Department of Defense
Fiscal Year (FY) 2023 Budget Estimates

April 2022

Army

Justification Book Volume 3b of 3

Research, Development, Test & Evaluation, Army

RDT&E − Volume III, Budget Activity 7

Volume 3b Table of Contents

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, $13,703,609,000.00 to remain available for obligation until September 30, 2024.

The FY 2023 Overseas Operations accounted for in the base budget are as follows:

Combat or direct combat support expenses that discontinue once combat operations end at major contingency location $12,800,000.

In-theater and in-CONUS expenses that remain after combat operations cease and have been previously funded in OCO $5,875,000.

COST STATEMENT

The following Justification Books were prepared at a cost of $474,495.00: 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 5D, Budget Activity 6, Budget Activity 7, and Budget Activity 8.

FY 2023 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 2022.

2. Relationship of the FY 2023 Budget Submitted to Congress to the FY 2022 Budget Submitted to Congress. This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

New Start Programs:

Budget Activity	***OSDPE / Project***	***Project Title***
02	0602002A / DC4	Army Applied Innovation
02	0602002A / DC5	Team Ignite
02	0602141A / CI1	Advanced Armaments Lethality Technology
02	0602141A / CZ9	Foundational Hypersonic Weapons Research
02	0602144A / CV3	Engineer Enablers Maneuver, LOG, & Sustainment Apl
02	0602144A / DA1	SAFR Alternatives for Readiness Applied Research
02	0602145A / CU5	Platform Agnostic Armaments Applied Technology
02	0602146A / CU6	Adaptive Information Mediation and Analytics
02	0602146A / CV4	Pathfinder 3D Applied Technology
02	0602150A / CV7	High Energy Laser Direct Diode Apl Tech
02	0602150A / CV8	Vulnerability Modules for Multi-Domain Operations
02	0602150A / DA9	Radar Survivability through Dis Sensing Tech
02	0602180A / DA5	AI Enabled Talent Management Applied Research
02	0602180A / DA6	AI-Enabled Command and Coordination Apl Research
02	0602183A / CU7	Control & Autonomy for Tactical Superiority Tech
02	0602183A / CU8	Structures Tech for Enduring Efficient Resilience

02	0602183A / CU9	Systems Design Technology
02	0602184A / CV9	Technical-SAVVY Soldier Applied Research
03	0603025A / DA3	Army Advanced Innovation
03	0603040A / CN6	Predictive Maintenance Advanced Technology
03	0603040A / DA7	AI-Enabled Command and Coordination Adv Tech
03	0603041A / DA4	All Domain Convergence Engineering & Architectures
03	0603043A / CV1	Control & Autonomy for Tactical Superiority Adv
03	0603043A / CV2	Structures Platform Int Resilience & Efficiency
03	0603119A / CV5	Engineer Enablers Maneuver, LOG, & Sustainment Adv
03	0603119A / DA2	SAFR Alternatives for Readiness Advanced Tech
03	0603466A / CV6	Optimized High Energy Laser Source Adv Tech
03	0603466A / DB3	Radar Survivability through Dis Sensing Adv Tech
04	0604020A / DC8	Army Experimentation and Prototyping
05	0604641A / CF5	Robotic Combat Vehicle (BA5) NGCV-CFT
05	0604827A / S65	Platoon Power Generator
05	0604854A / 516	Paladin/FAASV
06	0605235A / CQ4	Mid-Range Capability

Program Element/Project Restructures:

Budget Activity	***Old OSDPE / Project: Title***	***New OSDPE / Project***
02	0602143A / BE6: Reactive/Resp Surfaces & Matls-Soldiers & Sys	0602184A / CW9
02	0602146A / AΘ2: Stand-In Advanced RF Effects (STARE)	0602146A / AP5
02	0602146A / AR3: Intelligent Environmental Battlefield Awareness	0602182A / CX3
02	0602146A / AR7: Sensing in Contested Environments Technology	0602182A / CX5
02	0602146A / AR9: Persistent Geophysical Sensing-Infrasound Tech	0602182A / CX4
02	0602146A / AT2: Subterranean Detection and Monitoring Technology	0602182A / CX6
02	0602146A / AV7: Atmospheric Modeling and Meterological Technology	0602182A / CW2
02	0602146A / CK1: Assurred PNT Enabling Technologies	0602182A / CZ6
02	0602148A / AI9: Future UAS Engine Technology	0602183A / CW6

02	0602148A / AJ2: Next Generation Rotorcraft Transmission Technology	0602183A / CW8
02	0602148A / AJ6: Advanced Rotors Technology	0602183A / CW3
02	0602148A / AJ8: Experimental and Computational Aeromechanics Techn	0602183A / CW5
02	0602148A / AL2: High Performance Computing for Rotorcraft App Tech	0602183A / DC2
02	0602148A / AL4: High Speed and Efficient VTOL Vehicle Technology	0602183A / CW7
02	0602148A / AL5: Air Vehicle Structures and Dynamics Technology	0602183A / CW4
02	0602148A / AL8: Holistic Situational Awareness and Dec Making Tech	0602141A / CG4
02	0602150A / AD2: High Energy Laser (HEL) Enabling and Support Techn	0602150A / DC1
02	0602150A / AD3: Maneuver Air Defense Technology	0603466A / AD4
02	0602182A / CM9: Convergent CEMA Deception	0602182A / CZ7
03	0602145A / BJ9: Autonomous Mobility Tech	0603462A / BK1
03	0602146A / AM8: Protected SATCOM Technology	0603463A / AM9
03	0602148A / AK4: Multi-Role Small Guided Missile Technology	0603465A / AK5
03	0603463A / AR4: Intelligent Env Battlefield Awareness Adv Tech	0603042A / CX7
03	0603463A / AS9: Persistent Geophysical Sensing-Infrasound Adv Tech	0603042A / CX8
03	0603463A / AR8: Sensing in Contested Environments Adv Technology	0603042A / CX9
03	0603463A / AT3: Subterranean Detection and Monitoring Adv Technology	0603042A / CZ5
03	0603465A / AJ7: Advanced Rotors Advanced Technology	0603043A / CX1
03	0603043A / AJ3: Next Generation Rotorcraft Transmission Adv Technology	0603043A / CX2
03	0603043A / AL3: HPC for Rotorcraft Applications Adv Tech	0603043A / DC3
03	0603463A / AU2: Optimization of Geospatial Data for Visualization	0603463A / AT8
03	0603463A / AV1: GEOInt/Ops Logistics Integration-Planning Adv Tech	0603463A / AU4
03	0602147A / AF1: Long Range Maneuverable Fires (LRMF) Technology	0603464A / AF2
03	0603464A / AE8: Land-Based Anti-Ship Missile (LBASM) Advanced Tech	0603464A / CZ8
03	0603465A / CH6: Adapt & Resilnt Tach Autnmy Cont&Struct Adv Tech	0603043A / CV1
03	0603465A / CH6: Adapt & Resilnt Tach Autnmy Cont&Struct Adv Tech	0603043A / CV2
03	0603465A / CH8: UAS Survivability Advance Technology	0603465A / AK3
03	0603465A / CH8: UAS Survivability Advance Technology	0603465A / CG1
03	0602148A / BZ7: Future Vertical Lift Medical Technologies	0603465A / CJ5
04	0603466A / AD1: High Energy Laser Tactical Vehicle Demo Adv Tech	0604019A / BU9
04	0305251A / FA8: Cyberspace Operations Forces and Force Support	0305251A / DD3
04	0603801A / B47: Future Vertical Lift	0603801A / CS7
04	0604117A / FI4: Maneuver - Short Range Air Defense (M-SHORAD)	0604117A / CR9
04	0605054A / FI3: Rapid Capability Development and Maturation	0604117A / CR9
04	0604117A / FI4: Maneuver - Short Range Air Defense (M-SHORAD)	0604117A / CS1

04	0604644A / MR1: Mobile Intermediate Range Missile	0604135A / MR2
04	0604644A / MR1: Mobile Intermediate Range Missile	0604135A / MR3
04	0604644A / MR1: Mobile Intermediate Range Missile	0604135A / MR4
04	0604182A / HX1: Long Range Hypersonic Weapon	0604182A / HX3
04	0604182A / HX1: Long Range Hypersonic Weapon	0604182A / HX4
04	0604182A / HX1: Long Range Hypersonic Weapon	0604182A / HX5
04	0604182A / HX1: Long Range Hypersonic Weapon	0604182A / HX6
05	0604818A / EJ5: Mounted Computing Environment (MCE)	0604805A / 593
05	0605013A / T05: Army Business System Modernization Initiatives	0605013A / BY3
05	0608041A / CD1: Defensive Cyber - Software Prototype Devel	0605041A / XU3
05	0605042A / FA1: Manpack Radio	0605236A / CQ1
05	0605042A / FA2: Rifleman Radio (RR)	0605236A / CQ1
06	0605602A / 628: Developmental Test Technology & Sustainment	0605602A / FJ3
06	0605602A / 62C: Modeling and Simulation Instrumentation	0605602A / FJ3
07	0303142A / 456: MILSATCOM System Engineering	0303142A / CO7
07	0205778A / EG2: GMLRS Alternative Warheads	0205778A / EG3

Program Terminations (including transfers to Procurement and Sustainment):

Budget Activity	***OSDPE / Project***	***Project Title***
01	0601104A / CI9	University & Industry Rsch Ctrs / Strategic University Basic Research Alliance
02	0602141A / CJ6	Lethality Technology / Advanced Energetics for Missile Technologies
02	0602143A / BB9	Soldier Lethality Technology / Human Performance Tech for Mobility & Lethality
02	0602144A / CG5	Ground Technology / Ground Vehicle Sensor Concepts and Technologies
02	0602146A / AR1	Network C3I Technology / Robust, Resilient and Intelligent C3I Technology
02	0602150A / AD5	Air and Missile Defense Technology / Next Generation Fires Radar Technology
03	0603002A / MN3	Medical Advanced Technology / Immediate Cardiopulmonary Stabilization Adv Tech
03	0603002A / MN4	Medical Advanced Technology / Advanced Life Support Advanced Technology
03	0603002A / MN5	Medical Advanced Technology / Next Generation Blood Products Advanced Technology
03	0603002A / MN9	Medical Advanced Technology / Far Forward Behavioral Health Care Advanced Tech

03	0603463A / AN2	Network C3I Advanced Technology / Narrowband SATCOM Advanced Technology
03	0603466A / AD4	Air and Missile Defense Adv Technology / Maneuver Air Defense Advanced Technology
04	0604785A / DS4	Integrated Base Defense / Integrated Base Defense
05	0604854A / HB6	Artillery Systems EMD / Mobile 155MM Howitzer

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 the Army
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Apr 2022

Summary Recap of Budget Activities	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request
Basic Research	552,521	606,509	466,823
Applied Research	1,518,220	1,529,888	883,759
Advanced Technology Development	1,948,792	2,190,430	1,392,065
Advanced Component Development & Prototypes	3,589,313	3,818,276	4,098,749
System Development & Demonstration	2,979,946	3,254,230	4,031,334
Management Support	1,832,049	1,553,905	1,554,252
Operational Systems Development	1,719,691	1,466,180	1,188,403
Software and Digital Technology Pilot Programs	56,706	108,841	94,888
Total Research, Development, Test & Evaluation	**14,197,238**	**14,528,259**	**13,710,273**

Summary Recap of FYDP Programs			
General Purpose Forces	589,523	579,473	392,489
Intelligence and Communications	372,869	275,873	210,597
Research and Development	13,099,825	13,566,200	13,009,253
Central Supply and Maintenance	130,785	103,720	91,270
Administration and Associated Activities	253		
Classified Programs	3,983	2,993	6,664
Total Research, Development, Test & Evaluation	**14,197,238**	**14,528,259**	**13,710,273**

Department of the Army
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Apr 2022

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
1	0601102A	Defense Research Sciences	01	344,031	368,751	279,328	U
2	0601103A	University Research Initiatives	01	84,697	91,241	70,775	U
3	0601104A	University and Industry Research Centers	01	118,716	126,267	100,909	U
4	0601121A	Cyber Collaborative Research Alliance	01	5,077	5,067	5,355	U
5	0601601A	Artificial Intelligence and Machine Learning Basic Research	01		15,183	10,456	U
	Basic Research			**552,521**	**606,509**	**466,823**	
6	0602002A	Army Agile Innovation and Development-Applied Research	02			9,534	U
7	0602115A	Biomedical Technology	02	11,403	11,925		U
8	0602134A	Counter Improvised-Threat Advanced Studies	02	1,927	1,976	6,192	U
9	0602141A	Lethality Technology	02	117,484	91,626	87,717	U
10	0602142A	Army Applied Research	02	29,257	28,654	27,833	U
11	0602143A	Soldier Lethality Technology	02	201,511	205,058	103,839	U
12	0602144A	Ground Technology	02	159,358	216,550	52,848	U
13	0602145A	Next Generation Combat Vehicle Technology	02	258,341	245,525	174,090	U
14	0602146A	Network C3I Technology	02	202,256	164,804	64,115	U
15	0602147A	Long Range Precision Fires Technology	02	119,007	93,785	43,029	U
16	0602148A	Future Verticle Lift Technology	02	169,536	133,158	69,348	U
17	0602150A	Air and Missile Defense Technology	02	107,584	93,549	27,016	U
18	0602180A	Artificial Intelligence and Machine Learning Technologies	02		15,034	16,454	U
19	0602181A	All Domain Convergence Applied Research	02		25,967	27,399	U
20	0602182A	C3I Applied Research	02		12,406	27,892	U
21	0602183A	Air Platform Applied Research	02		6,597	41,588	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
22	0602184A	Soldier Applied Research	02		11,064	15,716	U
23	0602213A	C3I Applied Cyber	02	18,816	12,119	13,605	U
24	0602386A	Biotechnology for Materials - Applied Research	02		20,643	21,919	U
25	0602785A	Manpower/Personnel/Training Technology	02	20,399	18,701	19,649	U
26	0602787A	Medical Technology	02	101,341	120,747	33,976	U
	Applied Research			**1,518,220**	**1,529,888**	**883,759**	
27	0603002A	Medical Advanced Technology	03	95,146	137,804	5,207	U
28	0603007A	Manpower, Personnel and Training Advanced Technology	03	11,344	14,273	15,598	U
29	0603025A	Army Agile Innovation and Demonstration	03		22,231	20,900	U
30	0603040A	Artificial Intelligence and Machine Learning Advanced Technologies	03		909	6,395	U
31	0603041A	All Domain Convergence Advanced Technology	03		17,743	45,463	U
32	0603042A	C3I Advanced Technology	03		3,151	12,716	U
33	0603043A	Air Platform Advanced Technology	03		754	17,946	U
34	0603044A	Soldier Advanced Technology	03		890	479	U
35	0603115A	Medical Development	03	26,711	26,508		U
36	0603116A	Lethality Advanced Technology	03		8,066	9,796	U
37	0603117A	Army Advanced Technology Development	03	64,163	76,815	134,874	U
38	0603118A	Soldier Lethality Advanced Technology	03	154,161	152,369	100,935	U
39	0603119A	Ground Advanced Technology	03	196,055	280,490	32,546	U
40	0603134A	Counter Improvised-Threat Simulation	03	24,087	24,747	21,486	U
41	0603386A	Biotechnology for Materials - Advanced Research	03		53,736	56,853	U
42	0603457A	C3I Cyber Advanced Development	03	43,357	61,426	41,354	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
43	0603461A	High Performance Computing Modernization Program	03	221,161	229,123	251,964	U
44	0603462A	Next Generation Combat Vehicle Advanced Technology	03	309,860	299,712	193,242	U
45	0603463A	Network C3I Advanced Technology	03	215,337	211,068	125,565	U
46	0603464A	Long Range Precision Fires Advanced Technology	03	177,142	141,909	100,830	U
47	0603465A	Future Vertical Lift Advanced Technology	03	220,334	261,880	177,836	U
48	0603466A	Air and Missile Defense Advanced Technology	03	173,244	145,826	11,147	U
49	0603920A	Humanitarian Demining	03	16,690	19,000	8,933	U
		Advanced Technology Development		**1,948,792**	**2,190,430**	**1,392,065**	
50	0603305A	Army Missle Defense Systems Integration	04	139,518	56,702	12,001	U
51	0603308A	Army Space Systems Integration	04	25,584	25,755	17,945	U
52	0603327A	Air and Missile Defense Systems Engineering	04	47,098	15,000		U
53	0603619A	Landmine Warfare and Barrier - Adv Dev	04	56,067	46,637	64,001	U
54	0603639A	Tank and Medium Caliber Ammunition	04	106,881	73,844	64,669	U
55	0603645A	Armored System Modernization - Adv Dev	04	130,485	164,328	49,944	U
56	0603747A	Soldier Support and Survivability	04	5,312	2,897	4,060	U
57	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	182,400	113,365	72,314	U
58	0603774A	Night Vision Systems Advanced Development	04	15,179	62,820	18,048	U
59	0603779A	Environmental Quality Technology - Dem/Val	04	20,906	22,921	31,249	U
60	0603790A	NATO Research and Development	04	4,589	3,777	3,805	U
61	0603801A	Aviation - Adv Dev	04	694,296	1,178,460	1,162,344	U
62	0603804A	Logistics and Engineer Equipment - Adv Dev	04	15,287	11,055	9,638	U
63	0603807A	Medical Systems - Adv Dev	04	36,006	37,053	598	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
64	0603827A	Soldier Systems - Advanced Development	04	23,905	25,925	25,971	U
65	0604017A	Robotics Development	04	92,401	80,525	26,594	U
66	0604019A	Expanded Mission Area Missile (EMAM)	04		27,872	220,820	U
67	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04			106,000	U
68	0604021A	Electronic Warfare Technology Maturation (MIP)	04	15,034			U
69	0604035A	Low Earth Orbit (LEO) Satellite Capability	04	21,850	19,638	35,509	U
70	0604036A	Multi-Domain Sensing System (MDSS) Adv Dev	04		50,548	49,932	U
71	0604037A	Tactical Intel Targeting Access Node (TITAN) Adv Dev	04		28,347	863	U
72	0604100A	Analysis Of Alternatives	04	9,714	10,091	10,659	U
73	0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04	1,328	926	1,425	U
74	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	59,183	76,349	95,719	U
75	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	308,805	297,629	382,147	U
76	0604115A	Technology Maturation Initiatives	04	141,109	132,561	269,756	U
77	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	5,776	39,376	225,147	U
78	0604119A	Army Advanced Component Development & Prototyping	04	167,990	189,483	198,111	U
79	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	115,688	83,952	43,797	U
80	0604121A	Synthetic Training Environment Refinement & Prototyping	04	112,093	206,335	166,452	U
81	0604134A	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	13,326	13,379	15,840	U
82	0604135A	Strategic Mid-Range Fires	04			404,291	U
83	0604182A	Hypersonics	04	841,666	315,131	173,168	U
84	0604403A	Future Interceptor	04		6,895	8,179	U
85	0604531A	Counter - Small Unmanned Aircraft Systems Advanced Development	04		19,148	35,110	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
86	0604541A	Unified Network Transport	04	39,192	35,172	36,966	U
87	0604644A	Mobile Medium Range Missile	04	88,100	286,445		U
88	0604785A	Integrated Base Defense (Budget Activity 4)	04	2,020	2,040		U
89	0305251A	Cyberspace Operations Forces and Force Support	04	50,525	55,895	55,677	U
		Advanced Component Development & Prototypes		**3,589,313**	**3,818,276**	**4,098,749**	
90	0604201A	Aircraft Avionics	05	7,011	6,654	3,335	U
91	0604270A	Electronic Warfare Development	05	56,624	30,840	4,243	U
92	0604601A	Infantry Support Weapons	05	89,497	79,339	66,529	U
93	0604604A	Medium Tactical Vehicles	05	8,213	9,524	22,163	U
94	0604611A	JAVELIN	05	5,983	7,094	7,870	U
95	0604622A	Family of Heavy Tactical Vehicles	05	22,254	28,445	50,924	U
96	0604633A	Air Traffic Control	05	3,383	4,405	2,623	U
97	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05			115,986	U
98	0604642A	Light Tactical Wheeled Vehicles	05	4,371	2,055		U
99	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	123,992	122,778	71,287	U
100	0604710A	Night Vision Systems - Eng Dev	05	52,959	43,417	62,679	U
101	0604713A	Combat Feeding, Clothing, and Equipment	05	2,734	1,658	1,566	U
102	0604715A	Non-System Training Devices - Eng Dev	05	27,013	26,514	18,600	U
103	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	62,058	59,518	39,541	U
104	0604742A	Constructive Simulation Systems Development	05	9,779	22,240	29,570	U
105	0604746A	Automatic Test Equipment Development	05	5,375	8,807	5,178	U
106	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	7,605	12,453	8,189	U

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
107	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	20,175			U
108	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	3,438			U
109	0604798A	Brigade Analysis, Integration and Evaluation	05	18,737	21,423	21,228	U
110	0604802A	Weapons and Munitions - Eng Dev	05	277,344	297,086	263,778	U
111	0604804A	Logistics and Engineer Equipment - Eng Dev	05	53,676	54,642	41,669	U
112	0604805A	Command, Control, Communications Systems - Eng Dev	05	10,674	20,107	40,038	U
113	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	48,285	44,400	5,513	U
114	0604808A	Landmine Warfare/Barrier - Eng Dev	05	9,239	29,137	12,150	U
115	0604818A	Army Tactical Command & Control Hardware & Software	05	126,676	155,017	111,690	U
116	0604820A	Radar Development	05	105,271	122,607	71,259	U
117	0604822A	General Fund Enterprise Business System (GFEBS)	05	15,428	15,979	10,402	U
118	0604823A	Firefinder	05	18,278			U
119	0604827A	Soldier Systems - Warrior Dem/Val	05	6,546	6,454	11,425	U
120	0604852A	Suite of Survivability Enhancement Systems - EMD	05	62,012	96,132	109,702	U
121	0604854A	Artillery Systems - EMD	05	36,187	25,000	23,106	U
122	0605013A	Information Technology Development	05	123,659	129,380	124,475	U
123	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	111,078	67,701	67,564	U
124	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	76,140	35,560		U
125	0605030A	Joint Tactical Network Center (JTNC)	05	15,671	16,350	17,950	U
126	0605031A	Joint Tactical Network (JTN)	05	30,540	28,905	30,169	U
127	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	5,758			U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	29,770	16,630	11,523	U

Department of the Army
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Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Apr 2022

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
129	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	4,669	7,618		U
130	0605041A	Defensive CYBER Tool Development	05	28,544	18,811	33,029	U
131	0605042A	Tactical Network Radio Systems (Low-Tier)	05	20,511	28,741	4,497	U
132	0605047A	Contract Writing System	05	22,025	20,960	23,487	U
133	0605051A	Aircraft Survivability Development	05	99,403	61,768	19,123	U
134	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	152,399	182,257	131,093	U
135	0605053A	Ground Robotics	05	12,010	16,360	26,809	U
136	0605054A	Emerging Technology Initiatives	05	294,366	226,802	185,311	U
137	0605143A	Biometrics Enabling Capability (BEC)	05		4,326	11,091	U
138	0605144A	Next Generation Load Device - Medium	05		15,397	22,439	U
139	0605145A	Medical Products and Support Systems Development	05	919	962		U
140	0605148A	Tactical Intel Targeting Access Node (TITAN) EMD	05		54,972	58,087	U
141	0605203A	Army System Development & Demonstration	05	177,501	122,175	119,516	U
142	0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05	5,780	2,275	6,530	U
143	0605224A	Multi-Domain Intelligence	05		9,313	19,911	U
144	0605225A	SIO Capability Development	05		22,713		U
145	0605231A	Precision Strike Missile (PrSM)	05		188,452	259,506	U
146	0605232A	Hypersonics EMD	05		111,473	633,499	U
147	0605233A	Accessions Information Environment (AIE)	05		16,790	13,647	U
148	0605235A	Strategic Mid-Range Capability	05			5,016	U
149	0605236A	Integrated Tactical Communications	05			12,447	U
150	0605450A	Joint Air-to-Ground Missile (JAGM)	05	7,566	2,134	2,366	U

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Total Obligational Authority
(Dollars in Thousands)

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
151	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	213,956	159,873	265,288	U
152	0605531A	Counter - Small Unmanned Aircraft Systems Sys Dev & Demonstration	05		33,386	14,892	U
153	0605625A	Manned Ground Vehicle	05	162,390	202,320	589,762	U
154	0605766A	National Capabilities Integration (MIP)	05	7,670	13,454	17,030	U
155	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	1,500	2,564	9,376	U
156	0605830A	Aviation Ground Support Equipment	05	1,413	1,201	2,959	U
157	0303032A	TROJAN - RH12	05	3,451	3,362	3,761	U
158	0303667A	Citizen Broadband Radio System	05	900			U
159	0303767A	AMBIT - Pre-Auctioned SRF	05	9,785			U
160	0304270A	Electronic Warfare Development	05	59,755	75,520	56,938	U
	System Development & Demonstration			**2,979,946**	**3,254,230**	**4,031,334**	
161	0604256A	Threat Simulator Development	06	41,487	61,422	18,437	U
162	0604258A	Target Systems Development	06	35,279	42,404	19,132	U
163	0604759A	Major T&E Investment	06	119,231	93,617	107,706	U
164	0605103A	Rand Arroyo Center	06	12,989	32,296	35,542	U
165	0605301A	Army Kwajalein Atoll	06	221,949	240,877	309,005	U
166	0605326A	Concepts Experimentation Program	06	46,847	79,585	87,122	U
167	0605502A	Small Business Innovative Research	06	369,715			U
168	0605601A	Army Test Ranges and Facilities	06	390,366	367,125	401,643	U
169	0605602A	Army Technical Test Instrumentation and Targets	06	81,829	59,253	37,962	U
170	0605604A	Survivability/Lethality Analysis	06	36,001	36,370	36,500	U
171	0605606A	Aircraft Certification	06	2,736	2,489	2,777	U

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
172	0605702A	Meteorological Support to RDT&E Activities	06	6,360	6,521	6,958	U
173	0605706A	Materiel Systems Analysis	06	21,830	21,558	22,037	U
174	0605709A	Exploitation of Foreign Items	06	8,936	13,631	6,186	U
175	0605712A	Support of Operational Testing	06	54,116	55,122	70,718	U
176	0605716A	Army Evaluation Center	06	56,827	65,854	67,058	U
177	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,478	2,633	6,097	U
178	0605801A	Programwide Activities	06	89,023	96,558	89,793	U
179	0605803A	Technical Information Activities	06	25,817	31,987	28,752	U
180	0605805A	Munitions Standardization, Effectiveness and Safety	06	50,648	63,042	48,316	U
181	0605857A	Environmental Quality Technology Mgmt Support	06	1,715	1,789	1,912	U
182	0605898A	Army Direct Report Headquarters - R&D - MHA	06	50,859	48,981	53,271	U
183	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	74,089	80,921	90,088	U
184	0606003A	CounterIntel and Human Intel Modernization	06	5,200	5,363	1,424	U
185	0606105A	Medical Program-Wide Activities	06	18,973	39,041		U
186	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	6,496	5,466	5,816	U
187	0909999A	Financing for Cancelled Account Adjustments	06	253			U
		Management Support		**1,832,049**	**1,553,905**	**1,554,252**	
188	0603778A	MLRS Product Improvement Program	07	9,785	12,314	18,463	U
189	0605024A	Anti-Tamper Technology Support	07	8,436	8,868	9,284	U
190	0607131A	Weapons and Munitions Product Improvement Programs	07	24,666	35,828	11,674	U
191	0607134A	Long Range Precision Fires (LRPF)	07	100,146			U
192	0607136A	Blackhawk Product Improvement Program	07	8,300	14,773		U

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
193	0607137A	Chinook Product Improvement Program	07	49,409	67,872	52,513	U
194	0607139A	Improved Turbine Engine Program	07	232,159	260,024	228,036	U
195	0607142A	Aviation Rocket System Product Improvement and Development	07	11,321	12,417	11,312	U
196	0607143A	Unmanned Aircraft System Universal Products	07	19,460	4,594	512	U
197	0607145A	Apache Future Development	07	52,502	10,067	10,074	U
198	0607148A	AN/TPQ-53 Counterfire Target Acquisition Radar System	07		47,752	62,559	U
199	0607150A	Intel Cyber Development	07	14,652	3,611	13,343	U
200	0607312A	Army Operational Systems Development	07	35,851	28,029	26,131	U
201	0607313A	Electronic Warfare Development	07		5,673	6,432	U
202	0607665A	Family of Biometrics	07	1,276	1,144	1,114	U
203	0607865A	Patriot Product Improvement	07	178,984	125,932	152,312	U
204	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	43,060	25,489	19,329	U
205	0203735A	Combat Vehicle Improvement Programs	07	213,726	280,107	192,310	U
206	0203743A	155mm Self-Propelled Howitzer Improvements	07	217,959	175,076	136,680	U
207	0203744A	Aircraft Modifications/Product Improvement Programs	07	11,261	10,000		U
208	0203752A	Aircraft Engine Component Improvement Program	07	80	132	148	U
209	0203758A	Digitization	07	4,351	3,903	2,100	U
210	0203801A	Missile/Air Defense Product Improvement Program	07	1,241	127	3,109	U
211	0203802A	Other Missile Product Improvement Programs	07	15,268	10,265	9,027	U
212	0205412A	Environmental Quality Technology - Operational System Dev	07	250	262	793	U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	72,817	60,733	20,180	U
214	0208053A	Joint Tactical Ground System	07	9,510	13,379	8,813	U

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Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

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

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Enactment	FY 2023 Request	Sec
216	0303028A	Security and Intelligence Activities	07	23,367	24,531		U
217	0303140A	Information Systems Security Program	07	28,270	15,680	17,209	U
218	0303141A	Global Combat Support System	07	70,652	45,297	27,100	U
219	0303142A	SATCOM Ground Environment (SPACE)	07	18,002	15,222	18,321	U
222	0305179A	Integrated Broadcast Service (IBS)	07	382	5,430	9,926	U
223	0305204A	Tactical Unmanned Aerial Vehicles	07	38,151	8,410	4,500	U
224	0305206A	Airborne Reconnaissance Systems	07	28,858	24,460	17,165	U
225	0305208A	Distributed Common Ground/Surface Systems	07	40,771			U
226	0307665A	Biometrics Enabled Intelligence	07		2,066		U
227	0708045A	End Item Industrial Preparedness Activities	07	130,785	103,720	91,270	U
9999	9999999999	Classified Programs		3,983	2,993	6,664	U
		Operational Systems Development		**1,719,691**	**1,466,180**	**1,188,403**	
228	0608041A	Defensive CYBER - Software Prototype Development	08	56,706	108,841	94,888	U
		Software and Digital Technology Pilot Programs		**56,706**	**108,841**	**94,888**	
Total Research, Development, Test & Eval, Army				**14,197,238**	**14,528,259**	**13,710,273**	

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

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.785	12.314	18.463	-	18.463	14.770	14.440	9.516	9.880	0.000	89.168
093: *Multi-Launch Rocket System (MLRS)*	-	4.851	4.973	10.176	-	10.176	10.449	10.124	5.198	5.520	0.000	51.291
DX8: *HIMARS Product Improvement Program*	-	4.934	7.341	8.287	-	8.287	4.321	4.316	4.318	4.360	0.000	37.877

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the Multiple Launch Rocket System (MLRS) and the High Mobility Artillery Rocket System (HIMARS) programs.

Program Element 0603778A supports development and testing of the Army's rocket launcher fleet, including the Multiple Launch Rocket System (MLRS) launcher and the High Mobility Artillery Rocket System (HIMARS) launcher. MLRS and HIMARS launchers support the Army's number one priority modernization effort, Long Range Precision Fires. Updated launchers are required to fire current and future munitions such as the Precision Strike Missile (PrSM) and Extended Range (ER) Guided Multiple Launch Rocket System (GMLRS). Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Project 093. The M270A1 Multiple Launch Rocket System (MLRS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the current Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS-Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the Extended Range (ER) GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the MLRS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding in FY 2023-2027 also funds non-recurring engineering for system hardware and software modernization to the MLRS chassis, Launcher Loader Module, and Fire Control System. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the current and

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0603778A *I MLRS Product Improvement Program*

emerging Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS-Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the Extended Range (ER) GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the HIMARS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	9.786	12.314	0.000	-	0.000
Current President's Budget	9.785	12.314	18.463	-	18.463
Total Adjustments	-0.001	0.000	18.463	-	18.463
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.001	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	18.463	-	18.463

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) 093 / *Multi-Launch Rocket System (MLRS)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
093: *Multi-Launch Rocket System (MLRS)*	-	4.851	4.973	10.176	-	10.176	10.449	10.124	5.198	5.520	0.000	51.291
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 093. The M270A1 Multiple Launch Rocket System (MLRS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. MLRS launchers support the Army's number one priority modernization effort, Long Range Precision Fires. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the current Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS-Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the Extended Range (ER) GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the MLRS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding in FY 2023-2027 also funds non-recurring engineering for system hardware and software modernization to the MLRS chassis, Launcher Loader Module, and Fire Control System. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers. The M270A1 MLRS launcher program will develop nascent capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains.

Justification:
FY 2023 Base funding in the amount of $10.176 million for Project 093 continues tactical launcher software development, qualification, and materiel release to support the
Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a MLRS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. Also funds additional integration of Assured Positioning, Navigation and Timing (APNT) capabilities, and integration of satellite communications, allowing MLRS to continue to effectively operate in near-peer and peer-threat environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: MLRS Product Improvement Program	4.851	4.792	10.176
Description: The M270A1 MLRS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion as capability enhancements are developed and to mitigate electronic obsolescence. Support efforts include: obsolescence mitigation and enhancements for the M993A1 carrier, Fire Control System, Launcher Loader Module and			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** 093 / *Multi-Launch Rocket System (MLRS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Enhanced Command and Control; development and updating the Fire Control System software to keep pace with changes to the munitions; and performing Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information Assurance compliance certification and network interoperability testing. Perform technical assessments and concept studies for the following: electronic obsolescence mitigation, Assured Positioning, Navigation and Timing (APNT), crew protection, automotive and hardware/software enhancements, improving operational timelines and risk reduction. ***FY 2022 Plans:*** Continue updates to currently fielded tactical launcher software. Continue tactical launcher software development to incorporate updates post Functional Qualification and Post System Integration Qualification to support the Fire Control System (FCS) obsolescence mitigation hardware upgrade required to operate a MLRS launcher. Integrate and test the improved Assured Positioning, Navigation and Timing (APNT) capabilities and satellite communications. Development, integration, and testing of Multiple Launch Rocket System solutions, including test planning to support an annual PEO MS-led Multi-Domain Operations test/ demonstration event beginning in FY2023, to include biennial Survivability Resiliency/Cyber-Electromagnetic Activities exercises with an event planned in FY2022. ***FY 2023 Plans:*** Continue updates to currently fielded tactical launcher software. Continue tactical launcher software development to incorporate updates post Functional Qualification and Post System Integration Qualification to support the Fire Control System (FCS) obsolescence mitigation hardware upgrade required to operate a MLRS launcher. Integrate and test the improved Assured Positioning, Navigation and Timing (APNT) and satellite communications capabilities. Support development, integration, and testing of Multiple Launch Rocket System solutions, to support biennial Survivability Resiliency/Cyber-Electromagnetic (SUREX) activities exercises and the Positioning, Navigation and Training (PNTX) exercise that support an annual PEO MS-led Multi-Domain Operations test/demonstration event. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased funding of $5.203 million continues tactical launcher software development and APNT activities.			
Title: MLRS SBIR/STTR Transfer ***FY 2022 Plans:*** Funds transferred in accordance with OSD guidance and Title15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding as a result of no planned SBIR/STTR for FY23.	-	0.181	-
Accomplishments/Planned Programs Subtotals	4.851	4.973	10.176

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** 093 / *Multi-Launch Rocket System (MLRS)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C67500: *MLRS Mods*	330.419	273.856	218.359	-	218.359	171.168	170.366	169.611	169.679	Continuing	Continuing

Remarks

C67500 is Budget Line Item Number (BLIN) 21 funded in the Missiles Procurement Army appropriation.

D. Acquisition Strategy

The M270A1 MLRS Product Improvement Program performs development efforts required to address emerging requirements. Emerging requirements include, but are not limited to, updates to address emerging threats to the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility with other Army ground based systems reducing sustainability costs. Update software and hardware for communications and munitions to maintain compatibility and operational viability against near-peer adversaries. The Multiple Launch Rocket System will participate yearly in an integration event at the PEO Missiles and Space level to integrate with current C2, Air and Missile Defense, and Fires systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) 093 / *Multi-Launch Rocket System (MLRS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	STORM Project Office : Redstone Arsenal, AL	8.955	-		-		-		-		-	0.000	8.955	-
FY2022 SBIR/STTR	Various	Various : Various	-	-		0.181		-		-		-	0.000	0.181	-
		Subtotal	8.955	-		0.181		-		-		-	0.000	9.136	N/A

Remarks

Government Program Management funding was transferred to the Operations and Maintenance, Army (OMA) appropriation.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies OGA	MIPR	FT SILL OK, CECOM-NJ AMRDEC-RSA AL, : various	17.108	-		-		-		-		-	0.000	17.108	-
MLRS IAC	C/CPFF	LMMFC : Grand Prairie, TX	30.498	-		-		-		-		-	0.000	30.498	-
MLRS FCS Development	SS/CR	LMMFC : Grand Prairie, TX	70.200	-		-		-		-		-	0.000	70.200	-
Organic Software Development	MIPR	CCDC AvMC : Redstone Arsenal, AL	14.487	4.851	Dec 2020	2.268	Dec 2021	5.766	Nov 2022	-		5.766	Continuing	Continuing	Continuing
Risk Reduction Effort: Common Fire Control System	SS/CR	LMMFC : Grand Prairie, TX	21.900	-		-		-		-		-	0.000	21.900	-
Risk Reduction Effort: Hulls	MIPR	Red River Army Depot : Red River Army Depot, TX	3.200	-		-		-		-		-	0.000	3.200	-
Assured Positioning, Navigation and Timing (APNT) Demonstration	MIPR	CCDC AvMC : Redstone Arsenal, AL	0.176	-		-		-		-		-	0.000	0.176	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** 093 / *Multi-Launch Rocket System (MLRS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Assured Positioning, Navigation and Timing (APNT) Integration	WR	LMMFC : Grand Prairie, TX	-	-		1.907	Nov 2021	4.013	Nov 2022	-		4.013	0.000	5.920	-
		Subtotal	157.569	4.851		4.175		9.779		-		9.779	Continuing	Continuing	N/A

Remarks

Organic (government developed, maintained, and owned) software development includes additional research and development related to Fire Control System obsolescence.

Assured Positioning, Navigation and Timing (APNT) includes activities that modernized hardware which facilitates compliance with statutory requirements (M-Code) and improve system robustness against the GPS Jamming Threat (Anti-Jam), Anti-Spoofing capabilities, and integration of satellite communications.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contract	Various	Multiple : Multiple	4.834	-		-		-		-		-	0.000	4.834	-
		Subtotal	4.834	-		-		-		-		-	0.000	4.834	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support, Joint Interoperability Test Certificate	MIPR	CTSF, Ft. Hood : Texas	10.712	-		-		-		-		-	0.000	10.712	-
Test Support	MIPR	Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, : RSA: Various	1.174	-		0.617	Nov 2021	0.397	Nov 2022	-		0.397	Continuing	Continuing	Continuing
		Subtotal	11.886	-		0.617		0.397		-		0.397	Continuing	Continuing	N/A

Remarks

Test support includes software qualification for the Fire Control System as well as the qualification and testing of the Assured Positioning, Navigation and Timing (APNT) solution.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) 093 / *Multi-Launch Rocket System (MLRS)*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	183.244	4.851		4.973		10.176		-		10.176	Continuing	Continuing	N/A

Remarks

Acronyms:
AvMC: Aviation and Missile Center;
CCDC: Combat Capabilities Development Command;
AMRDEC - Aviation and Missile Research Development and Engineering Center;
STORM - Strategic and Operational Rocket and Missile Systems;
CTSF - Central Technical Support Facility;
ATEC - US Army Test and Evaluation Command;
APG MD - Aberdeen Proving Ground, Maryland;
WSMR - White Sands Missile Range;
RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama
LMMFC - Lockheed Martin Missiles & Fire Control

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** 093 / *Multi-Launch Rocket System (MLRS)*

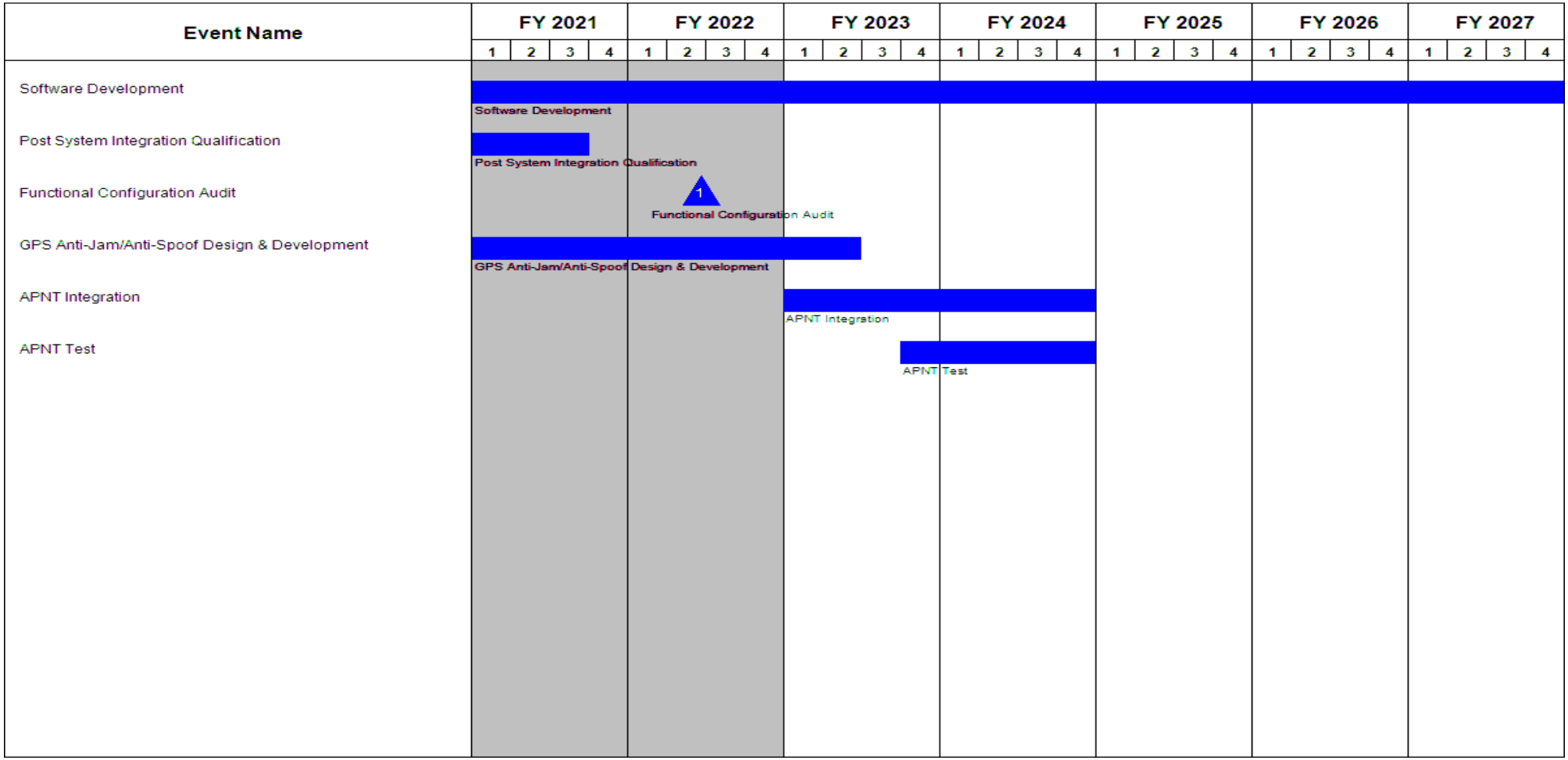

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** 093 / *Multi-Launch Rocket System (MLRS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Development	1	2018	4	2027
Software Qualification	3	2020	3	2020
Post System Integration Qualification	1	2021	3	2021
Functional Configuration Audit	2	2022	2	2022
Delta Live Fire Testing for Improved Armored Cab (IAC)	3	2020	3	2020
GPS Anti-Jam/Anti-Spoofing Integration	2	2020	2	2020
GPS Anti-Jam/Anti-Spoof Design & Development	1	2021	2	2023
APNT Integration	1	2023	4	2024
APNT Test	4	2023	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) DX8 / *HIMARS Product Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
DX8: *HIMARS Product Improvement Program*	-	4.934	7.341	8.287	-	8.287	4.321	4.316	4.318	4.360	0.000	37.877
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project DX8. The M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS launchers support the Army's number one priority modernization effort, Long Range Precision Fires. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the current and emerging Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS- Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the Extended Range (ER) GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the HIMARS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers. The M142 HIMARS launcher program will develop nascent capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains.

Justification:
FY 2023 Base funding in the amount of $8.287 million for Project DX8 supports tactical launcher software development and qualification to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. Also funds integration of Assured Positioning, Navigation and Timing (APNT) capabilities and satellite communications that allows HIMARS to continue to effectively operate in near-peer and peer-threat environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: MLRS Production Improvement Program (PIP)-HIMARS PIP	4.934	7.073	8.287
Description: The HIMARS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion as capability enhancements are developed, technology is inserted in order to mitigate obsolescence. Support efforts include: obsolescence mitigation and enhancements for the truck, Fire Control System, Launcher Loader Module and Enhanced Command and Control; development and updating the Fire Control System software to keep pace with changes to the munitions; and performing Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** DX8 / *HIMARS Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Assurance compliance certification and network interoperability testing. Perform technical assessments and concept studies for the following: electronic obsolescence mitigation and redesign to keep pace with the evolving threat, Assured Positioning Navigation and Timing (APNT), crew protection, automotive and hardware/software enhancements, improving operational timelines, leader-follower technology and risk reduction. ***FY 2022 Plans:*** Continue tactical launcher software development, risk reduction, and qualification to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. Integrate and test the improved Assured Positioning, Navigation and Timing (APNT) capabilities and satellite communications. Development, integration, and testing of High Mobility Artillery Rocket System solutions, including test planning to support an annual PEO MS-led Multi-Domain Operations test/demonstration event beginning in FY2023, to include biennial Survivability Resiliency/Cyber-Electromagnetic Activities exercises with an event planned in FY2022. ***FY 2023 Plans:*** Continue tactical launcher software development, risk reduction, and qualification to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. Integrate and test the improved Assured Positioning, Navigation and Timing (APNT) capabilities and satellite communications. Support integration and testing of the High Mobility Artillery Rocket System solutions, to support biennial Survivability Resiliency/Cyber-Electromagnetic (SUREX) activities and the Positioning, Navigation and Training (PNTX) exercise that will support the annual PEO MS-led Multi-Domain Operations test/demonstration event. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased funding of $0.946 million facilitates integration and testing of Assured Positioning Navigation and Timing (APNT) capabilities and satellite communications. This integration allows the HIMARS Launcher to continue effective operations in near-peer threat environments.			
Title: HIMARS SBIR/STTR Transfer ***FY 2022 Plans:*** Funds transferred in accordance with OSD guidance and Title15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding as a result of no planned SBIR/STTR for FY23.	-	0.268	-
Accomplishments/Planned Programs Subtotals	4.934	7.341	8.287

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** DX8 / *HIMARS Product Improvement Program*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C67501: *HIMARS Modifications*	6.081	7.192	20.468	-	20.468	35.562	50.378	54.986	54.968	Continuing	Continuing
• C02901: *High Mobility Artillery Rocket System (HIMARS)*	46.276	128.438	155.705	-	155.705	189.574	134.670	134.044	134.076	0.000	922.783

Remarks

C67501 (Budget Line Item Number 22) and C02091 (Budget Line Item Number 15) are funded in the Missiles Procurement Army appropriation.

D. Acquisition Strategy

The M142 HIMARS Product Improvement Program performs development efforts required to address emerging requirements. Emerging requirements include, but are not limited to, updates to address emerging threats of the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility with other Army ground based systems reducing sustainability costs. Update software and hardware for communications and munitions to maintain compatibility and operational viability against near-peer adversaries. The High Mobility Artillery Rocket System will participate yearly in an integration event at the PEO Missiles and Space level to integrate with current C2, Air and Missile Defense, and Fires systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) DX8 / *HIMARS Product Improvement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	STORM Project Office : Redstone Arsenal, AL	0.817	0.100		-		-		-		-	0.000	0.917	-
FY2022 SBIR/STTR	Various	Various : Various	-	-		0.268		-		-		-	0.000	0.268	-
		Subtotal	0.817	0.100		0.268		-		-		-	0.000	1.185	N/A

Remarks

Government Program Management funding was transferred to the Operations and Maintenance, Army (OMA) appropriation.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies (OGA)	MIPR	AMCOM, GSA, RSA : Various	3.318	-		-		-		-		-	0.000	3.318	-
Organic Software Development	MIPR	CCDC AvMC : Redstone Arsenal, AL	20.545	4.834	Apr 2021	4.549	Apr 2022	3.877	Apr 2023	-		3.877	Continuing	Continuing	Continuing
APNT Demonstration	MIPR	CCDC AvMC : Redstone Arsenal, AL	0.128	-		-		-		-		-	0.000	0.128	-
APNT Integration	WR	LMMFC : Grand Prairie, TX	-	-		1.907	Nov 2021	4.013	Nov 2022	-		4.013	0.000	5.920	-
		Subtotal	23.991	4.834		6.456		7.890		-		7.890	Continuing	Continuing	N/A

Remarks

Organic (government developed, maintained, and owned) software development includes additional research and development related to Fire Control System electronic obsolescence.

Assured Positioning, Navigation and Timing (APNT) activities includes integration of Global Positioning System (GPS) Anti-Jam, Anti-Spoofing capabilities, and integration of satellite communications.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / *MLRS Product Improvement Program*	Project (Number/Name) DX8 / *HIMARS Product Improvement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, RSA : Various	4.686	-		0.617	Nov 2021	0.397	Nov 2022	-		0.397	Continuing	Continuing	Continuing
		Subtotal	4.686	-		0.617		0.397		-		0.397	Continuing	Continuing	N/A

Remarks

Test support includes software qualification for the Fire Control System as well as the qualification and testing of the Assured Positioning, Navigation and Timing (APNT) solution.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.494	4.934		7.341		8.287		-		8.287	Continuing	Continuing	N/A

Remarks

APG MD - Aberdeen Proving Ground, Maryland
APNT - Assured Positioning, Navigation and Timing
ATEC - US Army Test and Evaluation Command
AvMC - Aviation and Missile Center
CCDC - Combat Capabilities Development Command
CTSF - Central Technical Support Facility
RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama
STORM - Strategic and Operational Rockets and Missiles
WSMR - White Sands Missile Range

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** DX8 / *HIMARS Product Improvement Program*

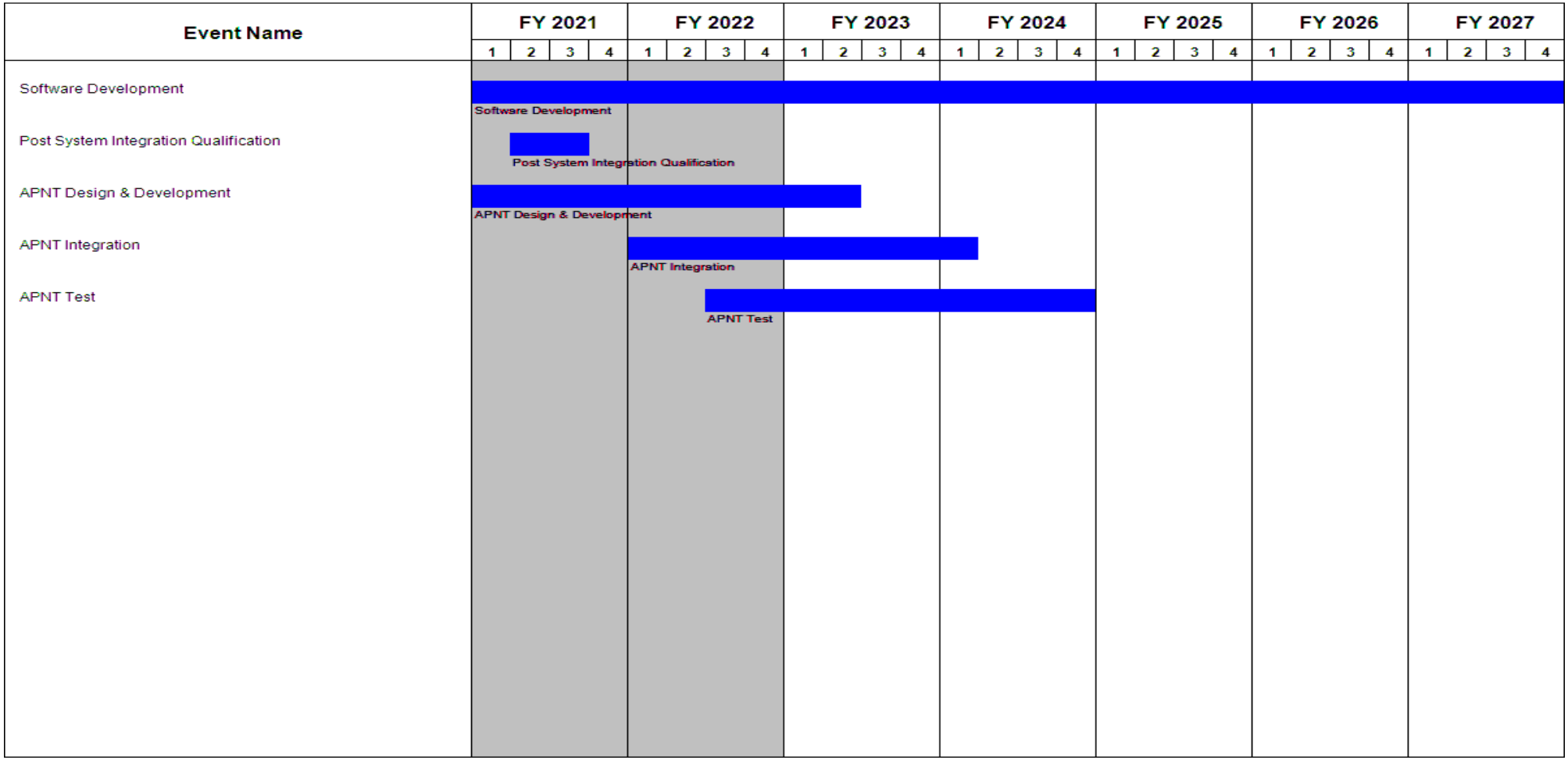

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0603778A / *MLRS Product Improvement Program*	**Project (Number/Name)** DX8 / *HIMARS Product Improvement Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Development	1	2019	4	2027
Software Qualification	3	2020	3	2020
Post System Integration Qualification	1	2021	3	2021
Improved Crew Protection (ICP) Cab Live Fire Testing (Coupon Testing)	2	2020	2	2020
Improved Crew Protection (ICP) Cab Live Fire Testing (Testing)	4	2020	4	2020
APNT Design & Development	1	2021	2	2023
APNT Integration	1	2022	1	2024
APNT Test	3	2022	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0605024A / *Anti-Tamper Technology Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.436	8.868	9.284	-	9.284	7.439	7.432	7.434	7.506	Continuing	Continuing
FB1: *Anti-Tamper Technology Support*	-	8.436	8.868	9.284	-	9.284	7.439	7.432	7.434	7.506	Continuing	Continuing

A. Mission Description and Budget Item Justification

Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	8.436	8.868	0.000	-	0.000
Current President's Budget	8.436	8.868	9.284	-	9.284
Total Adjustments	0.000	0.000	9.284	-	9.284
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.284	-	9.284

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0605024A / *Anti-Tamper Technology Support*	Project (Number/Name) FB1 / *Anti-Tamper Technology Support*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FB1: *Anti-Tamper Technology Support*	-	8.436	8.868	9.284	-	9.284	7.439	7.432	7.434	7.506	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Anti-Tamper (AT) Technology Support. The Protective Technologies (PT) organization is the Army's Technical Center for the DoD AT program, which is focused on preventing exploitation/reverse engineering (RE) of U.S. systems lost or captured on the battlefield or sold via Foreign Military Sales (FMS) or Direct Commercial Sales (DCS). In support of this mission, PT's classified efforts are focused on AT Validation and Verification (V&V) activities with Army programs, AT/RE Lab facilities and equipment and AT/RE Lab assessments

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Anti-Tamper (AT) Technology Support	8.436	8.544	9.284
Description: AT is a DoD program that encompasses the systems engineering activities intended to prevent and/or delay exploitation of critical technologies in U.S. weapon systems. These activities involve the entire life-cycle of systems acquisition, including research, development, implementation, and testing of AT measures. ***FY 2022 Plans:*** Will continue to build and maintain the PT core team of SMEs available for this ongoing Army-level mission to support the development of new and upgraded Army programs and evaluating their AT architectures. In support of that primary mission, PT must and will continue to build and maintain state-of-the-art RE capabilities to facilitate technical assessments to evaluate the vulnerabilities of micro-electronic components used in the electronic designs of Army weapons systems with CPI that requires protection. ***FY 2023 Plans:*** Will continue to build and maintain the PT core team of SMEs available for this ongoing Army-level mission to support the development and fielding of new and upgraded Army programs through the technical evaluation of their AT architectures. In support of that primary mission, PT must and will continue to build and maintain state-of-the-art RE capabilities to facilitate technical assessments to evaluate the vulnerabilities of micro-electronic components used in the electronic designs of Army weapons systems with CPI that requires protection. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding changes reflects planned lifecycle of this effort			
Title: FY22 SBIR/STTR Transfer	-	0.324	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0605024A / *Anti-Tamper Technology Support*	**Project (Number/Name)** FB1 / *Anti-Tamper Technology Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	8.436	8.868	9.284

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0605024A / *Anti-Tamper Technology Support*	Project (Number/Name) FB1 / *Anti-Tamper Technology Support*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AT CA - Accelerate new Novel Tech Solutions	TBD	AMRDEC : , Redstone Arsenal AL	3.000	-		-		-		-		-	0.000	3.000	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	N/A : N/A	0.001	-		-		-		-		-	0.000	0.001	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.324	Mar 2022	-		-		-	0.000	0.324	-
		Subtotal	3.001	-		0.324		-		-		-	0.000	3.325	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AT V&V Activities	Various	Redstone Arsenal & Prime Contract locations : Redstone Arsenal	4.763	3.245	Oct 2020	3.233	Oct 2021	3.390	Oct 2022	-		3.390	0.000	14.631	-
		Subtotal	4.763	3.245		3.233		3.390		-		3.390	0.000	14.631	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AT/RE Lab Facilities & Equipment	Various	Redstone Arsenal, AL : Redstone Arsenal, AL	4.955	3.231	Oct 2020	3.359	Oct 2021	3.522	Oct 2022	-		3.522	0.000	15.067	-
		Subtotal	4.955	3.231		3.359		3.522		-		3.522	0.000	15.067	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0605024A / *Anti-Tamper Technology Support*	**Project (Number/Name)** FB1 / *Anti-Tamper Technology Support*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AT/RE Laboratory Assessments	Various	Redstone Arsenal, AL : Redstone Arsenal, AL	2.581	1.960	Oct 2020	1.952	Oct 2021	2.372	Oct 2022	-		2.372	0.000	8.865	-
		Subtotal	2.581	1.960		1.952		2.372		-		2.372	0.000	8.865	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.300	8.436		8.868		9.284		-		9.284	0.000	41.888	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0605024A / *Anti-Tamper Technology Support*	**Project (Number/Name)** FB1 / *Anti-Tamper Technology Support*

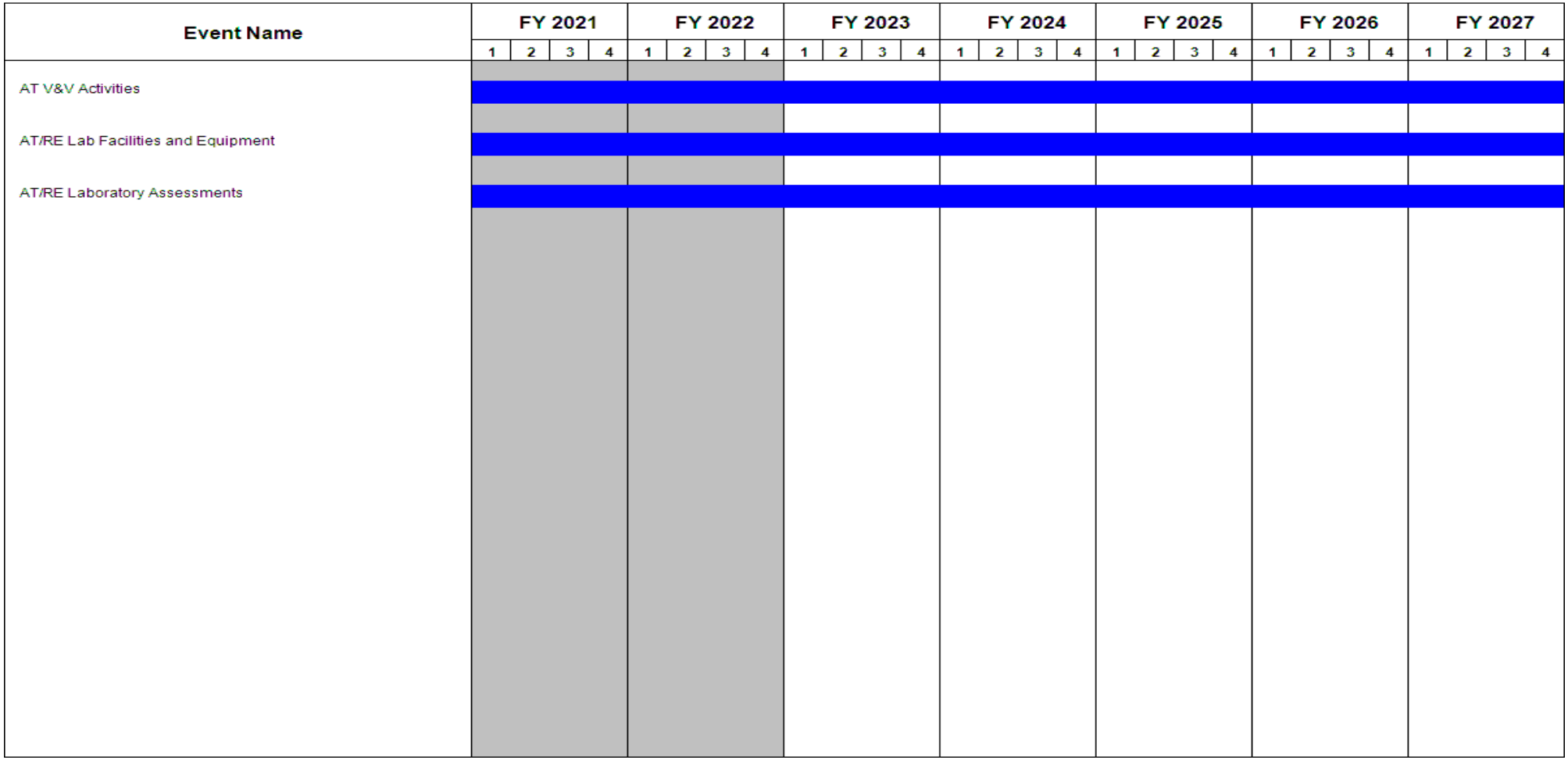

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0605024A / *Anti-Tamper Technology S upport*	**Project (Number/Name)** FB1 / *Anti-Tamper Technology Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AT V&V Activities	1	2017	4	2027
AT/RE Lab Facilities and Equipment	1	2017	4	2027
AT/RE Laboratory Assessments	1	2017	4	2027
AT Congressional Add - New Novel Tech Solutions	2	2019	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	24.666	35.828	11.674	-	11.674	4.952	2.288	2.288	2.311	Continuing	Continuing
CP2: *Precision Fire Technology Improvements*	-	-	8.210	-	-	-	-	-	-	-	0.000	8.210
ER2: *Close Combat Technology*	-	6.518	3.468	2.807	-	2.807	0.684	-	-	-	Continuing	Continuing
ER5: *Indirect Fire and Fuze Technology*	-	4.712	4.463	2.454	-	2.454	2.215	2.288	2.288	2.311	Continuing	Continuing
ER6: *Direct Fire Technology*	-	13.436	19.687	6.413	-	6.413	2.053	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project CP2 Precision Fire Technology Improvements supports required Precision Munitions and Fuze assessment and improvement initiatives to support increased rates of fire for items that have been fielded or in full rate production, such as the M1155 Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS), Excalibur and Precision Guidance Kit (PGK). Efforts will identify, characterize, study, analyze, test and develop Precision Munition and Fuze technologies to increase range, lethality, effectiveness, survivability and accuracy. This Project does not have a Fiscal Year (FY) 2023 budget request.

Project ER2 Close Combat Technology includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, and networked munitions and mines, that have been fielded or have received approval for full rate production. FY 2023 funding will allow the project to identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

Project ER5 The Indirect Fire and Fuze Technology Project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Initiatives include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products. Fiscal Year (FY) 2023 funding will support Fuze Technology Integration (FTI) efforts to complete conventional artillery fuze evaluations for compatibility with Long Range Precision Fire (LRPF) projectiles; expand and refine the fuze critical components database to identify and mitigate obsolescence and single point components & processes; and develop and evaluate M734A1 mortar fuze custom application specific integrated circuit (ASIC) signal processor and accelerometer; complete implementing the M739A1/M782 artillery fuze setback mass drop safety improvement; continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; continue maturing extended duration artillery fuze power sources; support M783 mortar fuze evaluation, design improvement and testing to preclude early fuze functioning; and evaluate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607131A *I Weapons and Munitions Product Improvement Programs*

Project ER6: The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, medium caliber ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. Fiscal Year (FY) 2023 funding supports a number of small caliber ammunition projects including improvements to training ammunition; improvements to make small caliber primers more environmentally friendly; optimization of handgun ammunition; exploring precision sniper improvements and continuing the effort to reduce Soldier load by developing lightweight ammunition. Improvements to medium caliber ammunition include lethality and safety enhancements on 40mm ammunition. Improvements to 105mm and 120mm tank ammunition include examination and implementation of performance enhancement and improvements to tracer, combustible cartridge case and 105mm Advanced Multipurpose (AMP).

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	19.666	22.828	0.000	-	0.000
Current President's Budget	24.666	35.828	11.674	-	11.674
Total Adjustments	5.000	13.000	11.674	-	11.674
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	13.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.000	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	11.674	-	11.674

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: ER6: *Direct Fire Technology*		
Congressional Add: *Tungsten Manufacturing Affordability Initiative for Armaments*	-	8.000
Congressional Add: *Printed Electronics (PEEMS)*	-	5.000
Congressional Add Subtotals for Project: ER6	-	13.000
Congressional Add Totals for all Projects	-	13.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CP2: *Precision Fire Technology Improvements*	-	-	8.210	-	-	-	-	-	-	-	0.000	8.210
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports required Precision Munitions and Fuze assessment and improvement initiatives to support increased rates of fire for items that have been fielded or in full rate production, such as the M1155 Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS), Excalibur and Precision Guidance Kit (PGK). Efforts will identify, characterize, study, analyze, test and develop Precision Munition and Fuze technologies to increase range, lethality, effectiveness, survivability and accuracy. FY 2022 funding will support preliminary fuze setter trade studies and improvement activities on setter technologies to inform requirements and the setter modernization roadmap. FY 2022 funding will also support the Excalibur high pressure setback testing and safety margin improvement initiatives that will ensure survivability and reliability with the Extended Range Cannon Artillery (ERCA) system in support of the Army's modernization priorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS) Modernization	-	3.299	-
Description: The effort supports fuze setting system requirements based on legacy and developmental platforms and munitions for 155mm Artillery systems. Efforts support development of comprehensive technology plan for Increased Range and Increased Rate of Fire improvements related to the ERCA weapon system as well as other Artillery Modernization efforts.			
FY 2022 Plans: FY 2022 funding will support preliminary fuze setter trade studies and improvement activities on setter technologies to inform requirements and the setter modernization roadmap.			
FY 2022 to FY 2023 Increase/Decrease Statement: This Project does not have a FY 2023 budget Request.			
Title: Excalibur Ib Modernization	-	4.611	-
Description: This effort will complete a series of Excalibur Ib safety and reliability test activities to ensure survivability at higher pressures in the ERCA system.			
FY 2022 Plans: FY 2022 funding will support the Excalibur high pressure setback testing and safety margin improvement initiatives that will ensure survivability and reliability with the ERCA system in support of the Army's modernization priorities.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
This Project does not have a FY 2023 budget Request.			
Title: FY 2022 SBIR/STTR Transfer	-	0.300	-
Description: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	-	8.210	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The EPIAFS Modernization effort will utilize US Government labor and development capabilities to accomplish trade studies and Other Transaction Agreement (OTA) contracts for development of promising fuze setting concepts. Upon completion, efforts will transition to production as Engineering Change Proposals (ECPs) to be integrated into existing production contracts as they become available.

The Excalibur Ib Modernization effort will utilize existing Engineering Services contract with Raytheon Missiles and Defense as well as various Federal Acquisition Regulation (FAR) contracts to support modernization activities. Upon successful completion, improvements will be integrated via Engineering Change Proposal (ECP) in the Excalibur Ib production contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.300		-		-		-	0.000	0.300	-
		Subtotal	-	-		0.300		-		-		-	0.000	0.300	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Excalibur Ib Modernization Component Hardware	Various	To Be Determined : TBD	-	-		0.286	Jan 2022	-		-		-	0.000	0.286	-
Excalibur Ib Modernization Hardware	SS/CPFF	Raytheon Missiles and Defense (RMD) : Tuscon, AZ	-	-		1.329	Apr 2022	-		-		-	0.000	1.329	-
EPIAFS Modernization Development and Hardware	Various	To Be Determined : TBD	-	-		1.179	Jun 2022	-		-		-	0.000	1.179	-
		Subtotal	-	-		2.794		-		-		-	0.000	2.794	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Excalibur Ib Modernization Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		0.600	Nov 2021	-		-		-	0.000	0.600	-
EPIAFS Modernization Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center	-	-		1.720	Nov 2021	-		-		-	0.000	1.720	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		(DEVCOM AC) : Picatinny Arsenal, NJ													
EPIAFS Modernization Platform/Fire Control Integration Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		0.100	Nov 2021	-		-		-	0.000	0.100	-
EPIAFS Modernization Cybersecurity Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		0.100	Nov 2021	-		-		-	0.000	0.100	-
		Subtotal	-	-		2.520		-		-		-	0.000	2.520	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Excalibur Ib High Pressure Setback Testing	MIPR	Army Test and Evaluation Command (ATEC), Yuma Proving Grounds : Yuma, AZ	-	-		0.525	May 2022	-		-		-	0.000	0.525	-
Excalibur Ib Safety Margin and Reliability Testing	MIPR	Army Test and Evaluation Command (ATEC), Yuma Proving Grounds : Yuma, AZ	-	-		1.871	Jun 2022	-		-		-	0.000	1.871	-
EPIAFS Modernization Environmental Testing	MIPR	Combat Capabilities Development Command Armaments Center	-	-		0.100	Aug 2022	-		-		-	0.000	0.100	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		(DEVCOM AC) : Picatinny Arsenal, NJ													
EPIAFS Modernization Firing Testing	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		0.100	Aug 2022	-		-		-	0.000	0.100	-
		Subtotal	-	-		2.596		-		-		-	0.000	2.596	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		8.210		-		-		-	0.000	8.210	N/A

Remarks

EPIAFS = Enhanced Portable Inductive Artillery Fuze Setter

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

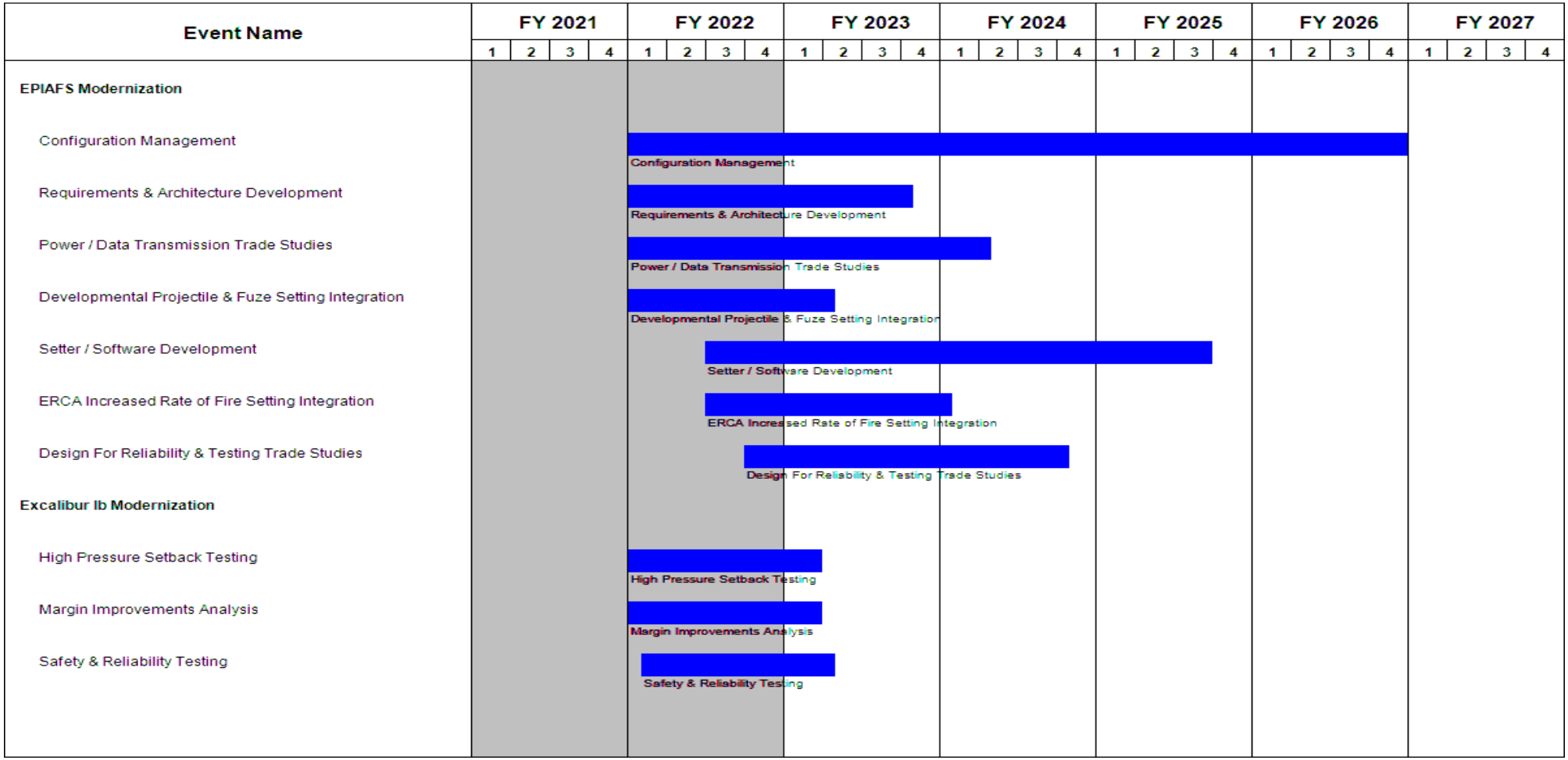

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EPIAFS Modernization	1	2022	4	2026
Configuration Management	1	2022	4	2026
Requirements & Architecture Development	1	2022	4	2023
Power / Data Transmission Trade Studies	1	2022	2	2024
Developmental Projectile & Fuze Setting Integration	1	2022	2	2023
Setter / Software Development	3	2022	3	2025
ERCA Increased Rate of Fire Setting Integration	3	2022	1	2024
Design For Reliability & Testing Trade Studies	4	2022	4	2024
Excalibur Ib Modernization	1	2022	4	2022
High Pressure Setback Testing	1	2022	1	2023
Margin Improvements Analysis	1	2022	1	2023
Safety & Reliability Testing	1	2022	2	2023

Note

EPIAFS = Enhanced Portable Inductive Artillery Fuze Setter
ERCA = Extended Range Cannon Artillery

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER2 / *Close Combat Technology*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ER2: *Close Combat Technology*	-	6.518	3.468	2.807	-	2.807	0.684	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project ER2 Close Combat Technology includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, and networked munitions and mines, that have been fielded or have received approval for full rate production. FY 2023 funding will allow the project to identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: M67 (G881) Fragmentation Hand Grenade	2.993	1.319	1.600
Description: The M67 Hand Grenade uses the M213 fuze which does not meet Insensitive Munitions (IM) requirements. This program is a modernization effort that will replace the legacy M67 with a new IM compliant system which greatly increases the safety of the warfighter as it will make the M67 less susceptible to inadvertent detonation. This effort will evaluate potential IM compliant foreign fuze candidates as a replacement to the current M213 fuze and incorporate an IM compliant explosive fill. The new IM compliant fuze and explosive fill will be qualified for incorporation into the M67 design and the TDP will be updated. The M67 is an enabler for Soldier Lethality as it provides Soldiers with a highly effective capability that is easy to throw and can produce casualties to enemy combatants via a 15 meter fragmentation radius. This capability allows for increased lethality of dismounted Soldiers making the unit more efficient and lethal.			
FY 2022 Plans: FY 2022 funding will integrate the IM compliant fuze with the IM compliant fill and conduct engineering testing.			
FY 2023 Plans: FY 2023 will finalize the load, assemble, pack of qualification hardware in support of qualification testing for the M67 fragmentation grenade.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase is due to the load, assemble, pack of qualification hardware.			
Title: M330 Obscuration Grenade	0.726	1.292	0.857
Description: The M330 is an improved obscurant grenade that provides the warfighter with screening performance equivalent to the legacy AN-M8 smoke grenade. The M330 will replace the toxic carcinogen fill used in the AN-M8 smoke grenade with a more environmentally friendly formulation. The legacy AN-M8 has been restricted to use in contingency operations only due to its toxic			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
effects. The M83 training smoke grenade currently used in lieu of the AN-M8 in both training and tactical operations does not give the screening performance comparable to the legacy AN-M8. Soldiers must also use three M83 grenades to produce obscuration effects comparable to a single AN-M8 grenade. The M330 will not only reduce the Soldier?s combat load but will also provide sufficient tactical obscuration compared to the M83 thereby increasing Soldier mobility and survivability during operations under enemy fire. ***FY 2022 Plans:*** FY 2022 funding will complete the prototype design, develop the Technical Data Package (TDP), start initial Engineering Change Proposal (ECP) process, procure Design Verification Testing (DVT) components, and complete the Qualification Plan for product release ECP. ***FY 2023 Plans:*** FY 2023 funding supports the completion of the hardware build and material procurement for Design Verification Testing (DVT) and will complete the TDP. FY 2023 supports the final release of the ECP allowing the M330 to enter production. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decrease is due to the reduction of design and developmental efforts to support planned testing events.			
Title: M112 Demolition Block ? Alternate Fill ***Description:*** This effort will qualify an alternative explosive fill (PAX-52) for the M112 demolition block. The alternate fill provides a more reliable demolition for use in cold and extreme cold conditions. It also eliminates the need for Polyisobutylene (PIB) a current single point failure within the production of the M112 Demolition Block. ***FY 2022 Plans:*** FY 2022 will fund Modified Energy Output and Penetrometer Testing over temperature extremes and a pilot run of 2,000 pounds of PAX-52 to be lapped into 1,500 blocks to support Insensitive Munitions (IM) and Material Release (MR) testing. ***FY 2023 Plans:*** FY 2023 funding supports the execution of Design Verification Testing (DVT) and Insensitive Munitions (IM) tests. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decrease is due to materials needed for testing being procured in FY 2022.	0.456	0.400	0.250
Title: Airborne Expendable Countermeasure Modernization ***Description:*** Combine legacy countermeasures into single cartridge to optimize Size, Weight, and Power (SWAP) and increase number of countermeasure solutions.	-	-	0.100

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 Plans: FY 2023 will support modeling and simulation countermeasure improvements and produce initial prototypes for future testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase needed to begin the modernization of legacy countermeasure capabilities.			
Title: Volcano Countermeasure Testing ***Description:*** The Family of Scatterable Mines (FASCAM)/Volcano use electronic sensors to detect vehicles and engage them. New foreign and domestic electronic counter-measure systems have been developed which may breach a field at a much higher speed than legacy mechanical breachers. This testing will assess the speed and range of electronic breaching Volcano. The program will also characterize newer electronic munition sensors for their ability to resist these new defeat systems.	0.250	-	-
Title: M18 Smoke Grenade Dye ***Description:*** Smoke Grenade Dyes are a key component of the M18 Color Smoke Hand Grenades (Green, Yellow, Red, Violet) and are among items at risk for future production. The M18 Smoke Grenade is an enabler to Soldier Lethality as it provides the Warfighter with a multi-functional capability that provides both effective marking and screening allowing the Unit to be more efficient and effective in combat operations. The anthraquinone-based intermediates necessary for dye production are foreign-sourced (non- National Technology and Industrial Base (NTIB)) and there are no alternative dye formulations identified to date. This effort seeks to prove out a pilot-scale process to synthesize the necessary intermediates that could lead to a dye producer within the NTIB. This will increase availability dyes necessary for production thereby increasing readiness for the warfighter. ***FY 2022 Plans:*** FY 2022 funding will build and prove out the prototype pilot scale process. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The M18 Smoke Grenade Dye effort will be completed in FY 2022.	0.200	0.048	-
Title: M111 Offensive Hand Grenade - Alternative Explosive Fill ***Description:*** This effort will qualify an alternative explosive fill for the M111 Offensive Hand Grenade, which replaces the MK3A2 Offensive Hand Grenade due to asbestos concerns with the legacy grenade. The alternate fill will mitigate availability risk of the current M111 fill, PAX-3, which is a single point failure within the production of the M111 Offensive Hand Grenade. The M111 is an enabler for soldier lethality as it provides Soldiers a capability to produce blast overpressure effects against enemy troops in indoor areas, bunkers, trench lines and tunnels. This capability allows for increased lethality of dismounted Soldiers making the unit more efficient and lethal.	1.448	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: M82 Simulant Smoke Practice Grenade ***Description:*** This effort is to address performance issues with the current M82 design. The M82 Simulant Smoke Grenade is a 66mm grenade fielded to train in the handling, usage and deployment of the M76 infra-red, M81 graphite and brass flake and L8 Red Phosphorus grenades. This effort will modernize the M82 and will eliminate the end item reliability issues experienced by the legacy design. The improvement to the design will provide the soldier with a reliable training device thus increasing Soldier readiness. ***FY 2022 Plans:*** FY 2022 funding will complete the redesign of the M82 components, complete the TDP, and implement the ECP. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The M82 Simulant Smoke Practice Grenade effort will be completed in FY 2022.	0.445	0.282	-
Title: FY 2022 SBIR/STTR Transfer ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638	-	0.127	-
Accomplishments/Planned Programs Subtotals	6.518	3.468	2.807

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E33010: *GRENADE, HAND OFFENSIVE, M111*	5.694	6.218	9.593	-	9.593	20.764	11.475	0.674	0.674	0.000	55.092
• E32000: *GRENADE, Hand, Frag, Delay, M67*	3.536	3.358	5.005	-	5.005	12.219	2.804	8.571	8.566	0.000	44.059

Remarks

D. Acquisition Strategy

The strategy for the legacy M67 Fragmentation Hand Grenade is to replace the legacy M67 with a new IM compliant system which greatly increases the safety of the warfighter as it will make the M67 less susceptible to inadvertent detonation. This involves integrating an IM compliant fuze along with an IM compliant explosive fill into

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the M67 offensive hand grenade. The new design will be tested and qualified in order to mitigate the insensitive munition hazards associated with the explosive fill and the fuze technology. Follow-on procurement efforts will be competitive pending market research.

The strategy for the M330 is to qualify an alternative fill as the legacy AN-M8 grenade is restricted for use in contingency operations only due to its toxicity. Development of the M330 will ensure the Warfighter has tactical smoke obscuration that is environmentally friendly. Once the smoke fill is qualified, the plan is to conduct design verification tests, system qualification testing, implement final design into technical data package, and prepare for production.

The strategy for the M68 MICLIC Trainer Improvement effort is to identify or design a trainer concept, leverage modeling and simulation, and build prototypes to be used for qualification testing ahead of a production decision.

The strategy for Volcano characterization is to test the speed and range of current Volcano electronic sensors using government testing facilities to inform future countermeasure development.

The strategy for the M18 Smoke Grenade is to prove out a pilot-scale process to synthesize the necessary intermediates that could lead to a producer within the NTIB thus eliminating a foreign, single point source for smoke grenade production. The program will utilize an Other Transaction Authority (OTA) acquisition vehicle to demonstrate a novel, prototype method of colored smoke dye production.

The strategy for the M111 is to qualify an alternate explosive fill for the M111 Offensive Hand Grenade, which replaces the MK3A2 Offensive Hand Grenade. The alternate fill solution mitigates availability risk of PAX-3, which is a single point failure within the production of the M111 Offensive Hand Grenade. The alternate fill, once qualified, will be implemented into the Grenade Consolidation Contract via an Engineering Change Proposal (ECP).

The M82 program is modernizing the design of specific parts to address reliability issues and to make it more producible. The new design will be validated through testing. The Technical Data Package (TDP) will be updated to implement the changes. The program will utilize an Other Transaction Authority (OTA) contract to demonstrate the design improvements.

The strategy for the Airborne Expendable Countermeasure Modernization is to use Other Transaction Authority (OTA) to produce test samples for flight testing and verification testing.

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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.127		-		-		-	0.000	0.127	Continuing
		Subtotal	-	-		0.127		-		-		-	0.000	0.127	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M67 Fragmentation Fuze Prototype	C/CPIF	IMI Systems : Israel	-	0.194	Jun 2021	-		0.650	Dec 2022	-		0.650	0.000	0.844	-
M67 Load Assemble and Pack (LAP)	C/FFP	Battelle Memorial Institute : Columbus, OH	-	0.242	Mar 2022	-		0.315	Jan 2023	-		0.315	0.000	0.557	-
M330 Enhanced Obscuration Grenade	MIPR	Pine Bluff Arsenal : White Hall, AR	0.190	-		0.233	Apr 2022	0.400	Jul 2023	-		0.400	0.000	0.823	-
M112 Demolition Block - Alternate Fill Effort Materials	C/FFP	TBD : TBD	-	-		0.250	Jun 2022	0.035	Oct 2022	-		0.035	0.000	0.285	-
M67 (G881) Fragmentation Hand Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.401	Apr 2021	-		-		-		-	0.000	0.401	-
M67 TDP Review & Testing Packaging Materials	MIPR	SAVIT Corporation : Rockaway, NJ	-	0.051	Feb 2021	-		-		-		-	0.000	0.051	-
M18 Smoke Grenade	C/FFP	Leidos Inc : Reston, VA	-	0.170	Apr 2021	0.021	May 2022	-		-		-	0.000	0.191	-
M111, Offensive Hand Grenade	C/FFP	Battelle Memorial Institute : Columbus, OH	1.135	0.147	Feb 2021	-		-		-		-	0.000	1.282	-
M112 Demolition Block - Alternate Fill Effort Materials	C/IDIQ	Joint Munitions Command : ROCK ISLAND,IL	-	0.056	Oct 2021	-		-		-		-	0.000	0.056	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M67 Fragmentation Grenade	C/FFP	Battelle Memorial Institute : Columbus, OH	0.347	-		-		-		-		-	0.000	0.347	-
M330 Enhanced Obscuration Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.265	-		-		-		-		-	0.000	0.265	-
M82 Simulant Smoke Practice Grenade	MIPR	Pine Bluff Arsenal : White Hall, AR	0.316	-		-		-		-		-	0.000	0.316	-
		Subtotal	2.253	1.261		0.504		1.400		-		1.400	0.000	5.418	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M67 (G881) Fragmentation Hand Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.725	Feb 2021	0.601	Apr 2022	0.635	Oct 2022	-		0.635	Continuing	Continuing	-
M330 Enhanced Obscuration Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.394	0.615	Nov 2020	0.720	Apr 2022	0.348	Nov 2022	-		0.348	Continuing	Continuing	-
M330 Enhanced Obscuration Grenade	MIPR	DEVCOM Chemical Biological Center : Edgewood, MD	1.371	0.045	Feb 2022	0.339	Apr 2022	0.109	Jan 2023	-		0.109	0.850	2.714	-
Countermeasure Modernization	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.050	Oct 2022	-		0.050	0.000	0.050	-
M111, Offensive Hand Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	3.638	0.553	Mar 2021	-		-		-		-	0.182	4.373	-
M82 Simulant Smoke Practice Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal. NJ	0.265	0.245	Mar 2021	0.142	Apr 2022	-		-		-	0.000	0.652	-

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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M18 Smoke Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal. NJ	-	0.030	Mar 2021	0.027	Apr 2022	-		-		-	0.000	0.057	-
M112 Demolition Block - Alternate Fill	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.400	Nov 2021	-		-		-		-	0.000	0.400	-
M67 (G881) Fragmentation Hand Grenade Support Contractor	C/FFP	BAH : Aberdeen Proving Grounds, MD	-	0.241	Jun 2021	-		-		-		-	0.000	0.241	-
M67 Fragmentation Hand Grenade Shipping	Allot	Shipping : Picatinny Arsenal, NJ	-	0.003	Nov 2021	-		-		-		-	0.000	0.003	-
M111, Offensive Hand Grenade	MIPR	Letterkenny Army Depot : Chambersburg, PA	0.039	-		-		-		-		-	0.000	0.039	-
M111, Offensive Hand Grenade Demil	MIPR	Tooele Army Depot : Tooele, UT	0.070	-		-		-		-		-	0.000	0.070	-
M111, Offensive Hand Grenade Shipping	Allot	Shipping : Picatinny Arsenal, NJ	0.009	-		-		-		-		-	0.000	0.009	-
M82 Simulant Smoke Practice Grenade	MIPR	DEVCOM Chemical Biological Center : Edgewood, MD	0.095	-		-		-		-		-	0.000	0.095	-
		Subtotal	5.881	2.857		1.829		1.142		-		1.142	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Countermeasure Modernization M&S	MIPR	TBD : TBD	-	-		-		0.050	Feb 2023	-		0.050	0.000	0.050	-
M112 Demolition Block - Alternate Fill Design Insensitive Munitions Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.125	Nov 2022	-		0.125	0.000	0.125	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M112 Demolition Block - Alternate Fill Design Verification Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.090	Oct 2022	-		0.090	0.000	0.090	-
Volcano Countermeasure Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.250	Dec 2020	-		-		-		-	0.000	0.250	-
M67 Arena & E3 Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.256	Jan 2022	-		-		-		-	0.000	0.256	-
M67 Engineering Testing	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	-	0.503	Oct 2021	0.718	Apr 2022	-		-		-	0.000	1.221	-
M67 E3 Testing	MIPR	Redstone Test Center : Redstone Arsenal, AL	-	0.185	Jan 2022	-		-		-		-	0.000	0.185	-
M67 Grenade IM Testing	C/FFP	NTS : Camden, AR	-	0.192	Mar 2022	-		-		-		-	0.000	0.192	-
M111, Offensive Hand Grenade	MIPR	Yuma Test Center : Yuma Proving Grounds, AZ	-	0.230	Sep 2021	-		-		-		-	0.000	0.230	-
M111, Offensive Hand Grenade	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, NJ	0.351	0.518	Jul 2021	-		-		-		-	0.000	0.869	-
M82 Simulant Smoke Practice Grenade	MIPR	Pine Bluff Arsenal : White Hall, AR	0.495	0.200	Aug 2021	0.140	Mar 2022	-		-		-	0.000	0.835	-
M330 Enhanced Obscuration Grenade demonstration testing	MIPR	Pine Bluff Arsenal : White Hall, AR	-	0.066	Sep 2021	-		-		-		-	0.000	0.066	-
M111, Offensive Hand Grenade	MIPR	Redstone Test Center : Redstone Arsenal, AL	0.037	-		-		-		-		-	0.000	0.037	-
M112 Demolition Block - Alternate Fill Penetrometer	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		0.150	Apr 2022	-		-		-	0.000	0.150	-

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
& Modified Energy Output Testing															
		Subtotal	0.883	2.400		1.008		0.265		-		0.265	0.000	4.556	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.017	6.518		3.468		2.807		-		2.807	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
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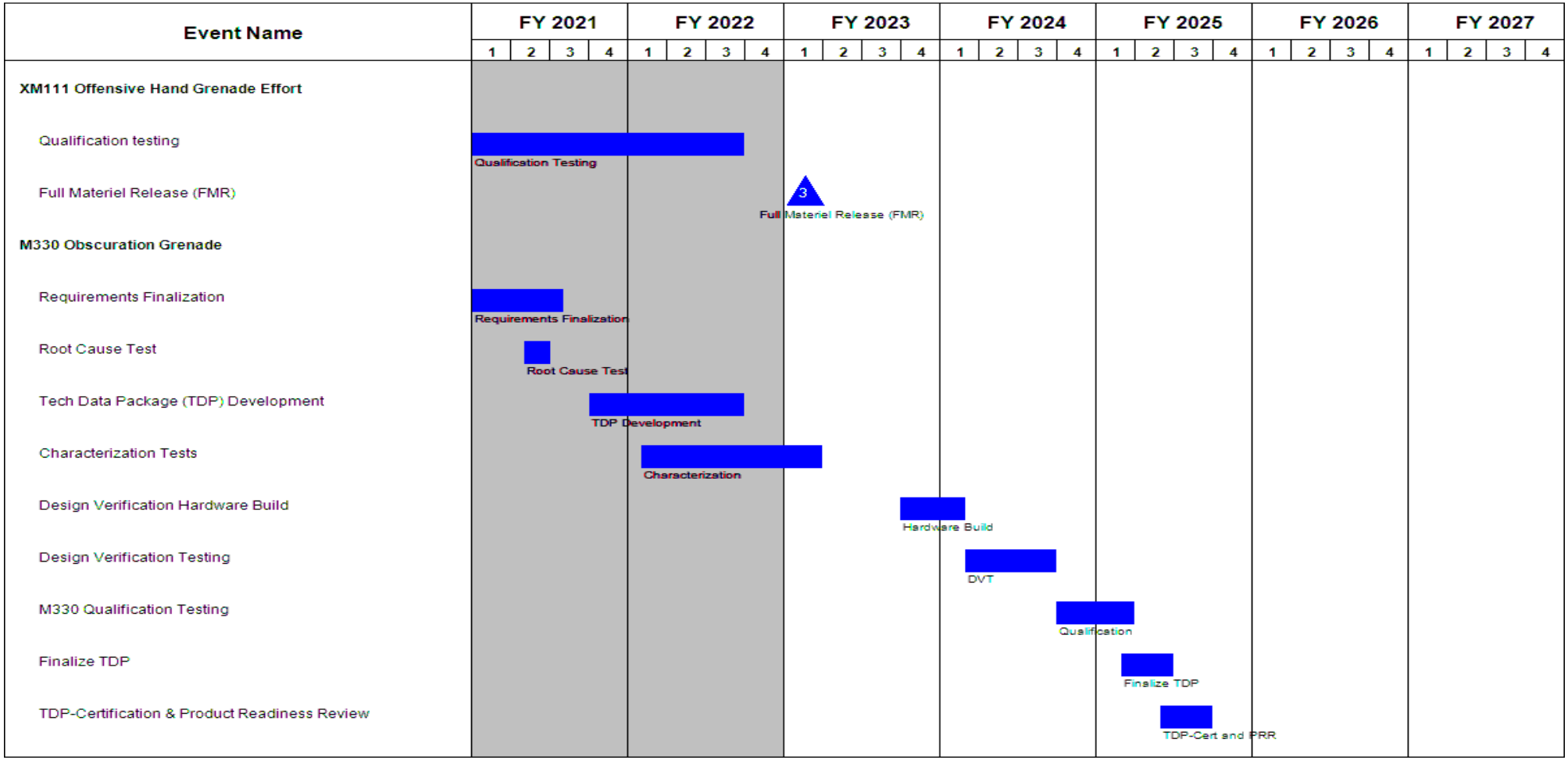

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
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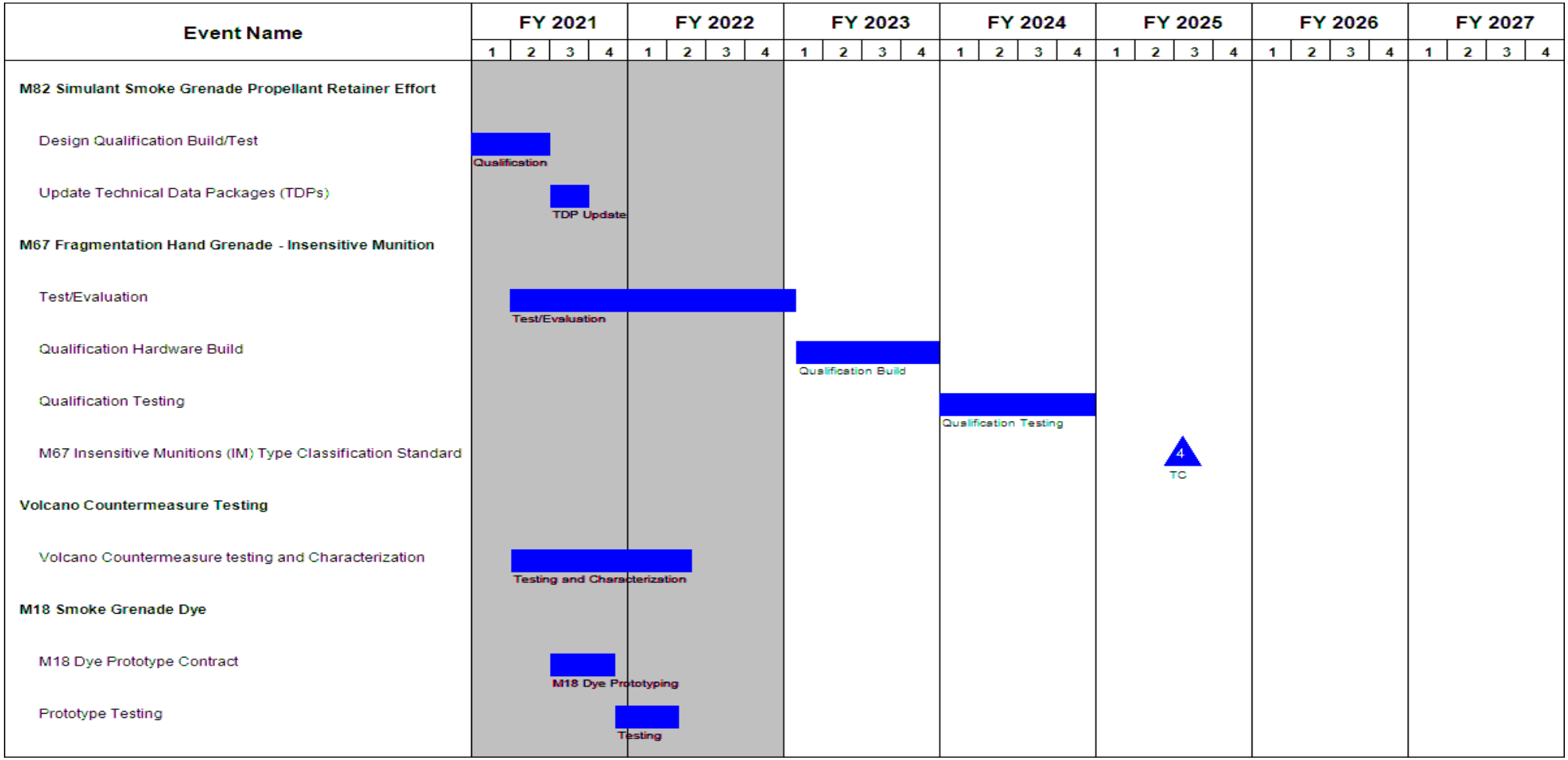

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
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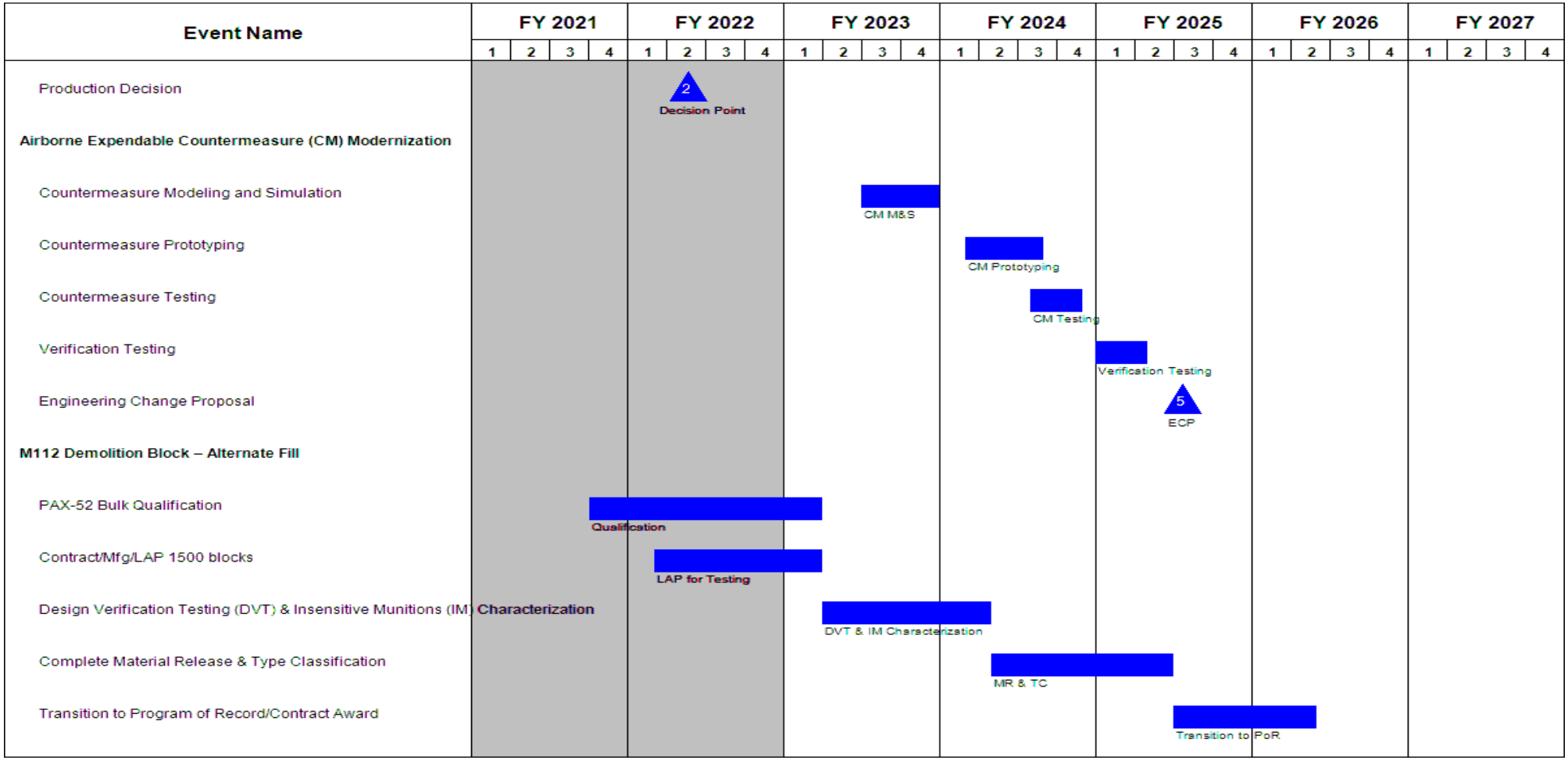

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
XM111 Offensive Hand Grenade Effort	1	2017	4	2023
Testing Insensitive Munitions (IM), E3	3	2018	1	2019
Limited User Assessment (LUA)	4	2018	1	2019
Type Classification (TC) Documentation	2	2018	3	2019
Type Classification	4	2019	4	2019
Prototype Development Contract Award	1	2020	1	2020
Prototype build for qualification testing	1	2020	4	2020
Qualification testing	1	2021	3	2022
Full Materiel Release (FMR)	1	2023	1	2023
M330 Obscuration Grenade	1	2017	4	2025
Hexachloroethane Titanium Oxide (HX) Toxicity Study	1	2017	1	2019
AN-M8A1 Ecological Study	4	2018	1	2019
Starter Cup Development	2	2018	3	2019
Technical Data Package (TDP) Scrub	1	2019	1	2019
Fuze Assessment	2	2019	3	2019
Trade Analysis & Requirements. Validation	2	2019	4	2019
Grenade Producibility Study	2	2019	1	2020
Requirements Finalization	1	2021	3	2021
Root Cause Test	2	2021	2	2021
Tech Data Package (TDP) Development	4	2021	3	2022
Characterization Tests	1	2022	1	2023
Design Verification Hardware Build	4	2023	1	2024

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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Design Verification Testing	1	2024	3	2024
M330 Qualification Testing	4	2024	1	2025
Finalize TDP	1	2025	2	2025
TDP-Certification & Product Readiness Review	2	2025	3	2025
M82 Simulant Smoke Grenade Propellant Retainer Effort	1	2017	3	2021
Propellant Retainer Development	1	2019	2	2019
Prototype Mold and Parts	2	2019	2	2020
Design Qualification Build/Test	4	2020	2	2021
Update Technical Data Packages (TDPs)	3	2021	3	2021
M67 Fragmentation Hand Grenade - Insensitive Munition	1	2021	4	2027
Test/Evaluation	1	2021	1	2023
Qualification Hardware Build	1	2023	4	2023
Qualification Testing	1	2024	4	2024
M67 Insensitive Munitions (IM) Type Classification Standard	3	2025	3	2025
Volcano Countermeasure Testing	1	2022	1	2022
Volcano Countermeasure testing and Characterization	2	2021	2	2022
M18 Smoke Grenade Dye	1	2021	1	2023
M18 Dye Prototype Contract	3	2021	4	2021
Prototype Testing	4	2021	2	2022
Production Decision	2	2022	2	2022
Airborne Expendable Countermeasure (CM) Modernization	1	2023	1	2028
Countermeasure Modeling and Simulation	3	2023	4	2023
Countermeasure Prototyping	1	2024	3	2024
Countermeasure Testing	3	2024	4	2024
Verification Testing	1	2025	2	2025

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Engineering Change Proposal	3	2025	3	2025
M112 Demolition Block ? Alternate Fill	4	2021	3	2025
PAX-52 Bulk Qualification	4	2021	1	2023
Contract/Mfg/LAP 1500 blocks	1	2022	1	2023
Design Verification Testing (DVT) & Insensitive Munitions (IM) Characterization	2	2023	2	2024
Complete Material Release & Type Classification	2	2024	2	2025
Transition to Program of Record/Contract Award	3	2025	2	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ER5: *Indirect Fire and Fuze Technology*	-	4.712	4.463	2.454	-	2.454	2.215	2.288	2.288	2.311	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Indirect Fire and Fuze Technology Project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Initiatives include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products. Fiscal Year (FY) 2023 funding will support Fuze Technology Integration (FTI) efforts to complete conventional artillery fuze evaluations for compatibility with Long Range Precision Fire (LRPF) projectiles; expand and refine the fuze critical components database to identify and mitigate obsolescence as well as single point components and processes; develop and evaluate M734A1 mortar fuze custom application specific integrated circuit (ASIC) signal processor and accelerometer; complete implementing the M739A1/M782 artillery fuze setback mass drop safety improvement; continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; continue maturing extended duration artillery fuze power sources; support M783 mortar fuze evaluation, design improvement and testing to preclude early fuze functioning; evaluate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Fuze Technology Integration (FTI)	2.263	2.321	2.454
Description: This project implements new and mature technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The FTI project addresses two major areas: (1) analysis/risk mitigation and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs by providing competition and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect, identify, and correct latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes, increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues and add capabilities.			
FY 2022 Plans: Analysis/Risk Mitigation: Will conduct engineering tests on the next generation micro-controller to modernize and replace a one-time programmable component for mortar proximity fuzes; will conduct analysis and laboratory evaluations on mortar training			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
fuzes for increased safety and improved performance; will conduct analysis on conventional artillery fuzes for compatibility with Long Range Precision Fires (LRPF) munitions and requirements; will conduct analysis on alternative suppliers for critical fuzing components. Block Upgrades: Will conduct engineering tests of enhanced fuze delay mode designs on the M739A1 Point Detonation (PD) fuze for increased safety and improved performance; will conduct laboratory evaluations on the hand grenade fuzes to reduce the number of critical defects that will improve producibility and increase safety; investigate proximity fuze alternative transceivers for proximity mortar fuzes to increase capability, performance, and survivability; hand grenade safety improvements integrating electronic and energetic technologies that will also improve insensitive munition capability; integrate extended range precision artillery fuzing power sources prototypes to support extended flight durations. ***FY 2023 Plans:*** Analysis/Risk Mitigation: Complete conventional artillery fuze evaluations for compatibility with LRPF projectiles; expand and refine the fuze critical components database to identify and mitigate obsolescence and single point components & processes; and develop and evaluate M734A1 mortar fuze custom application specific integrated circuit (ASIC) signal processor and accelerometer. Block Upgrade: Complete implementing the M739A1/M782 artillery fuze setback mass drop safety improvement; continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; continue maturing extended duration artillery fuze power sources; support M783 mortar fuze evaluation, design improvement and testing to preclude early fuze functioning; and evaluate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding in FY 2023 due to additional FTI efforts that have been identified for execution.			
Title: Ammunition Range and Reliability Improvements ***Description:*** This Project explores possibilities of increasing range, enhancing reliability, and increasing performance of Artillery and Mortar ammunition. This effort supports analysis efforts to identify improvement areas to key parameters. ***FY 2022 Plans:*** FY 2022 funding supports the continued studies and analysis (Key Parameter Development and Management (KPDM) and Model Based Systems Engineering (MBSE)). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding in FY 2023 due to completion of Ammunition Range and Reliability Improvements activities.	2.373	1.979	-
Title: Mortar Smoke Development	0.076	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: This Project supports the incorporation of the new Hexachloroethane Zinc Oxide (HC) smoke fill formulation while utilizing the existing illumination shell body configuration to support mortar smoke training for US Army Europe (USAREUR). The HC smoke fill formulation is less toxic and less incendiary than the current Mortar Red Phosphorus (RP) or White Phosphorous (WP) Smoke rounds and will reduce risk of unintended collateral damage or environmentally hazardous waste. USAREUR has yearly requirements for procurement of smoke mortar cartridges across all calibers to be used for training, but is prohibited from training with the current WP or RP smoke munitions in Europe due to environmental restrictions.			
Title: FY 2022 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.163	-
Accomplishments/Planned Programs Subtotals	4.712	4.463	2.454

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Fuze Technology Integration (FTI) will improve current production munitions by exploiting available fuzing technologies and integrating them into current fielded and/or production fuzes, providing safer, more producible, and more lethal fuzing solutions. FTI develops second source suppliers and resolves component obsolescence issues to mitigate risk and prevent production interruptions in order to continue to provide safer, more reliable munitions for the Warfighter with significant risk reduction to production fuzes also benefiting the U.S. Taxpayer. The effort is a continuation of studies, analysis, evaluations, and insertion of fuzing technologies and safe and arm devices in production and fielded fuzes. This program will implement these technologies into fuzing systems to preclude component obsolescence, maximize standardization, enhance performance, and improve the safety, reliability, and exportability of existing munitions. FTI utilizes both the competitively awarded DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) to produce prototypes of the fuze technologies and devices, and Federal Acquisition Regulation (FAR) based contracts to implement proven efforts into production fuzes.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.163		-		-		-	0.000	0.163	-
		Subtotal	-	-		0.163		-		-		-	0.000	0.163	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Technology Integration Development	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	5.227	1.119	Oct 2020	1.350	Nov 2021	1.486	Nov 2022	-		1.486	0.000	9.182	-
Ammunition Range and Lethality Improvements	MIPR	TBD : TBD	-	0.316	Mar 2021	1.655	Dec 2021	-		-		-	0.000	1.971	-
Mortar Smoke Development	MIPR	Government Owned Government Operated (GOGO) Facilities : Various	0.704	-		-		-		-		-	0.000	0.704	-
		Subtotal	5.931	1.435		3.005		1.486		-		1.486	0.000	11.857	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Technology Integration Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	4.127	1.099	Oct 2020	0.921	Nov 2021	0.918	Nov 2022	-		0.918	0.000	7.065	-
Ammunition Range and Lethality Improvements	MIPR	Combat Capabilities Development Command	0.300	2.102	Mar 2021	0.324	Dec 2021	-		-		-	0.000	2.726	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ													
Mortar Smoke Development Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	1.119	0.076	Nov 2020	-		-		-		-	0.000	1.195	-
Mortar Smoke Development Engineering Support	MIPR	Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC) : Army Research Laboratory, MD	0.382	-		-		-		-		-	0.000	0.382	-
		Subtotal	5.928	3.277		1.245		0.918		-		0.918	0.000	11.368	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Technology Integration Ballistic Testing	MIPR	Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ	0.100	-		0.050	Mar 2022	0.050	May 2023	-		0.050	0.000	0.200	-
Mortar Smoke Testing	MIPR	Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ	0.280	-		-		-		-		-	0.000	0.280	-
		Subtotal	0.380	-		0.050		0.050		-		0.050	0.000	0.480	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.239	4.712		4.463		2.454		-		2.454	0.000	23.868	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

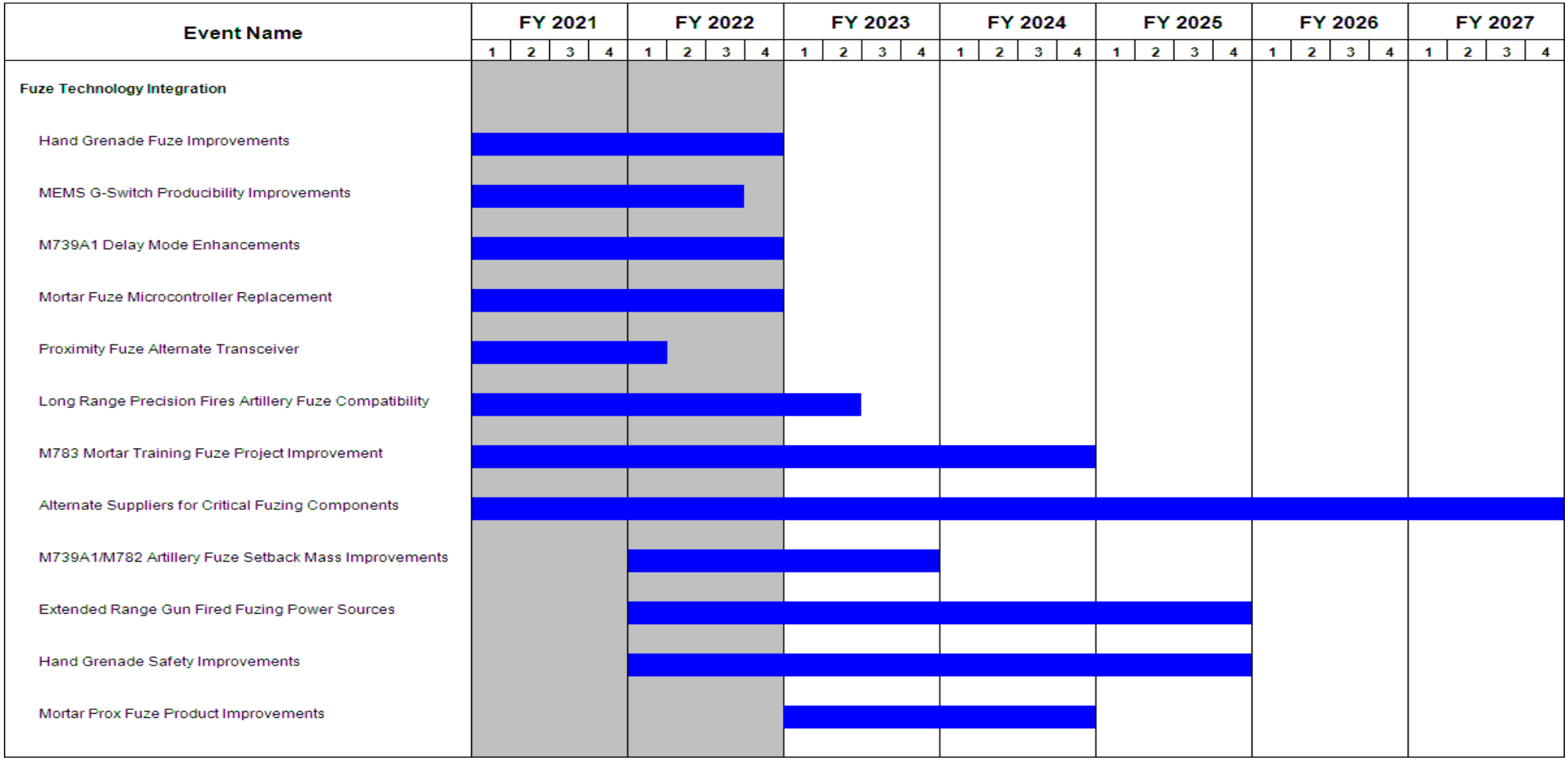

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

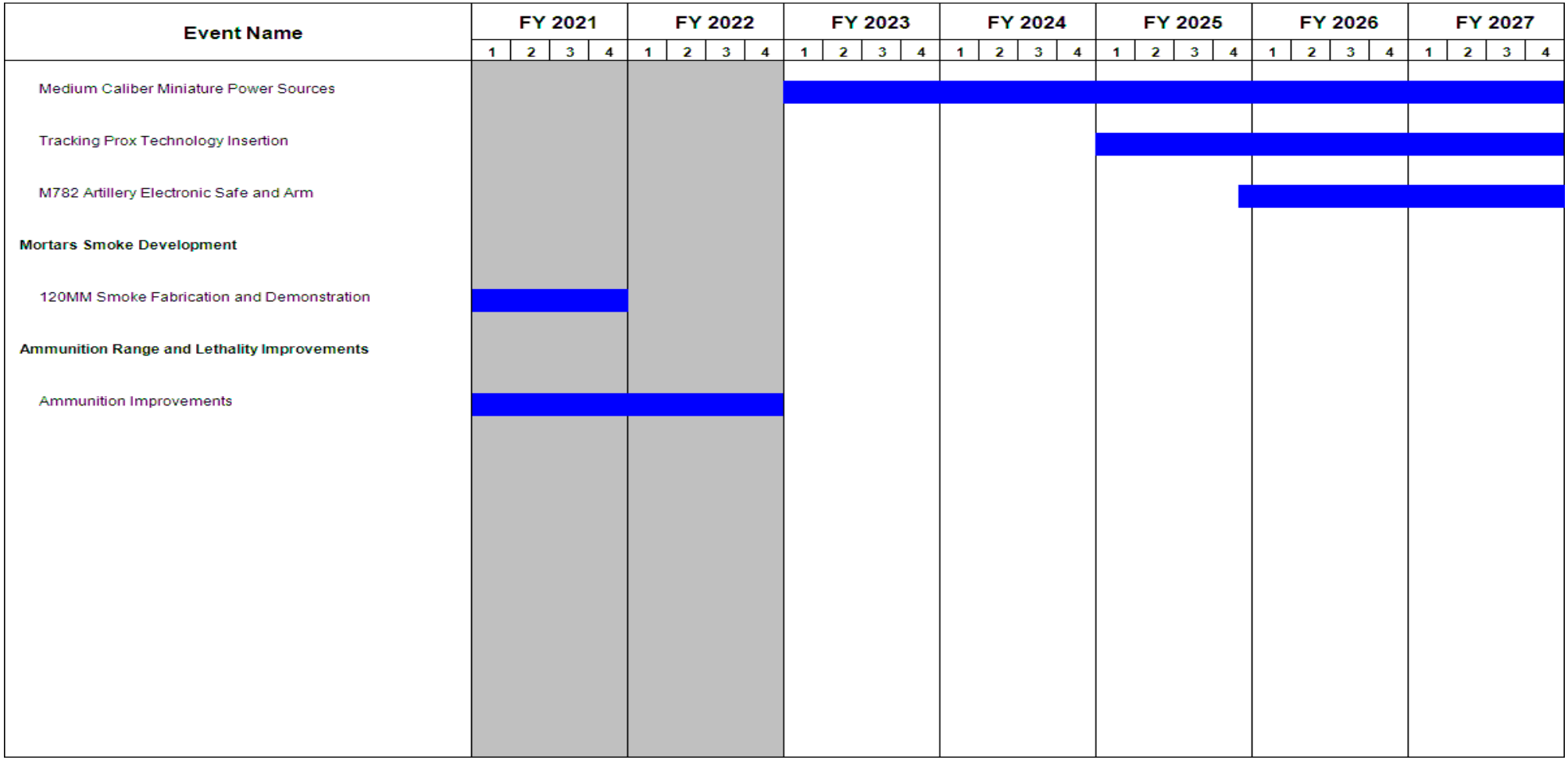

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Fuze Technology Integration	1	2016	4	2027
Hand Grenade Fuze Improvements	1	2020	4	2022
MEMS G-Switch Producibility Improvements	1	2018	3	2022
M739A1 Delay Mode Enhancements	1	2019	4	2022
Mortar Fuze Microcontroller Replacement	1	2020	4	2022
Proximity Fuze Alternate Transceiver	1	2021	1	2022
Long Range Precision Fires Artillery Fuze Compatibility	1	2021	2	2023
M783 Mortar Training Fuze Project Improvement	1	2021	4	2024
Alternate Suppliers for Critical Fuzing Components	1	2021	4	2027
M739A1/M782 Artillery Fuze Setback Mass Improvements	1	2022	4	2023
Extended Range Gun Fired Fuzing Power Sources	1	2022	4	2025
Hand Grenade Safety Improvements	1	2022	4	2025
Mortar Prox Fuze Product Improvements	1	2023	4	2024
Medium Caliber Miniature Power Sources	1	2023	4	2027
Tracking Prox Technology Insertion	1	2025	4	2027
M782 Artillery Electronic Safe and Arm	4	2025	4	2028
Mortars Smoke Development	1	2020	4	2021
120MM Smoke Fabrication and Demonstration	1	2019	4	2021
Ammunition Range and Lethality Improvements	1	2020	4	2022
Ammunition Improvements	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ER6: *Direct Fire Technology*	-	13.436	19.687	6.413	-	6.413	2.053	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, medium caliber ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. Fiscal Year (FY) 2023 funding supports a number of small caliber ammunition projects including improvements to training ammunition; improvements to make small caliber primers more environmentally friendly; optimization of handgun ammunition; exploring precision sniper improvements and continuing the effort to reduce Soldier load by developing lightweight ammunition. Improvements to medium caliber ammunition include lethality and safety enhancements on 40mm ammunition. Improvements to 105mm and 120mm tank ammunition include examination and implementation of performance enhancement and improvements to tracer, combustible cartridge case and 105mm Advanced Multipurpose (AMP).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Small Caliber Ammunition Product Improvements	10.558	4.407	5.413
Description: Develop, demonstrate, and qualify improvements for 5.56mm, 7.62mm, .50 cal, Next Generation Squad Weapon ammunition, Precision Sniper ammunition and Handgun ammunition to achieve an increase in overall lethality and effectiveness.			
FY 2022 Plans: FY 2022 supports Phase II development efforts for the lightweight case .50 Caliber ammunition variant, award Phase II down-select contract, prepare fielding documents, conduct a Critical Design Review (CDR). FY 2022 supports Phase III down-select to one concept for lightweight case 7.62mm ammunition variant and also conducting aging studies, obtaining safety release confirmation, conducting limited user evaluation, verification testing and preparing documents for engineering change proposal (ECP) in FY 2023. FY 2022 supports purchasing prototype equipment for the green primer pilot-line and pre-production qualification testing (PPQT) for 7.62mm green primer. FY 2022 supports improved dispersion and lethality for precision sniper ammunition particularly M1158. FY 2022 supports optimization and qualification testing to field handgun improvements such as Enhanced Ball Round (EBR) and Breeching capability.			
FY 2023 Plans: FY 2023 request will support development efforts for lightweight case .50 Caliber variant, material assessment, finalize design, and procure qualification sample, conduct qualification test. FY 2023 request will support an interim metallic solution development effort while developing the polymer case solution for lightweight case 7.62mm ammunition variant. FY 2023 will down-select to a single metallic solution, test polymer data, perform polymer aging study and material analysis, and conduct Lake City Army Ammunition Plant (LCAAP) Impact Study.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 request will support completing pre-production qualification testing (PPQT) for 7.62mm green primer, completing Energetic Qualification (EMQB) and initiate prototype machine design. FY 2023 request will support improved dispersion and lethality for precision sniper ammunition particularly M1158. FY 2023 request will support testing to field handgun improvements such as Enhanced Ball Round (EBR) and Breeching capability. FY 2023 request will support PPQT safety release, limited user evaluation, critical design review of 7.62mm M118LRA1 which improves sniper lethality. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increase due to new focus on both metallic and polymer case as viable lightweight case solutions.			
Title: Medium Caliber Ammunition Product Improvements ***Description:*** Develop, demonstrate, and qualify improvements for 20mm, 25mm, 30mm, and 40mm ammunition. 40mm M433E1 will improve lethality (fragmentation) of the M433 grenade. The 40mm M550 fuze replacement will replace the single stage fuze with a dual spinlock fuze to improve safety and performance reliability. Improve safety, performance and reliability issues on the 20mm M940 ammunition. ***FY 2022 Plans:*** FY 2022 supports finalizing type classification, full materiel release, and the technical data package for M433E1 and M550 fuze improvement. FY 2022 the Government is investigating 20mm ammunition safety, performance and reliability issues to achieve an increase in overall lethality and effectiveness including analysis of the self-destruct feature. Testing on the 20mm M940 conversion from metal to plastic rotating band technology to reduce barrel wear on the M61 gun. ***FY 2023 Plans:*** FY 2023 funding supports continuing various 20mm, 30mm, 40mm ammunition improvement efforts, such as investigating safety, performance, reliability issues, and reducing barrel wear. Type Classify M433E1 and M550 fuze improvement. Develop and demonstrate methods for increasing range, increasing system effectiveness through velocity correction, and improving point detonation sensitivity of the XM1166 cartridge. Develop, demonstrate and qualify an improved 40mm Smoke munition, including assessing current formulations compliance with environmental regulations and evaluating producibility of 40mm smoke munitions. Assess the potential to include a capability to obscure heat and Infra-Red (IR) signatures. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decrease due to M433E1 type classification in early FY 2023.	1.495	1.033	0.500
Title: Tank Ammunition Product Improvements ***Description:*** Develop and test potential improvements to 105mm and 120mm gun system ammunition.	1.383	1.003	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: FY 2022 funding supports continuing various 105mm and 120mm tank ammunition improvement efforts, including tracer improvements, combustible cartridge case design and fabrication improvements, and continuing efforts to assess the 105mm Advanced Multipurpose (AMP) cartridge/solution. Evaluate 105mm candidate cartridges, perform warhead lethality studies, modeling and simulation, conduct fuze assessment studies, perform propulsion system evaluation, assess fabrication improvements, and perform integration and testing of tank cartridges. ***FY 2023 Plans:*** FY 2023 funding supports continuing various 105mm and 120mm tank ammunition improvement efforts, including tracer improvements, combustible cartridge case design and fabrication improvements, and continuing efforts to assess the 105mm Advanced Multipurpose (AMP) and 120mm AMP training cartridge/solution. Evaluate 105mm candidate cartridges, perform warhead lethality studies, modeling and simulation, conduct fuze assessment studies, perform propulsion system evaluation, assess fabrication improvements, and perform integration and testing of tank cartridges. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decrease due to 105mm foreign comparative testing will be complete.			
Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR) ***Description:*** Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR) ***FY 2022 Plans:*** FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.	-	0.244	-
Accomplishments/Planned Programs Subtotals	13.436	6.687	6.413

	FY 2021	FY 2022
Congressional Add: Tungsten Manufacturing Affordability Initiative for Armaments	-	8.000
FY 2022 Plans: Improve capacity for novel swaging/finishing for long rod penetrators. Scale up production capacity to support emerging fragmentation requirements. Provide a higher level of consistency in material properties, improve capacity for production and surge requirements, and reduce cost. Establish new		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

	FY 2021	FY 2022
manufacturing source for industry to produce components for military applications. Perform assessment of deliverables and manufacturing readiness assessments.		
Congressional Add: Printed Electronics (PEEMS)	-	5.000
FY 2022 Plans: Meet US Army?s Priority to ensure the total Army is ready to deploy fight and win across Multi-Domain Operations. Utilize 10 USC 2368 authority to enhance Army?s PEEM Innovation Center of Excellence to design, develop, and integrate Printed Electronics for Producibility that employs the use of cost effective prototyping and fabrication techniques for the manufacture of flexible circuits, power sources, sensors, energy harvesting systems, antennas, MEMS and electronic components to increase force effectiveness and reduce operations and support costs. Partnering with New Jersey Based 501C3, and additional small business to expand opportunities to support DOD objectives. Share and leverage best practices with existing and new strategic thrusts; Agile Innovation Management (AIM), Printed Electronics (PEEMS), and Transformative Manufacturing. Enhance PEEMS.		
Congressional Adds Subtotals	-	13.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for small, medium and large caliber product improvements is that all contracts will be full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.244		-		-		-	0.000	0.244	-
		Subtotal	-	-		0.244		-		-		-	0.000	0.244	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Lightweight Case Ammunition - Polymer	C/FFP	TBD : TBD	-	3.000	Mar 2022	-		1.500	Mar 2023	-		1.500	Continuing	Continuing	Continuing
Lightweight Case Ammunition - Polymer	C/FP	Frontier Performance Polymers Corp : Dover, New Jersey	-	0.857	Nov 2021	-		-		-		-	0.000	0.857	-
Lightweight Case Ammunition	C/FFP	TBD : TBD	-	-		1.580	Jun 2022	-		-		-	0.000	1.580	-
Green Primer - Contract 1	C/FFP	Innovative Materials & Processes (IMP), LLC : Rapid City, South Dakota	0.117	0.119	Jul 2021	-		-		-		-	0.000	0.236	-
Green Primer - Contract 2	C/FFP	TBD : TBD	-	-		-		1.500	Mar 2023	-		1.500	0.000	1.500	-
M118LRA1 - Contract 1	C/FFP	Vista : Anoka, Minnesota	0.548	0.182	Feb 2021	0.565	Oct 2021	-		-		-	0.000	1.295	-
M118LRA1 - Contract 2	C/FFP	TBD : TBD	-	-		-		0.300	Mar 2023	-		0.300	Continuing	Continuing	Continuing
Tank Ammunition Foam Celluloid Contract	C/FFP	Polymer Processing Institute : Newark, New Jersey	0.391	0.203	Mar 2021	-		-		-		-	0.000	0.594	-
Tank Ammunition 105mm HE - Contract	Option/ FFP	IMI Systems, LTD : Ramat Hasharon, Israel	-	0.275	Apr 2021	-		-		-		-	0.000	0.275	-
M433E1 Cartridge Case Redesign Contract	Option/ IDIQ	AMTEC Corporation : Janesville, WI	-	0.307	Sep 2021	-		-		-		-	0.000	0.307	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tungsten Manufacturing - Contract	C/FFP	TBD : TBD	-	-		7.200	Aug 2022	-		-		-	0.000	7.200	-
Printed Electronics PEEMS - Contract	C/FFP	TBD : TBD	-	-		4.520	Aug 2022	-		-		-	0.000	4.520	-
		Subtotal	1.056	4.943		13.865		3.300		-		3.300	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support - Small, Medium & Large Caliber	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, New Jersey	7.506	4.647	Nov 2020	2.900	Nov 2021	1.825	Nov 2022	-		1.825	Continuing	Continuing	Continuing
Navy Engineering support LSCA	MIPR	NSWC INDIAN HEAD EOD TECH DIV : Picatinny Arsenal, New Jersey	-	0.853	Dec 2021	-		-		-		-	0.000	0.853	-
Engineering Support - Tungsten Manufacturing	MIPR	DEVCOM Armaments Center : Picatinny, NJ	-	-		0.800	Jun 2022	-		-		-	0.000	0.800	-
Engineering Support - Printed Electronics PEEMS	MIPR	DEVCOM Armaments Center : Picatinny, NJ	-	-		0.480	Jun 2022	-		-		-	0.000	0.480	-
		Subtotal	7.506	5.500		4.180		1.825		-		1.825	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARL Test Support Small Medium & Large Caliber	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	2.405	0.920	Dec 2020	1.298	Feb 2022	0.600	Jan 2023	-		0.600	Continuing	Continuing	Continuing
ATC Test Support Small Medium & Large Caliber	MIPR	Aberdeen Test Center (ATC) : Aberdeen, Maryland	2.000	1.998	Jan 2021	0.100	Jun 2022	0.688	Jan 2023	-		0.688	Continuing	Continuing	Continuing
Ballistic Support Office (BSO at LCAAP)	MIPR	Joint Munitions Command (JMC) : Independence, Missouri	0.125	0.075	Jan 2021	-		-		-		-	0.000	0.200	-
		Subtotal	4.530	2.993		1.398		1.288		-		1.288	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.092	13.436		19.687		6.413		-		6.413	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

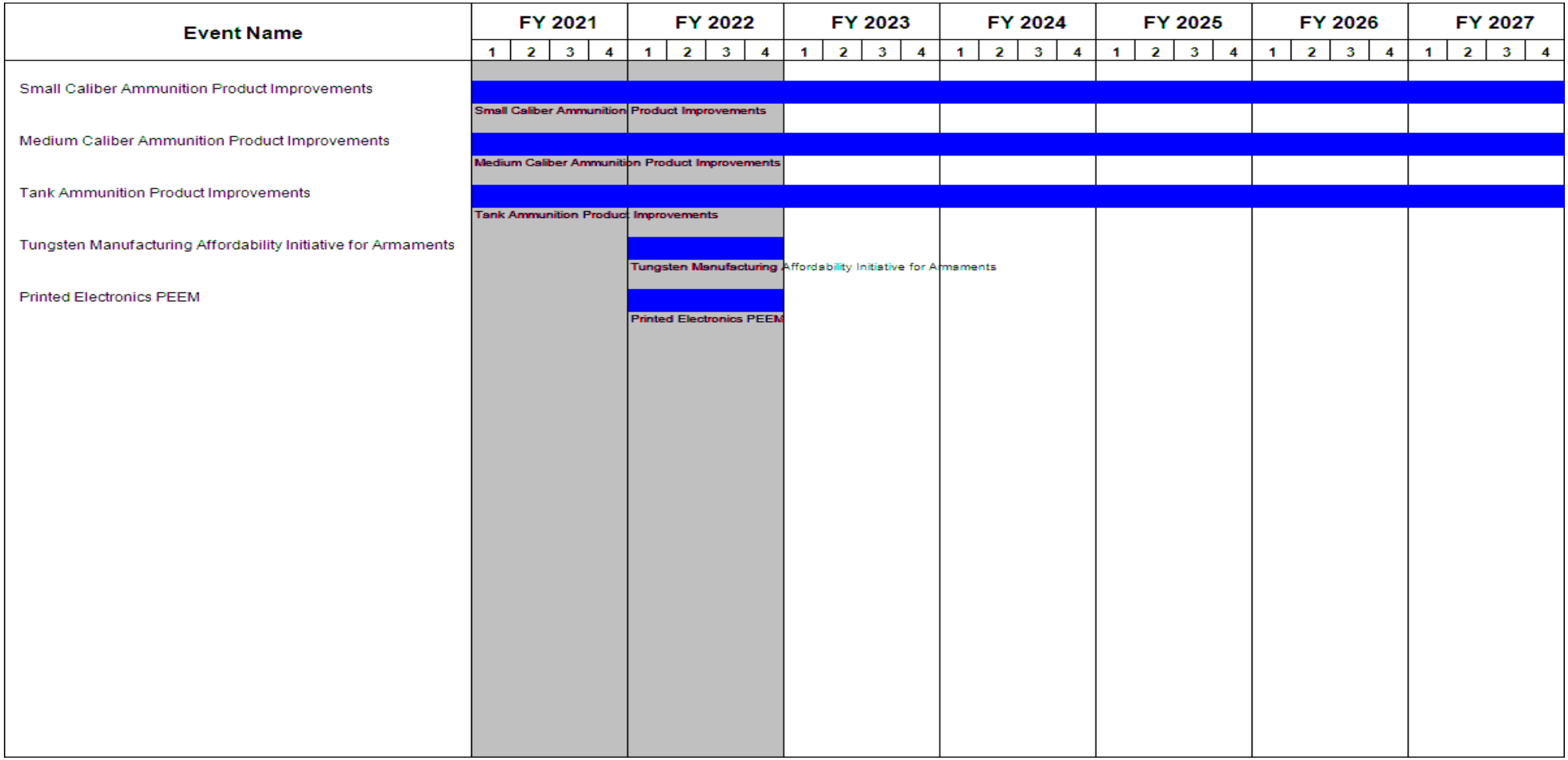

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Small Caliber Ammunition Product Improvements	1	2018	4	2033
Medium Caliber Ammunition Product Improvements	1	2018	4	2033
Tank Ammunition Product Improvements	1	2018	4	2033
Tungsten Manufacturing Affordability Initiative for Armaments	1	2022	4	2022
Printed Electronics PEEM	1	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607134A *I Long Range Precision Fires (LRPF)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	100.146	-	-	-	-	0.000	0.000	0.000	0.000	Continuing	Continuing
ES1: *Long Range Precision Fires (LRPF)*	-	100.146	-	-	-	-	-	-	-	-	Continuing	Continuing
Program MDAP/MAIS Code: 494												

Note

Starting in Fiscal Year (FY) 2022 all funds for this program were restructured from PE 0607134A to PE 0605231A. PE 0605231A is a continuation of the existing PrSM program.

A. Mission Description and Budget Item Justification

Precision Strike Missile (PrSM) is the Army's next generation surface-to-surface missile that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities. The mission of the PrSM system is to attack/neutralize/suppress/destroy targets using missile delivered indirect precision fires. PrSM will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. PrSM will counter the enemy's ability to conduct combat maneuver and air defense operations.

PrSM requirements include: max range of greater than 400 kilometers (km), specified lethality against the designated target set, a Launch Pod Missile Container (LPMC) that holds two missiles, survivability in a threat environment, and compatibility with the existing launcher platforms (M270A2 Multiple Launch Rocket System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS)). PrSM will meet cluster and insensitive munition requirements and is designed with an open system approach that provides the capability for future growth to counter new and emerging threats. Increment 2 of PrSM will include the ability to attack mobile or relocatable ground and maritime targets. Future PrSM increments will provide increased lethality against hardened targets and extend range capability to 650km. There is no funding for FY 2022.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0607134A *I Long Range Precision Fires (LRPF)*			
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	100.146	0.000	0.000	-	0.000
Current President's Budget	100.146	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / *Long Range Precision Fires (LRPF)*	Project (Number/Name) ES1 / *Long Range Precision Fires (LRPF)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ES1: *Long Range Precision Fires (LRPF)*	-	100.146	-	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Precision Strike Missile (PrSM) is the Army's next generation surface-to-surface missile that replaces and improves upon Army Tactical Missile System (ATACMS) capabilities. The mission of the PrSM System is to attack/neutralize/suppress/destroy targets using missile delivered indirect precision fires. PrSM will provide Joint Force Commanders with a 24/7, all-weather capability to attack critical and time sensitive area and point targets including threat air defense, missile launchers, command and control centers, assembly/staging areas and high payoff targets at all depths of the multi-domain battlefield. PrSM will counter the enemy's ability to conduct combat maneuver and air defense operations.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Enhanced Technology Maturation and Risk Reduction (E-TMRR) ***Description:*** E-TMRR activities to develop the Army's next generation missile capability that doubles volume of fire, meets range requirements by exceeding 400km, provides required lethality for both point and area targets, ensures survivability, meets cluster munition policy requirements, and provides an open system architecture. PrSM provides field artillery units with a deep-strike capability while supporting Brigade, Division, Corps, Army, Theater, Joint and Coalition forces in full, limited or expeditionary operations.	32.276	-	-
Title: Engineering and Manufacturing Development (EMD) ***Description:*** EMD activities to develop the Army's next generation missile capability that doubles volume of fire, meets range requirements by exceeding 400km, provides required lethality for both point and area targets, ensures survivability, meets cluster munition policy requirements, and provides an open system architecture. PrSM provides field artillery units with a deep-strike capability while supporting Brigade, Division, Corps, Army, Theater, Joint and Coalition forces in full, limited or expeditionary operations.	49.870	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607134A / *Long Range Precision Fires (LRPF)*	**Project (Number/Name)** ES1 / *Long Range Precision Fires (LRPF)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Increment 2 ***Description:*** Activities to procure long lead Increment 1 test hardware for PrSM Increment 2 for prototype development.	18.000	-	-
Accomplishments/Planned Programs Subtotals	100.146	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0605231A: *Precision Strike Missile (PrSM)*	-	188.452	259.506	-	259.506	237.566	237.323	237.394	239.702	0.000	1,399.943
• C29600: *PRECISION STRIKE MISSILE (PRSM)*	59.929	166.130	213.172	-	213.172	339.302	408.505	439.882	436.358	0.000	2,063.278

Remarks

D. Acquisition Strategy

PrSM follows the Major Capability Acquisition pathway. A 6 NOV 2013 Materiel Development Decision Acquisition Decision Memorandum designated PrSM as a Pre-Major Defense Acquisition Program. An AoA supporting the MS A decision was completed by U.S. Army Training and Doctrine Command (TRADOC) Analysis Center White Sands Missile Range (TRAC-WSMR), with an Office of the Secretary of Defense (OSD) letter of sufficiency issued in SEP 2015. In 4Q FY 2016, the Army awarded 9-month risk reduction, trade study and initial design development agreements to two contractors. The effort resulted in development of initial baseline designs presented during final technical reviews that resulted in a seamless transition into the Technology Maturation and Risk Reduction (TMRR) phase. Subsequent to MS A, on 31 MAR 2017, the Army awarded competitive Other Transaction Agreements to two contractors with planned down-select following the conclusion of system level prototype flight testing in FY 2020. On 16 NOV 2017, the DAE delegated the position of Milestone Decision Authority to the Army Acquisition Executive (AAE) and reclassified the program from ACAT 1D to ACAT 1B.

In FY 2018, the Army in response to immediate near-peer threats and the requirement to engage targets with a precision guided missile at ranges beyond 400km the Army directed acceleration of PrSM Early Operational Capability (EOC) with planned fielding in FY 2023. The PrSM acquisition approach was updated to include follow on competitive TMRR effort, Enhanced TMRR (E-TMRR). A successful system level prototype flight test was the entry criteria for award of the E-TMRR agreement.

In FY 2019 both contractors completed a Preliminary Design Review (PDR), conducted component level Design Verification Testing (DVT) on PrSM sub-assemblies prior to system level prototype flight tests. During DVT, one PrSM contractor experienced a catastrophic rocket motor failure. In FY 2020 The Army decided not to fund the contractor's additional cost growth and the contractor chose not to fund internally. The period of performance expired on this effort in 20 MAR 2020, leaving only one contractor to continue development activities. The remaining contractor conducted prototype flights in 1-3QFY2020 and was solely awarded E-TMRR on 12 JUN 2020 through MAR 2022 (2QFY 2022).

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607134A / *Long Range Precision Fires (LRPF)*	**Project (Number/Name)** ES1 / *Long Range Precision Fires (LRPF)*

During E-TMRR the contractor continues to finalize the tactical design, built missiles and conducted four Engineering Development Test (EDT) flight tests, began and is expected to complete subsystem qualification, and established a production capability for EOC missiles. On 3 FEB 2021 Army Futures Command, Commanding General signed a Directed Requirement for initial missile quantities to support a PrSM EOC. FY21-24 MIPA funds will initially support fielding of the EOC and then transition to Full Rate Production and achieve Initial Operational Capability in FY 2025. EOC production begins in FY 2021 with fielding occurring in FY 2023.

In April 2021, the PrSM program entered into a Memorandum of Understanding (MOU) for cooperative development participation between Department of Defense of Australia and the Department of Defense of the United States of America for the exchange of information pertaining to, and conducting joint research and development efforts and testing of PrSM Increment 2 and further development of current PrSM capabilities.

On 4 June 2021, the Joint Requirements Oversight Council validated the PrSM Capabilities Development Document (CDD). The PrSM program will develop nascent capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains. Development, integration, and testing of PrSM systems 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.

Milestone B approval occurred on 27 SEP 2021 and the EMD contract was awarded on 30 SEP 2021. The EMD Phase began in 1QFY2022 and includes assembly of PQT flight test articles in parallel with completion of ground and system qualification, tactical software integration on the HIMARS and M270A2 launchers and production planning efforts. The program will also refine critical missile survivability assessments to ensure the selected EMD design will successfully meet PrSM's kinetic, electro-magnetic spectrum, cyber, environmental, nuclear requirements.

The PrSM acquisition approach is incremental. The modular system Improvements will occur via technology insertions that increase the capabilities of the base missile. Increment 2 will transition from S&T to the Program Office after the design is fully integrated into the PrSM Increment 1 form factor and upon successful completion of initial flight-testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607134A / *Long Range Precision Fires (LRPF)*	**Project (Number/Name)** ES1 / *Long Range Precision Fires (LRPF)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : RSA, AL	10.908	5.169	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	10.908	5.169		-		-		-		-	Continuing	Continuing	N/A

Remarks

RSA - Redstone Arsenal, Alabama

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PrSM Increment 1 TMRR - 2 Vendors* (Raytheon and Lockheed Martin)	C/Various	LMMFCS / RMS : Grand Prairie, TX / Tucson, AZ	233.459	-		-		-		-		-	0.000	233.459	-
PrSM Increment 1 E-TMRR - 1 Vendor (Lockheed Martin)	C/CS	LMMFCS : Grand Prairie, TX	96.036	12.210	Mar 2021	-		-		-		-	0.000	108.246	-
PrSM Increment 1 EMD - 1 Vendor (Lockheed Martin)	SS/FPIS	LMMFCS : Grand Prairie, TX	-	46.262	May 2021	-		-		-		-	Continuing	Continuing	Continuing
PrSM Increment 2 - 1 Vendor (Lockheed Martin)	TBD	LMMFCS : Grand Prairie, TX	-	18.000	Aug 2021	-		-		-		-	Continuing	Continuing	Continuing
Development Engineering Support	MIPR	AMCOM/CCDC AvMC/S3I : RSA, AL	16.739	1.554	Jan 2021	-		-		-		-	Continuing	Continuing	Continuing
A-PNT	MIPR	CCDC AvMC : RSA, AL	7.000	-		-		-		-		-	0.000	7.000	-
Software Development	MIPR	S3I : RSA, AL	2.876	2.805	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
FY20 Rescission	TBD	N/A : N/A	30.000	-		-		-		-		-	0.000	30.000	-
		Subtotal	386.110	80.831		-		-		-		-	Continuing	Continuing	N/A

Remarks

*Lockheed Martin awarded E-TMRR in 1QFY2020 after successful flight test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / *Long Range Precision Fires (LRPF)*	Project (Number/Name) ES1 / *Long Range Precision Fires (LRPF)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMCOM - Aviation and Missile Command; A-PNT - Assured-Position, Navigation and Timing; CCDC AvMC - Combat Capabilities Development Center Aviation & Missile Command; DOTC - DoD Ordnance Technology Consortium; LMMFCS - Lockheed Martin Missiles and Fire Control System; OTA - Other Transaction Agreements; RMS - Raytheon Missile Systems; RSA - Redstone Arsenal, Alabama; S3I - Systems Simulation, Software and Integration; TX - Texas															

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Quality, Safety, SETA Support, and Analysis	SS/T&M	Various; S3 / Pending Competitor in Aug 2021 : RSA, AL	7.869	4.028	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	7.869	4.028		-		-		-		-	Continuing	Continuing	N/A

Remarks

RSA - Redstone Arsenal, AL; S3 Inc - System Studies & Simulation Inc.; SETA - Systems Engineering and Technical Support

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	WSMR; RTC : WSMR,NM; RSA, AL	14.153	10.118	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	14.153	10.118		-		-		-		-	Continuing	Continuing	N/A

Remarks

RTC - Redstone Test Center; RSA - Redstone Arsenal, Alabama; WSMR, NM - White Sands Missile Range, New Mexico

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	419.040	100.146		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607134A / *Long Range Precision Fires (LRPF)*	Project (Number/Name) ES1 / *Long Range Precision Fires (LRPF)*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607134A / *Long Range Precision Fires (LRPF)*	**Project (Number/Name)** ES1 / *Long Range Precision Fires (LRPF)*

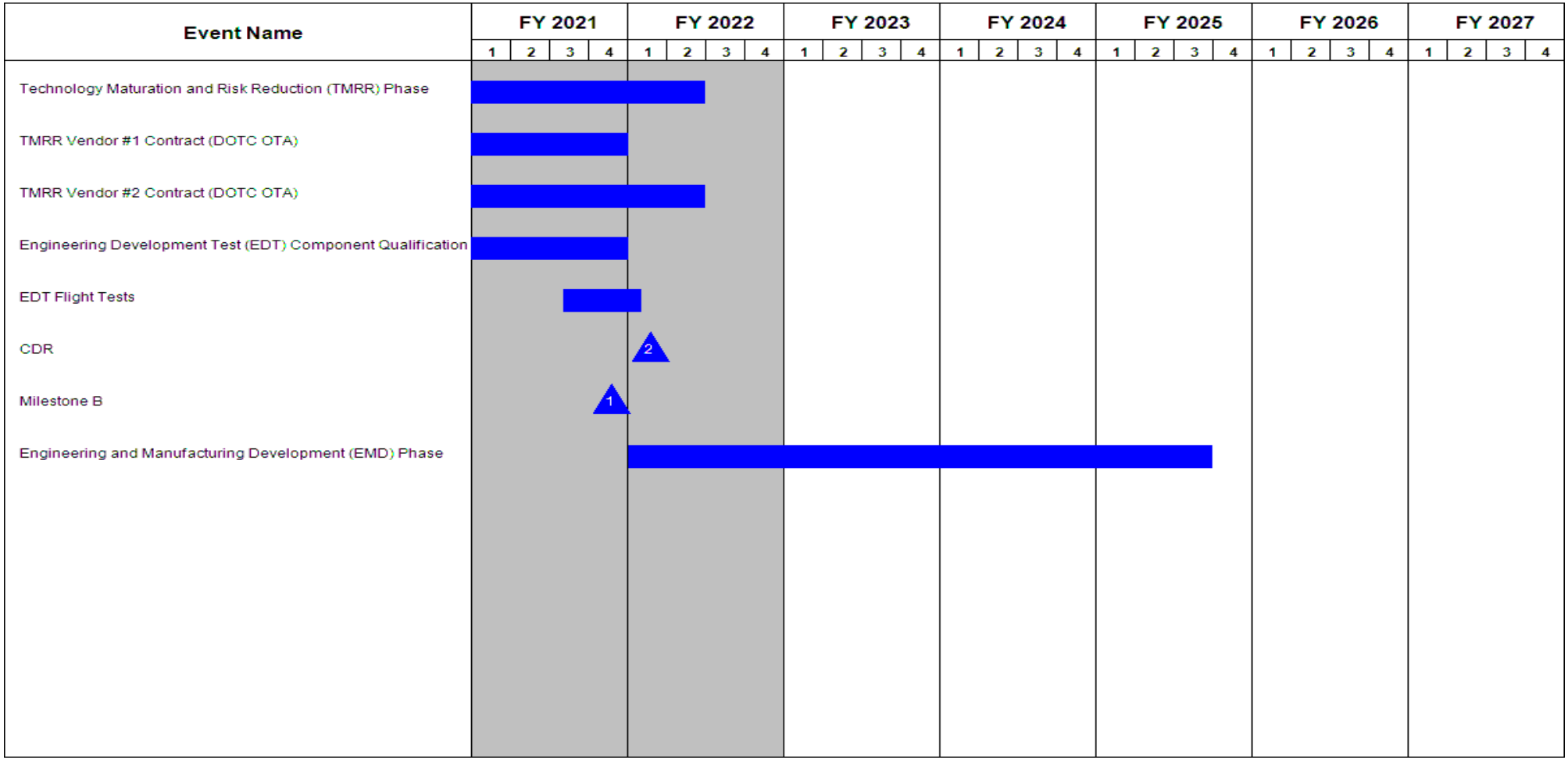

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607134A / *Long Range Precision Fires (LRPF)*	**Project (Number/Name)** ES1 / *Long Range Precision Fires (LRPF)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AoA	2	2015	3	2015
Materiel Solution Analysis (MSA)	1	2014	3	2017
MSA Vendor #1 Contract (DOTC OTA)	3	2016	3	2017
MSA Vendor #2 Contract (DOTC OTA)	3	2016	3	2017
Milestone A	2	2017	2	2017
Technology Maturation and Risk Reduction (TMRR) Phase	2	2017	2	2022
TMRR Vendor #1 Contract (DOTC OTA)	3	2017	4	2021
TMRR Vendor #2 Contract (DOTC OTA)	3	2017	2	2022
System Requirements Review (SRR)	4	2017	4	2017
System Functional Review (SFR)	1	2018	1	2018
Preliminary Design Review (PDR)	1	2019	1	2019
Prototype Flight Tests	1	2020	3	2020
Engineering Development Test (EDT) Component Qualification / Ground Testing	3	2020	4	2021
EDT Flight Tests	3	2021	1	2022
CDR	1	2022	1	2022
Milestone B	4	2021	4	2021
Engineering and Manufacturing Development (EMD) Phase	1	2022	3	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607136A / *Blackhawk Product Improvement Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.300	14.773	-	-	-	0.000	0.000	0.000	0.000	Continuing	Continuing
ES3: *Blackhawk Product Improvement Program*	-	8.300	14.773	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

UH-60V:

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:

Independent of the UH-60V Program of Record and Acquisition Program Baseline (APB), incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY 2019-2022. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, Program Executive Office for Aviation (PEOAVN) and the Medical Research Development Command, (MRDC). PEOAVN is responsible for the integration of MEDEVAC Mission Equipment Package (MEP) on the UH-60V. MRDC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	8.300	4.773	0.000	-	0.000
Current President's Budget	8.300	14.773	0.000	-	0.000
Total Adjustments	0.000	10.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: ES3: *Blackhawk Product Improvement Program*		
Congressional Add: *Blade Improvement Blackhawk*	-	10.000
Congressional Add Subtotals for Project: ES3	-	10.000
Congressional Add Totals for all Projects	-	10.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607136A / *Blackhawk Product Improvement Program*	Project (Number/Name) ES3 / *Blackhawk Product Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ES3: *Blackhawk Product Improvement Program*	-	8.300	14.773	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

UH-60V:

The H-60L Digital Blackhawk, now designated as UH-60V, is designed to update the existing H-60L analog architecture to a digital infrastructure enabling the upgraded aircraft to have a similar Pilot-Vehicle Interface (PVI) to the H-60M. The program will address current capability gaps and meet operational requirements by employing an evolutionary acquisition approach to leverage mature technologies that have been successfully integrated on other military aircraft. The program will reduce obsolescence and increase commonality and interoperability by installing a digital cockpit, bussing and upgrading the communication/identification suite, improving navigation guidance, and integrating Aircraft Survivability Equipment (ASE), digital moving map, and Joint Variable Message Format (JVMF) messaging. Continuing funding will provide hardware and software development, training material development, as well as developmental and operational testing.

MEDEVAC:

Independent of the UH-60V Program of Record and Acquisition Program Baseline (APB), incremental RDT&E funding to support integration of a MEDEVAC capability on UH-60V is planned for FY 2019-2022. In accordance with AR 40-60, Medical Materiel Acquisition Policy, the Army's Aeromedical Evacuation capability is funded by two portfolio managers, PEOAVN and MRDC. PEOAVN is responsible for the integration of MEDEVAC MEP on the UH-60V. MRDC is responsible for recurring costs to procure kits and resource the installation of MEP kits on UH-60V MEDEVAC helicopters.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: UH-60V Support ***Description:*** Support Costs include Systems Engineering/Program Management (SEPM) type activities performed at various test agencies.	0.350	-	-
Title: UH-60V Test & Evaluation ***Description:*** The Utility Helicopters Project Office (UHPO) is responsible for day-to-day test management activities to include execution of all developmental tests and support of operational tests for the UH-60V Program. The focal point for test management is the UH-60V Test Lead Engineer who is the chair for the UH-60V Test and Evaluation (T&E) Working-level Integrated Product Team. The UH-60 T&E team ensures integration and coordination of test and data requirements among all agencies involved in the test and acquisition of the UH-60V effort. T&E activities include: AFTD Baseline Flight Testing, IOTE, Cybersecurity and Interoperability tests.	4.610	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*	**Project (Number/Name)** ES3 / *Blackhawk Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: MEDEVAC MEP Integration Product Development ***Description:*** MEDEVAC MEP Integration Product Development. ***FY 2022 Plans:*** Finalize the Technical Data Package deliverables and close out the PIF contract task order. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No RDT&E funding required beyond FY2022 for MEDEVAC. Funding will shift to OPA funds to support MEDEVAC MEP procurement and fielding efforts.	0.842	2.886	-
Title: MEDEVAC MEP Integration Support ***Description:*** Support the HW and SW Design Activities with Airworthiness and Technical data division support. ***FY 2022 Plans:*** Support the hardware and software Design Activities with Airworthiness and Technical data division support. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No RDT&E funding required beyond FY2022 for MEDEVAC. Funding will shift to OPA funds to support MEDEVAC MEP procurement and fielding efforts.	0.186	0.388	-
Title: MEDEVAC MEP Management Services ***Description:*** Management Services includes all activities related to Government/Contractor SEPM to include the cost of Government and Contractor personnel supporting the H-60V MEDEVAC MEP Integration Program. ***FY 2022 Plans:*** Provide Management Services with Government / Contractor SEPM to include the cost of the Government and contractor personnel supporting the H-60V MEDEVAC MEP Integration Program. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No RDT&E funding required beyond FY2022 for MEDEVAC. Funding will shift to OPA funds to support rescue hoist, IMMSS patient handling system and MEDEVAC Mission Sensor procurement and fielding efforts.	1.565	0.658	-
Title: MEDEVAC Test & Evaluation ***Description:*** The UHPO is responsible for day-to-day test management activities to include the execution of all developmental tests for the UH-60V MEDEVAC program. As part of this responsibility, UHPO manages the Test and Evaluation Working Group with a UH-60V MEDEVAC Test lead. He/she ensures the test agencies are coordinated, test plans are created, instrumentation	0.747	0.667	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*	**Project (Number/Name)** ES3 / *Blackhawk Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
is developed and installed, and airworthiness approvals are obtained. He/she tracks status of the testing throughout the program, assists in resolving issues, and coordinates approval of the test data and test reports. For this effort, the UHPO will manage system-level testing necessary to receive a fielding AWR, including Electromagnetic Compatibility (EMC), Noise Floor, Electromagnetic Vulnerability (EMV), and ground system checkouts and flight testing of the MEDEVAC MEP. ***FY 2022 Plans:*** MEDEVAC plans to implement funding at RTC to continue execution of continued system-level testing and a delta operational test. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No RDT&E funding required beyond FY2022 for MEDEVAC. Funding will shift to OPA funds to support MEDEVAC MEP procurement and fielding efforts.			
Title: FY22 SBIR/STTR ***FY 2022 Plans:*** SBIR/STTR amount in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR amount in accordance with Title 15 USC 638	-	0.174	-
Accomplishments/Planned Programs Subtotals	8.300	4.773	-

	FY 2021	FY 2022
Congressional Add: Blade Improvement Blackhawk	-	10.000
FY 2022 Plans: Award contract for development and qualification of blade improvements		
Congressional Adds Subtotals	-	10.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A05009: *UH-60 Black Hawk L and V Models*	165.197	166.205	178.658	-	178.658	157.024	160.313	206.388	205.626	0.000	1,239.411
• Q13015: *MEDICAL EVACUATION*	-	12.314	32.164	-	32.164	16.617	23.178	26.447	25.476	0.000	136.196

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*	**Project (Number/Name)** ES3 / *Blackhawk Product Improvement Program*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

Q13015000 MEDICAL EVACUATION provides procurement funding for MEDEVAC MEP capability on UH-60 helicopters. Per requirements, starting in FY 2022, Q13015000 will resource procurement of MEDEVAC MEP kits and installations at a rate of 15 aircraft per year through FY 2034, which is the estimated year the AAO of 200 UH-60V MEDEVAC is reached. Figures shown above reflect the full FL8D/Q13015000/OPA/MEDICAL EVACUATION funding line, which includes the production kits and MEP installation costs at CCAD as well as other non-MEDEVAC funding requirements. UH-60V MEDEVAC MEP Q13015000 OPA requirements are $5.7 million in FY 2022, $6.1 million in FY 2023, $7.8 million in FY 2024, $8.1 million FY 2025 and $8.6 million FY2026. Total MEDEVAC MEP requirement in Q1301500 through FY 2034 is $88.1M.

D. Acquisition Strategy

The UH-60V program plans to leverage various test agencies, to design, integrate and build three production representative aircraft. The GOGO facility uses a cost plus contract vehicle and conducted full and open competition for the selection of the avionics solution provider.

Independent of the UH-60V Program of Record and Acquisition Program Baseline (APB), the MEDEVAC MEP program plans to utilize the U. S. Army Development Command (DEVCOM) Aviation and Missile Center (AvMC) and Prototype Integration Facility (PIF) to design and integrate MEDEVAC capability into the UH-60V. By leveraging the same GOGO facility utilized by the UH-60V program, efficient design, software development, integration, and testing will occur by eliminating redundant tasks and employing experienced government resources already in possession of pertinent UH-60V technical data required to support the MEDEVAC MEP nonrecurring engineering (NRE) effort. Prototype, validation, and verification of technical publications, as well as airworthiness testing, will be accomplished following completion of the UH-60V IOT&E, at which time one UH-60V Engineering Development Model (EDM) and two Low-Rate Initial Production (LRIP) aircraft will be allocated to the MEDEVAC MEP program. Following completion of MEDEVAC MEP NRE, technical products will feed production and fielding contracts, which will be resourced by the U.S. Army Medical Department, AMEDD. Procurement funding is programmed on Q13015000 MEDICAL EVACUATION.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607136A / *Blackhawk Product Improvement Program*	Project (Number/Name) ES3 / *Blackhawk Product Improvement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V - Organic	MIPR	Various : Redstone Arsenal, AL	12.791	-		-		-		-		-	0.000	12.791	-
UH-60V - Contractor	C/LH	Various : Redstone Arsenal, AL	10.060	-		-		-		-		-	0.000	10.060	-
MEDEVAC MEP Integration - Organic	MIPR	Various : Redstone Arsenal	2.032	0.208	Feb 2021	-		-		-		-	Continuing	Continuing	-
MEDEVAC MEP Integration - Contractor	C/LH	Various : Redstone Arsenal, AL	1.505	1.357	Feb 2021	0.658	Oct 2021	-		-		-	Continuing	Continuing	-
FY22 SBIR/STTR	TBD	TBD : TBD	-	-		0.174	Apr 2022	-		-		-	0.000	0.174	-
		Subtotal	26.388	1.565		0.832		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V Development Engineering	C/CPFF	CCDC AvMC : Redstone Arsenal, AL	170.456	-		-		-		-		-	0.000	170.456	-
MEDEVAC MEP Product Development and Integration	C/CPFF	DEVCOM AvMC, PIF : Redstone Arsenal AL	19.514	0.842	Feb 2021	2.886		-		-		-	0.000	23.242	-
SATCOM	MIPR	To Be Determined : Redstone Arsenal AL	9.926	-		-		-		-		-	0.000	9.926	-
Blade Improvement	TBD	To Be Determined : Redstone Arsenal AL	-	-		10.000		-		-		-	0.000	10.000	-
		Subtotal	199.896	0.842		12.886		-		-		-	0.000	213.624	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607136A / *Blackhawk Product Improvement Program*	Project (Number/Name) ES3 / *Blackhawk Product Improvement Program*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V	MIPR	Various : Redstone Arsenal, AL	17.482	0.350	Feb 2021	-		-		-		-	0.000	17.832	-
MEDEVAC MEP Integration Support	MIPR	Various : Redstone Arsenal AL	1.110	0.186	Feb 2021	0.388	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	18.592	0.536		0.388		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UH-60V	MIPR	Redstone Test Center : Redstone Arsenal, AL	17.156	4.610	Oct 2021	-		-		-		-	0.000	21.766	-
MEDEVAC	MIPR	Redstone Test Center : Redstone Arsenal, AL	-	0.747	Feb 2021	0.667	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	17.156	5.357		0.667		-		-		-	Continuing	Continuing	N/A

Remarks

Government Support

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	262.032	8.300		14.773		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*	**Project (Number/Name)** ES3 / *Blackhawk Product Improvement Program*

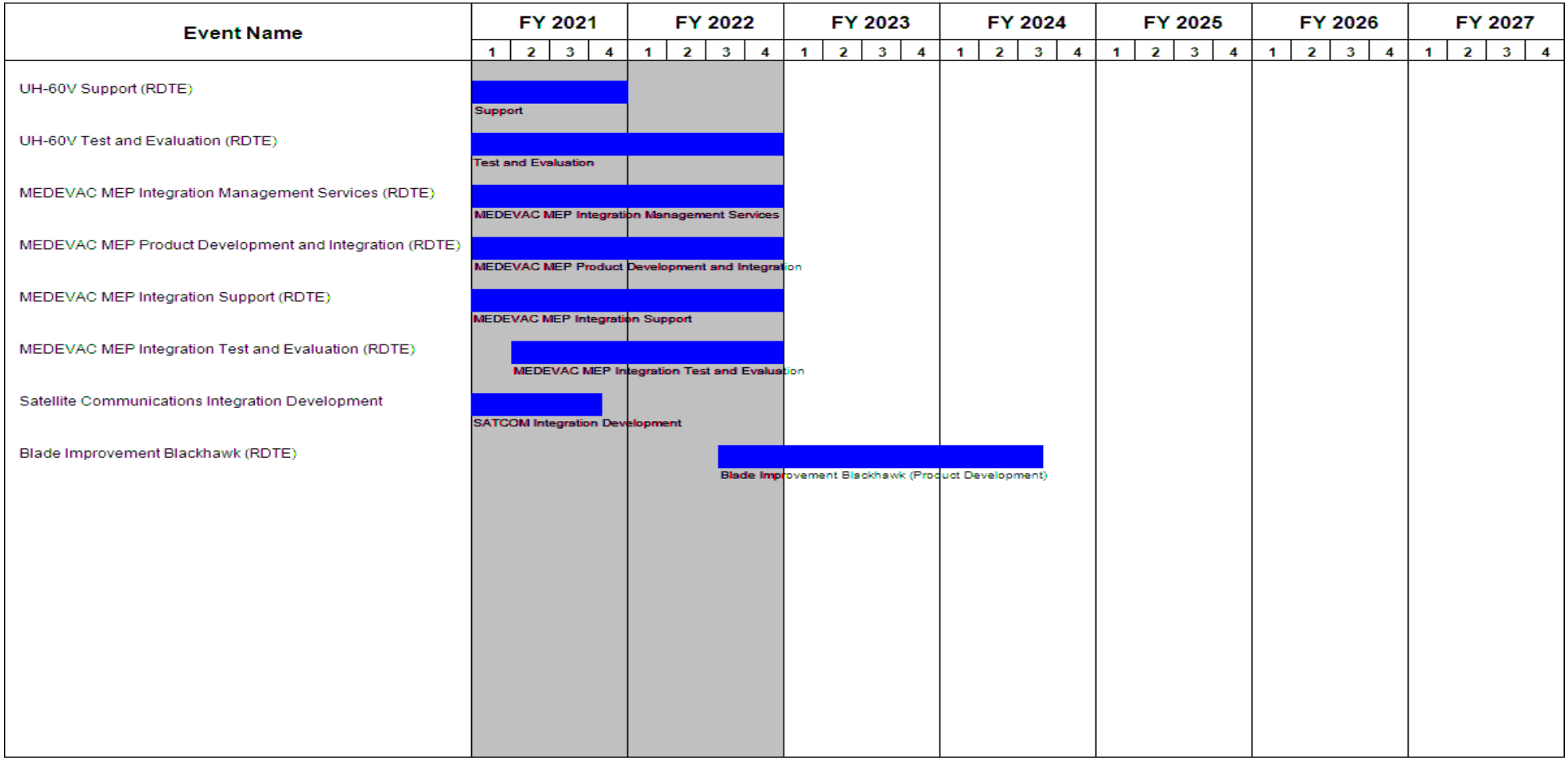

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607136A / *Blackhawk Product Improvement Program*	**Project (Number/Name)** ES3 / *Blackhawk Product Improvement Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UH-60V Development (Research, Development, Test, and Evaluation (RDTE)	4	2014	4	2020
UH-60V Management Services (RDTE)	1	2014	4	2020
UH-60V Support (RDTE)	1	2014	4	2021
UH-60V Test and Evaluation (RDTE)	4	2015	4	2022
MEDEVAC MEP Integration Management Services (RDTE)	1	2019	4	2022
MEDEVAC MEP Product Development and Integration (RDTE)	1	2019	4	2022
MEDEVAC MEP Integration Support (RDTE)	4	2019	4	2022
MEDEVAC MEP Integration Test and Evaluation (RDTE)	2	2021	4	2022
Satellite Communications Integration Development	4	2020	4	2021
Blade Improvement Blackhawk (RDTE)	3	2022	3	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607137A *I Chinook Product Improvement Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	49.409	67.872	52.513	-	52.513	9.461	5.027	13.140	9.105	Continuing	Continuing
ES4: *Chinook Product Improvement Program*	-	49.409	67.872	52.513	-	52.513	9.461	5.027	13.140	9.105	Continuing	Continuing
Program MDAP/MAIS Code: 577												

A. Mission Description and Budget Item Justification

Program Element (PE) 0607137A Chinook Product Improvement Program is critical to achieving the Army's heavy lift Joint All Domain Operational capability. With an increased payload and operational reach, the CH-47F Block II is the only platform that can lift the JLTV, M777 and medium girder bridge to enable Joint All Domain Forces to Compete, Penetrate, Disintegrate, and Exploit at operationally relevant distances.

The CH-47F Block II acquisition program upgrades existing CH-47F aircraft and procures common hardware that exists between the CH-47F and MH-47G aircraft for Special Operations Forces. The CH-47F Block II program reduces O&S costs and provides additional capability to the field with greater reach, increased payload capability and an increase in maximum gross weight to 54,000 pounds. CH-47F Block II upgrades include a strengthened airframe which introduces commonality with the MH-47G and improvements to rotor, fuel, and electrical systems which will improve safety and reliability for the aircraft. The program updates the Common Avionics Architecture System (CAAS) and Digital Advanced Flight Control System (DAFCS) software packages of the aircraft, and incorporates other avionics changes introduced into the final CH-47F production lots. Along with providing a significantly increased capability to the field, the program includes provisions for anticipated future upgrades as well as weight and cost savings initiatives to ensure the Army has a platform with the flexibility and performance needed to meet the needs of Joint All Domain Operations.

The Cargo Project Management Office awarded the CH-47F Engineering and Manufacturing Development (EMD) contract in July 2017. The EMD phase produced three production representative test articles to support an acquisition decision. This phase will include contractor and government led system level qualification testing. The contractor led system level qualification testing includes both ground and flight test. The system level qualification testing includes Electromagnetic Environmental Effects (E3), operation assessments, and aircraft subsystem Live-Fire Test and Evaluation (LFTE). On 27 September 2021, the Army provided direction to remove Advanced Chinook Rotor Blade (ACRB) from the CH-47F Block II system configuration, and replace them with the currently fielded Fiberglass Rotor Blades (FRB).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607137A *I Chinook Product Improvement Program*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	49.409	52.372	0.000	-	0.000
Current President's Budget	49.409	67.872	52.513	-	52.513
Total Adjustments	0.000	15.500	52.513	-	52.513
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	52.513	-	52.513

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: ES4: *Chinook Product Improvement Program*		
Congressional Add: *Program increase - carbon composite materials for helicopter wheels and brakes*	5.000	-
Congressional Add: *Program increase - Lightweight Ballistic Protection System*	-	8.000
Congressional Add: *Program increase - CH-47 Engine Enhancement*	-	7.500
Congressional Add Subtotals for Project: ES4	5.000	15.500
Congressional Add Totals for all Projects	5.000	15.500

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2021 Congressional Add of $5.000 million for carbon composite materials for helicopter wheels and brakes was received on 26 January 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / *Chinook Product Improvement Program*	Project (Number/Name) ES4 / *Chinook Product Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ES4: *Chinook Product Improvement Program*	-	49.409	67.872	52.513	-	52.513	9.461	5.027	13.140	9.105	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program Element (PE) 0607137A Chinook Product Improvement Program is critical to achieving the Army's heavy lift Joint All Domain Operational capability. With an increased payload and operational reach, the CH-47F Block II is the only platform that can lift the JLTV, M777 and medium girder bridge to enable Joint All Domain Forces to Compete, Penetrate, Disintegrate, and Exploit at operationally relevant distances.

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The Cargo Project Management Office awarded the CH-47F Engineering and Manufacturing Development (EMD) contract in July 2017. The EMD phase produced three production representative test articles to support an acquisition decision. This phase will include contractor and government led system level qualification testing. The contractor led system level qualification testing includes both ground and flight test. The system level qualification testing includes Electromagnetic Environmental Effects (E3), operational assessments, and aircraft subsystem Live-Fire Test and Evaluation (LFTE). On 27 September 2021, the Army provided direction to remove Advanced Chinook Rotor Blade (ACRB) from the CH-47F Block II system configuration, and replace them with the currently fielded Fiberglass Rotor Blades (FRB).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: CH-47F Block II Engineering and Manufacturing Development (EMD)	20.957	22.169	15.451
Description: Conduct and support aircraft development, complete assembly and deliver three EMD test articles to include airframe components, Improved Drive Train (IDT), rotor components, light weight fuel system, electrical components and the currently fielded Fiberglass Rotor Blade (FRB). Complete fabrication, assembly, initial functional checks of the Ground Test Vehicle (GTV) and remote control system (RCS), conduct GTV test operations, functional testing of the CH-47F Block II systems, Test Readiness Review (TRR) for EMD ground and flight testing. Release EMD flight test software. Begin contractor led system level ground and flight testing. Deliver documentation that demonstrates requirements verification and production configuration			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
baseline. Continue Integrated Logistics Support (ILS) and Integrated Contractor Supply (ICS) support for initial flight test activities. Shut down all ACRB efforts and terminate the associated contracts. ***FY 2022 Plans:*** Continue flight test operations in support of EMD system level qualification and initiate post flight test reporting requirements. Receipt and disposition of contract requirements to include test reports, qualification by similarity (QBS), Integrated Logistics Support (ILS) and Integrated Contractor Supply (ICS) deliverables, and delivery of Production Configuration Baseline. Shut down all ACRB efforts and terminate the associated contracts. ***FY 2023 Plans:*** Continue development of EMD flight test analysis and reporting deliverables in support of System Verification Review (SVR), system qualification, and an Army production decision. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY2023 decrease of $6.718 million reflects a transition from engineering test support to data analysis, report writing, and requirement verification activities.			
Title: Matrix and Contractor Support ***Description:*** This funding provides support costs for various government agencies, contractor support and matrix organizations supporting the Block II Engineering and Manufacturing Development (EMD) program with systems engineering, test support, airworthiness certification, project management, general engineering, logistics and business support. ***FY 2022 Plans:*** Continues funding support costs for various government agencies, contractor support, and other matrix organizations supporting the Block II EMD program. ***FY 2023 Plans:*** Continues funding support costs for various government agencies, contractor support, and other matrix organizations supporting Block II EMD program. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 decrease of $0.297 million aligns support requirement for the approved developmental activities and aircraft qualification.	5.026	5.841	5.544
Title: Advanced Chinook Rotor Blade (ACRB) ***Description:*** This effort designs, develops and performs contractor led component qualification for an improved rotor blade capability. This capability significantly increases lift capability, improves reliability, and is a form, fit replacement for the current blade, which will enable payload restoration to the ground force commander. Conduct additional flight testing to reduce risk for	9.217	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Engineering and Manufacturing Development (EMD) and validate Computational Fluid Dynamics (CFD) and Computational Structural Dynamics (CSD) models. On 27 September 2021, the Army provided direction to remove Advanced Chinook Rotor Blades (ACRB) from the CH-47F Block II system configuration, and replace them with the currently fielded Fiberglass Rotor Blades (FRB). The activities required to shut down all ACRB efforts, terminate the associated contracts, and complete the requirement and verification updates resulting from this system configuration change will occur within the EMD and System Support subprogram elements.			
Title: Testing and Evaluation	9.209	9.421	14.674
Description: This effort supports component and system level testing to qualify design improvements in the airframe, fuel system, avionics, drive train, and rotor subsystem. Block II improvements will be validated through component endurance, testing of IDT, IRS, Live Fire Test and Evaluation (LFTE), Electromagnetic Environmental Effects (E3), future developmental, and operational test activities. ***FY 2022 Plans:*** Increase in funding is required to perform system level testing to address qualification of the new CH-47F Block II FRB configuration. This will require added flight testing in the disciplines of performance, structural strength, and handling qualities of the aircraft. Further flight testing is required to increase data set on aircraft components in order to improve aircraft operational availability and reduce life cycle maintenance costs. Conduct stress and environmental testing of the program?s Ferrium C61 Steel components, which are deemed a critical technology. Continue live fire test and evaluation. Conduct Common Avionics Architecture System (CAAS) software testing, in both laboratory and flight test environments, to support an operational assessment. Plan for future developmental, operational, and cyber test activities. ***FY 2023 Plans:*** Continues system level testing on the CH-47 Block II FRB configuration to support system qualification and assessment of mitigations implemented to address technical challenges discovered during previous EMD phase testing events. Conduct Common Avionics Architecture System (CAAS) and Digital Advanced Flight Control System (DAFCS) software testing, in both laboratory and flight test environments, to support government acceptance of production aircraft. Plan for future developmental, operational, and cyber test activities. Conduct CH-47F Block II Operational Assessment and satisfy new program requirement to conduct Live Fire, Phase III testing of the Fiberglass Rotor Blades (FRB). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 increase of $5.253 million reflects a ramp up for system level testing, CH-47F Block II Operational Assessment, and Live Fire, Phase III testing of the Fiberglass Rotor Blades (FRB).			
Title: System Support	-	13.029	16.844

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Conduct design, system engineering, fabrication, and Integrated Logistics Support (ILS) in support of production-aircraft configuration, corrective hardware and software actions that are required to address technical challenges identified in the EMD phase. Conduct requirements update and verification efforts resulting from CH-47F Block II system configuration change from ACRB to FRB. Support test efforts to improve production aircraft operational availability and reduce maintenance costs. Conduct and support modifications of production aircraft and other test assets to support component and system level testing events, as well as corrective hardware and software actions that are required to address technical challenges identified during testing of the production aircraft. Release Digital Advanced Flight Control System (DAFCS) software in support of improved system handling qualities. Perform system level verification and validation of production aircraft configuration in preparation for future operational testing. Deliver documentation in support of a material release to support system fielding. ***FY 2022 Plans:*** Begin the requirement and verification updates resulting from CH-47F Block II system configuration change from ACRB to FRB. Begin engineering support and implementation of mitigations for technical challenges discovered during EMD phase testing events, to include improving ballistic protection of electrical and fuel system and improving sound protection for passenger area. Conduct development of pilot mission planning software to support future operational assessment. Begin development of Digital Advanced Flight Control System (DAFCS) software in support of improved system handling qualities. ***FY 2023 Plans:*** Continue the requirement and verification updates resulting from CH-47F Block II system configuration change from ACRB to FRB. Continue engineering support and implementation of mitigations for technical challenges discovered during EMD phase testing events. Initiate system level verification and validation of production aircraft configuration in preparation for future operational testing. Complete development of Digital Advanced Flight Control System (DAFCS) software in support of improved system handling qualities. Complete hardware and software modifications to include software integration laboratories (SIL) in order to support production-aircraft configuration software testing. Pursue incorporation of Modular Open Systems Architecture (MOSA) into aircraft systems. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 increase $3.795 million is due to an increase in technical mitigation engineering efforts resulting from the end of qualification flight testing to include system engineering, corrective hardware and software.			
Title: SBIR/STTR ***FY 2022 Plans:*** FY22 SBIR/STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	1.912	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase of $1.912M for FY22 SBIR/STTR Transfer.			
Accomplishments/Planned Programs Subtotals	44.409	52.372	52.513

	FY 2021	FY 2022
Congressional Add: Program increase - carbon composite materials for helicopter wheels and brakes ***FY 2021 Accomplishments:*** Carbon Composite materials for helicopter wheels and brakes	5.000	-
Congressional Add: Program increase - Lightweight Ballistic Protection System ***FY 2022 Plans:*** Congressional increase for Lightweight Ballistics Protection System	-	8.000
Congressional Add: Program increase - CH-47 Engine Enhancement ***FY 2022 Plans:*** Congressional increase for CH-47 Engine Enhancement.	-	7.500
Congressional Adds Subtotals	5.000	15.500

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A05105: *CH-47 SLEP*	368.122	333.677	187.898	-	187.898	199.116	201.179	206.447	205.694	Continuing	Continuing
• A05008: *CH-47 NEW BUILD*	50.472	-	0.000	-	0.000	-	-	-	-	0.000	50.472

Remarks

FY 2020 A05008 OCO is for Army Common MH-47G New Build War Replacement Aircraft Block II procurement.
FY 2021 A05008 OCO is for CH-47F New Build War Replacement Aircraft procurement.
FY 2020 A05105 All Funding is for Army Common MH-47G RENEW Block II procurement.
FY 2021 A05105 Funding is for 6 Army Common MH-47G RENEW Block II procurement.
FY 2021 A05105 Funding is for 4 CH-47F RENEW Block II procurement.
FY 2022 A05105 Funding is for 6 Army Common MH-47G RENEW Block II procurement.
FY 2023 A05105 Funding is for 6 Army Common MH-47G RENEW Block II procurement

D. Acquisition Strategy

Consolidated separate engineering change proposals into a single Block II upgrade to the CH-47F Block I. Current CH-47F Block I aircraft will enter into SLEP program to increase maximum gross weight to 54,000 pounds. The CH-47F Block II program provides additional benefits to increase commonality and interoperability between the two platforms, improve design life, lower maintenance cost, enhance reliability, safety, airworthiness, and cybersecurity. The CH-47F Block II program restores

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

payload lost through mission equipment package (MEP) growth and enhances flight control systems, while providing the most effective procurement alternative to maintain heavy lift capability and reduce Operation and Support (O&S) costs.

Quantity of RDT&E Articles:
FY 2018 - Awarded: 1 - Ground Test Vehicle (GTV), 2 - CH-47F Block II Prototypes
FY 2019 - Awarded: 1 - CH-47F Block II Prototype

FY 2019 - Delivered: 1 - GTV, 2 - CH-47F Block II Prototypes
FY 2020 - Delivered: 1 - CH-47F Block II Prototype

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / *Chinook Product Improvement Program*	Project (Number/Name) ES4 / *Chinook Product Improvement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY22 SBIR/STTR	TBD	To Be Determined : To Be Determined	-	-		1.912	Mar 2022	-		-		-	0.000	1.912	-
		Subtotal	-	-		1.912		-		-		-	0.000	1.912	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Manufacturing Development (EMD)	SS/CPIF	Boeing Ridley : Park, PA	329.403	20.957	Jun 2021	22.169	Nov 2021	15.451	Nov 2022	-		15.451	Continuing	Continuing	Continuing
Advanced Chinook Rotor Blade (ACRB)	SS/CPFF	Boeing Ridley : Park PA	67.694	9.217	Jul 2021	-		-		-		-	0.000	76.911	-
Improved Drive Train (IDT)	SS/CPFF	Boeing Ridley : Park, PA	53.062	-		-		-		-		-	0.000	53.062	-
Transportable Flight Proficienct Simulator (TFPS)	MIPR	NAVAIR : Patuxent River NAS, MD	23.215	-		-		-		-		-	0.000	23.215	-
System Support	TBD	To Be Determined : To Be Determined	-	-		13.029	Mar 2022	16.844	Jun 2023	-		16.844	0.000	29.873	-
Congressional Add Program Increase CH-47 Engine Enhancement	TBD	To Be Determined : To Be Determined	-	-		7.500	Aug 2022	-		-		-	0.000	7.500	-
Congressional Add Program Increase Block II Lightweight Improvements	TBD	To Be Determined : To Be Determined	6.500	-		8.000	Aug 2022	-		-		-	0.000	14.500	-
FY 2019 NDAA SEC 825 MDAP Cost Overrun	Allot	To Be Determined : To Be Determined	0.020	-		-		-		-		-	0.000	0.020	-
Congressional Add Program Increase Expandable Rotorcraft Diagnostics	TBD	To Be Determined : To Be Determined	3.300	-		-		-		-		-	0.000	3.300	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607137A / *Chinook Product Improvement Program*	Project (Number/Name) ES4 / *Chinook Product Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add Program Increase Carbon Composite Wheel	TBD	TBD : TBD	-	5.000	Jul 2022	-		-		-		-	0.000	5.000	-
		Subtotal	483.194	35.174		50.698		32.295		-		32.295	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	Various	Various Government and contractor : RSA & Huntsville, AL, Aberdeen Proving Ground MD,	29.185	5.026	Oct 2020	5.841	Oct 2021	5.544	Oct 2022	-		5.544	Continuing	Continuing	Continuing
		Subtotal	29.185	5.026		5.841		5.544		-		5.544	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing and Evaluation	Various	Boeing Ridley : Park PA and Various Government	50.630	9.209	Dec 2020	9.421	Nov 2021	14.674	Nov 2022	-		14.674	Continuing	Continuing	Continuing
		Subtotal	50.630	9.209		9.421		14.674		-		14.674	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	563.009	49.409		67.872		52.513		-		52.513	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

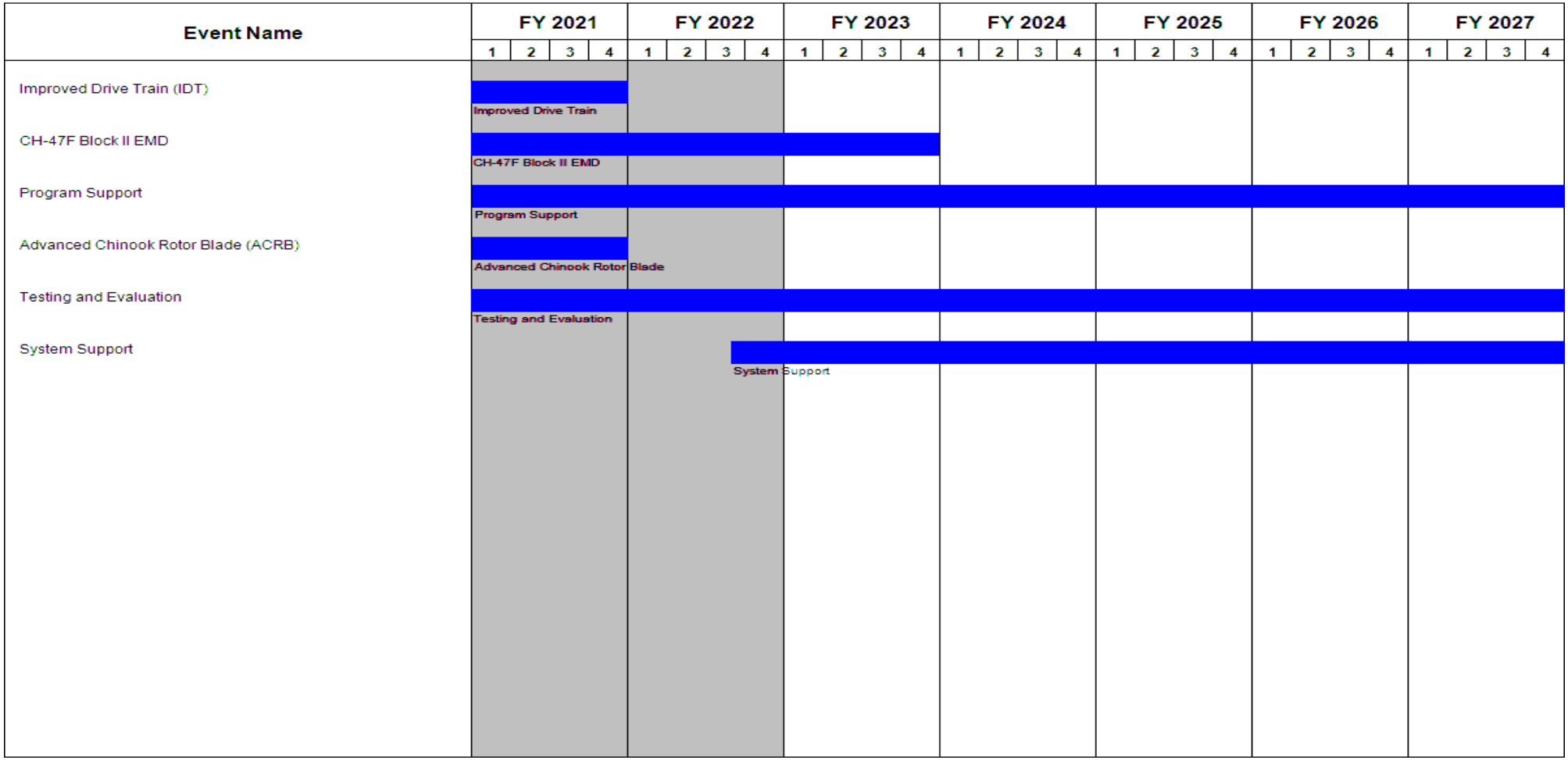


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607137A / *Chinook Product Improvement Program*	**Project (Number/Name)** ES4 / *Chinook Product Improvement Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Improved Drive Train (IDT)	3	2014	4	2021
Transportable Flight Proficiency Simulator (TFPS)	2	2018	4	2020
Milestone B	3	2017	3	2017
CH-47F Block II EMD	4	2017	4	2023
Program Support	1	2017	1	2028
Advanced Chinook Rotor Blade (ACRB)	1	2011	4	2021
Testing and Evaluation	3	2015	1	2028
System Support	3	2022	1	2028

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607139A *I Improved Turbine Engine Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	232.159	260.024	228.036	-	228.036	205.191	133.473	111.068	69.591	Continuing	Continuing
ES6: *Improved Turbine Engine Program*	-	232.159	260.024	228.036	-	228.036	205.191	133.473	111.068	69.591	Continuing	Continuing
Program MDAP/MAIS Code: 487												

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the army Modernization Priorities in support of the Improved Turbine Engine Program (ITEP). ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on Future Attack Reconnaissance Aircraft (FARA), Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth without an increase to the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, and platform integration and qualification.

FY 2021 funding completed Apache Incremental Critical Design Review #1 (iCDR), completed Black Hawk Integrated Baseline Review (IBR), completed the Live Fire Test Design Plan, continues the engine OEM EMD effort begun in FY 2019, continues engine component testing leading to First Engine To Test (FETT), began Preliminary Flight Rating (PFR) test planning, began physical airframe integration, initiated Apache A-Kit iCDR #2, and initiated Black Hawk A-Kit PDR. FY 2022 funding will continue PFR testing leading to a Preliminary Flight Rated engine in FY 2023, continues physical airframe integration, and continues Live Fire detailed test planning, completes Apache A-Kit iCDR #2, completes Black Hawk A-Kit PDR, and initiates Black Hawk A-Kit CDR. FY 2023 funding provides for completion of Black Hawk A-Kit CDR, completion of Live Fire detailed test planning, initiation of aircraft flight/qualification testing, and the initiation of engine full qualification testing. FY 2024 funding provides for continuation of aircraft flight/qualification testing, completion of Live Fire static engine tests, completion of engine qualification, and initiation of work to prepare for the Live Fire dynamic engine tests. FY 2025 funding provides for completion of Live Fire dynamic engine tests, continuation of flight/qualification testing, beginning of Low Rate Initial Production (LRIP), execution of Initial Operational Test and Evaluation (IOTE), beginning engine integration and A-kit development for the H-60V platform, and initiation of work to prepare for the Live Fire platform level testing (as needed). FY 2026 funding provides for H-60V A-kit CDR, and begins physical airframe integration. FY 2027 funding provides for continued H-60V physical integration and begins flight testing.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0607139A / *Improved Turbine Engine Program*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	232.159	275.024	0.000	-	0.000
Current President's Budget	232.159	260.024	228.036	-	228.036
Total Adjustments	0.000	-15.000	228.036	-	228.036
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-15.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	228.036	-	228.036

Change Summary Explanation

FY 2022 funding reduction reflects Congressional mark due to Integration Previously Funded.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / *Improved Turbine Engine Program*	Project (Number/Name) ES6 / *Improved Turbine Engine Program*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
ES6: *Improved Turbine Engine Program*	-	232.159	260.024	228.036	-	228.036	205.191	133.473	111.068	69.591	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the army Modernization Priorities in support of the Improved Turbine Engine Program (ITEP). ITEP develops, tests, qualifies, and integrates the next generation turboshaft engine on Future Attack Reconnaissance Aircraft (FARA), Black Hawk and Apache aircraft. The Improved Turbine Engine (ITE) replaces the existing T700 engine design originated in the 1970's and meets the operational requirement of 6,000 feet pressure altitude and 95 degrees (6K/95). The ITE will fit inside the existing engine bays of the Black Hawk and Apache Helicopters and provides a significant power enhancement of up to fifty percent (total of 3,000 class shaft horsepower) with increased fuel efficiency. Additional benefits include improved design life, enhanced reliability, lower maintenance cost and restored capability lost due to aircraft weight growth without an increase to the logistics footprint. The program consists of systems engineering and program management, detailed design engineering, design assurance, hardware manufacturing and testing, component and module level development and testing, system level testing and qualification, and platform integration and qualification.

FY 2021 funding completed Apache Incremental Critical Design Review #1 (iCDR), completed Black Hawk Integrated Baseline Review (IBR), completed the Live Fire Test Design Plan, continues the engine OEM EMD effort begun in FY 2019, continues engine component testing leading to First Engine To Test (FETT), began Preliminary Flight Rating (PFR) test planning, began physical airframe integration, initiated Apache A-Kit iCDR #2, and initiated Black Hawk A-Kit PDR. FY 2022 funding will continue PFR testing leading to a Preliminary Flight Rated engine in FY 2023, continues physical airframe integration, and continues Live Fire detailed test planning, completes Apache A-Kit iCDR #2, completes Black Hawk A-Kit PDR, and initiates Black Hawk A-Kit CDR. FY 2023 funding provides for completion of Black Hawk A-Kit CDR, completion of Live Fire detailed test planning, initiation of aircraft flight/qualification testing, and the initiation of engine full qualification testing. FY 2024 funding provides for continuation of aircraft flight/qualification testing, completion of Live Fire static engine tests, completion of engine qualification, and initiation of work to prepare for the Live Fire dynamic engine tests. FY 2025 funding provides for completion of Live Fire dynamic engine tests, continuation of flight/qualification testing, beginning of Low Rate Initial Production (LRIP), execution of Initial Operational Test and Evaluation (IOTE), beginning engine integration and A-kit development for the H-60V platform, and initiation of work to prepare for the Live Fire platform level testing (as needed). FY 2026 funding provides for H-60V A-kit CDR, and begins physical airframe integration. FY 2027 funding provides for continued H-60V physical integration and begins flight testing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: ITEP	232.159	250.533	228.036
Description: ITEP - a multi-platform turbine engine development required across existing Army aircraft to fill the capability gaps for Army Aviation Operations			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 funding will begin PFR testing, leading to a Preliminary Flight Rated engine in FY 2023, complete Apache A-Kit iCDR #2, complete Black Hawk A-Kit PDR, initiate Black Hawk A-Kit CDR, continue physical airframe integration, and continue Live Fire detailed test planning. ***FY 2023 Plans:*** FY 2023 funding provides for completion of Black Hawk A-Kit CDR, completion of Live Fire detailed test planning, initiation of aircraft flight/qualification testing, and the initiation of engine full qualification testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY 2022 to FY 2023 due to completion of First Engine to Test (FETT).			
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638	-	9.491	-
Accomplishments/Planned Programs Subtotals	232.159	260.024	228.036

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

For FY 2014 and prior, all funding for ITEP was contained in Program Element (PE) 0203744A - Aircraft Modifications/Product Improvement Programs, Project 504. FY 2015 funding was initially moved to PE 0203744A, Project EB1. Prior to execution, FY 2015 and beyond funding was moved to to PE 0607139A, Project ES6.

D. Acquisition Strategy

Following a successful Milestone B decision, a cost-plus-incentive-fee contract was awarded to General Electric for EMD contractual effort in FY 2019.

ITEP Platform Integration Trade Studies Contracts were awarded to the Boeing Company and the Sikorsky Corporation in FY 2015. In FY 2019, two follow-on efforts were awarded to design and develop A-kits to integrate the ITE into both the Apache and Black Hawk platforms. Following a successful Apache A-Kit iCDR in FY 2021 and FY 2022, and Black Hawk A-Kit CDR in FY2023, the integration efforts will continue to include fabrication of the A-kits, flight test support, and pubs/provisioning.

Upon completion of EMD, an LRIP contract will be awarded in FY 2025.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / *Improved Turbine Engine Program*	Project (Number/Name) ES6 / *Improved Turbine Engine Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP SEPM - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	45.462	9.550	Nov 2020	9.749	Oct 2021	9.881	Oct 2022	-		9.881	Continuing	Continuing	Continuing
ITEP SEPM - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	17.757	3.608	Nov 2020	3.878	Oct 2021	3.975	Oct 2022	-		3.975	Continuing	Continuing	Continuing
ITEP SEPM - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	20.641	2.215	Oct 2020	2.365	Oct 2021	2.425	Oct 2022	-		2.425	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	Army : TBD	-	-		9.491	Mar 2022	-		-		-	0.000	9.491	-
		Subtotal	83.860	15.373		25.483		16.281		-		16.281	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine OEM EMD Contract	C/CPIF	General Electric Company (GE) : Lynn, MA	254.167	148.495	Nov 2020	131.914	Oct 2021	85.905	Oct 2022	-		85.905	Continuing	Continuing	Continuing
Platform Integration and Qualification Contracts	SS/CPIF	The Boeing Company, The Sikorsky	58.468	42.019	Apr 2021	71.697	Jan 2022	93.662	Oct 2022	-		93.662	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607139A / *Improved Turbine Engine Program*	Project (Number/Name) ES6 / *Improved Turbine Engine Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Corporation : Phoenix, AZ, Stratford, CT													
		Subtotal	312.635	190.514		203.611		179.567		-		179.567	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ITEP Engineering Support - Organic	Allot	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	0.835	0.182	Oct 2020	0.186	Oct 2021	0.189	Oct 2022	-		0.189	Continuing	Continuing	Continuing
ITEP Engineering Support - Contractor	C/IDIQ	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	10.780	2.729	Oct 2020	2.894	Oct 2021	2.966	Oct 2022	-		2.966	Continuing	Continuing	Continuing
ITEP Engineering Support - OGA	MIPR	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	29.637	11.119	Nov 2020	12.405	Oct 2021	12.510	Oct 2022	-		12.510	Continuing	Continuing	Continuing
Platform Integration Support	MIPR	Program Management Office (PMO) Apache and Black Hawk Project	3.765	5.955	Oct 2020	6.075	Oct 2021	6.196	Oct 2022	-		6.196	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Offices : Redstone Arsenal, AL													
		Subtotal	45.017	19.985		21.560		21.861		-		21.861	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test Planning/Flight Test Support and Analysis	SS/TBD	Program Management Office (PMO) Aviation Turbine Engines Project Office (ATE), Various : Redstone Arsenal, AL	0.624	6.287	Oct 2020	9.370	Oct 2021	10.327	Oct 2022	-		10.327	Continuing	Continuing	Continuing
		Subtotal	0.624	6.287		9.370		10.327		-		10.327	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	442.136	232.159		260.024		228.036		-		228.036	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

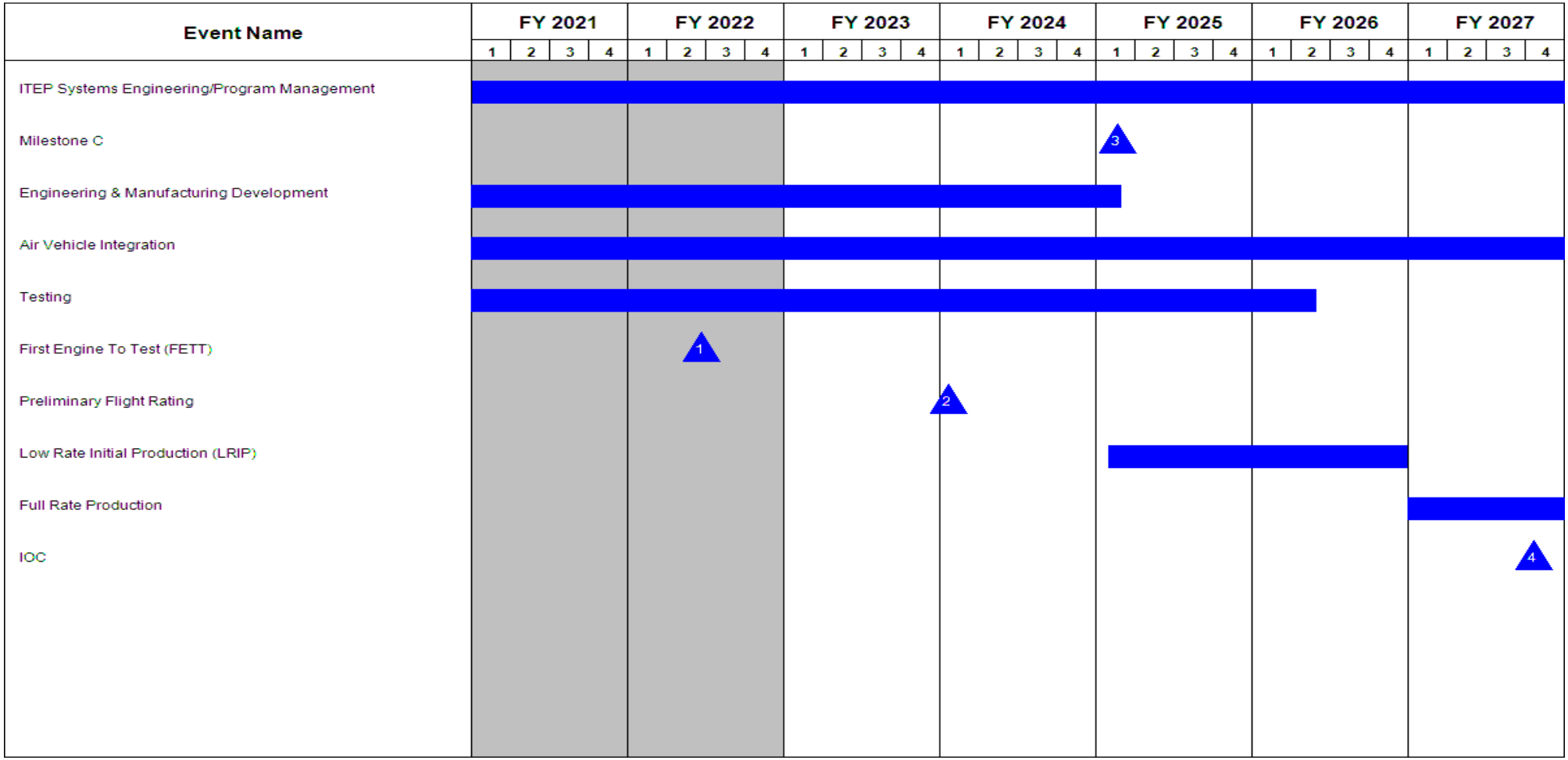


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607139A / *Improved Turbine Engine Program*	**Project (Number/Name)** ES6 / *Improved Turbine Engine Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ITEP Systems Engineering/Program Management	1	2015	4	2030
Milestone C	1	2025	1	2025
Engineering & Manufacturing Development	2	2019	1	2025
Critical Design Review (CDR)	4	2020	4	2020
Air Vehicle Integration	2	2019	4	2030
Testing	2	2019	2	2026
First Engine To Test (FETT)	2	2022	2	2022
Preliminary Flight Rating	1	2024	1	2024
Low Rate Initial Production (LRIP)	1	2025	4	2026
Full Rate Production	1	2027	4	2037
IOC	4	2027	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607142A *I Aviation Rocket System Product Improvement and Development*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	11.321	12.417	11.312	-	11.312	3.078	0.000	0.000	0.000	Continuing	Continuing
EW9: *Aviation Rocket System Product Improvement and Dev*	-	11.321	12.417	11.312	-	11.312	3.078	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2023 dollars in the amount of $11.312 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607142A *I Aviation Rocket System Product Improvement and Development*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	13.421	12.417	0.000	-	0.000
Current President's Budget	11.321	12.417	11.312	-	11.312
Total Adjustments	-2.100	0.000	11.312	-	11.312
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.100	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	11.312	-	11.312

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / *Aviation Rocket System Product Improvement and Development*	Project (Number/Name) EW9 / *Aviation Rocket System Product Improvement and Dev*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EW9: *Aviation Rocket System Product Improvement and Dev*	-	11.321	12.417	11.312	-	11.312	3.078	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2023 dollars in the amount of $11.312 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Guided Air-to-Ground Rocket (AGR) variants (Advanced Precision Kill Weapon System (APKWS))	0.748	0.785	0.801
Description: These funds will be used to optimize current and future air-to ground variant integration on the Apache and for activities required to obtain an Army Full Materiel Release (FMR). This effort will utilize in-house expertise and Other Government Agencies in order to complete activities to include design and build of all-up-round (AUR) containers and test assets, conduct of environmental qualification testing, performance of ground firings, update of aviation platform software, support of Apache weapon survey firings, technical support to platform integration and testing, and development and revision of training/maintenance materiel.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607142A / *Aviation Rocket System Product Improvement and Development*	**Project (Number/Name)** EW9 / *Aviation Rocket System Product Improvement and Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
1. Complete development of fire control integration on the AH-64E Apache for current rotary wing guided variants, and continue fire control optimization for the single variant block upgrade variant. 2. Characterize performance changes/improvements of single software variant block upgrade of guided rockets and qualify for use on Army Aviation platforms. ***FY 2023 Plans:*** Complete characterization of performance changes/improvements of single software variant block upgrade of guided rockets and qualify for use on Army Aviation platforms. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Minimal increase accounts for inflation.			
Title: Army Aviation Weapons ***Description:*** These funds will be used for fielded Army Aviation modular weapon systems and their interface to fielded launchers and platforms. These efforts will utilize in-house subject matter expertise, Other Government Agencies, defense industry capabilities, and Other Transactional Agreements to complete activities to include technical assessment, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms. ***FY 2022 Plans:*** 1. Perform analysis, engineering design, and demonstration of propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub systems and Munitions (AAWSSM) Initial Capability Document and the Army Aviation Munition Strategy, and provide future munitions capabilities. 2. Assessments, development, risk reduction effort and documentation to determine feasibility of the adaptation of fielded/legacy launcher technologies with future launcher technologies. ***FY 2023 Plans:*** 1. Continue analysis, engineering design, and demonstration of propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document and the Army Aviation Munition Strategy. 2. Continue studies, assessments, risk reduction effort and documentation to determine feasibility of the adaptation of future guided and unguided munition technologies. 3. Proceed from launcher concept development to prototype development, integration, and testing phase with future and enduring munitions. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.762	4.193	9.767

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607142A / *Aviation Rocket System Product Improvement and Development*	**Project (Number/Name)** EW9 / *Aviation Rocket System Product Improvement and Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to additional emphasis on technology and concept maturation supporting the Army Aviation Munition Strategy.			
Title: Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA) ***Description:*** These funds will be used to upgrade and enhance launcher components to support current and future munitions outlined in the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, dated 17 July 2018, the Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 Oct 2019, and the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021. This effort allows the Government to align technology-enabling solutions with the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, maturing technological developments of launcher component prototypes to mitigate launcher limitations. The launcher component efforts will define and provide the interfaces between aircraft and emerging munitions utilizing a nonproprietary, open systems architecture allowing easy compatibility when integrating onto aviation platforms. The inherent flexibility of an open architecture serves as a building block for future weapon systems. ***FY 2022 Plans:*** 1. Continue Launcher Electronics Assembly (LEA) development. 2. Inform fielded/legacy launcher capabilities against evolving threats and with future munitions/launch platform interface requirements. ***FY 2023 Plans:*** 1. Complete launcher technologies architecture design, and structure concept development. 2. Complete technical assessments and concept studies to inform capabilities against evolving threats. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to completion of efforts.	9.811	6.986	0.744
Title: SBIR/STTR ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.453	-
Accomplishments/Planned Programs Subtotals	11.321	12.417	11.312

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607142A / *Aviation Rocket System Product Improvement and Development*	**Project (Number/Name)** EW9 / *Aviation Rocket System Product Improvement and Dev*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E37300: *Rocket, Hydra 70, All Types*	159.795	117.536	171.697	-	171.697	64.937	73.261	96.162	76.532	Continuing	Continuing

Remarks

E37300 procures guided and unguided Hydra Rockets

D. Acquisition Strategy

The Acquisition Strategy utilizes in-house expertise, Other Government Agencies, defense industry capabilities, and when appropriate Other Transactional Agreements. The strategy allows the Government the ability to support urgent operational needs and unanticipated requirements, which require immediate and expert attention.

This strategy will allow for the Government to maintain the relevance of the Hydra-70 all-up-round rocket, its variants, and Small Guided Munitions, and posture for emerging requirements and capabilities, while leveraging new authorities and progressing as many technologies as funding allows.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / *Aviation Rocket System Product Improvement and Development*	Project (Number/Name) EW9 / *Aviation Rocket System Product Improvement and Dev*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering/ Project Management	Various	Various : Performers	8.879	1.902	Oct 2020	2.038	Nov 2021	2.079	Nov 2022	-		2.079	Continuing	Continuing	-
SBIR/STTR	C/TBD	Various : Various	-	-		0.453	Apr 2022	-		-		-	Continuing	Continuing	-
		Subtotal	8.879	1.902		2.491		2.079		-		2.079	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Precision Kill Weapon System (APKWS)	MIPR	CCDC : Redstone Arsenal, AL	1.388	0.405	Apr 2021	0.667	Apr 2022	0.681	Apr 2023	-		0.681	0.000	3.141	-
Army Aviation Weapons	MIPR	Various : Various Performers	11.963	0.419	Mar 2021	0.678	Mar 2022	5.002	Mar 2023	-		5.002	Continuing	Continuing	-
Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA)	MIPR	CCDC : Redstone Arsenal, AL	-	8.595	Mar 2021	5.712	Jan 2022	0.624	Jan 2023	-		0.624	Continuing	Continuing	-
		Subtotal	13.351	9.419		7.057		6.307		-		6.307	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Research Studies	MIPR	CCDC : Redstone Arsenal, AL	2.076	-		2.869	Jan 2022	2.926	Jan 2023	-		2.926	Continuing	Continuing	-
		Subtotal	2.076	-		2.869		2.926		-		2.926	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.306	11.321		12.417		11.312		-		11.312	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / *Aviation Rocket System Product Improvement and Development*	Project (Number/Name) EW9 / *Aviation Rocket System Product Improvement and Dev*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607142A / *Aviation Rocket System Product Improvement and Development*	**Project (Number/Name)** EW9 / *Aviation Rocket System Product Improvement and Dev*

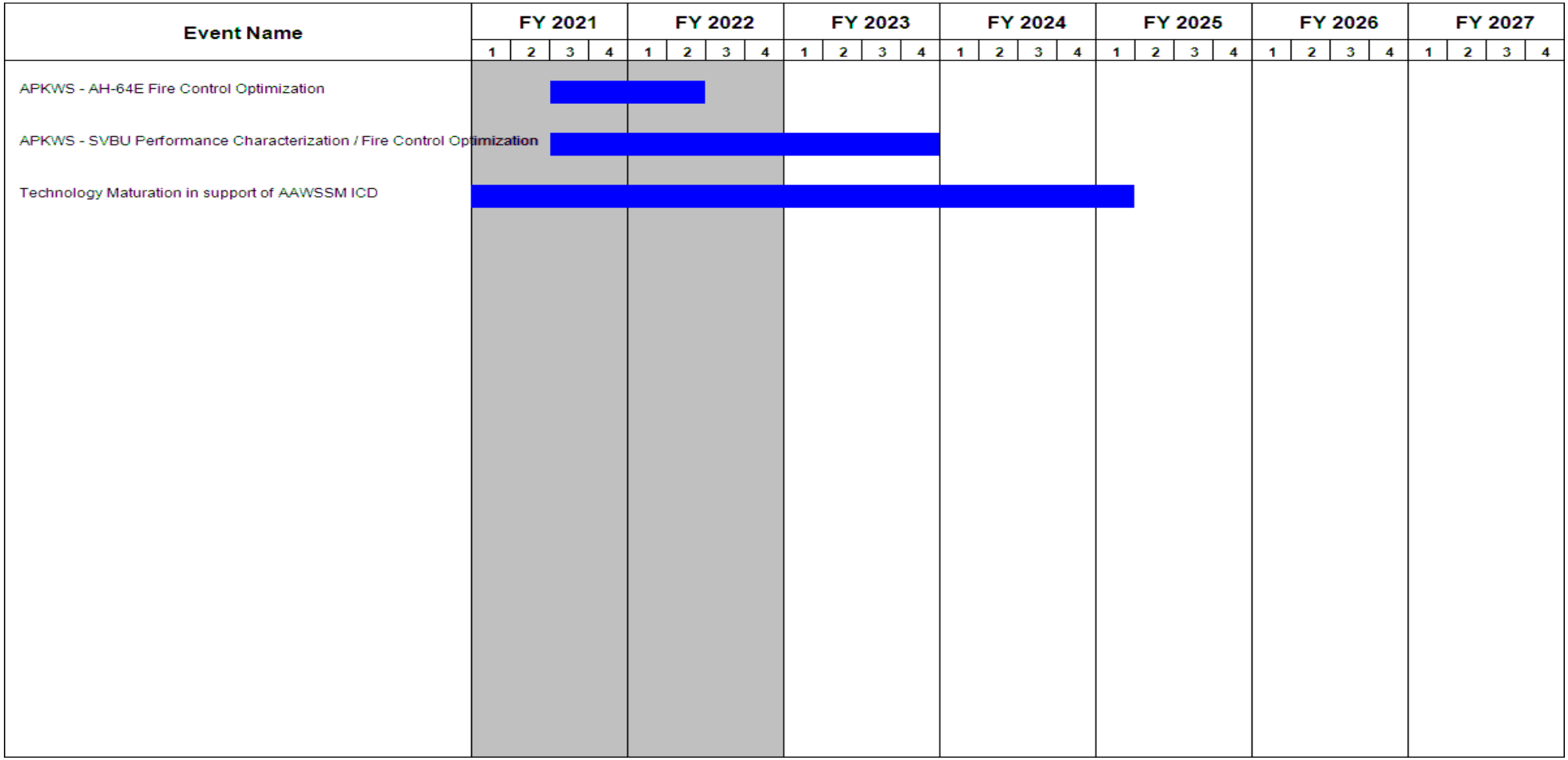


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607142A / *Aviation Rocket System Product Improvement and Development*	**Project (Number/Name)** EW9 / *Aviation Rocket System Product Improvement and Dev*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
APKWS - AH-64E Fire Control Optimization	3	2021	2	2022
APKWS - SVBU Performance Characterization / Fire Control Optimization	3	2021	4	2023
Technology Maturation in support of AAWSSM ICD	2	2019	1	2025

Note

APKWS: Advanced Precision Kill Weapon System
AAWSSM ICD: Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document
SVBU: Single Variant Block Upgrade

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	19.460	4.594	0.512	-	0.512	0.514	0.513	0.514	0.519	Continuing	Continuing
EX1: *Unmanned Aircraft Systems Universal Products*	-	19.460	4.594	0.512	-	0.512	0.514	0.513	0.514	0.519	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line directly aligns to the Future Vertical Lift (FVL) portfolio. Scalable Control Interface (SCI) will be the primary means of Command and Control (C2) for Future Unmanned Aircraft Systems (FUAS), to include Air Launched Effects (ALE), Future Tactical UAS (FTUAS) and optionally manned rotary wing aircraft. Mission Command devices in both ground and airborne platforms will host SCI software, serving as nodes on the Integrated Tactical Network to retrieve and provide data. SCI distributes UAS capabilities by greatly increasing the number of UAS control devices available to Soldiers, Commanders, and Battle Staff. SCI provides simultaneous employment of multiple aircraft/payloads from a single control node. SCI leverages a Modular Open System Approach (MOSA) to software in order to reduce time and cost to integrate new hardware and software in response to the dynamic future operating environment.

Deployment of SCI will include, but is not limited to, devices in the Mobile/Handheld Computing Environment (such as Nett Warrior) and Mounted Computing Environment (such as MFoCS [Mounted Family of Computer Systems]), and Command Post Computing Environment (such as TSI [Tactical Server Infrastructure). SCI will integrate decision aiding, autonomy, and artificial intelligence as they mature technically, in order to support MDO and reduce cognitive workload.

Justification: Fiscal Year (FY) 2023 SCI (Universal Products) Base funding of $0.512 million will continue the development, testing, and integration of software applications needed to address the SCI requirements that support Nett Warrior, Mounted Family of Computer Systems (MFoCS), and Tactical Server Infrastructure (TSI).

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	19.460	4.594	0.000	-	0.000
Current President's Budget	19.460	4.594	0.512	-	0.512
Total Adjustments	0.000	0.000	0.512	-	0.512
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.512	-	0.512

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: EX1: *Unmanned Aircraft Systems Universal Products*		
Congressional Add: *Micro Identification Friend or Foe Transmitters*	5.000	-
Congressional Add: *Program increase - scalable control interface*	7.000	-
Congressional Add Subtotals for Project: EX1	12.000	-
Congressional Add Totals for all Projects	12.000	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607143A / *Unmanned Aircraft System Universal Products*	Project (Number/Name) EX1 / *Unmanned Aircraft Systems Universal Products*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EX1: *Unmanned Aircraft Systems Universal Products*	-	19.460	4.594	0.512	-	0.512	0.514	0.513	0.514	0.519	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line directly aligns to the Future Vertical Lift (FVL) portfolio. Scalable Control Interface (SCI) will be the primary means of Command and Control (C2) for Future Unmanned Aircraft Systems (FUAS), to include Air Launched Effects (ALE), Future Tactical UAS (FTUAS) and optionally manned rotary wing aircraft. Mission Command devices in both ground and airborne platforms will host SCI software, serving as nodes on the Integrated Tactical Network to retrieve and provide data. SCI distributes UAS capabilities by greatly increasing the number of UAS control devices available to Soldiers, Commanders, and Battle Staff. SCI provides simultaneous employment of multiple aircraft/payloads from a single control node. SCI leverages a Modular Open System Approach (MOSA) to software in order to reduce time and cost to integrate new hardware and software in response to the dynamic future operating environment.

Deployment of SCI will include, but is not limited to, devices in the Mobile/Handheld Computing Environment (such as Nett Warrior) and Mounted Computing Environment (such as MFoCS [Mounted Family of Computer Systems]), and Command Post Computing Environment (such as TSI [Tactical Server Infrastructure). SCI will integrate decision aiding, autonomy, and artificial intelligence as they mature technically, in order to support MDO and reduce cognitive workload.

Justification: Fiscal Year (FY) 2023 SCI (Universal Products) Base funding of $0.512 million will continue the development, testing, and integration of software applications needed to address the SCI requirements that support Nett Warrior, Mounted Family of Computer Systems (MFoCS), and Tactical Server Infrastructure (TSI).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Scalable Control Interface (SCI)	7.460	4.426	0.512
Description: SCI will be the primary means of C2 for Program of Record Army UAS. SCI software will be hosted on Mission Command devices in both ground and airborne platforms serving as nodes on the Integrated Tactical Network to retrieve and provide data. SCI distributes UAS capabilities by greatly increasing the number of UAS control devices available to Soldiers, Commanders, and Battle Staff. SCI provides simultaneous employment of multiple aircraft/payloads from a single control node.			
FY 2022 Plans: Base Funding of $4.594 million will be used to continue the development, integration, test, and demonstration of software applications meeting the SCI MOSA/FACE compliant Software requirement on host Mission Command devices.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*	**Project (Number/Name)** EX1 / *Unmanned Aircraft Systems Universal Products*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Base Funding of $0.512 million will be used to continue the development, integration, test, and demonstration of software applications meeting the SCI Software requirements and hosted Mission Command devices as detailed in the SCI A-CDD. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Based on shifting Army priorities, the UAS Universal Products requirement/mission shifted to Scalable Control Interface (SCI) under the Army Modernization effort and aligned with the Future Vertical Lift program.			
Title: FY22 SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR amount in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR amount in accordance with Title 15 USC 638	-	0.168	-
Accomplishments/Planned Programs Subtotals	7.460	4.594	0.512

	FY 2021	FY 2022
Congressional Add: Micro Identification Friend or Foe Transmitters ***FY 2021 Accomplishments:*** This funding is planned to take a micro transponder capable of Mode 5 through certification and integration in support of UAS Universal Products. This includes IFF capabilities added to include: ADS-B in support of Gray Eagle UAS; Diversity with dual antennas and processing both antenna signals; Mode 5 Level 2-B (added message set and extended squitter); and TCAS / Collision Avoidance support. .	5.000	-
Congressional Add: Program increase - scalable control interface ***FY 2021 Accomplishments:*** Completed SCI portable software component development and integration for MVP1. Conducted lab and live flight tests demonstrations of MVP1 capability. Participated in Project Convergence 2021 Capability Showcase. Developed SCI user interface for ALE employment from FARA cockpit. Completed SCI Mounted/Dismounted MVP1 capability and conducted lab and live flight tests demonstrations.	7.000	-
Congressional Adds Subtotals	12.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*	**Project (Number/Name)** EX1 / *Unmanned Aircraft Systems Universal Products*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A02706: *Universal Ground Control Equipment (UAS)*	7.509	-	0.000	-	0.000	-	-	-	-	0.000	7.509

Remarks

D. Acquisition Strategy

SCI Software development and integration efforts are conducted under separate contracts awarded to niche experts in UAS software development, Human Machine Interface development and integration, and Mobile/Handheld and Mounted Computing Environment capabilities. Government ownership and management of the MOSA software interface standards is streamlining time and cost required to integrate future unmanned aircraft and payloads and reduce training resources by implementing a common user interface.

SCI promotes a competitive software application industry and provides warfighters with prompt updates by rapidly integrating best of breed software applications instead of relying on costly sole source sustainment of monolithic software well past its usable lifecycle.

SCI will reuse the Arbitrator Suite software. SCI reuses other government owned software as available in order to reduce program schedule and cost.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607143A / *Unmanned Aircraft System Universal Products*	Project (Number/Name) EX1 / *Unmanned Aircraft Systems Universal Products*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR	TBD	TBD : TBD	-	-		0.168	Apr 2022	-		-		-	0.000	0.168	-
		Subtotal	-	-		0.168		-		-		-	0.000	0.168	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Universal Products (UGCS) Improvements	C/CPFF	TBD : TBD	17.124	-		-		-		-		-	0.000	17.124	-
Training Device Improvements	C/CPFF	TBD : TBD	3.917	-		-		-		-		-	0.000	3.917	-
Scalable Control Interface (SCI) Software Development	C/Various	Various : Various	69.759	14.460	Mar 2021	4.426	Mar 2022	0.512	Mar 2023	-		0.512	0.000	89.157	-
Micro Identification Friend or Foe Transmitter	C/CPFF	R3 Engineering : Palmetto, FL	-	5.000	Apr 2021	-		-		-		-	0.000	5.000	-
		Subtotal	90.800	19.460		4.426		0.512		-		0.512	0.000	115.198	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	90.800	19.460		4.594		0.512		-		0.512	0.000	115.366	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*	**Project (Number/Name)** EX1 / *Unmanned Aircraft Systems Universal Products*

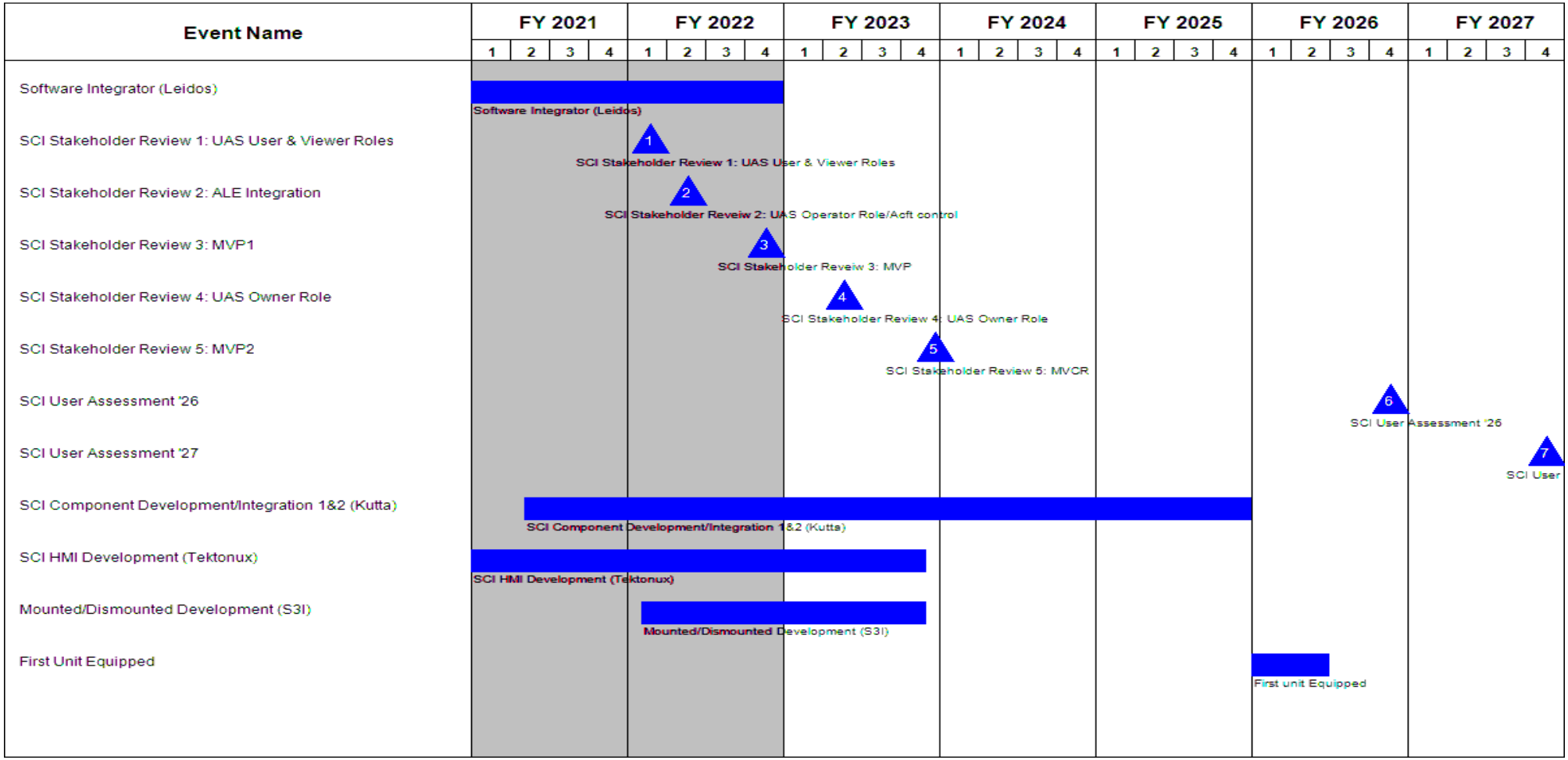


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607143A / *Unmanned Aircraft System Universal Products*	**Project (Number/Name)** EX1 / *Unmanned Aircraft Systems Universal Products*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Kutta Software Infrastrurcture Prototyping	3	2019	2	2020
Software Integrator (Leidos)	2	2020	4	2022
SCI Reference Architecture Demo	2	2020	2	2020
SCI Flight/Network Demo	4	2020	4	2020
SCI Stakeholder Review 1: UAS User & Viewer Roles	1	2022	1	2022
SCI Stakeholder Review 2: ALE Integration	2	2022	2	2022
SCI Stakeholder Review 3: MVP1	4	2022	4	2022
SCI Stakeholder Review 4: UAS Owner Role	2	2023	2	2023
SCI Stakeholder Review 5: MVP2	4	2023	4	2023
SCI User Assessment '26	4	2026	4	2026
SCI User Assessment '27	4	2027	4	2027
SCI Component Development/Integration 1&2 (Kutta)	2	2021	4	2025
SCI HMI Development (Tektonux)	4	2020	4	2023
Mounted/Dismounted Development (S3I)	1	2022	4	2023
First Unit Equipped	1	2026	2	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607145A / *Apache Future Development*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	52.502	10.067	10.074	-	10.074	10.770	0.000	0.000	0.000	0.000	83.413
FD5: *Apache Product Improvement*	-	52.502	10.067	10.074	-	10.074	10.770	-	-	-	0.000	83.413

A. Mission Description and Budget Item Justification

The Apache Capabilities Enhancements (ACE) prioritizes, informs, influences, matures, tracks, statuses, and packages technologies and/or material solutions to address known capability gaps, identified during real-world combat missions and associated with current/emerging threats; for transition to Apache development for integration and implementation to the AH-64E fleet to increase combat capability.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	52.502	10.067	0.000	-	0.000
Current President's Budget	52.502	10.067	10.074	-	10.074
Total Adjustments	0.000	0.000	10.074	-	10.074
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	10.074	-	10.074

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: FD5: *Apache Product Improvement*		
Congressional Add: *Program Increase - Crossbow*	5.000	-
Congressional Add Subtotals for Project: FD5	5.000	-
Congressional Add Totals for all Projects	5.000	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607145A / *Apache Future Development*	Project (Number/Name) FD5 / *Apache Product Improvement*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FD5: *Apache Product Improvement*	-	52.502	10.067	10.074	-	10.074	10.770	-	-	-	0.000	83.413
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Apache Capabilities Enhancements (ACE) prioritizes, informs, influences, matures, tracks, statuses, and packages technologies and/or material solutions to address known capability gaps, identified during real-world combat missions and associated with current/emerging threats; for transition to Apache development for integration and implementation to the AH-64E fleet to increase combat capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Product Development	2.245	9.700	10.074
Description: Future development of production program. ***FY 2022 Plans:*** Apache Program management Office (PMO) will continue to develop a phased approach to incorporate an Improved Tail Rotor Drive System (ITRDS) for the AH-64 platform. This second phase will build on the previous efforts that culminated in Preliminary Design Review (PDR). This phase will used the information gained previously and culminate in the Critical Design Review (CDR). Ultimately, these product improvements would increase performance from the legacy design, decrease the maintenance burden on the warfighter, and reduce overall O&S costs. These improvements would also build the infrastructure for an improved Drive system that will be able to handle increased performance upgrades, provide a positive impact to future sustainment, support Multi-Domain Operations, and ensuring the warfighter is not placed in a catastrophic situation when it is preventable. Additionally, As Joint Battle Spaces become more and more technically demanding, the need for greater processing power, hardware and software that supports Open System Architecture also increases. The Apache PMO needs to pursue trade studies and demonstrations on capabilities that support Open System Architecture and speeding insertions of technology. The funding would be utilized to conduct analysis, determine feasibility, identify integration			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607145A / *Apache Future Development*	**Project (Number/Name)** FD5 / *Apache Product Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
challenges and ultimately prove out these capabilities. ***FY 2023 Plans:*** Apache Project Management Office (PMO) will continue a phased approach to develop an Improved Tail Rotor Drive System (ITRDS) for the AH-64 platform. Phase III will consist of pre-qualification and risk reduction efforts. During this Phase, the PMO will procure parts and will initiate manufacturing and prototyping efforts for the design. Test plans and procedures are generated and pre-tests conducted to ensure design is stable prior to qualification. Ultimately, these product improvements will increase performance and safety from the legacy design, decrease the maintenance burden on the warfighter, and reduce overall O&S costs. These improvements will also build the infrastructure for an improved Drive System that will support Multi-Domain Operations, able to handle increased performance upgrades, provide a positive impact to future sustainment, and increase operator safety margin. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase in funding for Project FD5 Apache Product Improvement from FY22 to FY23 results from additional costs of development for the Improved Tail Rotor Drive System (ITRDS).			
Title: Spike NLOS (Non Line Of Sight) ***Description:*** Apache will Federate the Spike NLOS (Non Line Of Sight) missile system by providing Program Management, Systems Engineering, Development Test, Live Fire Test, Life Cycle Management and Integrated Logistics. This effort will support the directed requirement for the AH-64D/E interim Long Range Precision Munition (LRPM) solution. The Army will optimize the Aviation munitions portfolio as part of this strategy creating reinvestment opportunities to close existing lethality gaps by making the portfolio sufficiently lethal for both manned and unmanned platforms against a broad range of increasingly more sophisticated threats. The Spike NLOS Kit consists of a bus controller, video recorder, weapons controller panel, hand control grip, weapons processor, communication pod, power relay box and associated wiring harnesses. Final fielded configuration will include 18 kits and 3 spares.	45.257	-	-
Title: FY22 SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR amount in accordance with Title 15 USC 638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR amount in accordance with Title 15 USC 638.	-	0.367	-
Accomplishments/Planned Programs Subtotals	47.502	10.067	10.074

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607145A / *Apache Future Development*	**Project (Number/Name)** FD5 / *Apache Product Improvement*

	FY 2021	FY 2022
Congressional Add: Program Increase - Crossbow	5.000	-
FY 2021 Accomplishments: This is for demonstration of the AH?64 dual-piloted portion of the CROSSBOW System		
Congressional Adds Subtotals	5.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A05111: *AH-64 Apache Block IIIA Reman*	961.487	661.366	693.879	-	693.879	824.847	583.309	41.967	41.789	6,118.130	9,926.774
• A05133: *AH-64 Apache Block IIIB New Build*	69.154	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• AA6605: *AH-64 MODS*	99.816	118.560	85.840	-	85.840	66.270	5.072	66.498	66.256	Continuing	Continuing

Remarks

D. Acquisition Strategy

The NRE will encompass subsystem integration and will utilize existing test aircraft, incorporate the technical insertions, and initiate appropriate qualification and operational flight-testing. In FY 2014, a contract for Apache AH-64E Lot 3, initiating Full Rate Production, was awarded with options for Lot 4. Training device concurrency will be maintained with each technical insertion. The Engineering/Manufacturing Design (EMD) effort is managed as Cost Reimbursable. Production efforts will be awarded as Fixed Price Incentive (FPI) and include the Advance Procurement requirements. In FY 2013, FY 2014, and FY 2015 MRL NRE encompassed US Government (USG) design of the Hydra Launcher Electronics Assembly (LEA), modification of the M261 launcher, launcher fabrication, and launcher testing. In FY 2015 - FY 2019, Apache AH-64E Version 6 System Development and Demonstration (SDD) Contract. Multi-year production awarded March 15, 2017. FY 2020 - FY 2023, the Apache Capabilities Enhancements (ACE) delivers required capability enhancements supported by Apache's Modernization Strategy to ensure AH-64E maintains relevance and dominance throughout its expected service life.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607145A / *Apache Future Development*	Project (Number/Name) FD5 / *Apache Product Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR	TBD	TBD : TBD	-	-		0.367	Apr 2022	-		-		-	0.000	0.367	-
		Subtotal	-	-		0.367		-		-		-	0.000	0.367	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TBD or TBD	TBD	TBD : TBD	5.224	7.252	Dec 2020	9.700	Aug 2022	10.074	Oct 2022	-		10.074	0.000	32.250	-
TBD	TBD	TBD : TBD	-	45.250	Jan 2021	-		-		-		-	0.000	45.250	-
		Subtotal	5.224	52.502		9.700		10.074		-		10.074	0.000	77.500	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.224	52.502		10.067		10.074		-		10.074	0.000	77.867	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607145A / *Apache Future Development*	**Project (Number/Name)** FD5 / *Apache Product Improvement*

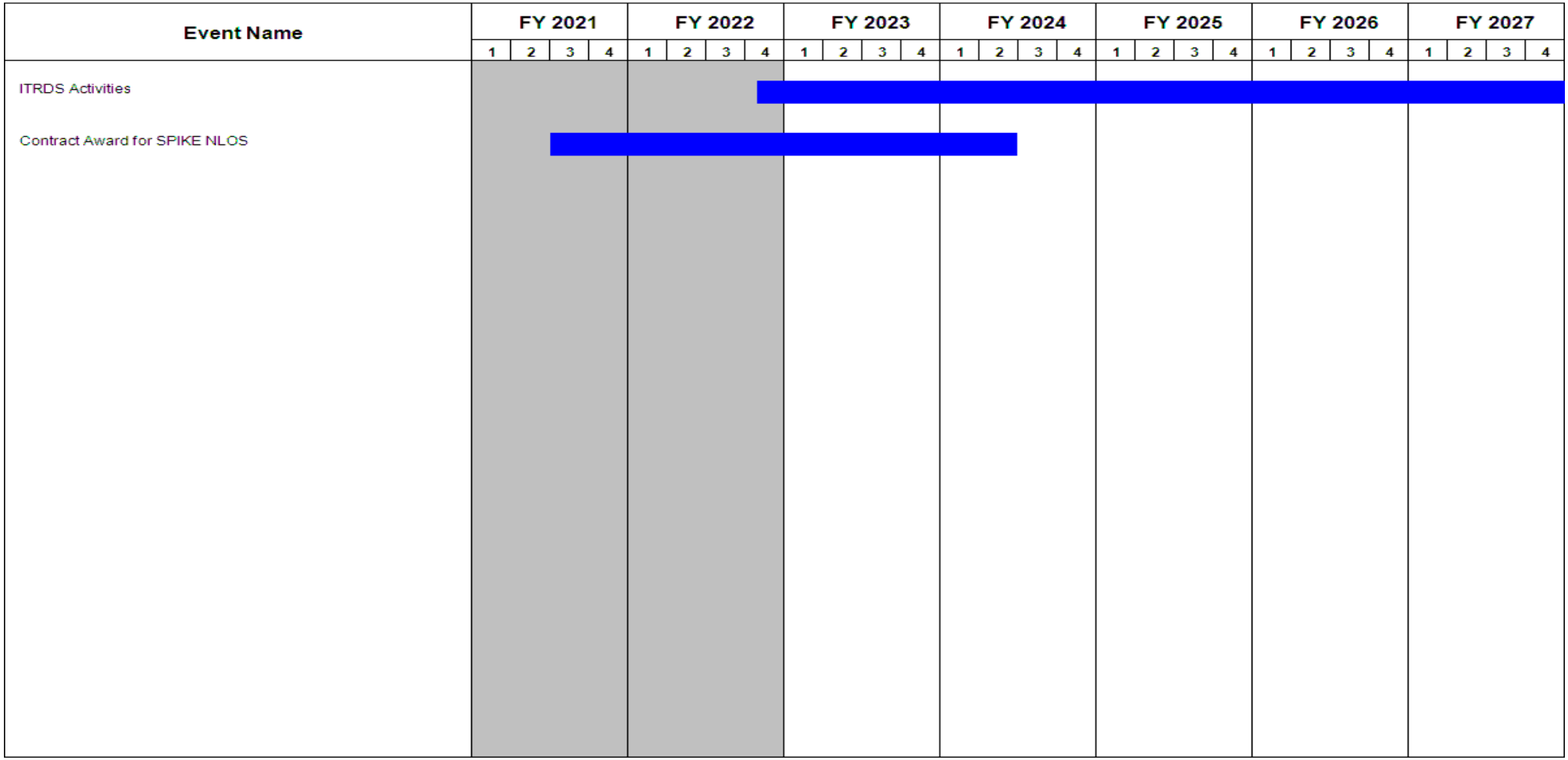


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607145A / *Apache Future Development*	**Project (Number/Name)** FD5 / *Apache Product Improvement*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ITRDS Activities	4	2022	4	2028
Contract Award for SPIKE NLOS	3	2021	2	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607148A *I AN/TPQ-53 Counterfire Target Acquisition Radar System*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	-	47.752	62.559	-	62.559	55.312	33.874	8.737	8.822	Continuing	Continuing
BY8: *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*	-	-	47.752	62.559	-	62.559	55.312	33.874	8.737	8.822	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Long Range Precision Fires (LRPF) Modernization Priority in support of the AN/TPQ-53 Counterfire target Acquisition Radar program. The AN/TPQ-53 Counterfire Target Acquisition Radar System is a highly mobile radar set that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) and replaces the AN/TPQ-36 and AN/TPQ-37 Firefinder Radars. The AN/TPQ-53 system interoperates with mission command systems to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-53 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-53 currently supports contingency operations to include Operation Inherent Resolve (OIR) and is provided to Brigade Combat Teams (BCTs), Field Artillery Brigades (FABs) and Division Artilleries (DIVARTYs).

Fiscal year (FY) 2023 modification-in-service research, development, test and evaluation (RDT&E) funds in the amount of $62.559 million supports the design and development of a hardware/software Multi Domain Operation (MDO) digitization upgrade kit to enhance system survivability, electronic protection (EP), bandwidth agility, and an integrated fires capability in a peer/near-peer threat environment. This includes development, integration, testing, and providing a capability beyond the current range and location accuracy requirements. Funding also supports efforts required to counter indirect fire and improve survivability against electronic warfare threats identified in the Validated Online Lifecycle Threat (VOLT).

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	56.681	0.000	-	0.000
Current President's Budget	0.000	47.752	62.559	-	62.559
Total Adjustments	0.000	-8.929	62.559	-	62.559
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.929			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	62.559	-	62.559

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607148A *I AN/TPQ-53 Counterfire Target Acquisition Radar System*

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	Project (Number/Name) BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BY8: *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*	-	-	47.752	62.559	-	62.559	55.312	33.874	8.737	8.822	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Long Range Precision Fires (LRPF) Modernization Priority in support of the AN/TPQ-53 Counterfire target Acquisition Radar program. The AN/TPQ-53 Counterfire Target Acquisition Radar System is a highly mobile radar set that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) and replaces the AN/TPQ-36 and AN/TPQ-37 Firefinder Radars. The AN/TPQ-53 system interoperates with mission command systems to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-53 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-53 currently supports contingency operations to include Operation Inherent Resolve (OIR) and is provided to Brigade Combat Teams (BCTs), Field Artillery Brigades (FABs) and Division Artilleries (DIVARTYs).

Fiscal year (FY) 2023 modification-in-service research, development, test and evaluation (RDT&E) funds in the amount of $62.559 million supports the design and development of a hardware/software Multi Domain Operation (MDO) digitization upgrade kit to enhance system survivability, electronic protection (EP), bandwidth agility, and an integrated fires capability in a peer/near-peer threat environment. This includes development, integration, testing, and providing a capability beyond the current range and location accuracy requirements. Funding also supports efforts required to counter indirect fire and improve survivability against electronic warfare threats identified in the Validated Online Lifecycle Threat (VOLT).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: MDO Digitization / Distributed Digital Receiver Exciter (DDREX)	-	35.760	49.752
Description: MDO Digitization / Distributed Digital Receiver Exciter (DDREX) is a mod-in-service Engineering Change Proposal (ECP) that provides increased force protection by addressing emerging and evolving electronic attack threats, improving electronic protection capabilities against Cyber Electromagnetic Activity (CEMA), and improving performance in a congested spectrum/environment via waveform diversity, spectrum agility and broadening the operational bandwidth. The system is also less susceptible to directed energy, jamming and anti-radiation missiles and provides improved extended range capability to enable timely and accurate targetable data in support of Long Range Precision Fires (LRPF).			
FY 2022 Plans: FY 2022 modification-in-service research, development, test and evaluation (RDT&E) funds in the amount of $35.760 million supports the DDREX modification kit system design, architecture and interface definition, hardware/software design and			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	**Project (Number/Name)** BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
development, initial system integration and test and material required for engineering development models. This DDREX development effort also includes associated government engineering support. ***FY 2023 Plans:*** FY 2023 modification-in-service research, development, test and evaluation (RDT&E) funds in the amount of $49.752 million supports the continuation of DDREX modification kit design, architecture and interface definition, hardware/software design and development in support of Capability Set #1 and Capability Set #2, and the procurement, delivery, integration, and testing of four DDREX Engineering Development Models (EDMs). This digitization upgrade kit will enhance system survivability (electronic protect (EP)) in a peer/near-peer threat environment and provide a capability that supports the latest range and location accuracy requirements. These Capability Sets, which include development of DDREX hardware and software to enable advanced survivability capability, will increase Counterfire Target Acquisition (CTA) performance and radar survivability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in FY 2023 funding required for additional engineering development model (EDM) studies as well as EDM phase 2 software development for increased system protection/survivability.			
Title: Modernization Development Efforts and Emerging Threats ***Description:*** Modernization Development Efforts and Emerging Threats provides the ability to address upcoming threats on the battlefield by countering indirect fire and improving survivability against electronic warfare threats identified in the Validated Online Lifecycle Threat (VOLT). These efforts will continue to address complex evolving threats through advanced survivability development. ***FY 2022 Plans:*** FY 2022 funding of $8.453 million supports software updates to counter new and emerging indirect fire munitions and improve survivability against electronic warfare threats identified in the VOLT. ***FY 2023 Plans:*** FY 2023 modification-in-service research, development, test and evaluation (RDT&E) funds in the amount of $9.037 million supports the Modernization Development Efforts and Emerging Threats. This requirement provides the ability to address upcoming threats on the battlefield by countering indirect fire and improving survivability against electronic warfare threats identified in the VOLT. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in FY 2023 funding required for modeling and simulation efforts in support of Capability Set #2.	-	8.453	9.037
Title: Program Management Support	-	1.796	3.770

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	**Project (Number/Name)** BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Program management efforts include engineering, integration, and test support associated with DDREX development and modernization efforts addressing new and emerging threats. ***FY 2022 Plans:*** FY 2022 funding of $1.796 million supports program management requirements. ***FY 2023 Plans:*** FY 2023 funding of $3.770 million supports program management requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in FY 2023 funding in support of two DDREX software baselines compared to one software baseline in FY 2022.			
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	1.743	-
Accomplishments/Planned Programs Subtotals	-	47.752	62.559

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0604823A: *Firefinder*	18.278	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• B05310: *AN/TPQ-53 Counterfire Target Acquisition Radar*	71.404	-	91.233	-	91.233	-	-	-	-	Continuing	Continuing
• BA5315: *AN/TPQ-53 MOD-IN-SERVICE LINE*	-	26.694	70.975	-	70.975	101.825	119.283	120.089	120.035	Continuing	Continuing

Remarks

D. Acquisition Strategy

The AN/TPQ-53 leverages technology developed in the multi-mission radar advanced technology objective (ATO) program. A Full Rate Production (FRP) decision was obtained in December 2015. The FRP contract to fill the remainder of the Army Acquisition Objective (AAO) was awarded in March 2017. Additionally, all initial

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	**Project (Number/Name)** BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*

production systems will be retrofitted to the FRP configuration. The AAO was increased from 174 to 189 systems in May 2017; the program has procured the AAO of 189 systems. Army approved a Total Army Analysis (TAA) force structure change in FY 2020. The AN/TPQ-53 system replaces all of the AN/TPQ-36 and AN/TPQ-37 systems in the fleet.

The AN/TPQ-53 multi-domain operations digitization effort full-up development begins in FY 2022. This effort will build upon ongoing full rate production (FRP) configuration risk mitigation activities and upgrades such as Gallium Nitride (GaN), signal data processor (SDP), extended range (ER), electronic protection, and secure contractor facilitization efforts. The initial development task order will take place on the FRP Indefinite Delivery Indefinite Quantity (IDIQ) contract in 1Q FY 2022 and will include engineering development, design, prototyping, subsystem integration and test, and survivability software (electronic protect). Due to the Period of Performance on the FRP IDIQ, a second development order will be put in place in 2QFY23 to develop and harden the survivability software. The development work starting in FY23 culminates in an Operational Test in 4QFY25. Initial production representative assets to include an initial survivability capability will undergo a DDREX Live Fire Soldier Touch Point in FY 2024 to support a procurement decision for 51 digitization mod kits. The program will utilize FY 2024-2026 procurement funds to support the mod kit buys, organic depot facilitization, and updates to technical manuals and training materials. Supply transition and full material release are planned for FY 2026. The program will utilize procurement funds to retrofit and re-field systems with digitization mod kits beginning in FY 2026. In FY 2027, the digitization configuration transitions to organic depot support and its related software build transitions to organic software support.

The AN/TPQ-53 program will develop growing capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	Project (Number/Name) BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY22 SBIR/STTR Transfer	SS/TBD	Various : Various	-	-		1.743	May 2022	-		-		-	0.000	1.743	Continuing
		Subtotal	-	-		1.743		-		-		-	0.000	1.743	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Modernization Development Efforts and EmergingThreats	SS/CPFF	Lockheed Martin : Syracuse, NY	-	-		8.453	Mar 2022	9.037	Dec 2022	-		9.037	0.000	17.490	Continuing
MDO Digitization / Distributed Digital Receiver Exciter (DDREX)	SS/CPFF	Lockheed Martin : Syracuse, NY	-	-		35.760	Mar 2022	49.752	Dec 2022	-		49.752	0.000	85.512	Continuing
		Subtotal	-	-		44.213		58.789		-		58.789	0.000	103.002	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Government	SS/ Various	Various : Various	-	-		0.916	Mar 2022	1.922	Nov 2022	-		1.922	0.000	2.838	Continuing
Program Management Support - Contractor	SS/ Various	Various : Various	-	-		0.880	Mar 2022	1.848	Nov 2022	-		1.848	0.000	2.728	Continuing
		Subtotal	-	-		1.796		3.770		-		3.770	0.000	5.566	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		47.752		62.559		-		62.559	0.000	110.311	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	**Project (Number/Name)** BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*

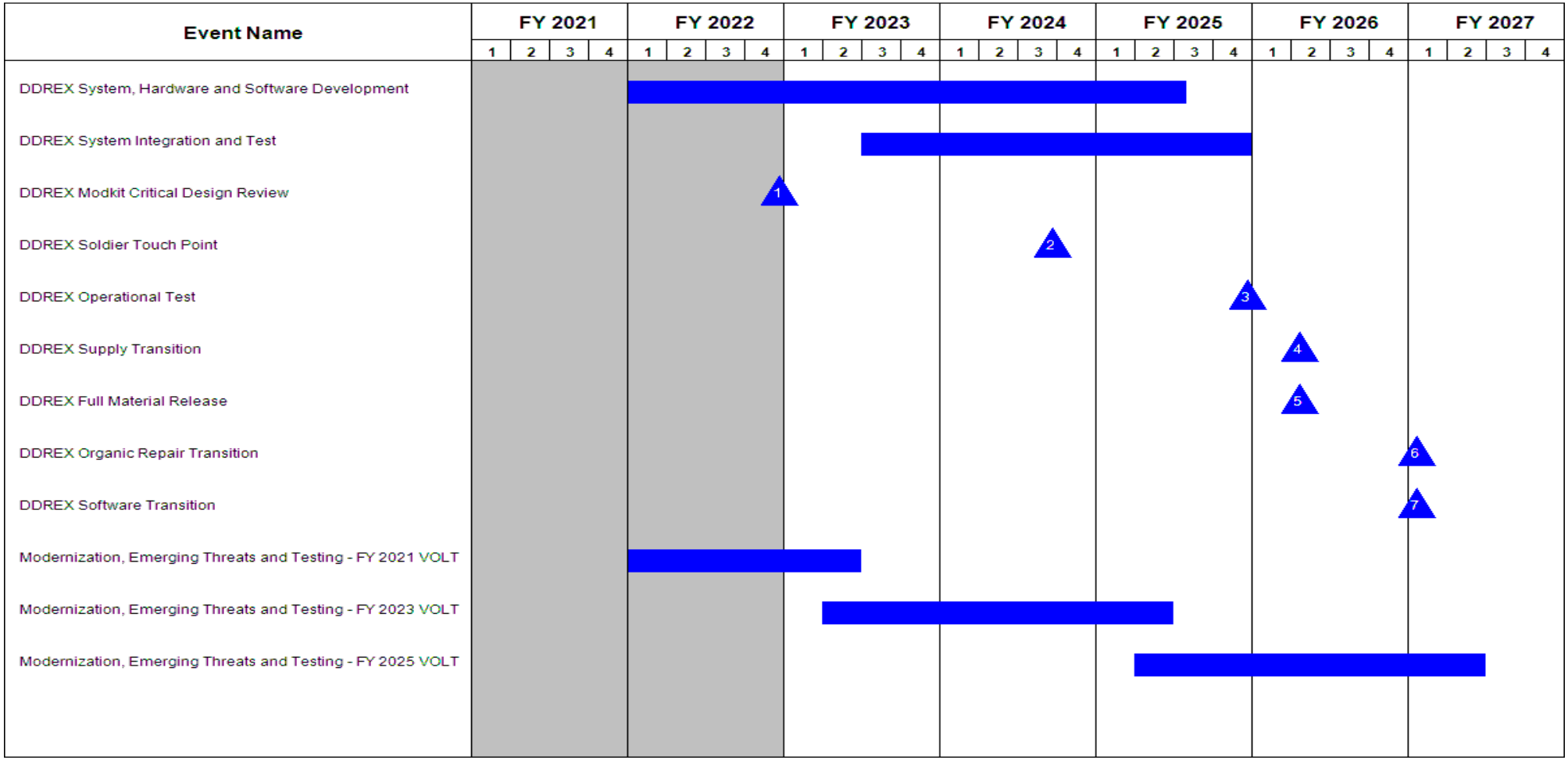


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607148A / *AN/TPQ-53 Counterfire Target Acquisition Radar System*	**Project (Number/Name)** BY8 / *AN/TPQ-53 Counterfire Target Acquisition Radar Sys*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DDREX System, Hardware and Software Development	1	2022	3	2025
DDREX System Integration and Test	3	2023	4	2025
DDREX Modkit Critical Design Review	4	2022	4	2022
DDREX Soldier Touch Point	3	2024	3	2024
DDREX Operational Test	4	2025	4	2025
DDREX Supply Transition	2	2026	2	2026
DDREX Full Material Release	2	2026	2	2026
DDREX Organic Repair Transition	1	2027	1	2027
DDREX Software Transition	1	2027	1	2027
Modernization, Emerging Threats and Testing - FY 2021 VOLT	1	2022	2	2023
Modernization, Emerging Threats and Testing - FY 2023 VOLT	2	2023	2	2025
Modernization, Emerging Threats and Testing - FY 2025 VOLT	2	2025	2	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607150A *I Intel Cyber Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.652	3.611	13.343	-	13.343	4.437	4.946	4.948	4.996	0.000	50.933
BS5: *Intel Cyber Development*	-	14.652	3.611	13.343	-	13.343	4.437	4.946	4.948	4.996	0.000	50.933

A. Mission Description and Budget Item Justification

INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) designed to collect, process, exploit and, when directed, degrade, deny, disrupt, destroy, or manipulate adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, NSPD-38, NSPD-54 and HSPD-23.

HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.

B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	14.652	3.611	0.000	-	0.000
Current President's Budget	14.652	3.611	13.343	-	13.343
Total Adjustments	0.000	0.000	13.343	-	13.343
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	13.343	-	13.343

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607150A / *Intel Cyber Development*	Project (Number/Name) BS5 / *Intel Cyber Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BS5: *Intel Cyber Development*	-	14.652	3.611	13.343	-	13.343	4.437	4.946	4.948	4.996	0.000	50.933
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) designed to collect, process, exploit and, when directed, degrade, deny, disrupt, destroy, or manipulate adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, NSPD-38, NSPD-54 and HSPD-23.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Offensive Cyberspace Operations Capability Development	14.652	3.611	13.343

Description: INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) designed to collect, process, exploit, and when directed, degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

FY 2022 Plans:

Develop and support leading-edge multi-domain intelligence and cyberspace operations technologies designed to collect, process, exploit, and, when directed, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of multi-domain intelligence and cyberspace operations technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept.

INSCOM will address the operational force reports of increasing threat sophistication that requires matching pace in development of offensive capabilities to maintain critical advantage across the operational domains, particularly within the electromagnetic spectrum focused on signals intelligence (SIGINT), electronic warfare (EW, composed of the sub-domains of Electronic Support and Electronic Attack), and cyberspace operations. Expand combatant command focal points in accordance with Secretary of the Army service component commander's emerging needs. The requirement to address NEER-PEER threat actors and Army

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607150A / *Intel Cyber Development*	**Project (Number/Name)** BS5 / *Intel Cyber Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
multi-domain operations that are expanding across the warfighting domains drive the need to reduce development gaps in these capabilities. ***FY 2023 Plans:*** Develop and support leading-edge multi-domain intelligence and cyberspace operations technologies designed to collect, process, exploit, and, when directed, degrade, deny, disrupt, or destroy threat command, control, communications, computers and intelligence (C4I) cyber systems to enable commanders in shaping the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. Support the development of multi-domain intelligence and cyberspace operations technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, Defense Cyber Strategy, Presidential Policy Directive (PPD) 20, National Security Presidential Directive (NSPD) 54, Homeland Defense Presidential Directive (HSPD) 23, and The Army Operating Concept. INSCOM will address the operational force reports of increasing threat sophistication that requires matching pace in development of offensive capabilities to maintain critical advantage across the operational domains, particularly within the electromagnetic spectrum focused on signals intelligence (SIGINT), electronic warfare (EW, composed of the sub-domains of Electronic Support and Electronic Attack), and cyberspace operations. Expand combatant command focal points in accordance with Secretary of the Army service component commander's emerging needs. The requirement to address NEER-PEER threat actors and Army multi-domain operations that are expanding across the warfighting domains drive the need to reduce development gaps in these capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 funding increased for the development of leading-edge multi-domain intelligence and cyberspace operations technologies.			
Accomplishments/Planned Programs Subtotals	14.652	3.611	13.343

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607150A / *Intel Cyber Development*	Project (Number/Name) BS5 / *Intel Cyber Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDI Cyberspace Operations Capability Development	Various	Various : Various	-	14.652		3.611		13.343		-		13.343	Continuing	Continuing	Continuing
		Subtotal	-	14.652		3.611		13.343		-		13.343	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.652		3.611		13.343		-		13.343	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607150A / *Intel Cyber Development*	**Project (Number/Name)** BS5 / *Intel Cyber Development*

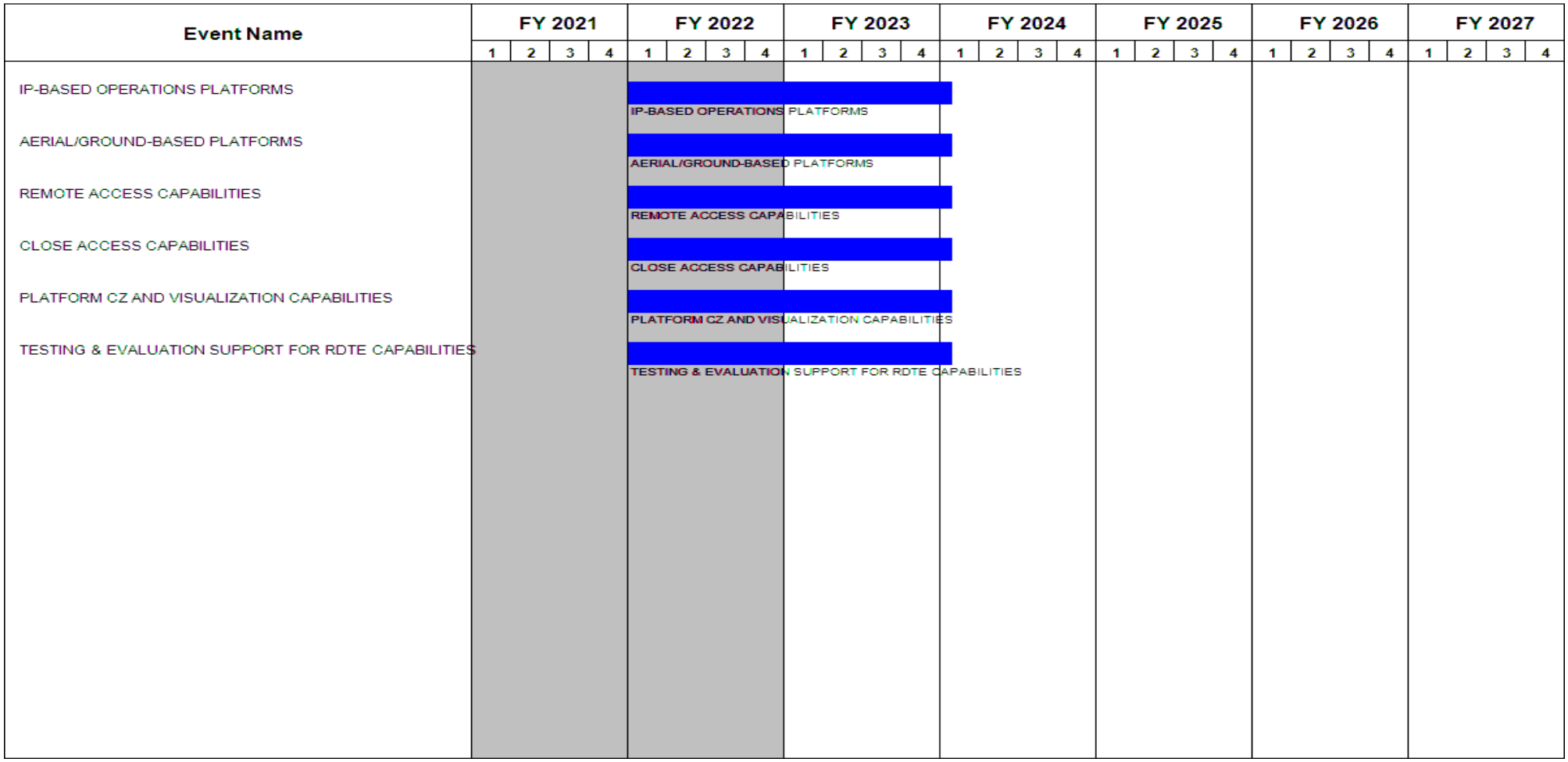


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607150A / *Intel Cyber Development*	**Project (Number/Name)** BS5 / *Intel Cyber Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IP-BASED OPERATIONS PLATFORMS	1	2022	1	2024
AERIAL/GROUND-BASED PLATFORMS	1	2022	1	2024
REMOTE ACCESS CAPABILITIES	1	2022	1	2024
CLOSE ACCESS CAPABILITIES	1	2022	1	2024
PLATFORM CZ AND VISUALIZATION CAPABILITIES	1	2022	1	2024
TESTING & EVALUATION SUPPORT FOR RDTE CAPABILITIES	1	2022	1	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607312A *I Army Operational Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	35.851	28.029	26.131	-	26.131	27.809	31.244	32.295	33.607	0.000	214.966
BR5: *Army Operational Systems Development*	-	35.851	28.029	26.131	-	26.131	27.809	31.244	32.295	33.607	0.000	214.966

A. Mission Description and Budget Item Justification

The Army Operational System Development budget line includes development efforts across all Army Battlefield Operating Systems to upgrade systems that have been fielded or have received approval for full rate production. Systems in this budget line are characterized as having, or supporting programs that have received, Milestone C or Low Rate Initial Production (LRIP) approval.

Selected programs within this budget line will exhibit a logical progression of program phases, development and production funding within the FYDP, consistent with the Department's full funding policy.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	35.851	28.029	0.000	-	0.000
Current President's Budget	35.851	28.029	26.131	-	26.131
Total Adjustments	0.000	0.000	26.131	-	26.131
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	26.131	-	26.131

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607313A / *Electronic Warfare Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	-	5.673	6.432	-	6.432	6.524	5.802	5.803	5.860	0.000	36.094
CE2: *Prophet*	-	-	5.673	6.432	-	6.432	6.524	5.802	5.803	5.860	0.000	36.094

A. Mission Description and Budget Item Justification

This Program Element encompasses operational system development for tactical Electronic Warfare (EW) terrestrial (ground) employment applications. The systems under this program provide the Army with the capability to detect, identify, locate, collect/process, report, and engage (disrupt, degrade or deny) hostile forces to prevent their effective use of communications & non-communications networks, counter-mortar/counter-battery radars, surveillance radars, electronically fused munitions and other enemy threats using the Electro-Magnetic Spectrum (EMS). Prophet enables integration, interoperability and force modernization with emerging capabilities in support of Multi-Domain Task Forces.

FY 2023 funding in the amount of $6.432M funds the Prophet Enhanced efforts (Project CE2). Project CE2 supports the Prophet Enhanced Program of Record, the Army's current terrestrial Signals Intelligence (SIGINT) system. Funding provides for development of relevancy efforts for state-of-the-art SIGINT exploitation to pace near peer and emerging enemy threat signals as well as engineering to mitigate component obsolescence. The primary mission of the Prophet Enhanced effort is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade enabling the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture based system solution optimized for ease of use in a variety of configurations.

B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	0.000	5.673	0.000	-	0.000
Current President's Budget	0.000	5.673	6.432	-	6.432
Total Adjustments	0.000	0.000	6.432	-	6.432
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	6.432	-	6.432

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607313A / *Electronic Warfare Development*	Project (Number/Name) CE2 / *Prophet*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CE2: *Prophet*	-	-	5.673	6.432	-	6.432	6.524	5.802	5.803	5.860	0.000	36.094
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project CE2 supports the Prophet Enhanced Program of Record, the Army's current fielded terrestrial Signals Intelligence (SIGINT) system. Funds provide for development and integration of signal of interest Technical Insertion engineering for Next Generation Signals and state-of-the-art SIGINT exploitation techniques to increase the capabilities of Prophet Enhanced, enabling the system to pace near peer and emerging enemy threat signals. Additionally funds provide for efforts to include, but not limited to engineering, development and testing to mitigate component obsolescence. The Prophet Enhanced is the tactical commander's organic ground-based SIGINT/Electronic Warfare system for the Multi-Function Teams (MfTs) organic to the Brigade Combat Teams (BCTs) and Expeditionary-Military Intelligence Brigades (E-MIBs). Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations. It also incorporates product modification, integration, evaluation and demonstration events of equipment for rapid integration of Technical Insertions (TI) and product development to ensure operational relevance.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Program Management ***Description:*** Engineering, technical and programmatic oversight of the development of next generation signals. ***FY 2022 Plans:*** Funds will provide for matrix and contractor system engineering and program management support for the Prophet program. ***FY 2023 Plans:*** Funds will provide for continued matrix and contractor system engineering and program management support for the Prophet program. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 level of effort anticipated to remain stable; cost increase is due to inflation and historical outlay rates	-	0.567	0.696
Title: Signal of Interest upgrades ***Description:*** The Signal Environment that Prophet Systems exploit is constantly contested with evolving threats. This environment creates gaps in Prophet's ability to collect and exploit these signals. Prophet must integrate the latest emerging Intelligence Community (IC), commercial solutions and capabilities from other sources to remain relevant against these numerous, key, and high-priority emerging threats.	-	2.553	2.868

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607313A / *Electronic Warfare Development*	**Project (Number/Name)** CE2 / *Prophet*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Development and integration of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2023 Plans:*** Continuing development and integration of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase due to necessity to conduct Customer Testing associated with the Signal of Interest upgrades in order to maintain the system's material release.			
Title: Componnet Obsolescence Engineering ***Description:*** Due to the highly technical nature of Prophet Enhanced, over the course of time, many components on the system are no longer produced or supported, which necessitates non-recurring engineering (NRE) to integrate and incorporate new and replacement parts. ***FY 2022 Plans:*** Including, but not limited to the obsolescence engineering for components on the Prophet Enhanced systems. ***FY 2023 Plans:*** Continuing obsolescence engineering for components on the Prophet Enhanced systems. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase due to necessity to conduct Customer Testing associated with the results from the obsolescence engineering in order to maintain the system's material release.	-	2.553	2.868
Accomplishments/Planned Programs Subtotals	-	5.673	6.432

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BZ9751: *SPECIAL PURPOSE SYSTEMS*	11.479	3.739	4.224	-	4.224	4.254	6.823	6.844	6.841	0.000	44.204

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607313A / *Electronic Warfare Development*	**Project (Number/Name)** CE2 / *Prophet*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The Prophet Research and Development (R&D) Acquisition Strategy is structured to maintain operational relevancy of Prophet Enhanced systems in a dynamic threat environment while reducing risk and streamlining business and engineering processes. Contracting activities are to maintain SIGINT relevance and complete Technical Insertion (TI) to Prophet Enhanced systems to pursue the latest Signals of Interest and design against obsolescence. The Technical Insertion (TI) contract supports R&D and other developmental work.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607313A / *Electronic Warfare Development*	Project (Number/Name) CE2 / *Prophet*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/Various	PM Electronic Warfare & Cyber : APG, MD	-	-		0.365	Feb 2022	0.696	Nov 2022	-		0.696	0.000	1.061	-
		Subtotal	-	-		0.365		0.696		-		0.696	0.000	1.061	N/A

Remarks

Efforts will be accomplished via a combination of Matrixed Government Support as well Systems Engineering and Technical Assistance (SETA) via competitive contract #W15P7T-10-D-D421.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Signal of Interest Upgrades	SS/CPFF	GD Mission Systems and Various Supporting Organizations : Scottsdale, AZ	-	-		2.654	Dec 2021	2.868	Dec 2022	-		2.868	0.000	5.522	-
Component Obsolescence Engineering	SS/CPFF	GD Mission Systems and Various Supporting Organizations : Scottsdale, AZ	-	-		2.654	May 2022	2.868	Dec 2022	-		2.868	0.000	5.522	-
		Subtotal	-	-		5.308		5.736		-		5.736	0.000	11.044	N/A

Remarks

Efforts will be accomplished contract # W56KGY-17-D-0006 to ensure systems remain relevant against emerging enemy threat signals and that any components of the system that become obsolete or are no longer produced can be re-engineered.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		5.673		6.432		-		6.432	0.000	12.105	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607313A / *Electronic Warfare Development*	Project (Number/Name) CE2 / *Prophet*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607313A / *Electronic Warfare Development*	**Project (Number/Name)** CE2 / *Prophet*

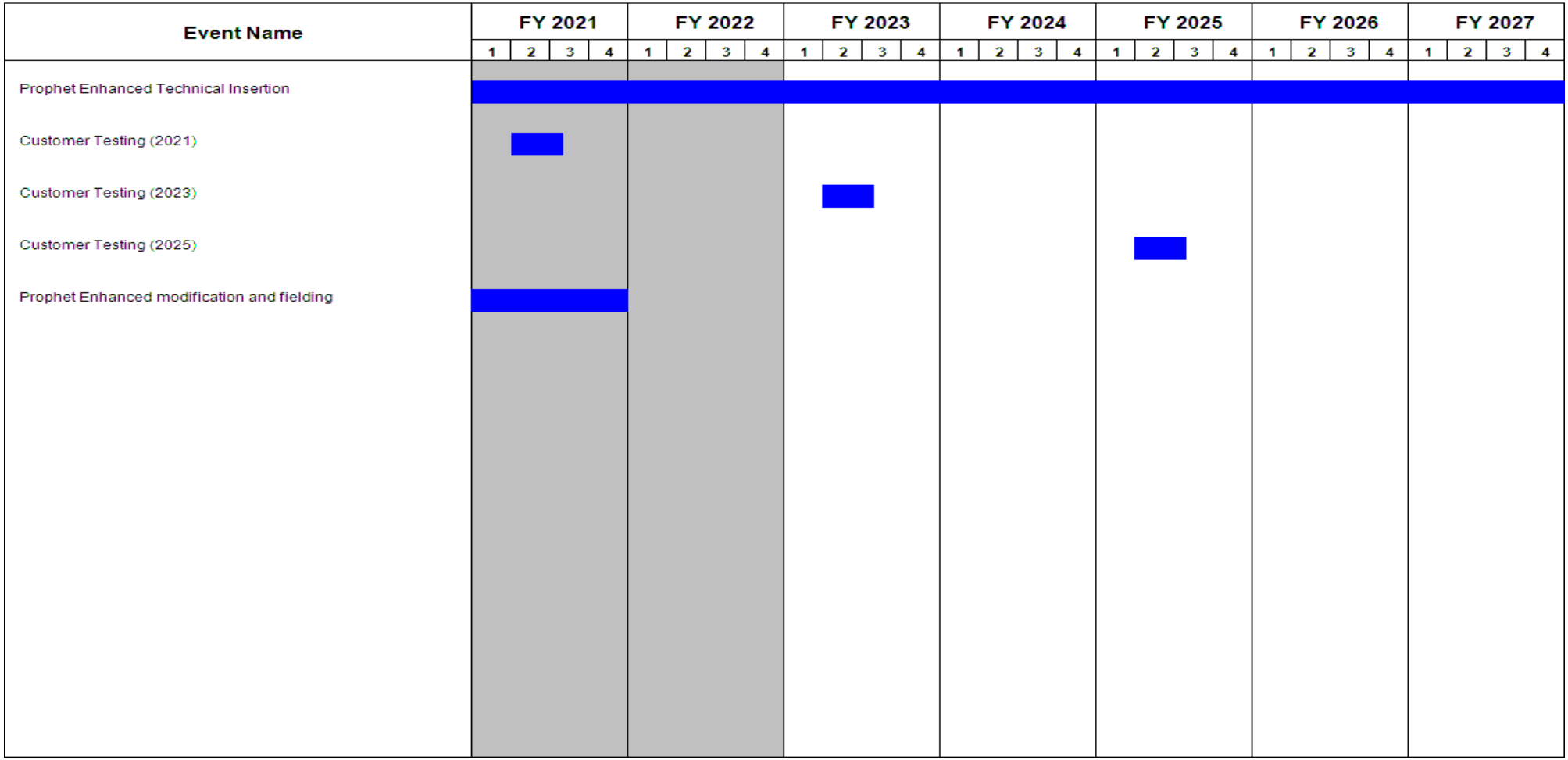


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607313A / *Electronic Warfare Development*	**Project (Number/Name)** CE2 / *Prophet*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Prophet Enhanced Technical Insertion	1	2020	3	2028
Customer Testing (2021)	2	2021	3	2021
Customer Testing (2023)	2	2023	3	2023
Customer Testing (2025)	2	2025	3	2025
Prophet Enhanced modification and fielding	3	2017	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607665A / *Family of Biometrics*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.276	1.144	1.114	-	1.114	1.193	1.211	1.225	1.228	Continuing	Continuing
DU2: *Management Agency*	-	1.276	1.144	1.114	-	1.114	1.193	1.211	1.225	1.228	Continuing	Continuing

A. Mission Description and Budget Item Justification

DT2 / Non-MIP Biometrics - Biometrics Enabling Capability 0 (BEC 0), aka DoD Automated Biometrics Identification System (DoD ABIS), is an Army information technology system supporting identity superiority by providing the critical core capability for Warfighters to identify known or suspected threat actors in Multi Domain Operations (MDO) to include peer adversaries, terrorists and third country nationals. BEC 0 is an Army Program of Record and DoD's only authoritative biometric repository, providing 24/7 operational support for the Warfighter and interagency partners to decide and act in near-real time with timely identification and identity verification of known or suspected threat actors across the full range of military operations. DoD ABIS enables actionable intelligence supporting offensive operations and preventing espionage, sabotage, terrorist operations and other coercive actions against US forces and partner nations. DoD ABIS enables the Army, all other DOD components, Interagency and International Partners to effectively impede adversary's ability to conceal their identity and intentions. DoD ABIS supports all three objectives of the National Defense Strategy to increase lethality, enhance International Cooperation, and improve business practices.

The Defense Forensics and Biometrics Agency (DFBA), under the Provost Marshal General, fulfills the Secretary of the Army's Executive Agent (EA) responsibilities for DoD forensics and biometrics activities. In addition, DFBA is the proponent to establish and maintain Research, Development, Test & Evaluation (RDT&E) and information management support throughout the Armed Services and DoD. DFBA leads and facilitates the development, improvement, and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:

FY 2023 funding in the amount of $1.114 million for Project DU2 will provide DFBA the ability to actively manage research efforts to address DoD biometrics objectives and requirements. DFBA supports the conduct of biometric and forensics activities (e.g. standards conformance and interoperability assessments), provides guidance to the research and development community, assists DoD acquisition organizations, and coordinates efforts with DoD and interagency stakeholders. This level of engagement promotes information sharing across the biometrics community to maximize utility of RDT&E efforts.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0607665A / *Family of Biometrics*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	1.276	1.178	0.000	-	0.000
Current President's Budget	1.276	1.144	1.114	-	1.114
Total Adjustments	0.000	-0.034	1.114	-	1.114
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	1.114	-	1.114
• FFRDC Transfer	-	-0.034	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding. FY2023 funding is within ~5% of FY2022 funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / *Family of Biometrics*	Project (Number/Name) DU2 / *Management Agency*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
DU2: *Management Agency*	-	1.276	1.144	1.114	-	1.114	1.193	1.211	1.225	1.228	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Forensics and Biometrics Agency (DFBA), under the Provost Marshal General, fulfills the Secretary of the Army's Executive Agent (EA) responsibilities for all DoD forensics and biometrics activities. As the proponent, DFBA supports and provides oversight for Research, Development, Test & Evaluation (RDT&E) activities and information management throughout the Armed Services and DoD. DFBA leads and facilitates in the development of improvement and implementation of efficiencies to developed and deployed biometric technologies for Combatant Commands (CCMDs), Services, DoD, and Agencies; facilitates transition of capabilities that contribute to the enhancement of the biometric community; increases Joint Service interoperability; and empowers the warfighter by improving operational effectiveness on the battlefield. The DFBA strategy pursues technology opportunities through scientific discovery and makes investments responsive to specific requirements identified by combat developers.

Justification:
FY 2023 funding in the amount of $1.192 million for Project DU2 will provide DFBA the ability to actively manage research efforts to address DoD biometrics objectives and requirements. DFBA supports the conduct of biometric and forensics activities (e.g. standards conformance and interoperability assessments), provides guidance to the research and development community, assists DoD acquisition organizations, and coordinates efforts with DoD and interagency stakeholders. This level of engagement promotes information sharing across the biometrics community to maximize utility of RDT&E efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Development and Implementation of Biometric Technologies	1.276	1.101	1.114
Description: Biometrics and Forensics Technologies Research			
FY 2022 Plans: FY 2022 funding in the amount of $1.178 million for Project DU2 will provide DFBA the ability to actively manage research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA supports the conduct of biometric and forensics activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.			
FY 2023 Plans: FY 2023 funding in the amount of $1.192 million for Project DU2 will provide DFBA the ability to actively manage research efforts to ensure scientific merit, feasibility, and DFBA objectives and requirements are met. DFBA supports the conduct of biometric and forensics activities (e.g. standards conformance and interoperability assessments), support to DoD acquisition organizations, and provision of subject matter expertise to DoD and non-DoD government stakeholders.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607665A / *Family of Biometrics*	**Project (Number/Name)** DU2 / *Management Agency*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Slight increase due to economic assumptions			
Title: FY22 SBIR/STTR Transfer	-	0.043	-
Description: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY22 funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	1.276	1.144	1.114

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

DFBA uses a variety of existing contract vehicles to support the continued development of technology advancements for the fingerprint, face, iris, palm, DNA reference, and voice modalities. In addition to advancing the state of the art, these efforts enable DFBA to produce updated standards and architectures for the DoD Biometrics and Forensics Enterprise in support of interoperability objectives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607665A / *Family of Biometrics*	Project (Number/Name) DU2 / *Management Agency*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	0.065	-		-		-		-		-	0.000	0.065	-
FY 2022 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.043		-		-		-	0.000	0.043	-
		Subtotal	0.065	-		0.043		-		-		-	0.000	0.108	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DFBA RDTE efforts	MIPR	Various Activities : Various locations	13.716	1.276	Jun 2021	1.101	Jun 2022	1.114	Jun 2023	-		1.114	Continuing	Continuing	-
		Subtotal	13.716	1.276		1.101		1.114		-		1.114	Continuing	Continuing	N/A

Remarks

Continuation of development of state of the art sensor capabilities enables the advancement of collection, match, share, and store capabilities. As sensors mature and take advantage of new spectra for biometric identification, the results from these capabilities enable DFBA to proactively advance the standards and architectures needed to use the advanced capabilities.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.781	1.276		1.144		1.114		-		1.114	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607665A / *Family of Biometrics*	**Project (Number/Name)** DU2 / *Management Agency*

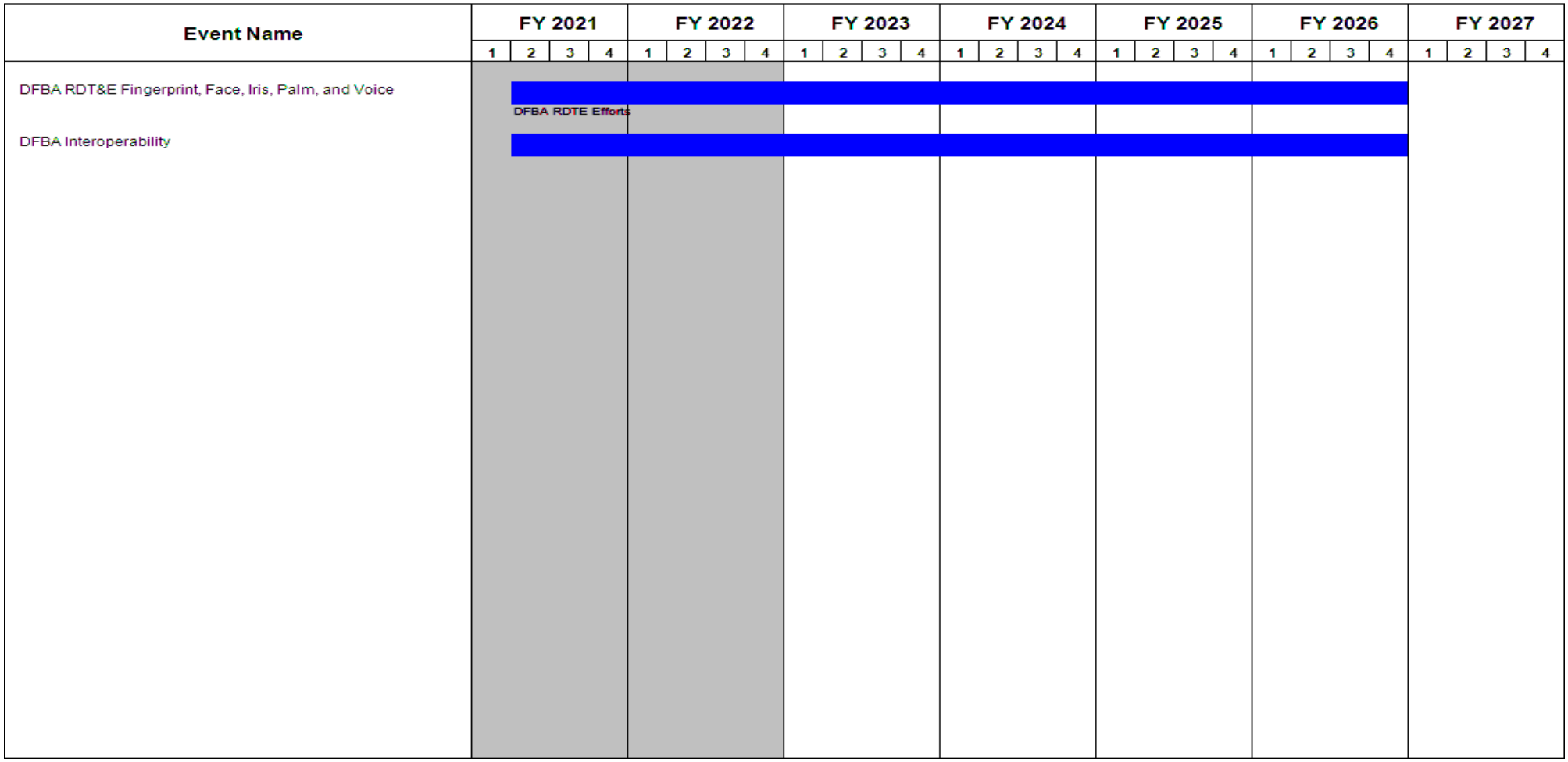


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607665A / *Family of Biometrics*	**Project (Number/Name)** DU2 / *Management Agency*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DFBA RDT&E Fingerprint, Face, Iris, Palm, and Voice	2	2021	4	2026
DFBA Interoperability	2	2021	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	178.984	125.932	152.312	-	152.312	140.999	140.870	140.916	142.287	Continuing	Continuing
DV8: *Patriot Product Improvement*	-	178.984	125.932	152.312	-	152.312	140.999	140.870	140.916	142.287	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the PATRIOT surface to air missile system. PATRIOT is an integral part of the Integrated Air and Missile Defense (IAMD) Architecture, and enables the incremental fielding of the IBCS capability for Army Air and Missile Defense Battalions.

The PATRIOT Product Improvement Program (PIP) provides for the upgrade of the PATRIOT System and the Army Integrated Air and Missile Defense (IAMD) system through software improvements and individual materiel changes and upgrades to current force and IAMD-connected PATRIOT system components (interceptors, ground system equipment, launcher, and current radar) to address operational lessons-learned and necessary system performance improvements to include enhancements that support joint force interoperability and enable convergence with IBCS to ensure overmatch capability. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against emerging threats in a manner that is not practical to demonstrate with live fire flight tests alone due to cost, target availability, and range constraints. Flight testing is periodically required for validation of the modeling and simulation as well as satisfying Army Test and Evaluation Command/ Director, Operational Test and Evaluation (ATEC/DOTE) requirements of segment improvements.

This effort supports work with national agencies to evaluate, assess, and develop means to mitigate threat trends and specific threat developments potentially impacting system performance including effective detection, tracking, discrimination, and engagement. Specific improvements may be developed and fielded under this task if warranted. The effort maintains the Mission Tailoring Database, responding to immediate tactical concerns. Database updates are fielded between major software upgrades as necessary.

The PIP line also supports the identification, analysis, design, and test of materiel solutions to counter cyber security and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY 2023 base dollars in the amount of $152.312 million support the continuance of critical software improvements for current force PATRIOT and Army IAMD, including Software Improvement for Threat Evolution, PAC-3 Seeker Software Improvement, Advanced Electronic Counter Measures (AECM), Combat ID enhancements, Tasks 2, 6, and 7 activities, program integration, modeling and simulation, acquisition of test assets and targets, Mobile Flight Mission Simulator (MFMS), PDB-8.1 and Patriot Component Software Build (PCSB) software, convergence with the IAMD Battle Command System (IBCS) and government and contractor support.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	178.984	125.932	0.000	-	0.000
Current President's Budget	178.984	125.932	152.312	-	152.312
Total Adjustments	0.000	0.000	152.312	-	152.312
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	152.312	-	152.312

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*				Project (Number/Name) DV8 / *Patriot Product Improvement*			
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
DV8: *Patriot Product Improvement*	-	178.984	125.932	152.312	-	152.312	140.999	140.870	140.916	142.287	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) and Ground Support Equipment. PATRIOT system components (interceptors, launcher, and radar) are integrated with current force PATRIOT and Army Integrated Air and Missile Defense (IAMD) components, including IBCS. As PATRIOT system components software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against specific threats in a manner that is not practical to demonstrate with live fire flight tests alone due to cost, target availability, and range constraints. Flight testing is periodically required for M&S validation as well as satisfying ATEC/DOTE requirements of segment improvements.

-PATRIOT system components software and hardware improvements for threat evolution: Performs necessary analysis and development efforts to maintain PATRIOT system (interceptors, ground support equipment, and current radar) effectiveness against evolving threat technologies and capabilities, support convergence with the IBCS, and complete PATRIOT Component Software Builds (PCSB). This effort identifies evolving threats and threat characteristics that present a challenge to PATRIOT's current capabilities and develops initial concepts to maintain system effectiveness including detection, tracking, discrimination, and engagement relative to these threats. Additionally, evolving threat information is used to develop, integrate, and assess evolving lethality models in high-fidelity interceptor simulations supporting system level assessment of hit-to-kill and warhead interceptor performance.

-Advanced Electronic Counter Measures (AECM): This task investigates the implications of advanced technology Digital Radio Frequency Memory available on airborne platforms that enables new ECM techniques which could adversely degrade Air and Missile Defense System effectiveness. AECM efforts support PATRIOT system interceptors, ground support equipment, and current radar.

-Task 2: Implements improved ground system and interceptor capabilities (PATRIOT Advanced Capability-2/Guidance Enhanced Missiles, PATRIOT Advanced Capability-3, and Missile Segment Enhancement) to counter emerging Tactical Ballistic Missile threats.

-Task 6: Software improvements enhance ground support equipment and current radar discrimination of higher altitude Tactical Ballistic Missile Re-entry Vehicles (RVs) from associated objects to support the full engagement capabilities of the interceptor. Longer-range detection, track, and improved high-altitude discrimination are required to achieve the required lethality performance against the RV and to mitigate and reduce missile wastage against separation debris. This task leverages the signal processing capabilities of the Radar Digital Processor, and supports the high altitude engagements required by the PATRIOT Advanced Capability-3 (PAC-3) and PAC-3 Missile Segment Enhancement (MSE) missiles.

-Task 7: Performs analysis on existing and evolving TBM countermeasures to determine the effects on PATRIOT system effectiveness. Develops hardware and software concepts to address countermeasure effects to ensure the PATRIOT system maintains its effectiveness. Develops detailed system requirements to implement concepts; design/code/test software implementation leveraging Radar Digital Processor, Modernized Adjunct Processor, Enhanced Weapons Control Computer - Emulator and Flight Solution Computer-Redesign processing capabilities. Implements simulation-based concepts to define trade space and establish system requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

-Combat ID Enhancements: Develop and implement improvements to the Radar Digital Processor-Capability Combat ID capabilities and additional Non-Cooperative Target Recognition techniques to further mitigate misclassification and fratricide risk, and to provide the Warfighter with improved situational awareness. This effort mitigates detection, tracking, and engagement errors on friendly targets.
-PAC-3 Seeker Software Improvements: Perform PAC-3 MSE Software improvements to address evolving and newly fielded Electronic Attack threats providing analysis, engineering, prototyping, testing, and tactical software implementation of improvements.
-Program Integration MSE LMMFC: This task support interceptor flight mission analysis, test missile preparation, flight mission interceptor integration, and range safety tasks allowing execution of required PATRIOT flight test activities.
-Mobile Flight Mission Simulator (MFMS) is a real-time system exerciser integrated with tactical ground hardware to simulate signals into the radar. The MFMS is part of the simulation and testing infrastructure required to support fielded PATRIOT.
-Post Deployment Build 8 (PDB-8) continues system testing and analysis for PATRIOT Component Software Build Developmental Test and Evaluation and Limited User Testing required to support fielded PATRIOT. MSE/PAC-3 Raytheon effort provides integration into PATRIOT and associated Raytheon/PATRIOT ground system flight test support.
-US Government and contractor support for PIP efforts supporting system interceptors, ground support equipment, and current radar provide studies and support to ensure the system and its components continue to evolve to defeat emerging threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: PATRIOT Product Improvement	178.984	121.335	152.312
Description: Patriot Product improvement line provides continuous improvement to current force PATRIOT and Army IAMD to keep pace with and counter evolving and emerging threats. ***FY 2022 Plans:*** -Continue Software Improvement for Threat Evolution and AECM to address emerging threats and convergence with IBCS -Continue Combat ID enhancements -Continue Tasks 2, 6, and 7 activities to develop hardware and software to maintain PATRIOT system effectiveness in the field -Continue program development through system level modeling, simulation, integration and test support to address emerging threats and convergence with IBCS -Continue test program to include utilization of targets/threat simulators, flight simulator and modeling efforts to maintain system effectiveness -Continue test activities to support the TEMP -Continue Ballistic Missile Defense System (BMDS) Integration Testing -Continue development and integration of Assured Position, Navigation and Timing (APNT) -Continue supporting Integrated Fires Testing -Continue PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-U.S. Government and contractor support to ensure force effectiveness is maintained to keep pace with evolving and emerging threats -Continue IBCS convergence and PCSB effort (IBCS convergence and PCSB efforts began in FY21) -Continue PAC-3 Seeker Software Improvements to counter Electronic Attack Threats -Continue interceptor design reviews, system integration activities, test and analysis, and threat analysis and modeling -Continue MSS-2 laboratory support for high fidelity seeker data collection, modeling and analysis ***FY 2023 Plans:*** -Continue Software Improvement for Threat Evolution and AECM to address emerging threats and convergence with IBCS -Continue Combat ID enhancements to reduce fratricide potential -Continue Tasks 2, 6, and 7 activities to develop hardware and software to maintain PATRIOT system effectiveness in the field -Continue program development through system level modeling, simulation, integration and test support to address emerging threats and convergence with IBCS -Continue test program to include utilization of targets/threat simulators, flight simulator and modeling efforts to maintain system effectiveness -Continue test activities to support the TEMP -Continue supporting Integrated Fires Testing -Continue Ballistic Missile Defense System (BMDS) Integration Testing -Continue PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements -U.S. Government and contractor support to ensure force effectiveness is maintained to keep pace with evolving and emerging threats -Continue IBCS convergence and PCSB effort -Continue PAC-3 Seeker Software Improvements to counter Electronic Attack Threats -Continue system integration activities, test and analysis, and threat analysis and modeling -Continue MSS-2 laboratory support for high fidelity seeker data collection, modeling and analysis ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The $26.380M increase in funding from FY22 to FY23 will restore funding levels for Advanced Electronic Counter Measures (AECM) and Task 7; increase Task 2, and SW improvements funding. These adjustments support development and testing required to defend against identified emerging threats and AMD transition to IBCS.			
Title: FY2022 SBIR/STTR Transfer ***Description:*** SBIR/STTR	-	4.597	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: SBIR/STTR ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.			
Accomplishments/Planned Programs Subtotals	178.984	125.932	152.312

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C50700: *Patriot Mods*	278.050	205.469	253.689	-	253.689	215.425	182.062	809.071	820.684	Continuing	Continuing

Remarks

The improvements/enhancements developed through the PATRIOT Product Improvement Program (PIP) are interrelated with the hardware kits that are procured and installed under the Missile Procurement, Army (MIPA) appropriation's PATRIOT Mods program and maximizes PAC-3 MSE capabilities.

D. Acquisition Strategy

The design objective of the PATRIOT system was to provide a baseline system capable of modification to cope with continuing threat evolution. This program minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT Product Improvement Program upgrades the PATRIOT system and the Army IAMD system to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements including detection, tracking, discrimination, and engagement to provide overmatch capability against the emerging threat. Upgrades are implemented through individual hardware and software materiel changes and fielded incrementally. This program encompasses several changes which will require the use of a variety of acquisition methods to develop, test, procure and field. Future hardware and software capabilities will be incorporated into Patriot Component Software Build (PCSB) releases and continue convergence efforts with IBCS. Developing, fabricating, and testing hit to kill surface to air missile and associated ground support equipment provides essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. These state-of-the-art capabilities and enhancements require ongoing demonstration through a series of flight tests and modeling and simulation activities to add survivability and resiliency in a denied environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DV8 / *Patriot Product Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	RSA, AL : RSA, AL	13.028	5.444	Oct 2020	5.474	Jan 2022	4.515	Jan 2023	-		4.515	Continuing	Continuing	-
U.S. Contracts	Various	Multiple : Multiple	9.800	1.700	Feb 2021	1.770	Feb 2022	1.770	Feb 2023	-		1.770	Continuing	Continuing	-
PAC-3 Product Office	RO	Project Office : Huntsville, AL	-	1.900	Oct 2020	-		-		-		-	Continuing	Continuing	-
FY 2020 Army Withhold Pending ATR	TBD	Various : Various	4.397	-		-		-		-		-	0.000	4.397	-
SIBR/STTR Transfer	TBD	Government : Government	-	-		4.597		-		-		-	0.000	4.597	-
		Subtotal	27.225	9.044		11.841		6.285		-		6.285	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Improvement for Threat Evolution	Various	Multiple : Multiple	63.270	8.756	Jan 2021	6.486	Jan 2022	9.260	Jan 2023	-		9.260	Continuing	Continuing	-
Advanced Electronic Counter Measures (AECM)	Various	Multiple : Multiple	100.797	16.390	Jan 2021	7.736	Jan 2022	19.350	Jan 2023	-		19.350	Continuing	Continuing	-
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	Various	Multiple : Multiple	48.339	6.300	Feb 2021	6.648	Feb 2022	9.765	Feb 2023	-		9.765	Continuing	Continuing	-
Task 6 Discrimination Improvements	Various	Multiple : Multiple	47.539	6.100	Feb 2021	5.074	Feb 2022	5.400	Feb 2023	-		5.400	Continuing	Continuing	-
Task 7 TBM Countermeasures / Effectors	Various	Multiple : Multiple	46.639	9.561	Feb 2021	8.787	Feb 2022	24.000	Feb 2023	-		24.000	Continuing	Continuing	-
Assured PNT	Various	Multiple : Multiple	16.779	1.900	Jan 2021	-		3.000	Jan 2023	-		3.000	Continuing	Continuing	-
Combat ID Enhancements	Various	Multiple : Multiple	48.828	14.736	Feb 2021	2.912	Feb 2022	15.328	Feb 2023	-		15.328	Continuing	Continuing	-
Anti-Radiation Missile (ARM) Asset Defense	Various	Raytheon : Andover, Massachusetts	5.000	1.200	May 2021	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DV8 / *Patriot Product Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Telemetry Ground Station	Various	Multiple : Multiple	0.250	-		-		2.000	Feb 2023	-		2.000	Continuing	Continuing	-
PAC-3 Seeker SW Improvement	TBD	Multiple : Multiple	21.015	13.874	Feb 2021	2.649	Feb 2022	2.000	Feb 2023	-		2.000	Continuing	Continuing	-
CDCC and OGAs	MIPR	RSA : RSA	-	0.800	Oct 2020	0.836	Oct 2021	0.850	Oct 2022	-		0.850	Continuing	Continuing	-
Program Integration MSE LMMFC	Various	LMMFC : Dallas, TX	-	21.262	Feb 2021	12.035	Feb 2022	7.442	Feb 2023	-		7.442	Continuing	Continuing	-
MSE/PAC-3 Raytheon	Various	Raytheon : Watham, Massachusetts	-	7.900	Feb 2021	4.600	Feb 2022	2.500	Feb 2023	-		2.500	Continuing	Continuing	-
SETA Contracts	Various	Multiple : Multiple	-	2.800	Feb 2021	2.900	Feb 2022	0.918	Feb 2023	-		0.918	Continuing	Continuing	-
		Subtotal	398.456	111.579		60.663		101.813		-		101.813	Continuing	Continuing	N/A

Remarks

The contract method type Sole Source/Various is Fixed Price Level of Effort which includes Cost Plus Fixed Fee for material, ODC, and travel.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CCDC and Other Govt Agencies	MIPR	RDEC and OGA'S : RSA, AL	6.251	6.800	Jan 2021	7.000	Jan 2022	4.255	Jan 2023	-		4.255	Continuing	Continuing	-
Targets/Threat Simulation	MIPR	Various : Huntsville, AL	-	26.396	Jan 2021	23.650	Jan 2022	25.841	Jan 2023	-		25.841	Continuing	Continuing	-
Modeling and Simulation	MIPR	Various : Huntsville, AL	-	3.022	Jan 2021	3.700	Jan 2022	3.700	Jan 2023	-		3.700	Continuing	Continuing	-
Contractor T&E	Various	Multiple : Various	-	8.328	Feb 2021	4.893	Jan 2022	3.048	Jan 2023	-		3.048	Continuing	Continuing	-
Other T&E	MIPR	Various : WSMR, NM	-	4.600	Jan 2021	4.600	Jan 2022	1.456	Feb 2023	-		1.456	Continuing	Continuing	-
Mobile Flight Mission Simulator	SS/FPIF	Raytheon : Massachusetts	-	1.000	Feb 2021	1.175	Feb 2022	1.166	Feb 2023	-		1.166	Continuing	Continuing	-
PDB-8.1	MIPR	Various : WSMR, NM	-	8.215	Feb 2021	8.410	Nov 2021	4.748	Nov 2022	-		4.748	Continuing	Continuing	-
		Subtotal	6.251	58.361		53.428		44.214		-		44.214	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DV8 / *Patriot Product Improvement*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	431.932	178.984		125.932		152.312		-		152.312	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

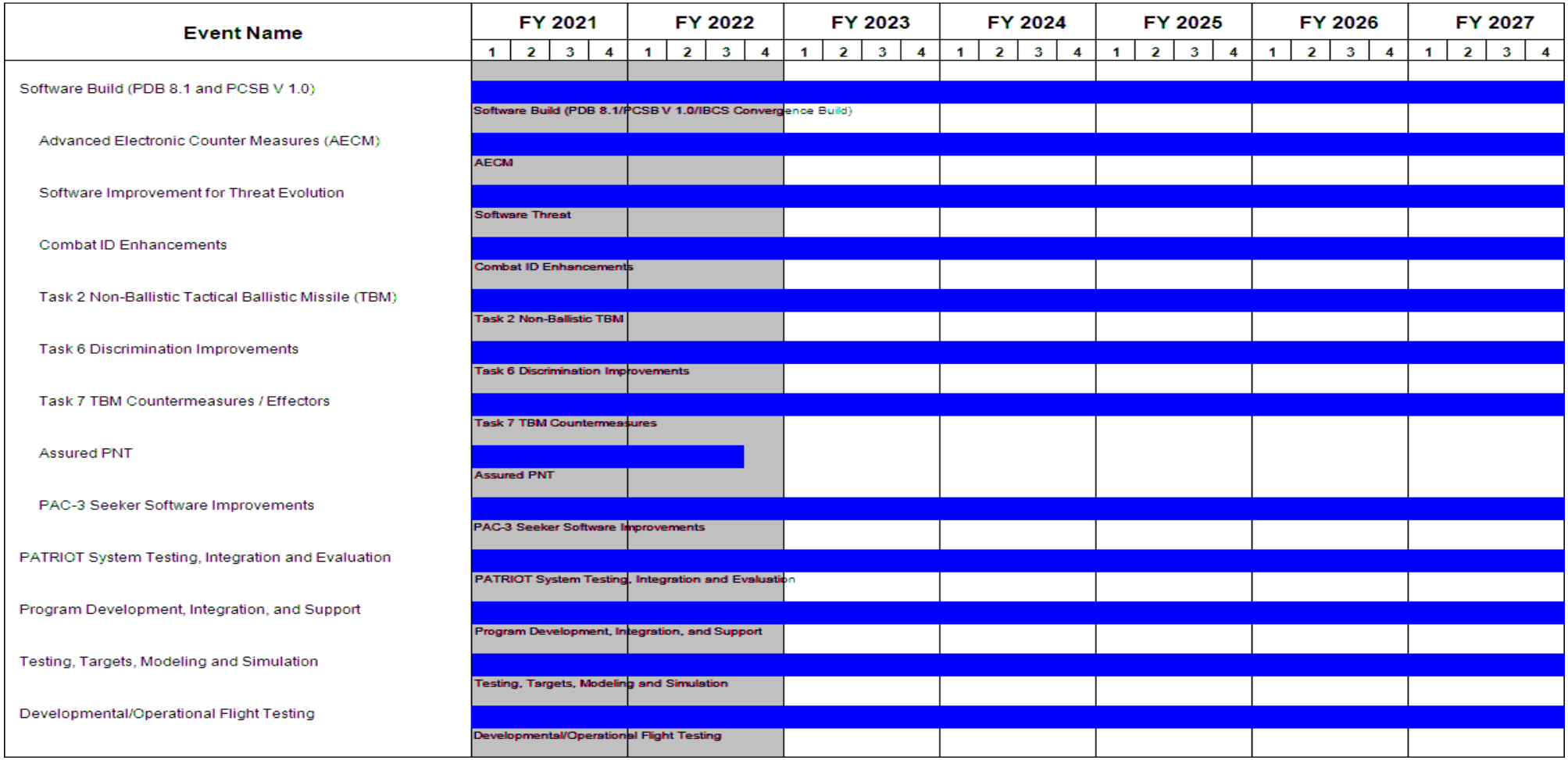


Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

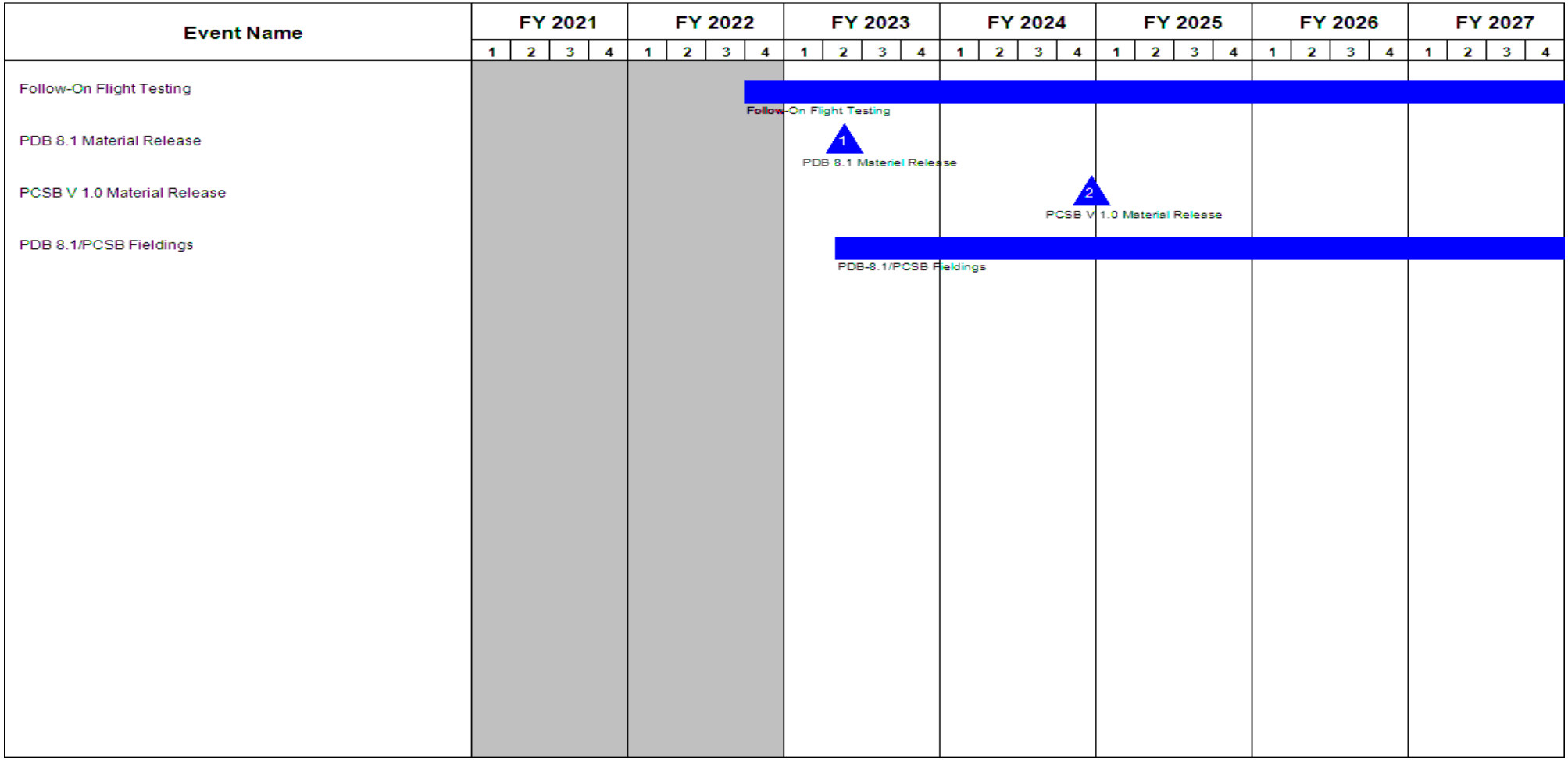


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Build (PDB 8.1 and PCSB V 1.0)	4	2005	4	2028
Advanced Electronic Counter Measures (AECM)	1	2014	4	2028
Software Improvement for Threat Evolution	1	2014	4	2028
Combat ID Enhancements	1	2014	4	2028
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	1	2015	4	2028
Task 6 Discrimination Improvements	1	2014	4	2028
Task 7 TBM Countermeasures / Effectors	1	2015	4	2028
Assured PNT	1	2020	3	2022
PAC-3 Seeker Software Improvements	2	2020	4	2028
PATRIOT System Testing, Integration and Evaluation	1	2016	4	2028
Program Development, Integration, and Support	1	2016	4	2028
Testing, Targets, Modeling and Simulation	1	2016	4	2028
Developmental/Operational Flight Testing	3	2020	4	2028
Follow-On Flight Testing	4	2022	4	2028
PDB 8.1 Material Release	2	2023	2	2023
PCSB V 1.0 Material Release	4	2024	4	2024
PDB 8.1/PCSB Fieldings	2	2023	1	2029

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	43.060	25.489	19.329	-	19.329	4.931	4.180	4.181	4.223	0.000	105.393
EF7: *Precision Fires Warrior Dismounted & Mounted*	-	3.199	3.024	3.384	-	3.384	3.395	2.762	2.763	2.791	0.000	21.318
EF8: *AFATDS Increment 1*	-	39.861	22.465	15.945	-	15.945	1.536	1.418	1.418	1.432	0.000	84.075

A. Mission Description and Budget Item Justification

This program element captures the funding for Fire Support Command and Control (FSC2) programs (Advanced Field Artillery Tactical Data System (AFATDS) and Precision Fires-Dismounted/Mounted (PF-D/M)), and their support to the Long Range Precision Fires (LRPF) and Network Cross Functional Teams (CFT). LRPF is the #1 priority and the network is the #4 priority in the Army Modernization Strategy, Efforts support the Common Operating Environment and align to the Network CFT's capability set approach.

FSC2 systems automate the planning and execution of fire support operations so suitable weapons or a group of weapons adequately cover targets. Fire support is the effect of lethal and non-lethal weapons (fires) that directly support land, maritime, amphibious and special operations forces to engage enemy forces, combat formations and facilities in pursuit of tactical and operational objectives.

AFATDS supports LRPF munitions, Extended Range Canon Artillery (ERCA), Extended Range Guided Multiple Launch Rocket System (ER-GMLRS), Precision Strike Missile System (PRSM), Joint Targeting support to multi-domain operations, and emerging sensor to shooter initiatives. To support these initiatives, AFATDS will serve as the key sensor to shooter link for the Army and Marine Corps, providing fully automated support for planning, coordinating, controlling and executing fires and effects. AFATDS began supporting Long Range Hypersonic Weapons in FY20.

AFATDS provides the Army and Marine Corps automated fire support command, control and communications. AFATDS is used to plan, execute, and deliver lethal and non-lethal effects and provides Joint/Coalition Situational Awareness for fires execution and mission management. The system interoperates and integrates with over 80 different battlefield systems, including Navy and Air Force command and control weapons systems. As a member of the Artillery System Cooperation Agreement (ASCA), AFATDS is interoperable with coalition partner fire support systems. Currently fielding AFATDS 6.8 baseline, which automates the planning, coordination, and control of all fire support assets (field artillery, mortars, close air support, naval gunfire, attack helicopters, offensive electronic warfare, fire support meteorological systems, forward observers, and fire support radars). AFATDS 7 modernizes the software currently in the field and enhances the existing legacy baseline by: (1) Providing a modernized web service backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's COE Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

PF-D/M provides the dismounted and mounted Forward Observer (FO) and Fire Support Teams (FISTs) the ability to execute fire missions. PF-D is a software application that operates on the Nett Warrior End User Device (EUD). It provides the dismounted FO and FISTs the capability and functionality to accurately and rapidly

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203728A *I Joint Automated Deep Operation Coordination System (JADOCS)*

locate ground targets and digitally process a Call for Fire. PF-D answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD. PF-M replaces the Lightweight Forward Entry Device's (LFED) Forward Observer Software (FOS) at the maneuver company FIST. PF-M answers the Mounted Computing Environment requirement and will reside on the Mounted Family of Computing Systems (MFoCS) computer.

FY23 funding of $15.945 million will be used for continued development and testing of AFATDS 7.0 capabilities, specifically, code conversion from Ada to Java, cyber enhancements, some User Interface improvements, Link 16 implementation and required testing.

FY23 funding of $3.384 million will be utilized for development of PF-D/M Block 3 capabilities onto target computing environments, including Net-enabled weapons capability with joint services. Funding also supports alignment with Nett Warrior architecture changes for PF-D and adapting the PF-D software to integrate with Mounted Mission Command-Software (MMC-S) and operate on the MFOCS within the Mounted Computing Environment.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	43.060	25.547	0.000	-	0.000
Current President's Budget	43.060	25.489	19.329	-	19.329
Total Adjustments	0.000	-0.058	19.329	-	19.329
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	19.329	-	19.329
• FFRDC Transfer	-	-0.058	-	-	-

Change Summary Explanation

FY 2023 funding decrease reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF7 / *Precision Fires Warrior Dismounted & Mounted*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EF7: *Precision Fires Warrior Dismounted & Mounted*	-	3.199	3.024	3.384	-	3.384	3.395	2.762	2.763	2.791	0.000	21.318
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Precision Fires Dismounted/Mounted (PF-D/M) provides the dismounted and mounted Forward Observer (FO) and Fire Support Teams (FISTs) the ability to execute fire missions. PF-D, is a software application that operates on the Nett Warrior End User Device (EUD). It provides the dismounted FO and FISTs the capability and functionality to accurately and rapidly locate ground targets and digitally process a Call for Fire. PF-D answers the Mobile Handheld Computing Environment requirement that all handheld applications reside on the Nett Warrior EUD. PF-M replaces the Lightweight Forward Entry Device's (LFED) Forward Observer Software (FOS) at the maneuver company FIST. PF-M answers the Mounted Computing Environment requirement and will reside on the Mounted Family of Computing Systems (MFoCS) computer.

FY23 funding of $3.384 million will be utilized for development of Block 3 capabilities onto target computing environments, including net-enabled weapons capability with joint services. Funding also supports alignment with Nett Warrior architecture changes for PF-D and adapting the PF-D software to integrate with Mounted Mission Command-Software (MMC-S) and operate on the MFOCS within the Mounted Computing Environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Program Management Support Costs for PF-D/M	0.410	0.409	0.418
Description: Program support for Precision Fires Dismounted/Mounted (PF-D/M) software development efforts. This includes contractor and matrix support. ***FY 2022 Plans:*** Will provide PMO support for all aspects of the PF-D/M program including requirements development, software development efforts, logistics and business management support. ***FY 2023 Plans:*** Will provide Matrix and Contractor/SETA support to PMO for all aspects of the PF-D/M program including requirements development, software development efforts, logistics and business management support. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding remains relatively constant from FY2022 to FY2023.			
Title: PF-D/M Software Development	2.291	2.006	2.668

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF7 / *Precision Fires Warrior Dismounted & Mounted*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: PF-D/M Software Development ***FY 2022 Plans:*** PF-M Block 3 development. ***FY 2023 Plans:*** Development of PF-D/M Block 3 capabilities onto target Computing Environments. Alignment with Nett Warrior architecture changes for Dismounted efforts and adapting PF-D software to integrate with MMC-S and operate within the Mounted Computing Environment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increase to support larger scope of development of Block 3 capabilities and begin integration of PF-D software with MMC-S to operate within the Mounted Computing Environment.			
Title: Testing for PF-D/M ***Description:*** Conduct and Support Army Testing Activities for PF-D/M ***FY 2022 Plans:*** DT/OT testing of Block 3. ***FY 2023 Plans:*** Will perform internal verification and validation testing of software releases. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to reduced test activities.	0.498	0.498	0.298
Title: SBIR/STTR ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.111	-
Accomplishments/Planned Programs Subtotals	3.199	3.024	3.384

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF7 / *Precision Fires Warrior Dismounted & Mounted*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BZ9851: *POCKET FORWARD ENTRY DEVICE (PFED)*	3.896	2.648	2.140	-	2.140	2.233	2.333	2.341	2.339	Continuing	Continuing

Remarks

D. Acquisition Strategy

PF-D/M is an Acquisition Category III program established to satisfy requirements captured in the Pocket-sized Forward Entry Device (PFED) Inc 2 Capability Production Document (CPD), which was approved as an IT Box requirement. A blocking approach was approved at Milestone B in 2015 to provide structure for incremental capability development over time.

PF-D/M is developed in partnership with a government integrator using a blocking approach where capability is incrementally added to the overall baseline.

PF-D/M Block 1 leveraged an Army Science and Technology (S&T) investment by transitioning a software application that was being developed and used in proponent experimentation events (e.g. Army Expeditionary Warrior Experiment (AEWE) and Bold Quest). Upon a successful Milestone B decision in FY15, this software application transitioned to PM Mission Command (PMMC) to conduct all Army developmental and operational test and evaluation requirements. With both the Mobile Handheld and Mounted Computing environments migrating towards a technical foundation that operates on an ATAK software baseline, the PF-D software was further adapted to coalesce to a new common operating environment. Reusable components and services were taken from the S&T baseline to help satisfy operational requirements and enhance the end user experience provided with the ATAK infrastructure.

PF-D Block 2 focused on transitioning from a standalone Android application to a plugin on the Android Tactical Assault Kit (ATAK) architecture. Capabilities include Sensor Interoperability, and Digitally Aided Close Air Support over the Link 16 network. A Full Deployment Decision for Block 2 was approved and Acquisition Decision Memorandum signed in Feb 22.

PF-D/M Block 3 encompasses the continuation of PF-D software with additional capabilities for the handheld environment, and begins the development of PF-M by transitioning PF-D software to the mounted environment. PF-M replaces the FOS at the maneuver company FIST and is different from PF-D in that it resides on the mounted platforms and leverages the vehicle's interfaces. The first generation of PF-M (Block 3) will reside on the Mounted Family of Computer Systems (MFoCS) computer to meet the Mounted Computing Environment (MCE) directive. Like NW, PdM Joint Battle Command - Platform (JBC-P) will provide an ATAK-based infrastructure called Mounted Mission Command - Software (MMC-S) to run the PF-M capabilities as a plugin. The PF-M will continue to be developed in partnership with a government integrator and will reuse previously developed components available under the ATAK architecture to serve as the baseline in order to satisfy mission requirements. A Block 3 Build Decision was achieved in Nov 21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF7 / *Precision Fires Warrior Dismounted & Mounted*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for PF-D/M (CORE)	Sub Allot	PM Mission Command (MC) : APG, MD	0.100	-		-		-		-		-	0.000	0.100	-
Program Management Support for PF-D/M (Matrix)	IA	Various Mix Orgs (Govt) : APG, MD	0.491	0.119		0.205		0.200	Feb 2023	-		0.200	0.000	1.015	Continuing
Program Management Support for PF-D/M (SETA)	C/FFP	CACI : APG, MD	0.650	-		0.204		0.218	Mar 2023	-		0.218	0.000	1.072	Continuing
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.111	Mar 2022	-		-		-	0.000	0.111	-
		Subtotal	1.241	0.119		0.520		0.418		-		0.418	0.000	2.298	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PF-D/M Software Development efforts	IA	DEVCOM C5ISR, ESI : APG, MD	16.490	2.892		2.006		2.668	Oct 2023	-		2.668	Continuing	Continuing	Continuing
		Subtotal	16.490	2.892		2.006		2.668		-		2.668	Continuing	Continuing	N/A

Remarks

Funding increase to support larger scope of development of Block 3 capabilities and begin integration of PF-D software with MMC-S to operate within the Mounted Computing Environment.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	PM Mission Command (MC) : APG, MD	1.517	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	1.517	-		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF7 / *Precision Fires Warrior Dismounted & Mounted*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (Engineering Release)	Various	Testing : Various	1.573	0.188		0.498		0.298	Jan 2023	-		0.298	Continuing	Continuing	Continuing
		Subtotal	1.573	0.188		0.498		0.298		-		0.298	Continuing	Continuing	N/A

Remarks

Decrease due to reduced test activities.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.821	3.199		3.024		3.384		-		3.384	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF7 / *Precision Fires Warrior Dismounted & Mounted*

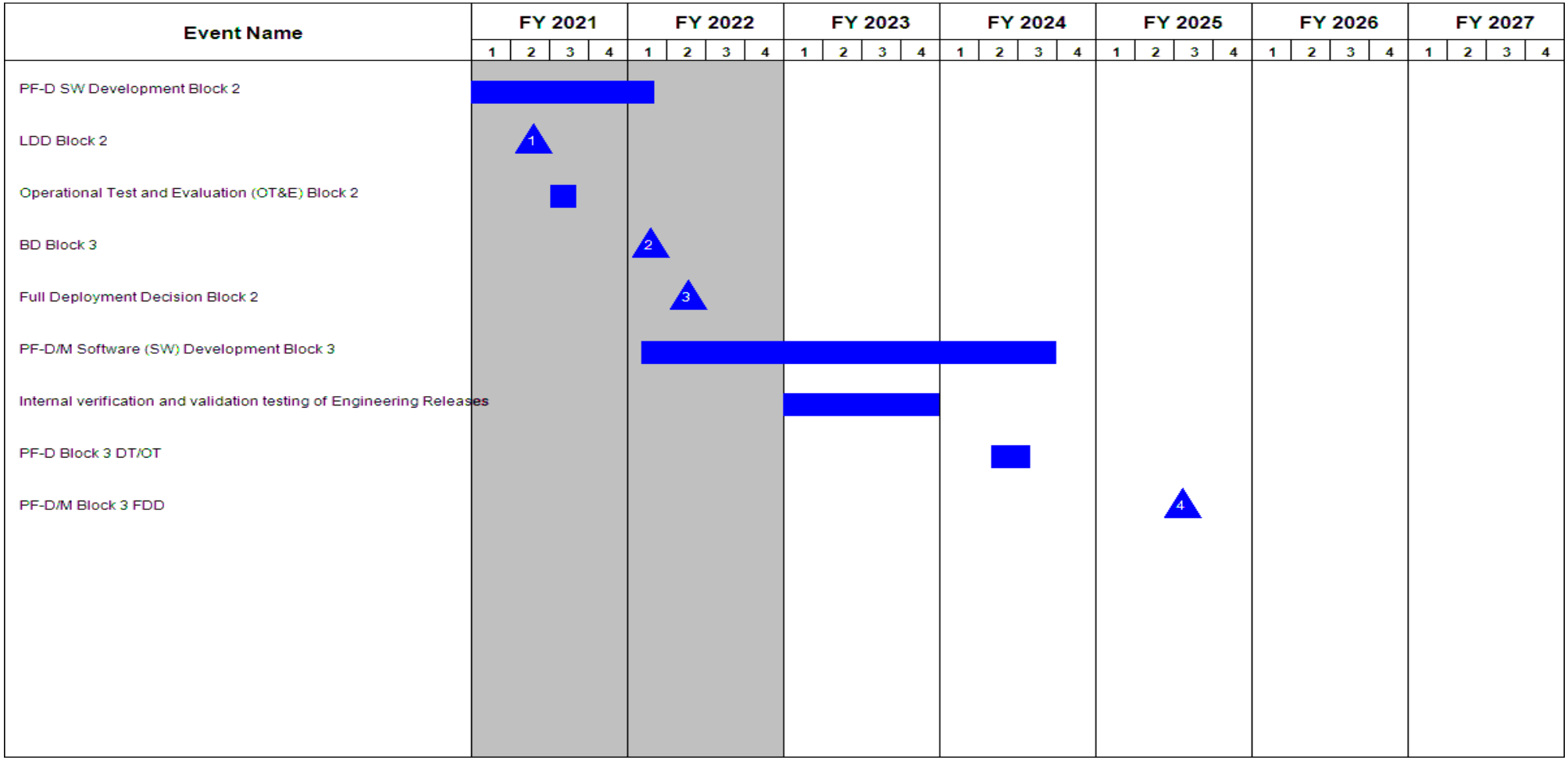


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF7 / *Precision Fires Warrior Dismounted & Mounted*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B	3	2015	3	2015
Limited Deployment Decision (LDD)	4	2016	4	2016
Operational Test (OT)	4	2016	4	2016
Full Deployment Decision (FDD)	2	2017	2	2017
Initial Operational Capability (IOC)	3	2017	3	2017
Build Decision (BD) Block 2	2	2018	2	2018
PF-D SW Development Block 2	2	2019	1	2022
LDD Block 2	2	2021	2	2021
Operational Test and Evaluation (OT&E) Block 2	3	2021	3	2021
BD Block 3	1	2022	1	2022
Full Deployment Decision Block 2	2	2022	2	2022
PF-D/M Software (SW) Development Block 3	1	2022	3	2024
Internal verification and validation testing of Engineering Releases	1	2023	4	2023
PF-D Block 3 DT/OT	2	2024	3	2024
PF-D/M Block 3 FDD	3	2025	3	2025

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF8 / *AFATDS Increment 1*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EF8: *AFATDS Increment 1*	-	39.861	22.465	15.945	-	15.945	1.536	1.418	1.418	1.432	0.000	84.075
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Field Artillery Tactical Data System (AFATDS) supports the Long Range Precision Fires (LRPF) and Network Cross Functional Teams (CFT). LRPF is the #1 priority and the network is the #4 priority in the Army Modernization Strategy, Efforts support the Common Operating Environment and align to the Network CFT's capability set approach.

AFATDS 7 modernizes the existing AFATDS software currently in the field and enhances the existing legacy baseline by: (1) Providing a modernized web service backend that will simplify long-term maintenance of the software, (2) Bringing AFATDS into full compliance with the Army's Common Operating Environment (COE) Command Post Computing Environment (CPCE) initiative and (3) Enhancing overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

AFATDS supports Long Range Precision Fires (LRPF) CFT, Extended Range Canon Artillery (ERCA), Extended Range Guided Multiple Launch Rocket System (ER-GMLRS), Precision Strike Missile System (PRSM), Joint Targeting support to multi-domain operations, and emerging sensor to shooter initiatives. To support these initiatives, AFATDS will serve as the key sensor to shooter link for the Army and US Marine Corps providing fully automated support for planning, coordinating, controlling and executing fires and effects. AFATDS began supporting Long Range Hypersonic Weapons in FY20.

FY23 funding of $15.945 million will be used for continued development and testing of AFATDS 7.0 capabilities, specifically, code conversion from Ada to Java, cyber enhancements, some User Interface improvements, Link 16 implementation and required testing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Program Management Costs for AFATDS software development	4.004	3.074	1.971
Description: Provide program support for AFATDS software development efforts.			
FY 2022 Plans: Continue to provide PMO support (Matrix, and Systems Engineering and Technical Assistance (SETA)) for all aspects of the AFATDS program including requirements analysis, software development efforts, logistics and business management support.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF8 / *AFATDS Increment 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue to provide PMO support (Matrix, and Systems Engineering and Technical Assistance (SETA)) for all aspects of the AFATDS program including requirements analysis, software development efforts, testing, logistics and business management support. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease reflects reduction in PMO personnel to align with reduced development efforts.			
Title: AFATDS software development efforts ***Description:*** Development of AFATDS 7.0 software ***FY 2022 Plans:*** continue development of AFATDS 7 capabilities, specifically, code conversion from Ada to Java, cyber enhancements and some User Interface improvements. ***FY 2023 Plans:*** Complete development of AFATDS 7.0 capabilities, specifically, code conversion from Ada to Java, cyber enhancements, Link 16 implementation, and some User Interface improvements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in cost as software development efforts complete and transition to support testing.	33.982	18.569	7.354
Title: AFATDS 7.0 test events ***Description:*** AFATDS 7.0 Test Support ***FY 2023 Plans:*** Complete required testing for AFATDS 7.0, including development, internal verification & validation, safety certification, operational fires, Army Interoperability Certification, and Joint Interoperability Testing. The program has a well-established internal verification and validation process which will be conducted while the software is being developed to verify the design, validate issues and/or identify new issues to be addressed to ensure stable designs are carried into the formal developmental and operational tests (DT and OT, respectively). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase supports required AFATDS 7.0 test events and activities including DT/OT, internal verification & validation, safety certification, operational fires, Army Interoperability Certification, and Joint Interoperability Testing.	1.875	-	6.620
Title: SBIR/STTR ***Description:*** Funding transferred in accordance with Title 15 USC ?638	-	0.822	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF8 / *AFATDS Increment 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	39.861	22.465	15.945

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• B28620: *MOD OF IN-SVC EQUIP, AFATDS*	5.494	7.205	7.536	-	7.536	6.793	0.913	0.915	0.915	0.000	29.771

Remarks

D. Acquisition Strategy

The AFATDS 7 requirement was validated by the Joint Requirements Oversight Council (JROC) under the AFATDS Increment 2 Capability Definition Document (CDD) in June 2011. On 13 May 2015, the Army Acquisition Executive (AAE) approved AFATDS as a modification to the existing program, continuing as an Acquisition Category (ACAT) II defense acquisition program (DAP) (non-Automated Information System) with PEO C3T oversight. The AFATDS 7 is a software only modification/ modernization effort that will be hosted on already fielded hardware used for legacy AFATDS software.

AFATDS 7 will modernize the underlying architecture of AFATDS to bring it in line with modern software development methodologies and leverage more mainstream technologies which will be easier to sustain long term than the currently fielded system. This modernization effort will eliminate cyber vulnerabilities, update back end code to a modern language (Java), modernize the user interface to reduce user workload and include embedded training that enables the Soldier to receive refresher training on key system capabilities on demand 24/7/365.

The AFATDS Increment 2 CDD was approved under an IT Box construct, which promotes evolutionary development by facilitating requirement refinement and the incorporation of the latest technology. While the JROC Memorandum (JROCM) 083-11 validated the AFATDS 7 performance parameters, it also delegated authority for identifying and approving future capability requirements that fall within the CDD's scope to the Fires Support Command and Control (FSC2) Tactical Software Requirements Governance Board. Subsequent versions of AFATDS 7 will be achieved through a full and open competition planned for FY24 and will continue to be developed to achieve full compliance with the Army's COE, Command Post Computing Environment (CPCE) initiative, and enhance overall usability of the system through the implementation of a role-based capability architecture with embedded training that allows the AFATDS operator to receive on-the-spot training for any aspect of AFATDS via interactive instruction.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF8 / *AFATDS Increment 1*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for AFATDS (Core)	Sub Allot	PM Mission Command (MC) : APG, MD	4.008	-		-		-		-		-	0.000	4.008	-
Program Management Support for AFATDS (Matrix)	IA	Various Matrix Orgs (Govt) : Aberdeen PG, MD	3.769	1.491		1.277		0.898	Oct 2022	-		0.898	0.000	7.435	-
Program Management Support for AFATDS (SETA Contr)	C/FFP	CACI : Aberdeen PG, MD	2.610	1.147	Mar 2021	1.797	Mar 2022	1.073	Mar 2023	-		1.073	0.000	6.627	-
Program Management Support for AFATDS (FFRDC)	FFRDC	MITRE : APG, MD	0.383	-		-		-		-		-	0.000	0.383	-
Taxes	TBD	PEO C3T : APG, MD	1.351	-		-		-		-		-	0.000	1.351	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.822	Mar 2022	-		-		-	0.000	0.822	-
		Subtotal	12.121	2.638		3.896		1.971		-		1.971	0.000	20.626	N/A

Remarks

Decrease reflects reduction in PMO personnel to align with reduced development efforts.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development of AFATDS Version 6.8.1.1	C/CPFF	Raytheon Systems Corp. : Ft. Wayne, IN	21.636	-		-		-		-		-	0.000	21.636	33.188
Software Development of AFATDS Version 7.0	C/CPFF	Leidos : APG, MD	111.868	36.949	Jul 2021	18.569		7.354	Oct 2022	-		7.354	0.000	174.740	-
		Subtotal	133.504	36.949		18.569		7.354		-		7.354	0.000	196.376	N/A

Remarks

Decrease in cost as software development efforts complete and transition to support testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF8 / *AFATDS Increment 1*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Information Assurance and Engineering Support for AFATDS requirements	C/CPFF	CSC : Various Locations	1.060	-		-		-		-		-	0.000	1.060	-
Defensive Cyber Tools (T-PKI)	TBD	TBD : TBD	1.100	-		-		-		-		-	0.000	1.100	-
		Subtotal	2.160	-		-		-		-		-	0.000	2.160	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Confidence Demo for AFATDS V6.8.x requirements.	IA	Army Test & Evaluation Command (ATEC)/Fires Test Directorate (FTD) : Various Locations	0.626	-		-		-		-		-	0.000	0.626	-
Independent Verification and Validation of AFATDS V7.0 requirements	C/CPFF	Engility : Various Locations	1.992	0.274		-		-		-		-	0.000	2.266	-
Developmental Testing for AFATDS v7.0	IA	Multiple Govt Test Agencies (ATEC, ATC, OTC) : Multiple	0.750	-		-		6.620	Jan 2023	-		6.620	0.000	7.370	-
		Subtotal	3.368	0.274		-		6.620		-		6.620	0.000	10.262	N/A

Remarks

Increase supports required AFATDS 7.0 test events and activities including DT/OT, internal verification & validation, safety certification, operational fires, Army Interoperability Certification, and Joint Interoperability Testing

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	151.153	39.861		22.465		15.945		-		15.945	0.000	229.424	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	Project (Number/Name) EF8 / *AFATDS Increment 1*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF8 / *AFATDS Increment 1*

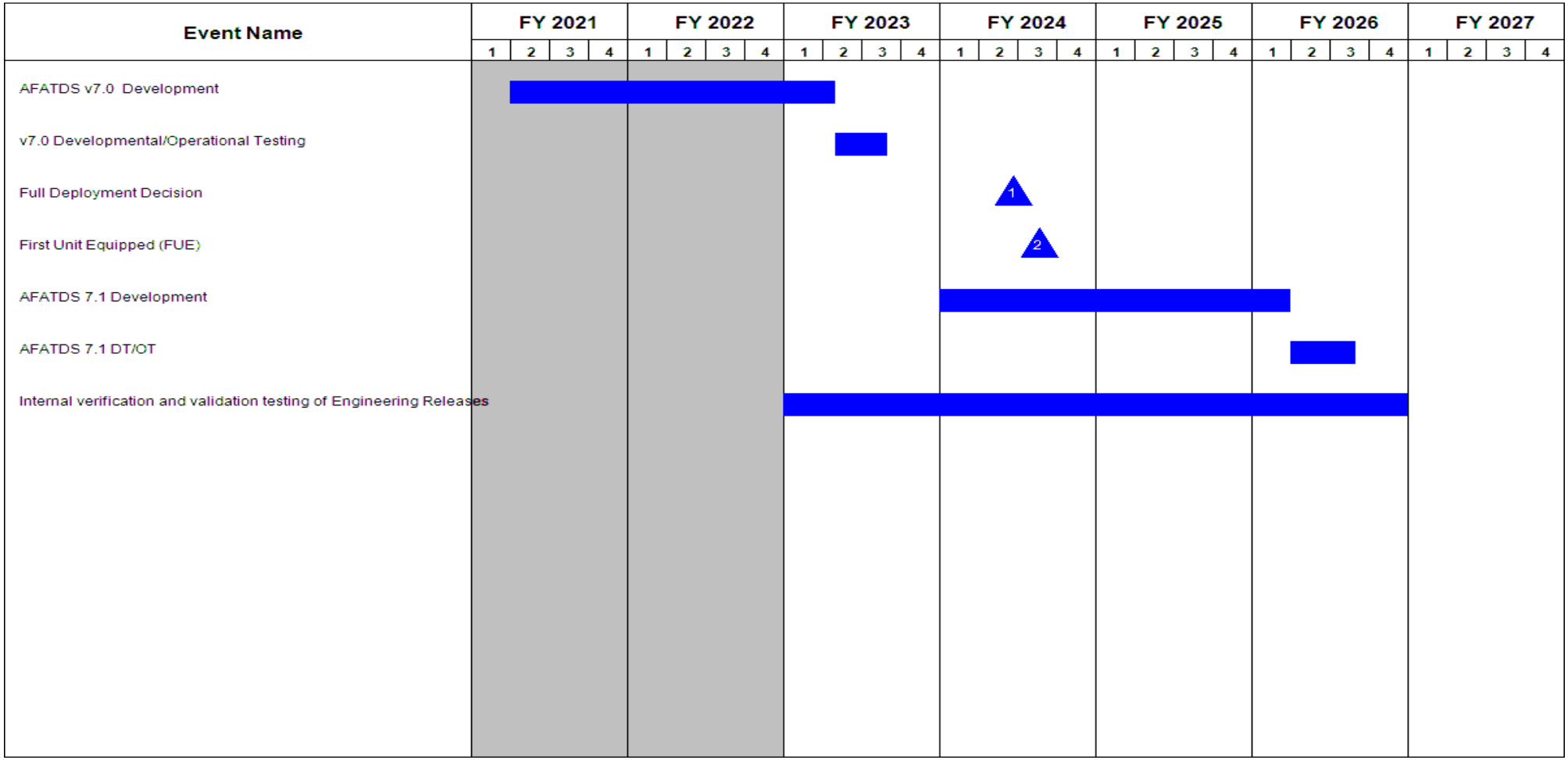


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203728A / *Joint Automated Deep Operation Coordination System (JADOCS)*	**Project (Number/Name)** EF8 / *AFATDS Increment 1*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AFATDS v7.0 Development	1	2021	2	2023
v7.0 Developmental/Operational Testing	2	2023	3	2023
Full Deployment Decision	2	2024	2	2024
First Unit Equipped (FUE)	3	2024	3	2024
AFATDS 7.1 Development	1	2024	1	2026
AFATDS 7.1 DT/OT	2	2026	3	2026
Internal verification and validation testing of Engineering Releases	1	2023	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	213.726	280.107	192.310	-	192.310	120.410	99.663	99.658	100.628	Continuing	Continuing
280: *RECOV VEH IMPROV PROG*	-	121.811	108.954	59.935	-	59.935	8.036	-	-	-	Continuing	Continuing
330: *Abrams Tank Improve Prog*	-	61.039	120.308	61.229	-	61.229	98.274	85.285	85.279	86.109	Continuing	Continuing
371: *Bradley Improve Prog*	-	8.773	19.878	-	-	-	-	-	-	-	Continuing	Continuing
EE2: *Stryker Improvement*	-	22.103	30.967	71.146	-	71.146	14.100	14.378	14.379	14.519	Continuing	Continuing

A. Mission Description and Budget Item Justification

Program Element (PE) 0203735A Combat Vehicle Improvement Programs corrects vehicle deficiencies identified during Army operations; continues technical system upgrades to include the integration of applicable technologies on ground systems; addresses needed evolutionary enhancements to tracked combat vehicles; and develops technology improvements which have application to or insertion opportunities across multiple Ground Combat Systems vehicles. This PE provides combat effectiveness and Operating and Support (O&S) cost reduction enhancements for the Abrams tanks, Bradley Fighting Vehicles and Stryker Family of Vehicles (FOVs) through a series of product improvements.

The strategy for Abrams and Bradley will focus on incrementally delivering capability to the warfighter to meet both near-term limitations as well as mitigating gaps and maintaining combat overmatch in the future. This effort was approved by the Army Acquisition Executive in 3rd Quarter (QTR) Fiscal Year (FY) 2011.

The Recovery Vehicle Improvement program is an Engineering Change Proposal (ECP) that will allow the current recovery vehicle to regain Single Vehicle Recovery (SVR) for the heaviest tracked combat vehicle as defined in the Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES) Enhanced M88A2E1 Capability Production Document Increment 2 dated 20 January 2017. The fielded M88A2 HERCULES lacks the necessary power, weight, and braking ability to safely support the recovery of the M1A2SEPv2 in all situations and with the next generation M1A2SEPv3 weight growth, the problem will get worse. The M88A3 vehicles will bring back the operational capability of the single vehicle recovery. The increased winching and lifting capability accommodates all 80 ton Abrams variants. Without this increased capability, units must use two M88A2 Medium Recovery Vehicles to perform the necessary spectrum of recovery operations.

The Abrams M1A2 SEP V2 and M2/M3A3 Bradley Fighting Vehicles are at or exceed Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to host and restore lost platform capability, the Abrams Tank and Bradley Fighting Vehicle programs will execute a series of ECPs to support the current embedded systems and to facilitate integration of technologies currently in development under other existing Programs of Record. The ECPs are not intended to exceed the operational capability outlined in current system requirements documents, but rather to ensure that the existing system performance is not further degraded and that Army mission equipment packages can be integrated on the Abrams and Bradley Platforms.

Stryker Improvement will address the development of Lethality, Survivability, Mobility, Network Lethality, and Communication, Command and Control (C3) improvements within the Stryker FOVs. Principal development efforts include upgrades associated with the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP),

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203735A *I Combat Vehicle Improvement Programs*

Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP upgrades restore Stryker DVH Space, Weight, and Power-Cooling (SWaP-C) lost as a result of incorporating vehicle changes to counter threats encountered during deployment operations while allowing the future network to be hosted without further degradation in vehicle protection and mobility. The Stryker 30mm ICVD and CROWS-J ONS efforts addressed Urgent Operational Need to increase the lethality of Stryker Infantry Carrier Vehicles (ICV) within the United States Army European Command (USAREUR). The 30mm ICVD ONS effort integrates a 30mm-equipped weapon station providing, USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancements address evolving threats by assessing survivability improvements, to include but not limited to, 360 Situational Awareness, reactive armor tiles, and integration of emerging and existing technologies and other Stryker based platform solutions. The Stryker platform will also include future Mission Equipment Package (MEP) integration that includes but not limited to the Fire Direction Center (FDC) providing an on-the move capability that processes voice and digital data while maintaining contact with the indirect fire team over extended distances. Stryker Lethality ECP efforts (ICVVA1-30mm, CROWS-J, Anti-Tank Guided Missile (ATGM), and other capabilities) focus on the integration of a suite of complementary MEP lethality upgrades that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs). Additionally, the Lethality MEP upgrades will address existing obsolescence issues of the Remote Weapon Station (RWS) with the CROWS and CROWS-J upgrade. The ATGM ECP will upgrade the Modified Improved Target Acquisitions System (MITAS), incorporating a far target locator and enabling the dissemination of target acquirement information utilizing networked lethality, providing a common operating picture. Stryker Network Modernization will formalize the system integration of the Integrated Tactical Network (ITN), Integrated Visual Augmentation System (IVAS), and Tactical Cloud Package (TCP) as part of Mounted Capability Set 23 (MCS23) for the Stryker platform. Upgrades of the Stryker flat-bottom hull and DVH variants were completed to mitigate known system deficiencies.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	213.728	211.523	0.000	-	0.000
Current President's Budget	213.726	280.107	192.310	-	192.310
Total Adjustments	-0.002	68.584	192.310	-	192.310
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.393			
• Congressional Rescissions	-	-			
• Congressional Adds	-	70.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	192.310	-	192.310
• FFRDC Transfer	-	-0.023	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 330: *Abrams Tank Improve Prog*		
Congressional Add: *CONGRESSIONAL ADD - Abrams Modernization*	-	65.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Congressional Add: *CONGRESSIONAL ADD - Next Generation Auxiliary Power Unit*	-	5.000
Congressional Add Subtotals for Project: 330	-	70.000
Congressional Add Totals for all Projects	-	70.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 280 / *RECOV VEH IMPROV PROG*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
280: *RECOV VEH IMPROV PROG*	-	121.811	108.954	59.935	-	59.935	8.036	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES), designated as an Acquisition Category (ACAT) IC program on 15 Jun 2016, has been providing towing, winching, and hoisting operations to support battlefield recovery operations and evacuation of heavy tanks and other tracked combat vehicles since its production and deployment in 1998. The M88A2 HERCULES recovers tanks mired to different depths, removes M1 Abrams turrets and power packs, and uprights overturned heavy combat vehicles. Currently, the M88A2 is unable to safely perform Single Vehicle Recovery (SVR) of the Abrams tank in all conditions, due to added weight/survivability improvements made to the tank. In order to ensure single vehicle recovery is met, Project Manager- Main Battle Tank Systems (PM-MBTS) will develop and integrate Engineering Change Proposal (ECP) technologies for the M88A2 HERCULES through an initiative to meet its operational requirements of single vehicle recovery throughout its life cycle. This initiative is not intended to exceed current operational capability, but will instead regain single vehicle recovery capability of the heaviest tracked combat vehicle.

Analyses conducted to date suggests that upgrades to the M88A2 track, suspension, hydraulics, engine, transmission and other related components are required to meet single vehicle recovery for the heaviest tracked combat vehicle.

Fiscal Year (FY) 2023 Base dollars will fund preparations for USG prototype testing and continue the Program Management Office support; to include labor, training, travel, supplies, and equipment to effectively manage the program. Program starts Government System Level test and verification, along with Logistics Demonstration activities within FY 2023. Program will conduct system verification review to ensure readiness to proceed to production. The system verification review will be followed by production readiness review at the end of FY23.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Program Management Office (PMO) Support	1.486	1.971	1.599
Description: PMO support includes Systems Engineering, Logistics, Government and in-house support Contractor salaries, travel and other support costs required to effectively manage the program.			
FY 2022 Plans: The program continues Other Transaction Authority (OTA) project oversight, supports technical solution development for continued M88A3 prototype builds, support for system-level verification and test, and preparation of production contract(s).			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 280 / *RECOV VEH IMPROV PROG*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue Government Systems Engineering, Logistics, test support at multiple sites and Program Management office support in FY 2022. This will include labor, training, travel, supplies, and equipment to effectively manage the program. ***FY 2023 Plans:*** The program continues OTA project oversight, supports completion of the last of (8) M88A3 prototype builds. The program then transitions into test and evaluation support for system-level verification and test, and preparation of production contract(s). Continue Government Systems Engineering, Logistics, test support at multiple sites and Program Management office support in FY 2023. This will include labor, training, travel, supplies, and equipment to effectively manage the program. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The M88A3 program is transitioning from development and prototype manufacturing to primarily test and logistics product development. Accordingly, there will be substantial decreases to the M88A3 program management support and systems engineering support efforts.			
Title: Product Development ***Description:*** Design and Development of ECPs. ***FY 2022 Plans:*** The program completes development of the M88A3 prototype builds, contractor component qualification and systems shakedown testing to support (8) M88A3 prototype vehicle Government Acceptance. Program starts Government System Level test and verification in FY 2023. ***FY 2023 Plans:*** The program continues OTA project oversight, supports completion of the last of (8) M88A3 prototype builds, support for system level verification and test execution, identification of early order material, user touch points and preparation of production contract(s). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 will represent a significant drawdown in product development as the technical configuration stabilizes heading into the test phase. Prototype builds will be complete early in FY 2023, and the program will transition from heavy development to test support, test induced corrective actions, along with a ramp up in Logistics product development and preparations for initial production.	119.828	97.859	44.220
Title: Test and Evaluation ***Description:*** The Army is conducting Developmental Test and Evaluation (DT&E) on (8) prototype M88A3 vehicles to confirm Single Vehicle Recovery capability for an 80T Main Battle Tank. Test data supports an evaluation of the M88A3 for use in a production decision in FY 2023. DT&E for the M88A3 includes safety testing, automotive performance, recovery, transportability,	0.497	5.147	14.116

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 280 / *RECOV VEH IMPROV PROG*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Reliability Availability and Maintainability (RAM), Electromagnetic Interference (EMI), Cybersecurity, Survivability-Live Fire Test & Evaluation (LFT&E), environmental effects, logistics demonstration, and Soldier Test Point. ***FY 2022 Plans:*** The Contractor and USG Test Readiness Reviews, as well as all associated M88A3 test planning and preparations, will occur in FY 2022. Vehicle inspection and characterization, instrumentation, and operator training will commence upon arrival of prototype vehicles at both Aberdeen Test Center (ATC) and Yuma Proving Grounds (YPG), followed by the startup of Automotive Performance and RAM testing. Modeling and Simulation (M&S) in support of LFT&E will begin upon receipt of technical data at Test Readiness Review (TRR). Technical manual validation will also start in FY 2022. ***FY 2023 Plans:*** The USG will continue test planning and preparation activities started in FY 2022, leading into the full M88A3 test program executed during FY 2023. The test program will consist of the DT&E effort, conducted at both Aberdeen Test Center (ATC) and Yuma Proving Grounds (YPG). Technical Manual Validation and the Logistics Demonstration will also occur in FY 2023, both at the contractor facility. Logistics Demo will take place from 4QFY23-1QFY24. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in test efforts are due to the execution of the M88A3 test program involving (8) vehicles; this includes the DT&E and Logistics efforts outlined above. Efforts started in FY 2022 (such as Live Fire M&S) will be completed in FY 2023 and support the evaluation of the system.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Accomplishments/Planned ***Description:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638.	-	3.977	-
Accomplishments/Planned Programs Subtotals	121.811	108.954	59.935

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• GA0570: *Improved Recovery Vehicle (M88A2 HERCULES)*	-	52.059	138.759	-	138.759	183.472	194.793	195.975	187.909	0.000	952.967

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 280 / *RECOV VEH IMPROV PROG*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• G80571: *M88 FOV MODS*	18.382	-	0.000	-	0.000	-	-	-	-	0.000	18.382

Remarks

D. Acquisition Strategy

The Project Manager (PM) for Main Battle Tank Systems (MBTS) is executing an Engineering Change Proposal (ECP) to regain single vehicle recovery capability of the M88A2 HERCULES vehicle. The strategy utilizes the Detroit Arsenal Automotive Other Transaction Authority (DA2 OTA) which competitively awarded a single contract to develop, integrate and produce (8) prototype vehicles entering testing in FY 2022. After achieving OTA success criteria, a contract award using procurement dollars procures up to (70) initial production vehicles, as well as the procurement of hardware kits/components comprised of engines, transmissions, track and suspensions. Follow on M88A3 production will utilize a Federal Acquisition Regulation (FAR) based contract through the defined Army Acquisition Objective (AAO). The M88A2 HERCULES production vehicles continue fielding to Units through FY 2023.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 280 / *RECOV VEH IMPROV PROG*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		3.977	Mar 2022	-		-		-	0.000	3.977	-
		Subtotal	-	-		3.977		-		-		-	0.000	3.977	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	BAE Systems : TBD	95.771	119.828	Oct 2020	97.859	Oct 2021	44.220	Oct 2022	-		44.220	0.000	357.678	-
		Subtotal	95.771	119.828		97.859		44.220		-		44.220	0.000	357.678	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO) Support	MIPR	PMO Support Offices, Ricardo Defense, DCS and Army Research Labs (ARL) : Various	5.375	1.486	Jan 2021	1.971	Dec 2021	1.599	Dec 2022	-		1.599	0.000	10.431	-
		Subtotal	5.375	1.486		1.971		1.599		-		1.599	0.000	10.431	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Aberdeeen Test Center (ATC), Yuma Test Center (YTC) : Various	0.512	0.497	May 2021	5.147	Aug 2022	14.116	Feb 2023	-		14.116	0.000	20.272	-
		Subtotal	0.512	0.497		5.147		14.116		-		14.116	0.000	20.272	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 280 / *RECOV VEH IMPROV PROG*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	101.658	121.811		108.954		59.935		-		59.935	0.000	392.358	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 280 / *RECOV VEH IMPROV PROG*

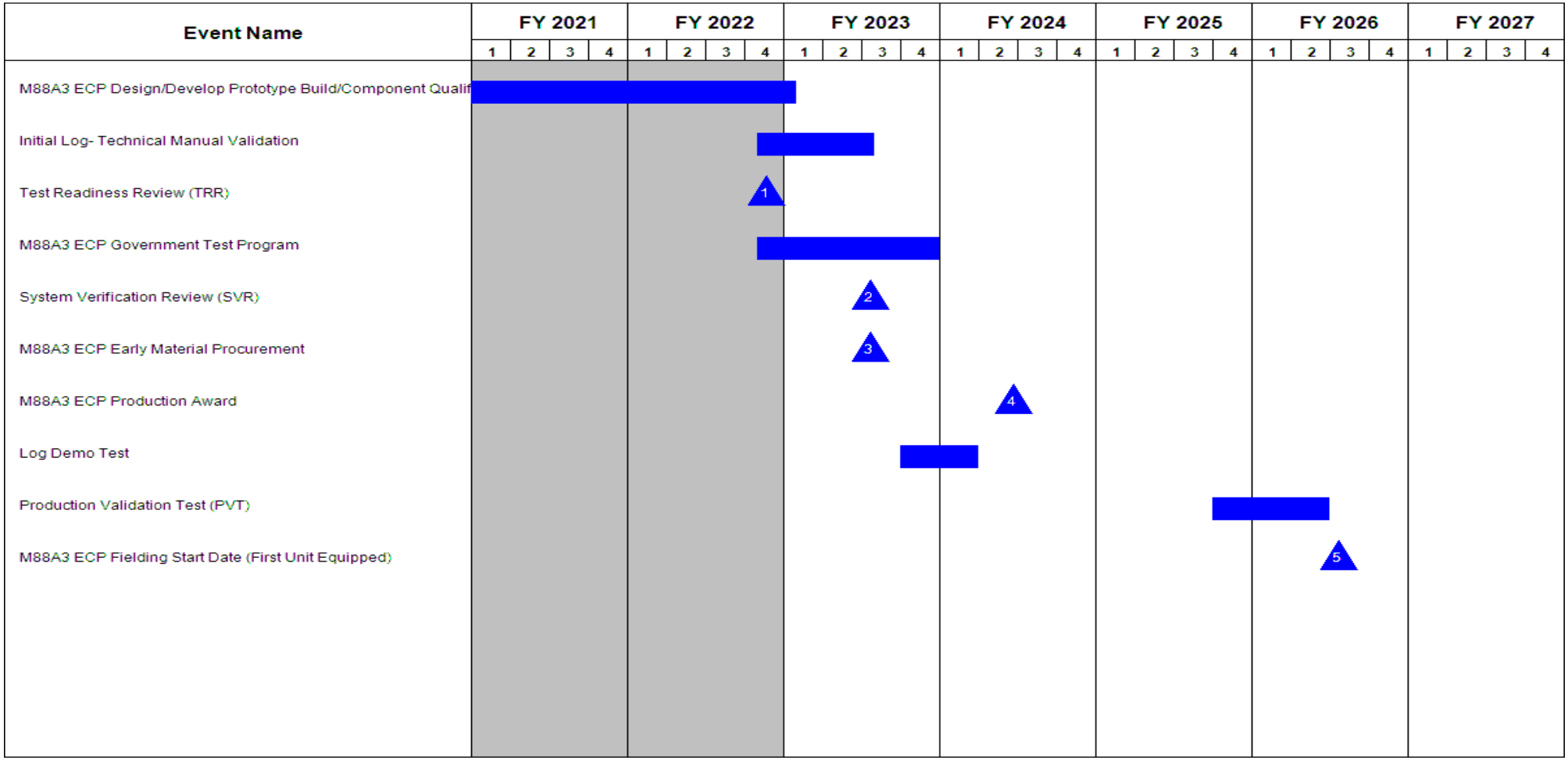


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 280 / *RECOV VEH IMPROV PROG*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
M88A3 ECP Design/Develop Prototype Build/Component Qualification	4	2019	1	2023
Initial Log- Technical Manual Validation	4	2022	3	2023
Test Readiness Review (TRR)	4	2022	4	2022
M88A3 ECP Government Test Program	4	2022	4	2023
System Verification Review (SVR)	3	2023	3	2023
M88A3 ECP Early Material Procurement	3	2023	3	2023
M88A3 ECP Production Award	2	2024	2	2024
Log Demo Test	4	2023	1	2024
Production Validation Test (PVT)	4	2025	2	2026
M88A3 ECP Fielding Start Date (First Unit Equipped)	3	2026	3	2026

Note

Survivability, lethality and vulnerability (SLV) Testing

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 330 / *Abrams Tank Improve Prog*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
330: *Abrams Tank Improve Prog*	-	61.039	120.308	61.229	-	61.229	98.274	85.285	85.279	86.109	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army has approved Engineering Change Proposals (ECPs) for the Abrams Main Battle Tank to restore lost capability, host inbound technologies, and to meet objective performance requirements called out in approved platform requirements documents. The strategy for Abrams will focus on incrementally delivering capability to the warfighter to meet both near-term limitations as well as mitigating gaps and maintaining combat overmatch in the future. This approach was approved by the Army Acquisition Executive in 3rd Quarter (Q) Fiscal Year (FY) 2011 and revalidated in an AROC decision in 2018.

The Abrams vehicle is at or exceeds Space, Weight, and Power-Cooling (SWaP-C) limitations. In order to restore lost platform capability, the Abrams Tank will execute a series of ECPs to support the current embedded systems and to facilitate integration of technologies currently in development. The ECPs are not intended to exceed the operational capability outlined in current system requirements documents, but rather to ensure that the existing system performance is not further degraded and that Army mission equipment packages can be integrated on the Abrams. The ECPs will incorporate lost power generation and distribution technologies, lethality improvements, force protection and survivability improvements to counter evolving threats to include, but not limited to Active Protection Systems, technologies to mitigate obsolescence issues, in-bound technologies under development, technologies to decrease the overall weight of the tank, and technologies in support of any validated Army requirement.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Abrams Lethality Engineering Change Proposal M1A2SEP V4/ECP 1B	52.646	40.530	46.117
Description: The Abrams SEP (System Enhancement Program) v4 program consists of lethality improvements primarily focused on the integration of 3rd Generation Forward Looking Infrared (FLIR). Additional improvements include a Laser Warning Receiver (LWR), Improved Thermal Management System (ITMS), and target acquisition sensor upgrades consisting of inclusion of color cameras, laser capabilities, and image processing. Other potential improvements include vehicle smoke generation, survivability enhancements, signature management improvements, embedded training enhancements, 360 Situational Awareness cameras, and weight reduction efforts. Trade studies, analysis and technology maturation will be performed to evaluate prospective improvements, along with obsolescence mitigation, and incorporation of inbound technologies currently under development.			
FY 2022 Plans: As a result of late contractor deliveries the prototype vehicle build and component qualification testing will continue longer than originally expected and delay the start of Original Equipment Manufacturer (OEM) vehicle testing until late FY 2022.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 330 / *Abrams Tank Improve Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
SEPv4 program completes contractor led OEM testing and begins Army developmental test and evaluation in 3QFY23. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase in funding for FY23 is to complete verification and validation activities that have been delayed due to late contractor hardware deliveries.			
Title: Program Management Office (PMO) Support ***Description:*** PMO Support includes Systems Engineering and Government and Contractor salaries, travel and other support costs required to effectively manage the program. ***FY 2022 Plans:*** Continue Government Systems Engineering and Program Management office support in FY 2022. This will include labor, training, travel, supplies, and equipment to effectively manage the program. ***FY 2023 Plans:*** Continue Government Systems Engineering and Program Management office support in FY 2023. This will include labor, training, travel, supplies, and equipment to effectively manage the program. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Program support decreased as program enters developmental test phase.	3.515	3.850	3.674
Title: Test & Evaluation - Engineering Change Proposal M1A2SEP V4/ECP 1B ***Description:*** Comprises government test and evaluation of the SEP (System Enhancement Program) v4. Testing includes developmental, operational, and live fire test and evaluation. Government test modeling and simulation, detailed vehicle test planning, and initial test site preparation are also included. ***FY 2022 Plans:*** Finalize preparation and planning of SEPv4 testing and continue live fire modeling and simulation. Begin test site support of OEM testing. ***FY 2023 Plans:*** SEPv4 program completes OEM testing and begin government developmental test and evaluation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased to complete OEM test and begin government developmental test and evaluation.	2.402	2.988	9.088
Title: Lethality and Survivability Enhancements	2.476	1.080	2.350

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 330 / *Abrams Tank Improve Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Enhances lethality primarily through integration of improved munitions (smart rounds), gun turret drive improvements, cannon improvements, image processing enhancements and advanced algorithms. Survivability enhancements will focus on improved sensors, 360 Situational Awareness, active protection systems, armor improvements, and unmanned system defeat. Mobility enhancements will focus on efforts to reduce the weight of the tank to ensure operational mobility. ***FY 2022 Plans:*** Abrams will initiate trade study to identify and evaluate technology that has the potential to reduce the weight of the tank to ensure operational mobility. Abrams to conduct trade study to investigate potential technology integration pathways that may reduce the increasing cognitive burden upon tank crew. Abrams continues integration of survivability enhancements. ***FY 2023 Plans:*** Abrams continues integration of survivability enhancements and further investigates technologies that may reduce crew cognitive burden and overall weight of tank to ensure operational mobility. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Minimal increase to account for results of ongoing trade studies and enhancements.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Accomplishments/Planned ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638.	-	1.837	-
Title: FFRDC ***FY 2022 Plans:*** FY22 FFRDC tax to program ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 FFRDC tax is TBD.	-	0.023	-
Accomplishments/Planned Programs Subtotals	61.039	50.308	61.229

	FY 2021	FY 2022
Congressional Add: CONGRESSIONAL ADD - Abrams Modernization	-	65.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 330 / *Abrams Tank Improve Prog*

	FY 2021	FY 2022
FY 2022 Plans: The Congressional Add of $65M reflects an increase for Abrams Modernization efforts to include, but not limited to: Unmanned Turret, Autoloader and Automated Ammunition Handling System, Hydro-Pneumatic suspension, Integration APS, and Hybrid Electric Drive.		
Congressional Add: CONGRESSIONAL ADD - Next Generation Auxiliary Power Unit ***FY 2022 Plans:*** The Congressional Add of $5M reflects an increase to evaluate integration of Hydro-Pneumatic Suspension Units onto the Abrams chassis.	-	5.000
Congressional Adds Subtotals	-	70.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• GA0700: *M1 Abrams Tank (MOD)*	375.107	-	0.000	-	0.000	-	-	-	-	0.000	375.107
• GA0750: *Abrams Upgrade Program*	968.094	1,145.837	656.340	-	656.340	814.234	1,072.434	1,046.346	1,049.429	Continuing	Continuing

Remarks

D. Acquisition Strategy

Research & Development Contract - Sole Source, Cost Plus Incentive Fee (CPIF); SEP v4 - Research & Development Contract - Sole Source, CPIF.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 330 / *Abrams Tank Improve Prog*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Accomplishments	TBD	TBD : TBD	-	-		1.837	Apr 2022	-		-		-	0.000	1.837	-
FFRDC	TBD	TBD : TBD	-	-		0.023		-		-		-	0.000	0.023	-
		Subtotal	-	-		1.860		-		-		-	0.000	1.860	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Abrams SEPV3	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	347.372	-		-		-		-		-	0.000	347.372	-
SEPV3 Training Device Upgrades	MIPR	PEO, STRI : Orlando, FL	4.252	-		-		-		-		-	0.000	4.252	-
Abrams SEPV4	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	319.313	52.646	Feb 2021	40.530	Feb 2022	46.117	Nov 2022	-		46.117	Continuing	Continuing	Continuing
Advanced Multi-Purpose (AMP) Round	SS/CPIF	General Dynamics Land Systems : Sterling Heights, MI	7.128	-		-		-		-		-	0.000	7.128	-
Lethality and,Survivability Enhancements	Option/ Various	Various : Various	11.885	2.476	Mar 2021	1.080	Jan 2022	2.350	Apr 2023	-		2.350	Continuing	Continuing	Continuing
CONGRESSIONAL ADD - Abrams Mobility	TBD	General Dynamics Land Systems : Sterling Heights, MI	-	-		65.000	Jun 2022	-		-		-	0.000	65.000	-
CONGRESSIONAL ADD - Auxiliary Power Unit	TBD	TBD : TBD	-	-		5.000	Jun 2022	-		-		-	0.000	5.000	-
		Subtotal	689.950	55.122		111.610		48.467		-		48.467	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 330 / *Abrams Tank Improve Prog*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO) Support	MIPR	PMO Support Offices : TACOM, GVSC, ARDEC, ARL, Picatinny	92.458	3.515	Jan 2021	3.850	Jan 2022	3.674	Dec 2022	-		3.674	Continuing	Continuing	Continuing
Program Management Office (PMO) Support - Survivability Enhancements	MIPR	PMO Support Offices : GVSC/ Various	2.207	-		-		-		-		-	0.000	2.207	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	TBD : TBD	0.160	-		-		-		-		-	0.000	0.160	-
		Subtotal	94.825	3.515		3.850		3.674		-		3.674	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing / SEPV4	MIPR	Aberdeen Proving Ground; Yuma Proving Ground; White Sands Missile Range, : Various	62.075	2.402	Jan 2021	2.988	Jun 2022	9.088	Nov 2022	-		9.088	Continuing	Continuing	Continuing
Government Testing SEPV3	MIPR	Various : Various	2.721	-		-		-		-		-	0.000	2.721	-
Contractor Testing SEPV3	SS/CPIF	General Dynamics Land Systems : Various	40.563	-		-		-		-		-	0.000	40.563	-
Contractor Testing SEPV4	SS/CPIF	General Dynamics Land Systems : Various	2.029	-		-		-		-		-	0.000	2.029	-
Government Testing - Survivability Enhancements	Various	Various : Various	24.491	-		-		-		-		-	0.000	24.491	-
		Subtotal	131.879	2.402		2.988		9.088		-		9.088	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 330 / *Abrams Tank Improve Prog*	

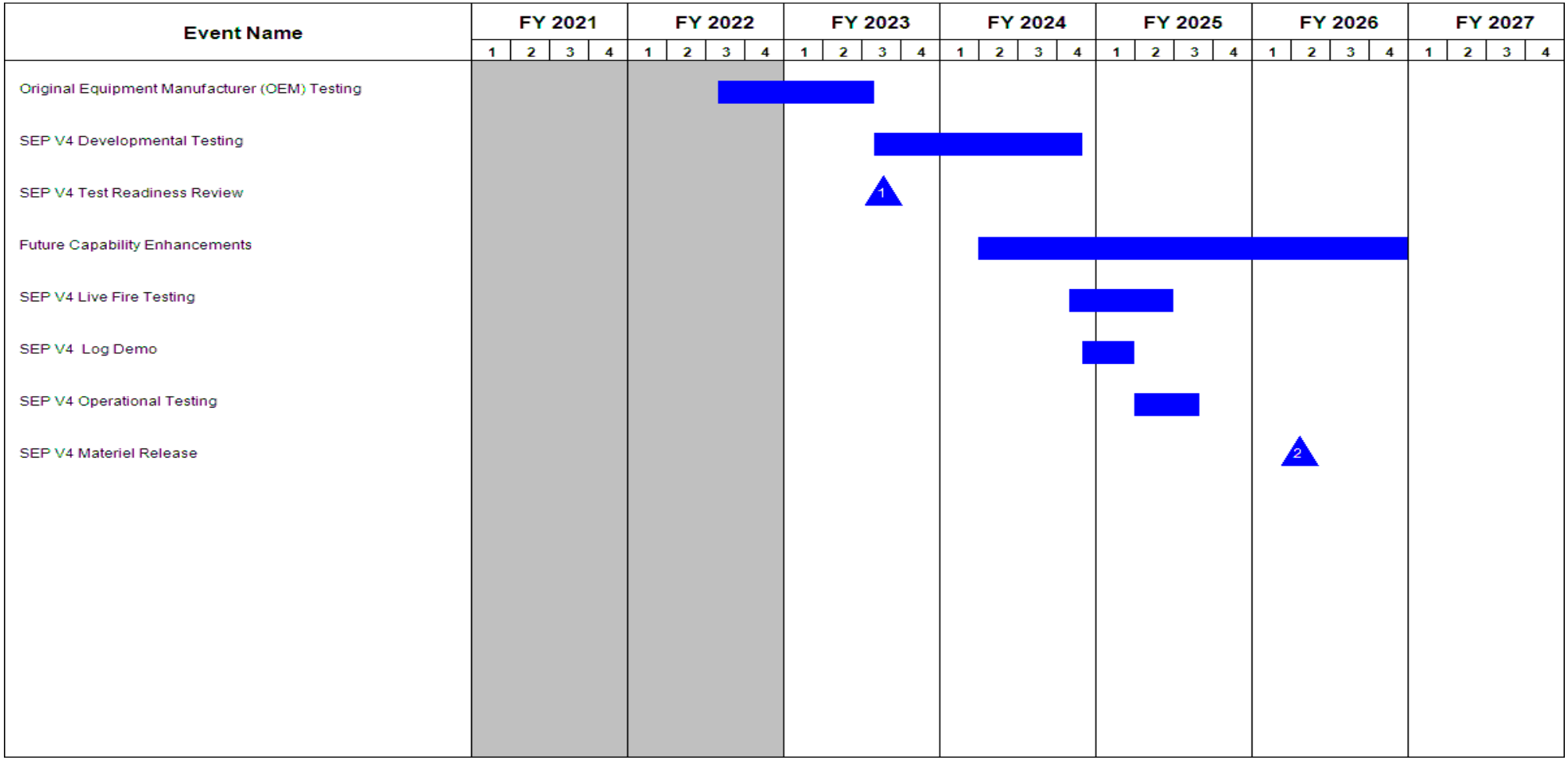
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
Government Testing/SEPV4 includes prior Government testing for prior vehicles and SEPv4 testing projected to begin in FY2021.															

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	916.654	61.039		120.308		61.229		-		61.229	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 330 / *Abrams Tank Improve Prog*



Note

SEP (System Enhancement Program)

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 330 / *Abrams Tank Improve Prog*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Original Equipment Manufacturer (OEM) Testing	3	2022	3	2023
SEP V4 Developmental Testing	3	2023	4	2024
SEP V4 Test Readiness Review	3	2023	3	2023
Future Capability Enhancements	2	2024	4	2026
SEP V4 Live Fire Testing	4	2024	2	2025
SEP V4 Log Demo	4	2024	1	2025
SEP V4 Operational Testing	2	2025	3	2025
SEP V4 Materiel Release	2	2026	2	2026
SEP V4 First Unit Equipped	3	2028	3	2028

Note

SEP (System Enhancement Program)

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 371 / *Bradley Improve Prog*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
371: *Bradley Improve Prog*	-	8.773	19.878	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Bradley Fighting Vehicle will continue to be a major combat vehicle in the Army Operational Force for the next 20-25 years. Current modernization efforts, such as the Track and Suspension Engineering Change Proposal (ECP) and the A4 Mobility ECP, address current space, weight, and power-cooling (SWAP-C) limitations. The Bradley will continue to modernize to support additional capabilities required to counter evolving threats in multi-domain operations including, but not limited to improved vehicle diagnostics and systems to increase maintainability, mobility, survivability, sensor digitization, improved power distribution, and cyber and software improvements. These improvements increase the Bradley Fighting Vehicle's ability to survive in a cyber and electronic warfare permissive environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Bradley Improvements ***Description:*** Provides funding for the analysis, engineering, development, and integration to support Army directed inbound technologies, address critical obsolescence concerns and other improvements to the Bradley vehicles. ***FY 2022 Plans:*** Will conduct integration activities for Army directed improvements and inbound technologies such as, but not limited to, Next Generation Automatic Test System (NGATS), power architecture, sensor digitization, and cyber security. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 is because program funding for Bradley RDT&E is not currently authorized after PB22.	4.697	16.046	-
Title: Test & Evaluation ***Description:*** Test & Evaluation efforts support developmental and operational test events. These events include test planning, system and subsystem testing, and development of test documentation. ***FY 2022 Plans:*** Provides funding to conduct cyber testing, software development and refurbish/overhaul prototype vehicles due to very high mileage and wear, will refurbish prototype Engineering & Manufacturing Development (EMD) A4 vehicles used during developmental testing (DT). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 is because program funding for Bradley RDT&E is not currently authorized after PB22.	1.227	1.000	-
Title: Bradley A4 ECP Program	1.477	1.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 371 / *Bradley Improve Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Current projections indicate the Bradley Fighting Vehicle and the Bradley Fire Support Vehicle will remain in the Armored Brigade Combat Team (ABCT) formation until the 2050s. Given this, additional Research and Development (R&D) is required to keep the force relevant. The Bradley Fighting Vehicle System (BFVS) improvements implemented through the ECP Program will focus on restoring lost platform capability and provide capacity to support Army inbound technologies and to facilitate integration of technologies currently in development under other existing programs of record. ***FY 2022 Plans:*** Provides funding to support National Maintenance Work Request (NMWR) pilot program to finalize draft NMWR currently in development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 is because program funding for Bradley RDT&E is not currently authorized after PB22.			
Title: Program Management Office (PMO) Support ***Description:*** PMO Support includes systems engineering, government and contractor salaries, travel, training and other support costs required to effectively manage the program. ***FY 2022 Plans:*** Will continue government program management and system engineering support costs. These funds will cover the costs of government and direct support contractor salaries, travel, training, supplies, equipment and facilities to manage the issues resulting from Bradley A4 ECP testing and developing logistics products and other development activities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 is because program funding for Bradley RDT&E is not currently authorized after PB22.	1.372	1.106	-
Title: FY2022 SBIR/STTR Transfer ***Description:*** FY2022 SBIR/STTR Transfer ***FY 2022 Plans:*** FY2022 SBIR/STTR adjustment ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2022 SBIR/STTR Transfer	-	0.726	-
Accomplishments/Planned Programs Subtotals	8.773	19.878	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 371 / *Bradley Improve Prog*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• GZ2400: *Bradley Program (MOD)*	277.259	460.385	279.531	-	279.531	56.037	30.989	30.951	30.946	Continuing	Continuing

Remarks

D. Acquisition Strategy

Product Manager Bradley will execute modification work orders following completion of development to support integrating FY 2022 funded capabilities into the formation at an average rate of three ABCTs per year. Software capability upgrades, including cyber, will be included in the next iteration of Voice, Video and Integrated Data (VVID) software in FY 2022 - FY 2024 time frame.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 371 / *Bradley Improve Prog*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Taxes	TBD	Assigned SBIR/ STTR Taxes : ABO	-	-		0.726	Mar 2022	-		-		-	0.000	0.726	-
		Subtotal	-	-		0.726		-		-		-	0.000	0.726	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Bradley Improvements	MIPR	TBD : TBD	76.767	2.766	Sep 2021	16.046	Sep 2022	-		-		-	Continuing	Continuing	Continuing
Bradley A4 Engineering Change Proposal (ECP) Program	MIPR	PMO : Warren, Picatinny NJ	102.401	1.477	Apr 2022	1.000	Dec 2022	-		-		-	0.000	104.878	-
Bradley Improvements - IBAS	SS/TBD	DRS : Melbourne, FL	-	0.622	Mar 2021	-		-		-		-	Continuing	Continuing	Continuing
Bradley Imrovements - Power Architecture	SS/TBD	BAE : Sterling Heights, MI	-	1.309	Jul 2021	-		-		-		-	Continuing	Continuing	Continuing
Non Recurring Engineering- Bradley A4 ECP	SS/CPIF	BAE : Sterling Heights, MI	276.530	-		-		-		-		-	0.000	276.530	-
Non Recurring Engineering- Bradley A4 ECP TADDS	TBD	TBD : TBD	7.484	-		-		-		-		-	0.000	7.484	-
Survability Enhancements - Underbelly Armor	SS/ Various	TBD : TBD	2.736	-		-		-		-		-	0.000	2.736	-
Current Fleet Enhancements	SS/ Various	TBD : TBD	2.580	-		-		-		-		-	0.000	2.580	Continuing
		Subtotal	468.498	6.174		17.046		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) 371 / *Bradley Improve Prog*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support/OGA	MIPR	PMO/PEO : Bradley ECP Program	37.785	0.527	Sep 2021	0.593	Dec 2022	-		-		-	Continuing	Continuing	Continuing
Government Engineering Support	MIPR	Various : Bradley ECP Program	52.189	0.845	Dec 2020	0.513	Dec 2022	-		-		-	Continuing	Continuing	Continuing
FY 2019 Rescission	TBD	FY 2019 Pending Recission : TACOM	25.000	-		-		-		-		-	0.000	25.000	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	FY 2018 NDAA SEC 825 MDAP Cost Overrun : TACOM	0.056	-		-		-		-		-	0.000	0.056	-
		Subtotal	115.030	1.372		1.106		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing	MIPR	Various : Test Sites	56.793	1.227	Jul 2021	1.000	Jul 2022	-		-		-	Continuing	Continuing	Continuing
		Subtotal	56.793	1.227		1.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	640.321	8.773		19.878		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 371 / *Bradley Improve Prog*

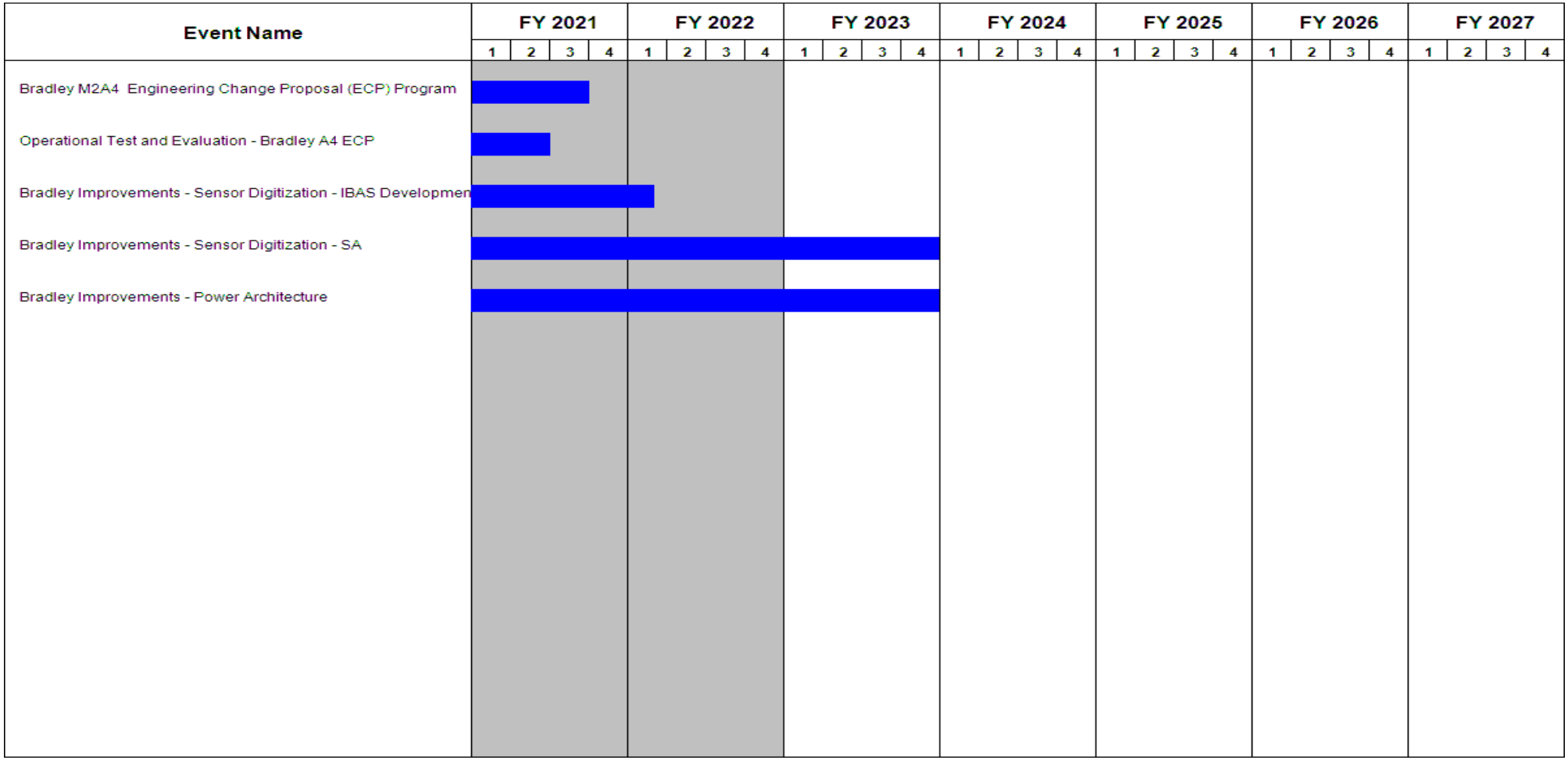


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** 371 / *Bradley Improve Prog*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Bradley M2A4 Engineering Change Proposal (ECP) Program	1	2012	3	2021
Operational Test and Evaluation - Bradley A4 ECP	4	2020	2	2021
Bradley Improvements - Sensor Digitization - IBAS Development	4	2019	1	2022
Bradley Improvements - Sensor Digitization - SA	2	2020	4	2023
Bradley Improvements - Power Architecture	4	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) EE2 / *Stryker Improvement*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EE2: *Stryker Improvement*	-	22.103	30.967	71.146	-	71.146	14.100	14.378	14.379	14.519	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Stryker Improvement will address the development of Lethality, Survivability, Mobility, Network Lethality, and Communication, Command and Control (C3) improvements within the Stryker Family of Vehicles (FOVs). Principal development efforts include upgrades associated with the Stryker Double V-Hull A1 (DVH A1) Engineering Change Proposal (ECP), Stryker 30mm Infantry Carrier Vehicle Dragoon (ICVD) Operational Needs Statement (ONS), Common Remotely Operated Weapon Station-Javelin (CROWS-J) ONS, Stryker Survivability Enhancement, and Stryker Lethality ECPs. DVH A1 ECP upgrades restore Stryker DVH Space, Weight, and Power-Cooling (SWaP-C) lost as a result of incorporating vehicle changes to counter threats encountered during deployment operations while allowing the future network to be hosted without further degradation in vehicle protection and mobility. The Stryker 30mm ICVD and CROWS-J ONS efforts addressed Urgent Operational Need to increase the lethality of Stryker Infantry Carrier Vehicles (ICV) within the United States Army European Command (USAREUR). The 30mm ICVD ONS effort integrates a 30mm-equipped weapon station providing, USAREUR with precision direct firepower to overwhelm the enemy in encounter actions and suppressive fire to preserve mounted and dismounted freedom of movement. The Stryker Survivability Enhancements address evolving threats by assessing survivability improvements, to include but not limited to, 360 Situational Awareness, reactive armor tiles, and integration of emerging and existing technologies and other Stryker based platform solutions. The Stryker platform will also include future Mission Equipment Package (MEP) integration that includes but not limited to the Fire Direction Center (FDC) providing an on-the move capability that processes voice and digital data while maintaining contact with the indirect fire team over extended distances. Stryker Lethality ECP efforts (ICVVA1-30mm, CROWS-J, Anti-Tank Guided Missile (ATGM), and other capabilities) focus on the integration of a suite of complementary MEP lethality upgrades that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's Stryker Brigade Combat Teams (SBCTs). Additionally, the Lethality MEP upgrades will address existing obsolescence issues of the Remote Weapon Station (RWS) with the CROWS and CROWS-J upgrade. The ATGM ECP will upgrade the Modified Improved Target Acquisitions System (MITAS), incorporating a far target locator and enabling the dissemination of target acquirement information utilizing networked lethality, providing a common operating picture. Stryker Network Modernization will formalize the system integration of the Integrated Tactical Network (ITN), Integrated Visual Augmentation System (IVAS), and Tactical Cloud Package (TCP) as part of Mounted Capability Set 23 (MCS23) for the Stryker platform. Upgrades of the Stryker flat-bottom hull and DVH variants were completed to mitigate known system deficiencies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Stryker DVH A1 ECP Development (Engineering/Prototypes)	-	1.836	-
Description: The Stryker DVH A1 ECP is a fleet-wide initiative that mitigates mobility degradation caused by survivability improvements. Addresses vehicle space, weight, power, cooling and computing challenges. Returns the performance of the DVH nearly back to the original design capacity and provides approximately 20% growth potential in gross vehicle weight and power generation capacity posturing these vehicles for efficient upgrades in the future.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Complete DVH A1 ECP verification and logistics products. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Completion of DVH A1 ECP development, including the completion of DVH A1 ECP verification and logistics products.			
Title: Stryker DVH A1 ECP Testing ***Description:*** Government and Contractor Support for developmental, operational and live fire testing in support of DVH A1 ECP.	0.092	-	-
Title: Stryker Lethality ECPs Development (Engineering/Protoypes) ***Description:*** Lethality ECPs encompass the integration of a 30 millimeter (mm) (ICVVA1-30mm), under armor Javelin fire capability (Common Remotely Operated Weapon Station-Javelin (CROWS-J)), improved optics and targeting systems, Inertial Navigation Unit (INU) sensor, and other capabilities into the Stryker fleet. These improvements will provide for increased under armor fire capability, target identification range, provide over-match against peer threats and supporting infantry assault, and address obsolescence within the targeting and reconnaissance systems utilized on the Stryker FoV. ***FY 2022 Plans:*** Continuing Stryker Lethality ECPs development to include completion of CROWS-J ECP and ATGM ECP logistic products. ***FY 2023 Plans:*** Continuing Stryker Lethality ECPs development to integrate the Inertial Navigation Unit (INU) sensor and Global Positioning System (GPS) information with CROWS-J to communicate with the Joint Battle Command - Platform (JBC-P). Complete ATGM ECP logistic products. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease based on the completion of ATGM ECP logistics products and completing development engineering of the Inertial Navigation Unit sensor integration efforts.	6.097	2.573	1.200
Title: Stryker Lethality ECPs Testing ***Description:*** Government and Contractor Support for developmental, operational and live fire testing in support of Lethality ECPs, including Inertial Navigation Unit (INU) sensor testing. ***FY 2023 Plans:*** Initiate development of test plans and procedures for the Inertial Navigation Unit (INU) sensor testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	2.690	-	1.461

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase based on start of test planning for the Inertial Navigation Unit (INU) sensor.			
Title: Government Systems Engineering and Project Management ***Description:*** Government Systems Engineering and Program Management includes salaries, travel and other support costs required to effectively manage all Research, Development, Test, & Evaluation (RDT&E) efforts. ***FY 2022 Plans:*** Continuing Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) for Stryker DVH A1 ECP, Survivability Enhancement, Lethality ECPs (CROWS-J, ATGM, and 30mm Medium Caliber Weapon System) and Fire Direction Center development efforts. ***FY 2023 Plans:*** Government Systems Engineering and Program Management support (labor, travel, training, supplies, and equipment) for Research, Development, Test, & Evaluation (RDT&E) efforts, including Survivability Enhancement, Non Primary Power Systems, Fire Direction Center development, and Stryker Network Modernization Development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase of Government Systems Engineering and Program Management support (labor, travel, training, supplies and equipment) based on annual inflation adjustment.	5.385	5.495	5.605
Title: Stryker Power System ***Description:*** Development and testing of a non-primary power solution for the Stryker platform. The non-primary power enhancement incorporates multiple components and capabilities, including the battery box container, Auxiliary Power Unit (APU) and interface kits. ***FY 2022 Plans:*** Continuation of testing and logistics products development for the non-primary solution. ***FY 2023 Plans:*** Continuing of the integration design effort, testing and logistics product development for the non-primary solution. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase based on continued development, testing and logistics product development for non-primary system.	4.168	4.250	5.750
Title: Stryker Platform Mission Equipment Packages Integration ***Description:*** Development engineering of MEP onto the Stryker platforms. Integration of the Fire Direction Center MEP onto the DVH A1 platform.	-	2.291	8.161

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Initiate developmental acquisition and MEP scope for the Fire Direction Center MEP onto a DVH A1 platform. ***FY 2023 Plans:*** Continue integration engineering and procurement of prototype hardware for the Fire Direction Center MEP onto the DVHA1. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase based on continuing integration engineering and prototype hardware buy for the Fire Direction Center MEP.			
Title: Stryker Survivability Enhancements ***Description:*** The Stryker Survivability Enhancements will develop strategies, through technical and engineering analyses, for the integration of emerging technologies onto the Stryker Platforms. The Stryker Survivability Enhancements will include, but are not limited to, the fleet wide 360 degree Situational Awareness, hardware convergence, and sensor suite collaboration. ***FY 2022 Plans:*** Continuation of 360 degree Situational Awareness through DVE Wide enhancements and IVAS efforts. Begin development of other emerging technologies onto the DVH A1 platform. ***FY 2023 Plans:*** Continuation of the 360 degree Situational Awareness effort with prototyping and testing, along with other emerging technologies. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to ramping down of the current phase of the 360 degree Situational Awareness effort.	3.671	13.392	1.990
Title: Stryker Network Modernization Development (Engineering / Prototypes) ***Description:*** Stryker Network Modernization will formally integrate the Integrated Tactical Network (ITN), Integrated Visual Augmentation System (IVAS) vehicle support kit, and Tactical Cloud Package (TCP) as part of Mounted Capability Set 23 (MCS23) at the System of Systems level. Effort will prioritize the DVHA1 Platform and include DVHA0. With the Army's Network Vision 2028, and Army 2030 planning, the Network CFT has coordinated closely with PEO C3T, PEO GCS, PEO Soldier, and PEO IEW&S to deliver a suite of capabilities as part of M-CS23 for DVHA1 and DVHA0. These capabilities are required in SBCT formations to provide Soldiers with a resilient and assured data transport network to the tactical edge, provide a robust and real-time common tactical operating picture among friendly forces and ensure overmatch with near-peer adversaries. ***FY 2023 Plans:***	-	-	42.421

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Begin to develop formalized system integration of M-CS23, develop and validate operator and maintainer manual updates, and deliver production-level installation kit technical data package (TDP) that can be used for a competitive production and retrofit installation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase based on the start of developing a formalized system integration of M-CS23 including development and validation of operator and maintainer manual updates and technical data package.			
Title: Stryker Network Modernization Testing ***Description:*** Government and Contractor support for developmental and operational testing of the Integrated Tactical Network (ITN), Integrated Visual Augmentation System (IVAS) vehicle support kit, and Tactical Cloud Package (TCP). ***FY 2023 Plans:*** Government and Contractor support for executing system level testing to achieve all safety and interoperability certifications to field the installation kits and provision components for the supply system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase based on start of Network Modernization test activities.	-	-	4.558
Title: SIBR STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638.	-	1.130	-
Accomplishments/Planned Programs Subtotals	22.103	30.967	71.146

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• GM0100: *Stryker (Mod)*	-	-	0.000	-	0.000	64.099	99.127	99.056	99.066	Continuing	Continuing
• G85200: *Stryker Upgrade*	1,164.152	1,082.828	671.271	-	671.271	827.512	871.670	880.705	873.457	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

23 March 2018 Army Requirements Oversight Council (AROC) decision to exchange all remaining flat-bottom brigades results in continuing exchange production beginning in FY 2018 funded in Stryker Upgrade (G85200). Stryker MOD (GM0100) supports Stryker Fleet modifications and Lethality ECP retrofits in FY 2019-2020.

Beginning in FY 2021 the requirements and funding in the Stryker MOD (GM0100) was moved to Stryker Upgrade (G85200).

In FY 2022, funding in the amount of $0.183 million for manpower was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

D. Acquisition Strategy

The Stryker ECP 1 effort will buy back the vehicle space, weight, and power margin lost due to the addition of numerous kits in response to eleven years of war (20-combat rotations & 37+ million total miles), in order to allow integration of the future network (as directed by VCSA in August 2011) without further degrading the performance of the platform. In May 2012, Stryker ECP 1 program (Phase I) was approved, permitting preliminary design and integration efforts on both the Flat Bottom (FB) and DVH variants. In March 2013, Phase II was approved continuing design and integration of ECP 1 mechanical power, electrical power generation, chassis upgrades, and the in-vehicle network upgrades. Based on additional testing conducted in the summer of 2013, the decision was made to focus ECP 1 efforts on the DVH platform and defer efforts on flat-bottom Stryker vehicles. The effort has subsequently been renamed the Stryker DVH A1 ECP. The DVH A1 ECP Phase II contract, awarded November 25, 2013, continued development engineering, prototype build test and evaluation. The initial DVH A1 ECP production contract was awarded in October 2016 (Sole-Source Firm Fixed Price arrangement). A second and third buy of DVH A1 ECP vehicles was awarded as a Fixed Price Incentive Fee arrangement. A March 2018 AROC decision was made to pure fleet the Stryker brigades to DVH with the initial approval for 6 DVH A1 brigades. The objective acquisition strategy is to annually procure 1/2 of a brigade.

On July 2, 2015, Army Systems Acquisitions and Review Council (ASARC) authorization was granted to execute the Stryker 30mm ICVD ONS effort. 30mm ICVD Engineering, Manufacturing, and Development (EMD) contracts for Non-Recurring Engineering (NRE) and Logistics Products Development/Test Support were awarded in January 2016 and May 2016, respectively (Cost Plus Incentive-Fee basis). The 30mm ICVD ONS Production/Retrofit contract was awarded in May 2016 through an Undefinitized Contract Action (UCA). Definitization of the Fixed Price Incentive Fee (FPIF) Production contract occurred in March 2017.

The Stryker Lethality ECP efforts will focus on the integration of a suite of complementary Mission Equipment Package MEP lethality upgrades, which include the ICVVA1-30mm (formerly known as 30mm Medium Caliber Weapon System), CROWS-J, ATGM target acquisition optics, integration of emerging and existing technologies such as the Fire Direction Center requirement, Integrated Visual Augmentation System (IVAS), and other Stryker-based platform solutions, as well as additional capabilities that will improve the suppressive fire and armored vehicle engagement capabilities across the Army's SBCTs. Army Acquisition Executive (AAE) approval to initiate the Stryker CROWS-J and ATGM ECP efforts was received in a September 30, 2016 Acquisition Decision Memorandum (ADM). A ICVVA1-30mm decision was made in March 2019. The ICVVA1-30mm effort awarded design studies to multiple vendors and evaluated the bid samples, and awarded a production

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

ready solution meeting requirements at the best value to the Army. To improve platform survivability fleet wide, 360 Situational Awareness is being developed by integrating existing technologies, for fleet wide installation over a period of six years to allow the occupants during both open and closed hatch operations to visualize their immediate surrounding while stationary and on the move in adverse weather conditions.

In 2016, the Army approved the FDC requirement and the Field Artillery Battalion TAC using excess Flat Bottom Hull (FBH) Stryker during Force Design Update (FDU) process. Following the March 2018 Pure fleet AROC decision, Force Design Division (FDD) identified the Double V Hull A1 (DVH A1) as the platform for the FDC.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) EE2 / *Stryker Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker 30mm ICVD ONS LethalityProject Management	MIPR	PEO GCS/TACOM : Sterling Heights, MI	9.602	-		-		-		-		-	0.000	9.602	-
Survivability Enhancement Government Engineering and Project Management	MIPR	PEO GCS/TACOM : Various	0.534	-		-		-		-		-	0.000	0.534	-
Project Management Office (PMO)	MIPR	PEO GCS/TACOM : Various	67.810	5.385	Jan 2021	5.495	Jan 2022	5.605	Jan 2023	-		5.605	23.959	108.254	-
FY2018 NDAA SEC 825 MDAP Cost Overrun	Allot	ASAALT : Huntsville, Alabama	0.029	-		-		-		-		-	0.000	0.029	-
SIBR STTR Transfer	Various	various : various	-	-		1.130		-		-		-	0.000	1.130	-
		Subtotal	77.975	5.385		6.625		5.605		-		5.605	23.959	119.549	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker DVH A1 ECP Development	SS/CPIF	GDLS, MI : Various	174.652	-		1.836	Jan 2022	-		-		-	0.000	176.488	-
Stryker DVH A1 ECP Training Device Updates	MIPR	PEO STRI, FL : Various	0.020	-		-		-		-		-	0.000	0.020	-
Stryker 30mm ICVD ONS Development	SS/CPIF	GDLS, MI : Various	75.412	-		-		-		-		-	0.000	75.412	-
Stryker Lethality ECPs Development	C/Various	PM CSW; PM CCWS : Various	51.049	6.097	Jan 2021	2.573	Jan 2022	1.200	Jan 2023	-		1.200	1.305	62.224	-
Stryker Lethality ECPs Training Device Updates	MIPR	PEO STRI, FL : Various	0.808	-		-		-		-		-	0.000	0.808	-
Stryker Survivability Enhancement	Various	US Army TARDEC, Various : Sterling Heights, MI	3.044	0.100	Jan 2021	12.086	Jan 2022	0.780	Jan 2023	-		0.780	1.419	17.429	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) EE2 / *Stryker Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker Power System Development	MIPR	US Army TARDEC, Various : US Army TARDEC	7.384	1.289	Jan 2021	2.375	Feb 2022	2.750	Feb 2023	-		2.750	0.000	13.798	-
Stryker Wireless Intercom Development	C/CPFF	Ricardo Defense : Washington DC	4.934	-		-		-		-		-	0.000	4.934	-
Stryker Fire Direction Center Variant Development	TBD	TBD : TBD	-	-		2.291	Jun 2022	8.089	Jun 2023	-		8.089	3.394	13.774	-
Stryker Network Modernization Development	TBD	TBD : TBD	-	-		-		42.421	Jan 2023	-		42.421	0.000	42.421	-
		Subtotal	317.303	7.486		21.161		55.240		-		55.240	6.118	407.308	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker DVH A1 ECP Testing	MIPR	Army Test Centers : Various	43.547	0.092	Jan 2021	-		-		-		-	0.000	43.639	-
Stryker DVH A1 ECP Contractor Support to Test	SS/CPFF	GDLS, MI : Various	40.194	-		-		-		-		-	0.000	40.194	-
Stryker 30mm ICVD ONS Test	MIPR	Army Test Centers : Various	20.335	-		-		-		-		-	0.000	20.335	-
Stryker 30mm ICVD ONS Contractor Support to Test	SS/CPFF	GDLS, MI : Various	25.631	-		-		-		-		-	0.000	25.631	-
Stryker Lethality ECPs Testing	MIPR	Army Test Centers : Various	29.066	2.690	Dec 2020	-		1.461	May 2023	-		1.461	0.000	33.217	-
Stryker Lethality ECPs Contractor Support to Test	MIPR	Various : Various	11.005	-		-		-		-		-	0.000	11.005	-
Stryker Survivability Enhancement	MIPR	Army Test Centers : Various	0.212	3.571	Dec 2020	1.306	Dec 2021	1.210	Dec 2022	-		1.210	0.495	6.794	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203735A / *Combat Vehicle Improvement Programs*	Project (Number/Name) EE2 / *Stryker Improvement*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker Power System Testing	MIPR	Army Test Centers : Various	2.979	2.879	Dec 2020	1.875	Dec 2021	3.000	Dec 2022	-		3.000	0.000	10.733	-
Stryker Wireless Intercom Testing	MIPR	Army Test Centers : Various	0.005	-		-		-		-		-	0.000	0.005	-
Stryker Fire Direction Center Variant Testing	TBD	TBD : TBD	-	-		-		0.073	Jul 2023	-		0.073	11.055	11.128	-
Stryker Network Modernization Testing	TBD	TBD : TBD	-	-		-		4.465	Apr 2023	-		4.465	0.000	4.465	-
Stryker Network Modernization Contractor Support to Test	TBD	TBD : TBD	-	-		-		0.092	Apr 2023	-		0.092	0.000	0.092	-
		Subtotal	172.974	9.232		3.181		10.301		-		10.301	11.550	207.238	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	568.252	22.103		30.967		71.146		-		71.146	41.627	734.095	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

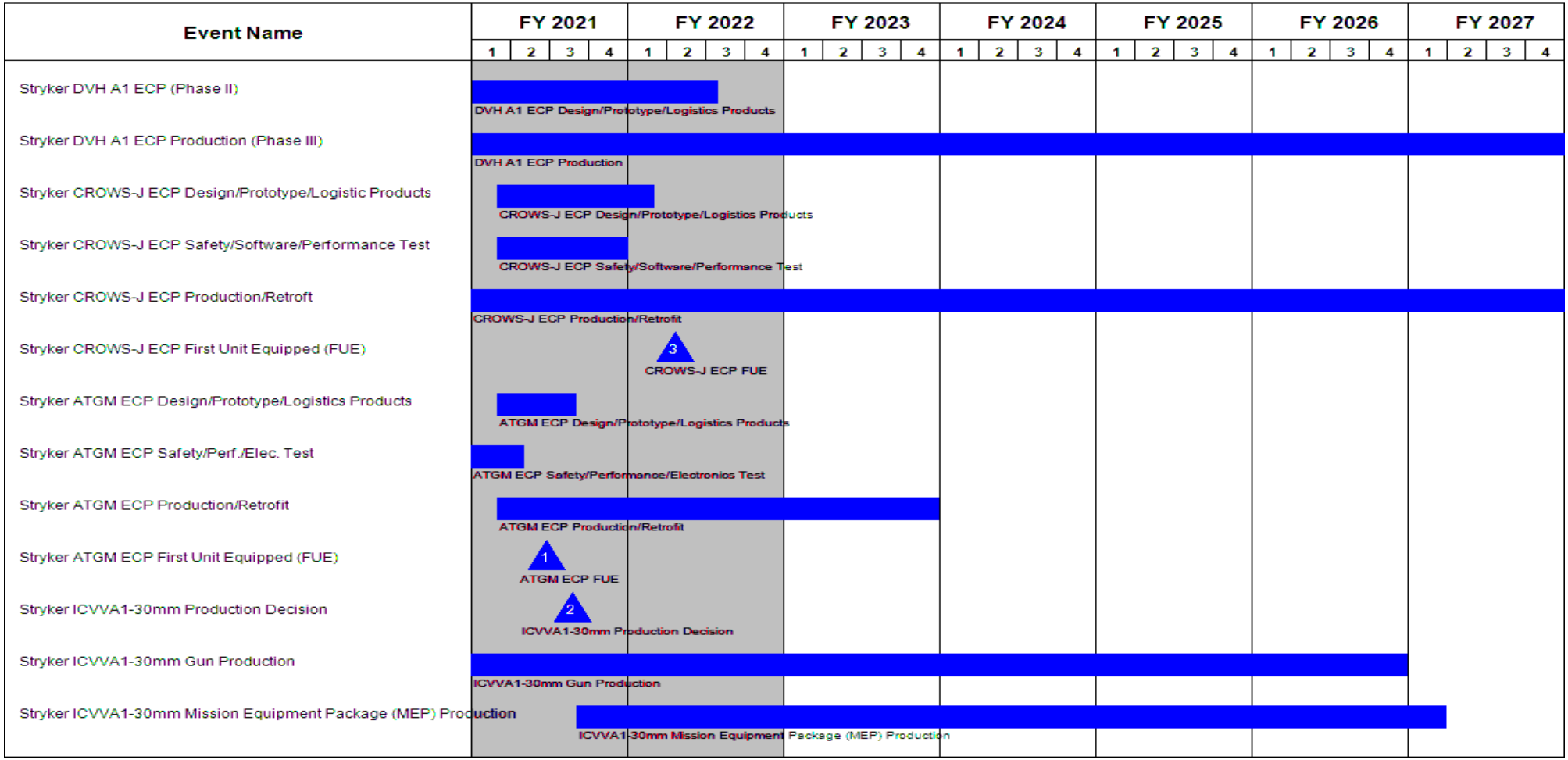


Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

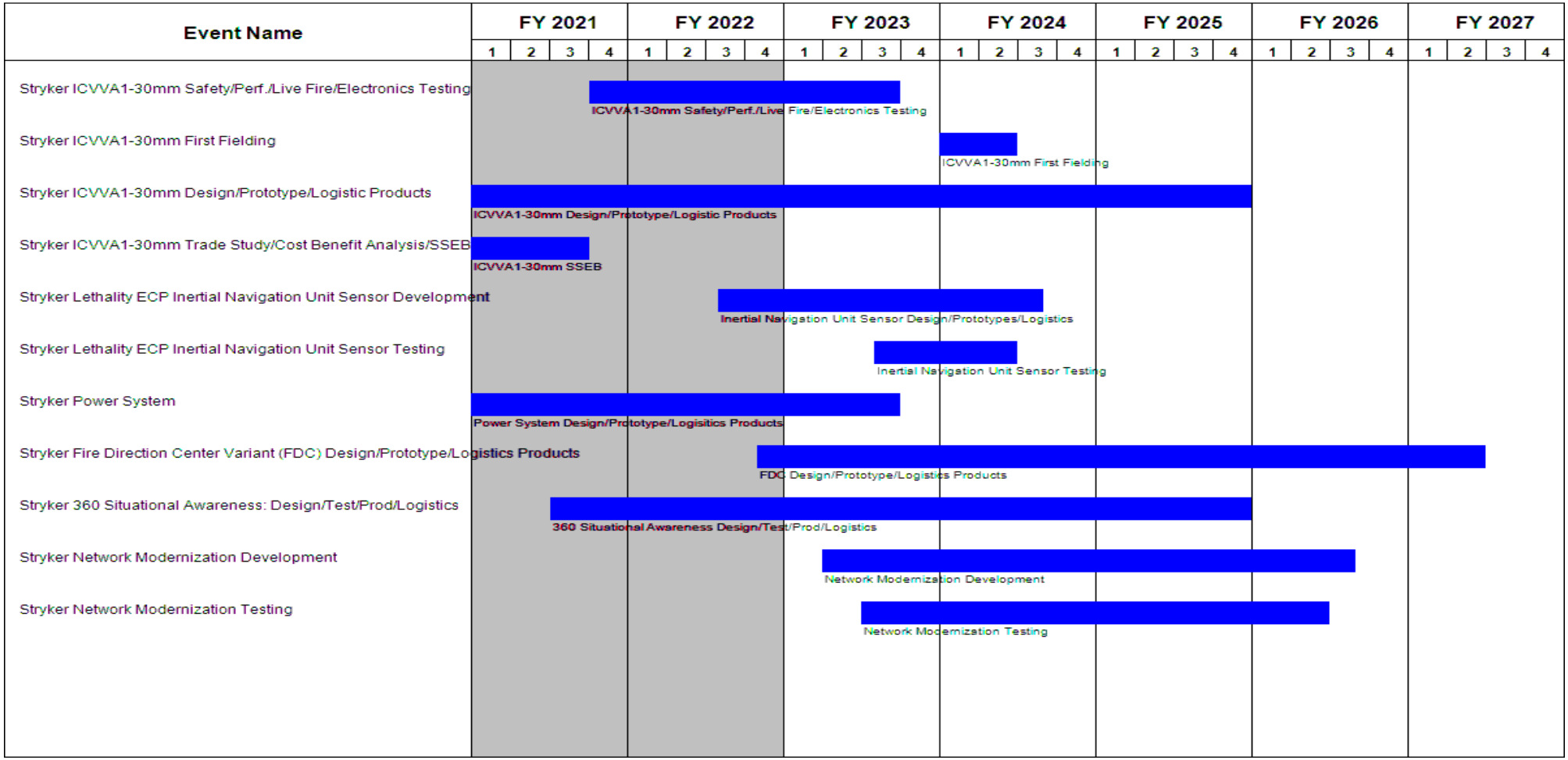


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Stryker DVH A1 ECP (Phase II)	1	2014	3	2022
Stryker DVH A1 ECP Production (Phase III)	1	2017	4	2030
Stryker CROWS-J ECP Design/Prototype/Logistic Products	1	2019	1	2022
Stryker CROWS-J ECP Safety/Software/Performance Test	1	2019	4	2021
Stryker CROWS-J ECP Production/Retroft	3	2019	4	2029
Stryker CROWS-J ECP First Unit Equipped (FUE)	2	2022	2	2022
Stryker ATGM ECP Design/Prototype/Logistics Products	1	2018	3	2021
Stryker ATGM ECP Safety/Perf./Elec. Test	4	2019	2	2021
Stryker ATGM ECP Production/Retrofit	1	2020	4	2023
Stryker ATGM ECP First Unit Equipped (FUE)	2	2021	2	2021
Stryker ICVVA1-30mm Production Decision	3	2021	3	2021
Stryker ICVVA1-30mm Gun Production	4	2020	4	2026
Stryker ICVVA1-30mm Mission Equipment Package (MEP) Production	3	2021	1	2027
Stryker ICVVA1-30mm Safety/Perf./Live Fire/Electronics Testing	4	2021	3	2023
Stryker ICVVA1-30mm First Fielding	1	2024	2	2024
Stryker ICVVA1-30mm Design/Prototype/Logistic Products	2	2019	4	2025
Stryker ICVVA1-30mm Trade Study/Cost Benefit Analysis/SSEB	4	2020	3	2021
Stryker Lethality ECP Inertial Navigation Unit Sensor Development	3	2022	3	2024
Stryker Lethality ECP Inertial Navigation Unit Sensor Testing	3	2023	2	2024
Stryker Power System	2	2019	3	2023
Stryker Fire Direction Center Variant (FDC) Design/Prototype/Logistics Products	4	2022	2	2027
Stryker 360 Situational Awareness: Design/Test/Prod/Logistics	3	2021	4	2025

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203735A / *Combat Vehicle Improvement Programs*	**Project (Number/Name)** EE2 / *Stryker Improvement*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Stryker Network Modernization Development	2	2023	3	2026
Stryker Network Modernization Testing	3	2023	2	2026

Note

Schedule includes the major Stryker RDTE and Procurement (WTCV) funded activities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203743A / *155mm Self-Propelled Howitzer Improvements*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908
FF9: *PIM Improvement Program*	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908

A. Mission Description and Budget Item Justification

The Extended Range Cannon Artillery (ERCA) modernization effort integrates emerging technologies to include: a new cannon, gun mount, gun drive systems, fire control systems, and rate of fire system improvements capability onto the M109A7 Self-Propelled Howitzer platform. ERCA improves lethality through increased range and increased rate of fire while also using mature technology to improve mobility, survivability, reliability, supportability, and lethality. This effort will analyze and evaluate the impact of the new cannon technology and make modifications to the cab, mobility and electronic architecture required to support ammunition automation, remote firing, and remote movement on the platform. This effort will also develop, evaluate, build, and test prototypes.

The total cost of the ERCA Middle Tier of Acquisition (MTA) effort is $807.678 million RDT&E from FY 2018 to FY 2023. The ERCA MTA is fully funded across the Future Years Defense Program.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	217.959	213.281	0.000	-	0.000
Current President's Budget	217.959	175.076	136.680	-	136.680
Total Adjustments	0.000	-38.205	136.680	-	136.680
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-38.126			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	136.680	-	136.680
• FFRDC Transfer	-	-0.079	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	Project (Number/Name) FF9 / *PIM Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FF9: *PIM Improvement Program*	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Extended Range Cannon Artillery (ERCA) modernization effort integrates emerging technologies to include: a new cannon, gun mount, gun drive systems, fire control systems, and rate of fire system improvements capability onto the M109A7 Self-Propelled Howitzer platform. ERCA improves lethality through increased range and increased rate of fire while also using mature technology to improve mobility, survivability, reliability, supportability, and lethality. This effort will analyze and evaluate the impact of the new cannon technology and make modifications to the cab, mobility and electronic architecture required to support ammunition automation, remote firing, and remote movement on the platform. This effort will also develop, evaluate, build, and test prototypes.

The total cost of the ERCA Middle Tier of Acquisition (MTA) effort is $807.678 million RDT&E from FY 2018 to FY 2023. The ERCA MTA is fully funded across the Future Years Defense Program.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: ERCA Prototype Development and Build	149.459	101.219	35.426
Description: Funds support the ERCA range and ERCA Rate of Fire development costs which include continuously improving drawings and the developing and building of the ERCA prototypes for testing. ***FY 2022 Plans:*** Conduct developmental engineering efforts, conduct vehicle integration design, and build ERCA prototypes for First Unit Issued battalion. Design and integrate increased range and rate of fire capabilities. Conduct system level integration and engineering efforts to upgrade and design mobility, survivability, reliability and lethality upgrades. Procure material and build ERCA prototype vehicles to support test and evaluation. ***FY 2023 Plans:*** Completion of developmental engineering efforts and ERCA prototype builds required for the First Unit Issued battalion at the end of FY 2023. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to conclusion of Middle Tier Acquisition Rapid Prototyping program in FY 2023.			
Title: Program Management	12.689	12.700	14.300
Description: Funding is provided for all Program Management efforts on the Extended Range Cannon Artillery effort.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	**Project (Number/Name)** FF9 / *PIM Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Continue the development and production for all required documents, office staff and engineering IPT development. Use non-traditional contractors OTAs to reduce risk. ***FY 2023 Plans:*** Continue the development and production for all required documents, office staff and engineering IPT development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding for upcoming Milestone C in FY 2023.			
Title: Test and Evaluation ***Description:*** This funding supports all Testing and Evaluation the Extended Range Cannon Artillery effort. ***FY 2022 Plans:*** Conduct Developmental Testing and ammunition qualification. These events include all test execution, data collection, contractor and logistics support for mobility, reliability and firings tests. ***FY 2023 Plans:*** Conduct Developmental Testing and start of Operational Assessment. These events include all test execution, data collection, contractor and logistics support for mobility, reliability and firings tests. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to Continuation of Developmental testing and start of Operational Assessment.	55.811	54.764	86.954
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Initial capture of the SBIR/STTR Transfer	-	6.393	-
Accomplishments/Planned Programs Subtotals	217.959	175.076	136.680

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	**Project (Number/Name)** FF9 / *PIM Improvement Program*

D. Acquisition Strategy

Extended Range Cannon (ERCA) uses the approved National Defense Authorization Act (NDAA) Section 804 Middle Tier Acquisition Authority for development efforts as the program moves forward and transitions to a program of record to field the ERCA system.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	Project (Number/Name) FF9 / *PIM Improvement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		6.393		-		-		-	0.000	6.393	-
		Subtotal	-	-		6.393		-		-		-	0.000	6.393	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PIM Improvement Program	MIPR	Various - OGAs : PEO	22.161	-		-		-		-		-	Continuing	Continuing	Continuing
ERCA Range - Developmental Eng	Various	Various : Various Locations	100.664	77.830	Jan 2021	62.862	Jan 2022	20.510	Jan 2023	-		20.510	Continuing	Continuing	Continuing
ERCA Range - Prototype Build	Various	Various : Various Locations	97.084	36.180	Jan 2021	33.436	Jan 2022	10.091	Jan 2023	-		10.091	Continuing	Continuing	Continuing
ERCA Rate of Fire - Developmental Eng	Various	Various : Various Locations	7.455	12.740	Feb 2021	4.921	Feb 2022	4.825	Feb 2023	-		4.825	Continuing	Continuing	Continuing
ERCA Rate of Fire - Prototype Build	Various	Various : Various Locations	-	22.709	Oct 2020	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	227.364	149.459		101.219		35.426		-		35.426	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	PM/PEO PIM : Various	11.478	12.689	Oct 2020	12.700	Oct 2021	14.300	Oct 2022	-		14.300	Continuing	Continuing	Continuing
		Subtotal	11.478	12.689		12.700		14.300		-		14.300	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	Project (Number/Name) FF9 / *PIM Improvement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Various - OGAs : Various	27.069	55.811	Oct 2020	54.764	Oct 2021	86.954	Oct 2022	-		86.954	Continuing	Continuing	Continuing
		Subtotal	27.069	55.811		54.764		86.954		-		86.954	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	265.911	217.959		175.076		136.680		-		136.680	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	**Project (Number/Name)** FF9 / *PIM Improvement Program*

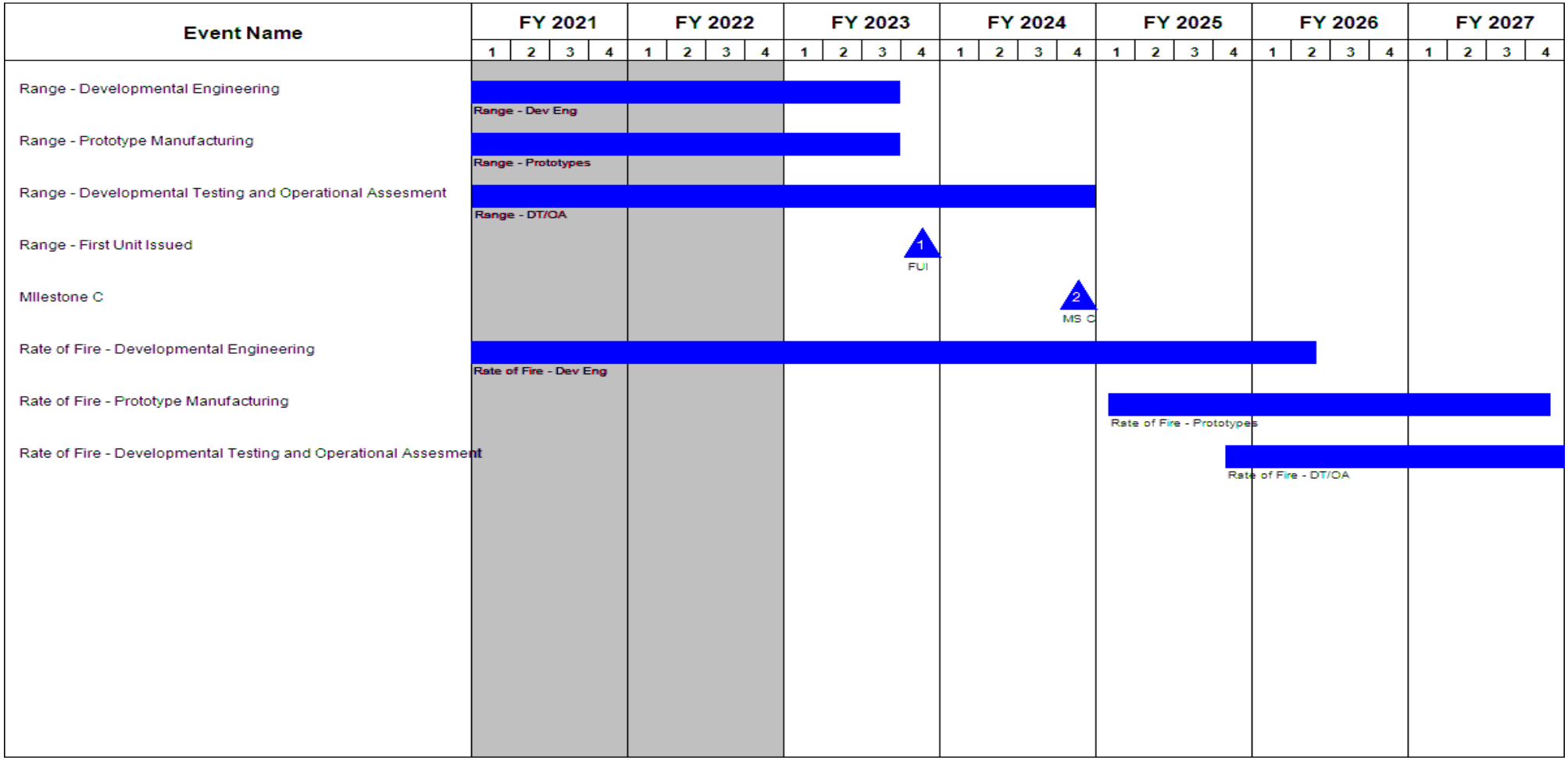


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203743A / *155mm Self-Propelled Howitzer Improvements*	**Project (Number/Name)** FF9 / *PIM Improvement Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Range - Developmental Engineering	2	2018	3	2023
Range - Integration OTA Award	4	2019	4	2019
Range - Prototype Manufacturing	4	2018	3	2023
Range - Developmental Testing and Operational Assesment	1	2019	4	2024
Range - First Unit Issued	4	2023	4	2023
MIlestone C	4	2024	4	2024
Rate of Fire - Developmental Engineering	4	2020	2	2026
Rate of Fire - Prototype Manufacturing	1	2025	4	2027
Rate of Fire - Developmental Testing and Operational Assesment	4	2025	2	2029

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203744A *I Aircraft Modifications/Product Improvement Programs*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	11.261	10.000	-	-	-	0.000	0.000	0.000	0.000	Continuing	Continuing
EB6: *MQ-1C Gray Eagle MODS*	-	11.261	10.000	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) Unmanned Aircraft System (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission UAS fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities within multi-domain battle operations.

Currently MQ-1C Gray Eagle high fuel efficiency engines are undergoing a propulsion reliability effort which will reduce MQ-1C Gray Eagle Return to Base events and decrease the likelihood of engine related aircraft mishaps. This modernization effort will increase operational readiness and posture Gray Eagle to support multi-domain.

The Ground Based Sense And Avoid (GBSAA) System provides an alternative means of compliance with FAR Part 91.113 requirement for an aircraft to "see and avoid" other aircraft while in the National Airspace System. This capability enhances the warfighter's ability to train with the Gray Eagle at CONUS fielding locations.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	11.261	0.000	0.000	-	0.000
Current President's Budget	11.261	10.000	0.000	-	0.000
Total Adjustments	0.000	10.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: EB6: *MQ-1C Gray Eagle MODS*		
Congressional Add: *Ground Based Sense And Avoid (GBSAA)*	-	10.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203744A *I Aircraft Modifications/Product Improvement Programs*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Congressional Add Subtotals for Project: EB6	-	10.000
Congressional Add Totals for all Projects	-	10.000

Change Summary Explanation

FY22 Congressional plus-up of $10.0M will be used to increase the capability of the Ground Based Sense And Avoid (GBSAA) System to provide better support for training activities, to investigate new solutions aimed at addressing hardware obsolescence, and to increase flexibility and useability of GBSAA system by allowing quicker configuration/setup and SATCOM capability."

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	Project (Number/Name) EB6 / *MQ-1C Gray Eagle MODS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EB6: *MQ-1C Gray Eagle MODS*	-	11.261	10.000	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Based on the fielding of the Gray Eagle ER ending in FY24 initial transition to sustainment will begin in FY24. Unfunded request is in place for FY23 for integration of Navigation (M-Code, dual EGI), Anti-Jam, Complementary Navigation (VBN), Timing, and other solutions to Survive, Persist, and Thrive in GPS denied/ contested environments (emerging GPS threats). M-Code transition is required by public law 111-383.

FY22 Congressional plus-up of $10.0M will be used to increase the capability of the Ground Based Sense And Avoid (GBSAA) System to provide better support for training activities, to investigate new solutions aimed at addressing hardware obsolescence, and to increase flexibility and useability of GBSAA system by allowing quicker configuration/setup and SATCOM capability.

A. Mission Description and Budget Item Justification

The MQ-1C Gray Eagle provides the Army with an extended range, multi-purpose (ERMP) Unmanned Aircraft System (UAS); capable of executing reconnaissance, security, attack, and intelligence collection missions in the range of military operations (ROMO). Sensors/payloads include an Electro-Optical/Infrared/Laser Designator (EO/IR/LD), Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI), Signals Intelligence (SIGINT), and HELLFIRE missiles; providing a near all-weather mission capability. MQ-1C Gray Eagle is a dedicated, assured, multi-mission UAS fielded to all Army Divisions, Intelligence and Security Command and Army Special Operations Command in support of the commander's warfighting priorities within multi-domain battle operations.

Currently the MQ-1C Gray Eagle high fuel efficiency engine is undergoing a propulsion reliability effort, which will reduce MQ-1C Gray Eagle Return to Base events and decrease the likelihood of engine related aircraft mishaps. Additionally, this effort will increase operational readiness for the Operational Commander.

The Ground Based Sense And Avoid (GBSAA) System provides an alternative means of compliance with FAR Part 91.113 requirement for an aircraft to "see and avoid" other aircraft while in the National Airspace System. This capability enhances the warfighter's ability to train with the Gray Eagle at CONUS fielding locations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Propulsion Reliability	11.261	-	-
Description: Propulsion Reliability improvements address material failures and Return to Base (RTBs) events experienced with the existing fielded MQ-1C engine. Contract efforts will address current engine component obsolescence and supply concerns. The initial contract supports engine qualification planning and execution of component, subsystem and system level testing/ analyses, critical to ensure development of a reliable replacement engine.			
Accomplishments/Planned Programs Subtotals	11.261	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	**Project (Number/Name)** EB6 / *MQ-1C Gray Eagle MODS*

	FY 2021	FY 2022
Congressional Add: Ground Based Sense And Avoid (GBSAA)	-	10.000
FY 2022 Plans: FY22 Congressional plus-up of $10.0M will be used to increase the capability of the GBSAA System to provide better support for training activities, to investigate new solutions aimed at addressing hardware obsolescence, and to increase flexibility and useability of GBSAA system by allowing quicker configuration/setup and SATCOM capability.		
Congressional Adds Subtotals	-	10.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A00005: *MQ-1 UAV*	110.000	-	0.000	-	0.000	-	-	-	-	0.000	110.000
• AA6601: *Gray Eagle Mods2*	30.280	123.143	13.038	-	13.038	11.735	-	-	-	0.000	178.196

Remarks

D. Acquisition Strategy

An ERMP Operational Requirement Document (ORD) was approved by the Joint Requirement Oversight Council (JROC) 6 Apr 2005. Milestone B occurred on 20 Apr 2005, and the System Development and Demonstration contract was awarded 8 Aug 2005, as a result of a competitive solicitation which included a vendor system capabilities demonstration. A Capabilities Production Document (CPD) was approved 14 Mar 2009. MQ-1C Gray Eagle completed Follow-On Test and Evaluation (FOTE) on 12 Jun 2015.

This RDTE element funds a propulsion reliability improvement with the development of the Heavy Fuel Engine (HFE) 2.0 engine system. The current MQ-1C aircraft engine has experienced material failures that have resulted in aircraft mishaps (loss of aircraft) and a high number lost flight hours due to Return to Base (RTB) events. HFE 2.0 implements aviation grade components and focused reliability improvements that will address previous material failures and RTB drivers. Additionally, the Army was notified by the original equipment manufacturer (OEM) that the current engine core is obsolete and the current manufacture will no longer supply the engine core. HFE 2.0 also resolves this obsolescence/supply issue. In 2018, the Army issued an RFI to industry to assess the state of engine technology and availability of a COTS/ NDI engine solution that could meet MQ-1C capability needs and requirements. The primary goal of the RFI was to establish an alternative engine for MQ-1C that is reliable and could be integrated and qualified in a two year timeframe to resolve critical reliability and supply issues with the current engine. Upon completion of the RFI evaluations, HFE 2.0 engine systems will be procured and fielded through attrition. As a result of the Army's RFI and Industry day event, it was determined that the HFE 2.0 was the only engine to meet requirements for an alternative MQ-1C engine. Funded RDTE elements will support completion of integration, test, and qualification of the HFE 2.0 engine system on the MQ-1C aircraft. This effort will secure engine supply and result in greater propulsion system reliability and increased operational readiness to the commander in the field. Funds are planned for award on the Gray Eagle Technical Services contract as a Technical Services Memorandum (TSM)

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	**Project (Number/Name)** EB6 / *MQ-1C Gray Eagle MODS*

task order, and as a Military Interdepartmental Purchase Requisitions (MIPRs) to various other Government agencies. Upon completion of qualification, HFE 2.0 engine systems will be procured under the PBL contract and fielded through attrition.

This RDTE effort funds increased capability for the Ground Based Sense And Avoid (GBSAA) system to include better performance in a terminal environment, alternative methods of obtaining telemetry data which will enable operations with classified systems, and address new hardware - which will provide better performance while also addressing system obsolescence issues. The current GBSAA system is not able to support classified operations, and by including an "ADS-B as ownship" solution in the software development, support for classified operations will be possible. During the 5+ years of operation of the GBSAA system at 5 fielding sites, issues with excessive alerts in congested airspace have been noticed. Part of the Block 2 effort will refine the maneuver algorithms to adjust for areas where air traffic is allowed to be in a closer proximity to other air traffic. Units currently utilizing the GBSAA system have requested the ability to conduct a quicker set up and operation of the system for systems with transportable radars systems. A portion of this funding will be used to investigate and implement the best way to accomplish this task.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	Project (Number/Name) EB6 / *MQ-1C Gray Eagle MODS*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY2019 Reprogramming Action	TBD	PEO M&S : Redstone Arsenal	3.000	-		-		-		-		-	0.000	3.000	-
		Subtotal	3.000	-		-		-		-		-	0.000	3.000	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global Positioning System (GPS) Denied	SS/CPFF	General Atomics/ ASI : San Diego, CA	11.768	-		-		-		-		-	Continuing	Continuing	-
Universal Ground Control Station (UGCS) Improvements	SS/CPFF	General Atomics/ ASI : San Diego, CA	15.279	-		-		-		-		-	Continuing	Continuing	-
Alternate Munitions Integration	SS/CPFF	General Atomics- ASI : Poway, CA	19.299	-		-		-		-		-	0.000	19.299	-
Ground Based Sense And Avoid Block II	SS/CPFF	Various : Various	25.362	-		10.000	May 2022	-		-		-	0.000	35.362	-
Survivability	MIPR	Various : Various	0.148	-		-		-		-		-	Continuing	Continuing	-
Propulsion Reliability	SS/CPFF	General Atomics/ ASI : San Diego, CA	6.492	8.773	Mar 2021	-		-		-		-	Continuing	Continuing	-
GETS Program Management	TBD	General Atomics/ ASI : San Diego, CA	0.886	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	79.234	8.773		10.000		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support - GBSAA	MIPR	Various : Various	2.163	-		-		-		-		-	0.000	2.163	-
		Subtotal	2.163	-		-		-		-		-	0.000	2.163	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	Project (Number/Name) EB6 / *MQ-1C Gray Eagle MODS*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Testing and Software Testing Block II - GBSAA	MIPR	Various : Various	0.403	-		-		-		-		-	0.000	0.403	-
Flight Test and Analysis	SS/ Various	Dugway Proving Grounds : Dugway Proving Grounds	4.350	2.488	Mar 2021	-		-		-		-	0.000	6.838	-
		Subtotal	4.753	2.488		-		-		-		-	0.000	7.241	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	89.150	11.261		10.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	**Project (Number/Name)** EB6 / *MQ-1C Gray Eagle MODS*

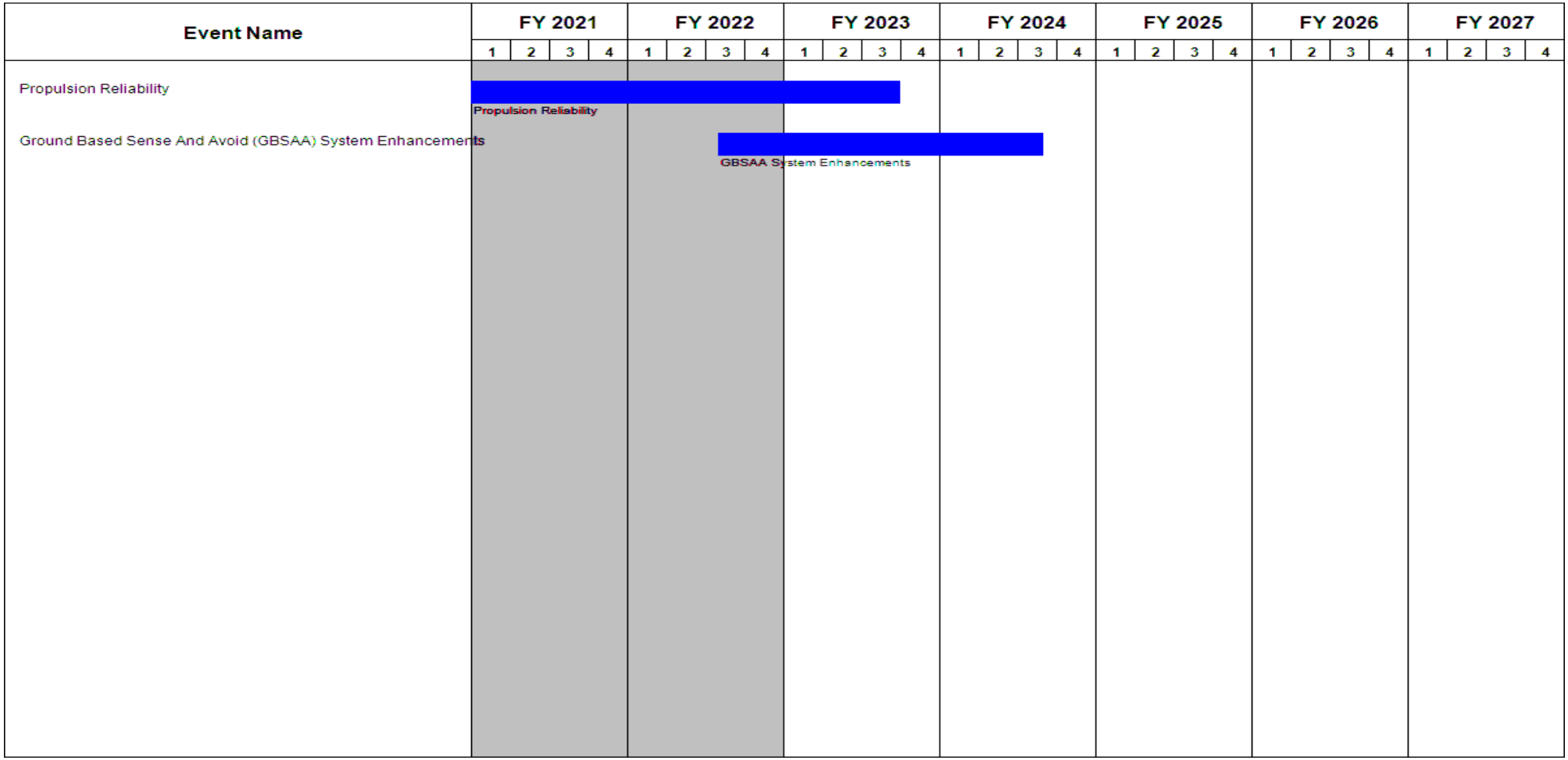


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203744A / *Aircraft Modifications/Product Improvement Programs*	**Project (Number/Name)** EB6 / *MQ-1C Gray Eagle MODS*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Alternate Munitions Integration	2	2017	4	2020
Global Positioning System Denied	2	2017	4	2020
Engineering and Software Development - MQ-1 Gray Eagle	2	2017	4	2020
Training Development and Software/System Testing - MQ-1 Gray Eagle	3	2017	4	2020
Survivability	2	2018	4	2020
Propulsion Reliability	2	2020	3	2023
Ground Based Sense And Avoid (GBSAA) System Enhancements	3	2022	3	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203752A *I Aircraft Engine Component Improvement Program*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957
106: *A/C Compon Improv Prog*	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.080	0.132	0.000	-	0.000
Current President's Budget	0.080	0.132	0.148	-	0.148
Total Adjustments	0.000	0.000	0.148	-	0.148
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.148	-	0.148

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
106: *A/C Compon Improv Prog*	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element (PE).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Gray Eagle UAS Turbocharger Compressor Blow-off Valve ***Description:*** UAV Gray Eagle turbocharger investigation at the United States (US) Army Vehicle Technology Directorate (VTD) at Army Research Laboratory (ARL) Aberdeen Proving Grounds. Provide research to support airworthiness, reliability and performance improvements of the UAV Gray Eagle Turbocharger. Investigate and research the technology challenges of incorporating a turbocharger compressor blow-off valve. The current wastegate configuration was found to be highly sensitive at altitude, resulting in combustion instability. Analysis has been reviewed showing that turbochargers configured with compressor blow-off valves are more reliable and robust than the currently used wastegate configuration.	0.037	-	-
Title: In-House Support ***Description:*** In-house support for the CIP engineers. Contracting support for CIP contracts. ***FY 2022 Plans:*** Will continue to provide in-house engineering support for UAV engine CIP programs. ***FY 2023 Plans:*** Will continue to provide in-house engineering support for UAV engine CIP programs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Inflation adjustment	0.005	0.054	0.055
Title: Hunter UAS Turbocharger Life Management ***Description:*** UAV Hunter fuel injector investigation at the US Army VTD at ARL Aberdeen Proving Grounds. Instrument the Hunter turbochargers and exhaust manifolds, and provide support for in-flight testing to acquire data for turbocharger lifing analysis to support of airworthiness, readiness, reliability, and safety of the Hunter aircraft. UAV Hunter turbocharger	0.038	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
investigation at the U.S. ARL VTD at Aberdeen Proving Ground, MD. Also provides research to support airworthiness, reliability and performance improvements of Hunter UAV turbocharger. An alternate turbocharger is required to support airworthiness, reliability and performance of Hunter UAS engine. The Hunter UAS has experienced "Soft Rotation" due to the aircraft's inability to achieve an engine speed sufficient for take-off (i.e. insufficient thrust). The increased frequency in soft rotations during take-off increases the risk of potential damage to equipment or injury to personnel due to the potential for the aircraft to depart the runway after rotation rather than taking flight. Testing has demonstrated that the current turbocharger is operating very close to the surge limit. The engine calibration limits turbocharger speed. However, there is no potential for an increase in performance with the currently installed turbocharger.			
Title: UAS Fuel System Component Evaluation ***Description:*** This program is to improve aircraft readiness and reliability by mitigating the root cause of common component failures. ***FY 2022 Plans:*** UAS Component investigations will support airworthiness, reliability and performance improvements of the critical Unmanned Aerial Vehicle (UAV) components (e.g.. FADECs, fuel injectors, and high pressure fuel pumps) to determine root cause of occurrences which result in performance anomalies during aircraft operation ***FY 2023 Plans:*** UAS Component investigations will continue to support airworthiness, reliability and performance improvements of the critical Unmanned Aerial Vehicle (UAV) components (e.g.. FADECs, fuel injectors, and high pressure fuel pumps) to determine root cause of occurrences which result in performance anomalies during aircraft operation ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funds increased to address identify/evaluate failure root causes for new Gray Eagle UAS engine hardware being fielded and to continue to identify/evaluate failure root causes to improve readiness and reliability across multiple UAS platforms.	-	0.073	0.093
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	0.005	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	0.080	0.132	0.148

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Improved designs will be implemented via Engineering Change Proposal (ECP) and follow-on procurement or modification to a production contract to introduce the improved hardware.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Engineering	Allot	US Army AMRDEC : Redstone Arsenal, AL	3.080	0.005	Oct 2020	0.054	Oct 2021	0.055	Oct 2022	-		0.055	Continuing	Continuing	Continuing
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.005	Mar 2022	-		-		-	0.000	0.005	-
		Subtotal	3.080	0.005		0.059		0.055		-		0.055	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T700 Engine	SS/IDIQ	GE-Air : Lynn, MA	61.729	-		-		-		-		-	Continuing	Continuing	Continuing
T55 Engine	SS/IDIQ	Honeywell : Phoenix, AZ	30.161	-		-		-		-		-	Continuing	Continuing	Continuing
T62 Auxiliary Power Unit (APU)	C/IDIQ	Redstone Technical Center Redstone Arsenal, AL : ATEC	0.050	-		-		-		-		-	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Kelly AFB, TX	13.647	-		-		-		-		-	Continuing	Continuing	Continuing
Gray Eagle UAS Turbocharger Compressor Blow-Off Valve	Various	ARL-Vehicle Technology Directorate : TBD	1.090	0.037	Sep 2021	0.034	Oct 2021	-		-		-	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Hill AFB, UT	2.319	-		-		-		-		-	Continuing	Continuing	Continuing
T-62T-2B Vibration Test	Various	Redstone Technical Text Center : Redstone Arsenal, AL	0.050	-		-		-		-		-	Continuing	Continuing	-
Hunter UAS Fuel Injector Evaluation	TBD	To Be Determined : To Be Determined	0.033	-		-		-		-		-	0.000	0.033	-
Hunter UAS Turbocharger Life Management	TBD	To Be Determined : To Be Determined	0.023	0.038	Sep 2021	-		-		-		-	0.000	0.061	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hunter UAS Lower Propeller Shafts	TBD	To Be Determined : To Be Determined	0.020	-		-		-		-		-	0.000	0.020	-
UAS Fuel System Component Evaluation	TBD	Army Research Lab : Aberdeen Proving Ground	-	-		0.039	Oct 2021	0.093	Oct 2022	-		0.093	Continuing	Continuing	Continuing
		Subtotal	109.122	0.075		0.073		0.093		-		0.093	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.202	0.080		0.132		0.148		-		0.148	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

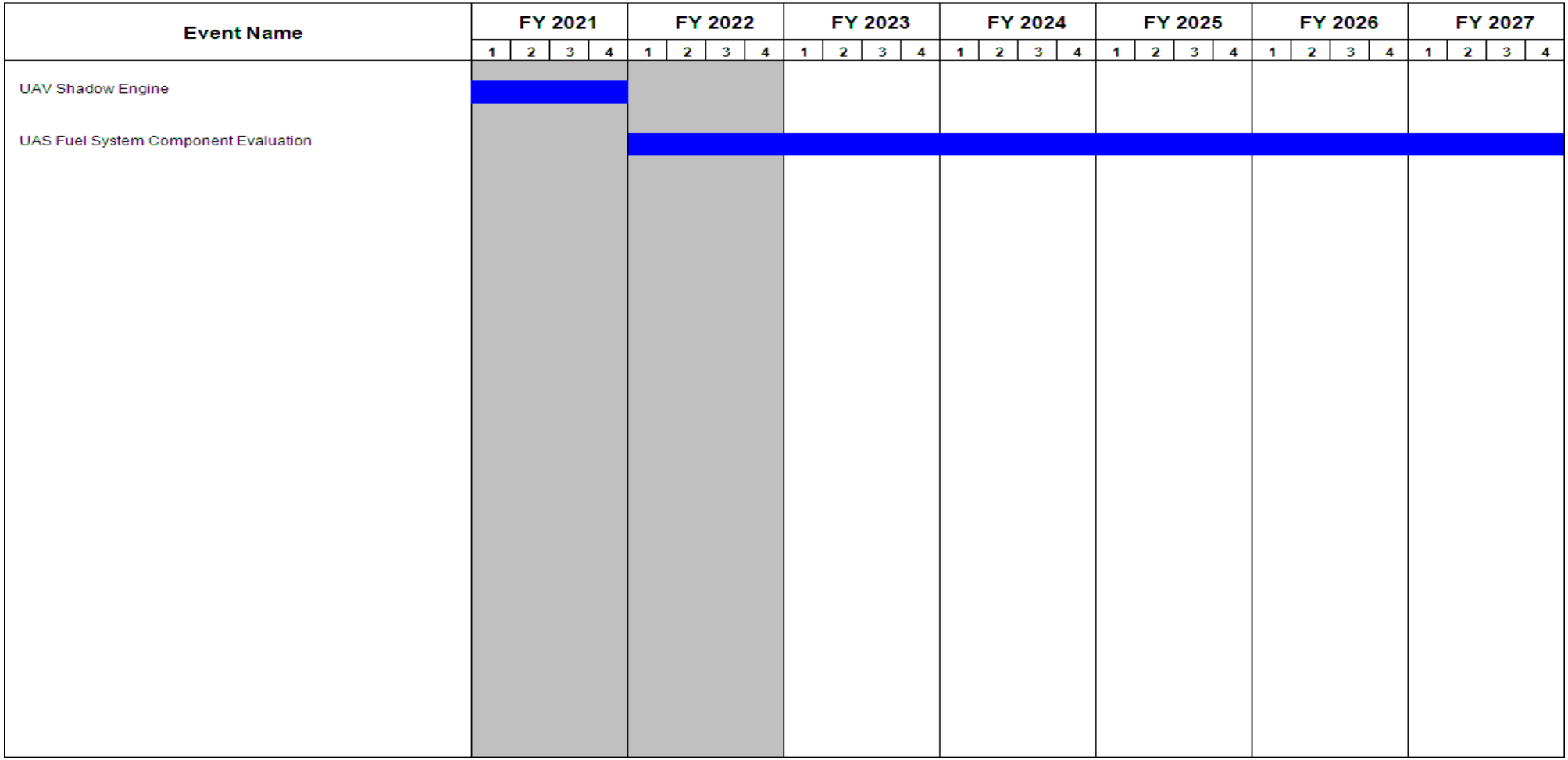


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
T700 Engine Spit Pit Testing	1	2011	4	2012
T700 Engine Temperature Survey	2	2014	4	2015
T55 Engine 1553 Engine Control Unit (ECU)	2	2012	1	2013
T55 Engine N1 Drive Line Redesign	1	2010	4	2012
T55 Engine ECU Block Upgrade	2	2013	4	2015
Auxiliary Power Units (APUs)	1	2014	4	2015
UAV Shadow Engine	2	2014	4	2021
T700 CSI Update	1	2017	4	2017
UAS Fuel System Component Evaluation	1	2022	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0203758A *I Digitization*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.351	3.903	2.100	-	2.100	2.106	2.148	2.148	2.191	Continuing	Continuing
374: *HOR Battlefld Digitizn*	-	4.351	3.903	2.100	-	2.100	2.106	2.148	2.148	2.191	Continuing	Continuing

A. Mission Description and Budget Item Justification

As the Army Equipping methodology transitions to the Army Modernization Enterprise or AME the information technology used to support Army Equipping must grow and change. The development of an upgraded Army Equipping Enterprise System (AE2S) will integrate and share programming data (dollars and quantities) with information from IT systems that support the Army Futures Command (AFC), ASA(ALT), ASA(FM&C) and Army G3/5/7. This data sharing will allow the AME to provide Army Senior Leaders with a complete picture of how well programs are executing, the impacts of programming decisions on Army current and future readiness and modernization, and help develop a road map needed to transition the current force to a fully modernize Army. The AE2S next generation capability requirements include a flexible data and software architectures that allows the user to integrate disparate data from differing architectures in order to develop new information that can be turned into actionable knowledge by senior leaders. The software architecture must have data visualization capabilities that allow the user to display data in ways that can articulate how AME decisions made impact warfighting effectiveness and plans.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	4.351	3.936	0.000	-	0.000
Current President's Budget	4.351	3.903	2.100	-	2.100
Total Adjustments	0.000	-0.033	2.100	-	2.100
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	2.100	-	2.100
• FFRDC Transfer	-	-0.033	-	-	-

Change Summary Explanation

FY 2022 funding decreased due to FFRDC adjustments to Budget Years.

FY 2023 funding decrease reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / *Digitization*	Project (Number/Name) 374 / *HOR Battlefld Digitizn*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
374: *HOR Battlefld Digitizn*	-	4.351	3.903	2.100	-	2.100	2.106	2.148	2.148	2.191	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As the Army Equipping methodology transitions to the Army Modernization Enterprise or AME the information technology used to support Army Equipping must grow and change. The development of an upgraded Army Equipping Enterprise System (AE2S) will integrate and share programming data (dollars and quantities) with information from IT systems that support the Army Futures Command (AFC), ASA(ALT), ASA(FM&C) and Army G3/5/7. This data sharing will allow the AME to provide Army Senior Leaders with a complete picture of how well programs are executing, the impacts of programming decisions on Army current and future readiness and modernization, and help develop a road map needed to transition the current force to a fully modernize Army. The AE2S next generation capability requirements include a flexible data and software architectures that allows the user to integrate disparate data from differing architectures in order to develop new information that can be turned into actionable knowledge by senior leaders. The software architecture must have data visualization capabilities that allow the user to display data in ways that can articulate how AME decisions made impact warfighting effectiveness and plans.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Interoperability and Integration	1.047	0.901	0.312
Description: Funds are to be used for the following efforts. ***FY 2022 Plans:*** Contractor continues to conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles, and interoperability baselines. ***FY 2023 Plans:*** Contractor will continue to conduct independent analyses of Army, joint, and multinational interfaces, adherence to standards, implementation profiles, and interoperability baselines. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is based on decrease in requirements.			
Title: Operational Capability Analysis and Evaluation	1.011	0.866	0.301
Description: Funds are to be used for the following efforts. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203758A / *Digitization*	**Project (Number/Name)** 374 / *HOR Battlefld Digitizn*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Contractor continues to conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support Army and joint initiatives. ***FY 2023 Plans:*** Contractor will continue to conduct iterative capability analyses and assessments consistent with CJCSI 3170 (JCIDS) and 6212 (Net Readiness) to ensure Army and joint program technical and operational requirements are consistent. Efforts support Army and joint initiatives. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is based on decrease in requirements.			
Title: Systems Architecture Development ***Description:*** Funds are to be used for the following efforts. ***FY 2022 Plans:*** FFRDC contractor continues to conduct broad concept studies with emphasis on interoperability and joint coalition operations. ***FY 2023 Plans:*** FFRDC contractor will continue to conduct broad concept studies with emphasis on interoperability and joint coalition operations. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is based on decrease in requirements.	0.770	0.633	0.508
Title: AE2S Software ***Description:*** Procures AE2S software integration and enhancements for the single program language, single platform system that incorporates FDIIS, CEaVa, COP, and AFM. ***FY 2022 Plans:*** Contractor continues to incorporate the development of new applications to satisfy Strategic Portfolio Analysis Review (SPAR), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower. ***FY 2023 Plans:*** Contractor will continue to incorporate the development of new applications to satisfy Strategic Portfolio Analysis Review (SPAR), Sustainment Program Evaluation Group (SS PEG), and Equipping PEG (EE PEG) Manpower. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase is based on increase in requirements.	0.558	0.566	0.596
Title: Technical Reviews and Technical Performance Analysis	0.825	0.686	0.241

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203758A / *Digitization*	**Project (Number/Name)** 374 / *HOR Battlefld Digitizn*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Funds are to be used for the following efforts. ***FY 2022 Plans:*** Contractor continues to provide technology maturity assessments, prepare technical recommendations in support of Army Transformation and specific technologies of interest, including test and evaluate network systems, and infrastructure modeling and simulations to the G-8. ***FY 2023 Plans:*** Contractor will continue to provide technology maturity assessments, prepare technical recommendations in support of Army Transformation and specific technologies of interest, including test and evaluate network systems, and infrastructure modeling and simulations to the G-8. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is based on decrease in requirements.			
Title: Academic Research ***Description:*** Apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces. ***FY 2022 Plans:*** Contractor continues to apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces. ***FY 2023 Plans:*** Contractor will continue to apply university academic and research resources to the integration of Army complex modeling, simulation, and training in support of modernized forces. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase is due to inflation.	0.140	0.107	0.142
Title: FY22 SBIR/STTR Transfer ***Description:*** FY22 SBIR/STTR Transfer in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	0.144	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203758A / *Digitization*	**Project (Number/Name)** 374 / *HOR Battlefld Digitizn*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	4.351	3.903	2.100

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The AE2S development will be done through either a competitive Cost Plus or Fixed Price Incentive contracts that will deliver capabilities in increments, recognizing up front the need for future improvements. The objective of the strategy is to develop and optimize system capabilities while reducing risk and streamlining business and engineering processes.

FFRDC requirements will be accomplished by competitive contract.

Other efforts will be accomplished by various contract methods and types.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / *Digitization*	Project (Number/Name) 374 / *HOR Battlefld Digitizn*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digitization Technical Integration	Various	Various : Various	5.556	-		-		-		-		-	0.000	5.556	-
Joint & Coalition Interoperability	Various	Various : Various	5.091	-		-		-		-		-	0.000	5.091	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	FY 2018 NDAA SEC 825 MDAP Cost Overrun : FY 2018 NDAA SEC 825 MDAP Cost Overrun	0.028	-		-		-		-		-	0.000	0.028	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.144	Mar 2022	-		-		-	0.000	0.144	-
		Subtotal	10.675	-		0.144		-		-		-	0.000	10.819	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Equipping Enterprise SYstem (AE2S) Software	C/CPFF	TBD : TBD	11.096	0.558		0.566		0.596		-		0.596	Continuing	Continuing	Continuing
Cross-Platform Development	Various	TBD : TBD	3.605	-		-		-		-		-	0.000	3.605	-
		Subtotal	14.701	0.558		0.566		0.596		-		0.596	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability and Integration	Various	Various : Various	8.998	1.047		0.901		0.312		-		0.312	0.000	11.258	-
Operational Capability Analysis and Evaluation	Various	VAR : VAR	8.338	1.011		0.866		0.301		-		0.301	0.000	10.516	-
Academic Research	Various	Various : Various	3.371	0.140		0.107		0.142		-		0.142	0.000	3.760	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203758A / *Digitization*	Project (Number/Name) 374 / *HOR Battlefld Digitizn*	

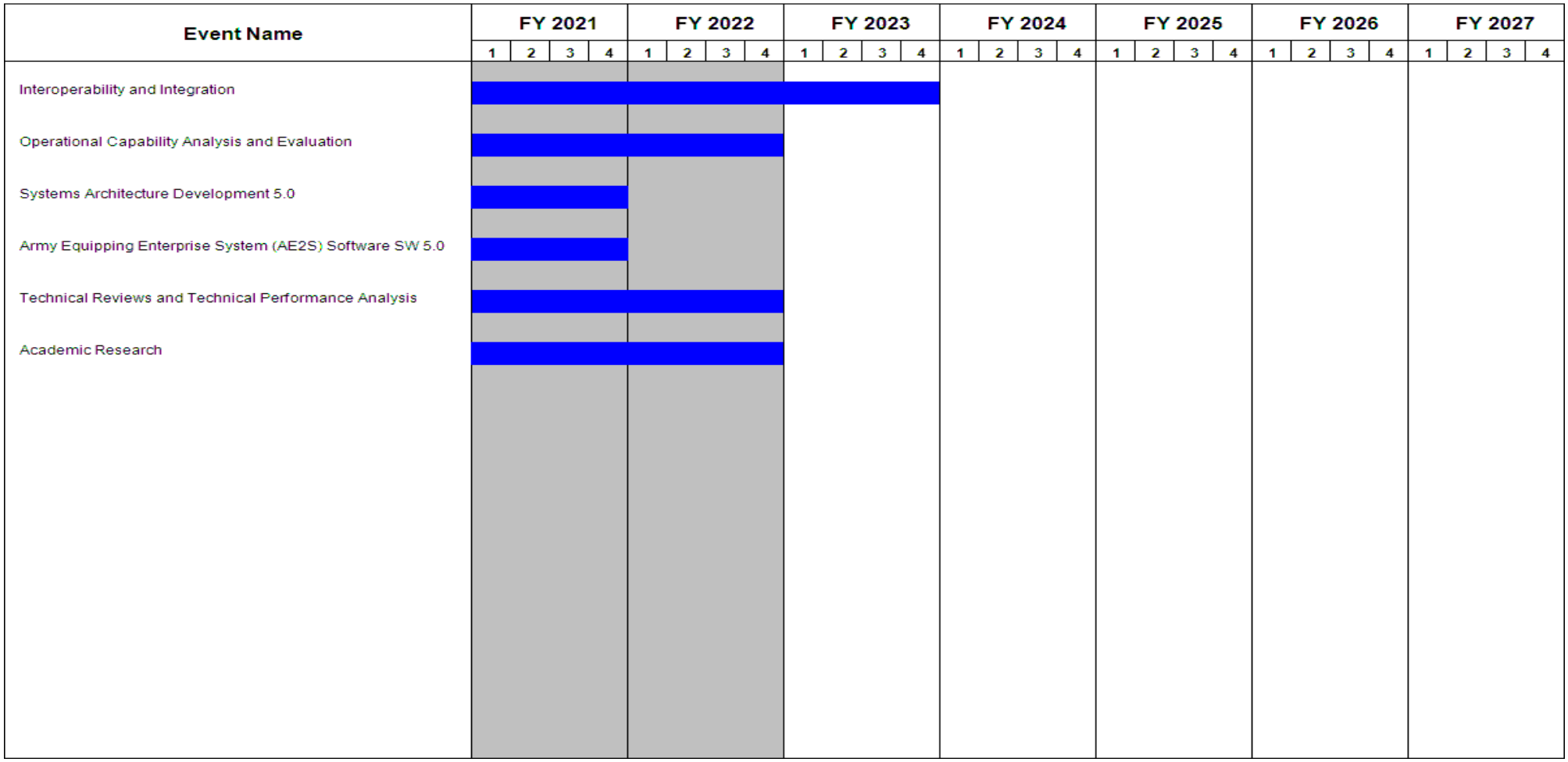
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational CapabilityAnalysis and Evaluation	Various	Various : Various	5.608	-		-		-		-		-	0.000	5.608	-
Systems Architecture Development	Various	VAR : VAR	7.414	0.770		0.633		0.508		-		0.508	0.000	9.325	-
Technical Reviews and Technical Performance Analysis	Various	VAR : VAR	7.182	0.825		0.686		0.241		-		0.241	0.000	8.934	-
		Subtotal	40.911	3.793		3.193		1.504		-		1.504	0.000	49.401	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	66.287	4.351		3.903		2.100		-		2.100	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203758A / *Digitization*	**Project (Number/Name)** 374 / *HOR Battlefld Digitizn*



Note

None.

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203758A / *Digitization*	**Project (Number/Name)** 374 / *HOR Battlefld Digitizn*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Interoperability and Integration	1	2016	4	2023
Operational Capability Analysis and Evaluation	1	2016	4	2022
Systems Architecture Development 1.0	2	2015	2	2016
Systems Architecture Development 2.0	3	2016	3	2017
Systems Architecture Development 3.0	4	2017	4	2018
Systems Architecture Development 4.0	1	2019	1	2020
Systems Architecture Development 5.0	2	2020	4	2021
Army Equipping Enterprise System (AE2S) Software SW 1.0	2	2015	2	2016
Army Equipping Enterprise System (AE2S) Software SW 2.0	3	2016	3	2017
Army Equipping Enterprise System (AE2S) Software SW 3.0	4	2017	4	2018
Army Equipping Enterprise System (AE2S) Software SW 4.0	1	2019	1	2020
Army Equipping Enterprise System (AE2S) Software SW 5.0	2	2020	4	2021
Technical Reviews and Technical Performance Analysis	1	2015	4	2022
Academic Research	3	2015	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0203801A *I Missile/Air Defense Product Improvement Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.241	0.127	3.109	-	3.109	0.000	0.000	0.000	0.000	0.000	4.477
038: *Avenger PIP*	-	1.241	0.127	3.109	-	3.109	-	-	-	-	0.000	4.477

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the Stinger missile program.

Avenger is a lightweight, ground-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV). The system protects against unmanned aircraft systems, cruise missiles, and fixed and rotary wing threats. Avenger provides day/night adverse weather operations, shoot on the move capability, rapid target engagement, and remote firing capability. It can be air dropped, lifted by helicopter and is air transportable. The system employs up to eight Stinger missiles to counter aerial threats and a .50 Caliber Machine Gun (M3P) for close-in ground and air threats. An Identification Friend or Foe (IFF) system aids in the identification of friendly aircraft in order to minimize the potential for fratricide. The Avenger fleet of 453 systems includes 169 systems that are equipped with a digital Slew-to-Cue (STC) capability to speed target detection and engagement.

The Avenger Modification - Service Life Extension Program (MOD-SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. The ongoing MOD-SLEP addresses obsolescence of Avenger components to ensure Avenger maintains operational capability through Fiscal Year (FY) 2031. Five key MOD-SLEP components are: the Targeting Console (TC), the M3P, the Avenger Fire Control Computer (AFCC), the Mode 5 IFF and the Vehicle Internal Communications (VIC-5). Additional Obsolescence Mitigation Items include Avenger Organizational Maintenance Tool Kits, AN/PSM-95 Electronic Systems Test Set and the Avenger Remote Handheld Terminal Unit mounting kits.

The Avenger MOD-SLEP is fielded in two phases. Phase I fields the TC to 169 STC Avengers. The M3P is fielded as spares through the supply system. Phase II fields the AFCC to 169 STC Avengers and both the VIC-5 and the Mode 5 IFF to all 453 Avengers.

FY 2023 funding of $3.109 million continues development, integration, prototyping and testing of technologies that will provide Assured Positioning Navigation and Timing (A-PNT) capability, including the Anti-Jam Antenna and DAGR Distributed Device (D3), which will provide M-Code capability.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0203801A *I Missile/Air Defense Product Improvement Program*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	1.241	0.127	0.000	-	0.000
Current President's Budget	1.241	0.127	3.109	-	3.109
Total Adjustments	0.000	0.000	3.109	-	3.109
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.109	-	3.109

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203801A / *Missile/Air Defense Product Improvement Program*	Project (Number/Name) 038 / *Avenger PIP*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
038: *Avenger PIP*	-	1.241	0.127	3.109	-	3.109	-	-	-	-	0.000	4.477
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Avenger is a lightweight, ground-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle. The system protects against unmanned aircraft systems, cruise missiles, and fixed and rotary wing threats. Avenger provides day/night adverse weather operations, shoot on the move capability, rapid target engagement, and remote firing capability. It can be air dropped, lifted by helicopter and is air transportable. The system employs up to eight Stinger missiles to counter aerial threats and a .50 Caliber Machine Gun (M3P) for close-in ground and air threats. An Identification Friend or Foe (IFF) system aids in the identification of friendly aircraft in order to minimize the potential for fratricide. The Avenger fleet of 453 systems includes 169 systems that are equipped with a digital Slew-to-Cue (STC) capability to speed target detection and engagement.

The Avenger Modification - Service Life Extension Program (MOD-SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. The ongoing MOD-SLEP addresses obsolescence of Avenger components to ensure Avenger maintains operational capability through Fiscal Year (FY) 2031. Five key MOD-SLEP components are: the Targeting Console (TC), the M3P, the Avenger Fire Control Computer (AFCC), the Mode 5 IFF and the Vehicle Internal Communications (VIC-5). Additional Obsolescence Mitigation Items include Avenger Organizational Maintenance Tool Kits, AN/PSM-95 Electronic Systems Test Set and the Avenger Remote Handheld Terminal Unit mounting kits.

The Avenger MOD-SLEP is fielded in two phases. Phase I fields the TC to 169 STC Avengers. The M3P is fielded as spares through the supply system. Phase II fields the AFCC to 169 STC Avengers and both the VIC-5 and the Mode 5 IFF to all 453 Avengers.

FY 2023 funding of $3.109 million continues development, integration, prototyping and testing of technologies that will provide Assured Positioning, Navigation and Timing (A-PNT) capability, including the Anti-Jam Antenna and DAGR Distributed Device (D3), which will provide M-Code capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Avenger MOD-SLEP	1.241	0.122	-
Description: The Avenger MOD-SLEP consists of development activities for platform integration, software upgrades, and capability enhancements. Develops and executes test requirements and conducts limited contractor and government testing. Performs technical assessments, concept studies, cost reduction, risk reduction and development documentation.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203801A / *Missile/Air Defense Product Improvement Program*	**Project (Number/Name)** 038 / *Avenger PIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding provides for continuing mitigation of emerging obsolescence issues and maintains the viability of the Avenger system. This includes the continuing investigation of technologies that will provide A-PNT capability, including the Anti-Jam Antenna and DAGR D3, which will provide M-Code capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The decrease is due to completion of RDT&E efforts associated with MOD-SLEP.			
Title: A-PNT ***Description:*** This effort consists of development, integration, prototyping and testing of technologies that will provide Assured Positioning, Navigation and Timing (A-PNT) capability. The A-PNT capability, including the Anti-Jam Antenna and DAGR Distributed Device (D3), will provide M-Code capability to the Avenger system. ***FY 2023 Plans:*** Funding continues integration, prototyping and testing of the A-PNT capability, including the Anti-Jam Antenna and DAGR D3, which will provide M-Code capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase from $0.000 million (FY 2022) to $3.109 million (FY 2023) is due to requirements associated with A-PNT.	-	-	3.109
Title: FY 2022 SBIR / STTR Transfer ***FY 2022 Plans:*** SBIR / STTR transfer. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The decrease from 2022 to 2023 is due to a one-time 2022 SBIR / STTR transfer.	-	0.005	-
Accomplishments/Planned Programs Subtotals	1.241	0.127	3.109

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• CE8710: *AVENGER MODS*	13.942	11.227	0.000	-	0.000	-	-	-	-	0.000	25.169

Remarks

CE8710 Avenger MODS procures the MOD-SLEP components for the Avenger system. This ensures that Avenger is viable and sustainable through FY 2031. This program is an integral part of the Army Air and Missile Defense Modernization strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203801A / *Missile/Air Defense Product Improvement Program*	**Project (Number/Name)** 038 / *Avenger PIP*

D. Acquisition Strategy

The Avenger MOD-SLEP addresses obsolescence of key components and ensures that Avenger is viable and sustainable through FY 2031.

The MOD-SLEP Phase I component is the TC.

The MOD-SLEP Phase II components are the AFCC, the Mode 5 IFF, the VIC-5 and the M3P machine gun. The M3P machine gun will be fielded through attrition. The other MOD-SLEP Phase II components will be installed in the field as a single installation package.

Development and testing of hardware and software modifications necessary to fully integrate the A-PNT capability into the Avenger will be performed by a combination of Government and Original Equipment Manufacturer efforts, using the existing and new Engineering Service contracts. Modifications will be completed with organic efforts with A-PNT hardware provided by Program Manager PNT.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203801A / *Missile/Air Defense Product Improvement Program*	Project (Number/Name) 038 / *Avenger PIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Management Services	Various	Various : Redstone Arsenal, AL	3.056	0.178	Oct 2020	-		-		-		-	0.000	3.234	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.053	-		-		-		-		-	0.000	0.053	-
FY 2022 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.005		-		-		-	0.000	0.005	-
		Subtotal	3.109	0.178		0.005		-		-		-	0.000	3.292	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Product Development	SS/ Various	Raytheon, The Boeing Company and others : Aberdeen Proving Grounds, MD and Huntsville, AL	9.849	0.396	Oct 2020	0.122	Oct 2021	2.809	Oct 2022	-		2.809	Continuing	Continuing	-
		Subtotal	9.849	0.396		0.122		2.809		-		2.809	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Avenger Modification Test Support	Various	The Boeing Company, U.S. Army Combat Capabilities Development Command Aviation and Missiles Center and others : Huntsville, AL and	7.351	0.667	Oct 2020	-		0.300	Oct 2022	-		0.300	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203801A / *Missile/Air Defense Product Improvement Program*	Project (Number/Name) 038 / *Avenger PIP*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Redstone Arsenal, AL													
		Subtotal	7.351	0.667		-		0.300		-		0.300	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.309	1.241		0.127		3.109		-		3.109	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203801A / *Missile/Air Defense Product Improvement Program*	**Project (Number/Name)** 038 / *Avenger PIP*

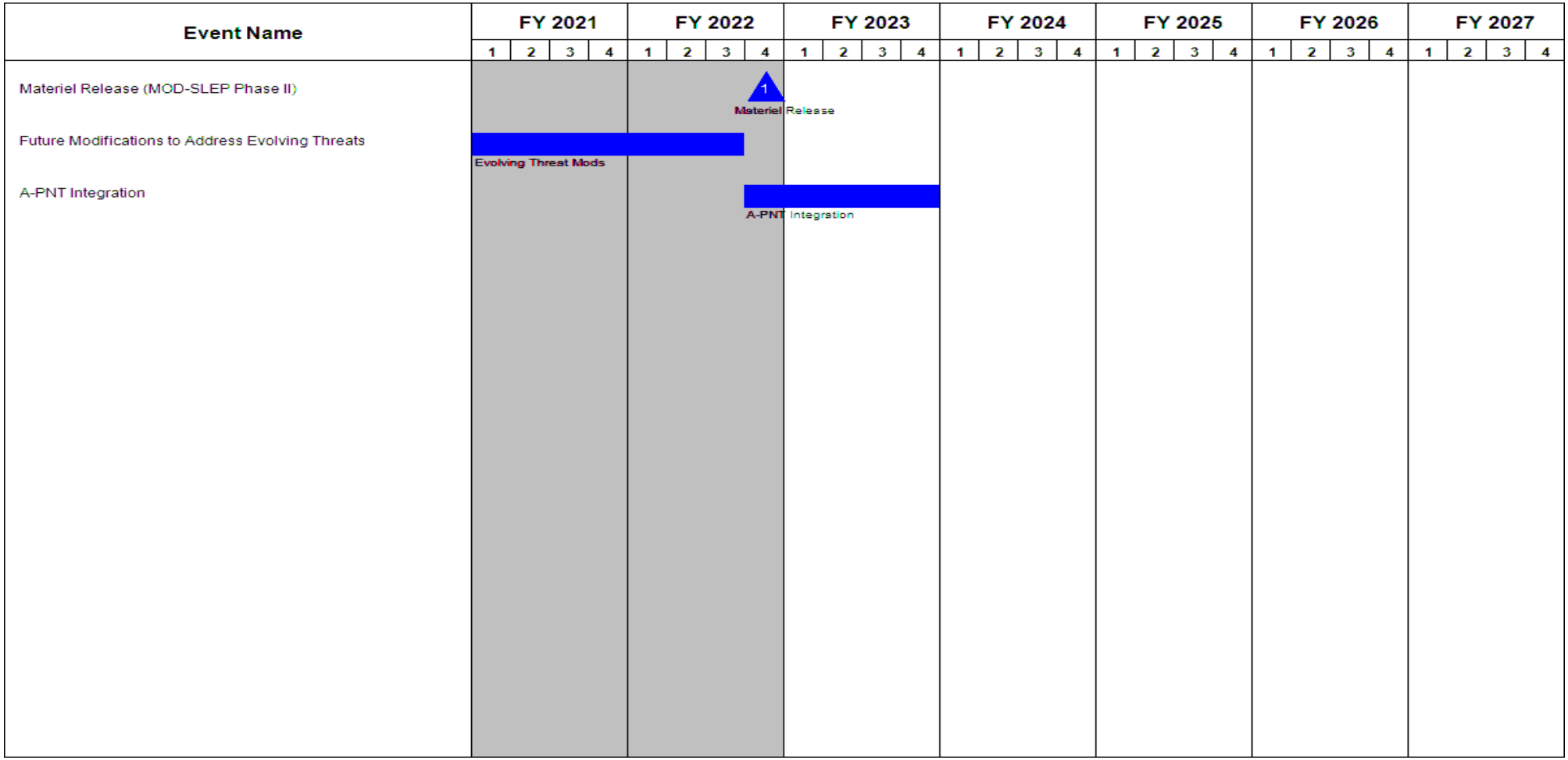


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203801A / *Missile/Air Defense Product Improvement Program*	**Project (Number/Name)** 038 / *Avenger PIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Integration and Testing (MOD-SLEP Phase II)	2	2018	2	2020
Live Fire Testing (MOD-SLEP Phase II)	4	2018	4	2018
Logistics Demo (MOD-SLEP Phase II)	2	2019	4	2019
Materiel Release (MOD-SLEP Phase II)	4	2022	4	2022
Future Modifications to Address Evolving Threats	1	2020	3	2022
A-PNT Integration	4	2022	4	2023

Note

MOD-SLEP Phase II components are the AFCC, IFF, VIC-5 and M3P machine gun.
AFCC: Avenger Fire Control Computer
IFF: Identification Friend or Foe
MOD-SLEP: Modification - Service Life Extension Program
VIC: Vehicle Internal Communications
A-PNT: Assured Positioning, Navigation and Timing

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	15.268	10.265	9.027	-	9.027	0.000	0.000	0.000	0.000	0.000	34.560
VT9: *Lethal Miniature Aerial Missile System (LMAMS)*	-	2.300	1.800	-	-	-	-	-	-	-	0.000	4.100
VV2: *TOW*	-	12.968	8.465	9.027	-	9.027	-	-	-	-	0.000	30.460
Program MDAP/MAIS Code: PRE												

A. Mission Description and Budget Item Justification

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of the Next-Generation Anti-Tank Guided Missile program..

VT9: LMAMS is a single man-portable/operable, light-weight organic, beyond line-of-sight, precision guided, loitering aerial missile system capable of locating and engaging obscured and/or fleeing enemy targets that otherwise cannot be engaged by typical direct fire weapon systems.

VV2: TOW Weapon System includes the Improved Target Acquisition System (ITAS) and other TOW missile launchers, TOW missiles (BGM-71 series) and other missiles capable of being fired from TOW Missile launchers, and associated tactical training aids/devices. The TOW Weapon System provides long-range, lethal anti-armor and precision assault fires capability for Army Infantry Brigade Combat Teams (IBCT), Stryker Brigade Combat Teams (SBCT) and Armor Brigade Combat Teams (ABCT) within the Active, Reserve, and National Guard components. The United States Marine Corps (USMC) employs the TOW missile from its ITAS derived M41A7 Saber launchers and ATGM vehicles.

The TOW Weapon System improvement program integrates US Army missile and launcher modifications to improve missile safety and reliability, increase system survivability and lethality, and enhance system network capabilities. These capability improvements support Multi-Domain Operations (MDO) as a part of Joint All Domain Operations (JADO) and the Functional Concept for Movement and Maneuver by providing precise lethal capabilities in multiple domains against armored threat systems.

FY23 funding in the amount of $9.027M is for TOW missile obsolescence mitigation, system improvements, and integration and countermeasure/threat management.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	15.268	10.265	0.000	-	0.000
Current President's Budget	15.268	10.265	9.027	-	9.027
Total Adjustments	0.000	0.000	9.027	-	9.027
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.027	-	9.027

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*	Project (Number/Name) VT9 / *Lethal Miniature Aerial Missile System (LMAMS)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
VT9: *Lethal Miniature Aerial Missile System (LMAMS)*	-	2.300	1.800	-	-	-	-	-	-	-	0.000	4.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

VT9: LMAMS is a single man-portable/operable, light-weight organic, beyond line-of-sight, precision guided, loitering aerial missile system capable of locating and engaging obscured and/or fleeing enemy targets that otherwise cannot be engaged by typical direct fire weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: LMAMS Capability Improvements	2.300	1.800	-
Description: Joint Urgent Operational Need (JUON) User Required Capability Improvements supporting CC-0556. ***FY 2022 Plans:*** Complete development of an improved datalink capable of integration into an LMAMS solution. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No additional funding required after FY22 to complete data link integration.			
Accomplishments/Planned Programs Subtotals	2.300	1.800	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C88001: *LETHAL MINIATURE AERIAL MISSILE SYSTEM (LMAMS)*	-	61.408	37.937	-	37.937	-	-	-	-	0.000	99.345

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*	Project (Number/Name) VT9 / *Lethal Miniature Aerial Missile System (LMAMS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering / Program Management	MIPR	CCDC AvMC : Redstone Arsenal, AL	-	0.193	Apr 2021	0.163	May 2022	-		-		-	0.000	0.356	-
		Subtotal	-	0.193		0.163		-		-		-	0.000	0.356	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	MIPR	CCDC AvMC : Redstone Arsenal, AL	-	2.061	May 2021	0.986	Jun 2022	-		-		-	0.000	3.047	-
Technology Integration	SS/CPFF	TBD : TBD	-	-		0.500	Jun 2022	-		-		-	0.000	0.500	-
		Subtotal	-	2.061		1.486		-		-		-	0.000	3.547	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Level Product Verification Testing	MIPR	Dugway Proving Grounds : Dugway, UT	-	0.046	Nov 2021	-		-		-		-	0.000	0.046	-
System Level Product Verification Testing	MIPR	Dugway Proving Grounds : Dugway, UT	-	-		0.151	Sep 2022	-		-		-	0.000	0.151	-
		Subtotal	-	0.046		0.151		-		-		-	0.000	0.197	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.300		1.800		-		-		-	0.000	4.100	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*	Project (Number/Name) VT9 / *Lethal Miniature Aerial Missile System (LMAMS)*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VT9 / *Lethal Miniature Aerial Missile System (LMAMS)*

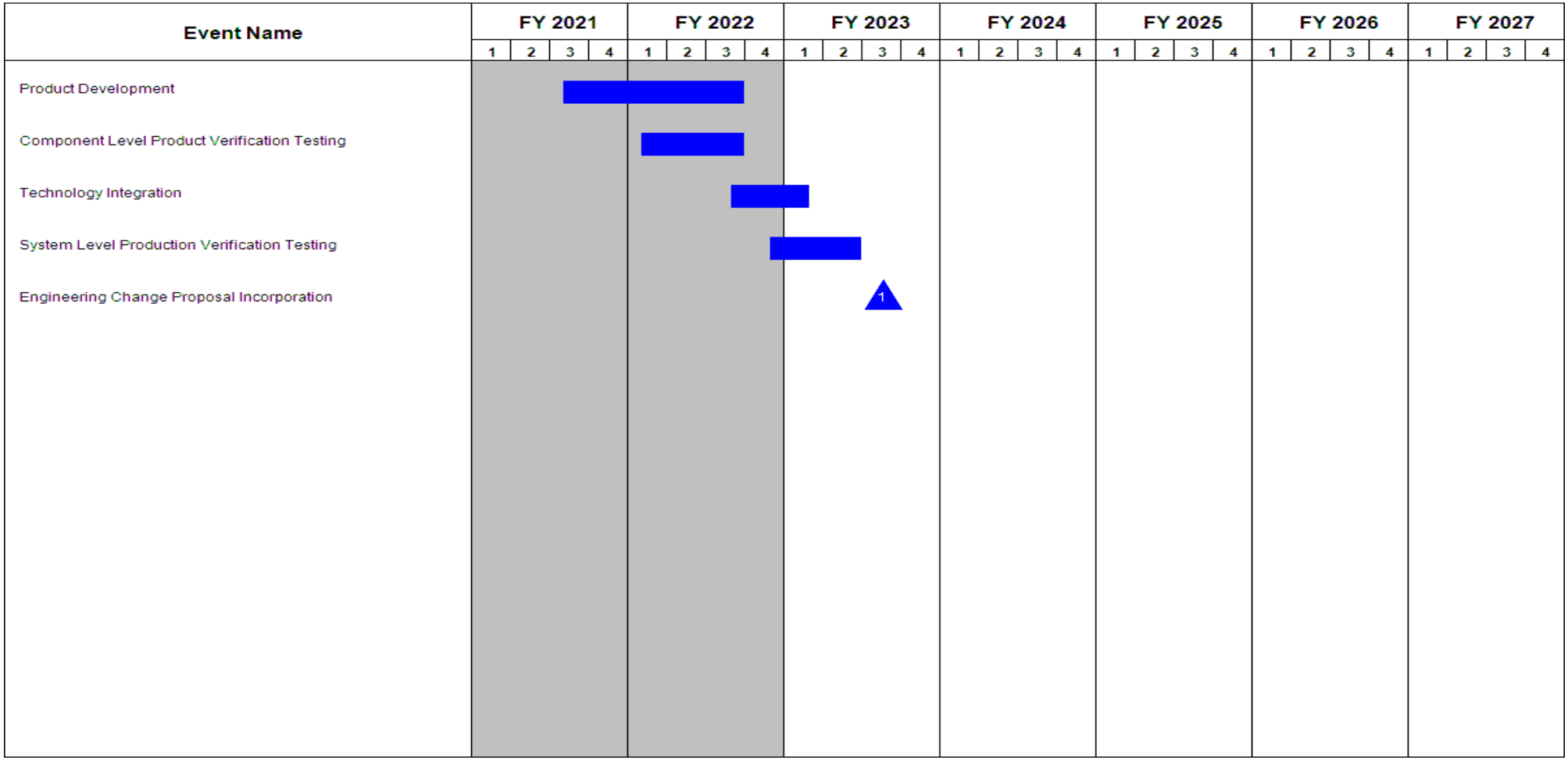


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VT9 / *Lethal Miniature Aerial Missile System (LMAMS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Product Development	3	2021	3	2022
Component Level Product Verification Testing	1	2022	3	2022
Technology Integration	3	2022	1	2023
System Level Production Verification Testing	4	2022	2	2023
Engineering Change Proposal Incorporation	3	2023	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*	Project (Number/Name) VV2 / *TOW*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
VV2: *TOW*	-	12.968	8.465	9.027	-	9.027	-	-	-	-	0.000	30.460
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

VV2: TOW Weapon System includes the Improved Target Acquisition System (ITAS) and other TOW missile launchers, TOW missiles (BGM-71 series) and other missiles capable of being fired from TOW Missile launchers, and associated tactical training aids/devices. The TOW Weapon System provides long-range, lethal anti-armor and precision assault fires capability for Army Infantry Brigade Combat Teams (IBCT), Stryker Brigade Combat Teams (SBCT) and Armor Brigade Combat Teams (ABCT) within the Active, Reserve, and National Guard components. The United States Marine Corps (USMC) employs the TOW missile from its ITAS derived M41A7 Saber launchers and ATGM vehicles.

The TOW Weapon System improvement program integrates US Army missile and launcher modifications to improve missile safety and reliability, increase system survivability and lethality, and enhance system network capabilities. These capability improvements support Multi-Domain Operations (MDO) as a part of Joint All Domain Operations (JADO) and the Functional Concept for Movement and Maneuver by providing precise lethal capabilities in multiple domains against armored threat systems.

FY23 funding in the amount of $9.027M is for TOW missile obsolescence mitigation, system improvements, and integration and countermeasure/threat management.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: TOW Missile Obsolescence Mitigation and System Improvements	12.968	7.384	8.540
Description: These funds will be used for development and qualification of new components, associated parts, and sub-systems such as the Radio Frequency Data-Link (RF DL), Missile Computer (MC), and Short Wave Infra-Red (SWIR) beacon. These components will be cut into production via Engineering Change Proposal upon qualification.			
FY 2022 Plans: Implement the design engineering of the RF DL, MC, and SWIR beacon, and required software to facilitate integration into a tactical system. Build and test components at the component and sub-system level. FY22 engineering efforts culminate in the completion of Design Engineering and a Component Critical Design Review in 1QFY23.			
FY 2023 Plans: Resolve potential issues uncovered in the CDR or component testing. Build components and hardware at the system level and complete component level testing. Hardware funded in FY23 will validate producibility of previously designed and tested components. Enable warhead improvements to keep pace with emerging threats as			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VV2 / *TOW*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
determined by threat assessments and analysis. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase in funds from FY2022 to FY2023 is due to an increase in requirements to validate producibility of previously designed and tested components for TOW Missile obsolescence mitigation, and an adjustment for inflation in FY23 in the amount of $316K.			
Title: Integration and Counter Measure/Threat management ***Description:*** These funds will be used to prepare and perform technical assessments, threat analysis, concept studies, demonstrations, tests and risk mitigation efforts to address current and emerging threats. ***FY 2022 Plans:*** Perform technical assessments, analysis and testing of TOW Missiles against various targets to demonstrate current and required capabilities. ***FY 2023 Plans:*** Perform technical assessments, analysis and testing of missiles against various targets to demonstrate current and future capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decrease from FY22 to FY23 due to reduced requirements for concept studies and government testing.	-	0.772	0.487
Title: SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638	-	0.309	-
Accomplishments/Planned Programs Subtotals	12.968	8.465	9.027

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C59300: *TOW 2 System Summary*	112.974	101.912	105.423	-	105.423	122.602	124.577	124.461	124.491	0.000	816.440
• C61700: *ITAS/TOW Mods*	5.666	4.561	5.154	-	5.154	-	-	-	-	0.000	15.381

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VV2 / *TOW*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

TOW Missile obsolescence mitigation design engineering, component hardware build, and component systems integration will be conducted via sole source contracts to Raytheon Missiles and Defense (RMD) as the current TOW Missile Prime contractor and only source that is both facilitized and qualified to produce all TOW Missile configurations.

The Acquisition Strategy uses in-house expertise, Other Government Agencies (OGA), defense industry capabilities, and when appropriate Other Transactional Agreements. The strategy allows the Government the ability to support urgent operational needs and unanticipated requirements, which require immediate and expert attention. This strategy allows the Government to maintain TOW Weapon System effectiveness and posture for emerging requirements while leveraging new authorities and incorporating new technologies.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203802A / *Other Missile Product Improvement Programs*	Project (Number/Name) VV2 / *TOW*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engr/Program Management, Govt	MIPR	Multiple : Redstone Arsenal, AL	-	1.359	Apr 2021	0.914	Jun 2022	0.792	Jan 2023	-		0.792	0.000	3.065	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.309		-		-		-	0.000	0.309	-
		Subtotal	-	1.359		1.223		0.792		-		0.792	0.000	3.374	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Design Engineering	SS/CPFF	Raytheon : Tucson, AZ	-	11.609	Apr 2021	1.933	Jun 2022	0.524	Jan 2023	-		0.524	0.000	14.066	-
Component Hardware Build	SS/CPFF	Raytheon : Tucson, AZ	-	-		3.129	May 2022	4.993	Jan 2023	-		4.993	0.000	8.122	-
Integration and Counter Measure/Threat management	Various	Various : Various	-	-		0.653	May 2022	0.428	Jan 2023	-		0.428	0.000	1.081	-
		Subtotal	-	11.609		5.715		5.945		-		5.945	0.000	23.269	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component/System Test and Evaluation	SS/CPFF	Raytheon : Tucson, AZ	-	-		1.527	Jun 2022	2.290	Jan 2023	-		2.290	0.000	3.817	-
		Subtotal	-	-		1.527		2.290		-		2.290	0.000	3.817	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.968		8.465		9.027		-		9.027	0.000	30.460	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VV2 / *TOW*

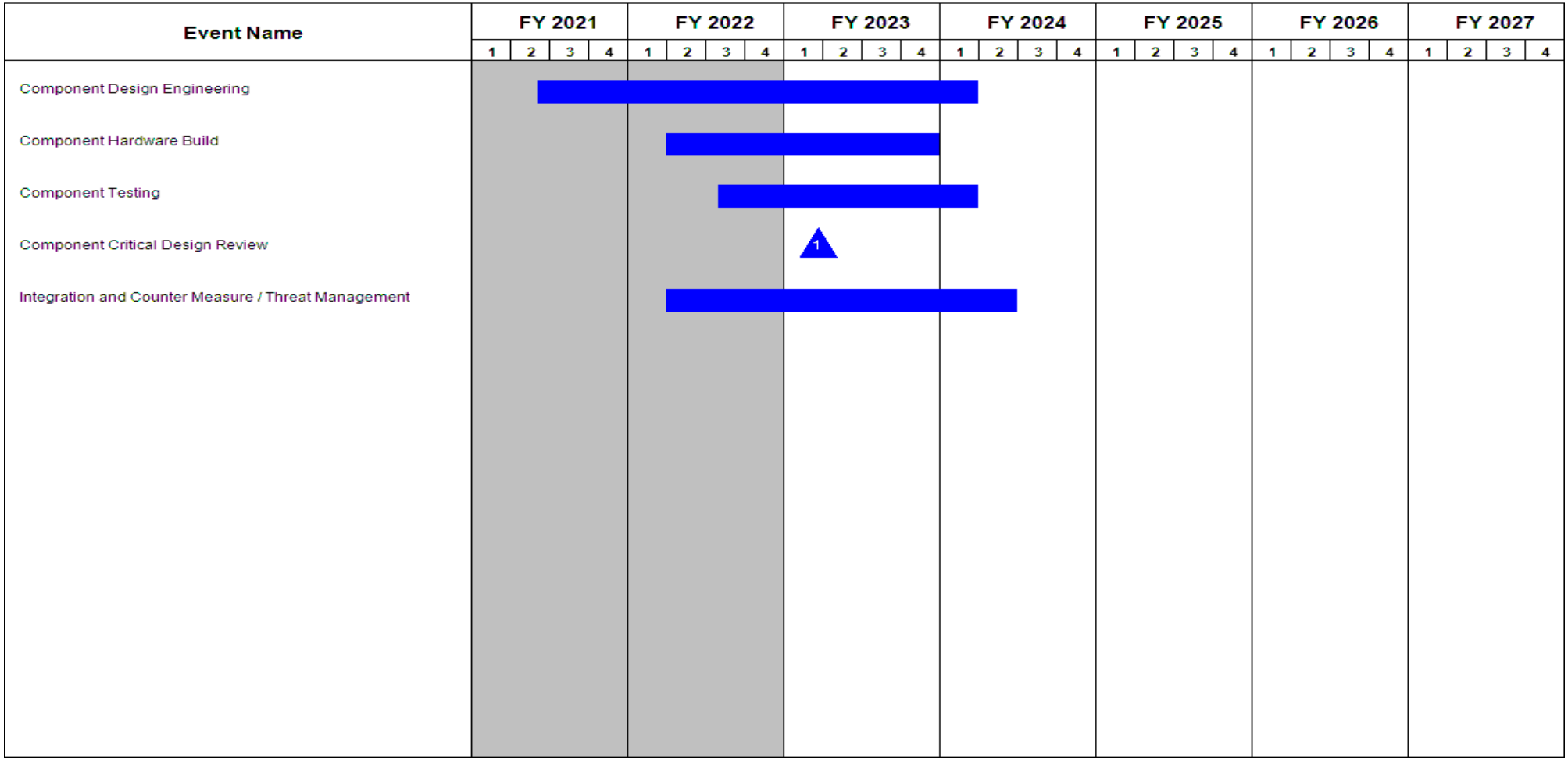


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203802A / *Other Missile Product Improvement Programs*	**Project (Number/Name)** VV2 / *TOW*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Component Design Engineering	2	2021	1	2024
Component Hardware Build	2	2022	4	2023
Component Testing	3	2022	1	2024
Component Critical Design Review	1	2023	1	2023
Integration and Counter Measure / Threat Management	2	2022	2	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205412A / *Environmental Quality Technology - Operational System Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.250	0.262	0.793	-	0.793	0.291	0.293	0.296	0.299	0.000	2.484
EE6: *Environmental Information Tech Modernization*	-	0.250	0.262	0.793	-	0.793	0.291	0.293	0.296	0.299	0.000	2.484

A. Mission Description and Budget Item Justification

The Environmental Information Technology Management (EITM) program includes support for the Defense Environment, Safety & Occupational Health Network Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS). This request for research, development, test and evaluation (RDTE) is to implement necessary enhancements to facilitate DENIX's Platform-as-a-Service capabilities, with additional modernizations that will improve the DoD's ESOH system of record and reporting tool set. This also includes upgrades to incorporate ongoing cybersecurity, cloud computing, and other information technology requirements.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.250	0.262	0.000	-	0.000
Current President's Budget	0.250	0.262	0.793	-	0.793
Total Adjustments	0.000	0.000	0.793	-	0.793
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.793	-	0.793

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205412A / *Environmental Quality Tech nology - Operational System Dev*	Project (Number/Name) EE6 / *Environmental Information Tech Modernization*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EE6: *Environmental Information Tech Modernization*	-	0.250	0.262	0.793	-	0.793	0.291	0.293	0.296	0.299	0.000	2.484
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Environmental Information Technology Management (EITM) program includes support for the Defense Environment, Safety & Occupational Health Network and Information Exchange (DENIX) defense business system, as well as its database and reporting application, the Knowledge Based Corporate Reporting System (KBCRS). This request for research, development, test, and evaluation (RDTE) is to implement necessary enhancements to facilitate DENIX's Platform-as-a-Service (PaaS) capabilities, with additional modernizations that will improve the DoD's ESOH system of record and reporting tool set. This also includes upgrades to incorporate ongoing cybersecurity, cloud computing, and other information technology requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Environmental Information Technology Modernization	0.250	0.253	0.793
Description: Prototype, develop, and implement platform enhancements as required to meet data management requirements for the Defense Environment, Safety & Occupational Health Network and Information Exchange (DENIX) and its reporting application, the Knowledge Based Corporate Reporting System (KBCRS). ***FY 2022 Plans:*** The DENIX platform will continue to use machine learning algorithms to ?learn? the business processes and rules used by OSD for the environmental data calls (Defense Environmental Programs Annual Report to Congress and the Environmental Management Review). ?Learning? this information will pave the way for the prototyping of a tool that will allow KBCRS to predict anomalies and trends in data input, improving data quality. ***FY 2023 Plans:*** The DENIX platform will continue to use machine learning algorithms to "learn" the business processes and rules used by OSD for the environmental data calls (Defense Environmental Programs Annual Report to Congress and the Environmental Management Review). "Learning" this information will pave the way for the prototyping of a tool that will allow KBCRS to predict anomalies and trends in data input, improving data quality. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 funds needed to increase to modernize the DENIX system in accordance with DEVSECOPS and the DENIX Capabilities Requirements Document dated 24 Sepember 2020.			
Title: FY22 SBIR/STTR Adjustments	-	0.009	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205412A / *Environmental Quality Technology - Operational System Dev*	**Project (Number/Name)** EE6 / *Environmental Information Technology Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** SBIR Title 15 USC ?638(n)(f)(1) $8k STTR Title 15 USC ?638(n)(1)(A) $1K ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	0.250	0.262	0.793

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OMA - 432612000: *Information Mgmt - Automation*	-	-	-	-	-	-	-	-	-		

Remarks

Information Mgmt - Automation 43261200 - This is the associated OMA line that provides daily support for the DoD Environment, Safety & Occupational Health Network Information Exchange and associated applications. EITM is managed as a Defense Business System #3180.

D. Acquisition Strategy

The Deputy Assistant Secretary of the Army for Environment, Safety & Occupational Health is the designated Executive Agent for the Environmental Information Technology Management (EITM) program. Defined by the DoD Directive 4715.1E, the EITM mission is to ensure efficient use of enterprise environment, safety, and occupational health (ESOH) corporate information management processes by providing and sustaining requirement-driven ESOH corporate data management, Congressional-reporting, and public outreach tools to the DoD, and other DoD stakeholders. Funding provided for this program will allow EITM to continue to develop and modernize the platform to meet Army and DoD policy-driven cloud computing and cybersecurity requirements. Prior to funding being committed, DoD ESOH stakeholders and authoritative information technology organizations were consulted to determine necessary system interface upgrades to be incorporated. Expanding DENIX's architecture to create a Level 2 container separate from the current Level 4 container will not only provide a more secure, cybersecurity risk-adverse environment, but it will also optimize performance, capabilities, and mandatory reporting for ESOH stakeholders using a PaaS delivery model. This phased solution begins in FY 2018 by prototyping of system architecture optimization that improves user experience, enabling web conferencing in FY 2019 and applying machine learning concepts to improve data quality in FY 2020-2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205412A / *Environmental Quality Technology - Operational System Dev*	Project (Number/Name) EE6 / *Environmental Information Tech Modernization*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.009	Mar 2022	-		-		-	0.000	0.009	-
		Subtotal	-	-		0.009		-		-		-	0.000	0.009	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System enhancements for required network interfaces to support EITM mission.	C/FFP	Delta Resources : Alexandria, VA	0.706	0.250		0.253		0.793		-		0.793	0.000	2.002	-
Congressinal Add - securing the availability of green, enhanced coatings	TBD	TBD : TBD	10.000	-		-		-		-		-	0.000	10.000	-
		Subtotal	10.706	0.250		0.253		0.793		-		0.793	0.000	12.002	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.706	0.250		0.262		0.793		-		0.793	0.000	12.011	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205412A / *Environmental Quality Technology - Operational System Dev*	**Project (Number/Name)** EE6 / *Environmental Information Tech Modernization*

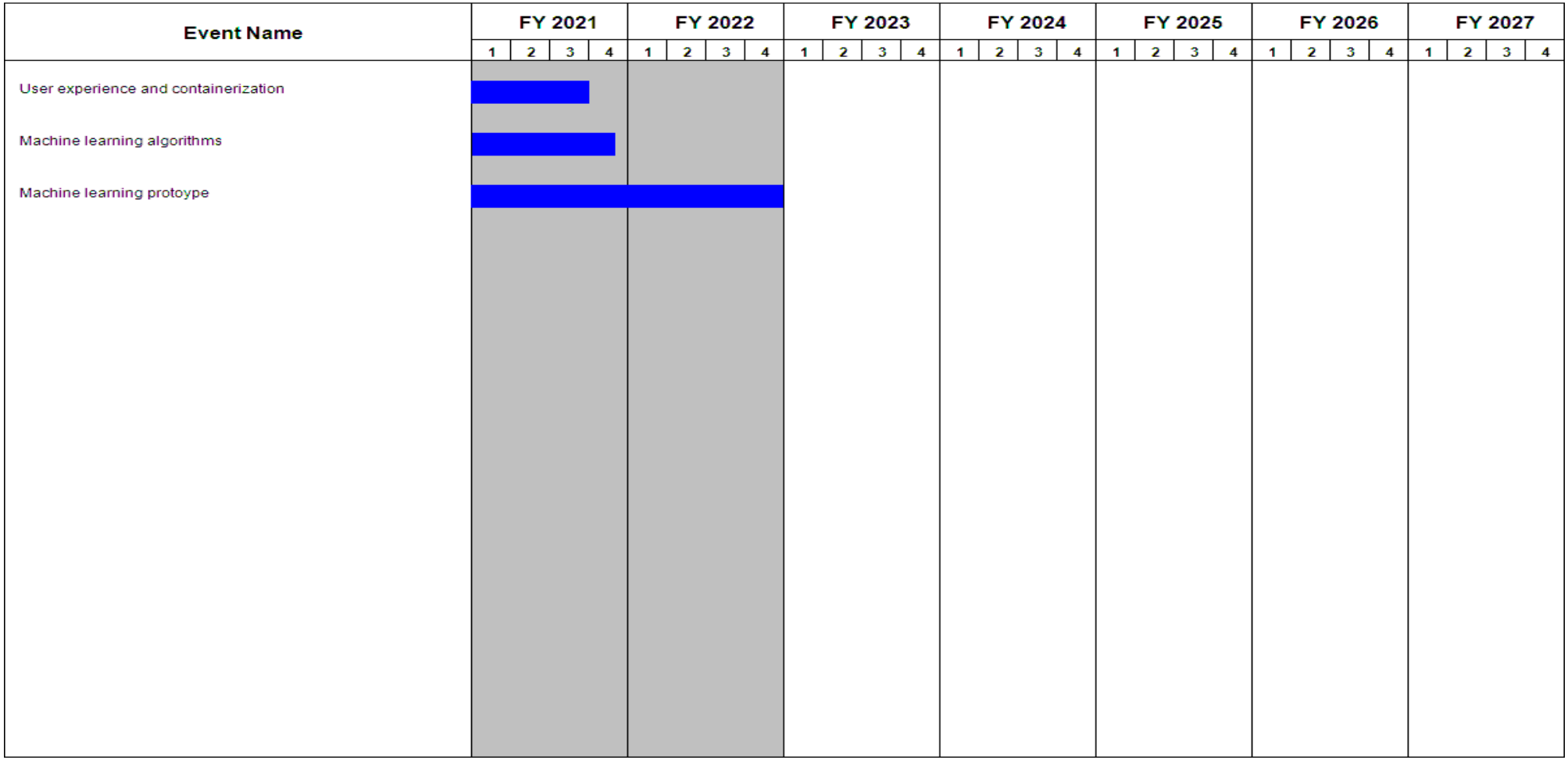


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205412A / *Environmental Quality Technology - Operational System Dev*	**Project (Number/Name)** EE6 / *Environmental Information Tech Modernization*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Split architecture prototype	2	2019	2	2020
User experience and containerization	3	2019	3	2021
Webinars/virtual conferencing prototype and development	1	2020	4	2020
Machine learning algorithms	1	2020	4	2021
Machine learning protoype	4	2020	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	72.817	60.733	20.180	-	20.180	51.759	46.455	46.470	41.466	0.000	339.880
EG2: *GMLRS Alternative Warheads*	-	7.986	24.088	-	-	-	-	-	-	-	0.000	32.074
EG3: *Guided MLRS*	-	64.831	36.645	20.180	-	20.180	51.759	46.455	46.470	41.466	0.000	307.806
Program MDAP/MAIS Code: 260												

A. Mission Description and Budget Item Justification

Guided Multiple-Launch Rocket System (GMLRS) rockets are surface-to-surface artillery rockets fired from the Multiple Launch Rocket System (MLRS) and High Mobility Artillery Rocket System (HIMARS) launchers. GMLRS rockets provide 24/7, all-weather precision fires to engage both area and point targets at short, medium, and long ranges. The GMLRS Program currently consists of multiple variants: GMLRS Unitary utilizes a 200 pound high explosive warhead to engage point targets with limited collateral damage; GMLRS Dual Purpose Improved Conventional Munition (DPICM) cluster munition to engage area or imprecisely located targets and GMLRS Alternative Warhead (AW) which has been developed as a non-cluster munition to engage the same target set as GMLRS DPICM. GMLRS DPICM Production was terminated in response to the June 2008 Department of Defense (DoD) Cluster Munitions Policy. GMLRS Unitary and AW are currently in full rate production.

The 26 October 2016 Deputy Secretary's Management Action Group (DMAG) directed the Army to define and execute an effort for GMLRS modifications that would extend the maximum range (Extended Range (ER) GMLRS) and integrate sensors and seekers into the rocket to engage complex targets with greater precision at greater ranges. These modifications to GMLRS were designated by the Army Acquisition Executive as an engineering change proposal (ECP) and not as a new program. During the FY23-27 POM review, the Army prioritized the development and integration of an Enhanced Alternative Warhead (EAW, formerly described as Enhanced Area Warhead in the PB 2022 R-Forms) over support for the seeker spiral.

The GMLRS program will develop nascent capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains.

The GMLRS program will continue to leverage ongoing Government and Industry research and development efforts to extend range, increase survivability, and enhance lethality. The EG2 funding line is used to support qualification and integration of EAW into a standard range GMLRS rocket. There are no funds in EG2 in FY 2023, the EAW effort continues under EG3. The EG3 funding line enables GMLRS enhancements such as EAW and ER GMLRS modification, statutorily required upgrades such as development of Assured Positioning, Navigation, and Timing (APNT), and aging technology mitigation and upgrades.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	72.817	63.937	0.000	-	0.000
Current President's Budget	72.817	60.733	20.180	-	20.180
Total Adjustments	0.000	-3.204	20.180	-	20.180
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.204			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	20.180	-	20.180

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG2 / *GMLRS Alternative Warheads*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EG2: *GMLRS Alternative Warheads*	-	7.986	24.088	-	-	-	-	-	-	-	0.000	32.074
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army initially funded the development of the Guided Multiple Launch Rocket System (GMLRS) Alternative Warhead (AW) increment under the EG2 - GMLRS Alternative Warheads project code. GMLRS AW entered full rate production in 2015. The 26 October 2016 Deputy Secretary's Management Action Group (DMAG) directed the Army to define and execute an effort for a GMLRS modification that would integrate a seeker into the rocket. During the FY23-27 POM review, the Army prioritized integration of an Enhanced Alternative Warhead (EAW) into a standard range GMLRS rocket over continuation of the seeker spiral.

There are no funds under EG2 for Fiscal Year (FY) 2023.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Enhanced Alternative Warhead ***Description:*** The Enhanced Alternative Warhead effort modifies the AW warhead, proximity sensor, and warhead fuze for increased lethality against light and medium armored targets. ***FY 2022 Plans:*** Build prototype warheads and Side Mounted Proximity Sensor (SMPS). Complete rocket operational flight software and launcher software update/modification. Conduct component level qualification and begin system qualification flight testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** In FY 2023, this effort transitions to the EG3 funding line.	7.986	23.209	-
Title: FY 2022 SBIR/STTR Transfer ***Description:*** FY 2022 Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) ***FY 2022 Plans:*** FY 2022 SBIR / STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in FY 2023 due to SBIR / STTR Transfer in FY 2022	-	0.879	-
Accomplishments/Planned Programs Subtotals	7.986	24.088	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG2 / *GMLRS Alternative Warheads*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C64400: *Guided MLRS Rocket (GMLRS)*	903.009	862.699	785.028	-	785.028	676.163	739.870	741.516	742.436	Continuing	Continuing
• EG3: *Guided MLRS*	64.831	36.645	20.180	-	20.180	51.759	46.455	46.470	41.466	Continuing	Continuing

Remarks

GMLRS missile Army procurement funding (MiPA) includes C65404 and C65406.

D. Acquisition Strategy

GMLRS AW is currently in Full Rate Production. The Enhanced Alternative Warhead will be fully qualified at the system/rocket level; this work continues under the EG3 funding line. Once the munition with the EAW completes Type Classification/Materiel Release, it will replace the current AW rocket in production. All GMLRS variants are procured under C64400.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG2 / *GMLRS Alternative Warheads*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	STORM Project Office : RSA	7.415	2.049		3.237		-		-		-	0.000	12.701	-
FY 2022 SBIR/STTR Transfer	Various	Various : Various	-	-		0.879		-		-		-	0.000	0.879	-
		Subtotal	7.415	2.049		4.116		-		-		-	0.000	13.580	N/A

Remarks

STORM-Strategic and Operational Rockets and Missiles; RSA-Redstone Arsenal

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AWP Contracts (Multiple)	Various	NGDS (Plymouth, MN) LMMFC (Dallas, TX) : Systems Integrator	9.955	-		-		-		-		-	0.000	9.955	-
Other Government Agencies	MIPR	CCDC/AvMC : RSA	5.992	2.361	Jan 2021	2.472	Jan 2022	-		-		-	0.000	10.825	-
Enhanced Alternative Warhead	C/CPFF	Kord : Huntsville, AL	5.688	3.000		17.500	Mar 2022	-		-		-	0.000	26.188	-
		Subtotal	21.635	5.361		19.972		-		-		-	0.000	46.968	N/A

Remarks

AWP-Alternative Warhead Program; Various-Competitive/Firm Fixed Price/Sole Source/Cost Plus Fixed Fee; CCDC-Combat Capabilities Development Command; AvMC-Aviation and Missile Center; RSA-Redstone Arsenal; NGDS-Northrop Grumman Defense Systems; MN-Minnesota; LMMFC-Lockheed Martin Missile and Fire Control; TX-Texas; AL-Alabama

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG2 / *GMLRS Alternative Warheads*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support for Seeker	MIPR	WSMR, : NM	14.363	-		-		-		-		-	0.000	14.363	-
Test Support for EAW	MIPR	WSMR, RTC, AVMC : NM, Redstone Arsenal	0.500	0.576		-		-		-		-	0.000	1.076	-
		Subtotal	14.863	0.576		-		-		-		-	0.000	15.439	N/A

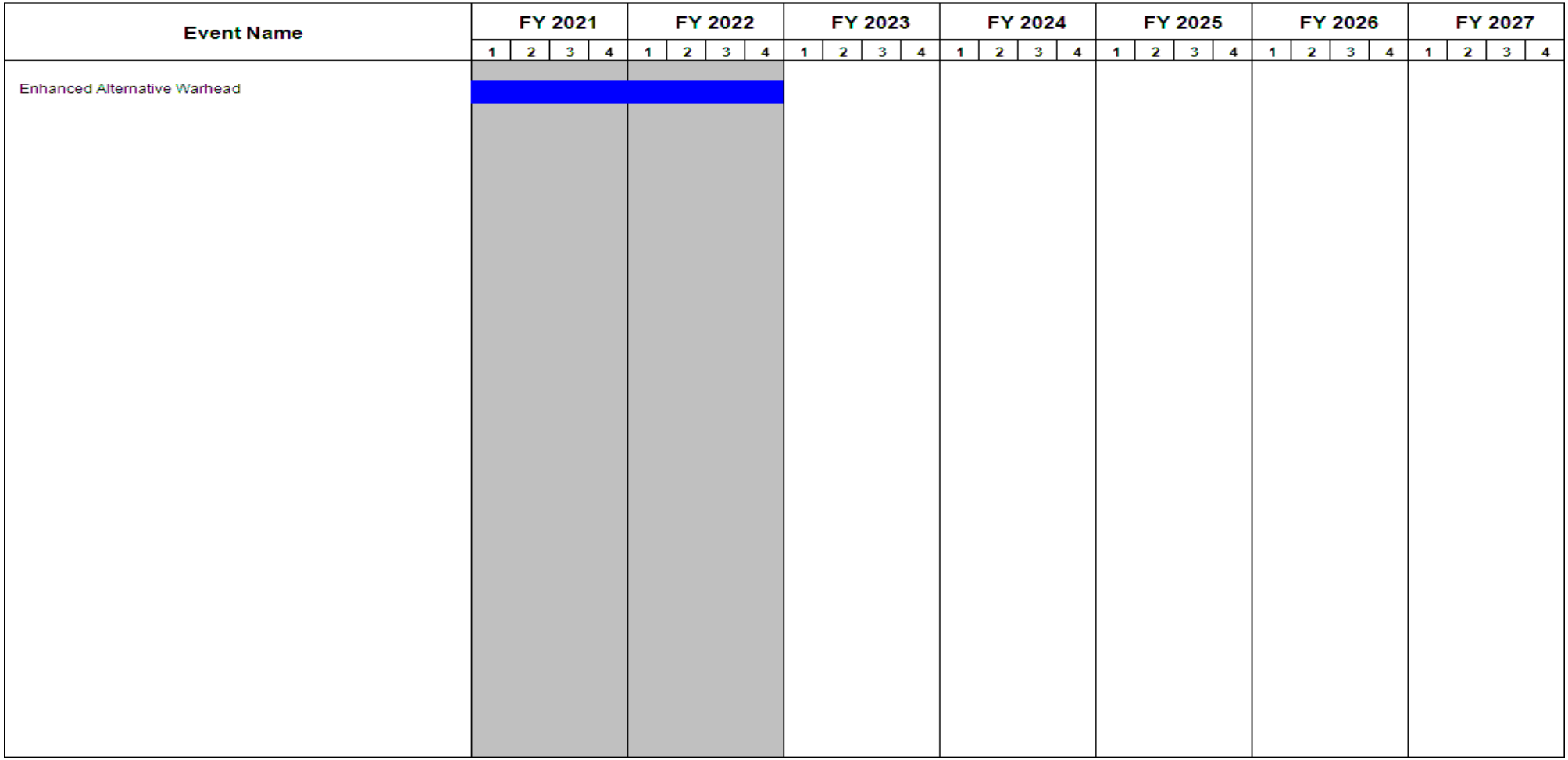
Remarks

WSMR-White Sands Missile Range; NM-New Mexico
RTC- Redstone Test Center; Redstone Arsenal, AL
AVMC- Aviation and Missiles Center; Redstone Arsenal, AL
Cost for Prior Years Test Support is for efforts prior to Seeker Test Support

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	43.913	7.986		24.088		-		-		-	0.000	75.987	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG2 / *GMLRS Alternative Warheads*



Note

Note: Enhanced Alternative Warhead efforts continue beyond FY22. Detailed schedules for Enhanced Alternative Warhead are shown under the schedule for EG3.

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG2 / *GMLRS Alternative Warheads*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Enhanced Alternative Warhead	2	2020	4	2022

Note

Enhanced Alternative Warhead efforts continue beyond FY22. Detailed schedules for EAW are shown under the schedule for EG3.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG3 / *Guided MLRS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EG3: *Guided MLRS*	-	64.831	36.645	20.180	-	20.180	51.759	46.455	46.470	41.466	0.000	307.806
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army continues to explore ways to enhance Guided Multiple Launch Rocket System (GMLRS) rockets and common components and to mitigate aging technology issues under Project EG3 Guided MLRS. The Army is requesting funding for the following GMLRS Research, Development, Test and Evaluation (RDT&E) activities: (1) evaluation of enhanced operational capabilities to provide more flexibility across the target set to include increased range, flight performance, and end-game optimization; (2) investigation of potential life cycle cost savings through mitigation of aging technology and second source qualification; (3) Preplanned Product Improvement (P3I); (4) evaluation and development of technologies to enhance overall product performance and survivability to include Assured Positioning, Navigation and Timing (APNT); and (5) system test and evaluation.

The Fiscal Year (FY) 2023 dollars in the amount of $19.473 million will continue to investigate and develop Objective Additional Performance Attribute (APA) options including Extended Range GMLRS, APNT solutions, and continue qualification of key rocket upgrades.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: GMLRS enhancements	7.331	8.164	11.987
Description: Develop and assess methods to improve rocket effectiveness. Continue to assess payload, motor, and guidance/ control options to meet Objective Additional Performance Attributes (APAs). ***FY 2022 Plans:*** Testing to support development and qualification of the EAW onto the standard range GMLRS rocket. Testing activities include ground tests to assess warhead effectiveness and Engineering Development flight testing. ***FY 2023 Plans:*** FY 2023 funds system level test activities of the Enhanced Alternative Warhead (EAW) into a standard range GMLRS rocket. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funds increase to support Ground and Flight Tests in support of system level qualification.			
Title: GMLRS cost savings initiatives and obsolescence mitigation	-	2.665	-
Description: Address issues related to aging technology, study cost reduction initiatives and opportunities for second source supplier efficiencies, and increase system survivability. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Conduct trade studies and perform cost benefit analyses on material changes to ER GMLRS components that are Cost Reduction Initiative (CRI) candidates. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funds in FY 2023 will decrease due to prioritization towards completion of Extended Range GMLRS and system level testing for EAW.			
Title: GMLRS Assured Position Navigation and Timing (APNT) ***Description:*** Address issues related to maintaining accuracy in a contested environment, improving accuracy over longer ranges, and compliance with statutory GPS requirements. ***FY 2022 Plans:*** APNT development continues in FY 2022, and includes Systems Engineering level activities, development of firmware, test equipment development, prototype builds, and prequalification testing of the receiver prototype builds. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding from FY 2022 to FY 2023 is due to prioritization of funds towards testing activities for EAW and ER GMLRS and a decrease in requirements for APNT.	0.243	14.480	-
Title: Extended Range (ER) GMLRS and complementary rocket pod development ***Description:*** Complete rocket pod development and conduct system level ground and flight tests. ***FY 2022 Plans:*** Conduct ER GMLRS Flight Testing, perform post-flight performance analysis, target damage assessments. ***FY 2023 Plans:*** System qualification flight testing for ER GMLRS ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding supports ERG test activities.	1.416	1.564	5.649
Title: Extended Range (ER) GMLRS development ***Description:*** Qualification and integration of ER GMLRS. ***FY 2022 Plans:***	55.841	8.434	2.544

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
OEM challenges and delays due to component hardware availability and qualification have extended the overall ER GMLRS development and qualification. FY22 plans include flight and launcher software development and associated cyber assessment and development of logistics products including technical publications and training devices. ***FY 2023 Plans:*** Continue launcher software integration associated with ERG. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Closeout of this effort is anticipated in FY 2023.			
Title: FY 2022 SBIR / STTR Transfer ***Description:*** FY 2022 Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) ***FY 2022 Plans:*** FY 2022 SBIR / STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in FY 2023 due to SBIR / STTR Transfer in FY 2022	-	1.338	-
Accomplishments/Planned Programs Subtotals	64.831	36.645	20.180

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• C64400: *Guided MLRS Rocket (GMLRS)*	903.009	862.699	785.028	-	785.028	676.163	739.870	741.516	742.436	Continuing	Continuing
• EG2: *GMLRS Alternative Warheads*	7.986	24.088	0.000	-	0.000	-	-	-	-	0.000	32.074

Remarks

GMLRS Procurement funding includes C65404 and C65406.

D. Acquisition Strategy

Project EG3 Guided MLRS supports, investigates, and develops alternative material changes to improve the GMLRS family of munitions as they are identified by the material developer or combat developer. This project also supports APNT activities to improve the overall system performance in a contested environment, and mitigates performance shortfalls or supply chain limitations. The ER GMLRS effort is pursuing a strategy of modifying the current GMLRS system through the Engineering Change Proposal (ECP) process in order to increase its range. The Enhanced Alternative Warhead effort that has been previously funded under EG2 shall be completed under

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

EG3. Where possible the improvements and modifications are incrementally integrated into the current GMLRS and ER GMLRS systems through the Engineering Change Proposal (ECP) process.

Development, integration, and testing of GMLRS systems 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG3 / *Guided MLRS*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : RSA	16.369	2.679	Jan 2021	0.280	Jan 2022	2.318	Jan 2023	-		2.318	Continuing	Continuing	Continuing
FY 2022 SBIR / STTR Transfer	Various	Various : Various	-	-		1.338		-		-		-	0.000	1.338	-
		Subtotal	16.369	2.679		1.618		2.318		-		2.318	Continuing	Continuing	N/A

Remarks

MIPR-Military Interdepartmental Purchase Request; RSA-Redstone Arsenal, Alabama; TBD-To Be Determined
Note that in FY 2023, EG3 funds all Government Program Management activities. In prior years, this was a shared cost between EG2 and EG3. Total cost for this activity in FY 2023 decreases as compared to FY 2022.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Unitary Contracts/Multiple	SS/FPIF	LMMFC : Dallas, TX	60.370	5.980	Jan 2021	3.595	Jan 2022	-		-		-	Continuing	Continuing	Continuing
IM Development & Qualification Contracts/ Multiple	C/FPIF	Orbital ATK, Aerojet Rocketdyne : Rocket Center, WV; Bristow, VA	36.380	-		-		-		-		-	0.000	36.380	-
GMLRS Extended Range	SS/FFP	LMMFC : Dallas, TX	146.696	48.261	May 2021	2.172		-		-		-	Continuing	Continuing	Continuing
APNT Development	C/CPFF	Kord : Huntsville, AL	13.980	-		10.164	Jan 2022	-		-		-	Continuing	Continuing	Continuing
Alternative Extended Range Motor	TBD	AMS : TBD	19.972	-		-		-		-		-	0.000	19.972	-
Enhanced Alternative Warhead	C/FPIF	Kord : Huntsville, AL	24.964	-		-		1.700	Jul 2023	-		1.700	Continuing	Continuing	Continuing
Other Government Agencies	MIPR	Various : Various	13.712	6.473		10.395	Dec 2021	2.252	Dec 2022	-		2.252	0.000	32.832	-
		Subtotal	316.074	60.714		26.326		3.952		-		3.952	Continuing	Continuing	N/A

Remarks

SS/FPIF-Sole Source/Fixed-Price Incentive Firm; LMMFC - Lockheed Martin Missile and Fire Control; TX - Texas; C/CPFF- Competitive/Cost Plus Fixed Fee; C/FPIF - Competitive/Fixed-Price Incentive Firm; WV - West Virginia; VA - Virginia; TBD - To Be Determined

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	Project (Number/Name) EG3 / *Guided MLRS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OGA costs in FY 2022 include ~$6.19M in support of ER GMLRS and $4.2M in support of APNT OGA costs in FY 2023 include ~$2.25M in support of ER GMLRS															

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	Various : Various	44.265	1.363	Jan 2021	8.701	Jan 2022	5.000	Jan 2023	-		5.000	Continuing	Continuing	Continuing
Enhanced Alternative Warhead	MIPR	Various : Various	-	0.075		-		8.910		-		8.910	0.000	8.985	-
		Subtotal	44.265	1.438		8.701		13.910		-		13.910	Continuing	Continuing	N/A

Remarks

Performing Activities include White Sands Missile Range (WSMR), Aviation and Missile Center (AvMC), Army Research Laboratory (ARL), and Redstone Test Center (RTC).

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	376.708	64.831		36.645		20.180		-		20.180	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

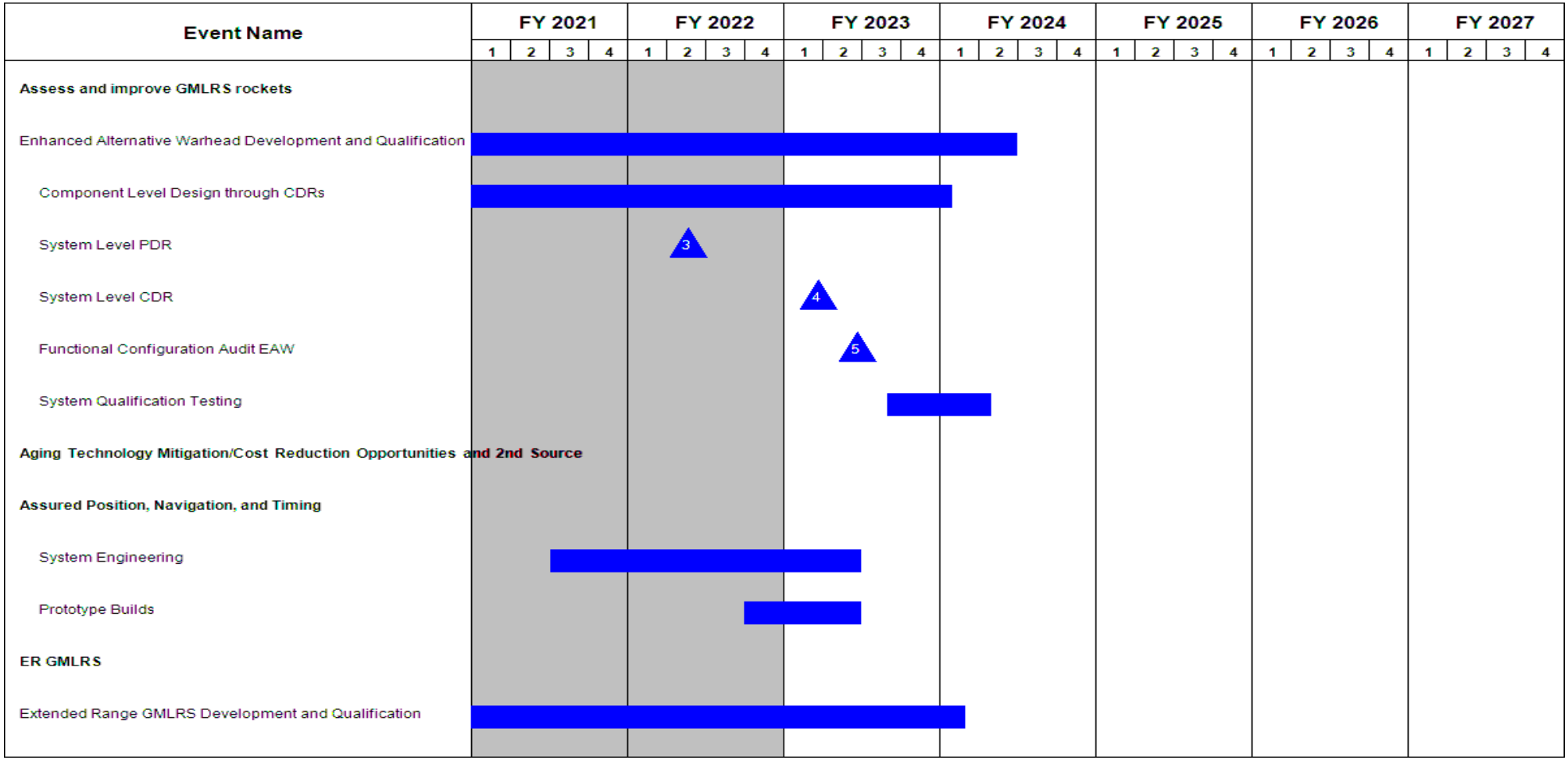


Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

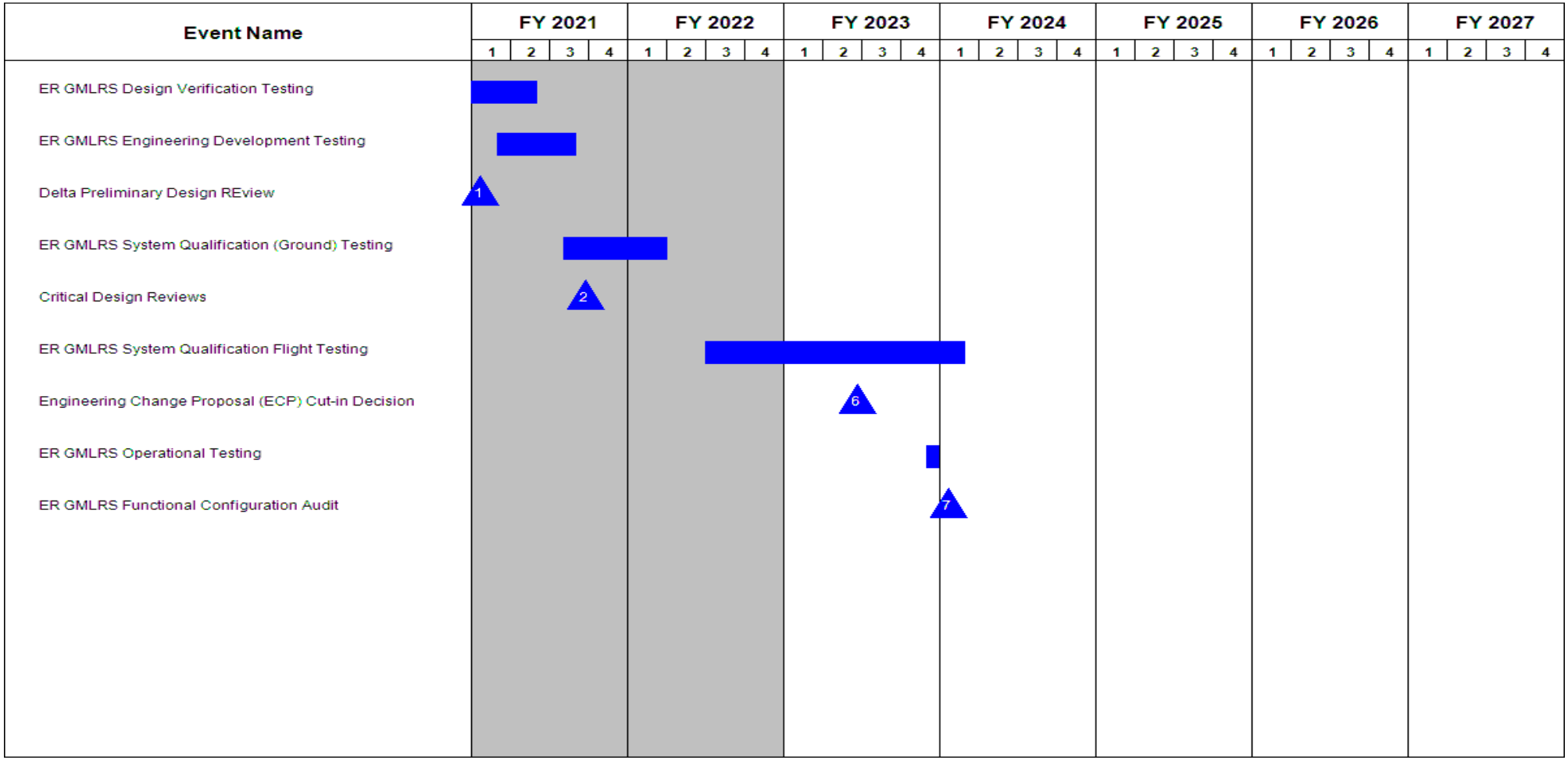


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Assess and improve GMLRS rockets	1	2015	4	2027
Enhanced Alternative Warhead Development and Qualification	2	2020	2	2024
Component Level Design through CDRs	2	2020	1	2024
System Level PDR	2	2022	2	2022
System Level CDR	1	2023	1	2023
Functional Configuration Audit EAW	2	2023	2	2023
System Qualification Testing	3	2023	2	2024
Aging Technology Mitigation/Cost Reduction Opportunities and 2nd Source	1	2015	4	2027
Second Source ER GMLRS Motor	4	2020	4	2020
Assured Position, Navigation, and Timing	3	2021	4	2026
System Engineering	3	2021	2	2023
Prototype Builds	4	2022	2	2023
ER GMLRS	2	2018	1	2024
Extended Range GMLRS Development and Qualification	2	2018	1	2024
Preliminary Design Review	3	2019	3	2019
ER GMLRS Design Verification Testing	3	2020	2	2021
ER GMLRS Engineering Development Testing	1	2021	3	2021
Delta Preliminary Design REview	1	2021	1	2021
ER GMLRS System Qualification (Ground) Testing	3	2021	1	2022
Critical Design Reviews	3	2021	3	2021
ER GMLRS System Qualification Flight Testing	3	2022	1	2024
Engineering Change Proposal (ECP) Cut-in Decision	2	2023	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0205778A / *Guided Multiple-Launch Rocket System (GMLRS)*	**Project (Number/Name)** EG3 / *Guided MLRS*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ER GMLRS Operational Testing	4	2023	4	2023
ER GMLRS Functional Configuration Audit	1	2024	1	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0208053A *I Joint Tactical Ground System*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.510	13.379	8.813	-	8.813	15.074	7.266	7.268	7.343	0.000	68.653
635: *Joint Tact Grd Station-P3I*	-	9.510	13.379	8.813	-	8.813	15.074	7.266	7.268	7.343	0.000	68.653

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, Acquisition Category (ACAT) III program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (United States Pacific Command (PACOM), United States Central Command (CENTCOM), United States European Command (EUCOM)), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is used as an institutional trainer, but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor-to-shooter connectivity. On 14 January 2016, the Army Acquisition Executive designated the JTAGS Pre-Planned Product Improvement (JTAGS P3I) program as a separate ACAT III modification program.

The JTAGS Program Element (PE) supports development and testing of the JTAGS Block II Preplanned Product Improvements (P3I) program based on the JTAGS Operational Requirements Document (ORD), additive Joint Requirements Oversight Council - Memorandum (JROC-M) requirements, and the formal JTAGS Block II Capability Development Document (CDD) thresholds. P3I upgraded JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and improved warning tactical parameters and timeliness. The JTAGS Block II P3I program based on the 2009 JTAGS ORD is on contract as a two phase development effort. JTAGS Block II P3I Phase 1 is complete. The final developmental efforts of JTAGS Block II P3I Phase 2 to achieve 2009 ORD requirements will be complete in FY2021 with Follow-on Test and Evaluation (FOTE) and Materiel Release efforts to be conducted in FY2022. JTAGS Block II Phase 2 fielding is planned for FY 2023. The JTAGS Block II CDD addresses evolving User-driven needs such as emerging threats and interface efforts that were not known at the time the JTAGS ORD was validated. Developmental efforts to achieve JTAGS Block II CDD threshold requirements and implementation of M-Code GPS (IAW PL 111-383) continue through FY28.

Fiscal Year 2023 (FY23) requested funding of $8.508 million allows for the continued development of cyber compliance, defense against emerging threats, system materiel release, Assured Positioning, Navigation and Timing (A-PNT) and M-code GPS compliance, addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and NextGen Polar Geosynchronous satellite interface efforts.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0208053A *I Joint Tactical Ground System*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	9.510	13.379	0.000	-	0.000
Current President's Budget	9.510	13.379	8.813	-	8.813
Total Adjustments	0.000	0.000	8.813	-	8.813
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	8.813	-	8.813

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0208053A / *Joint Tactical Ground Syst em*	Project (Number/Name) 635 / *Joint Tact Grd Station-P3I*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
635: *Joint Tact Grd Station-P3I*	-	9.510	13.379	8.813	-	8.813	15.074	7.266	7.268	7.343	0.000	68.653
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, Acquisition Category (ACAT) III program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades.

JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). Four OCONUS deployed JTAGS units, which are deployed in three theaters (United States Pacific Command (PACOM), United States Central Command (CENTCOM), United States European Command (EUCOM)), constitute DoD's only in-theater system providing space-based missile warning. The fifth CONUS system is used as an institutional trainer, but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor-to-shooter connectivity. On 14 January 2016, the Army Acquisition Executive designated the JTAGS Pre-Planned Product Improvement (JTAGS P3I) program as a separate ACAT III modification program.

The JTAGS Program Element (PE) supports development and testing of the JTAGS Block II Preplanned Product Improvements (P3I) program based on the JTAGS Operational Requirements Document (ORD), additive Joint Requirements Oversight Council - Memorandum (JROC-M) requirements, and the formal JTAGS Block II Capability Development Document (CDD) thresholds. P3I upgraded JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and improved warning tactical parameters and timeliness. The JTAGS Block II P3I program based on the 2009 JTAGS ORD is on contract as a two phase development effort. JTAGS Block II P3I Phase 1 is complete. The final developmental efforts of JTAGS Block II P3I Phase 2 to achieve 2009 ORD requirements will be complete in FY2021 with Follow-on Test and Evaluation (FOTE) and Materiel Release efforts to be conducted in FY2022. JTAGS Block II Phase 2 fielding is planned for FY 2023. The JTAGS Block II CDD addresses evolving User-driven needs such as emerging threats and interface efforts that were not known at the time the JTAGS ORD was validated. Developmental efforts to achieve JTAGS Block II CDD threshold requirements and implementation of M-Code GPS (IAW PL 111-383) continue through FY28.

Fiscal Year 2023 (FY23) requested funding of $8.508 million allows for the continued development of cyber compliance, defense against emerging threats, system materiel release, Assured Positioning, Navigation and Timing (A-PNT) and M-code GPS compliance, addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and NextGen Polar Geosynchronous satellite interface efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: JTAGS P3I Block II Phase 2	6.785	0.861	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0208053A / *Joint Tactical Ground System*	**Project (Number/Name)** 635 / *Joint Tact Grd Station-P3I*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: JTAGS Block II P3I Phase 2 activities seek to develop and test capabilities identified in the 2009 JTAGS Operational Requirements Document (ORD). Joint Requirements Oversight Council (JROC) Memos 197-12, 113-13, and 042-19 and PL 111-383 (Ike Skelton National Defense Authorization Act for Fiscal Year 2011) support the requirement to develop and field JTAGS Block II capabilities as soon as possible. ***FY 2022 Plans:*** Funding required for efforts includes work on materiel release package for JTAGS Block II P3I system full materiel release ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 decrease from FY2022 results from completing the ORD efforts for capability needs that have been developed.			
Title: Development and Test of Block II CDD requirements ***Description:*** JTAGS Block II program continues to focus on development/integration of evolving cyber hardening advances, defense against emerging threats, M-code GPS, and JTAGS Capability Development Document (CDD) threshold requirements. JROC-Memos 197-12, 113-13, and 042-19 and PL 111-383 (Ike Skelton National Defense Authorization Act for Fiscal Year 2011) require fielding of these capabilities as soon as possible. ***FY 2022 Plans:*** Funding required for efforts including continued development of cyber security tools to be achieve compliance with cyber requirements; continues development of new capabilities detailed in the JTAGS Block II Capability Development Document (CDD) defense against emerging threats, system materiel release, Assure Positioning Navigation and Timing (A-PNT) and M-code GPS compliance; addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades; and addresses NextGen Polar Geosynchronous satellite interface efforts. ***FY 2023 Plans:*** Funding required continues to support the development efforts detailed in the JTAGS Block II CDD of A-PNT and M-Code GPS compliance and continues to address obsolescence mitigation and COTS hardware and software upgrades. The funding supports continued efforts to complete requirements in the Block II CDD. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 decrease from FY2022 is a result of completion of the JTAGS Block II Phase II Spiral 2 effort.	-	9.148	6.122
Title: JTAGS Test and Evaluation Support ***Description:*** Test and evaluation support for the JTAGS program. ***FY 2022 Plans:***	2.725	3.370	2.691

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0208053A / *Joint Tactical Ground System*	**Project (Number/Name)** 635 / *Joint Tact Grd Station-P3I*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Conducts test planning/support for interoperability, cyber compliance confirmation, and new capabilities for the JTAGS Block II program as detailed in the JTAGS Block II Capability Development Document (CDD). Conducts a Follow-on Operational Test and Evaluation (FOTE) for JTAGS Block II P3I. ***FY 2023 Plans:*** Funding provides for A-PNT Cooperative Vulnerability & Penetration Assessment (CVPA) and Technical Manual Delta Validation and Verification Certification and of the JTAGS Block II system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 decrease from FY2022 is a result of completion of the JTAGS Block II Phase II Spiral 2 effort.			
Accomplishments/Planned Programs Subtotals	9.510	13.379	8.813

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BZ8420: *JOINT TACTICAL GROUND STATION MODS (JTAGS)*	-	8.088	0.349	-	0.349	0.591	-	-	-	0.000	9.028

Remarks

D. Acquisition Strategy

This program element develops critical software intensive improvements, while continuing to make maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components and Government Furnished Equipment (GFE). After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. The JTAGS Block II Pre-planned Product Improvement (P3I) program was initiated based on a 2009 JTAGS Operational Requirements Document (ORD) and upgrades JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. The JTAGS Block II P3I contract was a full and open competition, but only the incumbent JTAGS contractor submitted a proposal, resulting in a sole-source contract on 26 Aug 2012. The contract's development options are Cost Plus Incentive Fee; its production options are Firm Fixed Price, and its Sustainment options are Cost Plus Fixed Fee. The JTAGS Block II contract's period of performance is from 1 October 2012 through 30 September 2021 with a contract extension to March 2022. As threats continue to evolve and change as well as new satellite sensors become available, the JTAGS Users in conjunction with the Army Capabilities Manager have developed a JTAGS Block II Capability Development Document (CDD), requiring JTAGS to address new/changing threats that were not addressed in the 2009 JTAGS ORD. The acquisition of the continued JTAGS Block II efforts based on the JTAGS Block II CDD will be performed under a sole source follow-on contract to be awarded 2QFY22 to the current JTAGS contractor.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0208053A / *Joint Tactical Ground System*	Project (Number/Name) 635 / *Joint Tact Grd Station-P3I*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Allot	Various (AMC, AMCOM, CCDC) : Redstone Arsenal, AL	-	1.184	Oct 2020	1.143	Oct 2021	1.166	Oct 2022	-		1.166	0.000	3.493	Continuing
		Subtotal	-	1.184		1.143		1.166		-		1.166	0.000	3.493	N/A

Remarks

Provides Other Government Agency (OGA) support to the JTAGS acquisition program

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTAGS P3I Block II Phase 2 Development	SS/CPIF	Northrop-Grumman : Colorado Springs, Co	-	4.401	Oct 2020	-		-		-		-	0.000	4.401	34.100
Development and Test Block II CDD requirements	SS/ Various	Northrop-Grumman : Colorado Springs, Co	-	-		7.407	Mar 2022	4.028	Nov 2022	-		4.028	0.000	11.435	Continuing
System Engineering Support	C/CPFF	COLSA : Huntsville, AL	-	0.450	Nov 2020	0.558	Jan 2022	0.569	Jan 2023	-		0.569	0.000	1.577	Continuing
		Subtotal	-	4.851		7.965		4.597		-		4.597	0.000	17.413	N/A

Remarks

Continues development of the JTAGS Block II capabilities based on the JTAGS Block II Capability Development Document (CDD)

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Techinal Assistance	C/CPFF	COLSA : Huntsville, AL	-	0.750	Nov 2020	0.739	Jan 2022	0.754	Jan 2023	-		0.754	0.000	2.243	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0208053A / *Joint Tactical Ground System*	Project (Number/Name) 635 / *Joint Tact Grd Station-P3I*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.750		0.739		0.754		-		0.754	0.000	2.243	N/A

Remarks

Provides technical assistance in implementing the JTAGS Block II CDD

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTAGS Test Support (ATEC/AIC/JITC)	Allot	Various (ATEC, AIC, JITC) : Various locations	-	2.725	Oct 2020	3.532	Oct 2021	2.296	Oct 2022	-		2.296	0.000	8.553	Continuing
		Subtotal	-	2.725		3.532		2.296		-		2.296	0.000	8.553	N/A

Remarks

Conducts a JTAGS Block II Follow-on Test and Evaluation (FOTE) and supports testing of JTAGS Block II development efforts based on the JTAGS Block II CDD.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.510		13.379		8.813		-		8.813	0.000	31.702	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0208053A / *Joint Tactical Ground System*	**Project (Number/Name)** 635 / *Joint Tact Grd Station-P3I*

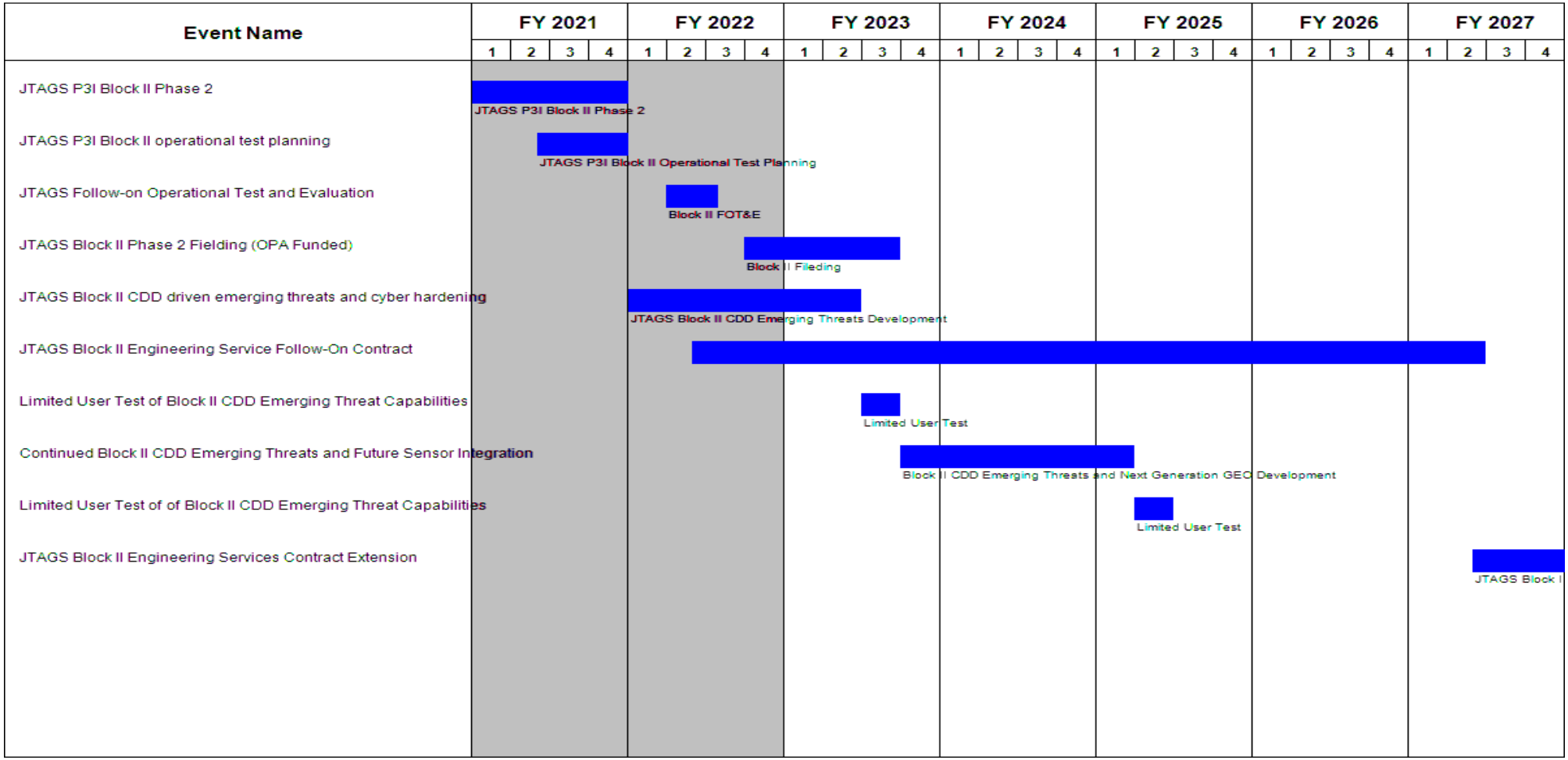


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0208053A / *Joint Tactical Ground System*	**Project (Number/Name)** 635 / *Joint Tact Grd Station-P3I*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JTAGS P3I Block II Phase 2	1	2021	4	2021
JTAGS P3I Block II operational test planning	2	2021	4	2021
JTAGS Follow-on Operational Test and Evaluation	2	2022	3	2022
JTAGS Block II Phase 2 Fielding (OPA Funded)	4	2022	3	2023
JTAGS Block II CDD driven emerging threats and cyber hardening	1	2022	2	2023
JTAGS Block II Engineering Service Follow-On Contract	2	2022	2	2027
Limited User Test of Block II CDD Emerging Threat Capabilities	3	2023	3	2023
Continued Block II CDD Emerging Threats and Future Sensor Integration	4	2023	1	2025
Limited User Test of of Block II CDD Emerging Threat Capabilities	2	2025	2	2025
JTAGS Block II Engineering Services Contract Extension	2	2027	4	2028

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	23.367	24.531	-	-	-	0.000	0.000	0.000	0.000	0.000	47.898
FG2: *Counterintelligence & Human Intel Modernization*	-	-	0.692	-	-	-	-	-	-	-	0.000	0.692
H13: *Information Dominance Center (IDC) - Tiara*	-	23.367	23.839	-	-	-	-	-	-	-	0.000	47.206

A. Mission Description and Budget Item Justification

Funding supports the U.S. Army Intelligence and Security Command's (INSCOM) RDTE program, which provides the Army with low-density, high-demand, extremely advanced offensive cyberspace technologies designed to degrade, deny, disrupt, or destroy adversary Command, Control, Communications, Computers and Intelligence (C4I) and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of offensive Cyberspace technologies in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, National Security Presidential Directive (NSPD)-38, NSPD-54 and Homeland Security Presidential Directive (HSPD)-23.

HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	23.367	24.531	0.000	-	0.000
Current President's Budget	23.367	24.531	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / *Security and Intelligence Activities*	Project (Number/Name) FG2 / *Counterintelligence & Human Intel Modernization*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FG2: *Counterintelligence & Human Intel Modernization*	-	-	0.692	-	-	-	-	-	-	-	0.000	0.692
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel.

Funding supports personnel security-related capabilities for identifying, reporting and responding to potential personnel security information of concern. These tools are key enablers of the Army Insider Threat Program. These tools provide statistical models to assess risk, centralized analysis, reporting and response capabilities, and reporting mechanisms for relevant insider threat data.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Insider Threat CE Support	-	0.667	-
Description: HQDA G-2 and the Intelligence and Security Command (INSCOM) Security Operations Center (ISOC) are charged with integrating, informing, and leveraging security and counterintelligence authorities in support of the Department of the Army Insider Threat Program mission to continuously deter, detect, and mitigate insider threats to Army information, networks, facilities, and personnel. ***FY 2022 Plans:*** Continue personnel security-related capabilities for identifying, reporting and responding to potential personnel security information of concern. These tools are key enablers of the Army Insider Threat Program. These tools provide statistical models to assess risk, centralized analysis, reporting and response capabilities, and reporting mechanisms for relevant insider threat data. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to funding moving to sustainment			
Title: FY22 SBIR/STTR Transfer	-	0.025	-
FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** FG2 / *Counterintelligence & Human Intel Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638.			
Accomplishments/Planned Programs Subtotals	-	0.692	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / *Security and Intelligence Activities*	Project (Number/Name) FG2 / *Counterintelligence & Human Intel Modernization*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	Various	To Be Determined : To Be Determined	0.799	-		-		-		-		-	0.000	0.799	0.799
Insider Threat CE Support	TBD	To Be Determined : To Be Determined	3.467	-		0.667		-		-		-	0.000	4.134	4.167
Identity Intelligence	TBD	To Be Determined : To Be Determined	0.467	-		-		-		-		-	0.000	0.467	0.467
Counterintelligence Activities	TBD	To Be Determined : To Be Determined	1.825	-		-		-		-		-	0.000	1.825	1.825
FY22 SBIR/STTR Transfer	TBD	VARIOUS : VARIOUS	-	-		0.025		-		-		-	0.000	0.025	-
		Subtotal	6.558	-		0.692		-		-		-	0.000	7.250	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.558	-		0.692		-		-		-	0.000	7.250	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** FG2 / *Counterintelligence & Human Intel Modernization*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Classified																	[redacted]											

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Classified																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** FG2 / *Counterintelligence & Human Intel Modernization*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Classified	1	2018	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / *Security and Intelligence Activities*	Project (Number/Name) H13 / *Information Dominance Center (IDC) - Tiara*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
H13: *Information Dominance Center (IDC) - Tiara*	-	23.367	23.839	-	-	-	-	-	-	-	0.000	47.206
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) designed to collect, process, exploit and, when directed, degrade, deny, disrupt, destroy, or manipulate adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power.

INSCOM conducts RDTE of multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) in direct support of the full range of missions called for in the National Defense Strategy, Comprehensive National Cyber-Security Initiative, National Security Strategy, National Defense Guidance, NSPD-38, NSPD-54 and HSPD-23.

The Fiscal Year (FY) 2022 Direct War/Enduring Operations dollars in the amount of $23.839 million are for activities in support of Combatant Command Operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Offensive Cyberspace Operations Capability Development	23.367	23.839	-
Description: Title: Multi-Domain Intelligence Collection and Cyberspace Operations Capability Development Description: INSCOM's RDTE program provides the Army with low-density, high-demand, extremely advanced multi-domain intelligence collection and cyberspace technologies (SIGINT, EW, Cyberspace) designed to collect, process, exploit, and when directed, degrade, deny, disrupt, or destroy adversary C4I and shape the operational warfighting environment in order to create conditions favorable to the application of other elements of national power. ***FY 2022 Plans:*** CDD Offensive Cyberspace Tools/Platform Capabilities and G2 ISOC Army Security Response Tool (ARST). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** RH01/375128H13 is Direct War / Enduring Costs funding; Army does not project Direct War / Enduring Costs funding beyond the next budget year (FY 2022), since the appropriation is year-to-year.			
Accomplishments/Planned Programs Subtotals	23.367	23.839	-

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** H13 / *Information Dominance Center (IDC) - Tiara*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303028A / *Security and Intelligence Activities*	Project (Number/Name) H13 / *Information Dominance Center (IDC) - Tiara*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobile Objects/ PHAEDRUS	C/Various	Multiple : Multiple	4.100	-		-		-		-		-	0.000	4.100	-
		Subtotal	4.100	-		-		-		-		-	0.000	4.100	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDI + Cyberspace Operations Capability Development	Various	TBD : TBD	167.548	23.367		23.839		-		-		-	Continuing	Continuing	Continuing
		Subtotal	167.548	23.367		23.839		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	171.648	23.367		23.839		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** H13 / *Information Dominance Center (IDC) - Tiara*

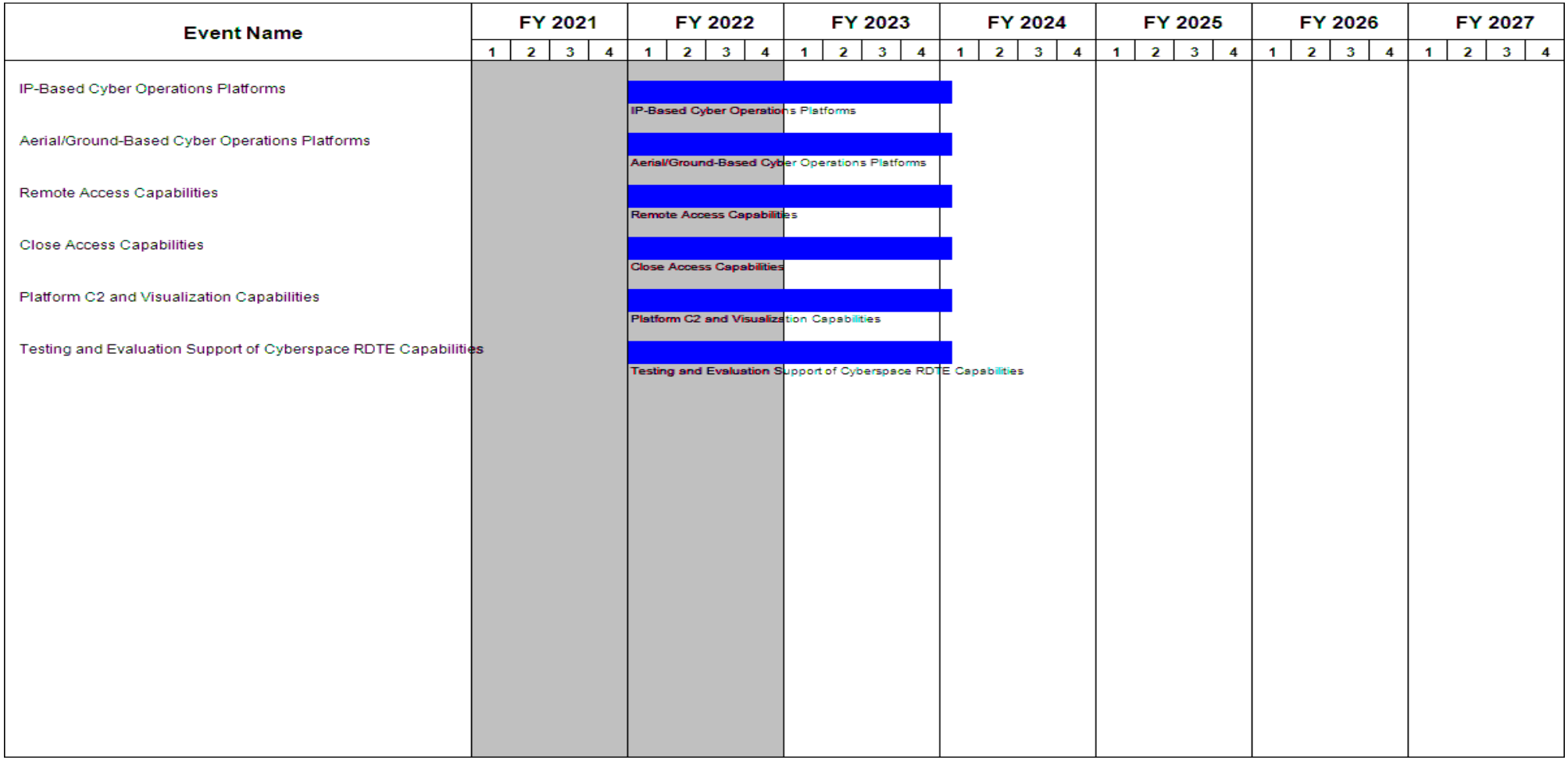


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303028A / *Security and Intelligence Activities*	**Project (Number/Name)** H13 / *Information Dominance Center (IDC) - Tiara*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IP-Based Cyber Operations Platforms	1	2022	1	2024
Aerial/Ground-Based Cyber Operations Platforms	1	2022	1	2024
Remote Access Capabilities	1	2022	1	2024
Close Access Capabilities	1	2022	1	2024
Platform C2 and Visualization Capabilities	1	2022	1	2024
Testing and Evaluation Support of Cyberspace RDTE Capabilities	1	2022	1	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	28.270	15.680	17.209	-	17.209	16.675	18.140	18.146	18.323	Continuing	Continuing
491: *Information Assurance Development*	-	8.009	6.937	7.816	-	7.816	7.184	8.202	8.205	8.285	Continuing	Continuing
DV4: *Key Management Infrastructure (KMI)*	-	12.457	0.987	1.023	-	1.023	1.027	1.435	1.436	1.450	Continuing	Continuing
DV5: *Crypto Modernization (Crypto Mod)*	-	7.804	7.756	8.370	-	8.370	8.464	8.503	8.505	8.588	Continuing	Continuing

A. Mission Description and Budget Item Justification

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of the Communications Security (COMSEC) Key Management Infrastructure (KMI) program.

Project 491: Army CIO/G6 manages Project 491

Project 491: Information Assurance (IA) Development supports the implementation of the National Security Agency (NSA) developed Communications Security (COMSEC) Modernization and Key Management (KM) technologies within the Army. This including current and next generation encryption techniques, current and future Key Management Infrastructure (KMI) and technology migrations. This program provides oversight in developing policies, guidance, standard operating procedures and recommendations in integrating COMSEC and KM techniques into specific systems in support of securing the Army Tactical and Enterprise Networks. This entails architecture studies, system integration and testing, developing installation kits, and technological collaborations with NSA, DISA and other Services for enterprise and last mile implementations. The program assesses, develops and integrates Cyber Security (CS)/COMSEC tools (hardware and software) which provide protection for fixed infrastructure post, camp and station networks as well as tactical networks. The cited work is consistent with Strategic Planning Guidance (SPG) and the Army Modernization and Strategy Plan (AMSP).

IA Development funding implements and establishes functional and technical boundaries of cryptographic, key management and IA capabilities in coordination with the NSA, the DISA, and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concept technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future material solutions that could underperform and disrupt classified operations. Develop and publish the COMSEC Implementation Planning Guidance to identify, standardize, and govern the insertion of CS capabilities to bridge operational gaps and support the DoD and NSA mandated requirements to enhance network capacity while providing for secure information exchange of voice, video, and data in accordance with the Army Network Campaign Plan. This will be accomplished by interoperability evaluation, standards testing, and CS, System of System Network Vulnerability Assessments (SoS NVA) for Army Capability Sets for CS/COMSEC capabilities that provide protections for tactical and fixed infrastructure post, camp, and station networks.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303140A *I Information Systems Security Program*

Project 491 FY 2022 Justification: This funding enables the continuation of oversight for the executions of the Army's COMSEC Modernization initiatives including major Advanced Cryptographic Capabilities (ACC) updates and replacements of existing devices and systems to meet NSA mandates. Continue to support the evaluation and testing of new technologies to support DoD Cryptographic Moderation 2 (CM2) Army implementations including Transmission Security (TRANSEC), EKMS to KMI migration and tactical networks/architecture future Capability Set developments. Support efforts to provide updated end-to-end, tactical-to-strategic COMSEC standardization and implementation guidance to meet Army's operational requirements. Continuous funding will enable the evaluations and maturity assessment of new COMSEC and key management capabilities developed by DoD joint KMI program for Army fielding to protect and strengthen the Army Network posture, with reduced cryptographic interoperability issues for both embedded and standalone systems. This funding also supports the risk reduction testing to document operational value of commercial products prior to insertion for Army use. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Also supports efforts to update and develop policies to posture Army's operations to implement innovative cryptographic and key management tools and services. Perform System of System Network Vulnerability Assessments (SoS NVA) to provide protections for the Army Integrated Tactical Networks.

Project 491 FY 2023 Justification: The program enables the continuation of oversight for the executions of the Army's COMSEC Modernization initiatives including major Advanced Cryptographic Capabilities (ACC) updates and replacements of existing devices and systems to meet NSA mandates. Continue to support the evaluation and testing of new technologies to support DoD Cryptographic Moderation 2 (CM2) Army implementations including Transmission Security (TRANSEC), EKMS to KMI migration and tactical network/architecture future Capability Set developments. Provide proof of concepts to provide updated end-to-end, tactical-to-strategic COMSEC standardization and implementation guidance to meet Army's operational requirements. Continuous funding will enable the evaluations and maturity assessment of new COMSEC and key management capabilities developed by DoD joint KMI program for Army fielding to protect and strengthen the Army Network posture, with reduced cryptographic interoperability issues for both embedded and standalone systems. This funding also supports the risk reduction testing to document operational value of commercial products prior to insertion for Army use. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Also supports efforts to update and develop policies to posture Army's operations to implement innovative cryptographic and key management tools and services.

The Defensive Cyberspace Operations (DCO) program provides initial capabilities that enable passive and active cyberspace defense operations to preserve friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. Big Data Pilot provides an advanced analytics capability capable of ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and proves situational awareness of cyberspace battlefield. It provides the computer network defense provider with common analytic platform which informs and reduces risk associated with future material solutions and forms a blueprint for future Big Data Analytics. Big Data (analysis-of-all DoD Information Network sensor data) provides two optimized and accredited clusters deployed in support of JRSS and Defense Research and Engineering Network (DREN) with a tools suite accessible to Cyber Mission Forces via secure remote access. The Army's DCO activities are a construct of active cyberspace defenses which provide synchronized, real-time capability to discover, detect, analyze, and mitigate threats to and vulnerability of DoD networks and systems.

Project DV4 & DV5: COMSEC is governed by the Chairman of the Joint Chiefs of Staff Instruction (CJCSA) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army communications systems are required to support modern cryptographic capabilities by implementing

modern algorithms. These efforts are consistent with Strategic Planning Guidance (SPG). These funding lines are key enablers of the Army Modernization Priorities in support of LOE 1, Unified Network.

Project DV4: The Army Key Management Infrastructure (AKMI) is the Army's implementation of the National Security Agency (NSA) KMI ACAT IAM program, automating the functions of COMSEC electronic key management, control, planning, and distribution. AKMI supports the Army's ability to communicate and distribute Cryptographic data on the Army's tactical and strategic networks by limiting adversarial access to and reducing the vulnerability of, Army Command, Control, Communications, Computers, Cyber, Intelligence (C5I) systems. AKMI devices receive, store, manage, and transfer electronic key through the network to be loaded into communication devices such as radios and satellites to secure the network. Without this technology Warfighters are required to manually receive their cryptographic products by traveling to COMSEC account locations (which may not be co-located) and manually fill their devices.

Project DV4 FY 2023 Justification: This funding line supports COMSEC technologies within the Army, specifically, Reprogrammable Single Chip Universal Encryptor (RESCUE) to create a secure, reprogrammable cryptographic engine in providing Cryptographic Modernized Capabilities including future Over the Network Keying (OTNK) to Fill Devices and End Cryptographic Units (ECU)s. The RESCUE is a potential solution for meeting the cryptographic requirements for the NGLD-M which is available as an option for integration by NGLD-M hardware developers. As of FY2022 NGLD-M development will transfer from PE 0303140A, Project DV4 to PE 0605144A, Project BY6 funding line. PE 0605144A, Project BY6 was established to clearly identify requirements for NGLD-M development and is not considered a new start effort.

Project DV5: Crypto Modernization (Crypto Mod) performs test, evaluation, development, and configuration management for cryptographic devices that receive key through fill devices and allow for secure communication through Army devices such as radios and satellite terminals. This program utilizes National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army providing encryption, trusted software, or standard operating procedures, and integrating these mechanisms into specified systems in support of securing the Army Tactical and Enterprise Networks. The effort supports network operations from end-to-end throughout the force thus mitigating networked vulnerabilities to Army information security systems. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army communications systems are required to be upgraded to modern algorithms to meet emerging threat developed by our adversaries. Crypto Modernization necessitates the utilization of the latest NSA cryptographic capabilities in order to defeat adversarial efforts to decrypt, disrupt, or exploit US Army networks. COMSEC is the Army's implementation of NSA protections to create a unified network that is protected, resilient, and survivable.

Project DV5 FY 2023 Justification: The program continues testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures. The program will test and evaluate Crypto Systems compliant devices, Suite B IPSec devices built on commercial standards, Cryptographic High Value Product (CHVP), Commercial Solutions for Classified (CSfC) Guidance, and new software releases to High Assurance Internet Protocol Encryptor (HAIPE) 4.X devices in accordance with AR 770-03 dated 16 July 2021. The program tests interoperability and provides ways to insert Data At Rest (DAR) and Data In Transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	28.270	15.720	0.000	-	0.000
Current President's Budget	28.270	15.680	17.209	-	17.209
Total Adjustments	0.000	-0.040	17.209	-	17.209
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	17.209	-	17.209
• FFRDC Transfer	-	-0.040	-	-	-

Change Summary Explanation

Fiscal Year 2023 (FY23) funding increase reflects the fact that the FY22 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) 491 / *Information Assurance Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
491: *Information Assurance Development*	-	8.009	6.937	7.816	-	7.816	7.184	8.202	8.205	8.285	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 491: Information Assurance (IA) Development supports the implementation of National Security Agency (NSA) developed Communications Security (COMSEC) technologies within the Army enterprise and tactical networks by ensuring COMSEC devices/systems are cryptographically interoperable and standard based. This entails architecture studies, technology assessments, secured devices testing, system integration and installation kits development to provide protections for fixed infrastructure post, camps and station networks as well as tactical networks. The cited work is consistent with Army's Mission Command Implementation Plan LOE 1, Network Enable Functions.

IA Development funding Implements, establishes functional and technical boundaries of cryptographic, key management and IA capabilities In Coordination With (ICW) the NSA, the Defense Information Systems Agency (DISA), and Joint Services, to secure National Security Systems (NSS), and National Security Information (NSI). Technical evaluations assess the security, operational effectiveness and network interoperability of advanced concepts/technologies to develop policies, standards, and fundamental building blocks for Army COMSEC capabilities that reduce the risk of future materiel solutions that could underperform and disrupt classified operations.

Develop and publish COMSEC and key management implementation planning guidance to identify, standardize, and govern the insertion of IA capabilities that will bridge operational gaps and support the DoD and NSA mandated requirements to enhance network capacity while providing secure information exchange of voice, video, and data IAW the Army Network Campaign Plan. This will be accomplished by interoperability test and evaluation, standards development, technology roadmap development and System of System Network Vulnerability Assessments (SoS NVA) to provide protections for the Army Integrated Tactical Networks.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Oversight and implementation guidance of emerging Cryptographic and CS capabilities to ensure interoperability to maintain compliance with DoD, NSA, and Army policies and regulations. (CIO/G6)	8.009	6.937	7.816
Description: The program provides oversight and guidance for technical research and evaluation of Cryptographic Modernization (CM) and Key Management (KM) capabilities to ensure IA compliance and interoperability. This effort improves operational effectiveness, ensures efficient implementation, and enhances network performance by deploying standardized COMSEC capabilities that are interoperable and supportable in Army, coalition and Joint operating environments. This program enables the Army to collaborate and participate in Joint and Army capability and technology evaluations efforts to define, improve, develop and publish Cyber Security (CS) standards for new/modernized technology insertion to support the Army future networks and key management enterprise. This effort assesses and defines risk mitigation of CS network vulnerabilities in end-to-end Army network operations and Common Operating Environment. (CIO/G6)			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** 491 / *Information Assurance Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Will continue to provide oversight for the executions of the Army's COMSEC Modernization initiatives including major ACC updates and replacements of existing devices and systems. Continue to evaluate and test new technologies for Army implementation in support of Cryptographic Modernization 2 (CM2) Transmission Security (TRANSEC) ICD, EKMS Tier 1 to KMI migration, Army last mile advanced key distribution concept development and ITN security architecture implementation. Continue to provide updated end-to-end, tactical-to-strategic COMSEC standardization and implementation guidance to meet Army?s operational requirements. Continue to assess new key management technologies developed by DoD joint KMI program to determine the maturity for Army fielding to protect and strengthen the Army Network posture. Continue to work with DoD CIO, NSA, DISA and other Services to resolve cryptographic interoperability issues for both embedded and standalone systems and performed risk reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps and requirements for protecting National Security Systems and National Security Information. Continue to update and develop policies to posture Army?s operations to implement innovative cryptographic and key management tools and services. Participated in DoD and Army working groups to develop plans for CM2 implementation. Perform System of System Network Vulnerability Assessments (SoS NVA) to provide protections for the Army Integrated Tactical Networks.			
FY 2023 Plans: Will continue to provide oversight for the executions of the Army's COMSEC Modernization initiatives including major ACC updates and replacements of existing devices and systems. Continue to evaluate and test new technologies for Army implementation in support of Cryptographic Modernization 2 (CM2) Transmission Security (TRANSEC) ICD, EKMS Tier 1 to KMI migration, Army last mile advanced key distribution concept development and ITN security architecture implementation. Continue to provide updated end-to-end, tactical-to-strategic COMSEC standardization and implementation guidance to meet Army?s operational requirements. Continue to assess new key management technologies developed by DoD joint KMI program to determine the maturity for Army fielding to protect and strengthen the Army Network posture. Continue to work with DoD CIO, NSA, DISA and other Services to resolve cryptographic interoperability issues for both embedded and standalone systems and performed risk reduction testing of commercial products prior to insertion into Army for use to increase operational availability with documented operational value and rapid integration. Provide timely test and evaluate results to enable the Army to make sound investment strategic decisions and to reduce or eliminate duplications. Participate in operational assessment of NSA, DoD, Joint Staff and Service led Joint Capability Technology Demonstrations to align new technologies to documented Army and Service capability gaps and requirements for protecting National Security Systems and National Security Information. Continue to			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** 491 / *Information Assurance Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
update and develop policies to posture Army?s operations to implement innovative cryptographic and key management tools and services. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase to assess new security standards benchmarks to align with the DoD ACC mandates and to report Army's compliance and frequency of modernization initiative to reduce risk and duplications			
Accomplishments/Planned Programs Subtotals	8.009	6.937	7.816

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• DV5: *Crypto Modernization (Crypto Mod)*	7.804	7.756	8.370	-	8.370	8.464	8.503	8.505	8.588	Continuing	Continuing
• B96002: *CRYPTOGRAPHIC SYSTEMS (CRYPTO SYS)*	81.156	47.990	50.151	-	50.151	51.403	56.832	57.000	56.975	0.000	401.507
• BS9716: *NON PEO-SPARES*	3.896	3.596	4.014	-	4.014	3.743	4.063	4.073	4.072	0.000	27.457

Remarks

D. Acquisition Strategy

The objective of the Cryptographic Systems program is to provide adaptive, flexible, and programmable cryptographic solutions using best practices, lessons learned and programmatic management to meet the challenge of modernizing the Army's aging cryptographic systems. Associated documents include CDD, approved by CIO/G6, 15 Jul 2010; ICD, approved by JROC, 25 Mar 2011; AAO; approved by G3, 15 Dec 2011 and revised and approved, 19 Jun 2015.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) 491 / *Information Assurance Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering (PL Net E)	SS/LH	CECOM RDEC : CECOM RDEC APG, MD	81.783	-		-		-		-		-	0.000	81.783	-
Big Data Pilot (PL ES-CYBER)	TBD	TBD : FT BELVOIR, VA	9.725	-		-		-		-		-	0.000	9.725	-
Information Assurance System Engineering Support (PL Net E)	C/FFP	DSCI Consulting : APG, MD	7.106	-		-		-		-		-	0.000	7.106	-
Engineering Support (PL Net E)	C/CPFF	CACI : APG, MD	5.018	-		-		-		-		-	0.000	5.018	-
Engineering Support (PL Net E)	C/CPFF	Booz Allen Hamilton : APG, MD	3.408	-		-		-		-		-	0.000	3.408	-
Engineering Support (PL Net E)	C/FP	CSC : APG, MD	16.448	-		-		-		-		-	0.000	16.448	-
		Subtotal	123.488	-		-		-		-		-	0.000	123.488	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support (PL Net E)	C/CPFF	TBD : TBD	1.598	-		-		-		-		-	0.000	1.598	-
Engineering Support (CIO/G-6)	C/FP	CACI : APG, MD	19.320	3.400	Oct 2020	5.020	Oct 2021	3.600	Oct 2022	-		3.600	0.000	31.340	-
System Engineering (CIO/G-6)	SS/LH	AFC C5ISR : APG, MD	10.597	2.189	Oct 2020	1.473	Oct 2021	2.345	Oct 2022	-		2.345	0.000	16.604	-
Engineering Support (CIO/G-6)	C/CPFF	booz Allen Hamiton : APG, MD	10.765	1.350	Oct 2020	-		1.480	Oct 2022	-		1.480	0.000	13.595	-
Engineering Support (CIO/G-6)	C/FFP	AASKI : Edgewood, MD	6.472	0.500		-		-		-		-	0.000	6.972	-
Service (CIO-G-6)	SS/LH	ARL/SLAD : White Sand Missile Range (WSMR)	7.460	0.570	Oct 2020	0.444	Oct 2021	0.391	Oct 2022	-		0.391	0.000	8.865	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** 491 / *Information Assurance Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	56.212	8.009		6.937		7.816		-		7.816	0.000	78.974	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	179.700	8.009		6.937		7.816		-		7.816	0.000	202.462	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** 491 / *Information Assurance Development*

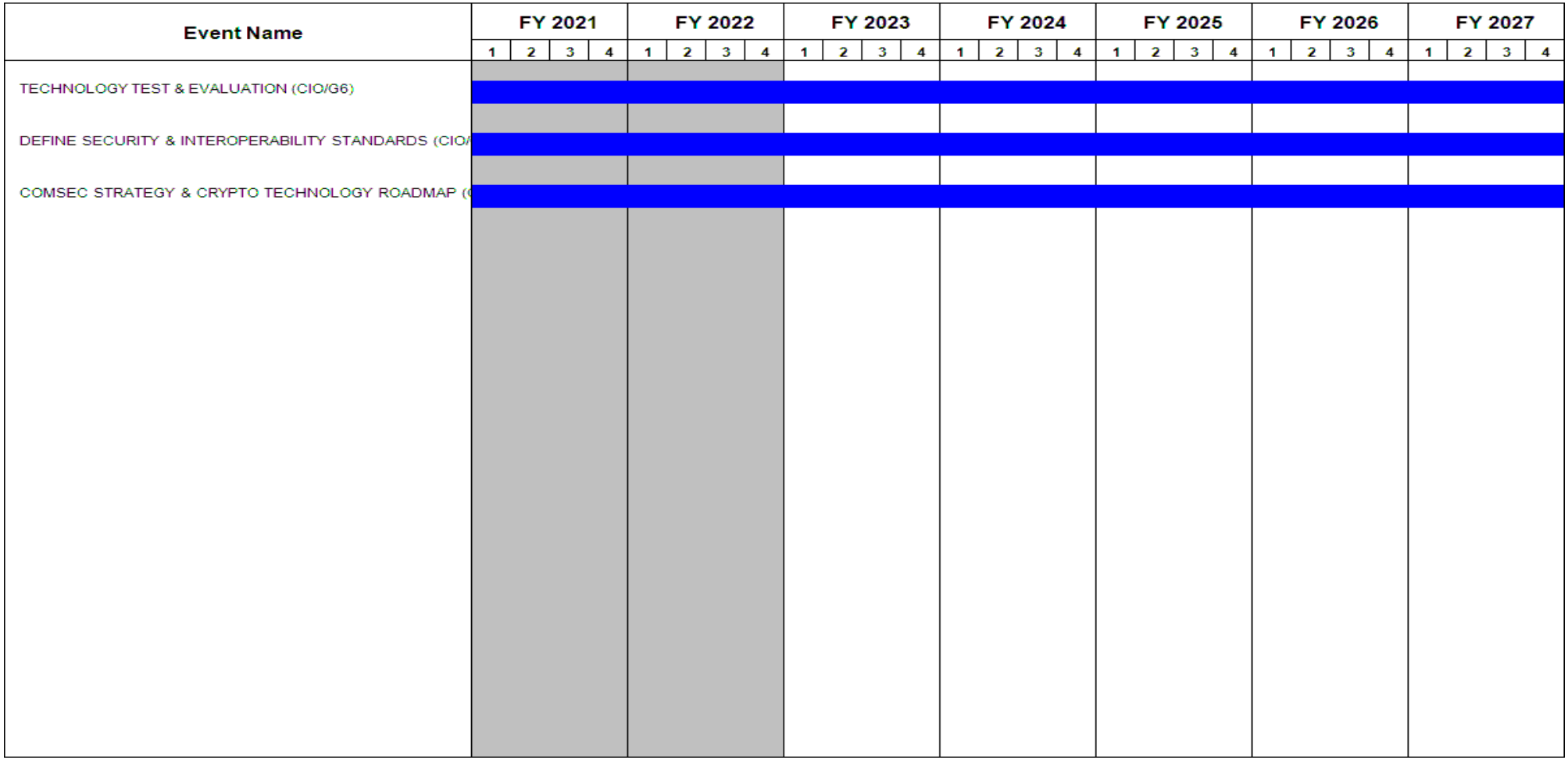


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** 491 / *Information Assurance Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TEST & EVALUATION OF CRYPTOGRAPHIC SYSTEMS (PL Net E)	1	2014	4	2014
STUDY OF CURRENT AND EMERGING CRYPTO ALGORITHMS AND TECHNOLOGIES (PL Net E)	1	2015	2	2015
TEST OF INE AND WIRELESS SOLUTION (PL Net E)	1	2016	4	2018
BIG DATA PILOT (PD ES-CYBER)	1	2016	4	2016
TECHNOLOGY TEST & EVALUATION (CIO/G6)	1	2017	4	2027
DEFINE SECURITY & INTEROPERABILITY STANDARDS (CIO/G6)	1	2017	4	2027
COMSEC STRATEGY & CRYPTO TECHNOLOGY ROADMAP (CIO/G6)	1	2014	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV4 / *Key Management Infrastructure (KMI)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
DV4: *Key Management Infrastructure (KMI)*	-	12.457	0.987	1.023	-	1.023	1.027	1.435	1.436	1.450	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of LOE 1, Unified Network.

Communications Security (COMSEC) is governed by the Chairman of the Joint Chiefs of Staff Instruction (CJCSA) 6510. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army communications systems are required to support modern cryptographic capabilities by implementing modern algorithms.

As part of the Army's Key Management Infrastructure (KMI) implementation, the Next Generation Load Device - Medium (NGLD-M) is an Acquisition Category III (ACAT III) Program of Record (POR). The NGLD-M requires RDT&E investment to develop and test the hardware and software solutions to meet the operational requirements outlined in the NGLD Capability Production Document (CPD) to modernize fill devices with capability to transfer and receive cryptographic key over a network to reduce causalities and maintain mission OPTEMPO. Without this technology Warfighters are required to manually receive their cryptographic products by traveling to COMSEC account locations (which may not be co-located) and manually filling their devices.

The Reprogrammable Single Chip Universal Encryptor (RESCUE) is a government owned reprogrammable cryptographic chip that incorporates KMI functionality and modern algorithms to encrypt and decrypt messages for the embedding.

NGLD-M development was realigned to 0605144A/BY6 funding line starting FY2022.

FY 2023 funds will support COMSEC technologies within the Army, specifically, Reprogrammable Single Chip Universal Encryptor (RESCUE) to create a secure, reprogrammable cryptographic engine in providing Cryptographic Modernized Capabilities including future Over the Network Keying (OTNK) to Fill Devices and End Cryptographic Units (ECU)s.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Reprogrammable Cryptographic Chip Development and Evaluation	1.087	0.987	1.023
Description: The Reprogrammable Single Chip Universal Encryptor (RESCUE) is a reprogrammable cryptographic chip that incorporates KMI functionality and modern algorithms to encrypt and decrypt messages for the embedding device. The RESCUE is built upon a modular architecture to enable tailoring of the chip to meet the specific requirements of the embedding device.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV4 / *Key Management Infrastructure (KMI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
This effort creates a government owned potential universal cryptographic chip enabling the Army to decrease costs for encryption devices. ***FY 2022 Plans:*** The RESCUE effort will consist of maintaining lab equipment, embedment planning to utilize the RESCUE chip with new capabilities, requirements analysis, tracking part's obsolescence, and software/firmware baseline development. ***FY 2023 Plans:*** The RESCUE effort will consist of maintaining lab equipment, embedment planning to utilize the RESCUE chip with new capabilities, requirements analysis, tracking part's obsolescence, and software/firmware baseline development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase is due to inflation.			
Title: NGLD Medium Development and NSA Certification ***Description:*** The Next Generation Load Device - Medium (NGLD-M) will conduct the Army's key fill mission by issuing, filling, and managing Cryptographic keys to both legacy and future KMI aware End-Cryptographic Units (ECUs). This technology requires RDT&E investment to meet the requirements outlined in the NGLD Capability Production Document (CPD). NGLD-M development was realigned to 0605144A/BY6 funding line starting FY2022.	11.259	-	-
Title: Program Management Support ***Description:*** PMO costs will be covered by OMA funding. This funds a matrixed Acquisition Program Manager (APM) from Combat Capabilities Development Command (CCDC) Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center to manage the NGLD-M development effort.	0.111	-	-
Accomplishments/Planned Programs Subtotals	12.457	0.987	1.023

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• B96004: *KEY MANAGEMENT INFRASTRUCTURE*	78.244	78.283	75.541	-	75.541	87.744	93.561	93.835	93.794	0.000	601.002
• OMA - 153140: *ISSP (TSEC-AKMS)*	-	-	-	-	-	-	-	-	-		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV4 / *Key Management Infrastructure (KMI)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

Line Item & Title:
B96004: Key Management Infrastructure (OPA2)
153140: ISSP (TSEC-AKMS) (OMA)

D. Acquisition Strategy

Army Key Management Infrastructure (AKMI) acquisition strategy consists of Army, Air Force, and NSA Programs of Record (POR). AKMI is the Army's implementation of the National Security Agency (NSA) Key Management Infrastructure (KMI) ACAT IAM Program of Record. The AKMI will allow the Army to manage, control, plan, and distribute electronic key for the ~1.5 million End Cryptographic Units (ECU)s necessary to communicate and distribute data on the Army's tactical and strategic networks such as radios, secure phones, and satellite terminals.

The AKMI Program includes the Simple Key Loader (SKL) and Automated Communications Engineering Software (ACES) workstation contracts managed by the Army, Tactical Key Loader (TKL) contract by the US Air Force, and the Management Clients (MGC) nodes by NSA.

The AKMI program funded development of a KMI compliant cryptographic engine, the government owned Reprogrammable Single Chip Universal Encryptor (RESCUE) that can be utilized by NGLD-M or other COMSEC devices.

The NGLD-M underwent full-and-open competition for development, production, and sustainment and awarded contracts on 10 August 2021. The Milestone Decision Authority issued a Materiel Development Decision (MDD) Acquisition Decision Memorandum (ADM) on 14 March 2019 that designated the NGLD-M as an ACAT III Program of Record (PoR) and authorized execution of FY2019-FY2021 RDT&E funds for acquisition planning and risk mitigation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV4 / *Key Management Infrastructure (KMI)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 NDAA SEC 825 MDAP Cost Overrun	SS/CR	APG, MD : APG, MD	0.044	-		-		-		-		-	0.000	0.044	-
		Subtotal	0.044	-		-		-		-		-	0.000	0.044	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KMI Awareness (RESCUE Development and NSA Certification	C/CPFF	Dynamics Research Corporation/Engility : APG, MD	15.445	1.087	Jul 2021	0.987	Jul 2022	1.023	Jul 2022	-		1.023	Continuing	Continuing	Continuing
KMI Awareness	C/CPFF	CCDC C5ISR, S&TCD : APG, MD	1.451	-		-		-		-		-	0.000	1.451	-
NGLD Development	C/CPFF	CCDC C5ISR S&TCD; NAVWARSYSCOM; GDMS; SNC : APG, MD; San Diego, CA; Dedham, MA; Sparks, NV	11.828	11.259	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	28.724	12.346		0.987		1.023		-		1.023	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	CCDC C5ISR S&TCD : APG, MD	0.109	0.111	Nov 2020	-		-		-		-	0.000	0.220	-
		Subtotal	0.109	0.111		-		-		-		-	0.000	0.220	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV4 / *Key Management Infrastructure (KMI)*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.877	12.457		0.987		1.023		-		1.023	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV4 / *Key Management Infrastructure (KMI)*

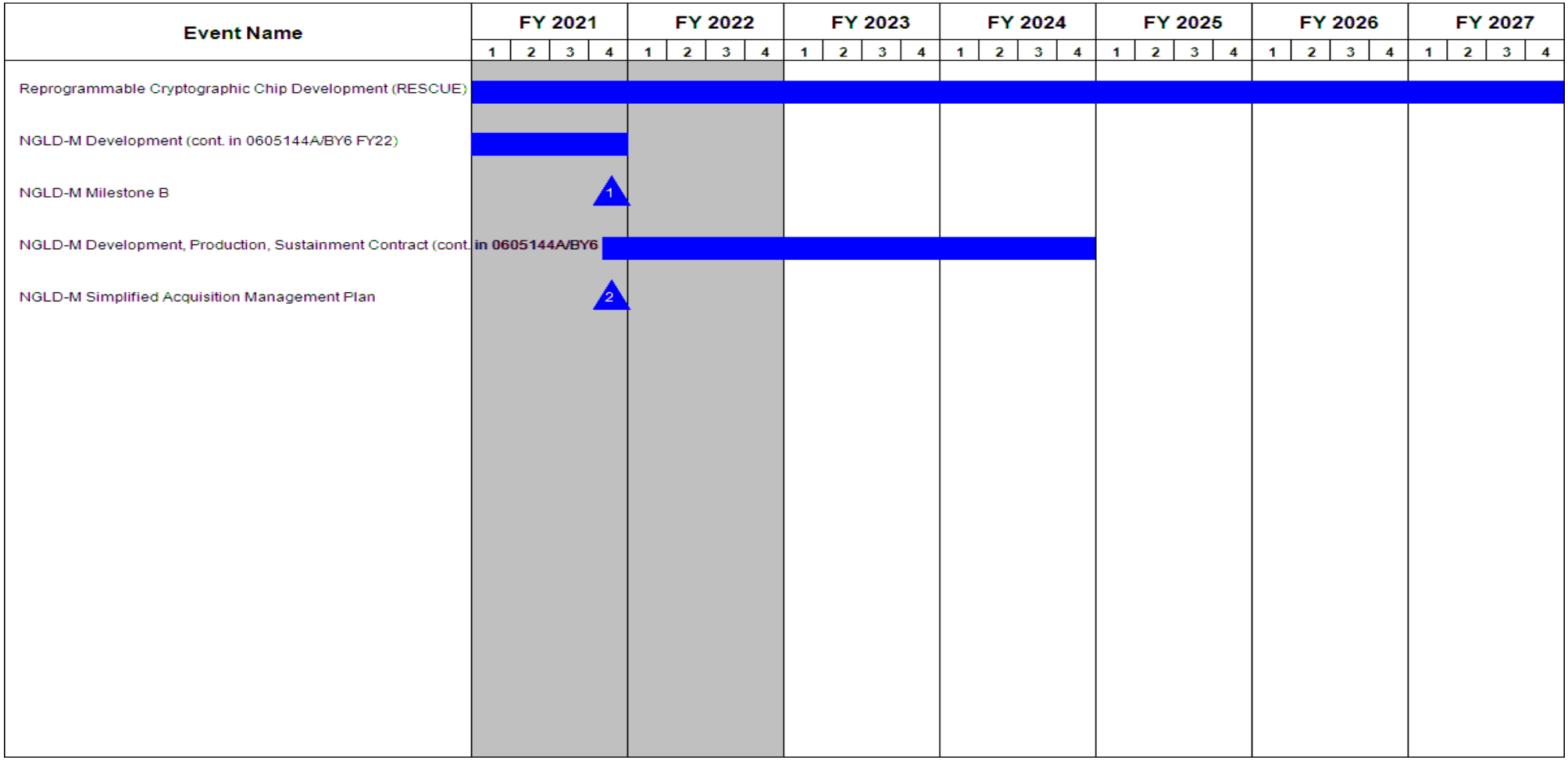


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV4 / *Key Management Infrastructure (KMI)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Reprogrammable Cryptographic Chip Development (RESCUE)	1	2019	4	2027
NGLD-M Development (cont. in 0605144A/BY6 FY22)	2	2019	4	2021
NGLD-M Milestone B	4	2021	4	2021
NGLD-M Development, Production, Sustainment Contract (cont. in 0605144A/BY6 FY22	4	2021	4	2024
NGLD-M Simplified Acquisition Management Plan	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV5 / *Crypto Modernization (Crypto Mod)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
DV5: *Crypto Modernization (Crypto Mod)*	-	7.804	7.756	8.370	-	8.370	8.464	8.503	8.505	8.588	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of LOE 1, Unified Network.

Project DV5, Crypto Modernization (Crypto Mod), supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy. Communications Security (COMSEC) is governed by the Chairman of the Joint Chiefs of Staff Instruction (CJCSA) 6510.

Crypto Mod performs test, evaluation, development, and configuration management for cryptographic devices that receive key through fill devices and allow for secure communication through Army devices such as radios and satellite terminals. In order to ensure Warfighters continue to have secured communications (i.e., encrypted data and voice), Army communications systems are required to be upgraded to modern algorithms to meet emerging threat developed by our adversaries. Crypto Modernization necessitates the utilization of the latest National Security Agency (NSA) cryptographic capabilities in order to defeat adversarial efforts to decrypt, disrupt, or exploit US Army networks. Communications Security (COMSEC) is the Army's implementation of NSA protections to create a unified network that is protected, resilient, and survivable.

To accomplish this multi-faceted effort, consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan, Crypto Mod performs evaluation of emerging threats, development of advances protections to defeat these threats, testing of commercial and government off the shelf applications developed to provide protections against identified threats, and assessment of new software and hardware updates to these end user devices and software to ensure they remain hardened against cyber-attack. This ensures that all endpoints from singular NIPRNET, SIPRNET, JWICS and Intelligence workstations in the strategic Enterprise to Tactical vehicles and equipment utilized by dismounted personnel forward deployed in hot zone are protected when processing the critical mission and voice data that provides the strategic overmatch required to accomplish the Army's mission.

FY 2023 funds will support the testing of all existing and emerging encryptors for Functionality, Security, and Interoperability.The program will continue testing and evaluation of COMSEC devices to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: VINSON/ANDVT (Advanced Narrowband Digital Voice Terminal) Cryptograph Modernization (VACM) program	0.300	0.306	0.329

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV5 / *Crypto Modernization (Crypto Mod)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: This program researches, assesses, tests, plans and works to integrate VACM products for the Army. The VACM program is a NSA mandated program established to replace legacy external cryptographic devices such as the KY-57, KY-99A, KY-58, KY-99, KY-100 and CV- 3591 / KYV-5. In order to ensure the confidentiality, integrity and availability of classified communications, the cryptographic modules must be tested for interoperability and form fit to ensure a successful fielding. Each software release will require testing to insure comparability and interoperability. ***FY 2022 Plans:*** The program will continue to test and evaluate new software update to VACM devices to confirm continued capability and interoperability on Army networks and different tactical platforms as well as identifying new risk areas for compliance with COMSEC regulations and procedures. Development activities are ongoing as programs continue fielding, performing site surveys and installing at both CONUS and OCONUS locations. ***FY 2023 Plans:*** The program will continue to test and evaluate new software update to VACM devices to confirm continued capability and interoperability on Army networks and different tactical platforms as well as identifying new risk areas for compliance with COMSEC regulations and procedures. Development activities are ongoing as programs continue fielding, performing site surveys and installing at both CONUS and OCONUS locations. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase is due to the inflation.			
Title: Cryptographic Systems Test and Evaluation ***Description:*** This program supports the Army Cryptographic Modernization Transformational Initiative. This is accomplished by providing test and evaluation capabilities to the COMSEC community in order to assess emerging technologies before being released and approved for Army use; testing will be performed on hardware, software and network systems. ***FY 2022 Plans:*** Conduct testing and evaluation of COMSEC devices Link Encryptor Family (LEF), In-Line Network Encryptor (INE), Secure Voice (SV) to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures, with particular emphasis on the Advanced Cryptographic Capabilities (ACC) program lead by the NSA. The program will test and evaluate Crypto Systems compliant devices, Suite B IPSec devices built on commercial standards, Cryptographic High Value Product (CHVP), Commercial Solutions for Classified (CSfC) Guidance and new software releases to HAIPE 4.X devices in accordance with AR 700-142 Revision dated 8 June 2018. These devices provides the critical security backbone for all NIPRNET, SIPRNET, JWICS and Intelligence networks in both the Tactical and Enterprise networks. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT)	5.876	5.789	6.258

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV5 / *Crypto Modernization (Crypto Mod)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
technology within the existing and future network infrastructure to defend against adversary attack and exploitation. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure. Additionally, this program evaluates performance of technologies and provides direction to ensure the lowest impact on performance while providing the greatest protection from loss of sensitive data. ***FY 2023 Plans:*** Conduct testing and evaluation of COMSEC devices Link Encryptor Family (LEF), In-Line Network Encryptor (INE), Secure Voice (SV) to confirm capability and interoperability on Army networks and tactical systems as well as identifying risk areas for compliance with COMSEC regulations and procedures, with particular emphasis on the Advanced Cryptographic Capabilities (ACC) program lead by the NSA. The program will test and evaluate Crypto Systems compliant devices, Suite B IPSec devices built on commercial standards, Cryptographic High Value Product (CHVP), Commercial Solutions for Classified (CSfC) Guidance and new software releases to HAIPE 4.X devices in accordance with AR 700-142 Revision dated 8 June 2018. These devices provides the critical security backbone for all NIPRNET, SIPRNET, JWICS and Intelligence networks in both the Tactical and Enterprise networks. The program tests interoperability and provides ways to insert data at rest (DAR) and data in transit (DIT) technology within the existing and future network infrastructure to defend against adversary attack and exploitation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase is due to the inflation.			
Title: High Assurance Internet Protocol Encryption (HAIPE) extension manager ***Description:*** A management tool to configure the new extensions to the HAIPE standard and process the resulting data to provide early indications of cyber-attacks. ***FY 2022 Plans:*** The program will continue software development efforts that will provide configuration and management of the HAIPE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIPE extensions. Addition of ACC software feature and new devices will be implemented. This will also facilitate the upgrade of the Army HAIPE to include new cyber sensor functionality for the tactical cell. ***FY 2023 Plans:*** The program will continue software development efforts that will provide configuration and management of the HAIPE extensions and the user interface for collecting and analyzing the data that results from implementation of these HAIPE extensions. Addition of ACC software feature and new devices will be implemented. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.984	1.004	1.078

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV5 / *Crypto Modernization (Crypto Mod)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
The increase is due to the inflation.			
Title: Program Management Office Support	0.644	0.657	0.705
Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings. ***FY 2022 Plans:*** FY22 funds will provide overall management and oversight to implement Crypto Mod test, evaluation, development and configuration management for cryptographic devices - to include Matrix and Contractor support. ***FY 2023 Plans:*** FY 2023 funds will provide overall management and oversight to implement Crypto Mod test, evaluation, development and configuration management for cryptographic devices - to include Matrix and Contractor support. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase is due to inflation			
Accomplishments/Planned Programs Subtotals	7.804	7.756	8.370

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• B96002: *CRYPTOGRAPHIC SYSTEMS (CRYPTO SYS)*	81.156	47.990	50.151	-	50.151	51.403	56.832	57.000	56.975	0.000	401.507
• BS9716: *NON PEO-SPARES*	3.896	3.596	4.014	-	4.014	3.743	4.063	4.073	4.072	0.000	27.457

Remarks

Line Item & Title:
B96002 - Cryptographic Systems - OPA2
BS9716 - NON PEO-SPARES - OPA4

D. Acquisition Strategy

The Cryptographic Systems procures off of NSA IDIQ contracts. Army RDT&E is used on existing and emerging encryptors which are tested and evaluated for Functionality, Security, Interoperability, and backward compatibility on software and hardware for both Tactical and Enterprise systems to ensure they remain hardened against cyberattack. CDD, approved by CIO/G6, 15 Jul 2010; ICD, approved by JROC, 25 Mar 2011; AAO; approved by G3, 15 Dec 2011 and revised and approved, 19 Jun 2015.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV5 / *Crypto Modernization (Crypto Mod)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Support	Various	PEO C3T & CECOM : Various; APG, MD	-	0.644	Dec 2020	0.657	Dec 2021	0.705	Dec 2022	-		0.705	0.000	2.006	-
		Subtotal	-	0.644		0.657		0.705		-		0.705	0.000	2.006	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	SS/LH	CCDC C5ISR S&TCD : APG, MD	6.618	1.011	Nov 2020	1.031	Nov 2021	1.107	Nov 2022	-		1.107	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	CACI : Aberdeen Maryland	7.782	0.637	Feb 2021	0.650	Feb 2022	0.698	Feb 2023	-		0.698	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Booz Allen Hamilton (BAH) : APG, MD	4.910	0.267	Feb 2021	0.272	Feb 2022	0.292	Feb 2023	-		0.292	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	AASKI : Edgewood, Maryland	5.834	-		-		-		-		-	Continuing	Continuing	Continuing
Information Assurance System Engineering Support	C/CPFF	Envision : Aberdeen, Maryland	0.966	-		-		-		-		-	0.000	0.966	Continuing
Embedded Crypto Modernization Support	C/LH	Canceled : Canceled	37.770	-		-		-		-		-	0.000	37.770	-
		Subtotal	63.880	1.915		1.953		2.097		-		2.097	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	SS/LH	CCDC C5ISR S&TCD : APG, MD	0.534	1.637	Nov 2020	1.670	Nov 2021	1.793	Nov 2022	-		1.793	0.000	5.634	-
Test & Evaluation	C/CPFF	CACI : APG, MD	4.241	3.608	Feb 2021	3.476	Feb 2022	3.775	Feb 2023	-		3.775	0.000	15.100	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303140A / *Information Systems Security Program*	Project (Number/Name) DV5 / *Crypto Modernization (Crypto Mod)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	C/CPFF	Booz Allen Hamilton (BAH) : APG, MD	2.042	-		-		-		-		-	0.000	2.042	-
Test & Evaluation	C/CPFF	AASKI : APG, MD	1.499	-		-		-		-		-	0.000	1.499	-
		Subtotal	8.316	5.245		5.146		5.568		-		5.568	0.000	24.275	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	72.196	7.804		7.756		8.370		-		8.370	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV5 / *Crypto Modernization (Crypto Mod)*

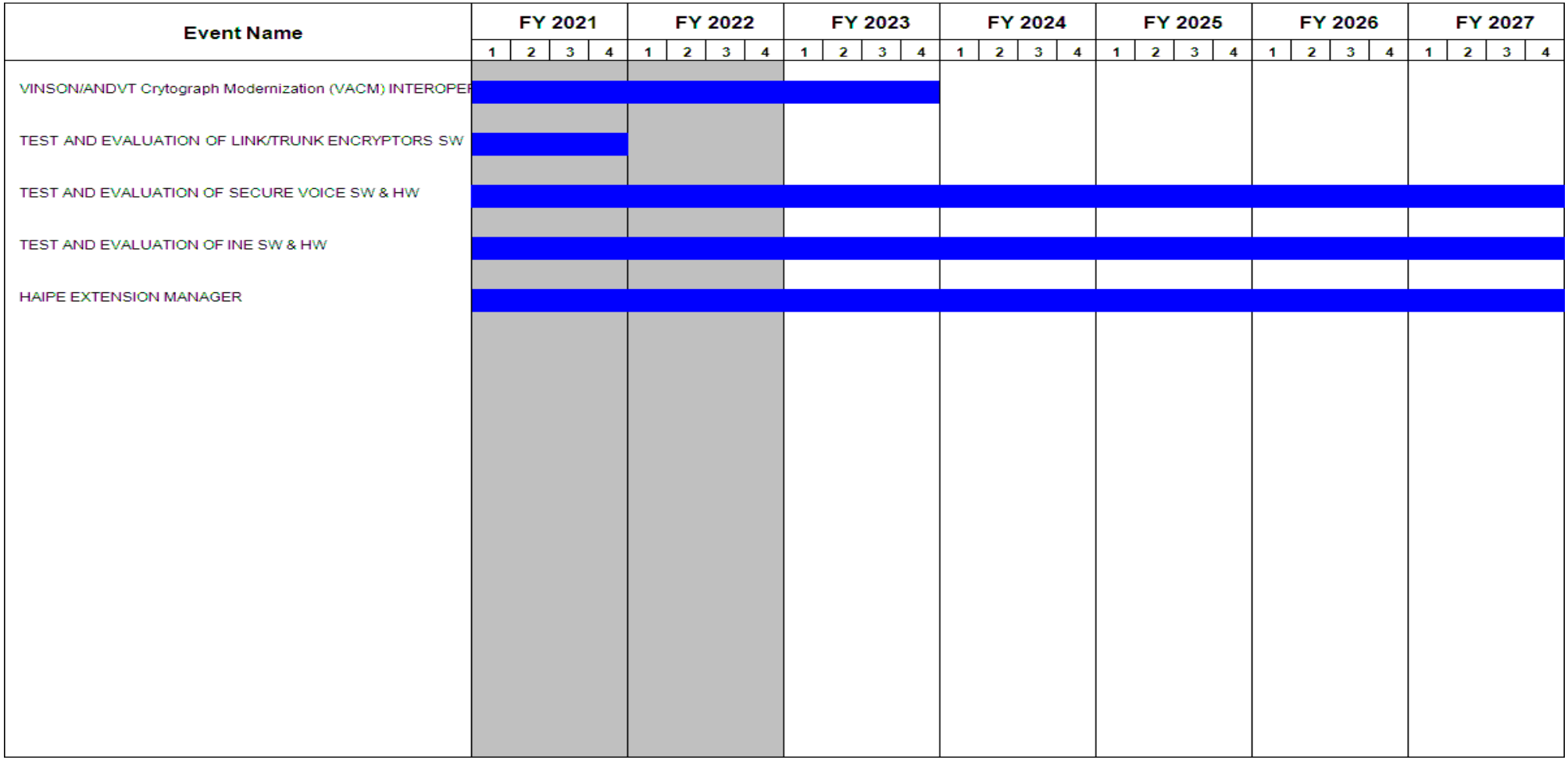


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303140A / *Information Systems Security Program*	**Project (Number/Name)** DV5 / *Crypto Modernization (Crypto Mod)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
VINSON/ANDVT Crytograph Modernization (VACM) INTEROPERABILITY	1	2016	4	2023
TEST AND EVALUATION OF LINK/TRUNK ENCRYPTORS SW	1	2016	4	2021
TEST AND EVALUATION OF SECURE VOICE SW & HW	4	2013	4	2035
TEST AND EVALUATION OF INE SW & HW	1	2017	4	2035
HAIPE EXTENSION MANAGER	1	2017	4	2035

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	70.652	45.297	27.100	-	27.100	0.000	0.000	0.000	0.000	0.000	143.049
083: *Global Combat Support Sys - Army*	-	20.883	14.933	27.100	-	27.100	-	-	-	-	0.000	62.916
EK2: *GCSS-A Increment 2*	-	49.769	30.364	-	-	-	-	-	-	-	0.000	80.133

Note

Effective February 2, 2017, the Department of Defense Instruction (DODI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle for Defense Business Systems. The DODI 5000.75 supersedes DODI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across the DOD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in the DODI 5000.75, are referred to as "Authority To Proceed" and replace DODI 5000.02 "Milestones."

A. Mission Description and Budget Item Justification

(Project 083) GCSS-Army Increment 1 gives combat forces a decisive edge by providing soldiers a seamless flow of timely, accurate, accessible, and secure logistics information to get combat power at the right place, at the right time. The GCSS-Army program is an information and communications technology investment that provides key
enabling support to the transformation of the Army into a network-centric, knowledge-based future force. The GCSS-Army approved Capability Description Document (CDD) and Capability Production Document (CPD) require an enterprise approach to replace current logistics and maintenance Standard Army Management Information Systems (STAMIS) to include supply, maintenance, ammunition, aviation, and property book. GCSS-Army implements best business practices to streamline supply, accountability, maintenance, distribution, and reporting procedures in support of the future force transition path of The Army Campaign Plan.

GCSS-A must take critical steps towards integration and implementation of the next generation of Enterprise Business Systems capabilities. This effort will address the obsolescence of existing SAP Enterprise Resource Planning (ERP) logistics and financial management platforms that the vendor plans to sunset by FY 28. GCSS-A's modernization work sets the conditions for development of a converged, post-modern Defense Business System that streamlines and integrates the Army's core business functions.

GCSS-A must identify redundant processes as candidates for business process re-engineering. Funding will support the 1) market research of Industry best practices, 2) Initiation of an Army Enterprise Development Environment to enable prototyping which reduces risk by aiding the requirements development. This environment includes: Cloud-hosted infrastructure, applications, and programs and tools, 3) government Program Management and Systems Engineering and Technical Assistance (SETA) contractors needed to plan for and manage the initiation of the post-modern system implementation effort.

(Project EK2) GCSS-Army Increment 2 consists of three waves: Wave 1- Enterprise Aviation (EAVN); Wave 2- Business Intelligence/Business Warehouse (BI/BW); Wave 3- Army Prepositioned Stocks (APS). Increment 2 builds on the current foundation by providing auditable EAVN maintenance, enhanced BI/BW, and APS functional capabilities which will directly impact the speed at which a deploying unit can draw combat equipment. Waves 1 and 2 will deliver greater efficiencies to

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303141A *I Global Combat Support System*

Aviation Logistics warfighters and improved information flow and accuracy in real time to decision makers, helping them make better decisions faster on the battlefield. Wave 3 will sunset the Army War Reserve Deployment System (AWRDS) legacy system.

The funds in the GCSS-Army Increment 1 Research Development Test & Evaluation (RDT&E) line are for building the software solution for disconnected supply, maintenance and accountability. The funds in FY 2020 are for critical change requests, coming from the warfighter and prioritized by the Combat Developer. In FY 2021, the Army will begin design, development and build of disconnected operations capability to support ground operations and will complete this effort in FY 2022.

In FY 2020, the Army Acquisition Executive (AAE) approved a change in technical approach for GCSS-Army Increment 2 due to unforeseen technical complexities identified by the vendor which would have significantly increased cost and schedule. The new technical approach will deliver capability in five capability drops for Waves 1 and 2 to be developed and deployed incrementally from FY 2020 thru FY 2023. FY 2022 funding will continue the GCSS-Army Enterprise Aviation development and deployment of the final three capability drops for Wave 1 and the third and fourth capability drops for Wave 2.

During this timeframe GCSS-Army Enterprise Aviation will integrate the Aircraft Notebook (ACN) data into GCSS-Army via an interface with the Enterprise Aviation Middleware components.

This interface between ACN and GCSS-Army will provide Warfighter level data to be populated into the Enterprise system that will provide Senior Leaders with a flight line view of Aviation assets as well as supports the data for Aviation reports through the Business Intelligence / Business Warehouse (BI/BW) application. The funding also supports trade studies, analysis and market research for SAP based ERP integration, consolidation and efficiencies.

Enterprise Resource Plan (ERP) modernization will consolidate the major Army Finance and Logistics ERPs & top tier Defense Business Systems into a Post Modern ERP environment with integration to enduring systems and microservices. Beginning in FY21, ERP Modernization is a product of Continuous Process and Product Improvements from both the Logistics and
Financial Management domains, which starts with Business Process Re-engineering, modernization of Army Business Enterprise Architecture, reevaluation of an evolving Army infrastructure, concepts and business needs, with emphasis on better serving our Soldiers through improved user experience and user interface (UI/UX).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0303141A *I Global Combat Support System*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	70.652	52.739	0.000	-	0.000
Current President's Budget	70.652	45.297	27.100	-	27.100
Total Adjustments	0.000	-7.442	27.100	-	27.100
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.442			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	27.100	-	27.100

Change Summary Explanation

FY2023 funding increased by $27.1 Million in Feb 2022 for ERP Modernization.
FY2023 funding increase reflects the fact that the FY2022 President's Budget request did not include out year funding.
FY2022 marks: $5.442M project 083 for Disconnected Ops; $2.000M project EK2 for testing.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) 083 / *Global Combat Support Sys - Army*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
083: *Global Combat Support Sys - Army*	-	20.883	14.933	27.100	-	27.100	-	-	-	-	0.000	62.916
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GCSS-Army Increment 1 provides critical Army sustainment support to the soldier with a seamless flow of timely, accurate, accessible, and secure information management that gives combat forces a decisive edge and is essential for combat readiness. The GCSS-Army approved Capability Description Document (CDD) and Capability Production Document (CPD) require an enterprise approach to replace current logistics and maintenance Standard Army Management Information Systems (STAMIS) to include supply, maintenance, ammunition and property book. GCSS-Army implements best business practices to streamline supply, accountability, maintenance, distribution, and reporting procedures in support of the future force transition path of The Army Campaign Plan. GCSS-Army is financially compliant and is a key component for the Army Enterprise Strategy to be financially auditable.

The funds in the GCSS-Army Increment 1 Research Development Test & Evaluation (RDT&E) line are for building the software solution for disconnected supply, maintenance and accountability. Aviation applications could leverage the ground disconnected operations solution for common functions without additional development. The Army requires a disconnected operations architecture for GCSS-Army to support ground mission. The FY22 funding will continue building the software solution for disconnected supply, maintenance and accountability. Currently the Army has battlefield gaps without network connectivity: inability to maintain or regenerate combat power, order/process spare parts, track battle losses, or conduct maintenance. The disconnected operations architecture will alleviate these problems when there are disruptions in communications or cyber-attacks. In FY2022 the Army will complete design, development and build of disconnected operations capability to support ground operations. The FY 2022 funding also supports critical change requests in each fiscal year, coming from the warfighter and prioritized by the Combat Developer, for the baseline system.

ERP Modernization will consolidate the major Army Finance and Logistics ERPs & top tier Defense Business Systems into a Post Modern ERP environment with integration to enduring systems and microservices. Beginning in FY21, ERP modernization was a product of Continuous Process and Product Improvements from both the Logistics and Financial Management domains, starting with Business Process Re-engineering, modernization of Army Business Enterprise Architecture, reevaluation of an evolving Army infrastructure,concepts and business needs, with emphasis on better serving our Soldiers through improved user experience and user interface (UI/UX).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Product Development	20.883	14.388	-
Description: The funds in the GCSS-Army Increment 1 RDT&E line are for building the software solution for disconnected supply, maintenance and accountability. The Army requires a disconnected operations architecture for GCSS-Army to support ground mission. The FY 2022 funding completes the development of the software solution for disconnected supply, maintenance and			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
accountability. Aviation applications could leverage the ground disconnected operations solution for common functions without additional development. ***FY 2022 Plans:*** The FY 2022 funding will complete development of software for disconnected supply, maintenance and accountability. The disconnected operations architecture, using FY 2022 RDTE funding, will alleviate these problems when there are disruptions in communications or cyber-attacks. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding for efforts for Disconnected operations is offset by increase in funding for convergence.			
Title: Product Development and Modernization ***Description:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. ***FY 2023 Plans:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. Product and Software Development: $9.104M	-	-	9.104

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Software Development includes all efforts related to the system integrator labor costs for prototyping of the ERP Modernized solution in the IL4 cloud hosted environment ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding for efforts for Disconnected operations is offset by increase in funding for ERP Modernization			
Title: ERP Modernization Program Managemnet Support ***Description:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. ***FY 2023 Plans:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. Program Support: $13.345 Description: Program support incudes program operations, acquisition support, system engineering, technical management and test management for the ERP Modernized solution. Costs include government management, contractor support, travel and facilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	-	13.345

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Decrease in funding for efforts for Disconnected operations is offset by increase in funding for ERP modernization			
Title: Cloud Support Development ***Description:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. ***FY 2023 Plans:*** RDT&E funding in FY23 to support ERP Modernization will focus on risk reduction, market research, provide analysis and prototype(s) demonstrating key Audit, Finance and Logistics capabilities, application and technical architecture to support the next phases of the ERP modernization. In support of this, government Program Management and Systems Engineering and Technical Assistance (SETA) contractors will be needed to plan for and manage the initiation of the ERP systems implementation effort. A cloud prototype(s) environment(s) will be established to support the development of modernized finance and logistics capabilities in compliance with Impact Level 4 (IL4) and Impact Level 6 (IL6) requirements. In addition, significant and continuous Business Process Re-engineering will be required to develop end to end processes based on commercial off the shelf software best practices to support limited to no customization approach and produce a solution that is commercial as possible and military as necessary. Cloud Support Development $4.651M Cloud support includes all costs related to cloud support provider (CSP), managed services provider (MSP), remote access for vendors, in support of Impact Level 4 and Impact Level 6 environments. Environments will include sandbox and development for the vendors conducting the prototypes for ERP Modernization. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding for efforts for Disconnected operations is offset by increase in funding for ERP modernization	-	-	4.651
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638	-	0.545	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	20.883	14.933	27.100

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

GCSS-Army will design and develop the software solution for disconnected ground operations . The program will design and build user screens for disconnected supply, maintenance and accountability.The Army will use a disconnected operations architecture for GCSS-Army to support the ground missions. Aviation applications could leverage the ground disconnected operations solution for common functions without additional development. In FY21, the program office awarded a development/ production base year (FY21) and option year (FY22) contract for the disconnected operations solution

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) 083 / *Global Combat Support Sys - Army*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1 . PM GCSS-Army- PMO Operations	Various	PM GCSS-Army : Fort Lee, VA 23805	103.931	-		-		-		-		-	0.000	103.931	62.385
2. PM Support - Program Management Support Services A	C/T&M	Engility Corporation : 3750 Centerview Drive Chantilly, VA 20151	1.386	-		-		-		-		-	0.000	1.386	-
FY22 SBIR/STTR Transfer	TBD	various : Various	-	-		0.545	Mar 2022	-		-		-	0.000	0.545	-
		Subtotal	105.317	-		0.545		-		-		-	0.000	105.862	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise Resource Planning (ERP) design and development	C/FPAF	Northrop Grumman Information Systems : Chester, VA 23836	467.058	-		-		-		-		-	0.000	467.058	457.056
Government Developer Subject Matter Experts	IA	ASA (FM&C), CASCOM and GFEBS : Various Locations	22.315	-		-		-		-		-	0.000	22.315	19.730
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.042	-		-		-		-		-	0.000	0.042	-
Disconnected Ground Operations	SS/TBD	TBD : Arlington VA	-	20.883		14.388		-		-		-	19.218	54.489	-
ERP Modernization SW Development	Option/ TBD	TBD : TBD	-	-		-		9.104		-		9.104	6.182	15.286	-
EERP Modernization Cloud Spt Development	Option/ TBD	TBD : TBD	-	-		-		4.651		-		4.651	0.000	4.651	-
		Subtotal	489.415	20.883		14.388		13.755		-		13.755	25.400	563.841	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) 083 / *Global Combat Support Sys - Army*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1. PM Support - Independent Verification and Validation (IV&V)	C/T&M	CAP Gemini : 2250 Corporate Park Dr, Herndon, VA 20171	1.031	-		-		-		-		-	0.000	1.031	1.031
3. PM Support - Program Management Support Services B	C/T&M	Logistics Management Institue : Colonial Heights, VA 23834	42.101	-		-		-		-		-	0.000	42.101	42.101
ERP Modernization Program Management	C/T&M	Logistics Management Institute : Tysons VA	-	-		-		13.345		-		13.345	0.000	13.345	-
		Subtotal	43.132	-		-		13.345		-		13.345	0.000	56.477	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1. Test and Evaluation - Test and Evaluation	C/IDIQ	Northrop Grumman : McLean VA	39.950	-		-		-		-		-	0.000	39.950	-
		Subtotal	39.950	-		-		-		-		-	0.000	39.950	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	677.814	20.883		14.933		27.100		-		27.100	25.400	766.130	N/A

Remarks

$27.1 Million added (Feb 22) to FY23 for ERP modernization.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

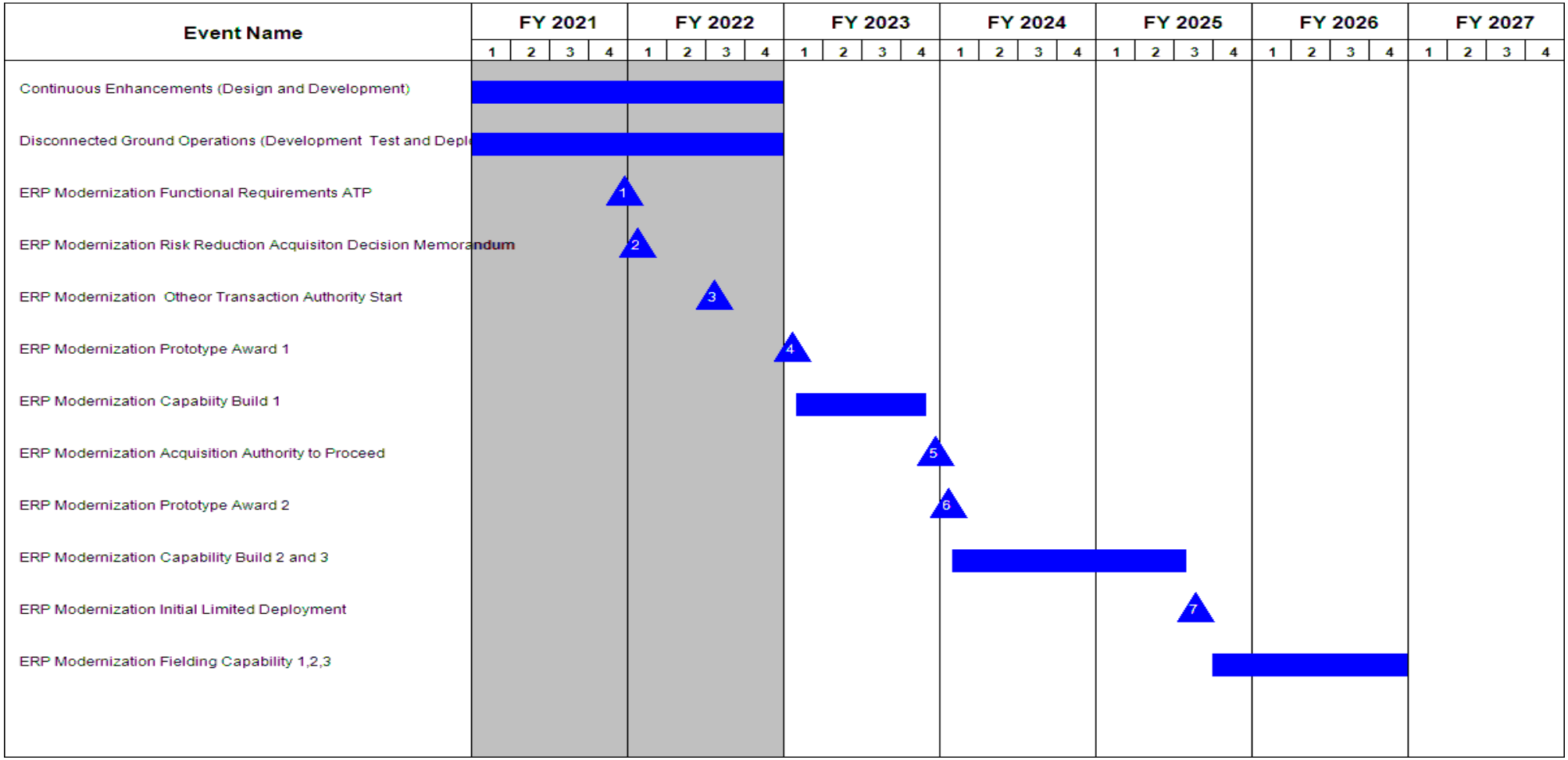


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Seg 2 Contract Award	1	2008	1	2008
Increment 1 - Acquisition Review	2	2008	2	2008
Increment 1/Segment 1 Operational Assessment	1	2008	3	2010
Increment 1 - Milestone B	4	2008	4	2008
Increment 1/Release 1.1 DTOE	3	2010	4	2010
GCSS-Army Release 1.1 Design, Build, Test & Stabilize	1	2011	3	2011
Increment 1 - Milestone C	4	2011	4	2011
Release 1.1 Intial Operational Test and Evaluation (IOT&E)	1	2012	1	2012
Release 1.1 Stabilization	2	2011	1	2013
Lead Site Verification	1	2013	1	2013
Release 1.1 Full Deployment Decision	1	2013	1	2013
Field Wave 1	1	2013	1	2016
GCSS-Army Release 1.2 (Wave 2) Plan, Analyze, Design, Build & Test	3	2011	4	2015
Release 1.2 (Wave 2) Lead Site Verification Test	3	2015	3	2015
Release 1.2 (Wave 2) In Progress Review	4	2015	4	2015
Field Release 1.2 (Wave 2)	1	2015	1	2018
Continuous Enhancements (Design and Development)	1	2018	4	2022
Disconnected Ground Operations (Development Test and Deployment)	1	2021	4	2022
ERP Modernization Functional Requirements ATP	4	2021	4	2021
ERP Modernization Risk Reduction Acquisiton Decision Memorandum	1	2022	1	2022
ERP Modernization Otheor Transaction Authority Start	3	2022	3	2022
ERP Modernization Prototype Award 1	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** 083 / *Global Combat Support Sys - Army*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ERP Modernization Capabiity Build 1	1	2023	4	2023
ERP Modernization Acquisition Authority to Proceed	4	2023	4	2023
ERP Modernization Prototype Award 2	1	2024	1	2024
ERP Modernization Capability Build 2 and 3	1	2024	3	2025
ERP Modernization Initial Limited Deployment	3	2025	3	2025
ERP Modernization Fielding Capability 1,2,3	4	2025	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) EK2 / *GCSS-A Increment 2*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EK2: *GCSS-A Increment 2*	-	49.769	30.364	-	-	-	-	-	-	-	0.000	80.133
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

(Project 083) GCSS-Army Increment 1 gives combat forces a decisive edge by providing soldiers a seamless flow of timely, accurate, accessible, and secure logistics information to get combat power at the right place, at the right time. The GCSS-Army program is an information and communications technology investment that provides key enabling support to the transformation of the Army into a network-centric, knowledge-based future force. GCSS-Army implements best business practices to streamline supply, accountability, maintenance, distribution, and reporting procedures in support of the future force transition path of The Army Campaign Plan.

(Project EK2) GCSS-Army Increment 2 builds on the current foundation by providing auditable Army Enterprise Aviation maintenance, enhanced Business Intelligence/ Business Warehouse (BI/BW) and Army Pre-Positioned Stocks (APS) functional capabilities and will sunset the legacy system Army War Reserve Deployment System (AWRDS). Increment 2 will deliver greater efficiencies to Aviation Logistics warfighters and improve information flow and accuracy in real time to decision makers, helping them make better decisions faster on the battlefield.This Project is undertaking to develop the underlying common architecture for the next generation Enterprise Business System converged capabilities. This will include efforts to implement updated Business Processes through Business Process Reengineering in a modernized technical capability.

In FY 2020, the Army Acquisition Executive (AAE) approved the program's technical approach that provides the software solution for Enterprise Aviation via five incremental capability drops. The change resulted from technical risk identified by the vendor which would have significantly increased cost and schedule to the program. The new approach will integrate the Aircraft Notebook (ACN) with GCSS-Army for Aviation maintenance data, usage data, readiness data, Aviation supply processes, airworthiness data for Aviation assets, fully integrate the Aviation Critical Safety Item (Aviation Tracked Components for airworthiness) Process, and provide an end to end solution for the Aviation Directed Maintenance Action process.

Implementation of the BI/BW capabilities provide enhancements in materiel and supply chain readiness analytics that are critical to improve commanders' understanding of weapons systems readiness, helping them make better decisions faster on the battlefield.

The APS capabilities directly impacts the speed at which a deploying unit can draw combat equipment while reducing the burden of the day-to-day maintenance and accountability of Army Prepositioned Stocks.

The FY 2022 funding continues design, development, and incremental testing for Enterprise Aviation capability in the GCSS-Army baseline software; FY 2022 RDTE funds also allows the Army to develop critical maintenance, supply and financial reports that will be used for Enterprise Aviation and key functional areas in order to improve readiness reporting. FY 2022 will provide the development and deployment of the final three Capability Drops that will integrate the Aircraft Notebook with GCSS-Army for Aviation supply processes, airworthiness data for Aviation assets, fully integrate the Aviation Critical Safety Item (Aviation Tracked Components for airworthiness) Process, and provide an end to end solution for the Aviation Directed Maintenance Action process.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** EK2 / *GCSS-A Increment 2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: System Design, Develop and Build ***Description:*** The purpose of this phase is to begin the system development for an incremental capability that is affordable and executable to satisfy the Key Performance Parameters and Key System Attributes. ***FY 2022 Plans:*** Building on the momentum initiated in FY2020 and continued through FY2021, the EAVN team will complete software design, development, and developmental testing on Capability Drops 2.3, 2.4, and 2.5 in FY2022. In addition to the planned developmental testing on these capabilities, Operational Testing is required for Capability Drops 2.3 and 2.5. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Program funding ends FY22.	47.809	24.891	-
Title: Government System Test and Evaluation ***Description:*** Government System Test and Evaluation ***FY 2022 Plans:*** FY2022 funding will provide for testing of Capability Drops 2.3, 2.4, and 2.5, including IOT&E as development of the capability drops concludes. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Program funding ends FY22.	1.960	4.364	-
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	1.109	-
Accomplishments/Planned Programs Subtotals	49.769	30.364	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• W11011: *GCSS-Army Increment 2*	0.794	8.715	4.102	-	4.102	-	-	-	-	0.000	13.611

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** EK2 / *GCSS-A Increment 2*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OMA - 423612000-OMA: *GCSS-Army Increment2*	16.791	-	0.000	-	0.000	-	-	-	-	0.000	16.791

Remarks

D. Acquisition Strategy

GCSS-Army Increment 2 continues the evolutionary acquisition strategy of Increment 1 and will define, develop, and deploy additional and enhanced capabilities to GCSS-Army based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities.

GCSS-Army Increment 2 is being implemented in three waves:

Wave 1 provides the Army Enterprise Aviation logistics capability. Government System Integrator is the Combat Capability Development Command (CCDC) Aviation and Missile Center, System Simulation and Software Integration (S3I) Directorate. The program office will employ System Simulation and Software Integration Directorate (S3I) to design and develop the minimum viable Aviation solution through a series of five Capability Drops which will bring Aviation data and functionality into GCSS-Army and be independently designed, developed, and deployed.
Wave 2 provides the enhanced BI/BW capability. Base contract was awarded as a small business set aside IDIQ contract, June 2019. Option year awarded June 2020.

Wave 3 provides the APS capability. Will leverage Army Shared Service Center (ASSC) contract.

GCSS-Army also leverages the partnership with the U.S. Army Communications-Electronics Command, and supplements the design and development team with architecture and engineering support from the existing support contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) EK2 / *GCSS-A Increment 2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Operations	Allot	PMO : Huntsville AL	1.860	-		-		-		-		-	0.000	1.860	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.109	Mar 2022	-		-		-	0.000	1.109	-
		Subtotal	1.860	-		1.109		-		-		-	0.000	2.969	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EAVN Blueprinting	RO	AMRDEC : Huntsville AL	90.815	-		-		-		-		-	0.000	90.815	90.815
EAVN System Design, Develop and Build	C/T&M	CCDC Aviation and Missile Cmd : Huntsville AL	58.830	30.591	Oct 2020	19.632	Oct 2020	-		-		-	20.062	129.115	115.397
FY 2019 SBIR / STTR Transfer	C/FFP	4M : Huntsville AL	4.667	2.533		-		-		-		-	1.407	8.607	-
EAVN ADO Development	C/FFP	DOD ESI : Arlington VA	6.112	-		-		-		-		-	2.366	8.478	25.337
EAVN SME Services	C/T&M	DOD ESI : Richmond VA	1.555	1.667		-		-		-		-	1.701	4.923	5.168
EAVN SETA Supt	C/T&M	LMI : Arlington VA	12.998	7.197	Dec 2020	2.150	Dec 2020	-		-		-	6.924	29.269	27.364
BI/BW Development	C/FFP	4M : Huntsville AL	3.058	2.491		0.447		-		-		-	4.971	10.967	10.677
BI/BW Program/SETA Support	C/T&M	LMI : Arlington VA	1.886	0.889		0.258		-		-		-	1.335	4.368	4.355
Program Support	TBD	Various : Various	1.234	1.219		0.404		-		-		-	1.335	4.192	4.033
EAVN Government Matrix Supt	RO	CCDC Aviation and Missile Cmd : Huntsville A	2.285	1.222		-		-		-		-	0.000	3.507	-
		Subtotal	183.440	47.809		22.891		-		-		-	40.101	294.241	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303141A / *Global Combat Support System*	Project (Number/Name) EK2 / *GCSS-A Increment 2*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	RO	ATEC : Aberdeen PG MD	1.099	1.960	Oct 2019	6.364	Oct 2019	-		-		-	10.290	19.713	-
		Subtotal	1.099	1.960		6.364		-		-		-	10.290	19.713	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	186.399	49.769		30.364		-		-		-	50.391	316.923	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** EK2 / *GCSS-A Increment 2*

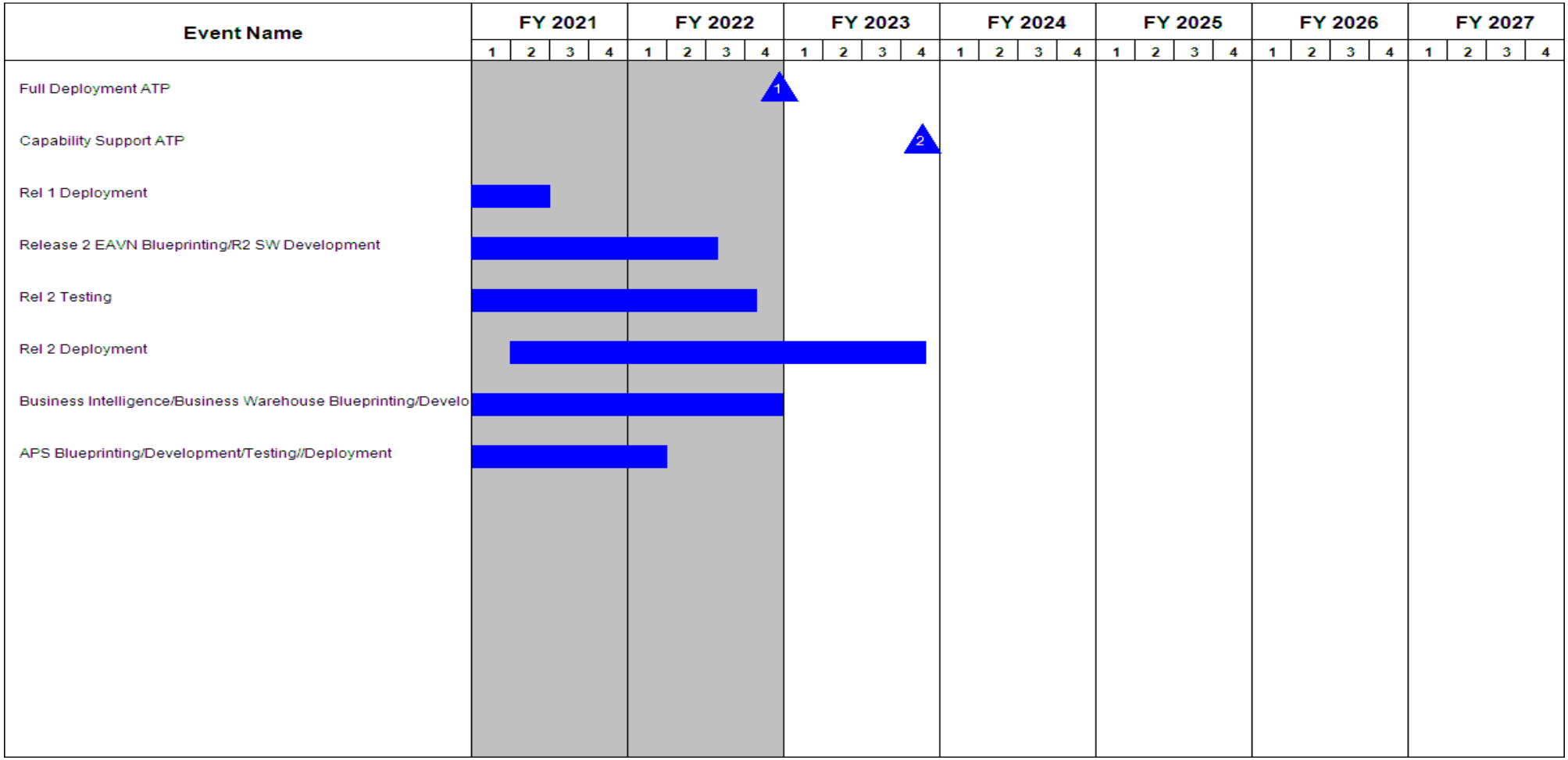


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303141A / *Global Combat Support System*	**Project (Number/Name)** EK2 / *GCSS-A Increment 2*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MDA Meeting	2	2016	2	2016
Full Deployment ATP	4	2022	4	2022
Capability Support ATP	4	2023	4	2023
Rel 1 EAVN Blueprinting/ SW Development	1	2018	4	2019
Rel 1 Testing	1	2018	2	2020
Rel 1 Deployment	4	2019	2	2021
Release 2 EAVN Blueprinting/R2 SW Development	3	2019	3	2022
Rel 2 Testing	1	2021	4	2022
Rel 2 Deployment	1	2021	4	2023
Business Intelligence/Business Warehouse Blueprinting/Development	1	2019	4	2022
APS Blueprinting/Development/Testing//Deployment	1	2021	1	2022

Note

The schedule for GCSS-Army Increment 2 is based upon the Army Acquisition Executive (AAE) decision to utilize the Government System Integrator. Schedule reflects two releases for Enterprise Aviation (Wave 1), one release for Business Intelligence/Business Warehouse (Wave 2), and one release for Army Prepositioned Stock (Wave 3).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303142A *I SATCOM Ground Environment (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	18.002	15.222	18.321	-	18.321	15.133	11.965	12.622	12.724	Continuing	Continuing
253: *Dscs-Dcs (Phase II)*	-	4.212	4.080	7.832	-	7.832	7.242	5.012	5.014	5.063	Continuing	Continuing
456: *MILSATCOM System Engineering*	-	13.790	11.142	2.920	-	2.920	1.812	1.800	2.455	2.510	0.000	36.429
CO7: *Protected Tactical Satellite Communications*	-	-	-	7.569	-	7.569	6.079	5.153	5.153	5.151	0.000	29.105

A. Mission Description and Budget Item Justification

A portion of this funding line is directly aligned to support the Network Army Modernization Priority. Project 253, Dscs-Dcs (Phase II), SATCOM Ground Environment (SPACE) supports the Army's Network Modernization Strategy Line of Effort (LOE) 1 - Unified Network.

Project 253, Fiscal Year 2023 (FY23) Base funding in the amount of $7.832 million develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

Project 456, MILSATCOM System Engineering supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network Cross-Functional Team (N-CFT) capability set approach to achieve the network modernization strategy.

Fiscal Year 2023 (FY23) Base funding in the amount of $2.920 million - MILSATCOM System Engineering assures the tactical Army satellite communications (SATCOM) and SATCOM On-the-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM System Engineering shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM System Engineering represents the Army's tactical interests within Department of Defense (DoD), Commercial and International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts. MILSATCOM System Engineering also provides the technical and programmatic expertise to facilitate the Unified Network Capabilities and Integration (UNCI) integration mission of transport convergence and integration of N-CFT emerging solutions within the Tactical Network portfolio as part of future Capability Sets. MILSATCOM SE provides the programmatic and technical expertise to coordinate the UNCI mission to align and integrate elements of the Tactical Network portfolio in support of the Expeditionary Signal Battalion (ESB) and Multi Domain Task Force (MDTF).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303142A *I SATCOM Ground Environment (SPACE)*

Project 456 also includes Protected Anti-jam Tactical SATCOM efforts, which fill a critical communications gap for anti-jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the tactical Army to be resilient in a contested environment and protect against catastrophic loss of situational awareness and command and control during critical battle movement. It will offer the tactical Army protection against interference that is either intentional or unintentional. These efforts are synchronized with the Space Force and DoD's plans for Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), the Protected Tactical Satellite (PTS), and commercial SATCOM systems.

Funds transferred to project CO7 in FY23 fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts under the same program element 0303142A. Protected Tactical Anti-jam SATCOM supported initial development, testing and certification of production representative PTW modems, incorporating Army specific requirements, to support continued spiral development of critical protected communications capabilities to address resiliency in jamming environments. The Protected/Resilient SATCOM Abbreviated - Capabilities Development Document was validated and approved in June 2021.

FY23 Protected Anti-jam Tactical SATCOM funding under project CO7 in the amount of $7.569M will support Protected SATCOM modem development, test and evaluation, system engineering, program management, and development of training materials and data rights.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	18.002	15.247	0.000	-	0.000
Current President's Budget	18.002	15.222	18.321	-	18.321
Total Adjustments	0.000	-0.025	18.321	-	18.321
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	18.321	-	18.321
• FFRDC Transfer	-	-0.025	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 253 / *Dscs-Dcs (Phase II)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
253: *Dscs-Dcs (Phase II)*	-	4.212	4.080	7.832	-	7.832	7.242	5.012	5.014	5.063	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 253, Dscs-Dcs (Phase II), SATCOM Ground Environment (SPACE) supports the Army's Network Modernization Strategy Line of Effort (LOE) 1 - Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

Fiscal Year 2023 (FY23) Base funding in the amount of $7.832 million develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: SATCOM Terminal Digital Intermediate Frequency Implementation Analysis	2.190	1.299	4.158
Description: SATCOM Terminal Digital Intermediate Frequency (IF) implementation analysis and experimentations aimed at improving bandwidth efficiency of gateway terminals while providing an additional layer of resiliency through terminal redundancy. These analysis and experimentations include various evaluations for digital terminal components to replace current, less efficient, analog components. These analyses also include assessment of terrestrial connectivity among SATCOM terminals to enable Continuity Of Operations (COOP) and failover scenarios required for resiliency.			
FY 2022 Plans: Integrate Digital IF Solutions for the Interconnect Facility (ICF) Replacement into the Prototyping, Integration, Test, Training (PITT) facility at Tobyhanna Army Depot (TYAD). Perform technical assessments and Wideband Global SATCOM (WGS) delta certification tests.			
FY 2023 Plans: Integrate Digital IF Solutions for the Interconnect Facility (ICF) Replacement Wideband Signal Processors (WSP), COTS LAN Switches and Routers and High Speed Fiber Optics into the Prototyping, Integration, Test, Training (PITT) facility at Tobyhanna Army Depot (TYAD). Perform technical assessments and Wideband Global SATCOM (WGS) delta certification tests.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to integration of various Digital IF components required to support Gateway Optimization and Resiliency (GOaR) study recommendations for a digital IF Initial Operational Capability (IOC) in FY2025. Digital IF Wideband Signal Processors (WSP), COTS LAN Switches and Routers and High Speed Fiber Optics must be assessed and certified during FY23 and FY24 to be incorporated into GOaR IOC set in FY25.			
Title: Electromagnetic Interference Mitigation Analysis ***Description:*** Continue to assess multiple interference mitigation/cancellation technologies for effectiveness in improving reliability/ resiliency of strategic and tactical communications. Mature technology to software/firmware that will improve protected SATCOM modem/terminal performance in a electro-magnetic interference contested environment. Technology will also improve terminal performance against adversary and friendly satellite link jamming resources. ***FY 2022 Plans:*** Assess multiple interference mitigation/cancellation technologies for effectiveness in improving reliability/resiliency of strategic and tactical communications. Mature technology to software/firmware that will improve protected SATCOM modem/terminal performance in a electro-magnetic interference contested environment. Technology will also improve terminal performance against adversary and friendly satellite link jamming resources. ***FY 2023 Plans:*** Integrate Interference Mitigation algorithms into Enterprise Digital IF Multi-carrier (EDIM) Modem. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is due to the Interference Cancellation Algorithms reaching TRL-6 in FY22. FY23 efforts will be focused on incorporating Interference Mitigation algorithms into EDIM Modem.	2.022	1.346	0.400
Title: Low Earth Orbit (LEO)/Medium Earth Orbit (MEO) Satellite Service Integration ***Description:*** Investigate the availability of LEO/MEO Satellite Services in the commercial market place and assess their viability for use at Department of Defense (DoD) SATCOM gateways. ***FY 2022 Plans:*** Based on previously conducted studies and analyses, assess technology readiness for supporting DoD Gateway users in conjunction with Geosynchronous Earth Orbit (GEO) satellite services. Conduct analyses of alternatives and provide a recommendation on how to integrate these services into the DoD SATCOM Gateways. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This effort is being superseded by Enterprise Digital IF Multi-carrier (EDIM) Modem System Engineering Analysis.	-	1.286	-
Title: Enterprise Digital IF Multi-carrier (EDIM) Modem	-	-	3.274

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Assess and integrate various commercial technologies on to a single modem platform to replace the existing almost out of life EDEM modem currently fielded at all DoD Gateways. New technologies include Multi-carrier capability to assist future growth of SATCOM, Digital IF to enable resiliency and path diversity and Interference Cancellation to improve reliability of SATCOM communication links. ***FY 2023 Plans:*** Integrate Multi-carrier capabilities, Interference Cancellation Algorithms and Digital IF technology into EDIM Modem. Initiate Non-Recurring Engineering (NRE) contract to integrate, test and certify EDIM Modem Platform. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This effort supersedes Low Earth Orbit (LEO)/Medium Earth Orbit (MEO) Satellite Service Integration requirement.			
Title: SBIR/STTR Transfer ***Description:*** FY22 SBIR/STTR Transfer ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.149	-
Accomplishments/Planned Programs Subtotals	4.212	4.080	7.832

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BB8500: *Defense Enterprise Wideband Satcom Systems*	101.498	90.928	107.228	-	107.228	116.716	90.849	94.346	94.304	Continuing	Continuing

Remarks

D. Acquisition Strategy

This finances Project Manager, Defense Communications and Army Transmission Systems (PM DCATS) netcentric systems engineering, modem risk mitigation, and risk management framework support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which improves SATCOM gateway resiliency while allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
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trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into WSOMS and EWSTS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband Satellite System (DEWSS) terminal family beyond 2035 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future. Contracting approach for new technology is through the use of Broad Agency Announcements (BAA) and Other Transaction Authority (OTA) contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	To Be Determined : To Be Determined	-	-		0.149		-		-		-	0.000	0.149	-
		Subtotal	-	-		0.149		-		-		-	0.000	0.149	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SATCOM Terminal Digital IF Implementation Analysis	MIPR	Aberdeen Proving Ground : MD	-	1.885	Jan 2021	1.125	Jan 2022	3.206	Jan 2023	-		3.206	Continuing	Continuing	Continuing
Electromagnetic Interference Mitigation Analysis	MIPR	Aberdeen Proving Ground : MD	-	1.666	Jan 2021	1.095	Jan 2022	0.400	Jan 2023	-		0.400	Continuing	Continuing	Continuing
Low Earth Orbit/Medium Earth Orbit (LEO/MEO)	MIPR	Aberdeen Proving Ground : MD	-	-		1.116	Jan 2022	-		-		-	Continuing	Continuing	Continuing
Enterprise Digital IF Multi-carrier (EDIM) Modem System Engineering Analysis	MIPR	ACC - Rock Isand : IL	-	-		-		3.274	Jan 2023	-		3.274	Continuing	Continuing	Continuing
		Subtotal	-	3.551		3.336		6.880		-		6.880	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Support	Allot	PdM WESS : Ft. Belvoir, VA	-	0.060		0.045		0.060		-		0.060	Continuing	Continuing	Continuing
Contractor Support	MIPR	ACC : Rock Island, IL	-	0.601	Jan 2021	0.550	Jan 2022	0.892	Jan 2023	-		0.892	Continuing	Continuing	Continuing
		Subtotal	-	0.661		0.595		0.952		-		0.952	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
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	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.212		4.080		7.832		-		7.832	Continuing	Continuing	N/A

Remarks

SATCOM Terminal Digital Intermediate Frequency (IF) demonstrations with multi-vendor equipment will be conducted using live satellite links between Tobyhanna Army Depot (TYAD) and Joint SATCOM Engineering Center (JSEC) at Aberdeen Proving Grounds. All components demonstrated will be at Technology Readiness Level (TRL) 6.

Electromagnetic Interference Algorithms at TRL 6 will be hosted on a stand-alone hardware platform and tested at JSEC using live satellite links. All verified algorithms and performance specifications will transition to the Enterprise Digital IF Multi-Carrier (EDIM) modem program during 4Q FY 2023.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
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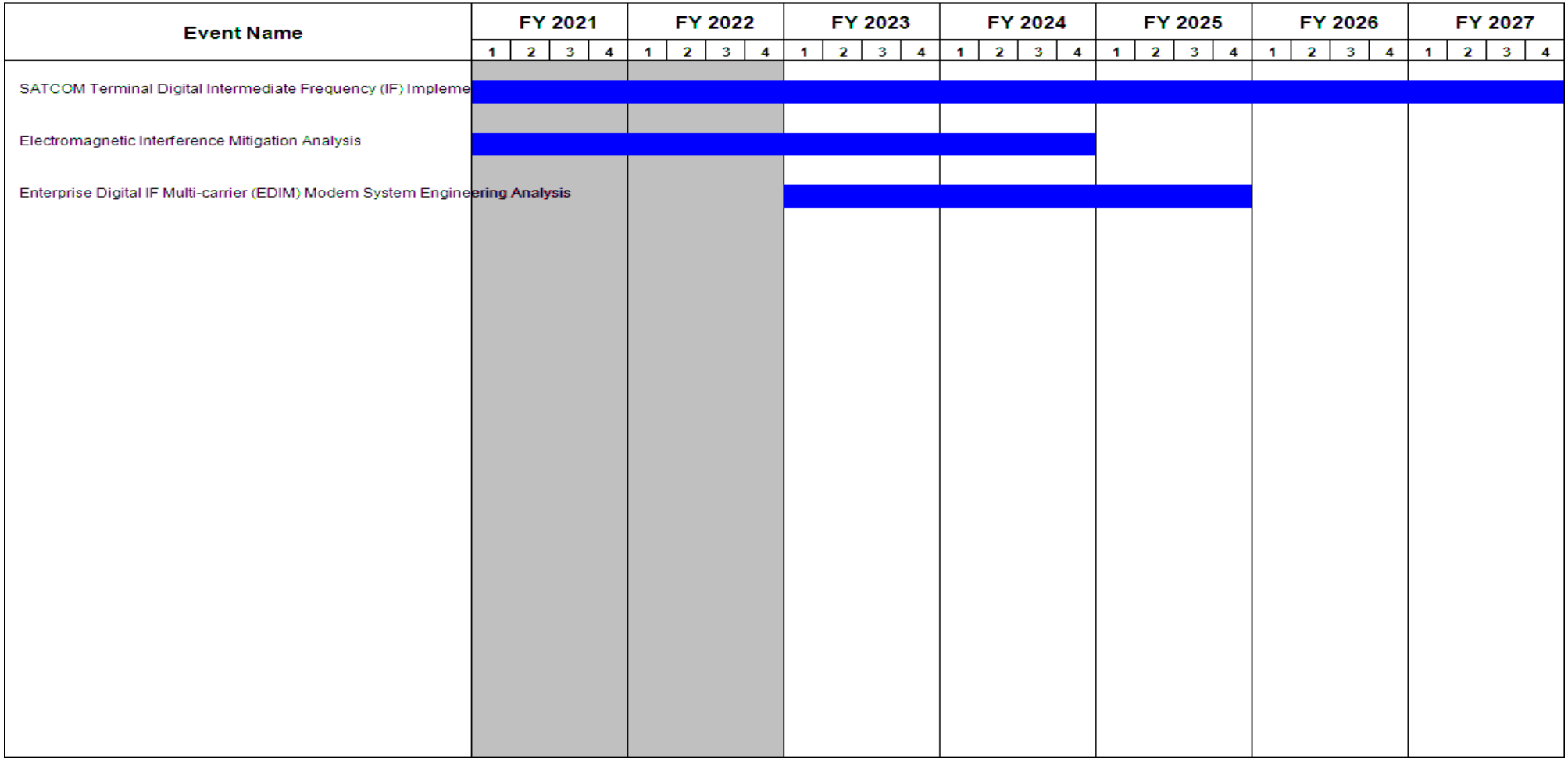

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SATCOM Terminal Digital Intermediate Frequency (IF) Implementation Analysis	1	2021	4	2027
Electromagnetic Interference Mitigation Analysis	1	2021	4	2024
Enterprise Digital IF Multi-carrier (EDIM) Modem System Engineering Analysis	1	2023	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 456 / *MILSATCOM System Engineering*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
456: *MILSATCOM System Engineering*	-	13.790	11.142	2.920	-	2.920	1.812	1.800	2.455	2.510	0.000	36.429
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Cross Functional Team.

MILSATCOM System Engineering assures the tactical Army satellite communications (SATCOM) and SATCOM On-the-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM System Engineering shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM System Engineering represents the Army's tactical interests within Department of Defense (DoD), Commercial and International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts. MILSATCOM System Engineering also provides the technical and programmatic expertise to facilitate the Unified Network Capabilities and Integration (UNCI) integration mission of transport convergence and integration of N-CFT emerging solutions within the Tactical Network portfolio as part of future Capability Sets. These emerging solutions include Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) capabilities and are synchronized with Space Force DoD's plans for Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), the Protected Tactical Satellite (PTS), and commercial SATCOM systems. MILSATCOM SE provides the programmatic and technical expertise to coordinate the UNCI mission to align and integrate elements of the Tactical Network portfolio in support of the Expeditionary Signal Battalion (ESB) and the Multi Domain Task Force (MDTF).

FY 2023 funding supports the systems engineering required to support technology maturation, systems analysis, experimentation and planning associated with Joint SATCOM development efforts. This line continues to fund the systems architecture and analysis for current and future SATCOM efforts in both wideband and protected satellite communications.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Protected communications system engineering and WGS communications	0.896	0.752	0.502
Description: Provides systems engineering support for technology maturation, development and planning associated with joint SATCOM development efforts.			
FY 2022 Plans: Funding supports continued systems engineering and analysis for Protected Communications and WGS Communications, as well as development and technology maturation of NCW-T.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding supports continued systems engineering and analysis for Protected Communications and WGS Communications, as well as development and technology maturation of NCW-T. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to realignment of efforts.			
Title: Systems architecture and analysis support ***Description:*** Provides systems engineering support relating to the architecture and analysis of Network Centric Waveform Tool (NCW-T) and collaborative SATCOM efforts. These efforts, such as research, analysis, technical engineering and integration services for bandwidth studies and future technology insertions, impact Army use of military and commercial satellite constellations and integration of enabling technologies. Provides additional programmatic support across the tactical network. ***FY 2022 Plans:*** Funding supports continued in house engineering support, contractor support, and system architecture and analysis. ***FY 2023 Plans:*** Funding supports continued in house engineering support, contractor support, and system architecture and analysis. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in system engineering support relating to architecture and analysis of NCWT and joint DoD SATCOM efforts	1.997	1.191	1.568
Title: Testing and certification of critical SATCOM and SATCOM On-the-Move communication and network technologies ***Description:*** Provides testing and certification of the critical SATCOM and SATCOM On-the-Move (SOTM) communication and network technologies. ***FY 2022 Plans:*** Funding supports continued testing and certification of critical SATCOM and SATCOM On-the-Move communication and network technologies. ***FY 2023 Plans:*** Funding supports continued testing and certification of critical SATCOM and SATCOM On-the-Move communication and network technologies. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.425	0.435	0.600

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to new modems in development			
Title: Protected Tactical Waveform (PTW) Modem Development and Testing ***FY 2022 Plans:*** Funding supports development and engineering of Army specific requirements for the PTW modem that will be utilized for protected tactical communications. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Effort transitioned to Project CO7.	10.472	8.357	-
Title: Unified Network Capabilities and Integration Program Management and Support ***Description:*** Provides programmatic and technical expertise in systems engineering to align and integrate elements of the Tactical Network Portfolio. ***FY 2023 Plans:*** Funding supports systems engineering and integration efforts in support of cross domain elements such as the Expeditionary Signal Battalion ? Enhanced (ESB-E) and the Multi-Domain Task Force (MDTF) ***FY 2022 to FY 2023 Increase/Decrease Statement:*** New Accomplishment	-	-	0.250
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR Transfer for MSE/Protected SATCOM ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR Transfer for MSE/Protected SATCOM	-	0.407	-
Accomplishments/Planned Programs Subtotals	13.790	11.142	2.920

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

In FY 2023 funding was realigned from PE 123142A / 456 to 1203142A / CO7 (Protected Tactical Satellite Communications)

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

D. Acquisition Strategy

MILSATCOM System Engineering provides advanced systems engineering, research, development, test, evaluation (RDTE) and integration of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation and integration of the technology will transition to PM Tactical Network and related Programs of Record.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 456 / *MILSATCOM System Engineering*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.407		-		-		-	0.000	0.407	-
		Subtotal	-	-		0.407		-		-		-	0.000	0.407	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Protected Communications and WGS Communications	TBD	Various : APG, MD	-	0.580	Apr 2021	0.752	Apr 2022	0.752	Apr 2023	-		0.752	0.000	2.084	-
Protected Tactical Waveform (PTW) Modem Development	C/IDDQ	To Be Determined : To Be Determined	-	10.912	Apr 2021	7.710	Mar 2022	-		-		-	0.000	18.622	-
		Subtotal	-	11.492		8.462		0.752		-		0.752	0.000	20.706	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering (In House)	MIPR	PM WIN-T : APG, MD	-	0.330	Dec 2020	0.647	Dec 2021	-		-		-	0.000	0.977	-
Engineering Contractor Support	C/CPFF	PM WIN-T : APG, MD	-	1.546	Jan 2021	1.191	Dec 2021	-		-		-	0.000	2.737	-
System Architecture and Analysis Support	MIPR	CERDEC : APG, MD	-	0.208	Sep 2021	-		1.568	Dec 2022	-		1.568	0.000	1.776	-
		Subtotal	-	2.084		1.838		1.568		-		1.568	0.000	5.490	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	MIPR	CERDEC : APG, MD	-	0.214	Aug 2021	0.435	Dec 2021	0.600	Dec 2022	-		0.600	0.000	1.249	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.214		0.435		0.600		-		0.600	0.000	1.249	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	13.790		11.142		2.920		-		2.920	0.000	27.852	N/A

Remarks

In FY 2023 funding was realigned from PE 123142A / 456 to 1203142A / CO7 (Protected Tactical Satellite Communications)

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

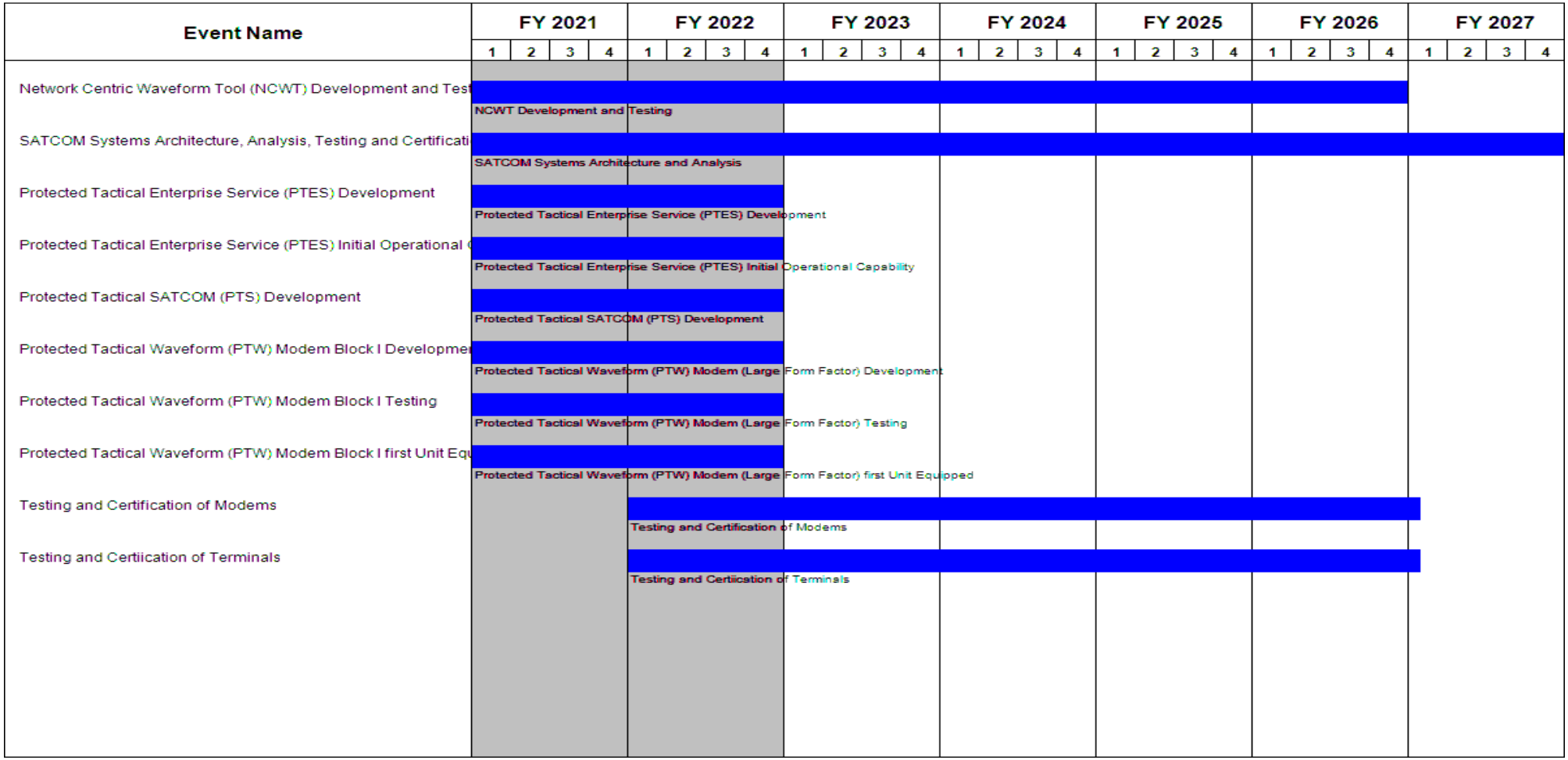

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Network Centric Waveform Tool (NCWT) Development and Testing	1	2021	4	2026
SATCOM Systems Architecture, Analysis, Testing and Certification	1	2021	4	2027
Protected Tactical Enterprise Service (PTES) Development	1	2021	4	2022
Protected Tactical Enterprise Service (PTES) Initial Operational Capability	1	2021	4	2022
Protected Tactical SATCOM (PTS) Development	1	2021	4	2022
Protected Tactical Waveform (PTW) Modem Block I Development	1	2021	4	2022
Protected Tactical Waveform (PTW) Modem Block I Testing	1	2021	4	2022
Protected Tactical Waveform (PTW) Modem Block I first Unit Equipped	1	2021	4	2022
Testing and Certification of Modems	1	2022	1	2027
Testing and Certiication of Terminals	1	2022	1	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) CO7 / *Protected Tactical Satellite Communications*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CO7: *Protected Tactical Satellite Communications*	-	-	-	7.569	-	7.569	6.079	5.153	5.153	5.151	0.000	29.105
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Cross Functional Team.

Protected Anti-jam Tactical SATCOM (Protected SATCOM) fills a critical communications gap for Anti-jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the Army tactical terminals to be resilient in a contested environment and protect against catastrophic loss of situational awareness and command and control during critical battle movement with Anti-jam capabilities.

Air Force/Army Anti-Jam Modem (A3M) will offer tactical Army protection against interference that is either intentional or unintentional. These DoD Joint efforts are synchronized with United States Space Force (USSF) and Army for execution of Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), Protected Tactical Satellites (PTS), and commercial SATCOM systems.

Protected Anti-jam Tactical SATCOM is a continuation of efforts previously funded under the MILSATCOM System Engineering 0303142A/456 line. Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts. Protected Tactical Anti-jam SATCOM supported initial development, testing and certification of production representative PTW modems, incorporating Army specific requirements, to support continued spiral development of critical protected communications capabilities to address resiliency in jamming environments. The Protected/Resilient SATCOM Abbreviated - Capabilities Development Document was validated and approved in June 2021.

FY23 funding in the amount of $7.569M will support Protected SATCOM modem development, test and evaluation, system engineering, program management, and development of training materials and data rights.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: PTW Block I Modem Development	-	-	5.524
Description: PTW Development of Block I Modems (formerly referred to as Large Form Factor) supports development and engineering of Army specific requirements for the PTW modems that will be utilized for protected tactical communications.			
FY 2023 Plans: Funding supports system test and evaluation and development of Block I Modems.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Previously funded effort under project 456. Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts.			
Title: Logistics Support and Data Development ***Description:*** Funding supports the total documentation (training, tech manuals) and logistics support package. The efforts associated with the design, development, and production of prototype training equipment, and the execution of training services. Transforming data into Government format, Technical data providing instructions for installation, operation, maintenance, training, and support, formatted into a technical manual. The data items necessary for configuration management, required by the Government. The data items designed to document support planning in accordance with functional categories. Cost decreased aligning existing terminal TSP and TM approved products resulting in less government requirements. ***FY 2023 Plans:*** Funding supports development of training materials for Block I/II modems ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Previously funded effort under project 456. Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts.	-	-	0.208
Title: Government System Engineering and Program Management Support (SEPM) ***Description:*** Funding supports Government System Engineering and Program Management (SEPM) which includes programmatic personnel, travel, and other related administrative costs. Government Program Management consists of matrix personnel labor and travel requirements. This includes all required program oversight, system engineering and technical control, risk management, and fielding support. CORE Government program management is paid with OMA. Cost decreased and forecasted with current with matrix staffing levels. ***FY 2023 Plans:*** Funding support SEPM efforts related to Block I/II modem development ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Previously funded effort under project 456.	-	-	0.359

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts.			
Title: Contractor System Engineering and Program Management Support (SEPM) ***Description:*** Funding supports Contractor System Engineering and Program Management (SEPM) which includes programmatic personnel (program analyst, budget analyst, engineer, etc.), travel, and other related administrative costs. No change ***FY 2023 Plans:*** Funding supports Contractor System Engineering and Program Management (SEPM) which includes programmatic personnel (program analyst, budget analyst, engineer, etc.), travel, and other related administrative costs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Previously funded effort under project 456. Funding supports Contractor System Engineering and Program Management (SEPM) which includes programmatic personnel (program analyst, budget analyst, engineer, etc.), travel, and other related administrative costs.	-	-	0.454
Title: Test and Certification ***Description:*** Funding for Gov?t led labor for testing and certification. New Planned Accomplishment. ***FY 2023 Plans:*** FY 2023 Gov?t led labor for testing and certification ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Previously funded effort under project 456. Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts.	-	-	1.024
Accomplishments/Planned Programs Subtotals	-	-	7.569

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

C. Other Program Funding Summary ($ in Millions)

Remarks

This is not a new start. Effort was previously funded under project 456.

Funds transferred in FY23 from project 456 to project C07 under the same program element 0303142A to fund continuing Protected Anti-jam Tactical SATCOM and Protected Tactical Waveforms (PTW) efforts. Procurement funding line Parent BC4000/B34002 (baby) begins in FY23 ($5.853M).

D. Acquisition Strategy

Protected Anti-jam Tactical SATCOM (Protected SATCOM) is a Joint effort with United States Space Force (USSF) for development. There is a current USSF Acquisition Strategy (AS), and Memorandum of Agreement (MOA) signed 14 June 2019 with Space Force for collaborative modem development and cost sharing for A3M Block I modem. The program will leverage contracts established by USSF for the development of Protected Tactical Waveform (PTW) modems, including development of a small form factor modem capable of running the PTW and Network Centric Waveform - Resilient (NCW-R). Two multi-vendor USSF IDIQ contracts are being utilized for modem development efforts concluding in FY23. In FY24, Army will lead A3M Block II modem development efforts, which will be awarded to a single vendor IDIQ contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) CO7 / *Protected Tactical Satellite Communications*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Enginnering and Program Management	MIPR	Various : APG	-	-		-		0.359	Dec 2022	-		0.359	0.000	0.359	-
Contractor Systems Engineering and Program Support	MIPR	Various : APG	-	-		-		0.454	Dec 2022	-		0.454	0.000	0.454	-
		Subtotal	-	-		-		0.813		-		0.813	0.000	0.813	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Logistics Support and Data Development	MIPR	APG : APG	-	-		-		0.208	Dec 2022	-		0.208	0.000	0.208	-
PTW Development of Block I Modems	C/FPIF	L3 Harris, Raytheon : Massachusetts	-	-		-		5.524	Oct 2022	-		5.524	0.000	5.524	-
		Subtotal	-	-		-		5.732		-		5.732	0.000	5.732	N/A

Test and Evaluation ($ in Millions)

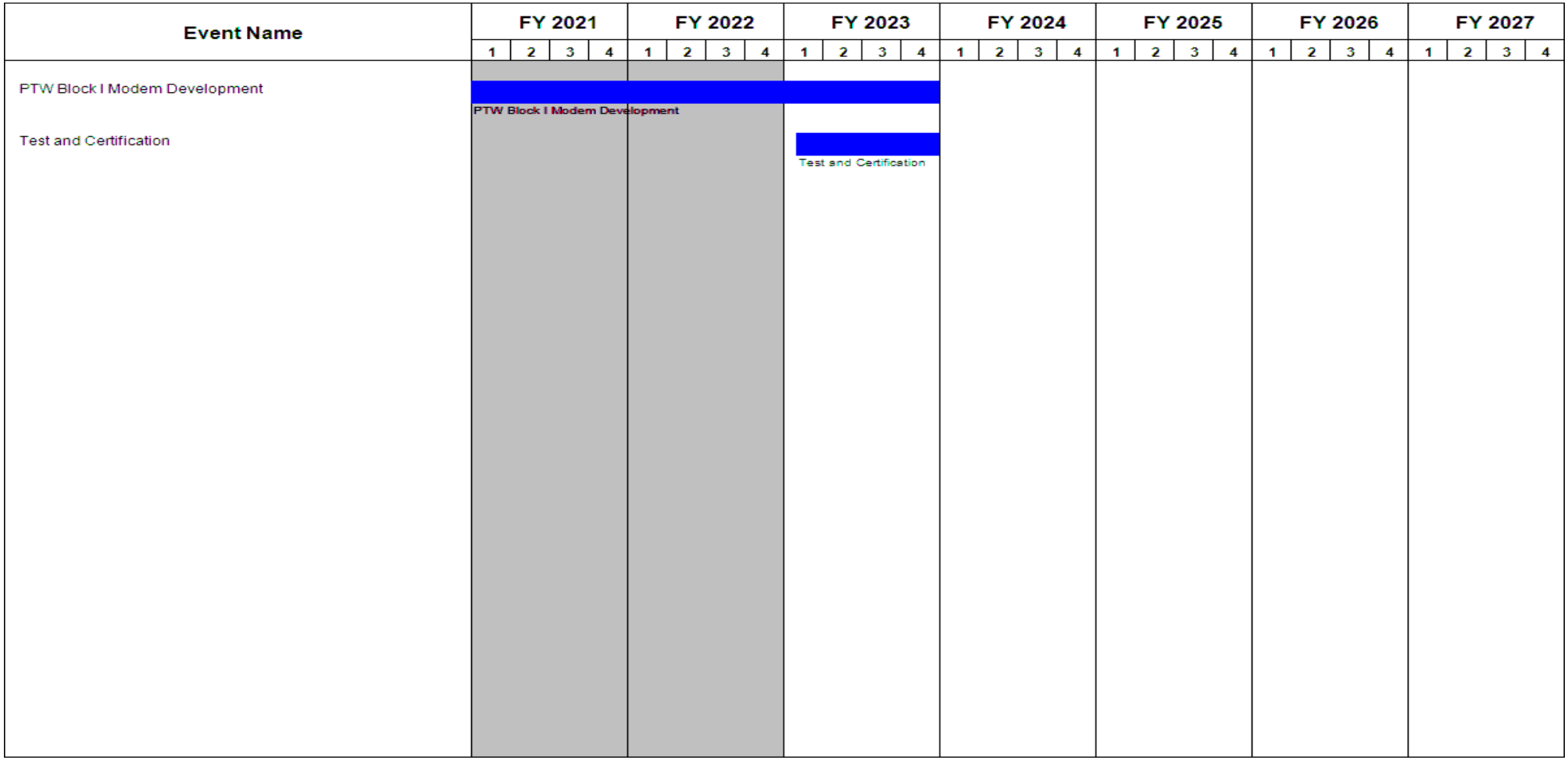
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	TBD	TBD : TBD	-	-		-		1.024	Nov 2022	-		1.024	0.000	1.024	-
		Subtotal	-	-		-		1.024		-		1.024	0.000	1.024	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		7.569		-		7.569	0.000	7.569	N/A

Remarks

This is not a new start. Effort was previously funded under project 456.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*



Note

This is not a new start. Effort was previously funded under project 456.

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PTW Block I Modem Development	2	2020	4	2023
Test and Certification	1	2023	4	2023

Note

This is not a new start. Effort was previously funded under project 456.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305179A / *Integrated Broadcast Service (IBS)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.382	5.430	9.926	-	9.926	9.655	5.951	1.745	1.762	0.000	34.851
EF4: *Integrated Broadcast System*	-	0.382	5.430	9.926	-	9.926	9.655	5.951	1.745	1.762	0.000	34.851

A. Mission Description and Budget Item Justification

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts in support of Air and Missile Defense, Long Range Precision Fires, Soldier Lethality, and Network Command, Control, Communications and Intelligence Cross Functional Teams and Tactical Intelligence Targeting Access Node. The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The Joint Tactical Terminal (JTT) is the official IBS system and ensures continued IBS interoperability to a variety of tactical producers and consumers across the Joint Services. The transmit/receive-capable JTT systems currently consist of the JTT-Senior and JTT-IBS configurations. The JPO is executing updates to the JTT terminal to incorporate Mobile User Objective System-Wideband Code Division Multiple Access (WCDMA) elements based on modernization requirements.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.382	5.430	0.000	-	0.000
Current President's Budget	0.382	5.430	9.926	-	9.926
Total Adjustments	0.000	0.000	9.926	-	9.926
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.926	-	9.926

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305179A / *Integrated Broadcast Service (IBS)*	Project (Number/Name) EF4 / *Integrated Broadcast System*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EF4: *Integrated Broadcast System*	-	0.382	5.430	9.926	-	9.926	9.655	5.951	1.745	1.762	0.000	34.851
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Program Office (JPO) for Integrated Broadcast Service (IBS) Terminals supports the Joint Services and the Special Operations Command (SOCOM). The JPO is responsible for coordinating modernization and sustainment of IBS terminals compatible with the UHF SATCOM IBS broadcasts in support of Air and Missile Defense, Long Range Precision Fires, Soldier Lethality, and Network Command, Control, Communications and Intelligence Cross Functional Teams and Tactical Intelligence Targeting Access Node. The IBS transmits worldwide time-sensitive tactical and strategic intelligence and targeting data to all echelons of Joint Service operational users. The Joint Tactical Terminal (JTT) is the official IBS system and ensures continued IBS interoperability to a variety of tactical producers and consumers across the Joint Services. The transmit/receive-capable JTT systems currently consist of the JTT-Senior and JTT-IBS configurations. The JPO is executing updates to JTT systems to incorporate Mobile User Objective System-Wideband Code Division Multiple Access (WCDMA) based on modernization requirements. The IBS network uses Type-1 encryption, Common Interactive Broadcast (CIB), and Common Message Format (CMF).

FY 2023 RDTE Dollars in the amount of $9.926M will be used for Vendor terminal software development and porting, vendor testing and evaluation, independent testing, integration and certification by government and contracting agencies (JITC, NSA, Navy, General Dynamics) in support of IBS and MUOS modernization efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Support Costs and Management Services	0.382	0.500	2.501
Description: Engineering and Testing support ***FY 2022 Plans:*** Will continue testing support. ***FY 2023 Plans:*** Will continue engineering and testing support to obtain operational certification from external agencies to include JITC, Navy SSC PAC and General Dynamics ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased engineering support for modernization and migration to WCDMA. Program will start more expansive and extensive test efforts to support modernization.			
Title: Modernization Efforts	-	4.930	7.425

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305179A / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** EF4 / *Integrated Broadcast System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Joint Tactical Terminal (JTT) and Integrated Broadcast Services (IBS) modernization efforts.' ***FY 2022 Plans:*** Funds are required to initiate Joint Tactical Terminal (JTT) and Integrated Broadcast Services (IBS) modernization efforts. ***FY 2023 Plans:*** Funds are required to continue Joint Tactical Terminal (JTT) and Integrated Broadcast Services (IBS) modernization efforts to include design reviews, MUOS SW development and porting, SW prototyping, integration and testing, SW configuration management, IBS-LEO/IBS-Alt path upgrades and support to MUOS testing, MIL-STD compliance & certification. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in technical requirements, documentation, and software development efforts to modernize IBS architecture with WCDMA architecture.			
Accomplishments/Planned Programs Subtotals	0.382	5.430	9.926

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• V29600: *JTT/CIBS-M*	5.304	5.463	2.352	-	2.352	0.509	0.508	0.510	0.509	0.000	15.155

Remarks

FY 2023 funds continue support of the modernized JTT acquisition as well as the IBS/WCDMA modernization efforts.

D. Acquisition Strategy

The Integrated Broadcast Service (IBS) was designed to consolidate legacy broadcasts into an interoperable set of broadcasts that can carry threat warning and situational data to both users and producers. The requirement for IBS is documented in the Integrated SIGINT Information Mission Needs Statement (MNS) validated by the Joint Requirements Oversight Council (JROC) Memo (JROCM) 115-95 on 15 September 1995. The JTT program is an effort to provide common tactical terminals capable of receiving and transmitting into the IBS UHF broadcasts. The House Permanent Select Committee for Intelligence (HPSCI) requested an IBS Implementation Plan, which was approved by the Assistant Secretary for Defense for Command, Control, Communications and Intelligence (ASD/C3I) (ref (i)) on 24 October 1995. The JTT was included as part of the solution in the Implementation Plan. The JTT program Operational Requirements Document (ORD) was signed on 24 September 1996. Subsequent updates in March 2005 and November 2017 were made to reflect changes in interoperability/Net Readiness certifications and Post Milestone C enhancements respectively. Additional fact of life administrative changes were made and the updated ORD was signed on 25 April 2018. The JTT is integrated into platforms that have a requirement to interact (transmit and/or receive) with the IBS Common Interactive Broadcast (CIB). The legacy IBS Terminals will reach sustainment end-of-life in FY2027. The award of a post-Milestone C contract was completed to replace the end-of-life systems, leverage updated technology, and

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305179A / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** EF4 / *Integrated Broadcast System*

enable flexible configurations to meet Joint customer operational needs. To support IBS architecture modernization efforts, the Next generation JTT will incorporate MUOS and needed IBS upgrades into the software baseline in order to keep pace with evolving SATCOM requirements, IBS operational needs, and obsolescence.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305179A / *Integrated Broadcast Service (IBS)*	Project (Number/Name) EF4 / *Integrated Broadcast System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
User Support	MIPR	ICOE : Fort Huachuca, AZ	0.046	-		-		-		-		-	0.000	0.046	-
Project Management Support	Allot	PM IS&A : APG, MD; Fort Huachuca, AZ	0.075	-		-		0.575	Nov 2022	-		0.575	0.000	0.650	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	Allot	PM DCGS-A : APG, MD	0.002	-		-		-		-		-	0.000	0.002	-
		Subtotal	0.123	-		-		0.575		-		0.575	0.000	0.698	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IBS Modernization	MIPR	TBD : DRS; Dayton, OH	0.448	-		4.930	Jan 2022	7.425	Feb 2023	-		7.425	0.000	12.803	-
Integration and Testing of JTT fleet Modernization	MIPR	JITC : Fort Huachuca, AZ; APG,MD, SSC PAC, GD-Scottsdale	1.088	0.382	Jun 2021	0.500	Jun 2022	1.926	Jan 2023	-		1.926	0.000	3.896	-
		Subtotal	1.536	0.382		5.430		9.351		-		9.351	0.000	16.699	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.659	0.382		5.430		9.926		-		9.926	0.000	17.397	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305179A / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** EF4 / *Integrated Broadcast System*

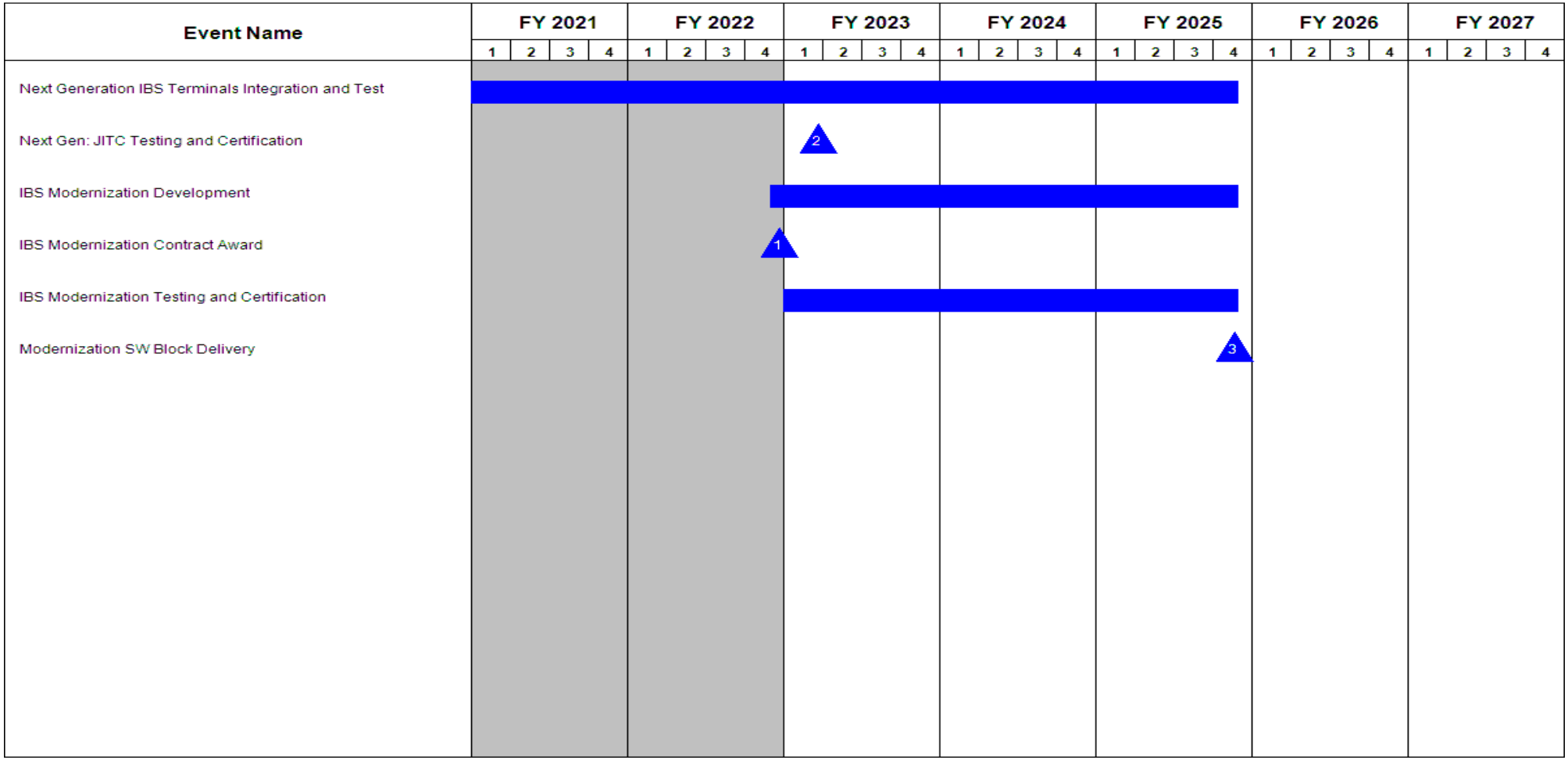


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305179A / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** EF4 / *Integrated Broadcast System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation IBS Terminals Integration and Test	2	2020	4	2025
Next Gen: JITC Testing and Certification	1	2023	1	2023
IBS Modernization Development	4	2022	4	2025
IBS Modernization Contract Award	4	2022	4	2022
IBS Modernization Testing and Certification	1	2023	4	2025
Modernization SW Block Delivery	4	2025	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	38.151	8.410	4.500	-	4.500	0.000	0.000	0.000	0.000	0.000	51.061
11A: *Advanced Payload Develop & Spt*	-	34.246	8.410	4.500	-	4.500	-	-	-	-	0.000	47.156
123: *Joint Technology Center System Integration*	-	3.905	-	-	-	-	-	-	-	-	0.000	3.905

A. Mission Description and Budget Item Justification

Project 11A Advanced Payload Develop & Spt: The Advanced Payloads Development project is a shared funding line between multiple payload programs. These payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Common Sensor Payload (CSP) - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums with day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities. Current product improvements continue to focus on the development and implementation of the Target Location Accuracy (TLA) capabilities that directly support emerging requirements of the Army's Current and Future Force.

Project 123 Joint Technology Center System Integration: The UAS Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a Joint facility that develops, integrates, and supports the enhancement of its Multiple Unified Simulation Environment (MUSE) capability for Army systems and operational concepts. The JTC/SIL conducts prototype hardware and software development, builds the UAS Institutional Mission Simulator (IMS) trainers for the Shadow, Hunter, and Gray Eagle programs, and provides modeling and simulation support. The MUSE is a real-time, operator in-the-loop simulation that may be integrated with larger simulations in support of Army and Joint training and exercises. The MUSE is also employed as a Mission Rehearsal Tool for ongoing combat operations. This project funds the management of the JTC/SIL and MUSE enhancements. This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

Fiscal Year (FY) 2023 funds in the amount of $4.500 million will fund the completion of testing the TLA upgrade to the CSP to support combat or direct combat support expenses for Operation Inherent Resolve. TLA will begin production in FY2023.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army					Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0305204A *I Tactical Unmanned Aerial Vehicles*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	38.151	8.410	0.000	-	0.000
Current President's Budget	38.151	8.410	4.500	-	4.500
Total Adjustments	0.000	0.000	4.500	-	4.500
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.500	-	4.500

Change Summary Explanation

Fiscal Year (FY) 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
11A: *Advanced Payload Develop & Spt*	-	34.246	8.410	4.500	-	4.500	-	-	-	-	0.000	47.156
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Payloads Development project is a shared funding line between multiple payload programs. These payload programs support the Army's transformation by developing Reconnaissance, Surveillance and Target Acquisition (RSTA) and Intelligence, Surveillance and Reconnaissance (ISR) payload systems for Brigade Combat Teams, Divisions, and Corps Unmanned Aircraft Systems (UAS). This is in accordance with Headquarters Department of the Army (HQDA) and Training and Doctrine Command (TRADOC) UAS priorities. Additionally, this Program Element (PE) supports Future Advanced Payloads for Army UAS systems.

Common Sensor Payload (CSP) - Acquisition Category (ACAT) III - Electro Optical / Infrared / Laser Designator (EO/IR/LD) provides Standard Definition (SD) or High Definition (HD) Full Motion Video (FMV) in both the Electro Optical and Mid Wave IR spectrums. These systems provide day/night capability to collect and display continuous imagery and the ability to designate targets of interest for attack by laser guided precision weapons. It is the EO/IR/LD sensor for the Gray Eagle UAS which supports intelligence gathering, force applications, battlespace awareness, force protection, and net-centric operations across the battlefield to provide wide area, near real time RSTA capabilities.

Fiscal Year (FY) 2023 funds in the amount of $4.500 million will fund the completion of testing the Target Location Accuracy (TLA) upgrade to the Common Sensor Payload (CSP) to support combat or direct combat support expenses for Operation Inherent Resolve. TLA provides validated, precision geolocation data for real-time targeting by coordinate-seeking weapons, reducing the kill chain timeline from minutes to seconds. TLA begins production in FY 2023.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: CSP Increased Usability and Lethality	34.246	8.410	4.500
Description: Software and Hardware developments to increase lethality and usability of the CSP while reducing cognitive burden on the Warfighter.			
FY 2022 Plans: Complete TLA contractor Qualification testing, perform platform integration and conduct government testing			
FY 2023 Plans: Funds the completion of testing the Target Location Accuracy (TLA) upgrade to the CSP.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Fiscal Year (FY) 2023 decrease is due to the completion of TLA development effort.			
Accomplishments/Planned Programs Subtotals	34.246	8.410	4.500

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A01005: *CSP FMV*	-	-	57.700	-	57.700	-	-	-	-	0.000	57.700

Remarks

D. Acquisition Strategy

The Enhanced Electro-Optical (EO)/Infrared (IR) Capability Production Document, approved 19 December 2016, defines additional Key Performance Parameter (KPP) requirements for the Full Motion Video (FMV) sensor on the Gray Eagle platform. The first KPP increases detection, recognition, and identification requirements which can only be met with the High Definition (HD) variation of the Common Sensor Payload (CSP). Currently, units are being fielded with HD CSPs, with additional HD CSPs in production and retrofit. The second KPP requirement is for the CSP to be a metric sensor providing rapid and enhanced Target Location Accuracy (TLA). A five (5) year follow-on production and system support contract was awarded in 2019 for integration, test, upgrade, and sustainment of these enhanced capabilities. The FY 2023 acquisition strategy for CSP includes the completion of testing supporting CSP-TLA development

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP Program Management	MIPR	PM EOIR : Fort Belvoir, VA	3.139	3.456	Dec 2020	1.761	Feb 2022	0.290	Dec 2022	-		0.290	0.000	8.646	-
		Subtotal	3.139	3.456		1.761		0.290		-		0.290	0.000	8.646	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP HW/SW Improvements Reduce Cognitive Burden	MIPR	Night Vision Labs : Fort Belvoir, VA	4.590	-		-		-		-		-	0.000	4.590	-
CSP Target Location Accuracy (TLA)	SS/CPFF	Raytheon : McKinney, TX	14.963	20.545	Dec 2020	0.025	Feb 2022	-		-		-	0.000	35.533	-
CSP TLA Integration	MIPR	Various : Various	3.755	7.346	Jan 2021	0.631	Apr 2022	-		-		-	0.000	11.732	-
Training Development	TBD	i3 : Huntsville, AL	-	-		0.878	Apr 2022	0.640	Apr 2023	-		0.640	0.000	1.518	-
		Subtotal	23.308	27.891		1.534		0.640		-		0.640	0.000	53.373	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSP Testing (TLA)	MIPR	Various : Various	-	-		0.583	Apr 2022	3.570	Nov 2022	-		3.570	0.000	4.153	-
CSP Qual Testing (TLA)	SS/CPFF	Raytheon : McKinney, TX	2.302	2.899	Sep 2021	-		-		-		-	0.000	5.201	-
CSP TLA NGA Validation	SS/TBD	General Atomics : Poway, CA	-	-		4.532	Aug 2022	-		-		-	0.000	4.532	-
		Subtotal	2.302	2.899		5.115		3.570		-		3.570	0.000	13.886	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 11A / *Advanced Payload Develop & Spt*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.749	34.246		8.410		4.500		-		4.500	0.000	75.905	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial V ehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt*

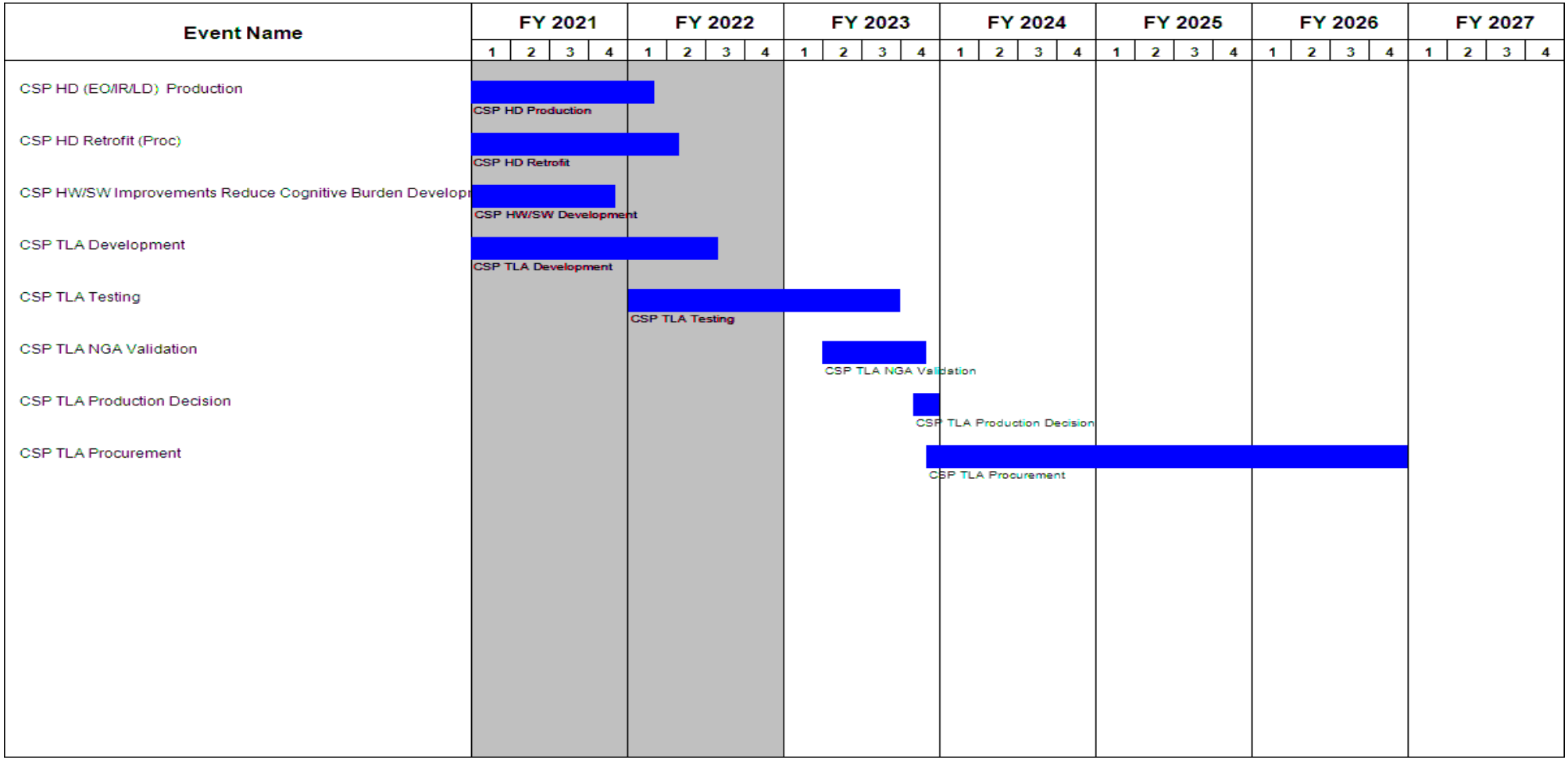


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 11A / *Advanced Payload Develop & Spt*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CSP HD (EO/IR/LD) Production	2	2013	1	2022
CSP HD Retrofit (Proc)	4	2013	2	2022
CSP HW/SW Improvements Reduce Cognitive Burden Development	1	2016	4	2021
CSP HW/SW Improvements Reduce Cognitive Burden Testing / Integration	3	2017	4	2020
CSP TLA Development	4	2018	3	2022
CSP TLA PDR/CDR	1	2020	1	2020
CSP TLA Testing	1	2022	3	2023
CSP TLA NGA Validation	2	2023	4	2023
CSP TLA Production Decision	4	2023	4	2023
CSP TLA Procurement	4	2023	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 123 / *Joint Technology Center System Integration*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
123: *Joint Technology Center System Integration*	-	3.905	-	-	-	-	-	-	-	-	0.000	3.905
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program development discontinued for transition to sustainment

A. Mission Description and Budget Item Justification

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a Joint facility that supports UAS and RPA programs within the Joint Services by providing the system engineering, test and integration, interoperability, rapid technology insertion and develops training capability to include the MUSE/AFSERS system. This project funds the management of the JTC/SIL and MUSE/AFSERS Enhancements

The Multiple Unified Simulation Environment (MUSE) is the DoD simulation/training system for Unmanned Aircraft Systems (UAS), RPA, and ISR systems. MUSE is also known as the Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) in its Air Force Application. The MUSE/AFSERS is a software suite that simulates ISR & strike systems, tailored air vehicle & data links, and visualization systems used for payload product outputs-including Full Motion Video (FMV), Fixed Frame Imagery (FFI), Ground Moving Target Indicator (GMTI) data, and Link 16 (J2.2 and J3.5) tracking messages. Outputs are compliant with applicable DoD standards and are continually tested against actual ground ISR processors to ensure interoperability with over 40 systems within DoD.

The MUSE/AFSERS creates a realistic operational environment which supports the ability to assess military utility, architecture and concept of employment development, Tactics, Techniques, and Procedures (TTP) refinement, practice Processing, Exploitation, and Dissemination (PED) of intelligence information, conduct emerging concepts experimentation, and optimize tactical operations within warfighting exercises and experiments. MUSE/AFSERS is currently in use across Services and most unified commands simulating MQ-1, MQ-9, RQ-4, MQ-1C, M/RQ-5, RQ-7, national and commercial satellite collectors, P-3, E-8, and the U-2. During warfighting exercises, the MUSE/AFSERS provides National Imagery Transmission Format (NITF) images for associated C4ISR systems to support the execution of PED. The MUSE/AFSERS is also used as a mission rehearsal tool for current, on-going military combat operations. Most of the components of the MUSE/AFSERS software suite are also used in multiple UAS RPA system training devices including those for the RQ-7 [Shadow], MQ-1C [Gray Eagle], M/RQ-5 [Hunter], MQ-9 [Medium Altitude Long Endurance Tactical (MALET) JSIL Aircrew Trainer (MJAT)] and RQ-4 [Global Hawk Sensor Operator Part Task Trainer (GHSOPTT) and Global Hawk Weapon System Trainer (WST)].

This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Product Development	3.455	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 123 / *Joint Technology Center System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Funding is provided for the following efforts planned each Fiscal Year (FY).			
Title: Management Services ***Description:*** Funding is provided for the following efforts.	0.450	-	-
Accomplishments/Planned Programs Subtotals	3.905	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PE 0305206F Air Force: *PE 0305206F Air Force*	3.607	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing

Remarks

The JTC/SIL and the MUSE receive funding from the Air Force, Program Element (PE) 0305206F. This effort is a continuing effort in support of Service UAS programs.

D. Acquisition Strategy

The acquisition strategy is to continue MUSE development which will be accomplished through a combination of Government in-house functional directorate support using a variety of existing contract vehicles.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305204A / *Tactical Unmanned Aerial Vehicles*	Project (Number/Name) 123 / *Joint Technology Center System Integration*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL	4.639	0.450	Oct 2020	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	4.639	0.450		-		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MUSE Development	MIPR	AMC, AMCOM, AMRDEC, SED : Redstone Arsenal, AL	29.853	3.455		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	29.853	3.455		-		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability Support	MIPR	AMC, RDECOM, AMRDEC : Redstone Arsenal, AL	9.460	-		-		-		-		-	0.000	9.460	-
		Subtotal	9.460	-		-		-		-		-	0.000	9.460	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	43.952	3.905		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 123 / *Joint Technology Center System Integration*

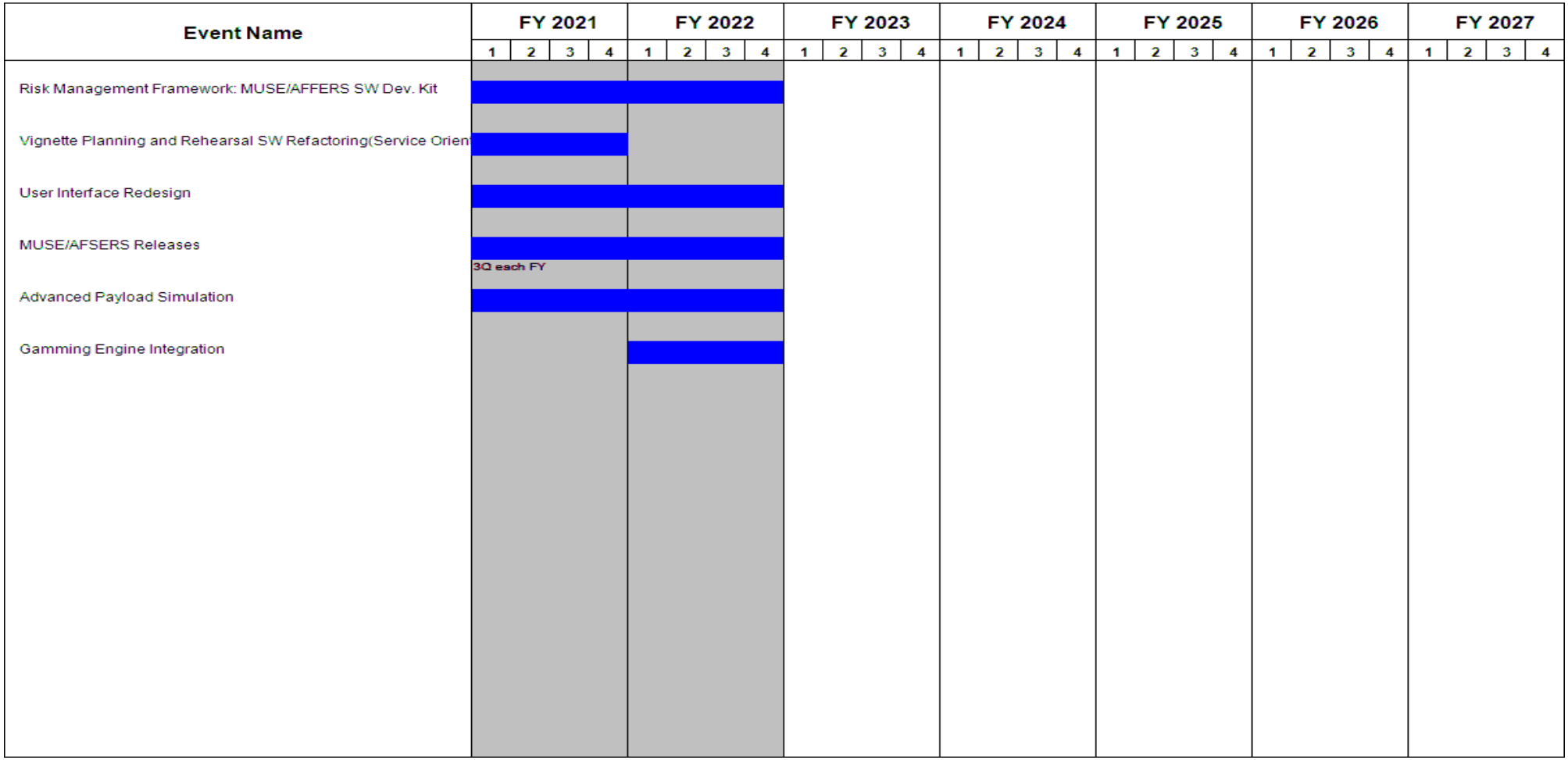


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305204A / *Tactical Unmanned Aerial Vehicles*	**Project (Number/Name)** 123 / *Joint Technology Center System Integration*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Windows Entity Server and NetLink Redesign	1	2015	3	2016
Risk Management Framework: MUSE/AFFERS SW Dev. Kit	3	2015	4	2022
Vignette Planning and Rehearsal SW Refactoring(Service Oriented Architecture)	2	2015	4	2021
Incorporate Command and Control Using STANAG 4586	1	2016	3	2017
Generic 6 Degrees of Freedom	1	2017	4	2018
Web Based MUSE/AFSERS	1	2018	4	2019
Integration of Night Vision Image Generator (NVIG)	2	2019	4	2020
User Interface Redesign	1	2015	4	2022
MUSE/AFSERS Releases	3	2015	4	2022
Advanced Payload Simulation	1	2021	4	2022
Gamming Engine Integration	1	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	28.858	24.460	17.165	-	17.165	20.368	27.936	27.946	28.218	0.000	174.951
EH2: *EMARSS ADV DEV*	-	1.998	1.834	2.096	-	2.096	5.886	19.446	19.453	19.642	0.000	70.355
EH3: *EMARSS Payloads ADV DEV*	-	6.290	11.194	15.069	-	15.069	7.124	7.190	7.192	7.262	0.000	61.321
EH5: *ARL Payloads ADV DEV*	-	16.574	7.417	-	-	-	7.358	1.300	1.301	1.314	0.000	35.264
EH7: *Guardrail Common Sensor (GRCS) Payloads*	-	3.996	4.015	-	-	-	-	-	-	-	0.000	8.011

A. Mission Description and Budget Item Justification

Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's newest generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the United States (U.S.) Army Intelligence and Security Command (INSCOM) Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. EMARSS is also assigned to the United States Army Training and Doctrine Command (TRADOC) in support of training at the US Army Intelligence Center of Excellence (USAICoE). The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT). Budget Item Justification is addressed in each Project.

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 in accordance with the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) enabled workstations. ARL-E will be assigned to the U.S. Army INSCOM AISR Brigade providing support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine (9). The Mission Equipment Package (MEP) objective is eight (8). Budget Item Justification is addressed in each Project.

The RC-12X Guardrail Common Sensor (GRCS) is a fixed-wing, airborne COMINT and Electronic Intelligence (ELINT) collection and precision targeting location system. GRCS provides a persistent capability to detect, locate and classify/identify high value targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) U.S. Army INSCOM Aerial Exploitation Battalions providing AISR support to combatant commanders. The Army's Acquisition Objective/Army's Procurement Objective is 19 RC-12X; seven (7) fielded to 3rd Military Intelligence Battalion (MI BN); and seven (7) fielded to the 204th MI BN, and five (5) trainers within TRADOC and INSCOM. Budget Item Justification is addressed in each Project.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305206A *I Airborne Reconnaissance Systems*

Guardrail Common Sensor (GRCS) is currently the most capable Army Aerial Intelligence, Surveillance and Reconnaissance (AISR) system that currently provides Signals Intelligence (SIGINT) capabilities to support long range targeting of peer threats in an Anti-Access Area Denial (A2AD) environment.

Research Development Technology & Evaluation (RDT&E) and procurement funding currently planned will address obsolescence issues for critical SIGINT and Electronic Intelligence (ELINT) capabilities on the GRCS platform. These investments ensure GRCS AISR support in the A2AD environment is not impacted, which would prevent critical intelligence collection at large standoff which is needed to address long range targeting of peer threats and maintain system relevancy.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	28.858	24.460	0.000	-	0.000
Current President's Budget	28.858	24.460	17.165	-	17.165
Total Adjustments	0.000	0.000	17.165	-	17.165
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	17.165	-	17.165

Change Summary Explanation

Fiscal Year (FY) 2023 funding increase reflects the fact that the FY 2022 President's Budget did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH2 / *EMARSS ADV DEV*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EH2: *EMARSS ADV DEV*	-	1.998	1.834	2.096	-	2.096	5.886	19.446	19.453	19.642	0.000	70.355
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's newest generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the United States (U.S.) Army INSCOM Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. EMARSS is also assigned to the United States Army Training and Doctrine Command (TRADOC) in support of training at the US Army Intelligence Center of Excellence (USAICoE). The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT).

The FY21 funding line of $1.998 million supported Non-Recurring Engineering (NRE), development of Type Certificates (TC), testing and integration of Army Aerial Intelligence, Surveillance and Reconnaissance (AISR) systems. The FY23 funding line of $2.096 million supports NRE, development of TC, testing, integration of Modifications in Service of current or future EMARSS AISR systems. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards and future integration efforts supporting A-ISR modernization in the Multi-Domain Operations (MDO) environment. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) to include integration of Air Launched Effects onto Army fixed wing platforms; integration of AISR mission equipment package (MEP); as well as solving obsolescence issues and increasing commonality across EMARSS aircraft.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Non-Recurring Engineering	1.998	1.834	2.096
Description: This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of current or future EMARSS Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) to include integration of Air Launched Effects onto Army fixed wing platforms; integration of AISR mission equipment package (MEP); as well as solving obsolescence issues and increasing commonality across EMARSS aircraft.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 / *EMARSS ADV DEV*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
This funding line supports non-recurring engineering (NRE), development of type certificates (TC), testing, integration of Modifications in Service of current or future EMARSS Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards and future integration efforts supporting A-ISR modernization in the Multi-Domain Operations (MDO) environment. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) to include integration of Air Launched Effects onto Army fixed wing platforms; integration of AISR mission equipment package (MEP); design and integration of Modular Open System Architecture (MOSA) onto Army fixed wing platforms as well as solving obsolescence issues and increasing commonality across EMARSS aircraft. ***FY 2023 Plans:*** This funding line supports NRE, development of TC, testing, studies, integration of Modifications in Service of current or future EMARSS Army Aerial, Intelligence, Surveillance and Reconnaissance (AISR) systems. Funding provides for the integration of Department of Defense (DoD) mandated safety equipment to meet current and evolving International Standards and future integration efforts supporting A-ISR modernization in the Multi-Domain Operations (MDO) environment. It also enhances aircraft communications, navigations and surveillance (CNS); aircraft survivability equipment (ASE) to include integration of Air Launched Effects onto Army fixed wing platforms; integration of AISR mission equipment package (MEP); design and integration of Modular Open System Architecture (MOSA) onto Army fixed wing platforms as well as solving obsolescence issues and increasing commonality across EMARSS aircraft. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Successfully completed prior year NRE activities. The $2.096 million in FY2023 allows for completion of additional NRE efforts as listed in the FY 2023 Base Plan above.			
Accomplishments/Planned Programs Subtotals	1.998	1.834	2.096

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A02112: *EMARSS SEMA MODS*	28.912	1.568	1.591	-	1.591	2.033	27.697	27.950	28.197	Continuing	Continuing
• AZ2054: *EMARSS PAYLOADS*	15.204	9.912	0.456	-	0.456	3.124	3.418	3.434	3.422	Continuing	Continuing
• EH3: *EMARSS Payloads ADV DEV*	6.290	11.194	15.069	-	15.069	7.124	7.190	7.192	7.262	0.000	61.321

Remarks

The EMARSS Research Development Technology & Evaluation (RDT&E) efforts are found in the following two project lines; 0305206AEH2 EMARSS ADV DEV (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting Aircraft Procurement Army (APA

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 / *EMARSS ADV DEV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

lines are A02112 (P-1 Line #24) for Fixed Wing and AZ2054 (P-1 Line #19) for Aerial Intelligence. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

D. Acquisition Strategy

The acquisition strategy, supported by the EMARSS Capabilities Production Document (CPD), is to design, test and field 24 systems as well as provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-optical/Infrared (EO/IR)/Full Motion Video (FMV); Communications Intelligence (COMINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) radar; line-of-site (LOS) and beyond line-of-site (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations. The EMARSS fleet of 23 systems consists of the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); seven (7) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT); one (1) aircraft was damaged beyond economical repair.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH2 / *EMARSS ADV DEV*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO	RO	FW PO/ PM SAI : Huntsville, AL/ Aberdeen, MD	0.649	0.160	Jan 2021	0.156	Jan 2022	0.178	Jan 2023	-		0.178	0.000	1.143	-
		Subtotal	0.649	0.160		0.156		0.178		-		0.178	0.000	1.143	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-Recurring Engineeering	SS/CPFF	Textron;MIT; TDD-A;RTC : Wichita, KS' Lexington, MA	5.878	1.838	May 2021	1.678	May 2022	-		-		-	0.000	9.394	-
		Subtotal	5.878	1.838		1.678		-		-		-	0.000	9.394	N/A

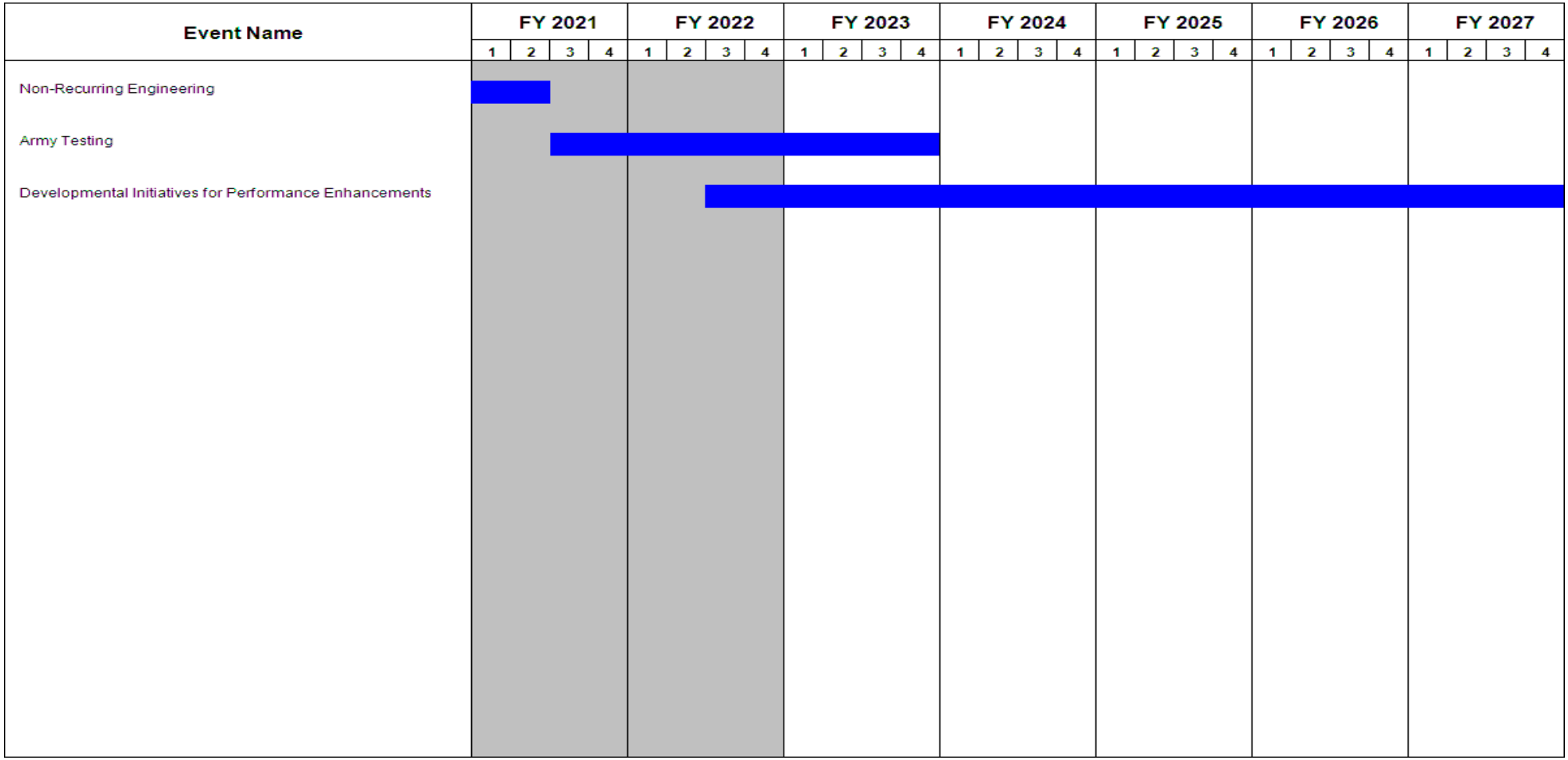
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	MIPR	AFTD RTC;MIT;TDD-A : Eglin, AFB, FL;Lexington, MA	1.636	-		-		1.918	May 2023	-		1.918	0.000	3.554	-
		Subtotal	1.636	-		-		1.918		-		1.918	0.000	3.554	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.163	1.998		1.834		2.096		-		2.096	0.000	14.091	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 / *EMARSS ADV DEV*



Note

FY21 $1.998 FY22 $1.834 FY23 $2.096 FY24 $5.886 FY25 $19.446 FY26 $19.453 FY27 $19.642

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH2 / *EMARSS ADV DEV*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Non-Recurring Engineering	3	2019	2	2021
Army Testing	3	2021	4	2023
Developmental Initiatives for Performance Enhancements	3	2022	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH3 / *EMARSS Payloads ADV DEV*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EH3: *EMARSS Payloads ADV DEV*	-	6.290	11.194	15.069	-	15.069	7.124	7.190	7.192	7.262	0.000	61.321
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) is the Army's newest generation C-12 based, direct support, manned airborne intelligence collection, processing, and targeting support system. It provides a persistent capability to detect, locate, classify/identify, and track surface targets with a high degree of timeliness and accuracy. EMARSS is assigned to the United States (U.S.) Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance support to combatant commanders. EMARSS is also assigned to the U.S. Army Training and Doctrine Command (TRADOC) in support of training at the US Army Intelligence Center of Excellence (USAICoE). The Army Acquisition Objective for EMARSS is 36 systems, with an Army Procurement Objective of 24, to include the following variants: eight (8) EMARSS-G (Geo-INT); four (4) EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight (8) EMARSS-M (Multi-INT); and four (4) EMARSS-S (SIGINT). Loss of an EMARSS-M in 2020 has reduced the operational fleet to 23 aircraft.

This funding line supports enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Communications Intelligence (COMINT); Signals Intelligence (SIGINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) Radar; Line-Of-Site (LOS) and Beyond Line-Of-Sight (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations.

Fiscal Year (FY) 2023 Base funding of $6.769 million continues the development of SIGINT server software and sensor enhancements. These enhancements are accomplished through SIGINT software porting and development of new SIGINT software focusing on resource management and emerging signals of interest applicable in a peer environment. This continued development effort leverages previous SIGINT server investments by PM SAI and other services facilitating rapid and continuous integration of capabilities targeting emerging signal sets and threats. This SIGINT development work will continue to address new threats as they emerge. Funds also provide sensor engineering and program management office support.

FY 2023 funding of $8.300 million provides peer readiness and mitigates ongoing sensor sub-component obsolescence impacting the Enhanced Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI) Sensor Systems for combat or direct combat support expenses for Operation Enduring Sentinel. This funding continues the development of upgraded extended range antenna and associated signal processor to provide increased effective range and target processing. This sensor development work will continue through FY 2024.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: EMARSS - Sensor Enhancement	5.799	5.038	6.287

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Enhancement of EMARSS Joint All-Domain Operations (JADO) SIGINT capabilities to decrease target identification time, increase probability of intercept, and increased signal simultaneity. Efforts include software porting and design analysis of modular open system architecture. ***FY 2022 Plans:*** Continues sensor software updates to develop the next generation SIGINT capability and improve performance in a near peer environment to integrate capabilities developed by other programs. ***FY 2023 Plans:*** Continues sensor software updates to develop the next generation SIGINT capability and improve performance in a near peer environment to integrate capabilities developed by other programs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2022 SIGINT enhancements are incremental development efforts that will be fielded to modernized EMARSS-S Aircraft. Phase 1 of those efforts began in FY2022 and Phase 2 of the development efforts planned to begin in FY2023 are more complex. Phase 2 will consist of continuing the Phase 1 efforts and additional tasking of developing software required for accelerated SIGINT processing requiring an increased need for FY 2023 funding.			
Title: EMARSS - Synethetic Aperture Radar / Moving Target Indicator (SAR/MTI) ***Description:*** Efforts include development of upgraded Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI) extended range antenna and associated signal processor to provide increased effective range and target processing. ***FY 2022 Plans:*** Begins development of Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI) modification due to VaDER obsolescence and to increase range for improved JADO mission relevancy. ***FY 2023 Plans:*** Continue development of Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI) modification due to VaDER obsolescence and to increase range for improved JADO mission relevancy. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2022 effort funded program kick-off and ramp up development of Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI) modification due to VaDER obsolescence and to increase range for improved JADO mission relevancy. Increase for FY 2023 will fund 12 full months to continue development of SAR / MTI modification due to VaDER obsolescence and to increase range for improved JADO mission relevancy.	-	5.278	8.300
Title: EMARSS - Sensor Engineering Support	0.310	0.588	0.290

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Matrix engineering support for sensor enhancements. ***FY 2022 Plans:*** Continue matrix government engineering support for sensor enhancements and provides engineering support required for SAR/ MTI development efforts. ***FY 2023 Plans:*** Continue matrix government engineering support for sensor enhancements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decrease due to reduction in required personnel to support development efforts.			
Title: Program Management Support ***Description:*** Program Management Office (PMO) support and travel, as well as Systems Engineering and Technical Assistance (SETA) support. ***FY 2022 Plans:*** Continue Program Management Office government support and SETA support. ***FY 2023 Plans:*** Continue Program Management Office government support and SETA support. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decrease due to reduction in required personnel to support development efforts.	0.181	0.290	0.192
Accomplishments/Planned Programs Subtotals	6.290	11.194	15.069

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• A02112: *EMARSS SEMA MODS*	28.912	1.568	1.591	-	1.591	2.033	27.697	27.950	28.197	Continuing	Continuing
• AZ2054: *EMARSS PAYLOADS*	15.204	9.912	0.456	-	0.456	3.124	3.418	3.434	3.422	Continuing	Continuing
• EH2: *EMARSS ADV DEV*	1.998	1.834	2.096	-	2.096	5.886	19.446	19.453	19.642	0.000	70.355

Remarks

The EMARSS Research Development Technology & Evaluation (RDT&E) efforts are found in the following two (2) project lines; 0305206AEH2 EMARSS ADV DEV (Fixed Wing Project Office) and 0305206AEH3 EMARSS Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02112 and AZ2054. AZ2054 funding supports subsequent procurement and integration of the RDTE funded sensor enhancements. Separate funding lines support

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum to assign overall acquisition lead for manned airborne intelligence systems to Program Executive Officer for Aviation and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

D. Acquisition Strategy

The acquisition strategy, supported by the EMARSS CPD, is to provide enhancements to the following sensor capabilities in order to maintain relevancy to the Warfighter: Electro-Optical (EO)/Infrared (IR) Full-Motion Video (FMV), Communications Intelligence (COMINT); Signals Intelligence (SIGINT); Wide Area Aerial Surveillance (WAAS); Light Imaging Detection and Ranging (LiDAR) and improved Synthetic Aperture Radar / Moving Target Indicator (SAR/MTI) Radar; Line-Of-Site (LOS) and Beyond Line-Of-Sight (BLOS) communications; and Processing Exploitation and Dissemination (PED) supporting two Distributed Common Ground System - Army (DCGS-A) enabled operator workstations. The EMARSS fleet of 24 systems consists of the following variants: eight EMARSS-G (Geo-INT); four EMARSS-V (Vehicle and Dismount Exploitation Radar, VaDER); eight EMARSS-M (Multi-INT); and four EMARSS-S (SIGINT). Loss of an EMARSS-M in 2020 reduced the operational fleet to 23 aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO	C/CR	PEO IEW&S, PM SAI : APG, MD	0.877	0.181	Nov 2020	0.290	Nov 2021	0.192	Nov 2022	-		0.192	Continuing	Continuing	-
		Subtotal	0.877	0.181		0.290		0.192		-		0.192	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LiDAR sensor enhancement	SS/CPFF	JHU APL : Laurel, MD	1.500	-		-		-		-		-	0.000	1.500	-
AWAPSS sensor enhancement	C/CPIF	BAE : Nashua, CT	0.200	-		-		-		-		-	0.000	0.200	-
SIGINT sensor enhancement	C/CPFF	CACI/Boeing : APG, MD	0.114	-		-		-		-		-	0.000	0.114	-
SIGINT sensor enhancement	C/CPFF	Lockheed Martin Integrated Systems : Marlton, NJ	0.948	-		-		-		-		-	0.000	0.948	-
Advanced LiDAR Development	SS/CPFF	Johns Hopkins University Applied Physics Laboratory, LLC : Laurel, Md	7.424	-		-		-		-		-	0.000	7.424	-
SIGINT Sensor Enhancement	C/CPFF	AASKI : Tinton Falls, NJ	5.826	5.799	Dec 2020	5.038	Mar 2022	6.287	Jan 2023	-		6.287	Continuing	Continuing	-
SAR/MTI Development	C/CPFF	Northrop Grumman : Linthicum, MD	-	-		5.278	May 2022	8.300	Feb 2023	-		8.300	0.000	13.578	-
		Subtotal	16.012	5.799		10.316		14.587		-		14.587	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH3 / *EMARSS Payloads ADV DEV*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Government Engineering Support	MIPR	CCDC : APG, MD	0.473	0.310	Dec 2020	0.588	Feb 2022	0.290	Dec 2022	-		0.290	Continuing	Continuing	-
Contractor Engineering Support	C/CPFF	BAH : APG, MD	0.776	-		-		-		-		-	0.000	0.776	-
		Subtotal	1.249	0.310		0.588		0.290		-		0.290	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Government Testing	MIPR	CFA : Lakehurst, NJ	0.125	-		-		-		-		-	0.000	0.125	-
		Subtotal	0.125	-		-		-		-		-	0.000	0.125	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.263	6.290		11.194		15.069		-		15.069	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

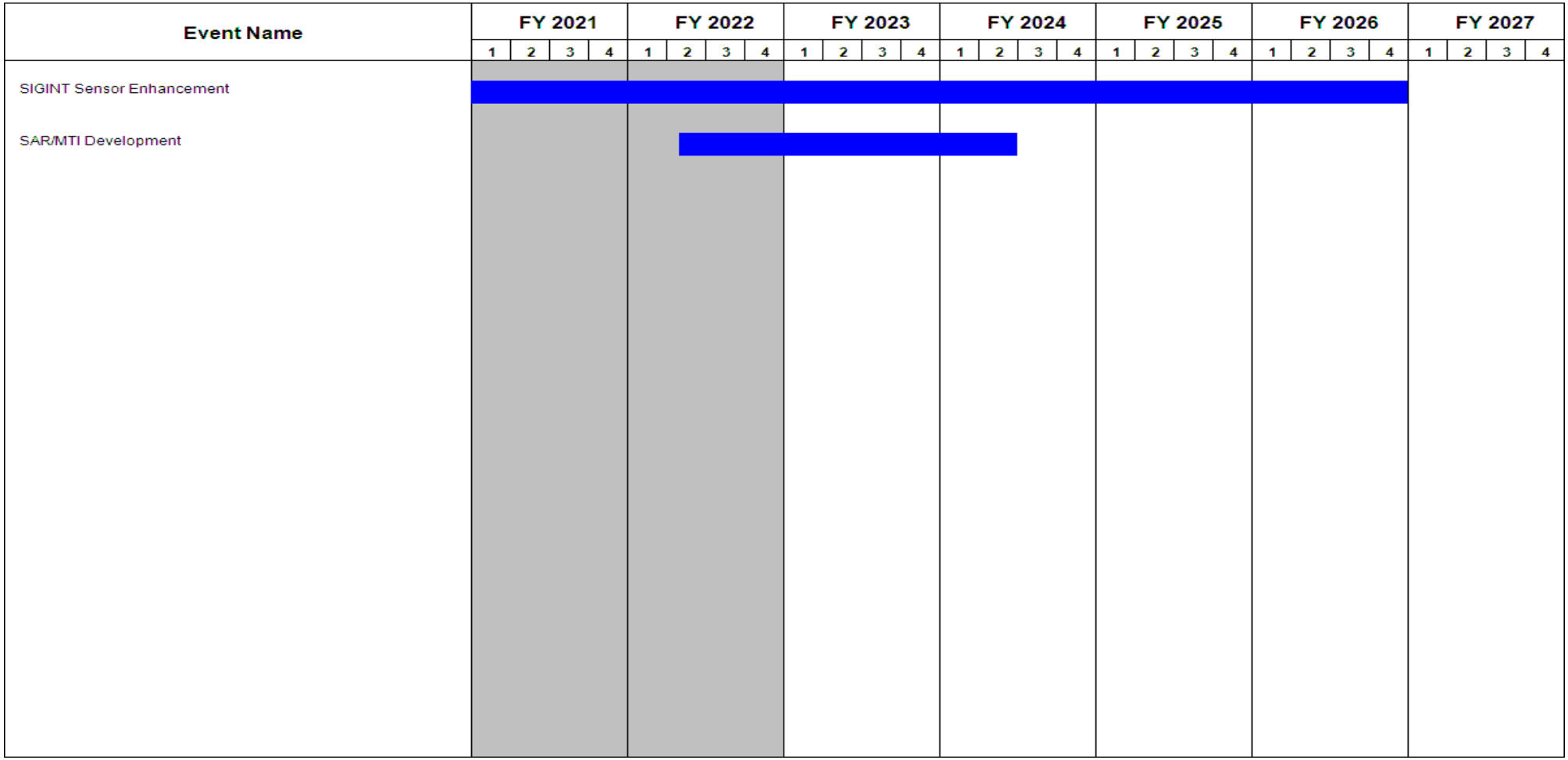


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH3 / *EMARSS Payloads ADV DEV*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
QRC to EMARSS POR Modification and Conversion	2	2015	4	2019
EMARSS Fielding	3	2017	4	2019
Advanced LiDAR Development	2	2018	2	2020
Advanced LiDAR Analysis Study	2	2020	2	2020
Advanced LiDAR PDR	2	2020	2	2020
SIGINT Sensor Enhancement	2	2020	4	2026
SAR/MTI Development	2	2022	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH5 / *ARL Payloads ADV DEV*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EH5: *ARL Payloads ADV DEV*	-	16.574	7.417	-	-	-	7.358	1.300	1.301	1.314	0.000	35.264
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Airborne Reconnaissance Low - Enhanced (ARL-E) is a worldwide self-deployable airborne Intelligence Surveillance Reconnaissance (ISR) system designed for timely, accurate, assured support to tactical forces over the full spectrum of operations. This system is a De Havilland DHC-8 aircraft replacing the DHC-7 IAW the Aerial ISR (AISR) 2020 Strategy. ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E Capabilities Production Document (CPD) requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), Electro-Optical/Infrared (EO/IR)/Full-Motion Video (FMV) , Multi-Mode Radar, Robust Communications Intelligence (COMINT), on-Board Collection, Analysis, Sensor Cross Cue and dissemination through Distributed Common Ground System-Army (DCGS-A) Enabled workstations. ARL-E will be assigned to the United States (U.S.) Army Intelligence and Security Command's Aerial ISR Brigade providing AISR support to combatant commanders. For the overall system, the Army Acquisition Objective and the Army Procurement Objective, is nine. The Mission Equipment Package (MEP) objective is eight.

0305206A EH5 has no Fiscal Year (FY) 2023 funding request.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: New Signals (COMINT/Software Upgrades)	16.574	7.417	-
Description: To develop software for Signals 1, 3, 4, 5, and 6. ***FY 2022 Plans:*** Fiscal Year (FY) 2022 Base funding of $5.253 million will fund the continued the new signal enhancement development efforts for Signals 3 and Signal 4 to enhance the COMINT collection capabilities including lab and flight test to meet the requirements in the ARL-E CPD. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** For Fiscal Year (FY) 2023 there is no funding.			
Accomplishments/Planned Programs Subtotals	16.574	7.417	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• AZ2050: *ARL PAYLOADS*	62.876	81.989	0.000	-	0.000	14.601	14.605	14.685	14.622	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH5 / *ARL Payloads ADV DEV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• DX9: *National Integration To Tactical Systems*	4.219	2.796	3.197	-	3.197	3.254	3.278	3.480	3.513	0.000	23.737
• A02109: *A02109*	9.796	-	0.000	-	0.000	-	-	-	-	0.000	9.796
• A02110: *ARL SEMA MODS*	9.598	14.437	0.000	-	0.000	5.007	5.215	5.240	5.213	Continuing	Continuing

Remarks

The ARL-E Research Development Technology & Evaluation (RDT&E) efforts are found in the following two (2) project lines; 0305206AEH4 ARL ADV DEV (Fixed Wing Project Office) and 0305206AEH5 ARL Payloads ADV DEV (Project Manager Sensors - Aerial Intelligence). The supporting procurement lines are A02110 and AZ2050. Separate funding lines support the Army Acquisition Executive's directive, codified in the October 28, 2011 memorandum, to assign overall acquisition lead for manned airborne Intelligence systems to Program Executive Officer for Aviation; and overall sensor, processing, exploitation, and dissemination responsibilities to Program Executive Officer for Intelligence, Electronic Warfare, and Sensors.

D. Acquisition Strategy

ARL-E will enhance the ARL-M sensor capability sets through the procurement of new and refurbished sensors to meet the ARL-E CPD requirements. It provides a persistent capability to include: Broad-Area Surveillance and/or Focused Stare on Target Areas of Interest (Point or Objective Targets), EO/IR FMV, COMINT, on-Board Collection, Analysis, Sensor Cross Cue and dissemination through DCGS-A Enabled workstations. This includes software development to enhance COMINT collection capabilities. The software will be added to existing COMINT systems to effectively prosecute high priority and emerging modern signal emitters.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH5 / *ARL Payloads ADV DEV*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	TBD	PM SAI : Aberdeen Proving Ground, MD	0.260	-		-		-		-		-	0.000	0.260	-
		Subtotal	0.260	-		-		-		-		-	0.000	0.260	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
New Signals (COMINT/ Software Upgrades)	C/CPFF	Boeing Argon : Mountain View, CA	40.968	12.575	Jan 2021	3.253	Jan 2022	-		-		-	0.000	56.796	-
Radar Software Electronic Protection Measures/ Enhancements	SS/CPFF	Northrup Grumman : Baltimore, MD	-	1.799	Nov 2020	1.964	Nov 2021	-		-		-	0.000	3.763	-
		Subtotal	40.968	14.374		5.217		-		-		-	0.000	60.559	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support to New Signals (COMINT/Software Upgrades)	C/CPFF	Boeing Argon : Mountain View, CA	10.690	2.000	Jan 2021	2.000	Jan 2022	-		-		-	0.000	14.690	-
Radar Software Electronic Protection Measures/ Enhancements	SS/CPFF	Northrup Grumman : Batlimore, MD	-	0.200	Nov 2020	0.200	Nov 2021	-		-		-	0.000	0.400	-
		Subtotal	10.690	2.200		2.200		-		-		-	0.000	15.090	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	51.918	16.574		7.417		-		-		-	0.000	75.909	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH5 / *ARL Payloads ADV DEV*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH5 / *ARL Payloads ADV DEV*

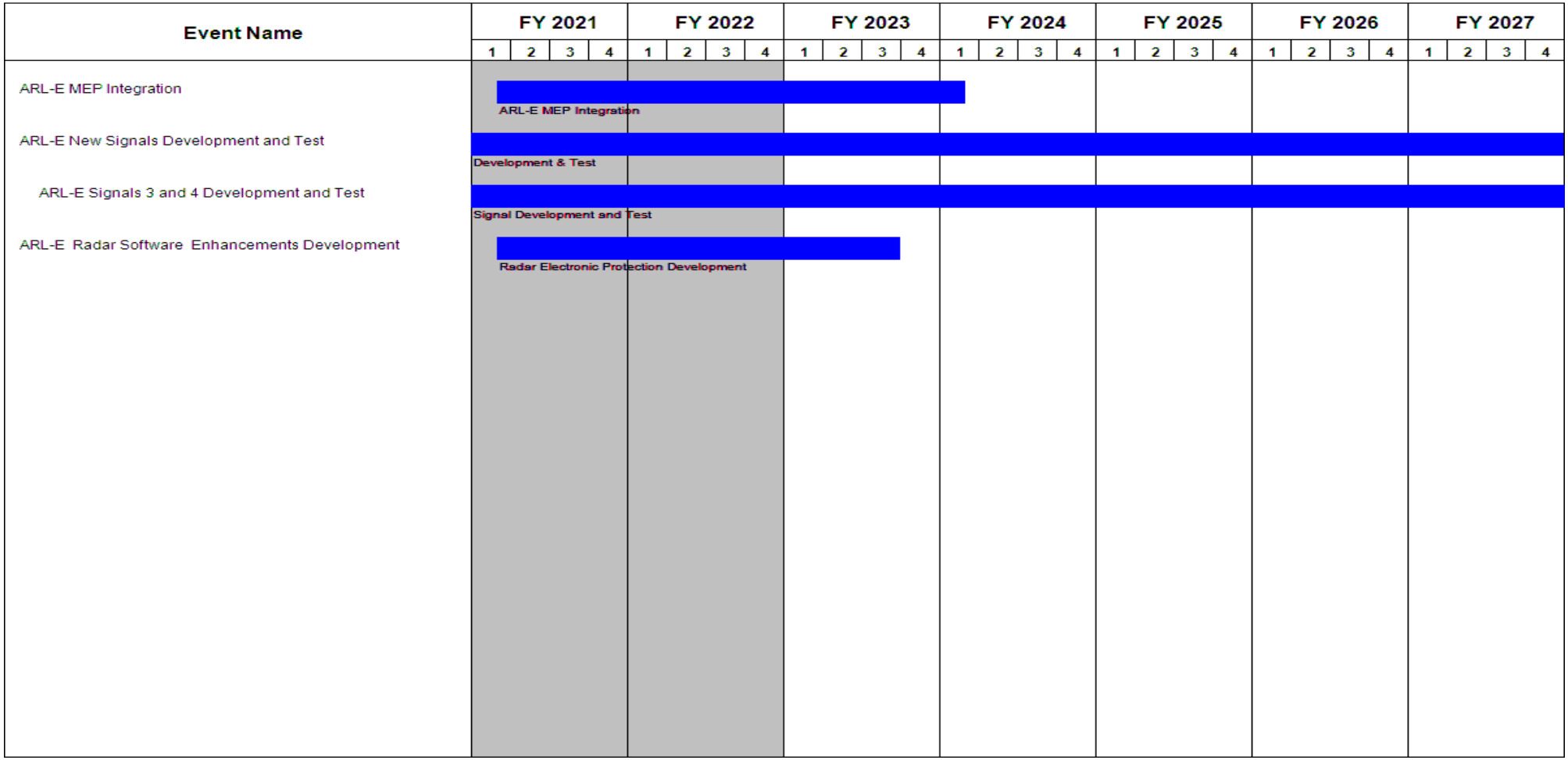


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH5 / *ARL Payloads ADV DEV*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ARL-E MEP Contract Award	1	2016	1	2016
ARL-E MEP Integration	1	2016	1	2024
ARL-E New Signals Development and Test	2	2016	4	2027
ARL-E Signals 3 and 4 Development and Test	2	2016	4	2028
ARL-E Signal 1 Development and Test	4	2017	2	2020
ARL-E Radar Software Enhancements Development	1	2021	3	2023
ARL-E Long Range Radar Development	4	2017	3	2019
ARL-E Long Range Radar Testing	3	2019	3	2019

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305206A / *Airborne Reconnaissance Systems*	Project (Number/Name) EH7 / *Guardrail Common Sensor (GRCS) Payloads*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EH7: *Guardrail Common Sensor (GRCS) Payloads*	-	3.996	4.015	-	-	-	-	-	-	-	0.000	8.011
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Guardrail Common Sensor (GRCS) is an airborne Signals Intelligence (SIGINT) Collection and Location System capable of providing Tactical Commanders Near-Real Time intelligence. It provides a persistent capability to detect, locate and classify/identify critical targets with a relevant degree of timeliness and accuracy. GRCS is assigned to two (2) United States (U.S.) Army Intelligence and Security Command's Aerial Exploitation Battalions, providing Aerial Intelligence, Surveillance and Reconnaissance (AISR) support to combatant commanders. In accordance with the Army's AISR 2020 strategy, the Army's Acquisition Objective/Army's Procurement Objective (AAO/APO) is 19 RC-12X; seven (7) fielded to 3rd MI BN; seven (7) fielded to the 204th MI BN, and five (5) pilot trainers to support Force Generation. The five (5) trainers are not equipped with Primary Mission Equipment (PME).

0305206A EH7 has no Fiscal Year (FY) 2023 funding request.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: GRCS SIGINT Sensor Upgrades	3.896	3.833	-
Description: Funding line supports GRCS advanced signal enhancement efforts and software development and testing of signal enhancement infrastructure for GRCS updated SIGINT sensor development. Funding also supports simulation development to allow for continued software enhancements and capability development to keep pace with emerging threats and new technology as well as provide the training required to maintain military proficiency.			
FY 2022 Plans: FY 2022 funding continues advanced signal enhancement efforts, software development and testing of SIGINT infrastructure for GRCS sensors. Funding also supports development of simulation capabilities for future software enhancements to pace threat signals and to provide additional training tools to maintain military proficiency.			
FY 2022 to FY 2023 Increase/Decrease Statement: GRCS program will be fully supported by sustainment partners.			
Title: Program Management Support	0.100	0.182	-
Description: Funds support program management office (PMO) efforts including travel.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 / *Guardrail Common Sensor (GRCS) Payloads*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 funding will support PMO efforts including travel. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** GRCS program will be fully supported by sustainment partners.			
Accomplishments/Planned Programs Subtotals	3.996	4.015	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• AZ2052: *GUARDRAIL PAYLOADS*	25.869	11.799	3.714	-	3.714	-	-	-	-	0.000	41.382

Remarks

D. Acquisition Strategy

The acquisition strategy is to address obsolescence by providing advanced signal enhancement efforts, software development and testing to the GRCS SIGINT Sensors to extend the useful life through FY 2028. Existing PM SAI contracts to be leveraged.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 / *Guardrail Common Sensor (GRCS) Payloads*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USFK ONS Development/ JICD 4.2 Compliance	C/CPFF	PEO IEW&S : Aberdeen Proving Ground, MD	0.700	-		-		-		-		-	0.000	0.700	0.700
Program Management Support	C/Various	Various : Various	0.076	0.100	Dec 2020	0.182	Jan 2022	-		-		-	0.000	0.358	-
		Subtotal	0.776	0.100		0.182		-		-		-	0.000	1.058	N/A

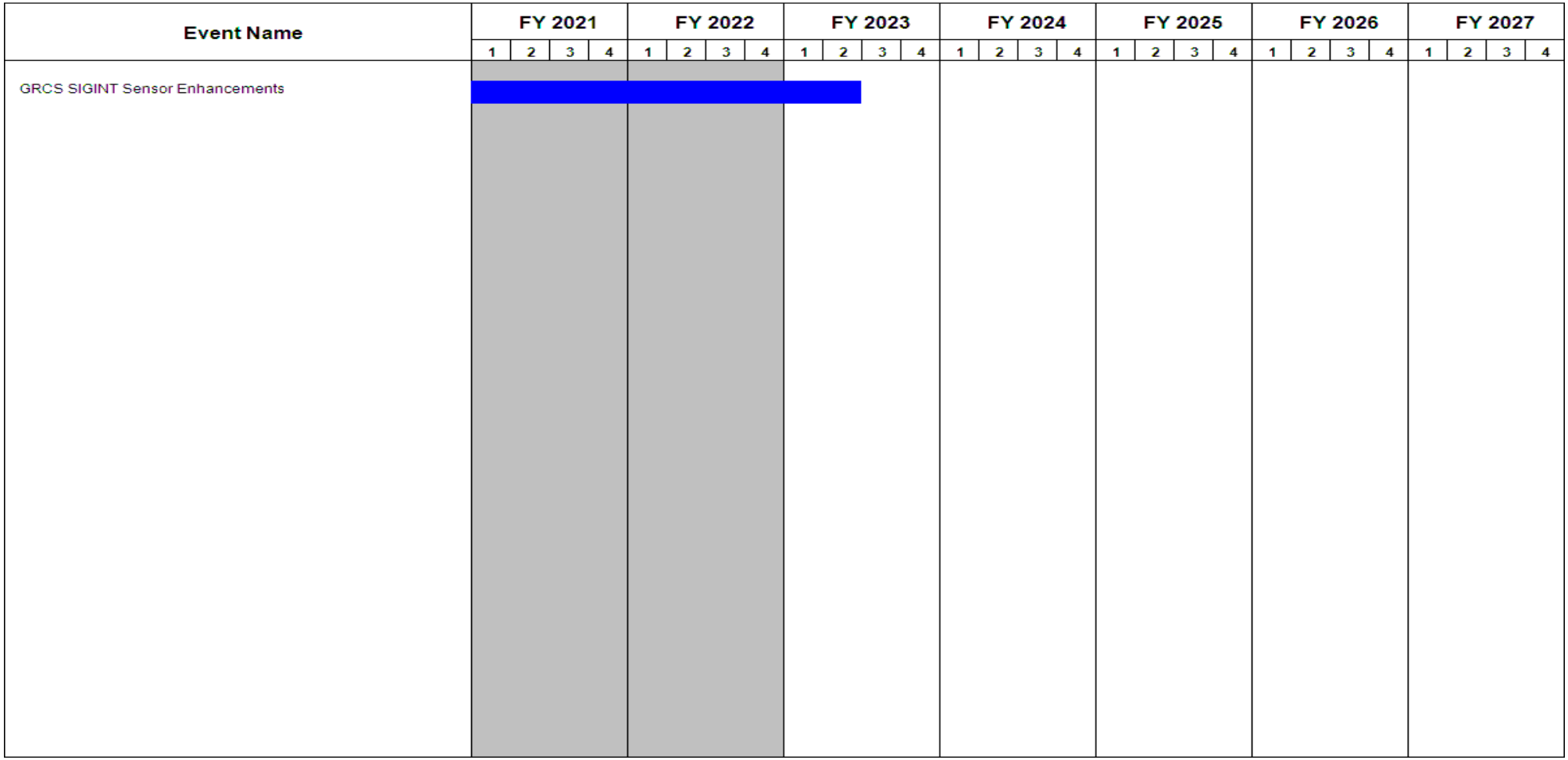
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GRCS SIGINT Sensor Enhancements	C/CPFF	AASKI : Tinton Falls, NJ	1.924	3.896	Dec 2020	3.833	Apr 2022	-		-		-	0.000	9.653	2.000
		Subtotal	1.924	3.896		3.833		-		-		-	0.000	9.653	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.700	3.996		4.015		-		-		-	0.000	10.711	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 / *Guardrail Common Sensor (GRCS) Payloads*



Note

Execution of FY 2022 funding continues into FY 2023 due to non-severable contract.

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305206A / *Airborne Reconnaissance Systems*	**Project (Number/Name)** EH7 / *Guardrail Common Sensor (GRCS) Payloads*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
USFK ONS Development/JICD 4.2 Compliance	1	2019	2	2019
GRCS SIGINT Sensor Enhancements	2	2020	2	2023

Note

JICD: Joint Interface Control Document
GRCS SIGINT: Guardrail Common Sensor Signals Intelligence

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305208A *I Distributed Common Ground/Surface Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	40.771	-	-	-	-	0.000	0.000	0.000	0.000	0.000	40.771
D07: *DCGS-A Common Modules*	-	40.771	-	-	-	-	-	-	-	-	0.000	40.771

A. Mission Description and Budget Item Justification

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, compliant with standards providing the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As enhanced commercial capabilities are integrated and tested, a continuing series of software capability drop releases will be provided into Army Common/commodity hardware and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CPCE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI).

DCGS-A provides technologically advanced Processing, Exploitation, and Dissemination (PED) capabilities through iterative software releases delivered in tailored and scalable mobile, fixed, and embedded configurations in all maneuver and maneuver support units from Company Intelligence Support Team to Army Service Component Command, and in select maneuver sustainment units battalion and above.

PE 0305208A has no FY23 funds request.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305208A / *Distributed Common Ground/Surface Systems*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	40.771	0.000	0.000	-	0.000
Current President's Budget	40.771	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / *Distributed Common Ground/Surface Systems*	Project (Number/Name) D07 / *DCGS-A Common Modules*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
D07: *DCGS-A Common Modules*	-	40.771	-	-	-	-	-	-	-	-	0.000	40.771
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Distributed Common Ground System - Army (DCGS-A) is the Intelligence, Surveillance and Reconnaissance (ISR) System of Systems (SoS) for Joint, Interagency, Allied, Coalition, and National data analysis, sharing and collaboration. The core functions of DCGS-A are: the vertical and horizontal synchronization of ISR Processing, Exploitation and Dissemination (PED) efforts; operations in a networked environment at multiple security levels; the control of select Army and joint sensor systems; the fusion of all acquired data and information, and distribution of relevant red (threat), gray (non-aligned), and environmental (weather and terrain) information; and providing the Warfighters' early warning, targeting, and sensor ground station capabilities. DCGS-A provides a single integrated ISR ground processing system composed of common components that are interoperable with sensors, other information sources, all Warfighting Functions, compliant with standards providing the Defense Information & Intelligence Enterprise (DI2E) and Intelligence Community Information Technology Enterprise (IC ITE). DCGS-A is fielded in Fixed, Mobile, and embedded configurations emphasizing the use of reach and split based operations by improving accessibility of data in order to reduce forward deployed footprint. As enhanced commercial capabilities are integrated and tested, a continuing series of software capability drop releases will be provided into Army Common/commodity hardware and fielded to units IAW the Army Resourcing Priority List (ARPL) process.

DCGS-A is designated as a Program of Record (PoR) within the Command Post Computing Environment (CPCE) of the Common Operating Environment (COE). DCGS-A provides the Single and Shareable Geospatial Foundation (SSGF) Cross Cutting Capability (CCC), and is defining the DCGS-A architecture to fit within the COE as described by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) COE Implementation Plan. This is in accordance with the G-3/5/7 priority to align all Army networks, procurements and enhancements under one COE and one vision leveraging intelligence community investments. PM DCGS-A continues to work with PM Mission Command (PM MC) to converge on CP CE Tactical Server Infrastructure (TSI).

DCGS-A provides technologically advanced Processing, Exploitation, and Dissemination (PED) capabilities through iterative software releases delivered in tailored and scalable mobile, fixed, and embedded configurations in all maneuver and maneuver support units from Company Intelligence Support Team to Army Service Component Command, and in select maneuver sustainment units battalion and above.

PE 0305208A has no funds request in FY23.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Integrate and Test Software	7.639	-	-
Description: DCGS-A Intelligence applications will issue commercial contracts to vendors on multiple-award contract/s. Initial contract awards will be followed by brief design and develop periods, incorporating maximum Soldier participation and feedback to inform procurement and fielding decisions. Each evaluate, modify (if necessary) and integrate period will result in minor			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305208A / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** D07 / *DCGS-A Common Modules*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
modifications to adapt commercial capabilities for military use through customization, cyber accreditation, and integration with other Army systems.			
Title: Government Matrix Support for Integration ***Description:*** Matrix Support Government for software integration to the target platforms.	3.516	-	-
Title: Project Management ***Description:*** Project Management support to manage the cost, schedule, and performance metrics for the program.	3.492	-	-
Title: Army and Joint Interoperability and Operational Testing ***Description:*** Testing of DCGS-A	3.024	-	-
Title: Training Development ***Description:*** Training support - embedded computer based training (CBT) for the DCGS-A software.	1.045	-	-
Title: Logistics Documentation ***Description:*** Logistics activities including maintenance task analysis, level of repair analysis, user manual, training support package, and MANPRINT activities.	0.990	-	-
Title: Ground Station Modernization ***Description:*** Ground Station evaluation, modernization, modification, and risk reduction activities.	18.094	-	-
Title: Next Generation Analytics Evaluation ***Description:*** Next generation analytics market research, studies, evaluate, modify, and integrate experimentation	2.971	-	-
Accomplishments/Planned Programs Subtotals	40.771	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BZ7316: *DCGS-A-INTEL*	197.595	92.613	76.771	-	76.771	113.124	116.145	38.078	38.131	0.000	672.457

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305208A / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** D07 / *DCGS-A Common Modules*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

The Distributed Common Ground System - Army is designated a ACAT IAC

D. Acquisition Strategy

The DCGS-A program will consist of multiple capability drops structured to meet DCGS-A User requirements. The DCGS-A program will follow the Information Technology (IT) Box concept for an agile acquisition strategy to iteratively provide and field Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, hosted on Commercial off the Shelf (COTS) equipment/hardware, providing low risk, efficient, time- phased releases of capability to satisfy the Army's operational needs.

The DCGS-A capabilities under Increment 1 will be leveraged to the maximum extent where applicable to meet the future DCGS-A requirements set. The DCGS-A will also leverage the Increment 1 configuration platforms fielded across the Army.

DCGS-A is a collection of software packages (COTS, and GOTS products) selected to provide each Army echelon (from Battalion up to Echelon Above Corps (EAC)) the capability to synthesize and exploit intelligence data. DCGS-A delivers these software packages on COTS and GOTS hardware components, tailored to meet each Army Echelon's intelligence mission requirements. DCGS-A is the Army's ISR Foundation Layer for Tasking, Processing, Exploitation, Dissemination (TPED) and development of situation understanding using intelligence information about the threat, weather, and terrain at all Army Echelons. DCGS-A provides the capabilities necessary for Commanders to access information, task organic sensors, and synchronize non-organic sensor assets with their organic assets. DCGS-A will continuously acquire and synthesize data and information from Joint, Interagency, Intergovernmental, and Multi-national (JIIM) sources to maintain an updated and accurate understanding of the operational environment to inform critical and time sensitive command decisions.

The DCGS-A software baseline will be updated and iteratively deployed to address emerging and prioritized operational requirements. PM DCGS-A, in coordination with the operational user community, will align releases with the technological readiness of targeted enhancements, and to support low-risk integration and test cycle times. As requirements are approved, DCGS-A will leverage commercially-available solutions and non-developmental items (NDI) to meet user needs, based on market research results. DCGS-A will issue commercial contracts or conduct NDI technology transitions from DoD Science and Technology organizations, or will re-use NDI from other Army programs, Services, or other Governmental Agencies. The DCGS-A software will be hardware agnostic so that the software can be deployed in any processing hardware equipment. This allows the DCGS-A software to be scalable and deployable in different hardware system configurations, as required by the Army at different echelons. The implementation of the latest COTS hardware procurement through the Army Common Hardware System (CHS) program with the established post-deployment hardware sparing, sustainment, and maintenance provisions, will result in significant cost efficiencies.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / *Distributed Common Ground/Surface Systems*	Project (Number/Name) D07 / *DCGS-A Common Modules*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	Allot	DCGS-A : APG, MD	10.951	3.492	Oct 2020	-		-		-		-	Continuing	Continuing	-
Milestone preparation; Activities; Trade Space Analysis (TSA)	MIPR	Various : Various	3.318	-		-		-		-		-	0.000	3.318	-
		Subtotal	14.269	3.492		-		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrate & Test software	C/FP	Various : Various	75.153	7.639	Dec 2020	-		-		-		-	Continuing	Continuing	Continuing
System reconfiguration	C/FP	Various : Various	4.020	-		-		-		-		-	Continuing	Continuing	-
Ground Station Modernization	C/CPFF	Various : Various	-	18.094	Feb 2021	-		-		-		-	Continuing	Continuing	-
Next Generation Analytics Evaluation	C/CPFF	Various : Various	-	2.971	Feb 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	79.173	28.704		-		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various : Various	17.725	-		-		-		-		-	Continuing	Continuing	-
Training Development	MIPR	Various : Various	11.600	1.045	Feb 2021	-		-		-		-	Continuing	Continuing	-
Logistics Documentation	MIPR	Various : Various	2.622	0.990	Jan 2021	-		-		-		-	Continuing	Continuing	-
Government Matrix Support for Integration	MIPR	Various : Various	-	3.516	Feb 2021	-		-		-		-	Continuing	Continuing	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	Allot	PM DCGS-A : APG, MD	0.011	-		-		-		-		-	0.000	0.011	-
		Subtotal	31.958	5.551		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0305208A / *Distributed Common Ground/Surface Systems*	Project (Number/Name) D07 / *DCGS-A Common Modules*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test & Integration Lab	MIPR	Various : Various	13.768	-		-		-		-		-	Continuing	Continuing	-
Army and Joint Interoperability & operational Testing	MIPR	Various : Various	-	3.024	Feb 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	13.768	3.024		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	139.168	40.771		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305208A / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** D07 / *DCGS-A Common Modules*

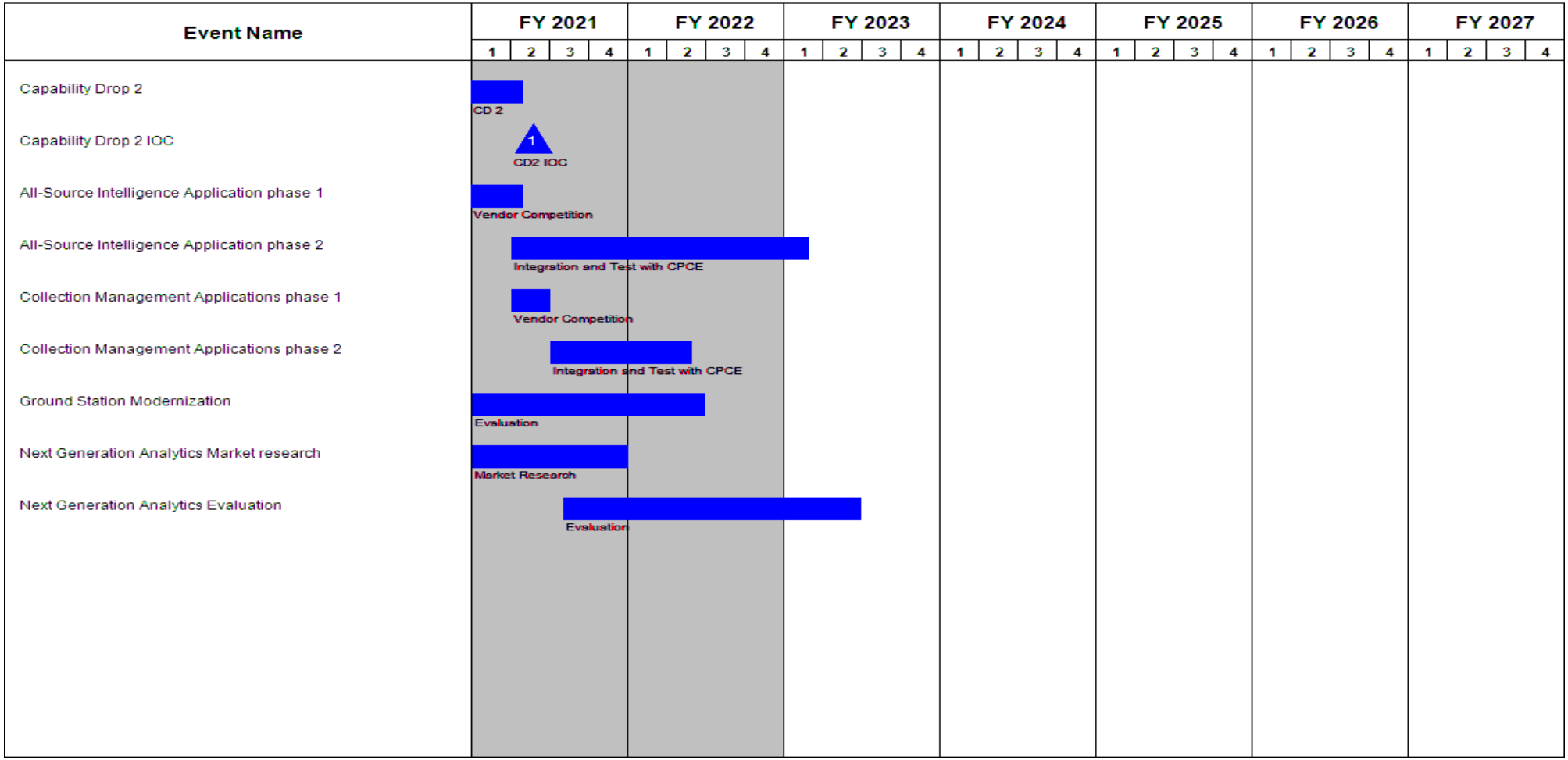


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0305208A / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** D07 / *DCGS-A Common Modules*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Capability Drop 1	4	2017	3	2019
Capability Drop 1 IOC	3	2019	3	2019
Capability Drop 2	4	2019	1	2021
Capability Drop 2 IOC	2	2021	2	2021
All-Source Intelligence Application phase 1	1	2021	1	2021
All-Source Intelligence Application phase 2	2	2021	1	2023
Collection Management Applications phase 1	2	2021	2	2021
Collection Management Applications phase 2	3	2021	2	2022
Ground Station Modernization	1	2021	2	2022
Next Generation Analytics Market research	1	2021	4	2021
Next Generation Analytics Evaluation	3	2021	2	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0307665A / *Biometrics Enabled Intelligence*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	-	2.066	-	-	-	0.000	0.000	0.000	0.000	0.000	2.066
BI7: *Biometrics Enabled Intelligence*	-	-	2.066	-	-	-	-	-	-	-	0.000	2.066

A. Mission Description and Budget Item Justification

Identity Intelligence Analytic Repository (I2AR) will serve as an analytical tool to produce, manage, and disseminate the DoD Biometrically Enabled Watchlist (BEWL) as well as extend opportunities for system and data integration with enhanced analytic data sharing across the Army and Intelligence Community (IC) partners. Analysts will use I2AR to conduct analysis and develop intelligence reports, in support of DoD and national community missions. I2AR will include the legacy Biometrics Identity Intelligence Resource (BI2R) functionality as well as elasticity, encryption, and open source software for enduring interoperability with DoD, IC, and external partners.

Justification:
There is no FY2023 funding request.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	2.066	0.000	-	0.000
Current President's Budget	0.000	2.066	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0307665A / *Biometrics Enabled Intelligence*	Project (Number/Name) BI7 / *Biometrics Enabled Intelligence*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BI7: *Biometrics Enabled Intelligence*	-	-	2.066	-	-	-	-	-	-	-	0.000	2.066
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Identity Intelligence Analytic Repository (I2AR) will serve as an analytical tool to produce, manage, and disseminate the DoD Biometrically Enabled Watchlist (BEWL) as well as extend opportunities for system and data integration with enhanced analytic data sharing across the Army and Intelligence Community (IC) partners. Analysts will use I2AR to conduct analysis and develop intelligence reports, in support of DoD and national community missions. I2AR will include the legacy Biometrics Identity Intelligence Resource (BI2R) functionality as well as elasticity, encryption, and open source software for enduring interoperability with DoD, IC, and external partners.

Justification:
There is no FY2023 funding request.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Army G2 Projects - BI7	-	2.066	-
Description: Development of intelligence capabilities currently used to support Operation Freedom's Sentinel (OFS) and Operation Inherent Resolve (OIR) including the Identity Intelligence Analytic Repository (I2AR). ***FY 2022 Plans:*** FY2022 funding to complete prototype and New Equipment Training development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Fiscal Year (FY) 2023 decrease of $2.066 Million represents the completion of development and transition to implementation of the capability.			
Accomplishments/Planned Programs Subtotals	-	2.066	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0307665A / *Biometrics Enabled Intelligence*	Project (Number/Name) BI7 / *Biometrics Enabled Intelligence*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Management Services	C/Various	TBD : TBD	12.921	-		-		-		-		-	0.000	12.921	-
		Subtotal	12.921	-		-		-		-		-	0.000	12.921	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Base Products Development	C/IDIQ	Various : TBD	59.462	-		2.066	Mar 2022	-		-		-	0.000	61.528	-
Product Development	C/FFP	ACC / Picatinny : New Jersey	6.847	-		-		-		-		-	0.000	6.847	-
		Subtotal	66.309	-		2.066		-		-		-	0.000	68.375	N/A

Remarks

Product Office used an Other Transaction Agreement (OTA) for product selection.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Civilian Personnel and Other Support Costs	Various	Various : Various	20.102	-		-		-		-		-	0.000	20.102	-
		Subtotal	20.102	-		-		-		-		-	0.000	20.102	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IA, T&E, Threat Assessment,	Various	Various : TBD	5.066	-		-		-		-		-	0.000	5.066	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0307665A / *Biometrics Enabled Intelligence*	Project (Number/Name) BI7 / *Biometrics Enabled Intelligence*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperabiity Certifications															
Subtotal			5.066	-		-		-		-		-	0.000	5.066	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	104.398	-		2.066		-		-		-	0.000	106.464	N/A

Remarks

Prior years are mostly associated with the termination of the Joint Personnel Identification Version 2 (JPIv2) project.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0307665A / *Biometrics Enabled Intelligence*	**Project (Number/Name)** BI7 / *Biometrics Enabled Intelligence*

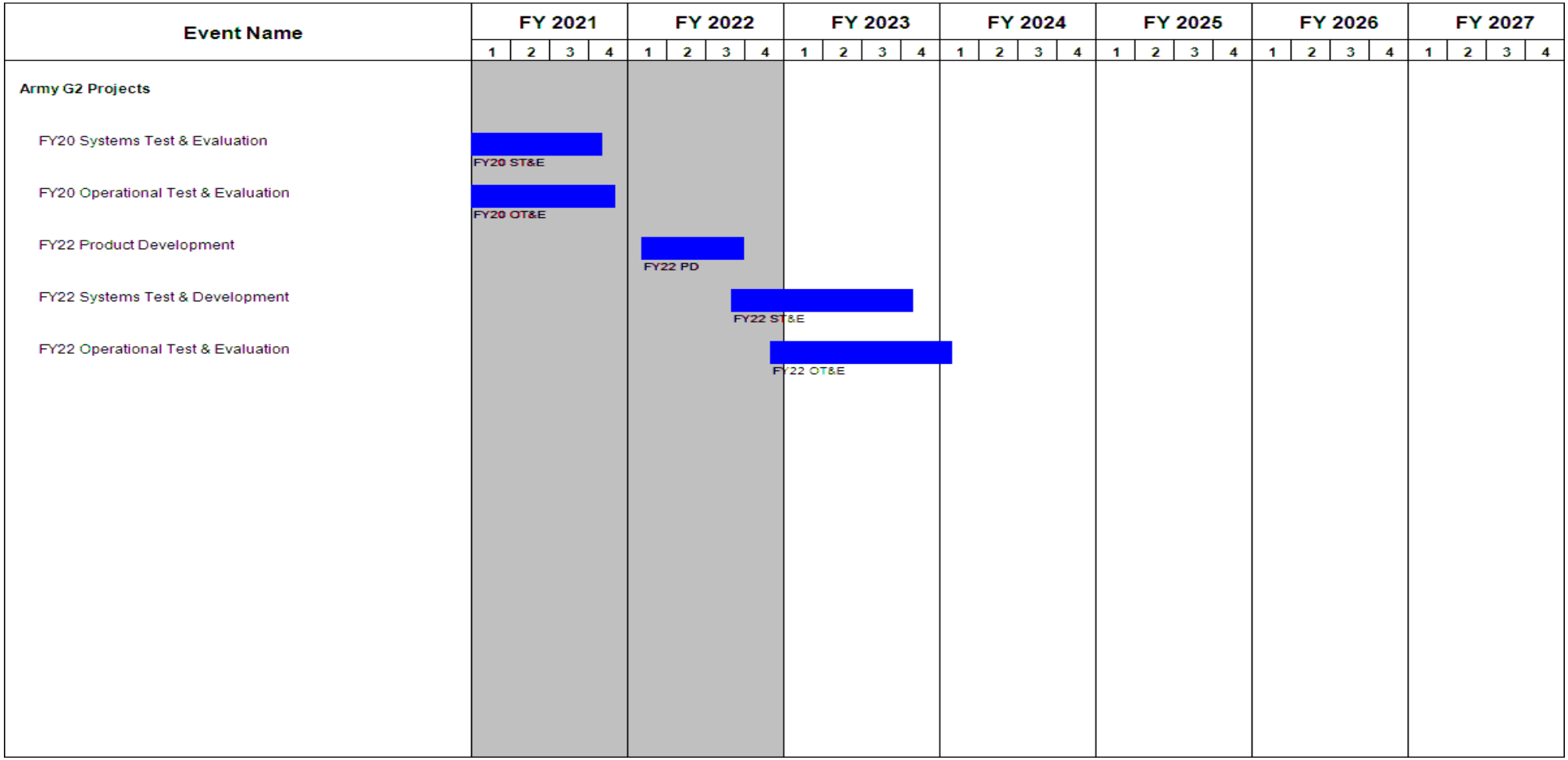


Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0307665A / *Biometrics Enabled Intelligence*	**Project (Number/Name)** BI7 / *Biometrics Enabled Intelligence*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Army G2 Projects	1	2017	1	2025
FY20 Systems Test & Evaluation	3	2020	4	2021
FY20 Operational Test & Evaluation	4	2020	4	2021
FY22 Product Development	1	2022	3	2022
FY22 Systems Test & Development	3	2022	4	2023
FY22 Operational Test & Evaluation	4	2022	1	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	130.785	103.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	601.473
E25: *Mfg Science & Tech*	-	58.785	61.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	487.473
EA2: *MANTECH INITIATIVES (CA)*	-	72.000	42.000	-	-	-	-	-	-	-	0.000	114.000

A. Mission Description and Budget Item Justification

This Program Element (PE) develops, demonstrates, and transitions manufacturing technologies and processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, as well as sensors and electronics. Initiatives within the PE result in cost savings and reduced risk of transitioning military-unique manufacturing processes into production. Project E25 fosters the transfer of new/improved manufacturing technologies to the industrial base, including manufacturing efforts that have potential for high payoff across the spectrum of Army systems.

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

Work in this PE is performed by the United States (U.S.) Army laboratories and research centers, U.S. Army Program Executive Offices and Program Management Offices, and U.S. Army depots and arsenals.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	130.785	61.720	0.000	-	0.000
Current President's Budget	130.785	103.720	91.270	-	91.270
Total Adjustments	0.000	42.000	91.270	-	91.270
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	42.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	91.270	-	91.270

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: EA2: *MANTECH INITIATIVES (CA)*		

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708045A *I End Item Industrial Preparedness Activities*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Congressional Add: *Functional Fabrics and Smart Textiles- Continued*	10.000	-
Congressional Add: *Smart Manufacturing of Engineered Fabrics - Continued*	7.000	-
Congressional Add: *Scalability of Functional Fabric Manufacturing - Continued*	5.000	5.000
Congressional Add: *Nanoscale Materials Manufacturing- Continued*	10.000	5.000
Congressional Add: *Compact Efficient Rotary Engine*	10.000	-
Congressional Add: *Lightweight High Efficiency Generators*	10.000	-
Congressional Add: *Glass Separators for Lithium Bateries- Continued*	5.000	-
Congressional Add: *Advanced Manufacturing Cell for Missile Fins*	5.000	8.000
Congressional Add: *Advanced Manufacturing Technology*	5.000	-
Congressional Add: *Tungsten Manufacturing Affordability Initiative for Armaments - Continued*	5.000	-
Congressional Add: *Liquid Hydrogen Refueling Systems*	-	10.000
Congressional Add: *N2O5*	-	10.000
Congressional Add: *Lightweight Transparent Film Armor- Continued*	-	4.000
Congressional Add Subtotals for Project: EA2	72.000	42.000
Congressional Add Totals for all Projects	72.000	42.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) E25 / *Mfg Science & Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
E25: *Mfg Science & Tech*	-	58.785	61.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	487.473
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project develops and demonstrates manufacturing technologies and processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Work is performed to advance the state of the art in manufacturing processing and fabrication techniques for coatings, multifunctional materials, and structural elements for Army specific applications.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Networks and Command, Control, Communications and Intelligence	12.440	10.542	12.410

Description: ManTech efforts focused on an integrated system of hardware, software and infrastructure that is sufficiently mobile, reliable, user-friendly, discreet in signature, expeditionary and appropriate for any environment where the electromagnetic spectrum is denied or degraded. It also focuses on dependable communication or assured position, navigation, and timing; tactical space; navigation warfare; and Cyber operations. Additionally, it covers virtual and immersive Common Operation Environments in support of faster decision making. These efforts support the Army modernization priority for future systems and enabling areas for assured positioning, navigation, timing and synthetic training environments. Efforts are aligned to programs within the executive offices of Intelligence Electronic Warfare & Sensors; and Command Control Communications-Tactical.

FY 2022 Plans:
Develop and advance manufacturing processes and capabilities supporting command and control systems/subsystems and position, navigation, and timing systems.

FY 2023 Plans:
Continue to develop and advance manufacturing processes and capabilities supporting command and control systems/ subsystems and position, navigation, and timing systems.

FY 2022 to FY 2023 Increase/Decrease Statement:
The increase in this effort will support the maturation of the manufacturing of the low cost chip scale atomic clock redesign supporting the mounted and dismounted assured positioning systems; the development of raw materials for optical improvements

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
in the 3rd gen forward looking infrared cameras; and support the transition of the digital pixel imagers for aviation to the apache pilot night vision system.			
Title: Long Range Precision Fires ***Description:*** The effort funds manufacturing improvements to support areas that enable hypersonics, cannons, and missiles. Efforts focus on reduction in cost and time for manufacturing. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting long range precision fires resulting in the affordability and producibility of advanced energetics, warheads, propulsion, guidance and navigation technology. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Long Range Precision Fires will transition to the Weapon Systems effort to better reflect the level of effort and it's support to both current and future programs of record.	2.962	7.369	-
Title: Air & Missile Defense ***Description:*** This effort funds advance manufacturing processes and capabilities supporting air and missile defense efforts. Efforts include manufacturing improvements to missile systems, directed energy systems, propulsion, and radar technologies. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting air and missile defense efforts. This effort focuses on affordability and producibility of directed energy systems, advanced missiles and seekers, guidance and control, advanced aerostructures/propulsion, and air defense radar technologies. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Air Missile Defense will transition to the Weapon Systems effort to better reflect the level of effort and it's support to both current and future programs of record.	8.000	12.409	-
Title: Weapon Systems ***Description:*** Manufacturing technology efforts focused on current and future comprehensive weapons system platforms which include munitions and formations that improve range, lethality, mobility, precision, target acquisition and force protection capabilities within multi-domain operations. Additionally, these efforts support the Army modernization priorities for long-range precision fires (LRPF) which is focused on strategic fires, precision strike missile capabilities, and extended range cannon artillery as well as air missile defense (AMD) systems to include directed energy systems and interceptors focused on providing maneuverability for short range air defense, and indirect fire protection capabilities. Efforts are aligned to programs within the executive office of Missile and Space; and the joint executive office Armaments & Ammunition.	-	-	26.930

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Long Range Precision Fires and Air & Missile Defense. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes for weapon systems to include long range precision fires resulting in the affordability and producibility of advanced energetics, warheads, propulsion, guidance and navigation technology. Additionally supports air and missile defense capabilities focused on the affordability and producibility of directed energy systems, advanced missiles and seekers, guidance and control, advanced aero structures / propulsion, air defense radar technologies, directed energy weapon systems, high energy laser weapons systems, short range air defense, and indirect fire protection capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding will advance manufacturing processes and manufacturability of cannon tubes in support of the extended range cannon artillery, smooth bore cannons, and the affordability and producibility of directed energy systems.			
Title: Next Generation Combat Vehicle ***Description:*** This effort funds manufacturing technology advances needed for more affordable and reliable components and subsystems for tactical and combat vehicles and weapons systems. This effort focuses on addressing challenges in areas such as advanced armor, protection systems, lighter weight components, insensitive propellants, armament systems, precision munitions, engines, sensor systems, and vehicle power devices for current and future systems. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting the ground vehicles that results in dependable technology with an emphasis on providing affordable and timely solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Next Generation Combat Vehicle will transition to Ground Systems to better reflect the level of effort and it's support to both current and future programs of record.	19.953	5.629	-
Title: Ground Systems ***Description:*** ManTech efforts focused primarily focused on Army land maneuverability and ground system platforms. These efforts support the Army?s ability to gain positions of relative advantage, overmatch the enemy, protect Soldiers from harm, and impose a tempo of event and multiple simultaneous dilemmas on the enemy to overwhelm enemy effectiveness through ground mobility. Additionally, these efforts support the Army?s modernization priority for Next Generation Combat Vehicles which integrate other close combat capabilities in manned and unmanned teaming, leveraging semi-autonomous and autonomous platforms in conjunction with improved firepower, protection, mobility and power generation capabilities. The ground portfolio	-	-	9.800

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
also supports force projection and force protection technologies to enable the Army to realize close combat. Efforts are aligned to programs within the executive offices of Ground Combat Systems; Combat Support & Combat Service Support; and the joint program executive office, Armaments & Aviation. Formerly titled Next Generation Combat Vehicle. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes and capabilities supporting ground vehicles that result in dependable technology with an emphasis on providing affordable and timely solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase will support the power converter in support of the the extended range cannon artillery capabilities and the composite rubber track efforts.			
Title: Future Vertical Lift ***Description:*** This effort funds manufacturing technology advances supporting future vertical lift platforms to increase operational reach and capabilities with a concentration on affordability and producibility through manufacturing solutions. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting future vertical lift platforms for future attack, reconnaissance and long range assault capabilities, and air launched effects. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Future vertical lift will transition to Aviation Systems to better reflect the level of effort and it's support to both current and future programs of record.	6.290	11.301	-
Title: Aviation Systems ***Description:*** ManTech efforts focused on Army manned and unmanned aviation platforms to improve maneuverability, range, speed, payload capacity, mission systems, survivability, reliability, and reduced logistical footprint. Additionally, these efforts support the Army Future Vertical Lift modernization priority through manufacturing technologies that provide next generation of vertical lift aircraft for the Army. Efforts are aligned to programs within the joint executive office of Armaments & Ammunition and program executive office for Aviation.	-	-	19.870

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Future Vertical Lift. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes and capabilities supporting future vertical lift platforms for future attack, reconnaissance and long range assault capabilities, and air launched effects. Efforts align to the air platform systems. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased efforts associated with air system platforms in support of maturing high impact advanced manufacturing capabilities. Specific components funded will include advanced manufacturing processes supporting rotor blades, advanced manufacturing efforts supporting multi-laser stitching production requirements, and the extended battery performance through weight reduction efforts.			
Title: Soldier Lethality ***Description:*** This effort funds manufacturing technology and processes in support of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their ability to respond to emerging situations through advanced manufacturing processes with a concentration affordability and producibility. Work focuses on addressing challenges in areas such as multifunctional fabrics for shelters, uniforms and portage equipment; lightweight materials for body armor; and medical technologies such as biotechnology. ***FY 2022 Plans:*** Increase the capability of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their protection and ability to respond to emerging situations through advanced manufacturing technology and processes. Efforts will result in greater affordability and producibility with a concentration on next generation squad weapons and ammunition, Soldier borne power, enhanced protective materials and systems, and sensor development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Soldier Lethality will transition to Soldier Systems to better reflect the level of effort and it's support to both current and future programs of record.	9.140	12.216	-
Title: Soldier Systems ***Description:*** ManTech efforts focused primarily on integrated Soldier and Squad weapon platforms. These efforts provide manufacturing solutions that enhance integrated Soldier capabilities through their equipment, personal sustainment, performance, protection, and communication. Additionally, this effort supports the Soldier Lethality modernization priority. Efforts are aligned to programs within the executive offices of Soldier; Combat Support & Combat Service Support; Chemical Biological Radiological and Nuclear Defense; and the joint program office for armaments and ammunition.	-	-	22.260

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Soldier Lethality. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Increase the capability of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their protection and ability to respond to emerging situations through advanced manufacturing technology and processes. Efforts will result in greater affordability and producibility with a concentration on next generation squad weapons and ammunition, Soldier borne power, enhanced protective materials and systems, and sensor development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased efforts in support of high emerging requirements supporting ammunition, tactical power for warfighter systems, food rations, and vision protection requirements.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	2.254	-
Accomplishments/Planned Programs Subtotals	58.785	61.720	91.270

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Not applicable for this item.

D. Acquisition Strategy

Not applicable for this item.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) E25 / *Mfg Science & Tech*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 NDAA SEC 825 MDAP Cost Overrun	Allot	N/A : N/A	0.037	-		-		-		-		-	0.000	0.037	-
		Subtotal	0.037	-		-		-		-		-	0.000	0.037	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mfg Science & Tech	Various	TBD : TBD	506.387	58.785		61.720		91.270		-		91.270	0.000	718.162	-
		Subtotal	506.387	58.785		61.720		91.270		-		91.270	0.000	718.162	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	506.424	58.785		61.720		91.270		-		91.270	0.000	718.199	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2016	4	2019

Note

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) EA2 / *MANTECH INITIATIVES (CA)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EA2: *MANTECH INITIATIVES (CA)*	-	72.000	42.000	-	-	-	-	-	-	-	0.000	114.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Congressional Interest Item funding provided for ManTech Initiatives.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for ManTech Initiatives.

This effort accelerates manufacturing technology for more affordable electronic warfare, communications and sensors systems components and subsystems to include radio frequency amplifiers, antennas, and focal plane arrays. This effort accelerates and supplements manufacturing technology for more affordable components and subsystems for tactical and combat vehicles and weapon systems. Work focuses benefit from working to develop and scale up the manufacturing process for nano-tungsten carbide powders and high-volume single-crystal tungsten rod manufacturing processes. This effort accelerates and supplements manufacturing technology for more advanced manufacturing and enterprise solutions. Work focuses on accelerating model based manufacturing to specific organic Army facilities and novel ways of applying additive manufacturing and monitoring material powder beds and process controls during additive manufacturing part build for weapon system components.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Functional Fabrics and Smart Textiles- Continued ***FY 2021 Accomplishments:*** Prototype demonstrations and Soldier testing to advance fabric-based sensor manufacturing processes.	10.000	-
Congressional Add: Smart Manufacturing of Engineered Fabrics - Continued ***FY 2021 Accomplishments:*** Continued the process of integrating engineered fabrics into wearable soldier applications.	7.000	-
Congressional Add: Scalability of Functional Fabric Manufacturing - Continued ***FY 2021 Accomplishments:*** Integrated fiber and fabric capabilities for fabric-based electronic devices and systems. ***FY 2022 Plans:*** Continue to do assessments for product integration and scaling as appropriate for with commercial manufacturing partners. Specific efforts in FY22 will include system development for commercial	5.000	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
prototype build to a maturity readiness level of 6; system validation and testing; in-house operational experiments and prototype testing.		
Congressional Add: Nanoscale Materials Manufacturing- Continued ***FY 2021 Accomplishments:*** Matured processes for silver Ink provider to support flexible electronic printing. ***FY 2022 Plans:*** Continue to scale up Nanoscale materials for manufacturing improvements and industrial based preparedness for critical component materials and armaments systems. Specific efforts will include the application of Tungsten Carbide for small to medium caliber penetrators to improve performance; optimization of Boron Carbide for application on ballistic protection and lightweight body borne plates; and advancement of critical materials (e.g. tantalum, niobium, etc.) for future applications (e.g. additive, hypervelocity, etc). Beneficiaries of this technology will be PEO Soldier and JPEO Armaments and Ammunition, and applied to maneuver ammunition systems, soldier lethality.	10.000	5.000
Congressional Add: Compact Efficient Rotary Engine ***FY 2021 Accomplishments:*** Advanced engine core design, fabrication and dyno testing for heavy-fuel rotary engine technology for next generation unmanned aircraft systems.	10.000	-
Congressional Add: Lightweight High Efficiency Generators ***FY 2021 Accomplishments:*** Matured manufacturing process of High Efficiency Hybrid thermodynamic Cycle (HEHC) engine to power a 1-3 kW electric generator.	10.000	-
Congressional Add: Glass Separators for Lithium Bateries- Continued ***FY 2021 Accomplishments:*** Advanced the manufacturing technology and processes for battery materials to be integrated into these SL and Future Vertical Lift CFT systems.	5.000	-
Congressional Add: Advanced Manufacturing Cell for Missile Fins ***FY 2021 Accomplishments:*** Developed a manufacturing production process for cell for missile fins to improve performance, quality and throughput. ***FY 2022 Plans:*** Develop manufacturing process for missile fin casting. FY22 efforts will specifically work on improving shell mold throughput; enhance melting and mold preheat; enhance core removal; and automate defect location and removal. Beneficiaries of this technology will be PEO Missile and Space, PM Strategic and Operational Rockets and Missiles. This technology will integrate into the Army Tactical Missile System and Precision Strike Missile.	5.000	8.000
Congressional Add: Advanced Manufacturing Technology	5.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
FY 2021 Accomplishments: Matured advanced manufacturing processes for aluminum rolling mills, to include real time measurements of mill products and automated operations for improved cold mill processes, producibility and throughput for armor products. Assessed multiple materials for wear with low viscosity fuel and completed microstructure assessment .		
Congressional Add: Tungsten Manufacturing Affordability Initiative for Armaments - Continued ***FY 2021 Accomplishments:*** Provided new manufacturing source for to produce rocket nozzles and long rod penetrators that demonstrated reduced cracking and erosion.	5.000	-
Congressional Add: Liquid Hydrogen Refueling Systems ***FY 2022 Plans:*** Develop Manufacturing processes for multiple Portable Liquid Hydrogen Refueling Ground Support Equipment (GSE) Systems for the Army?s PM Counter Unmanned Aerial Systems (UAS). As the technology advances, hydrogen fuel cells will provide energy for a range of stationery and mobile applications. These efforts will specifically develop and demonstrate autonomous liquid hydrogen refueling by; proving that manufacturing, producing, storing and using hydrogen fueling systems will play an important role in driving further development of renewable energy, by balancing their intermittent supply modalities with the challenging end-user demands.	-	10.000
Congressional Add: N2O5 ***FY 2022 Plans:*** Develop manufacturing process to use dinitrogen pentoxide (N2O5) in the manufacture of explosives reducing manufacturing costs and reducing chromium-contaminated ammonium nitrate solution (ANSOL) waste byproducts that must be treated as hazardous waste and has a high remediation cost in their disposal.	-	10.000
Congressional Add: Lightweight Transparent Film Armor- Continued ***FY 2022 Plans:*** Continue optimization trials for integrated manufacturing process and begin flat UOPP film and laminate evaluations. This effort is developing a domestic source supporting manufacturing technology critical to the US Army.	-	4.000
Congressional Adds Subtotals	72.000	42.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
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D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	N/A : N/A	0.039	-		-		-		-		-	0.000	0.039	-
		Subtotal	0.039	-		-		-		-		-	0.000	0.039	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mfg Science & Tech	TBD	TBD : TBD	126.561	72.000		42.000		-		-		-	0.000	240.561	-
		Subtotal	126.561	72.000		42.000		-		-		-	0.000	240.561	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	126.600	72.000		42.000		-		-		-	0.000	240.600	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2016	4	2016