, in new and existing systems for how the Army can achieve these goals. All solutions will be virtually modeled on a software testbed for verification. Continued updates to the network architecture includes support as new challenges arise. Lead for Army Systems Engineering Program Support: Leads the Army?s development of policy and best practices to ensure systems engineering rigor in Army Acquisition. Primary advisor to the Chief Systems Engineer Army Acquisition Executive regarding the sufficiency of systems engineering rigor in programs. Collaborates with the Army?s systems engineering community to identify systemic systems engineering challenges and			

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issues and their solutions, as well as identifying and sharing best practices. OCSE leads the immediate Army response to NDAA statutory requirements that involve systems engineering, as well as identifying and facilitating the best means to institutionalize those requirements. Additionally, OCSE will collaborate with OSD, Industry and the Joint community in developing synchronized approaches to NDAA Systems Engineering related statutes. As the National Defense Strategy and Army Senior Leadership have emphasized increased speed of delivery of capabilities to the Warfighter, OCSE will work with PEOs/PMs, along with the Army Futures Command (AFC) on enabling processes and tools in order to accelerate the Army?s acquisition process, from requirements development through delivery of capability to the field and rapid technology insertion or upgrades. OCSE will continue to implement the modular open system approaches by refining and developing implementation guidance and supporting PM development of MOSA architectures. Elements will include identifying and prioritizing key system attributes into functional, modular components that provide the greatest operational effects on the battlefield, and support the fielding of an MDO-capable force by 2028 and an MDO-ready force by 2035. These efforts will encompass the development planning process to rapidly identify and refine requirements and speed development from concept to solution. OCSE will also work to assist the Army in assessing what emerging capabilities should be transitioned into programs of record, and facilitate the rapid integration of the technology through modular open systems approaches. A key element of this will be advancing the state of practice of Digital Engineering (DE) across the Army Modernization Enterprise. This work will also seek to streamline communications between Government and Industry by identification of technical data and emphasis of appropriate implementation of technical data rights. Through the implementation of Digital Engineering, OCSE will work with the PMs to institutionalize modern engineering processes and integrate those processes through the engineering data they produce in order to establish and maintain traceability from the activities that drive system concept development through system acquisition, fielding, and sustainment to the decision to divest. The Army?s Digital Engineering implementation will establish a workforce equipped with the necessary skills and infrastructure to achieve this goal. To further the Army?s modernization efforts, OCSE synchronizes the Army's Modeling and Simulation Strategy with OSD's Digital Engineering Strategy to focus current and emerging efforts on the efficient development and use of M&S and Model Based Systems Engineering capabilities in order to advance the Army's system development efforts. In order to promote program success, OCSE will continue to assist programs in the identification and mitigation of risk (i.e. Independent Technical Risk Assessments (ITRA), PDR/CDR sufficiency assessments, SEP, LCSP, and SVR reviews, etc.) and develop processes to support the necessary rigor and consistency across the Army, in support of any/all key milestone events. For ACAT 1C programs the Army will lead these efforts, and support USD(R&E) for ACAT 1D. Provides guidance and support to programs for development of systems engineering documentation required for milestone decisions and certification. Serves as the Army level concurrence authority on System Engineering Plans (SEPs) and provides systems engineering expertise for Program Protection Plans (PPPs) for all Army Major Defense Acquisition Programs. OCSE will			

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also provide the AAE with an assessment of the MOSA implementation for ACAT 1C programs and will review and recommend approval for the PEO?s approach to implementing MOSA across their responsible portfolio. OCSE will serve as the Army focal point for matters of hardware and software assurance, microelectronics, planning and countermeasures, and systems engineering focal point for program protection, anti-tamper, and program protection plans. Army Representative for the FY 2014 NDAA Section 937 Congressional requirement to stand up a Joint Federated Assurance Center (JFAC) to develop work plans, manage funding, track progress and report regular status to Army Leadership and OSD Leadership. In addition, also maintains direct collaboration and communication with Combat Capabilities Development Commands (CCDCs), Army Research Labs, and specifically the Software, Hardware and Cyber Subject Matter Experts and Communities of Practice, to define, federate, maintain and evolve, Army Cyber, System Security Engineering, and allow access to available Hardware/Software Assurance capabilities to meet today's threats and emerging threats. Provide systems engineering expertise, oversight, review, and development assistance for PPPs to determine/review risks/identify vulnerabilities associated with Security. Provide advice and experience to influence system design considerations in support of developing effective and resilient program protection strategies. Conduct client advocacy and education forums (Road Show presentations/Army Systems Engineering Forums) amongst Army PEOs/Chief Systems Engineers, DASD(SE), other agencies and joint service stakeholders, to promulgate best practices to the acquisition community. Interface as an executive agent on matters of Anti-Tamper with program personnel, systems security engineers and service providers. OCSE serves as the primary responsibility for Software Assurance and Anti-Tamper. Provide alternate assurance options for critical DoD unique parts as part of the US Microelectronic Strategy. Advance the Army's capability to perform hardware analysis of critical components and transition to a new microelectronics trust model that leverages commercial state of the art practices. Provide systems engineering advice on Critical Intelligence Parameter Breach recommendations through emerging Acquisition, Intelligence, Requirements (AIR) policy directives. IAW FY 2017 NDAA Sec 807 Responsible for the conduct and execution of Post-Preliminary and Critical Design Review (PDR/CDR) and Independent Technical Risk Assessments (ITRA) for all Army ACAT I and II programs where the Army Acquisition Executive serves as the Milestone Decision Authority. The reviews will provide recommendations on Technical Risk and PDR/CDR sufficiency will be included in the Milestone Decision Authority (MDA) package for the Milestone Review, approval, and certification. OCSE will continue in the development of Modular Open Systems Approach (MOSA) policy and implementation guidance, in accordance with NDAA FY 2017 2466a/b/c/, that leads to the certification of MOSA in MDAPS. Other responsibilities include confirming that Army programs proceeding to Milestone B have incorporated clearly defined major subsystem interfaces between the major system platform and major system components, between major system components, and between major system platforms, and that these major system interfaces are consistent with the widely supported and consensus-based standards.			

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Leads the assessment of Reliability, Availability, and Maintainability (RAM) efforts of Army programs of record through a cross functional IPT that emphasizes lessons learned and best practices for RAM. Assist programs in the research for root causes of reliability issues and provide detailed assessment along with recommendation to senior leadership. As the Army implements the Army?s People Strategy, OCSE supports the functional lead for Engineering by identifying skills gaps and recommending the needed training. OCSE will also promotes workforce development efforts to improve the level of systems engineering competency through credentials that provide focused enhanced skills in Digital Engineering, Cyber, Data engineering. This will include engineering support to OSD and the Army to oversee the growth of civilian talent to support Assistant Secretary of the Army (Acquisition, Logistics and Technology) Systems Engineering requirements. This includes recommending improvements in Training, Education, Rotational Assignments, and Mentoring for a Systems Engineering (SE) work force across the Army. SEPS will support ASA(ALT) in the development of the Human Capital Strategic Plan (HCSP) and refinement of the System Engineering Functions with OSD. Standards & Interoperability: OCSE will support Common Operating Environment Systems Engineering Governance by continuing to host ASA(ALT) monthly governance forums to promote convergence of legacy combat systems towards a common software and hardware infrastructure, effective migration of Army sensing capabilities towards common data sharing interface standards, and alignment of enterprise capabilities with tactical level services. This includes continuing to host a bi-weekly ASA(ALT) Configuration Control Board to optimize System of Systems risk reduction and preparatory actions prior to execution of HQDA G-6 independent Title 40 Army Interoperability Certification (AIC) test events. Secondly, OCSE will continue hosting the Standards IPT, Digital Engineering (DE) IPT, Software Baseline IPT, and the Technical Advisory Board (TAB) to create, modify, or maintain a system of system engineering approach for Army interoperability. This includes configuration management of ASA(ALT) System of Systems technical bassline artifacts in support of achieving Full Operational Capability (FOC) of the Common Operating Environment (COE) in 2025, as well as, continue maintenance of the enterprise level Fielded Software Tracker Database via data curation, user requested functionality enhancements, systems administration, and user help desk support. OCSE will serve as the ASA(ALT) staff lead for Joint All Domain Command & Control (JADC2) / Multi Partner Environment (MPE) Technical Standards by providing ASA(ALT) technical representation on Joint Staff J6 and Army Joint All-Doman Command & Control (JADC2) technical governance forums. Additionally, OCSE will continue ASA(ALT) technical representation on the DoD CIO Information Technology Standards Steering Group (ITSSG) and review of Interoperability Standards Technical Packages (ITSP) in support of pre-coordination, review, and staffing of Communities of Practice (CoP) and Change Requests (CRs) to the DoD Information Technology Standards Repository (DISR) baseline IAW DoDI 8310.01. Lastly, OCSE will continue to provide ASA(ALT) technical representation for Army pre-ratification review and staffing of American, British, Canadian, Australian, and New Zealand (ABACANZ) Technical Statement of Requirements (TSOR) in support of the Army Interoperability Campaign Plan and Mission Partner Environment (MPE) Concept of Operations (CONOPS).			

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OCSE will serve as the Army Acquisition Executive (AAE) designated ASA(ALT) Standardization Executive to lead policy development and exercise independent technical review authority intended to optimize Army compliance with statutory guidance focused on increasing the use of commercial and non-governmental standards and specifications in Army acquisition programs. Additionally, the effort includes publishing a common desktop reference for ASA(ALT) Program Managers and Chief Engineers detailing statutory and regulatory mandates, best practices, tools, and training. Mission Engineering, Integration, Requirements and Feasibility Analysis: Perform pre-Materiel Development Decision (MDD) activities, to include risk assessments to address program uncertainty and influence decision making to promote development of a mature capability and successful delivery of a program within cost, schedule, and performance criteria. Develop and execute a process to ensure that appropriate systems of systems integrations, design for supportability, cyber resilience, and other important design characteristics are addressed in new system designs. Continue prioritization of AME modernization efforts and ensure that appropriate metrics are developed and used to confirm that materiel developed meets warfighter needs. Support AME modernization efforts in order to achieve persistent modernization. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase reflects the remaining funding in Project DY5 / Production/Field Coordination for Capability Sets is tied to OCSE core manpower authorizations which are realigned to Project DY7 / Army Systems Engineering, Architecture & Analysis in Fiscal Year (FY) 2022.			
Title: Cyber ***Description:*** This project funds cyber support to PEOs/PMs to include cybersecurity support to risk management framework, cyber engineering and architecture development, industry cybersecurity engagement, and cyber program oversight and governance, which ensures the secure, affordable, and effective delivery of Army materiel solutions that address critical Army modernization objectives, as well as the delivery of agile and advanced cyber solutions to equip the Army?s offensive and defensive forces in the cyberspace domain. These funds support synchronization, analysis and integration of Cyber functions and products. ***FY 2021 Plans:*** Summary: Perform the functions of the Principal Cyber Adviser (PCA) to the AAE, ASA(ALT) Chief Information Security Officer (CISO), ASA(ALT) Engineering Governance for Cyberspace, and ASA(ALT) lead for Cyber Resilience. Lead a coordinated, comprehensive acquisition approach to enhance cyber resiliency and survivability across ASA(ALT) communities and the materiel enterprise. Optimize cybersecurity as a critical enabler of capability delivery. Facilitate and ensure execution of cyber-related	3.592	3.594	3.677

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
tasks and efforts by appropriate ASA(ALT) organizations. Represent and advocate for ASA(ALT) cyberspace equities in external governance bodies, senior leader forums, and partner engagements. Shape cyberspace policy, directives and orders that may impact acquisition. Deliver systemic and crosscutting value to PMs executing cyber-related missions. Army Futures Command (AFC). Engage AFC to institutionalize support for ASA(ALT) Cyber Discipline in order to begin system survivability and cyber resilience efforts early in the acquisition lifecycle. Principal Cyber Adviser (PCA) to the AAE: Provide the AAE with subject matter expertise on acquisition interests related to cyberspace. Topics include the development of decisive cyberspace systems, the survivability/resilience of cyber-dependent systems, the evolution of pre-acquisition cyberspace requirements / capability development, and the continued use of systems throughout Operations & Support. Advise emerging developments and policies in cyberspace from joint, interagency, and coalition partners. Monitor and advise relevant threats to Army systems, and develop mitigation roadmaps as required. Principal ASA(ALT) cyber representative for coordination across government agencies, industry, and academia. ASA(ALT) Chief Information Security Officer (CISO). Lead, plan, integrate and synchronize cybersecurity efforts across ASA(ALT) including PEOs and headquarters. Lead the ASA(ALT) CIO/CISO Council in order to identify crosscutting issues and opportunities from across the PEOs requiring ASA(ALT) senior leader attention. Represent ASA(ALT) cybersecurity equities in external stakeholder forums (e.g. Army Cyberspace Council, Army Enterprise Network Council, CIO Executive Board). Review and shape all cyberspace related strategies, policies, and orders affecting ASA(ALT) from OSD, HQDA, and ARCYBER; and elevate issues to the ASA/PDEP/MDEP as needed. Synchronize architectures between enterprise and acquisition systems. Support critical modernization of unsupported software for secure operations. Assist and respond with data call requests, synchronization efforts, and IPRs with DoD CIO, HQDA CIO/G-6, Army Cyber Command (ARCYBER), and the Vice Chief of Staff of the Army (VCSA). Examples: Federal Information Security Modernization Act (FISMA), DoD Cybersecurity Scorecard, Windows / unsupported software migrations, HQDA Execution Orders (EXORD), Army Cyber Command (ARCYBER) Operations Orders (OPORD). Leverage cybersecurity policy as a technology enabler. Fulfill cybersecurity functions mandated by public law, federal directives, and DoD/Army policy. Coordinate, optimize, and monitor RMF execution among PEOs, assist with common issues requiring senior leader attention, and liaise with HQDA CIO/G-6. Ensure appropriate transfer of Enterprise Mission Assurance Support Service (eMASS) records for systems that transitioned to sustainment. Review and approve requirements for Communications Security (COMSEC) materiel. Serve as approval authority for ASA(ALT) HQ eMASS accounts and Army Training & Certification Tracking System (ATCTS) records, as well as for reviewing and approving system transfers to sustainment in the Army Program Management System (APMS). ASA(ALT) Engineering Governance for Cyberspace. Provide engineering governance for emerging cyberspace-related capabilities and advances to include artificial intelligence, cloud-computing governance, DevSecOps, supply chain risk management, etc. Ensure ASA(ALT)?s cyber-related roadmaps align with Army/DoD CIO regarding data, cloud migration, data			

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centers, etc. Analyze requirements and opportunities, and publish ASA(ALT) internal Technical Bulletins and other information papers to inform PMs. Drive definition and implementation of Information Security Architectures from a system-of-systems perspective. As needed, conduct engineering assessments of crosscutting cyber focused architectures, solutions, and capabilities proposed by PORs, CFTs, and RCCTO. ASA(ALT) lead for Cyber Resilience: Coordinate updates to the ASA(ALT) Cyber Discipline Policy and Implementation Guidebook and transition to Army policy. Synchronize ASA(ALT) cyber resilience strategy with DoD CIO, OUSD(A&S), and HQDA CIO/G-6. Coordinate with Army Futures Command to accelerate the delivery of survivable systems by integrating resilience requirements early in capability development. Review Cyber Discipline related artifacts before submission to the MDA in support of milestone decision reviews. Coordinate support with stakeholders from across Army to implement effectively across system lifecycles. Coordinate revisions and adapt to regulation as needed. The ASA(ALT) Cyber Discipline positions the Army to fight and win with agility in a congested and contested cyberspace domain by maximizing survivability and resiliency of Army systems. This policy mandates the need for PMs to integrate threat-driven systems security engineering, to include cyber assessments and mitigations, both early and continuously across system lifecycles. This policy builds upon of the Risk Management Framework (RMF) and can inform compliance decisions. This implementation guide describes the roles and responsibilities for Milestone Decision Authorities (MDA), PEOs, and PMs. This discipline empowers the PM to expend resources and consider cyber resiliency within trade space decisions along with cost, schedule, and performance. Cyber Vulnerability Assessments & Mitigations ? ASA(ALT) Enduring Program: Lead ASA(ALT) effort to institutionalize cyber vulnerability assessments and mitigations over system lifecycles. Plan funding over the Future Year Defense Program and manage distributed execution by the supporting organizations. Coordinate with system owners to integrate funding as part of organic acquisition strategies. Define Terms of Reference with stakeholders across Army. Coordinate all assessment/mitigation reporting to Army, joint and DoD forums. Support prioritization of weapon systems for assessments based on COCOM prioritization. Establish repository of Army lessons learned for mitigations. Synchronize legacy-focused efforts with current efforts to expand cyber assessment and mitigation planning / implementation earlier in the development lifecycle for all acquisition systems, i.e. ASA(ALT) Cyber Discipline. In parallel, lead Cyberspace Operational Resiliency Assessment - Platform (CORA-P) as the Army-supported organization and oversee planning, execution and reporting of overall CORA-P activities. This effort will support weapon system prioritization and assessment by understanding which weapon systems are critical to combatant commanders, and then assessing those systems in an operational environment. Integrate into planning cycle for a currently-schedule COCOM exercise. Conduct multiple CTTX throughout event planning cycle, with iterative feedback to event planners and system owners. Deliver final vulnerability assessment report (VAR) to COCOM			

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and system owners. Integrate CORA-P / CTTX lessons learned into program planning and execution. After baselining this process, conduct multiple assessments throughout the fiscal year. This effort will 1. identify weapon systems (including relevant networks) that are critical to combatant commanders in an operational environment; 2. identify cyberspace vulnerabilities within prioritized weapon systems; 3. identify system-based risk to mission for combatant commanders; and 4. coordinate the mitigation of vulnerabilities with system and network owners. Ultimately, this effort will accelerate the delivery of critical mitigations to the weapon systems designated as critical assets / key terrain in cyberspace by Combatant Commanders. ASA(ALT) lead for System Security Engineering (SSE): Army requires a professional and effective systems security engineering (SSE) workforce, which is separate from information system security management (ISSM) or network defense functions. SSE contributes to a broad-based, holistic security perspective and focus within the systems engineering (SE) discipline. SSE ensures stakeholder protection needs and security concerns are properly identified and addressed in all engineering stages of the system life cycle. Coordinate with OUSD to define the DoD body of knowledge for SSE. Ensure duties align with prescribed training, experience, and certification. Coordinate appointment and implementation, and facilitate collaboration across PEOs through meetings and publications. ASA(ALT) Enterprise Systems: Support the CSE as Authorizing Official (AO) for ASA(ALT) headquarters. Perform the duties of Program Information System Security Management (P-ISSM) to include guiding HQ system owners in achieving Authorizations To Operate (ATO) and then continuously monitoring systems throughout operations. Major Incident Response (as needed): As needed, coordinate ASA(ALT) strategic response for major malware / computer incidents and Command Cyber Operational Readiness Inspections (CCORI). Engage 7th Signal Command as the PEO liaison. Report to HQDA CIO/G-6 and ARCYBER for cybersecurity related requirements and issues. Monitor and coordinate response to the various cybersecurity inspection programs and audit findings related to DoD Inspector General and Army Audit Agency. ***FY 2022 Plans:*** Perform the functions of the Chief Cyber Acquisition Officer (CCAO), ASA(ALT) Chief Information Security Officer (CISO), ASA(ALT) Engineering Governance for Cyberspace (Policy and System-of-Systems Engineering), Army lead for Cyber Operational Resilience Assessments ? Platform (CORA-P), and the Cybersecurity Program lead for ASA(ALT) Headquarters. Lead a coordinated, comprehensive acquisition approach to enhance cyber resiliency and survivability across ASA(ALT)			

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communities and the materiel enterprise. Optimize cybersecurity as a critical enabler of capability delivery. Facilitate and ensure execution of cyber-related tasks and efforts by appropriate ASA(ALT) organizations. Represent and advocate for ASA(ALT) cyberspace equities in external governance bodies, senior leader forums, and partner engagements. Shape cyberspace policy, directives and orders that may impact acquisition. Deliver systemic and crosscutting value to PMs executing cyber-related missions. Army Futures Command (AFC). Engage AFC to institutionalize support for ASA(ALT) Cyber Discipline in order to begin system survivability and cyber resilience efforts early in the acquisition lifecycle. Chief Cyber Acquisition Officer (CCAO): Serve as primary ASA(ALT) staff point of contact for acquisition concerns related to cyberspace. Lead ASA(ALT) response to major cyberspace incidents requiring ASA(ALT) Principal leader awareness. This includes but is not limited to coordinating with PEO staffs at all levels in order to analyze requirements/orders, facilitate guidance, present findings/status, and interface with Army Cyber Command (ARCYBER) and/or other Headquarters, Department of the Army (HQDA) organizations. In accordance with AR 70-75, coordinate Army survivability policy and guidance in Army acquisition efforts related to cyberspace. Represent HQDA on boards and committees concerning materiel survivability matters related to cyberspace. Coordinate and lead an assessment of the ASA(ALT) portfolio to apply a rigorous, systems engineering approach to consider cyber resilience within the Acquisition trade-space (e.g. performance attribute). Identify systemic vulnerabilities and coordinate the development and implementation of enterprise solutions to mitigate those vulnerabilities. Develop and implement a risk-based process to assess the impact of vulnerabilities and assist with prioritization of funding for corrective actions for high-risk vulnerabilities. Coordinate with PEO STRI regarding the certification and implementation of cyber acquisition assessment teams in order to facilitate the reduction of risk across the ASA(ALT) portfolio. Coordinate with PEO staffs on the integration of traditional cybersecurity (risk management framework) and cyber resilience survivability. Coordinate the Cyber Acquisition Task Force to unify strategy and execution of cyber resilience efforts across Army. Synchronize ASA(ALT) cyber resilience strategies with OSD, USCYBERCOM, and joint Service counterparts. Engineering Governance for Cyberspace (Policy): Establish and oversee systems engineering governance that positions the Army to fight and win in a contested cyberspace domain by maximizing survivability and operational resilience of delivered Army acquisition systems. Increase engineering rigor though policies, processes, tools, and technical oversight across systems and systems-of-systems in order to maximize the cyberspace survivability of the Army Acquisition portfolio. Define, publish and revise as needed a standardized Cyber Acquisition Discipline Implementation Assessment for PMs to demonstrate the repeatable implementation of cyber survivability attributes during decision point reviews. Develop and maintain an Implementation Guidebook to improve awareness and consistency of related planning and execution. Support the AAE in reviewing the Cyber Acquisition Discipline Implementation Assessment during decision reviews for all Acquisition Category 1 and 2 programs, as well as MDAs/DAs for other systems as requested. IAW AR-70-75, represent HQDA on boards and committees concerning materiel survivability matters related to cyberspace resilience.			

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Serve as HQDA lead responsible for tracking and monitoring cyberspace remediations (find-fix-verify) as recommended by DODIG. Provide engineering governance for emerging cyberspace-related capabilities and advances to include artificial intelligence, cloud-computing governance, DevSecOps, supply chain risk management, etc. Ensure ASA(ALT)?s cyber-related roadmaps align with Army/DoD CIO regarding data, cloud migration, data centers, etc. Analyze requirements and opportunities, and publish ASA(ALT) internal Technical Bulletins and other information papers to inform PMs. Coordinate with Army Futures Command to establish systems engineering criteria in order to ensure new requirements documents address cyber resilience. Coordinate with Army Materiel Command to establish policy and processes that shall maintain cybersecurity and survivability for programs transitioning to sustainment. Coordinate with HQDA G-3/5/7 to establish the materiel component of the cyber readiness framework as an interface between systems and operations, which requires authoritative and accessible data from the acquisition and sustainment communities to reduce operational risk. Engineering Governance for Cyberspace (SoS Engineering): Establish engineering governance by developing and overseeing the implementation of technical processes and tools. Army is working on an authoritative acquisition lifecycle data and a standardized and automated continuous monitoring (CM) process for Army acquisition vulnerability management that enables timely data-informed decisions for the operation and defense of the DoDIN-A. Develop objective architecture (e.g. data structures, warehouses, interactions, products) and drive implementation of Information Security Architectures from a system-of-systems perspective. As needed, coordinate engineering change request to federate existing Army business processes and systems. Synchronize with Army policy/strategy and with mission system owners. As needed, conduct engineering-assessments of crosscutting cyber focused architectures, solutions, and capabilities proposed by PORs, CFTs, and RCCTO. Army lead for Cyberspace Operational Resiliency Assessment - Platform (CORA-P): Lead CORA-P as the supported organization to oversee the planning, execution, and reporting of all key tasks, in accordance with HQDA EXORD 123-20. CORA-P is an enduring effort to maintain the readiness, survivability, and cyber resilience of Army and Joint Forces, capabilities, and systems by identifying and mitigation cyberspace vulnerabilities in critical systems including relevant portions of the DOD Information Network. Present overall status to the Army Cyberspace Council GOSC. Plan/program funding over the Future Year Defense Program and oversee distributed execution by stakeholders. Develop and distribute Terms of Reference to all stakeholders. Coordinate all reporting to Army, Joint, and DOD forums. Ensure the on-time completion of Cyber Vulnerability Assessment Reports. Pilot emerging cyber resilience efforts (e.g. Cyber Readiness Framework, mitigation mapping techniques, resilience metrics) in future assessments and extrapolate findings and best practices across ASA(ALT) portfolio. ASA(ALT) Chief Information Security Officer (CISO):			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Lead, plan, integrate and synchronize cybersecurity efforts across ASA(ALT) including PEOs and headquarters. Identify crosscutting issues and opportunities from across the PEOs requiring ASA(ALT) senior leader attention. Represent ASA(ALT) cybersecurity equities in external stakeholder forums (e.g. Army Cyberspace Council, CIO Executive Board). Review and shape all cyberspace related strategies, policies, and orders affecting ASA(ALT) from OSD, HQDA, and ARCYBER; and elevate issues to the Chief Systems Engineer as needed. Synchronize architectures between enterprise and acquisition systems. Support critical modernization of unsupported software for secure operations. Assist and respond with data call requests, synchronization efforts, and IPRs with DoD Chief Information Officer and the HQ G6, ARCYBER, and the Vice Chief of Staff of the Army (VCSA). Examples: Federal Information Security Modernization Act (FISMA), DoD Cybersecurity Scorecard, Windows / unsupported software migrations, HQDA Execution Orders (EXORD), Army Cyber Command (ARCYBER) Operations Orders (OPORD). Leverage cybersecurity policy as a technology enabler. Fulfill cybersecurity functions mandated by public law, federal directives, and DoD/Army policy. Coordinate, optimize, and monitor RMF execution among PEOs, assist with common issues requiring senior leader attention, and liaise with Chief Information Officer and the HQ G6. Ensure appropriate transfer of Enterprise Mission Assurance Support Service (eMASS) records for systems that transitioned to sustainment. Serve as approval authority for ASA(ALT) HQ eMASS accounts and Army Training & Certification Tracking System (ATCTS) records, as well as for reviewing and approving system transfers to sustainment in the Army Program Management System (APMS). OCSE serves as the ASA(ALT) lead for System Security Engineering (SSE). Army requires a professional and effective systems security engineering (SSE) workforce, which is separate from information system security management (ISSM) or network defense functions. SSE contributes to a broad-based, holistic security perspective and focus within the systems engineering (SE) discipline. SSE ensures stakeholder protection needs and security concerns are properly identified and addressed in all engineering stages of the system life cycle. Coordinate with OUSD to define the DoD body of knowledge for SSE. Ensure duties align with prescribed training, experience, and certification. Coordinate appointment and implementation, and facilitate collaboration across PEOs through meetings and publications. Cybersecurity Program for ASA(ALT) HQ: OCSE serves as Program Information System Security Manager (ISSM) for ASA(ALT) HQ, establish and monitor the HQ cybersecurity program that includes cybersecurity objectives and policies, cybersecurity personnel, and cybersecurity processes and procedures. Support the CSE as Authorizing Official (AO) for ASA(ALT) HQ. Function as the primary cybersecurity technical advisor to the AO and managerial lead for RMF throughout the command. Ensure cybersecurity-related events or configuration changes that may impact authorizations or security postures are formally reported to the AO and other stakeholders such as information owners and AOs of interconnected systems. Monitor compliance with cybersecurity policies, as appropriate, and review the results of such monitoring.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
SETA labor cost increase.			
Title: Facilities and IT Support ***Description:*** Provides funding for infrastructure/facilities and IT support. ***FY 2021 Plans:*** Provide funding for infrastructure/facilities. It includes the costs for purchasing/leasing hardware, software, computers, communications equipment and services. ***FY 2022 Plans:*** Provide funding for infrastructure/facilities. It includes the costs for purchasing/leasing hardware, software, computers, communications equipment and services.	0.097	0.233	0.233
Title: Data ***FY 2022 Plans:*** OCSE represents and coordinates the ASA(ALT) community?s data activities across the Army Modernization Enterprise (AME). OSCE supports the ASA(ALT) Data Steward and performs the duties as the Functional Data Manager in Army Data Governance Forums including the Army Data Board (ADB), Army Analytics Board (AAB) and Joint All Domain Command and Control (JADC2) Working Groups. In addition to representing the ASA(ALT) in Army data forums the OCSE is actively improving the ASA(ALT) data environment through the establishment of governance forums, standards, policies and implementation guides in order to facilitate rapid and relevant acquisition decisions. Continuous maturation of the Acquisition Data Domain (ADD) ensures that technical data is available for successful integration and support of product and program life-cycle requirements, additive and advanced manufacturing, digital engineering, product/technical data, intellectual property management, modular open systems approach and other AME initiatives. OCSE has developed a roadmap for the digital transformation of the ASA(ALT) and has begun executing against that plan through the execution of data analytic use cases which provide minimum viable products (MVP) and delivers incremental value to the AME. OCSE will continue to deliver MVPs for data analytic use cases and as appropriate scale these MVPs across the enterprise in order to transform the ASA(ALT)?s business processes in support of its digital and data centric transformation. OCSE hosts the Product Data and Engineering Working Group (PEWG) which provides a collaboration forum focused on product and technical data with representatives from the ASA(ALT), Army Futures Command (AFC), and Army Materiel Command (AMC). This group includes a collection of product and technical data SMEs that collaborate and synchronize responses to questions related to the technical and product data needs that support modernization requirements across these organizations. PEWG members collaborate to work through details of strategic Army initiatives, and facilitate the transition of technical data throughout the product development lifecycle.	-	-	1.961

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
The OCSE is the Army?s lead for the implementation of Digital Engineering. OCSE has developed a Vision for Digital Engineering and initiated the development of a Digital Engineering Policy. The OCSE will complete the approval and publication of the Digital Engineering Policy in FY21. Follow-on efforts will include the approval and publication of a Digital Engineering Implementation Guidance aligned with the DoD Digital Engineering Strategy. The OCSE represents the Army in OSD Digital Engineering forums and is the point of contact within the Army for the governance and processes required for the execution of NDAA, DoD, and Army mandates that involve systems and digital engineering. OCSE leads Army interaction with OSD for systems and digital engineering issues, and identifies and advocates for Army equities during the establishment and implementation of DoD policy involving systems engineering. OCSE has been given the responsibility for leading a Digital Thread Operational Integrated Product Team (OIPT) in order to define and develop the requirement for the Digital Thread in support of the Army Modernization Enterprise. This cross-organization team includes representatives from (ASA)ALT HQ, PEOs, AMC, HQDA G4, and AFC. The Digital Thread will provide a means to integrate digital artifacts which link cross organizational efforts in a manner that facilitates traceability from initial concept through a fielded and supported piece of equipment. OCSE is the lead for the Acquisition Community at the Army Modeling and Simulation (M&S) general officer steering committee (GOSC), council of colonels (CoC), and other M&S forums. OCSE provides guidance to PEOs and PMs to plan for the integrated use of M&S throughout the acquisition lifecycle and coordinates M&S activities within the Army Acquisition Community. Additionally, efforts continue to formally establish governance, policies and standards that support systems engineering efforts across the Army Modernization Enterprise. OCSE continues as the primary action office for the duration of the ASA(ALT) migration to Office 365 (O365), as designated by the HQDA G-6. Continue to provide notifications and updates to the ASA(ALT) DASAs and PEO CIOs points of contact to alert them of the proposed requirements and migration schedule to the Microsoft (MS) Teams Impact Level 5 (IL5) environment. The OCSE will continue to update the ASA(ALT) O365 Migration Hub in the MS Teams CVR environment to better coordinate the required migration tasks. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Emerging OCSE Mission, previous FY 2021/2022 requirements and funding for future early planning effort were embedded in the Army System of Systems Engineering and Analysis line of DY7. The increase reflects the funding for authorized OCSE core positions in Program Element (PE) 0604798A projects, being realigned to support all OCSE requirements in project DY7 moving forward.			
Accomplishments/Planned Programs Subtotals	16.740	17.702	21.534

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DY3: *NIE Test & Evaluation*	6.390	-	-	-	-	-	-	-	-	-	-
• 432612: *Logistic Automation Systems Sustainment*	-	-	-	-	-	-	-	-	-		
• DY5: *Production/Field Coordination for Capability Sets*	0.929	1.035	-	-	-	-	-	-	-	-	-
• 435212: *Other Service Support*	-	-	-	-	-	-	-	-	-		
• DZ6: *Army Integration Management & Coordination*	5.793	-	-	-	-	-	-	-	-	-	-
• B88801: *BCT Emerging Technologies*	19.312	8.491	13.835	-	13.835	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.330		-		-		-		-	0.000	0.330	-
		Subtotal	-	0.330		-		-		-		-	0.000	0.330	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army System of Systems Engineering and Analysis	TBD	TBD : Various	44.603	-		-		-		-		-	0.000	44.603	-
Common Operating Environment (COE)	TBD	TBD : Various	12.969	-		-		-		-		-	0.000	12.969	-
Cyber	TBD	TBD : Various	4.764	-		-		-		-		-	0.000	4.764	-
Army System of System Engineering and Analysis Core Labor	Allot	SoSE&I : Various	11.001	4.746	Nov 2019	5.456	Nov 2019	7.268	Nov 2019	-		7.268	Continuing	Continuing	-
Army System of System Engineering and Analysis Matrix Labor	MIPR	CERDEC : Various	2.395	0.851	Nov 2019	1.742	Nov 2019	2.033	Nov 2019	-		2.033	Continuing	Continuing	-
Army System of System Engineering and Analysis SETA Labor	C/CPFF	TBD : Various	4.116	4.213	Nov 2019	4.825	Nov 2019	5.214	Nov 2019	-		5.214	Continuing	Continuing	-
Army System of System Engineering and Analysis FFRDC Labor	FFRDC	MITRE : Various	7.698	2.738	Nov 2019	2.146	Nov 2019	2.800	Nov 2019	-		2.800	Continuing	Continuing	-
Common Operating Environment (COE) Core Labor	Allot	SoSE&I : Various	1.311	0.117	Nov 2019	0.175	Nov 2019	0.161	Nov 2019	-		0.161	Continuing	Continuing	-
Cyber Core Labor	Allot	SoSE&I : Various	3.053	1.728	Nov 2019	1.718	Nov 2019	2.038	Nov 2019	-		2.038	Continuing	Continuing	-
Cyber Matrix Labor	MIPR	CERDEC : Various	0.691	0.536	Nov 2019	0.418	Nov 2019	0.584	Nov 2019	-		0.584	Continuing	Continuing	-
Cyber SETA Labor	C/CPFF	TBD : Various	0.454	0.391	Nov 2019	0.358	Nov 2019	0.727	Nov 2019	-		0.727	Continuing	Continuing	-
Cyber FFRDC Labor	FFRDC	MITRE : Various	1.136	0.937	Nov 2019	0.704	Nov 2019	0.709	Nov 2019	-		0.709	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DY7 / *Army Systems Engineering, Architecture & Analysis*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	Various : None	0.339	-		-		-		-		-	0.000	0.339	-
		Subtotal	94.530	16.257		17.542		21.534		-		21.534	Continuing	Continuing	N/A

Remarks

Note: 1
- Program Activities performed at Aberdeen Proving Ground (MD), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC), TACOM (Warren, MI)

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities and IT Support	TBD	Various: Note: 1 : TBD	4.389	0.153	Nov 2019	0.160	Nov 2019	-		-		-	0.000	4.702	-
		Subtotal	4.389	0.153		0.160		-		-		-	0.000	4.702	N/A

Remarks

Note:1
- Program Activities performed at Aberdeen Proving Ground (MD), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC), TACOM (Warren, MI)

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	98.919	16.740		17.702		21.534		-		21.534	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*

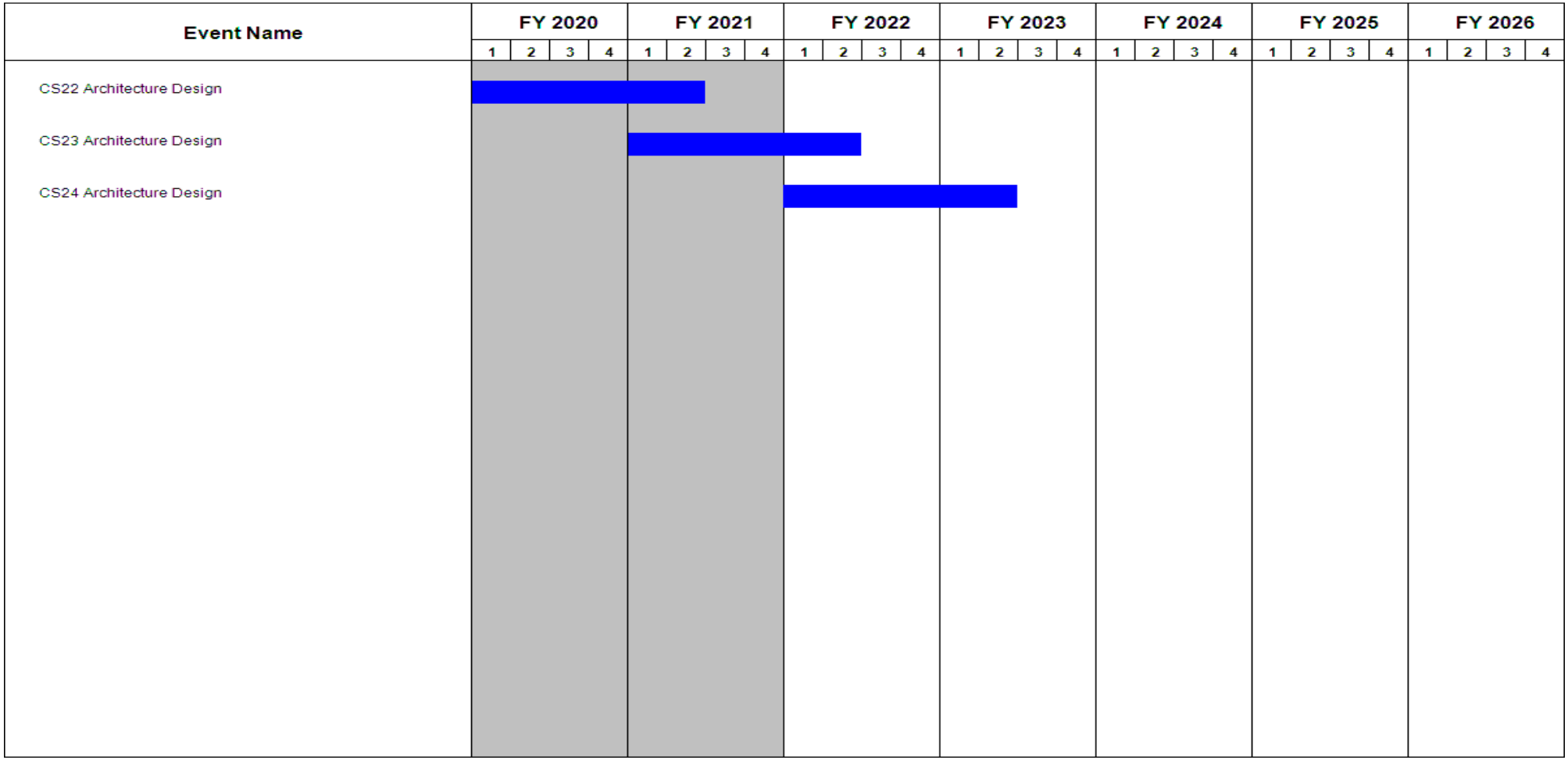

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DY7 / *Army Systems Engineering, Architecture & Analysis*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CS22 Architecture Design	1	2020	2	2021
CS23 Architecture Design	1	2021	2	2022
CS24 Architecture Design	1	2022	2	2023
COE V3.0 CPCE/MCE CDR	1	2018	1	2018

Note

Capability Set (CS)

Common Operating Environment (COE):
Army Interoperability Certification (AIC), Command Post Computing Environment (CPCE), Critical Design Review (CDR), Mounted Computing Environment (MCE), Network Integration Evaluation (NIE), Operational Test (OT)

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DZ6 / *Army Integration Management & Coordination*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
DZ6: *Army Integration Management & Coordination*	-	5.793	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds resources that support the technical and management (i.e. headquarters, resource management, acquisition, human resources, and operations) aspects of the Army Rapid Capabilities and Critical Technologies Office (RCCTO). Effectively utilizing these resources reduces overall cost to the program. All core RCCTO personnel costs will be funded out of this project.

This project was realigned to PE 0605054A (Emerging Technologies Initiatives) in FY 2021.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Program Management and Integration	5.793	-	-
Description: This effort funds resources that support the Army Rapid Capabilities and Critical Technologies Office (RCCTO).			
Accomplishments/Planned Programs Subtotals	5.793	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• DY3: *NIE Test & Evaluation*	6.390	-	-	-	-	-	-	-	-	-	-
• DY5: *Production/Field Coordination for Capability Sets*	0.929	1.035	-	-	-	-	-	-	-	-	-
• DY7: *Army Systems Engineering, Architecture & Analysis*	16.740	17.702	21.534	-	21.534	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / *Brigade Analysis, Integration and Evaluation*	Project (Number/Name) DZ6 / *Army Integration Management & Coordination*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	0.026		-		-		-		-	0.000	0.026	-
		Subtotal	-	0.026		-		-		-		-	0.000	0.026	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SoSE&I Program Management and Integration	TBD	Various Note: 1 : TBD	54.276	5.767	Nov 2019	-		-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	Various : None	0.078	-		-		-		-		-	0.000	0.078	-
		Subtotal	54.354	5.767		-		-		-		-	Continuing	Continuing	N/A

Remarks

Note: 1
- Program Activities performed at Aberdeen Proving Ground (MD), TACOM (Warren MI), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities and IT Support	TBD	Various Note: 1 : TBD	5.298	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	5.298	-		-		-		-		-	Continuing	Continuing	N/A

Remarks

Note:1
- Program Activities performed at Aberdeen Proving Ground (MD), TACOM (Warren MI), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC), FT Bliss (TX), White Sands Missile Range (NM).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	59.652	5.793		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DZ6 / *Army Integration Management & Coordination*

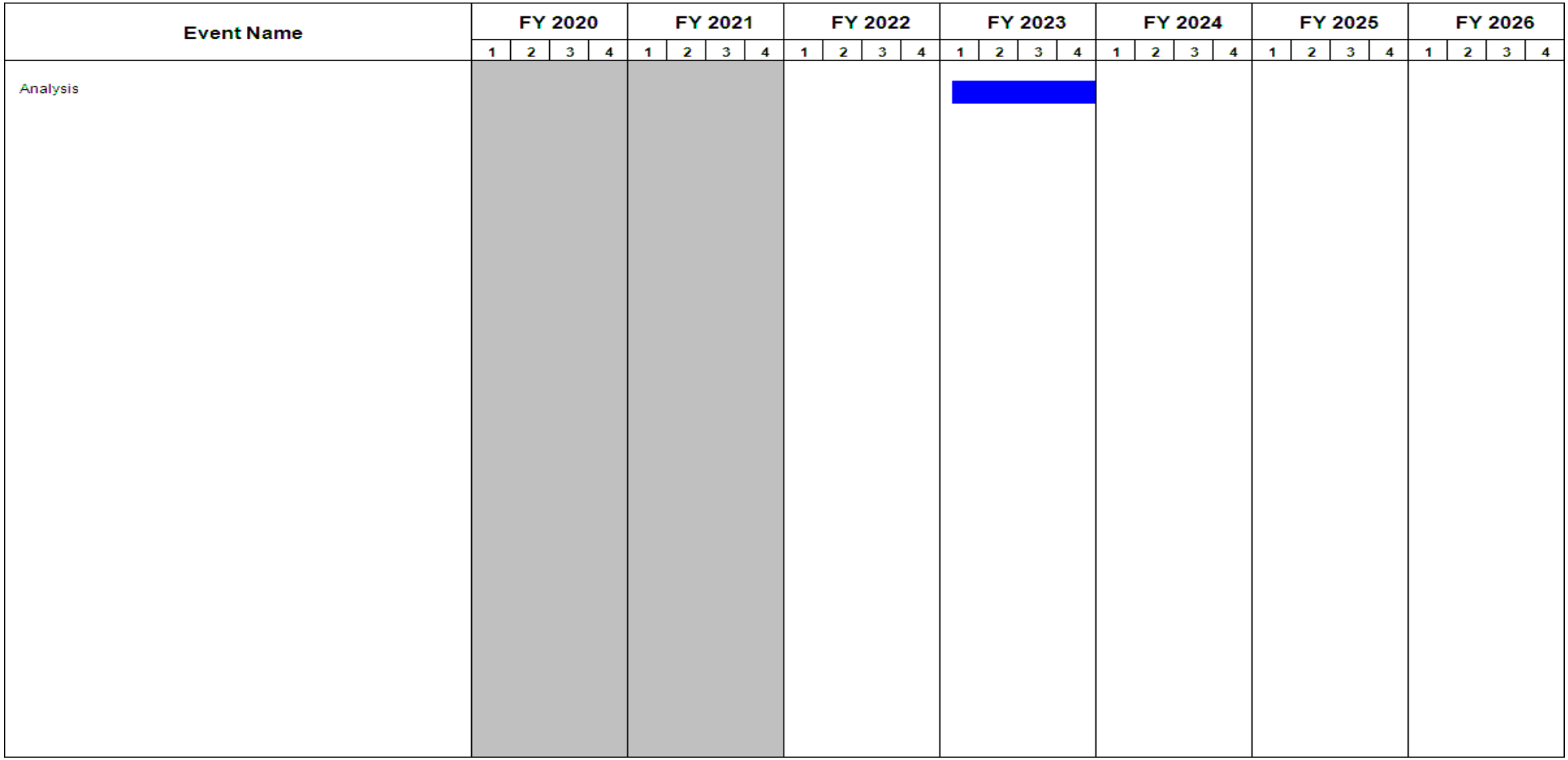

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604798A / *Brigade Analysis, Integration and Evaluation*	**Project (Number/Name)** DZ6 / *Army Integration Management & Coordination*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Analysis	1	2023	4	2023