

UNCLASSIFIED

**Department of Defense
Fiscal Year (FY) 2023 Budget Estimates**

April 2022



Army

Justification Book Volume 2a of 2

Research, Development, Test & Evaluation, Army

RDT&E – Volume II, Budget Activity 4

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

Volume 2a Table of Contents

Introduction and Explanation of Contents.....Volume 2a - ii
Comptroller Exhibit R-1..... Volume 2a - viii
Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 2a - xx
Program Element Table of Contents (Alphabetically by Program Element Title).....Volume 2a - xxiii
Exhibit R-2s.....Volume 2a - 1

UNCLASSIFIED

UNCLASSIFIED
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY
APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$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.

UNCLASSIFIED
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:

<i>Budget Activity</i>	<i>OSDPE / Project</i>	<i>Project Title</i>
02	0602002A / DC4	Army Applied Innovation
02	0602002A / DC5	Team Ignite
02	0602141A / CII	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:

<u>Budget Activity</u>	<u>Old OSDPE / Project: Title</u>	<u>New OSDPE / Project</u>
02	0602143A / BE6: Reactive/Resp Surfaces & Matls-Soldiers & Sys	0602184A / CW9
02	0602146A / A02: 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 Meteorological Technology	0602182A / CW2
02	0602146A / CK1: Assured 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):

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>Project Title</u>
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

<u>Summary Recap of Budget Activities</u>	<u>FY 2021</u> <u>(Base + OCO)</u>	<u>FY 2022</u> <u>Enactment</u>	<u>FY 2023</u> <u>Request</u>
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
<u>Summary Recap of FYDP Programs</u>			
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

UNCLASSIFIED

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	Se c
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

UNCLASSIFIED

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	Se c
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

UNCLASSIFIED

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
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 Missile 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

UNCLASSIFIED

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	Se c
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

UNCLASSIFIED

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
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

UNCLASSIFIED

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
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

Page A-7

UNCLASSIFIED

Volume 2a - xiv

UNCLASSIFIED

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
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

UNCLASSIFIED

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	Se
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

UNCLASSIFIED

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	Se c
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

UNCLASSIFIED

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
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

UNCLASSIFIED

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
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	

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

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

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
50	04	0603305A	Army Missile Defense Systems Integration.....	Volume 2a - 1
51	04	0603308A	Army Space Systems Integration.....	Volume 2a - 15
52	04	0603327A	Air and Missile Defense Systems Engineering.....	Volume 2a - 28
53	04	0603619A	Landmine Warfare and Barrier - Adv Dev.....	Volume 2a - 37
54	04	0603639A	Tank and Medium Caliber Ammunition.....	Volume 2a - 75
55	04	0603645A	Armored System Modernization - Adv Dev.....	Volume 2a - 133
56	04	0603747A	Soldier Support and Survivability.....	Volume 2a - 151
57	04	0603766A	Tactical Electronic Surveillance System - Adv Dev.....	Volume 2a - 166
58	04	0603774A	Night Vision Systems Advanced Development.....	Volume 2a - 193
59	04	0603779A	Environmental Quality Technology - Dem/Val.....	Volume 2a - 216
60	04	0603790A	NATO Research and Development.....	Volume 2a - 234
61	04	0603801A	Aviation - Adv Dev.....	Volume 2a - 246
62	04	0603804A	Logistics and Engineer Equipment - Adv Dev.....	Volume 2a - 276
63	04	0603807A	Medical Systems - Adv Dev.....	Volume 2a - 300
64	04	0603827A	Soldier Systems - Advanced Development.....	Volume 2a - 332
65	04	0604017A	Robotics Development.....	Volume 2a - 371

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
66	04	0604019A	Expanded Mission Area Missile (EMAM).....	Volume 2a - 403
67	04	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping.....	Volume 2a - 416
68	04	0604021A	Electronic Warfare Technology Maturation (MIP).....	Volume 2a - 425
69	04	0604035A	Low Earth Orbit (LEO) Satellite Capability.....	Volume 2a - 432
70	04	0604036A	Multi-Domain Sensing System (MDSS) Adv Dev.....	Volume 2a - 441
71	04	0604037A	Tactical Intel Targeting Access Node (TITAN) Adv Dev.....	Volume 2a - 450
72	04	0604100A	Analysis Of Alternatives.....	Volume 2a - 458
73	04	0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4).....	Volume 2a - 464
74	04	0604113A	Future Tactical Unmanned Aircraft System (FTUAS).....	Volume 2a - 472
75	04	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor.....	Volume 2a - 482
76	04	0604115A	Technology Maturation Initiatives.....	Volume 2a - 492
77	04	0604117A	Maneuver - Short Range Air Defense (M-SHORAD).....	Volume 2a - 561
78	04	0604119A	Army Advanced Component Development & Prototyping.....	Volume 2a - 581
79	04	0604120A	Assured Positioning, Navigation and Timing (PNT).....	Volume 2a - 582
80	04	0604121A	Synthetic Training Environment Refinement & Prototyping.....	Volume 2a - 612
81	04	0604134A	Counter Improvised-Threat Demonstration, Prototype Development, and Testing.....	Volume 2a - 665
82	04	0604135A	Strategic Mid-Range Fires.....	Volume 2a - 677
83	04	0604182A	Hypersonics.....	Volume 2a - 700

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
84	04	0604403A	Future Interceptor.....	Volume 2a - 731
85	04	0604531A	Counter - Small Unmanned Aircraft Systems Advanced Development.....	Volume 2a - 737
86	04	0604541A	Unified Network Transport.....	Volume 2a - 750
87	04	0604644A	Mobile Medium Range Missile.....	Volume 2a - 776
88	04	0604785A	Integrated Base Defense (Budget Activity 4).....	Volume 2a - 788
89	04	0305251A	Cyberspace Operations Forces and Force Support.....	Volume 2a - 795

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

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

Program Element Title	Program Element Number	Line #	BA	Page
Air and Missile Defense Systems Engineering	0603327A	52	04.....	Volume 2a - 28
Analysis Of Alternatives	0604100A	72	04.....	Volume 2a - 458
Armored System Modernization - Adv Dev	0603645A	55	04.....	Volume 2a - 133
Army Advanced Component Development & Prototyping	0604119A	78	04.....	Volume 2a - 581
Army Missile Defense Systems Integration	0603305A	50	04.....	Volume 2a - 1
Army Space Systems Integration	0603308A	51	04.....	Volume 2a - 15
Assured Positioning, Navigation and Timing (PNT)	0604120A	79	04.....	Volume 2a - 582
Aviation - Adv Dev	0603801A	61	04.....	Volume 2a - 246
Counter - Small Unmanned Aircraft Systems Advanced Development	0604531A	85	04.....	Volume 2a - 737
Counter Improvised-Threat Demonstration, Prototype Development, and Testing	0604134A	81	04.....	Volume 2a - 665
Cross Functional Team (CFT) Advanced Development & Prototyping	0604020A	67	04.....	Volume 2a - 416
Cyberspace Operations Forces and Force Support	0305251A	89	04.....	Volume 2a - 795
Electronic Warfare Technology Maturation (MIP)	0604021A	68	04.....	Volume 2a - 425
Environmental Quality Technology - Dem/Val	0603779A	59	04.....	Volume 2a - 216
Expanded Mission Area Missile (EMAM)	0604019A	66	04.....	Volume 2a - 403
Future Interceptor	0604403A	84	04.....	Volume 2a - 731
Future Tactical Unmanned Aircraft System (FTUAS)	0604113A	74	04.....	Volume 2a - 472

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Hypersonics	0604182A	83	04.....	Volume 2a - 700
Integrated Base Defense (Budget Activity 4)	0604785A	88	04.....	Volume 2a - 788
Landmine Warfare and Barrier - Adv Dev	0603619A	53	04.....	Volume 2a - 37
Logistics and Engineer Equipment - Adv Dev	0603804A	62	04.....	Volume 2a - 276
Low Earth Orbit (LEO) Satellite Capability	0604035A	69	04.....	Volume 2a - 432
Lower Tier Air Missile Defense (LTAMD) Sensor	0604114A	75	04.....	Volume 2a - 482
Maneuver - Short Range Air Defense (M-SHORAD)	0604117A	77	04.....	Volume 2a - 561
Medical Systems - Adv Dev	0603807A	63	04.....	Volume 2a - 300
Mobile Medium Range Missile	0604644A	87	04.....	Volume 2a - 776
Multi-Domain Sensing System (MDSS) Adv Dev	0604036A	70	04.....	Volume 2a - 441
NATO Research and Development	0603790A	60	04.....	Volume 2a - 234
Night Vision Systems Advanced Development	0603774A	58	04.....	Volume 2a - 193
Robotics Development	0604017A	65	04.....	Volume 2a - 371
Small Unmanned Aerial Vehicle (SUAV) (6.4)	0604101A	73	04.....	Volume 2a - 464
Soldier Support and Survivability	0603747A	56	04.....	Volume 2a - 151
Soldier Systems - Advanced Development	0603827A	64	04.....	Volume 2a - 332
Strategic Mid-Range Fires	0604135A	82	04.....	Volume 2a - 677
Synthetic Training Environment Refinement & Prototyping	0604121A	80	04.....	Volume 2a - 612
Tactical Electronic Surveillance System - Adv Dev	0603766A	57	04.....	Volume 2a - 166

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2023 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Tactical Intel Targeting Access Node (TITAN) Adv Dev	0604037A	71	04.....	Volume 2a - 450
Tank and Medium Caliber Ammunition	0603639A	54	04.....	Volume 2a - 75
Technology Maturation Initiatives	0604115A	76	04.....	Volume 2a - 492
Unified Network Transport	0604541A	86	04.....	Volume 2a - 750

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>
---	---

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	-	139.518	56.702	12.001	-	12.001	12.708	12.951	12.952	13.078	0.000	259.910
TR5: <i>Missile Defense Battlelab</i>	-	139.518	56.702	12.001	-	12.001	12.708	12.951	12.952	13.078	0.000	259.910

A. Mission Description and Budget Item Justification

This Program Element (PE) funds missile defense systems integration efforts for the US Army Space and Missile Defense Command in its role as the Army Service Component Command (ASCC) to USSTRATCOM and USSPACECOM.

USASMDC: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC as the Army proponent for ground-based midcourse defense (GMD), the Army integrator for global missile defense, and the ASCC of the U.S. Strategic Command (USSTRATCOM). Upon its establishment, USASMDC became the ASCC of the United States Space Command (USSPACECOM). Army Regulation (AR) 10-87 Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007 and AR 5-22 The Army Force Modernization Proponent System dated 19 August 2009 designates USASMDC as the Army specified proponent for Global Missile Defense (GMD) capabilities. As the Army proponent for GMD, USASMDC is responsible for developing warfighting concepts, conducting warfighting experiments to validate those concepts, identifying capabilities needed to implement the validated concepts, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize GMD capabilities. As the Army integrator for global missile defense, USASMDC is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM and USSPACECOM to execute their global missile defense responsibilities.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	140.195	11.702	0.000	-	0.000
Current President's Budget	139.518	56.702	12.001	-	12.001
Total Adjustments	-0.677	45.000	12.001	-	12.001
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	45.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	12.001	-	12.001
• Adjustment to the execution year	-0.677	-	-	-	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration
--	--

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

Project: TR5: *Missile Defense Battlelab*

	FY 2021	FY 2022
Congressional Add: <i>Program increase - pragmatic artificial intelligence and new technology</i>	10.500	-
Congressional Add: <i>Program increase - integrated environmental control and power</i>	16.000	5.000
Congressional Add: <i>Program increase - hot air tunnel and MESO technologies for hypersonics</i>	47.000	-
Congressional Add: <i>Program increase - conventional mission capabilities</i>	10.250	-
Congressional Add: <i>Program increase - air and missile system critical technology development</i>	12.000	-
Congressional Add: <i>Program increase - advanced technology end-to-end testbed</i>	10.500	-
Congressional Add: <i>Program increase - gun launched interceptors</i>	8.000	-
Congressional Add: <i>Program increase</i>	15.000	-
Congressional Add: <i>Electro-Magnetic Denial and Protect</i>	-	6.000
Congressional Add: <i>Multiple Engagement End-To-End Testbed</i>	-	2.500
Congressional Add: <i>A2IFS (Advanced Dynamic and Features Simulation)</i>	-	23.500
Congressional Add: <i>PNT Resiliency Lab</i>	-	8.000
Congressional Add Subtotals for Project: TR5	129.250	45.000
Congressional Add Totals for all Projects	129.250	45.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab
--	--	---

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
TR5: <i>Missile Defense Battlelab</i>	-	139.518	56.702	12.001	-	12.001	12.708	12.951	12.952	13.078	0.000	259.910
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the Strategic Missile Defense (SMD) Force Development activities of the United States Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE). The SMDCoE is the warfighting function lead and Department of the Army force modernization proponent to develop the associated operational prototyping, experimentation, operational analysis, and modeling and simulation in support of missile defense capabilities for current and future Forces. The SMDCoE SMD Force Development workforce support the research and doctrine development from one of the SMDCoE principle locations in Huntsville, AL; Colorado Springs, CO; and Joint Base Langley-Eustis. As the Army proponent for SMD, USASMDC is responsible for developing warfighting concepts, conducting warfighting experiments to validate those concepts, identifying capabilities needed to implement the validated concepts, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to develop future SMD capabilities. As the Army integrator for SMD, USASMDC is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM and USSPACECOM to execute their strategic missile defense responsibilities.

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

	FY 2021	FY 2022	FY 2023
Title: Prototypes	1.602	1.713	1.720
Description: Develop and assess current SMD technologies and assess capabilities through participation in wargames and experiments.			
FY 2022 Plans: Take the lessons learned from the FY 2021 efforts to continue to evaluate new technologies in realistic operating environments. This is accomplished by participating in and providing support to Unified Quest wargames and experiments to analyze and integrate technology to identify the feasibility integration into Army missile defense systems. The Space and Missile Defense Command will participate and support biennial rewrites of Army Capstone, Operational and Functional Concepts. Continue to provide operational manager support to USSTRATCOM, USNORTHCOM and USSOCOM Joint Technical Capability Demonstrations to ensure Army missile defense equities are represented in advanced technology developments by demonstrating military utility when applied to military equipment and techniques. Examples include: supporting multi service experiments and capability development of the national-directed Phased Adaptive Approach (PAA) for Ballistic Missile Defense (BMD) as it is applied to each of the regional CCMDs; developing effective Integrated Missile Defense concepts for Army support to the Phased Adaptive Approach (PAA) being implemented within each regional CCMD. A focus area will be improving upon the Missile Defeat Integrated Capability Development Working Group formed in FY 2020 with additional experimentation aimed			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>at further improving the timeliness and effectiveness of counter ballistic missile time sensitive targeting. Continue support to TRADOC proponents with their responsibilities relative to doctrine, organization, training, material, leader development and education, personnel, facilities and policy (DOTMLPF-P) plus related matters to continue missile defense proponent input to Joint Capabilities Integration and Development System (JCIDS), Science and Technology, Concept Development, and Capability Development. Provide Government program management and oversight for DOTMLPF-P development and analysis for missile defense-related programs for which USASMDC is the Army's proponent - Ground-based Midcourse Defense System, the Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2) Forward-based Mode Radar (FBM), and Army-specific applications of the Command and Control, Battle Management and Communications program. Specifically, provide support to Ground-based Midcourse Defense (GMD) Missile Field #4 (MF4) development and construction. Provide support to recapitalized MEP-810C generator fielding and radar site power conversion activities in USINDOPACOM AOR. Provide Hardened Transportable Terminal fielding to USCENTCOM, USINDOPACOM, and USEUCOM AORs and continue to support C2BMC software development, integration, fielding, and operations & sustainment activities. Provide Government program management and oversight for National Capital Region's Integrated Air Defense System.</p> <p>FY 2023 Plans: USASMDC SMDCoE will continue to pursue Army modernization priorities through participation in the Joint Warfighting Concept and support to combatant command wargaming, experimentation and concept development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Adjustment to economic assumptions.</p>			
<p>Title: Analysis, and Models and Simulations (M&S)</p> <p>Description: USASMDC is the proponent for multiple models and simulations (M&S) critical to the Army and Joint analysis, exercise, wargaming, and experimentation communities.</p> <p>FY 2022 Plans: Take the lessons learned from the FY 2021 efforts and continue to evaluate new technologies in realistic operating environments. This will be accomplished by supporting ongoing efforts that provide the most realistic operating environment available to perform technology gap and cost reduction analysis of missile defense systems. Realistic operating environments will be available to determine the ability of the specific technologies to fill capability gaps in terms of utility to the warfighter. Support of technology demonstrations, Analysis and Demonstration Tools/Test Beds for evolving missile defense concepts will address emerging needs and continue to be expanded to ensure that advanced technology development can adequately enhance missile defense capabilities. The Space and Missile Defense Center of Excellence (SMD CoE) will continue to provide program management for maintenance, sustainment, and development for Extended Air Defense Simulation (EADSIM) delivering the required high fidelity synthetic operating environment to provide the capability to perform system and cost benefit analysis, operational planning, and</p>	0.701	0.750	0.753

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>exercise/ experimentation support. The SMD CoE will continue to provide program management for maintenance, sustainment, and development for Reconfigurable Tactical Operations Simulator (RTOS) and Future Force Experimentation Air Defense Simulation (FFEADS) delivering operator in the loop capability for air and missile defense simulation in distributed exercises and experiments. The SMD CoE will continue to provide program management for maintenance, sustainment, and development for for the Joint Embedded Messaging System (JEMS) providing data translation application that enables communications between disparate systems, protocols and architectures. These funds will be executed by USASMDC SMD CoE.</p> <p>FY 2023 Plans: Continue improve Missile Defense analysis, advanced modelling and simulations by leveraging lessons learned from previous efforts. Evaluate new technologies in realistic operating environments to accurately reflect modern missile defense capabilities. Develop the Future Force Experimentation Air Defense System (FFEADS) simulation model to provide operator-in-the-loop representations of all Army air and missile defense weapon, and command and control systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Adjustment to economic assumptions.</p>				
<p>Title: Disruptive Concepts and Technologies Development</p> <p>Description: Provide concept development / DOTMLPF-P support to the Army Air and Missile Defense Cross Functional Team (AMD CFT) for priority programs.</p> <p>FY 2022 Plans: Current efforts are focused on maturing operating concepts leveraging advanced technologies to include Artificial Intelligence Air and Missile Defense (AIAMD), enduring Indirect Fires Protection Capability (IFPC) and laser technology air and missile defense protection systems.</p> <p>FY 2023 Plans: USASMDC SMDCoE maintains focus on developing concepts to integrate emerging technologies which support the development of next generation capabilities to match, then outpace the threat in order to ensure success in competition, crisis, conflict, and change.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Adjustment to economic assumptions.</p>		6.262	7.296	7.700
<p>Title: Strategic Missile Defense Operations Resourcing and Support</p> <p>Description: Requirement supports the SMDCoE responsibility to provide resources to support underlying operating expenses for the strategic missile defense force development mission area.</p>		1.703	1.820	1.828

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Resources provide the support staff for senior SMDCoE leadership, budget and program support, reimbursement for Army Contracting Command (ACC), and a variety of logistical support requirements all necessary to sustain operations and ensure efficient accomplishment of the larger force development mission.</p> <p>FY 2023 Plans: Continue to provide operational and logistical support to ensure the long range planning and overall mission accomplishment of the Army SMDCoE.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Adjustment to economic assumptions.</p>				
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>		-	0.123	-
Accomplishments/Planned Programs Subtotals		10.268	11.702	12.001
		FY 2021	FY 2022	
<p>Congressional Add: Program increase - pragmatic artificial intelligence and new technology</p> <p>FY 2021 Accomplishments: FY21 Pragmatic Artificial Intelligence and new Technology Laboratory: The Space and Missile Defense Technical Center (SMDTC) initiated the Pragmatic Artificial Intelligence and New Technology (PAINT) laboratory capability to apply Artificial Intelligence (AI) ?Expert Systems? and other new technologies to Integrated Air and Missile Defense (IAMD) capabilities. The effort began applications of expert computer systems capturing human knowledge and incorporate it into a bounded, autonomous software program. The effort develops methodologies, decision making criteria, lessons learned by IAMD subject matter experts (SMEs), and encode them into the command and control software applications. The PAINT effort focuses on applications of basic AI principals to impact the speed and accuracy of software for the benefit of testing IAMD systems in a lab environment such as exercise and test safety and operational planning.</p>		10.500	-	
<p>Congressional Add: Program increase - integrated environmental control and power</p>		16.000	5.000	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>	Project (Number/Name) TR5 / <i>Missile Defense Battlelab</i>	
		FY 2021	FY 2022
<p>FY 2021 Accomplishments: FY21 Integrated Environmental Control and Power: The Space and Missile Defense Technical Center (SMDTC) continue the development, testing and evaluation, and pre-production reliability testing of integrated power and thermal management technologies, components, and systems. The effort integrated thermal and power management sub-systems to refine and mature advanced platforms of Counter-Unmanned Aircraft System (C-UAS) needs of advanced weapon pods or small stationary container systems to more effectively operate and contribute to Integrated Air and Missile Defense/Short Range Air Defense (IAMD) objectives. The effort built upon the advanced high efficiency Alternating Current (AC) and Direct Current (DC) compatible Environmental Control Unit and electronics cooling technologies allowing for the rapid integration of highly compact and energy efficient DC generators.</p> <p>FY 2022 Plans: The project further addresses the need and requirement as set forth by CENTCOM and expressed to the Rapid Equipping Force to facilitate integration of power generation equipment with environmental control systems for lighter weight and true plug-and-play operation. The effort builds upon the advanced high efficiency AC and DC compatible ECU and electronics cooling technologies developed under this program in the past years and thus allows for the rapid integration of highly compact and energy efficient DC generators. These integrated systems find their best use in battlefield theaters for air missile defense applications.</p>			
<p>Congressional Add: Program increase - hot air tunnel and MESO technologies for hypersonics</p> <p>FY 2021 Accomplishments: FY21 Hypersonic Testing and Related Technology Development: The Space and Missile Defense Technical Center (SMDTC) will initiate the design and development of a test laboratory capability for High Speed/Hypersonic (HS/H) systems. The test will confirm design margins for a test capability for testing HS/H systems in a validated realistic environment. This test supports design refinements of capabilities related to the use of nitrous oxide for non-vitiated hot air flow used in HS/H engine testing. The Hot Air Tunnel validates safety and chemistry requirements for HS/H systems in a validated realistic environment. The effort will began development of a full duration test laboratory capability for HS/H systems.</p>		47.000	-
<p>Congressional Add: Program increase - conventional mission capabilities</p> <p>FY 2021 Accomplishments: FY21 Conventional Mission Capabilities: The Space and Missile Defense Technical Center (SMDTC) matured rapid mission planning and range safety capabilities leveraging existing, proven, and low-risk systems. These efforts integrates and develops software tools for trajectory propagation, aerothermal analysis, flight guidance, system vulnerability, and real-time weather. The effort supports test in the Air and Missile Software Integration Laboratory (AMSIL) to meet the near and long-term advances in Integrated Air and Missile Defense (IAMD) system requirements including the Long Range Hypersonic Weapon (LRHW).</p>		10.250	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab	
		FY 2021	FY 2022
The SMDTC continues the development of a mission planner supporting detailed flight planning of emerging weapon systems including the LRHW. This planner combines high fidelity vehicle flight dynamics, aerothermal analyses, signature analyses, and environmental analyses (including real-time and predicted weather) with a comprehensive human/machine interface (HMI) and visualization capability. The SMDTC augmented the planner compliant tools enabling hazard analysis. Initiated adding capabilities for link margin analyses for telemetry, radar, and flight termination systems. Initiated integration of capability within the AMSIL.			
Congressional Add: Program increase - air and missile system critical technology development		12.000	-
FY 2021 Accomplishments: FY21 Air and Missile System Critical Technology Development (AMSCT): The Space and Missile Defense Technical Center (SMDTC) continue the development and demonstration of scalable HPM devices that can be integrated on multiple platforms. The effort assess HPM lethality to optimized effects in threat systems and Identifies HPM protection capabilities to battlefield systems. Provides and develops Air and Missile test environment supporting multiple Space and IAMD technologies and weapon systems.			
Congressional Add: Program increase - advanced technology end-to-end testbed		10.500	-
FY 2021 Accomplishments: FY21 Advanced Technology end-to-end testbed: The Space and Missile Defense Technical Center (SMDTC) initiates the establishment an Advanced Technology Testbed simulation and test capability to replicate realistic flight in 3 and 6 Degrees of Freedom (DOF) dynamic environments for advanced weapon systems. The capability supported the assessment of effect of these environments on critical subsystems, including the state-of-the-art Integrated Air and Missile Defense (IAMD) seekers/sensors, avionics guidance computers, and inertial measurement units (IMU). The testbed will be designed and developed to include offensive and defensive weapon technologies to engage the emerging threats in a realistic environment, for complete kill chain of air and missile defense technology evaluation capability. Initiate technical simulations of advanced IAMD threat sand capabilities to assess system task plans, and engagement plans (e.g. 3DOF, 6DOF) with possible use for ground tests			
Congressional Add: Program increase - gun launched interceptors		8.000	-
FY 2021 Accomplishments: Research and develop how Counter - Rocket, Artillery, Mortar / Unmanned Aerial Systems (C-RAM / C-UAS) defenses can be overwhelmed by swarm attack . This work will prototype a maneuverable, laser guided GLI by utilizing an Insensitive Munitions compliant solid propulsion divert system and a laser seeker assembly. Design, integrate, and test a prototype GLI to address the C-RAM / C-UAS mission as part of the Integrated Air and Missile Defense role.			
Congressional Add: Program increase		15.000	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab	
		FY 2021	FY 2022
<p>FY 2021 Accomplishments: Develop techniques for protection of tactical space resources against cyberattack and dedicated capabilities for continual responsiveness to threat advancement. Develop and integrate advanced capability prototype Hardware in The Loop (HWIL) / Software in the Loop (SWIL) for cyber resilient tactical space technologies. Perform non-invasive multi-source attack vector stimulation of space prototypes to support the development and integration of future Army space capabilities that are globally responsive to the joint warfighter and provide the foundation for long-term overmatch against near-peer adversaries. Develop and fabricate thermal management system test and integrations evaluation capability. Develop Electronics cooling for supersonic and hypersonic missiles scalable directly with missile components. Complex compound heat shield materials development and test the joint warfighter and provide the foundation for long-term overmatch against near-peer adversaries. Research and Enhance Laser Lethality Infrastructure for Cruise Missile Lethality Vulnerability Modules developments. Research and Purchase targets for Lethality Vulnerability Module developments.</p>			
<p>Congressional Add: Electro-Magnetic Denial and Protect</p>		-	6.000
<p>FY 2022 Plans: Develop High Power Microwave (HPM) technologies and systems capable of engaging specific target classes. Leverage extensive history of HPM hardware system development, effects testing, and predictive algorithms to narrow the focus of the effort to provide efficient and expedient technology development.</p>			
<p>Congressional Add: Multiple Engagement End-To-End Testbed</p>		-	2.500
<p>FY 2022 Plans: Establish an End-to-End Advanced Weapons Technology Architecture Testbed to deliver a software architecture to incorporate disparate models into an end-to-end, raid on salvo, Red Force/Blue Force weapons versus ballistic missile defense system simulation testbed to be used for technical assessment of the weapon systems.</p>			
<p>Congressional Add: A2IFS (Advanced Dynamic and Features Simulation)</p>		-	23.500
<p>FY 2022 Plans: Develop advanced ground test techniques and technologies to dramatically decrease the cost and schedule associated with the development of ground testing and hypersonic systems development by: Providing continuous test capability to accelerate the deployment of advanced systems Providing precise control of testing environment provides highest fidelity data capture Providing a secure method to develop future systems without adversary observation</p>			
<p>Congressional Add: PNT Resiliency Lab</p>		-	8.000
<p>FY 2022 Plans: The intent of this funding is to establish a world class test facility to simulate, characterize and develop innovative technologies that assure PNT resiliency to the warfighter. It will enable end-to-end</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>	Project (Number/Name) TR5 / <i>Missile Defense Battlelab</i>
--	---	--

	FY 2021	FY 2022
assessment of capabilities, vulnerabilities, identification of mitigation strategies, alternatives and solutions and then validation of means to ensuring Commanders guaranteed access to critical PNT information and services.		
Congressional Adds Subtotals	129.250	45.000

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

N/A

Remarks

SMDCoE strategic missile defense capability development efforts have a natural association and linkage with Army Space and High Altitude (SHA) capability development also performed within the SMDCoE. Emerging space and high altitude technologies and concepts often influence SMD identification, tracking and response.

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Personnel and Operations Support	C/TBD	To Be determined : To be Determined	16.577	6.630		7.674		8.356		-		8.356	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.123	Mar 2022	-		-		-	0.000	0.123	-
Subtotal			16.577	6.630		7.797		8.356		-		8.356	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Contracts	Various	To Be Determined : To Be determined	6.060	3.638		3.905		3.645		-		3.645	Continuing	Continuing	-
Various	Various	To be determined : to be determined	48.438	129.250		-		-		-		-	0.000	177.688	-
Electro-Magnetic Denial and Protect (CA)	TBD	SMDC : Various	-	-		6.000		-		-		-	0.000	6.000	-
Integrated Environmental Control and Power (CA)	TBD	SMDC : Various	-	-		5.000		-		-		-	0.000	5.000	-
Multiple Engagement End-To-End Testbed	TBD	SMDC : Various	-	-		2.500		-		-		-	0.000	2.500	-
A2IFS (Advanced Dynamic and Instrumentation and Features Simulation) (CA)	TBD	SMDC : Various	-	-		23.500		-		-		-	0.000	23.500	-
PNT Resiliency Lab (CA)	TBD	SMDC : Various	-	-		8.000		-		-		-	0.000	8.000	-
Subtotal			54.498	132.888		48.905		3.645		-		3.645	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Experiments & technology enhancements of	Various	Various Colorado Springs CO and	117.427	-		-		-		-		-	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army													Date: April 2022		
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration						Project (Number/Name) TR5 / Missile Defense Battlelab					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
prototypes/tools and analysis.		Huntsville AL : Alabama, Colorado Springs													
Govt Support and Support Contracts	Various	Various Colorado Springs CO and Huntsville AL : Alabama, Colorado Springs	138.783	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			256.210	-		-		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			327.285	139.518		56.702		12.001		-		12.001	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

Event Name	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
Experiments & Technology Enhancements of Prototypes																												
Development of Extended Air Defense Simulation Updates																												
Reconfigurable Tactical Operations System (RTOS) Development																												
Force Development Support to the Air and Missile Defense Cross Functional Team																												
AN/TPY-2 Forward Based Mode (FBM) Program Management																												
Missile Defense Simulation Support for the Joint Warfighting Concept																												
Force Design Requirements Assessment for Missile Defense Forces																												
Hypersonics Tracking Capability Development																												
Provide Support to Army Future Command's Modernization Enterprise Processes																												
Future Force Experimentation Air Defense System (FFEADS) Development																												
Analysis Support to Joint Inter Agency Missile Defense Office (JIAMDO)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>	Project (Number/Name) TR5 / <i>Missile Defense Battlelab</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Experiments & Technology Enhancements of Prototypes	1	2022	4	2027
Development of Extended Air Defense Simulation Updates	1	2022	4	2027
Reconfigurable Tactical Operations System (RTOS) Development	1	2022	4	2027
Force Development Support to the Air and Missile Defense Cross Functional Team	1	2022	4	2027
AN/TPY-2 Forward Based Mode (FBM) Program Management	1	2022	4	2027
Missile Defense Simulation Support for the Joint Warfighting Concept	1	2022	4	2027
Force Design Requirements Assessment for Missile Defense Forces	1	2022	4	2027
Hypersonics Tracking Capability Development	1	2022	4	2027
Provide Support to Army Future Command's Modernization Enterprise Processes	1	2022	4	2027
Future Force Experimentation Air Defense System (FFEADS) Development	2	2022	3	2024
Analysis Support to Joint Inter Agency Missile Defense Office (JIAMDO)	1	2022	3	2024

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603308A / <i>Army Space Systems Integration</i>							
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	-	25.584	25.755	17.945	-	17.945	19.087	19.511	19.515	19.706	0.000	147.103
990: <i>Space And Missile Defense Integration</i>	-	25.584	25.755	17.945	-	17.945	19.087	19.511	19.515	19.706	0.000	147.103

A. Mission Description and Budget Item Justification

USASMD/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMD/ARSTRAT as the Army proponent for space, the Army integrator for global missile defense (GMD), and the Army Service Component Command (ASCC) of the USSTRATCOM. Army Regulation (AR) 10-87, Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007, and AR 5-22, The Army Force Modernization Proponent System, dated 19 August 2009, designated USASMD/ARSTRAT as the Army specified proponent for Space/High Altitude capabilities. As the Army proponent for space and high altitude, USASMD/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions.

The Friendly Force Data Integration and Management (FFDIM) Capability Definition Package (CDP), a Joint Capabilities Integration and Development System (JCIDS) requirements document (October 2017) validated the Joint Friendly Force Tracking (JFFT) Testbed's development, testing and integration capabilities and Friendly Force Tracking (FFT) System Expert support provided by U.S. Army Space and Missile Defense Command (USASMD) as U.S. Strategic Command's (USSTRATCOM's) Army Service Component Command (ASCC). In addition, Chairman of the Joint Chiefs of Staff Instruction 3910 (FFT Operations Guidance) directs USSTRATCOM's ASCC to execute eight specified FFT mission support responsibilities that include providing a testing and development capability to support joint, interagency and coalition partners FFT operations. USASMD/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMD/ARSTRAT as the Army proponent for space, the Army integrator for global missile defense (GMD), and the Army Service Component Command (ASCC) of the USSTRATCOM. Army Regulation (AR) 10-87, Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007, and AR 5-22, The Army Force Modernization Proponent System, dated 19 August 2009, designated USASMD/ARSTRAT as the Army specified proponent for Space/High Altitude capabilities. As the Army proponent for space and high altitude, USASMD/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603308A / <i>Army Space Systems Integration</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	25.584	18.755	0.000	-	0.000
Current President's Budget	25.584	25.755	17.945	-	17.945
Total Adjustments	0.000	7.000	17.945	-	17.945
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	7.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	17.945	-	17.945

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

Project: 990: *Space And Missile Defense Integration*

Congressional Add: *Multi Function and Multi Mission Payload*

Congressional Add: *Communications Resiliency Arrays of Distributed Local Elements (CRADLE)*

Congressional Add Subtotals for Project: 990

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	-	2.000
	-	5.000
Congressional Add Subtotals for Project: 990	-	7.000
Congressional Add Totals for all Projects	-	7.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration				Project (Number/Name) 990 / Space And Missile Defense 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
990: Space And Missile Defense Integration	-	25.584	25.755	17.945	-	17.945	19.087	19.511	19.515	19.706	0.000	147.103
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the Force Development activities of the United States Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE). The SMDCoE is the warfighting function lead and Department of the Army force modernization proponent for integration of current and future Space and High Altitude (SHA) systems to enable Army forces on the battlefield. The SMDCoE workforce supports the research and doctrine development from one of the SMDCoE principle locations in Huntsville, AL; Colorado Springs, CO; and Joint Base Langley-Eustis. As the Army proponent for SHA, the SMDCoE is responsible for developing warfighting concepts, identifying and validating needed capabilities, conducting warfighting experiments, and developing Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions for the Army to leverage the SHA domains in support of Army operations. The SMDCoE focuses on providing solutions for capability gaps of land domain forces in a multi-domain battle environment in two ways: First, by leveraging the benefits of the SHA domains to enable decentralized land force operations in support of the Army's mission command philosophy; and second by delivering synchronized capabilities from, through and into the space domain in direct support of land domain forces. Effective integration of SHA capabilities enable the application of strategic land power and execution of Multi-Domain Operations (MDO). Additionally, SHA capabilities anchor the Army's ability to penetrate and disintegrate enemy anti-access and area denial (A2AD) systems and exploit the resultant freedom of maneuver to achieve strategic objectives and force a return to competition on favorable terms. Under the direction of an experienced member of the Senior Executive Service (SES), the SMDCoE receives guidance from the USASMDC Commanding General and works in close coordination with the Army Combined Arms Center, Army Futures Command, the United States Strategic Command, the United States Space Command the Missile Defense Agency.

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

	FY 2021	FY 2022	FY 2023
Title: Architecture Development, War games and Demonstrations	11.651	10.179	10.240
Description: Perform Army Force Modernization Responsibilities for the SHA Altitude Domains.			
FY 2022 Plans: USASMDC Space and Missile Defense Center of Excellence (SMDCoE) will continue the full spectrum of JCIDS concept to capability development efforts to enhance the resiliency and effectiveness of critical space-based and space enabled assets and JCIDS capability development activities for space superiority, theater missile warning, high altitude, and emerging concepts/technology for the full range of Navigation Warfare, tactical space layer, hypersonics, counter hypersonics, and directed energy. SMDCoE will participate in robust campaign of learning with the Army, Army Futures Command, Joint and sister service wargaming, experimentation, live prototyping, studies, assessments, and exercises to learn, validate, develop, and integrate the concepts and technology described above. SMDCoE will provide support to PEO IEWS and PEO M&S to acquire and field space			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>superiority and enhanced missile warning capabilities. USASMDC Space and Missile Defense Center of Excellence (SMDCoE) will execute these funds in FY 2022.</p> <p>FY 2023 Plans: Continue to develop concepts, transition technologies, and provide acquisition support for SHA technologies to assure uninterrupted access to space based technologies and leverage the capabilities provided for Army force operations on the battlefield.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Adjustment to economic assumptions.</p>				
<p>Title: Joint Friendly Force Tracking (J-FFT) Testbed</p> <p>Description: Development and deployment of J-FFT capabilities.</p> <p>FY 2022 Plans: J-FFT Testbed supports SMDC Force Tracking Mission Management Center (FT MMC) Special Operations Command (SOCOM) Africa Command (AFRICOM) Air Force Rapid Capabilities Office (AF RCO) Joint Staff J6 and other U.S. Government agencies by providing agile capability development and integrated solutions to validated requirements that enable interoperable force tracking data exchange and satisfy joint, agency and coalition warfighting needs for timely, accurate Common Operational Picture (COP) displays and decision making. JFFT development will continue to respond to the growth in FFT device use by enabling the number of device types, data types, and displays supported by the various FFT and HF TTL data architectures. The JFFT Testbed is scheduled to develop and deliver new capabilities for added functionality in data visualization and management. JFFT will continue to exploit, expand and provide mission owners with approved infrastructures at all classification levels that achieve improved performance and reduce costs. JFFT Testbed will remain a key contributor to support North Atlantic Treaty Organization Capability Team activities and other coalition assessments and exercises that advance US and coalition FFT interoperability. USASMDC Space and Missile Defense Center of Excellence (SMDCoE) will execute these funds in FY 2022.</p> <p>FY 2023 Plans: J-FFT will continue to exploit, expand and provide mission owners with approved infrastructures at all classification levels that achieve improved performance and reduce costs. Ensure J-FFT technologies remain a key contributor to support coalition assessments and exercises that advancing US and allies FFT interoperability.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Efficiencies and cost savings measures are expected to result in an approximate 8.5% reduction in J-FFT testbed funding levels from FY2022.</p>		3.170	3.498	3.200
<p>Title: Organizational Development as Part of the SRC40 Proponecy Mission</p>		2.853	2.567	2.355

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Provide PNT/NAVWAR capability development support for the Army.</p> <p>FY 2022 Plans: Continue to participate in the Force Design Update (FDU) process. The U.S. Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE) will participate in the recurring process used to gain HQDA approval of organizational structure changes and designs through the FDU and FDU Jr. processes. This includes the development of Operational & Organizational Concept Papers, Organization Design Papers, Cost Benefit Analyses, Unit Reference Sheets, and Manpower Requirements Criteria determination. Participate in the Total Army Analysis (TAA), the Army's annual process to examine the projected Army force qualitatively and quantitatively. USASMDC will support TAA Rule of Allocation development, Capability Demand Analysis and Resourcing phases to ensure SRC40 units are properly accounted for in the future Program Objectives Memorandum (POM) Force. This is performed to analyze the projected Army Force against future demands and levels of funding/authorizations to build the POM Force. USASMDC SMDCoE will review the USASMDC Troops, Organization and Equipment (TOE) requirements documents conducted as part of a cyclic process as well when needed during other Force Design processes (i.e.-Basis of Issue Plan (BOIP) Modernization Path (MODPATH) reviews, Notification of Change reviews, SSN-LIN Automated Management and Integrating System (SLAMIS) reviews, etc.). Participate in BOIP Development. BOIP Development is collection of processes including the cyclic review of Army-wide BOIPs under development, development of Feeder Data for USASMDC proponent item BOIPs, and validation of BOIP MODPATHs to USASMDC TOEs. Complete the Space Forces Force Structure Review which is a Cost-Benefit Analysis-like structured three-phased process consisting of a Needs Analysis, Gap Analysis, and Solutions Analysis to identify and document organizational based capability needs and gaps, develop a prioritized list of those gaps, and identify potential materiel and/or non-materiel solutions.</p> <p>U.S. Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE) will execute these funds in FY 2022.</p> <p>FY 2023 Plans: Continue to identify, develop, integrate and provide the Assured-Positioning, Navigation, and Timing (A-PNT) Cross Functional Team to guide development and fielding of capabilities to achieve the PNT overmatch necessary to support future Army operations.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Efficiencies and cost savings measures are expected to result in an approximate 8% reduction in Organizational Development efforts from FY2022.</p>			
Title: Position, Navigation, and Timing Navigation Warfare (PNT/NAVWAR)	3.033	2.157	2.150

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Requirement supports the SMDCoE responsibility to provide space and high altitude modeling and simulations, and resources underlying operating expenses and support.</p> <p>FY 2022 Plans: Based on the results of our efforts in 2021 the USASMDC Space and Missile Defense Center of Excellence will continue to identify and advocate for PNT and NAVWAR emerging requirements through Commander, U.S. Strategic Command to the joint staff to establish and formalize joint NAVWAR requirements, in the JCIDS process. Support the Army Assured Positioning Navigation and Timing (APNT) Cross Functional Team by conducting required capability analysis and developing JCIDS documents for APNT Enabling systems and APNT Situational Awareness. Specific actions planned are</p> <ul style="list-style-type: none"> * Write Alternate Navigation Concept of Operations * Support planning and execution of Lonestar Development Operations * Support planning and execution of Alternate Navigation Development Operations * Write and coordinate Gunsmoke requirements document * Write and coordinate Lonestar requirements document * Document Alternate Navigation requirements * Obtain input from the NAVWAR Community of Interest and write NAVWAR Attack CONOPS * Support execution of NAVWAR Attack Study * Facilitate inclusion of NAVWAR Attack systems in Army experiment, exercises, war games and other events to build knowledge about the Army need for this capability * Write and coordinate NAVWAR Attack requirements document * Identify how NAVWAR Attack concepts and capabilities will Multi-Domain operations * Provide NAVWAR and space subject matter expertise to help develop Fires Organizational and Operational Concept Document * Furnish NAVWAR subject matter expertise to support revision of Space Brigade Organizational and Operational Concept Division * Conduct analysis to determine if the fielding of a candidate NAVWAR technology would drive organizational changes <p>U.S. Army Space and Missile Defense Command (USASMDC) Space and Missile Defense Center of Excellence (SMDCoE) will execute these funds in FY 2022.</p> <p>FY 2023 Plans: Continue to support modeling and simulation, operational analysis and overarching operations to test and provide analytical rigor behind space and high altitude concepts and capability development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Army Position, Navigation, and Timing Navigation Warfare (PNT/NAVWAR) funding in this program remains essentially unchanged from FY22 at less than a 0.3% decrease in FY2023.			
Title: APNT Integrated Space Communications Description: Development of a unique advanced space communications capability to explore advanced ground based space communications technologies and concepts utilizing bi-static Radio Frequency (RF) scattering and propagation with precision frequency, phase, and power management. This space communications capability will develop and demonstrate multiple advanced Army LEO space communications concepts and will also assess interfacing with multiple Joint Service space communication missions.	4.877	-	-
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	-	0.354	-
Accomplishments/Planned Programs Subtotals	25.584	18.755	17.945

	FY 2021	FY 2022
Congressional Add: Multi Function and Multi Mission Payload FY 2022 Plans: This project will develop a low-cost multi-function multi-mission SAR sensor payload that can be used to provide SAR imagery for multiple mission functions including weather prediction, mission planning and other tactical and strategic operations. Project will result in a design of LEO satellite to provide high resolution, multi-spectral imagery of cloud cover, including sensor, orbital configuration and down linked high resolution multi-spectral capability for multiple missions.	-	2.000
Congressional Add: Communications Resiliency Arrays of Distributed Local Elements (CRADLE) FY 2022 Plans: CRADLE is a new bi-static communications and radar system that uses Army developed technologies to form distributed arrays using networks of local elements in theater. The successful implementation will leverage not only new advancements in beam-forming but also the Army's investment in portable communication systems.	-	5.000
Congressional Adds Subtotals	-	7.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

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

N/A

Remarks

SMDCoE space and high altitude capability development efforts have a natural association and linkage with Army Strategic Missile Defense (SMD) capability development also performed within the SMDCoE. Emerging space and high altitude technologies and concepts often influence SMD identification, tracking and response.

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603308A / Army Space Systems Integration				990 / Space And Missile Defense Integration							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Personnel and Operations support	TBD	SMDC/ARSTRAT : Huntsville, AL and Colorado Springs,	-	17.537		18.401		14.745		-		14.745	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.354		-		-		-	0.000	0.354	-
Subtotal			-	17.537		18.755		14.745		-		14.745	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
APNT Integrated Space Communications	TBD	Various : Huntsville AL, Wilmington, MA, Boulder CO, VA	-	4.877		-		-		-		-	0.000	4.877	-
Communications Resiliency Arrays of Distributed Local Elements (CRADLE) (CA)	TBD	SMDC : Various	-	-		5.000		-		-		-	0.000	5.000	-
Multi-Function and Multi-Mission Payload	TBD	Various : Various	-	-		2.000		-		-		-	0.000	2.000	-
Subtotal			-	4.877		7.000		-		-		-	0.000	11.877	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
J-FFT Testbed and Development	TBD	SMDC/ARSTRAT : Colorado Springs, CO	-	3.170		-		3.200		-		3.200	0.000	6.370	-
Subtotal			-	3.170		-		3.200		-		3.200	0.000	6.370	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration				Project (Number/Name) 990 / Space And Missile Defense Integration					
	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		-	25.584	25.755	17.945	-	17.945	Continuing	Continuing	N/A			

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

Event Name	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
Space Superiority Capability Development	[Redacted]																											
Counter ISR Capability Development	[Redacted]																											
Space Operations Multit-Domain Environment Analysis	[Redacted]																											
Multi-Domain Task Force (MTDF) Multi-Domain Expeditionary Brigade (MD)	[Redacted]																											
High Altitude Impacts on Ground Effectiveness Study	[Redacted]																											
NAVWAR Characterization Study	[Redacted]																											
APNT CFT Analysis Support	[Redacted]																											
Joint Space Warfighting Forum (JSWF) Analysis Support	[Redacted]																											
Tactical Space Layer Sensor to Shooter Concept Development	[Redacted]																											
Low Earth Orbit	[Redacted]																											
Development of SMDC MMN Force Tracking	[Redacted]																											
Jericho Thunder Analysis Support	[Redacted]																											
SMDC NanoSat Analysis (SNAP, KE)	[Redacted]																											

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

Event Name	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
Space Superiority Joint Architecture Analysis	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Force Design Assessment of Army Forces	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
NAVWAR/PNT Gap Analysis and Advocacy	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Space Simulation Support to TRADOC ARCIC Experimentation	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
NAVWAR Defense/Attack Operating Concepts and Requirements	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Army Enduring JFFT Development	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
High Altitude Persistent Platform Capability Development Document	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
APNT Integrated Space Communications	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Space Superiority Capability Development	1	2021	4	2027
Counter ISR Capability Development	1	2021	4	2027
Space Operations Mult-Domain Environment Analysis	1	2021	4	2027
Multi-Domain Task Force (MTDF) Multi-Domain Expeditionary Brigade (MDEB) Study	3	2021	3	2023
High Altitude Impacts on Ground Effectiveness Study	1	2021	1	2021
NAVWAR Characterization Study	1	2021	1	2021
APNT CFT Analysis Support	1	2021	4	2027
Joint Space Warfighting Forum (JSWF) Analysis Support	1	2021	4	2027
Tactical Space Layer Sensor to Shooter Concept Development	3	2021	4	2027
Low Earth Orbit	1	2021	4	2021
Development of SMDC MMN Force Tracking	1	2021	4	2023
Jericho Thunder Analysis Support	1	2021	4	2024
SMDC NanoSat Analysis (SNAP, KE)	1	2021	4	2021
Space Superiority Joint Architecture Analysis	1	2021	4	2024
Force Design Assessment of Army Forces	1	2021	4	2027
NAVWAR/PNT Gap Analysis and Advocacy	1	2021	4	2025
Space Simulation Support to TRADOC ARCIC Experimentation	1	2021	4	2027
NAVWAR Defense/Attack Operating Concepts and Requirement	1	2021	4	2027
Army Enduring JFFT Development	1	2021	4	2027
High Altitude Persistent Platform Capability Development Documentation	1	2021	4	2027
APNT Integrated Space Communications	1	2021	4	2025

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</i>
---	--

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	-	47.098	15.000	-	-	-	0.000	0.000	0.000	0.000	Continuing	Continuing
FG9: <i>Air and Missile Defense (AMD) Electronic Warfare</i>	-	47.098	15.000	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Funding in this program supports Cyber and Electromagnetic Activities (CEMA) efforts to conduct operational realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army Integrated Fires systems, to include other Service and other Agency radar and sensor systems as appropriate. Upon completion of CEMA demonstration analyses, funding will facilitate initial recommendations for potential mitigations and solutions to Army sensors, C2, and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army radar and sensor systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Additionally, virtual models of critical hardware and software are being developed and implemented to allow for destructive testing with advanced CEMA threats in a lab environment. There will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. These activities follow a time-phased roadmap that identifies the investments needed to improve the resiliency of Army radar and sensors, C2, and RF data and voice networks in contested CEMA environments.

FY 2021 base funding of \$26.482 million will be used to plan and execute the FY 2021 Survivability Exercise to assess the performance of the Army Integrated Fires architecture, with Joint participants, in a live, tactically relevant, contested CEMA environment. Funds will be used to analyze the performance data of the FY 2021 Survivability Exercise participant weapon systems, identify vulnerabilities, and develop rapid mitigation concepts. Additionally, the funds will be used to execute Cyber Table Tops, continue the development of virtualized critical hardware and software, conduct destructive cyber vulnerability assessments, and integrate artificial intelligence and machine learning into weapon systems to mitigate current and future CEMA threats. FY 2021 OCO funding of \$.500 million will be used to complete operational assessment of ALPS prototype systems in support of a Combatant Commander.

FY23 has no funding.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</i>
---	--

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	47.098	0.000	0.000	-	0.000
Current President's Budget	47.098	15.000	0.000	-	0.000
Total Adjustments	0.000	15.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

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

Project: FG9: *Air and Missile Defense (AMD) Electronic Warfare*

- Congressional Add: *Program increase - cyber and supply chain resiliency*
- Congressional Add: *Program increase - machine learning for integrated fires*
- Congressional Add: *Program increase - software memory protection methods*

	<u>FY 2021</u>	<u>FY 2022</u>
	22.500	-
	5.000	10.000
	-	5.000
Congressional Add Subtotals for Project: FG9	27.500	15.000
Congressional Add Totals for all Projects	27.500	15.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering				Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare			
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
FG9: Air and Missile Defense (AMD) Electronic Warfare	-	47.098	15.000	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, the Army Long-Range Persistent Surveillance (ALPS) system efforts transition to Program Element 0604741A, Project 126.

A. Mission Description and Budget Item Justification

Funding in this program supports Cyber and Electromagnetic Activities (CEMA) efforts to conduct operational realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army Integrated Fires systems, to include other Service and other Agency radar and sensor systems as appropriate. Upon completion of CEMA demonstration analyses, funding will facilitate initial recommendations for potential mitigations and solutions to Army sensors, C2, and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army radar and sensor systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Additionally, virtual models of critical hardware and software are being developed and implemented to allow for destructive testing with advanced CEMA threats in a lab environment. There will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. These activities follow a time-phased roadmap that identifies the investments needed to improve the resiliency of Army radar and sensors, C2, and RF data and voice networks in contested CEMA environments.

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

	FY 2021	FY 2022	FY 2023
Title: Advanced Electronic Protection Enhancements	19.598	-	-
Description: Provides Cyber and Electromagnetic Activities (CEMA) planning, conducts CEMA demonstrations and post-mission analysis.			
Accomplishments/Planned Programs Subtotals	19.598	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare	
		FY 2021	FY 2022
Congressional Add: Program increase - cyber and supply chain resiliency		22.500	-
<p>FY 2021 Accomplishments: - Continue developing innovative technology to identify and mitigate cyber and supply chain risks to PEO MS weapon system programs.</p> <ul style="list-style-type: none"> - Build a coordinated and consolidated system security engineering support capability to achieve cyber and supply chain survivability and resiliency. - Continue to develop processes to evaluate suppliers and quantify risks to the PEO MS weapon systems. - Improve information analytics and integrate technical disciplines while providing cooperative supply chain risk analyses and cyber risk identification. 			
Congressional Add: Program increase - machine learning for integrated fires		5.000	10.000
<p>FY 2021 Accomplishments: - Continue Integration of Machine Learning (ML) technology into Army Air and Missile Defense (AMD) weapon systems.</p> <ul style="list-style-type: none"> - Continue design, code, and integrate ML technology into existing CEMA Detection Algorithm (CDA). - Assess applicability of ML CEMA algorithms for use in Army warfighter Training Aids, Devices, Simulator, and Simulations (TADSS). - Continue efforts to detect and recognize the effects of cyber, Positioning, Navigation, and Timing (PNT), and Electronic Warfare (EW) attacks. <p>FY 2022 Plans: Software memory protection and machine learning.</p> <p>Supports memory protection and machine learning in contested environment.</p>			
Congressional Add: Program increase - software memory protection methods		-	5.000
<p>FY 2022 Plans: - Develop technology transition paths for software memory protection methods that align with on-going missile programs and air and defense missile systems</p> <ul style="list-style-type: none"> - Execute prototype implementation of software memory protection methods to immunize missile programs, and air and missile defense systems, from the primary cybersecurity threat to software today, memory corruption exploits 			
Congressional Adds Subtotals		27.500	15.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</i>	Project (Number/Name) FG9 / <i>Air and Missile Defense (AMD) Electronic Warfare</i>

D. Acquisition Strategy

Assessment events will be conducted approximately every two years in live and simulated CEMA environments. In addition to Government planning and conduct of assessments, funding will also be provided through various contracts for subject matter expertise.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603327A / Air and Missile Defense Systems Engineering				FG9 / Air and Missile Defense (AMD) Electronic Warfare							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	Various : Various	5.426	0.926	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			5.426	0.926		-		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Integration Assessment	Various	Various : Various	7.071	2.568	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
Interoperability of Integrated AMD	SS/CPFF	Various : Various	49.968	-		-		-		-		-	0.000	49.968	-
Cyber and Supply Chain Resiliency	Various	Various : Various	3.273	5.000		-		-		-		-	0.000	8.273	-
Artificial Intelligence and Machine Learning	Various	Various : Various	14.667	22.500		-		-		-		-	0.000	37.167	-
ALPS Development/ Integration	Various	Various : Various	36.784	0.482	Jan 2020	-		-		-		-	0.000	37.266	-
machine learning for integrated fires	TBD	Various : Various	-	-		10.000	Jun 2022	-		-		-	0.000	10.000	-
Software Memory Protection Methods	TBD	Various : Various	-	-		5.000	Jun 2022	-		-		-	0.000	5.000	-
Subtotal			111.763	30.550		15.000		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Assessments & Research and Trade Studies	Various	Various : Various	29.344	8.801	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare
--	---	--

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total		Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Subtotal			29.344	8.801		-		-		-		-	Continuing	Continuing	N/A	

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total		Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Demonstration Planning and Execution	Various	Various : Various	15.794	6.821	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing	
Subtotal			15.794	6.821		-		-		-		-	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			162.327	47.098	15.000	-	-	-	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering		Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare	

Event Name	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
FY21 Survivability Exercise Planning Efforts	█	█																										
FY21 Survivability Exercise		█	█																									
FY21 Survivability Exercise Analysis and Trade Studies			█	█																								
FY 21 Survivability Exercise Report and Implementation								█	█	█	█																	
Air and Missile Defense Systems Hardware Virtualization	█	█	█	█	█	█	█	█	█	█	█	█																
Interoperability of Integrated Air and Missile Defense (Congress	█	█																										

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
P-11 Demonstration	2	2018	3	2018
P-11 Analysis Efforts, Trade Studies, and Implementation	3	2018	1	2019
P-12 Demonstration Planning Efforts	4	2018	4	2019
P-12 Demonstration	4	2019	1	2020
P-12 Analysis Efforts, Trade Studies, and Implementation	1	2020	4	2020
FY21 Survivability Exercise Planning Efforts	4	2020	2	2021
FY21 Survivability Exercise	2	2021	3	2021
FY21 Survivability Exercise Analysis and Trade Studies	3	2021	1	2022
FY 21 Survivability Exercise Report and Implementation	2	2022	4	2022
Air and Missile Defense Systems Hardware Virtualization	2	2019	4	2022
Interoperability of Integrated Air and Missile Defense (Congressional Adds)	4	2018	2	2021

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - 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
Total Program Element	-	56.067	46.637	64.001	-	64.001	41.260	6.288	6.282	6.342	Continuing	Continuing
606: Cntrmn/Barrier Adv Dev	-	2.000	-	-	-	-	-	-	-	-	0.000	2.000
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	6.702	2.379	-	-	-	-	-	-	-	0.000	9.081
CE5: Breaching Capability Development - Mounted	-	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024
EK7: Area Denial Capability Development	-	47.365	40.391	56.844	-	56.844	41.260	6.288	6.282	6.342	Continuing	Continuing

Note

Project 606 / Breaching Capability Development - Mounted within Program Element (PE) 0603619A / Landmine Warfare and Barrier - Adv Dev restructures to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

Program Element 0603619A / Landmine Warfare and Barrier - Adv Dev provides for the Concept Exploration and Refinement of Terrain Shaping Obstacles and develops modernized alternatives to the Family of Scatterable Mines systems and Mine Breaching capabilities.

Projects 606 and CE5 - The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles which does not support Multi-Domain Operations (MDO). This effort will focus on the development of the Next Generation Breaching Technology - Advanced Breacher system, an MDO-capable modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhanced operational reliability, supportability, mobility and survivability beyond the current state. The target platform for Advanced Breacher is the Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV-RCV-M) and has been endorsed by the NGCV Cross Functional Team (CFT) to fulfill the RCV-M breaching requirements. The modularity also allows for integration with other platforms and backwards compatibility with existing platforms.

Project BU5 - XM343 Standoff Activated Volcano Obstacle (SAVO) supports the United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702 as well as revisions to the Multiple Delivery Mine System (Volcano) Joint Service Operational Requirement (JSOR) # 0683. SAVO is the top priority capability in the Army's Mobility portfolio. This capability will allow for a formation of pre-emplaced directed obstacles that can be initiated remotely via fielded wired or wireless initiation systems. XM343 SAVO can be initiated via one of three fielded systems; the M7 Spider Networked Munition System, the MK152/M156 Remote Activation Munition Systems (RAMS), or the CD450-4J Blasting Machine. SAVO has the ability to create a complex obstacle when combined with Top Attack systems such as the XM204 Interim Top Attack system. The primary item is the newly developed SAVO base plate which is placed on the ground and has four ports to connect fielded Volcano mine canisters. The base plate is packaged with ancillary components to aid in emplacement such as initiation wire, stabilizing ground stakes, sand bags,

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
---	---

and canister carrying straps. If the emplaced obstacle is not initiated, XM343 SAVO can be recovered for future re-deployment. This item is compliant with the DoD Landmine Policy and supports the U.S. Army modernization priorities in support of the National Defense Strategy. SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical SAVO base plate. Trainer base plates interface with the fielded Volcano training canisters and are reusable. Upon receipt of a launch signal from a fielded initiation system, the training base plates produce sight and sound effects to effectively represent the SAVO obstacle's mine launch and armed status functionality.

Project EK7 - Project EK7 Area Denial Capability Development provides for the advanced capability development of Close Terrain Shaping Obstacle (CTSO) systems and develops modernized, non-persistent, DoD Landmine Policy compliant munition fields. During joint, multi-domain, high intensity conflict CTSO systems disrupt, fix, turn and block enemy freedom of maneuver while enhancing friendly freedom of maneuver within the same battle space. CTSO systems enable maneuver commanders to directly influence where battlefield engagements occur. CTSO systems will replace the Family of Scatterable Mines (FASCAM) systems which are nearing their end of useful life. CTSO systems are a networked munition capability suite composed of top and bottom attack munitions which can be employed independently or together to create a controlled, scalable complex obstacle. The project will evaluate integrated technologies and develop prototype systems in a realistic operating environment for the next generation of CTSO systems to achieve doctrinally required obstacle effects during combat operations. CTSO systems will use an open system and modular architecture to facilitate future development, maintenance, repair, and product improvements. The enduring CTSO capability development supports the approved Army Futures Command (AFC) Terrain Shaping Strategy for Land Domain and multi-domain operations (MDO). Full TSO capabilities will be developed through a series of capability insertions as approved by the Army Acquisition Executive on Feb 19, 2020. The XM204 Interim Top Attack system, the first CTSO capability insertion, supports a United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702. XM204 can operate independently but can be used in conjunction with the Standoff Activated Volcano Obstacle (SAVO) system to create a complex obstacle. Follow on capability insertions will develop a Common Anti-Vehicular Munition (CAVM) which will be suitable for multiple delivery methods. Follow on capabilities will also include remote command and control, recoverability after arming, self-reporting, and full network capability.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	56.067	50.314	0.000	-	0.000
Current President's Budget	56.067	46.637	64.001	-	64.001
Total Adjustments	0.000	-3.677	64.001	-	64.001
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.627			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	64.001	-	64.001
• FFRDC Transfer	-	-0.050	-	-	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
---	---

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

Project: 606: *Cntrmn/Barrier Adv Dev*

Congressional Add: *Program increase - M58 mine clearing line charge*

Congressional Add Subtotals for Project: 606

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	2.000	-
	2.000	-
	2.000	-

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) 606 / Cntrmn/Barrier 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
606: Cntrmn/Barrier Adv Dev	-	2.000	-	-	-	-	-	-	-	-	0.000	2.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Project 606 / Breaching Capability Development - Mounted within Program Element (PE) 0603619A / Landmine Warfare and Barrier - Adv Dev restructures to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles which does not support Multi-Domain Operations (MDO). This effort will focus on the development of the Next Generation Breaching Technology - Advanced Breacher system, an MDO-capable modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhanced operational reliability, supportability, mobility and survivability beyond the current state. The target platform for Advanced Breacher is the Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV-RCV-M) and has been endorsed by the NGCV Cross Functional Team (CFT) to fulfill the RCV-M breaching requirements. The modularity also allows for integration with other platforms and backwards compatibility with existing platforms.

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

	FY 2021	FY 2022
Congressional Add: Program increase - M58 mine clearing line charge	2.000	-
FY 2021 Accomplishments: Begin Technology Maturation and Risk Reduction (TMRR) efforts to be implemented into future prototyping efforts. Complete Market Research and Trade Study efforts. Define system architecture and required subsystems. Continue development of prototype sub-munitions for transition to program of record in FY 2022.		
Congressional Adds Subtotals	2.000	-

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
• CE5: Breaching Capability Development - Mounted	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks
Project 606 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev restructures to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in FY 2022.

D. Acquisition Strategy

Breaching technologies developed through the Next Generation Breaching Technology Science & Technology effort will be matured and utilized on the Advanced Breacher system. Initial effort will focus on the target defeat mechanism and risk reduction ahead of a prototype build and demonstration of sub-systems, which may include a combination of Government-developed sub-systems and defense industry-available sub-systems that are high Technology Readiness Level (TRL) and may be purchased through an OTA contract. Upon successful demonstration, the sub-systems will be integrated into a modular-mission payload breaching system. This payload will then be fielded primarily on the planned Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M) but will be backwards compatible with existing platforms and adaptable to other/future platforms.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Capability Development	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.652	Apr 2021	-		-		-		-	0.000	1.652	-
Subtotal			-	1.652		-		-		-		-	0.000	1.652	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Vehicle Integration Support	MIPR	DEVCOM Ground Vehicle Systems Center (GVSC) : Warren, MI	-	0.124	Aug 2021	-		-		-		-	0.000	0.124	-
Testing Planning Support	MIPR	Engineer Research and Development Center (ERDC) : Vicksburg, MS	-	0.056	Jan 2022	-		-		-		-	0.000	0.056	-
Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.168	Mar 2022	-		-		-		-	0.000	0.168	-
Subtotal			-	0.348		-		-		-		-	0.000	0.348	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		-	2.000	-	-	-	0.000	2.000	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev

Event Name	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
Breacher Development																												
Technology Maturation and Risk Reduction																												
Prototype Development																												
Materiel Development Decision																												
Subsystem Testing																												
Milestone B																												
Engineering and Manufacturing Development																												
Integration Testing																												
Critical Design Review																												
Milestone C																												
LRIP Contract																												
Operational Testing																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) 606 / <i>Cntrmn/Barrier Adv Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Breacher Development	1	2022	1	2022
Technology Maturation and Risk Reduction	3	2021	4	2024
Prototype Development	1	2022	4	2024
Materiel Development Decision	2	2022	2	2022
Subsystem Testing	4	2022	4	2024
Milestone B	4	2024	4	2024
Engineering and Manufacturing Development	4	2024	2	2026
Integration Testing	1	2025	2	2026
Critical Design Review	3	2025	3	2025
Milestone C	2	2026	2	2026
LRIP Contract	4	2026	4	2027
Operational Testing	4	2027	2	2028

Note

Project 606 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev transitions to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in FY 2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev			Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv 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
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	6.702	2.379	-	-	-	-	-	-	-	0.000	9.081
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project BU5 XM343 Standoff Activated Volcano Obstacle (SAVO) supports the United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702 as well as revisions to the Multiple Delivery Mine System (Volcano) Joint Service Operational Requirement (JSOR) # 0683. This capability will allow for a formation of pre-emplaced directed obstacles that can be initiated remotely via fielded wired or wireless initiation systems.

XM343 SAVO can be initiated via one of three fielded systems; the M7 Spider Networked Munition System, the MK152/M156 Remote Activation Munition Systems (RAMS), or the CD450-4J Blasting Machine. SAVO can operate independently but can be used in conjunction with the Top Attack systems such as the XM204 Interim Top Attack system to create a complex obstacle. The primary item is the newly developed SAVO base plate which is placed on the ground and has four ports to connect fielded Volcano mine canisters. The base plate is packaged with ancillary components to aid in emplacement such as initiation wire, stabilizing ground stakes, sand bags, and canister carrying straps. If the emplaced obstacle is not initiated, SAVO can be recovered for future re-deployment.

This item is compliant with the DoD Landmine Policy and supports the U.S. Army modernization priorities in support of Multi Domain Operations (MDO).

SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical XM343 SAVO base plate. Trainer base plates interface with the fielded Volcano training canisters and are reusable. Upon receipt of a launch signal from a fielded initiation system, the training base plates produce sight and sound effects to effectively represent the SAVO obstacle's mine launch and armed status functionality.

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

	FY 2021	FY 2022	FY 2023
Title: SAVO Rapid Prototyping	2.236	1.427	-
Description: SAVO system Rapid Prototyping phase.			
FY 2022 Plans: Complete Rapid Prototyping, complete qualification testing, and conduct operational assessment.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased as a result of Standoff Volcano Obstacle (SAVO) Adv Tech began production under Line Item E76740 / Close Terrain Shaping Obstacle, Item F76740 / Standoff Activated Volcano Obstacle in FY 2022.			
Title: Engineering Support	2.212	0.405	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Provide Engineering Support.</p> <p>FY 2022 Plans: Continue to perform government and contract engineering support to the Integrated Product Team supporting the completion of the Rapid Prototyping effort and an urgent material release.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased as a result of Standoff Volcano Obstacle (SAVO) Adv Tech began production under Line Item E76740 / Close Terrain Shaping Obstacle, Item F76740 / Standoff Activated Volcano Obstacle in FY 2022.</p>				
<p>Title: SAVO Management Services</p> <p>Description: Program Management and Support</p> <p>FY 2022 Plans: Continue to perform program management of the SAVO program and the transition to production.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased as a result of Standoff Volcano Obstacle (SAVO) Adv Tech began production under Line Item E76740 / Close Terrain Shaping Obstacle, Item F76740 / Standoff Activated Volcano Obstacle in FY 2022.</p>		0.425	0.120	-
<p>Title: SAVO Test & Evaluation</p> <p>Description: Provides support to Contractor/Government test activities.</p> <p>FY 2022 Plans: Complete government qualification testing and conduct operational assessment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased as a result of Standoff Volcano Obstacle (SAVO) Adv Tech began production under Line Item E76740 / Close Terrain Shaping Obstacle, Item F76740 / Standoff Activated Volcano Obstacle in FY 2022.</p>		1.829	0.340	-
<p>Title: SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	0.087	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) BU5 / <i>Standoff Volcano Obstacle (SAVO) Adv Tech</i>

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	6.702	2.379	-

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
• F76740: <i>Standoff Activated Volcano Obstacle</i>	-	4.685	4.503	-	4.503	10.700	6.186	0.753	-	0.000	26.827

Remarks

D. Acquisition Strategy

SAVO utilizes the Middle Tier of Acquisition pathway for Rapid Prototyping in accordance with Section 804 of the 2016 NDAA. The Rapid Prototyping phase leverages 10 U.S.C. 2371b "Other Transaction Authority" to award a competitive prototype contract. Prototypes will undergo a series of developmental tests ahead of qualification testing and operational assessment to support Initial Operational Capability scheduled for FY 2023.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SAVO Program Management Travel and Support	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	0.061	0.087	Mar 2021	0.020	Apr 2022	-		-		-	0.000	0.168	-
SAVO Contractor Support	C/FFP	BOWHEAD : Alexandria VA	-	0.108	Jun 2021	0.100	Jul 2022	-		-		-	0.000	0.208	-
SAVO Contractor Support	C/FFP	Booz Allen Hamilton : Dover, NJ	0.075	0.230	Jun 2021	-		-		-		-	0.000	0.305	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.087		-		-		-	0.000	0.087	-
Subtotal			0.136	0.425		0.207		-		-		-	0.000	0.768	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hardware Development	C/CPFF	Northrop Grumman Defense Systems : Plymouth, MN	11.789	2.236	Jan 2021	1.427	Mar 2022	-		-		-	0.000	15.452	-
Prototype Components	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.009	-		-		-		-		-	0.000	0.009	-
Subtotal			11.798	2.236		1.427		-		-		-	0.000	15.461	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SAVO - Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.917	1.793	Jan 2021	0.400	May 2022	-		-		-	0.000	4.110	-
Human Research & Engineering (HRED) MANPRINT Support	MIPR	DEVCOM Army Research Laboratory	0.024	0.044	Jun 2021	0.005	May 2022	-		-		-	0.000	0.073	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech
--	--	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		- HRED : Aberdeen, MD													
SAVO - Colocated Matrix	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.375	Nov 2020	-		-		-		-	0.000	0.375	-
Subtotal			1.941	2.212		0.405		-		-		-	0.000	4.558	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Qualification Testing	MIPR	Yuma Test Center : Yuma, AZ	0.037	1.237	May 2021	0.150	Jul 2022	-		-		-	0.000	1.424	-
Electronic Environmental Effects E3 Testing	MIPR	White Sands Test Center : White Sands, NM	0.035	0.404	Dec 2021	0.050	Jun 2022	-		-		-	0.000	0.489	-
Electronic Environmental Effects E3 Testing	MIPR	Redstone Test Center : Huntsville, AL	0.102	0.188	Apr 2021	0.020	Jun 2022	-		-		-	0.000	0.310	-
Electronic Environmental Effects E3 Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal NJ	-	-		0.020	Jul 2022	-		-		-	0.000	0.020	-
Operational Assessment	MIPR	Various : Various	-	-		0.100	Jul 2022	-		-		-	0.000	0.100	-
Subtotal			0.174	1.829		0.340		-		-		-	0.000	2.343	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		14.049	6.702	2.379	-	-	-	0.000	23.130

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech

Event Name	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	
Rapid Prototyping OTA	[Blue Bar]																												
User Jury 1	▲ 1 User Jury 1																												
Doctrine Tactics and Training Event					▲ 4 Doctrine Tactics and Training Event																								
Design Review 1	▲ 2 Design Review 1																												
Design Review 2					▲ 3 Design Review 2																								
Qualification Testing					[Blue Bar] Qualification Testing																								
Design Review 3					▲ 5 Design Review 3																								
Operational Assessment					▲ 6 Operational Assessment																								
Production Decision Review					▲ 7 Production Decision Review																								
SAVO Production Contract	[Blue Bar]																												
Urgent Materiel Release									▲ 8 UMR																				
Initial Operational Capability													▲ 9 IOC																
Full Operational Capability																					▲ 10 FOC								

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) BU5 / <i>Standoff Volcano Obstacle (SAVO) Adv Tech</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Rapid Prototyping Decision Review	3	2020	3	2020
Rapid Prototyping OTA	3	2020	4	2022
User Jury 1	2	2021	2	2021
Doctrine Tactics and Training Event	2	2022	2	2022
Design Review 1	2	2021	2	2021
Design Review 2	1	2022	1	2022
Qualification Testing	1	2022	4	2022
Design Review 3	3	2022	3	2022
Operational Assessment	4	2022	4	2022
Production Decision Review	4	2022	4	2022
SAVO Production Contract	4	2022	4	2027
Urgent Materiel Release	2	2023	2	2023
Initial Operational Capability	4	2023	4	2023
Full Operational Capability	3	2026	3	2026

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev			Project (Number/Name) CE5 / Breaching Capability Development - 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
CE5: Breaching Capability Development - Mounted	-	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project 606 / Breaching Capability Development - Mounted within Program Element (PE) 0603619A / Landmine Warfare and Barrier - Adv Dev restructures to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles which does not support Multi-Domain Operations (MDO). This effort will focus on the development of the Next Generation Breaching Technology - Advanced Breacher system, an MDO-capable modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhanced operational reliability, supportability, mobility and survivability beyond the current state. The target platform for Advanced Breacher is the Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV-RCV-M) and has been endorsed by the NGCV Cross Functional Team (CFT) to fulfill the RCV-M breaching requirements. The modularity also allows for integration with other platforms and backwards compatibility with existing platforms. FY 2023 request supports integrated breacher prototype demonstration, subsystem testing, Soldier touchpoints/assessments, and Pre-Milestone B activities.

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

	FY 2021	FY 2022	FY 2023
Title: Next Generation Mounted Breaching	-	3.726	7.157
Description: Develop the Next Generation Mounted Breaching capability to engage modernized threat obstacles.			
FY 2022 Plans: Continue Technology Maturation and Risk Reduction (TMRR) efforts to be implemented into future prototyping efforts.			
FY 2023 Plans: FY 2023 will support continued TMRR with subsystem development and testing and defining the final system architecture.			
FY 2022 to FY 2023 Increase/Decrease Statement: Additional funding supports subsystem development and pre-MS-B activities.			
Title: FY 2022 SBIR/STTR Transfer	-	0.141	-
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) CE5 / Breaching Capability Development - Mounted
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC 638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i>			
Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals	-	3.867	7.157

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 606: Cntrmn/Barrier Adv Dev	2.000	-	0.000	-	0.000	-	-	-	-	0.000	2.000

Remarks

D. Acquisition Strategy

Breaching technologies developed through the Next Generation Breaching Technology Science & Technology effort will be matured and utilized on the Advanced Breacher system. Initial effort will focus on the target defeat mechanism and risk reduction ahead of a prototype build and demonstration of sub-systems, which may include a combination of Government-developed sub-systems and defense industry-available sub-systems that are high Technology Readiness Level (TRL) and may be purchased through an OTA contract. Upon successful demonstration, the sub-systems will be integrated into a modular-mission payload breaching system. This payload will then be fielded primarily on the planned Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M) but will be backwards compatible with existing platforms and adaptable to other/future platforms.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603619A / Landmine Warfare and Barrier - Adv Dev				CE5 / Breaching Capability Development - Mounted							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.141		-		-		-	Continuing	Continuing	-
Subtotal			-	-		0.141		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TMRR Development Government	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		2.057	May 2022	3.817	Oct 2022	-		3.817	Continuing	Continuing	-
Subtotal			-	-		2.057		3.817		-		3.817	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Sensor Modification and Integration	MIPR	DEVCOM C5ISR : Fort Belvoir, VA	-	-		0.600	May 2022	1.629	Oct 2022	-		1.629	Continuing	Continuing	-
Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		1.000	May 2022	1.000	Oct 2022	-		1.000	Continuing	Continuing	-
Subtotal			-	-		1.600		2.629		-		2.629	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Testing	MIPR	Various : Various	-	-		-		0.711	Oct 2022	-		0.711	Continuing	Continuing	-
Test and Evaluation Support	MIPR	Army Test & Evaluation	-	-		0.069	Jul 2022	-		-		-	0.000	0.069	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) CE5 / Breaching Capability Development - Mounted
--	--	--












Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Command (ATEC) : Aberdeen, MD													
Subtotal			-	-	0.069			0.711			-	0.711	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			-	-	3.867	7.157	-	7.157	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) CE5 / Breaching Capability Development - Mounted

Event Name	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				
Technology Maturation and Risk Reduction					 TMRR																											
Prototype Development					 Prototype Development																											
Material Development Decision					 MDD																											
Subsystem Testing					 Subsystem Testing																											
Milestone B													 MS B																			
Engineering and Manufacturing Development													 EMD																			
Integration Testing													 Integration Testing																			
Critical Design Review																	 CDR															
Milestone C																					 MS C											
LRIP Contract																					 LRIP Contract											
Operational Testing																									 Operational Testing							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) CE5 / <i>Breaching Capability Development - Mounted</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation and Risk Reduction	3	2021	4	2024
Prototype Development	1	2022	4	2024
Material Development Decision	2	2022	2	2022
Subsystem Testing	4	2022	4	2024
Milestone B	4	2024	4	2024
Engineering and Manufacturing Development	4	2024	2	2026
Integration Testing	1	2025	2	2026
Critical Design Review	3	2025	3	2025
Milestone C	2	2026	2	2026
LRIP Contract	4	2026	4	2027
Operational Testing	4	2027	2	2028

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability 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
EK7: Area Denial Capability Development	-	47.365	40.391	56.844	-	56.844	41.260	6.288	6.282	6.342	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EK7 Area Denial Capability Development provides for the advanced capability development of Close Terrain Shaping Obstacle (CTSO) systems and develops modernized, non-persistent DoD Landmine Policy compliant munition fields. During joint, multi-domain, high intensity conflict CTSO systems disrupt, fix, turn and block enemy freedom of maneuver while enhancing friendly freedom of maneuver within the same battle space. CTSO systems enable maneuver commanders to directly influence where battlefield engagements occur. CTSO systems will replace a portion of the Family of Scatterable Mines (FASCAM) systems which are beyond their designed life.

The project will evaluate integrated technologies and develop prototype systems in a realistic operating environment for the next generation of CTSO systems to achieve doctrinally required obstacle effects during combat operations. CTSO systems will use an open system and modular architecture to facilitate future development, maintenance, repair, and product improvements.

XM204 Interim Top Attack program, the first CTSO capability insertion, is on schedule to start Production in FY 2022 and will achieve Initial Operational Capability (IOC) by FY 2023 to meet United States Army Europe (USAREUR) Operational Needs Statement (ONS) #18-22702. XM204 can operate independently but can be used in conjunction with the Standoff Activated Volcano Obstacle (SAVO) system to create a complex obstacle.

The Army is incrementally developing an enduring solution to fill the close directed obstacle capability gap. The three increments are the Increment 1 (Top Attack), Increment 2 (Bottom Attack) and Increment 3 (Full Networked Capability) that comply with DoD Landmine Policy. Increments 1 and 2 provide the commander greater speed and flexibility to transition between offensive and defensive operations. Increment 3 Full Network Capability (FNC) will integrate the Top and Bottom Attack programs into Mission Command. The enduring CTSO capability development supports the approved Common Anti-Vehicular Munition (CAVM)-based Close Terrain Shaping Obstacle (CTSO) Abbreviated-Capability Development Document (A-CDD) and Army Futures Command (AFC) Terrain Shaping Strategy for Land Domain and Multi-Domain Operations (MDO). CAVM will be used for future mid and deep ranges in accordance with the AFC Terrain Shaping Strategy for Land Domain and MDO. CTSO systems are a networked munition capability suite composed of top and bottom attack munitions which can be employed independently or together to create a controlled, scalable complex obstacle.

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

	FY 2021	FY 2022	FY 2023
Title: Terrain Shaping Obstacles Capability Development	28.881	25.080	41.122
Description: Develop, build, and demonstrate Terrain Shaping Obstacle common munitions system. Demonstrate system in an operationally relevant environment.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Complete XM204 Interim Top Attack (ITA) system prototyping efforts in support of Operational Assessment. Award the Increment 1 Top Attack Rapid Prototyping and Common Anti-Vehicular Munition (CAVM) development contract.</p> <p>FY 2023 Plans: Complete XM204 ITA Urgent Materiel Release. Mature CTSO Increment 1 munition design against peer targets and demonstrate performance and lethality. Conduct research to address all fuzing and ammunition safety concerns. Conduct munition concept assessment for Common Anti-Vehicular Munition (CAVM) modular payload for future delivery methods. Complete Increment 1 prototype and demonstration during User Jury 1 of the obstacle planning tool, Remote Control Station (RCS), and the safety device. Demonstrate communication architecture and prepare for integration with munition prototype. Coordinate and conduct Cryptographic Module Validation Program (CMVP) encryption certification review by National Institute of Science & Technology (NIST). Complete Preliminary Design Review. Integrate all major components for follow-on Development Testing (DT).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase due to research and development of Increment 1 prototypes, communications architecture, and Common Anti-Vehicular Munitions. Develop and mature all major sub systems required for future integration into complete design.</p>			
<p>Title: Engineering Support</p> <p>Description: Provide engineering support for Terrain Shaping Capability.</p> <p>FY 2022 Plans: Provide engineering support for final XM204 Interim Top Attack system prototyping efforts, Operational Assessment, and prepare Urgent Materiel Release supporting data package. Provide initial engineering support for CTSO Increment 1 System Requirement Documentation (SRD) and Source Selection activities.</p> <p>FY 2023 Plans: Provide engineering support for CTSO Increment 1 system design documentation, User Jury 1, contractor integration verification, and preliminary design review. Prepare for qualification testing. Commence preparation to support contractor system verification testing.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase due to additional engineering support for preliminary design review, and contractor risk reduction testing to be executed in FY 2023.</p>	13.293	10.707	11.045
<p>Title: Program Management and Oversight</p> <p>Description: Program management and oversight of Terrain Shaping Obstacle Capability development and system evaluation.</p>	0.078	0.080	0.362

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Provide program management and oversight of Terrain Shaping Obstacle Capability in support of development of the Increment 1 Top Attack Munition capabilities.</p> <p>FY 2023 Plans: Provide program management and oversight of Terrain Shaping Obstacle Capability in support of development of the Increment 1 Top Attack Munition capabilities.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 Program Management Support will increase due to Earned Value Management, Cost and Software Data Reporting (CSDR) Oversight for CTSO Increment 1 Top Attack Munition Contractor.</p>			
<p>Title: Test & Evaluation</p> <p>Description: Conduct testing and evaluation of Terrain Shaping Obstacle Capability performance.</p> <p>FY 2022 Plans: Conduct final Safety and Suitability tests for XM204 culminating in Operational Assessment Test (OA). Procure three new threat target vehicles to support CTSO INC 1 development.</p> <p>FY 2023 Plans: FY 2023 CTSO INC 1 Preliminary testing will be conducted on Cyber resilience and Threat's Countermeasures against first integrated prototype. Commencing contractor risk reduction testing; such as environmental and transportation testing. Conduct system sensor testing. Conduct simulated integrated operational performance. Develop models to support future system evaluation. Procures additional threat target vehicles for Increment 1 and repairs destroyed target vehicles from XM204 qualification. Target vehicles required for CTSO Increment 1 contractor verification testing.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase due to procurement of targets for demonstration of performance and transition to INC 1 development.</p>	5.113	3.048	4.315
<p>Title: SBIR/STTR Transfer</p> <p>FY 2022 Plans: SBIR/STTR Transfer</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>	-	1.476	-
Accomplishments/Planned Programs Subtotals	47.365	40.391	56.844

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• E76740: <i>Close Terrain Shaping Obstacle</i>	5.994	34.761	53.579	-	53.579	49.637	17.453	12.012	11.258	0.000	184.694

Remarks

D. Acquisition Strategy

In support of the Army's modernization priorities, the Army Acquisition Executive approved Terrain Shaping Obstacles (TSO) development using a series of incremental acquisition efforts to accelerate mature technology development and facilitate the fielding of lethal, non-persistent munitions to the Warfighter.

The XM204 system, the first CTSO funded by this project, is the interim solution that supports the United States Army Europe Operational Needs Statement 18-22702. XM204 is currently completing development and qualification to obtain Urgent Materiel Release. Afterwards, the XM204 system will achieve IOC in FY 2023 and complete production in FY 2025.

The follow-on CTSO increments, Top Attack INC 1 and Bottom Attack INC 2, will provide advanced command and control and advanced lethality. The programs will request use of the Middle Tier of Acquisition (MTA) pathway to allow for rapid prototyping of a complex obstacle solution with Army decision points to transition to a Program of Record. CTSO Increment 1 Modular Open Systems Architecture approach taken in the first increment of capability will establish the Command and Control hooks for Increment 2 (Bottom Attack) and Increment 3 (Full Network Capability) follow-on additions.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	3.802	0.078	Apr 2021	0.080	Nov 2021	0.362	Nov 2022	-		0.362	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.476		-		-		-	0.000	1.476	-
Subtotal			3.802	0.078		1.556		0.362		-		0.362	Continuing	Continuing	N/A

Remarks
In FY 2022, funding in the amount of \$0.338 million for manpower that was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CTSO INC 1 Rapid Prototype Development	C/CPFF	TBD : TBD	-	-		13.012	Jul 2022	41.122	Oct 2022	-		41.122	Continuing	Continuing	-
XM204 Capability Development	C/CPFF	Textron Defense Systems : Wilmington, MA	42.631	28.803	Nov 2020	12.068	Nov 2021	-		-		-	0.000	83.502	-
TRAC/WSMR capability study	MIPR	White Sands Missile Range : White Sands, NM	0.525	-		-		-		-		-	0.000	0.525	-
Common Secure Network Architecture	SS/FFP	Northrop Grumman Systems Corporation : Plymouth, MN	4.709	-		-		-		-		-	0.000	4.709	-
Common Secure Network Architecture	SS/CPFF	Textron Defense Systems : Wilmington, MA	22.526	-		-		-		-		-	0.000	22.526	-
Common Component Communications Study	SS/FFP	NAL Research Corporation : Manassas, Va	4.170	-		-		-		-		-	0.000	4.170	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
High Powered Computer	C/FP	ACC New Jersey : Picatinny, NJ	0.247	-		-		-		-		-	0.000	0.247	-
TSO Common Scene Generator	MIPR	DEVCOM Aviation And Missile Center : Redstone Arsenal, AL	0.350	-		-		-		-		-	0.000	0.350	-
Top Attack Prototype Development A	SS/CPFF	Northrop Grumman Innovation Systems : Plymouth, MN	4.352	-		-		-		-		-	0.000	4.352	-
Top Attack Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	14.309	-		-		-		-		-	0.000	14.309	-
Technology Maturation Risk Reduction (TMRR) Development A	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Technology Maturation Risk Reduction (TMRR) Development B	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Secure Communications Network	SS/CPFF	Northrop Grumman Mission Systems : Redondo Beach, CA	16.976	-		-		-		-		-	0.000	16.976	-
User Evaluation Prototypes	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.214	-		-		-		-		-	0.000	0.214	-
PAX2A Explosive Binder	MIPR	NALAS Engineering : Norwich, CT	-	0.078	Apr 2021	-		-		-		-	0.000	0.078	-
Subtotal			111.081	28.881		25.080		41.122		-		41.122	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>
--	---	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DEVCOM Armaments Center Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	19.095	8.733	Jan 2021	6.186	Nov 2021	7.416	Oct 2022	-		7.416	Continuing	Continuing	-
DEVCOM C5ISR Center Engineering Support	MIPR	DEVCOM C5ISR NVESD Center : Fort Belvoir, VA	2.566	0.596	Nov 2021	0.725	Apr 2022	0.837	Jan 2023	-		0.837	Continuing	Continuing	-
Program Support	C/FFP	Bowhead : Picatinny Arsenal, NJ	1.133	0.214	Jun 2021	0.341	May 2022	0.661	May 2023	-		0.661	Continuing	Continuing	-
DEVCOM Army Research Laboratory Engineering Support	MIPR	DEVCOM Army Research Laboratory : Adelphi, MD	1.931	0.301	May 2021	0.312	Mar 2022	0.296	Jan 2023	-		0.296	Continuing	Continuing	-
Data Analysis Center	MIPR	DEVCOM-DAC : Aberdeen Proving Ground, MD	0.759	0.908	Mar 2021	0.811	Apr 2022	0.209	Jan 2023	-		0.209	Continuing	Continuing	-
Milestone Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	4.497	1.503	Nov 2020	0.922	May 2022	0.232	Feb 2023	-		0.232	Continuing	Continuing	-
Logistics Support	MIPR	CECOM ILSC : Aberdeen, MD	-	-		0.141	Apr 2022	0.079	Feb 2023	-		0.079	0.000	0.220	-
Contractor Engineer Support	MIPR	American Systems INC : Chantilly, VA	0.074	0.126	Nov 2020	0.076	Apr 2022	0.075	Mar 2023	-		0.075	Continuing	Continuing	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	1.473	0.804	Sep 2021	1.193	Aug 2022	1.240	Aug 2023	-		1.240	Continuing	Continuing	-
Tactical and Trainer TDP development	MIPR	SAVIT Corporation : Rockaway, NJ	0.156	-		-		-		-		-	0.000	0.156	-
Integrated Logistics Support	MIPR	TACOM ILSC : Warren, MI	0.156	0.057	Mar 2021	-		-		-		-	Continuing	Continuing	-
Fibertek, INC. Operational Contractor Support	C/CPFF	FIBERTEK, INC. : Herndon, VA	0.130	-		-		-		-		-	0.000	0.130	-
Program Support	C/FFP	Millennium Corporation : Picatinny Arsenal, NJ	0.411	-		-		-		-		-	0.000	0.411	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Air Worthiness Certification	MIPR	AMRDEC : Redstone Arsenal, AL	0.010	-		-		-		-		-	0.000	0.010	-
Polaris Contractor Support	C/FFP	MSCOE : Ft Leonard Wood - MO	0.024	-		-		-		-		-	0.000	0.024	-
Full Hazard Classification for PAX2A	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.051	Jun 2021	-		-		-		-	0.000	0.051	-
Subtotal			32.415	13.293		10.707		11.045		-		11.045	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CTSO INC 1 System Verification Testing Targets	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	-		-		1.650	Nov 2022	-		1.650	0.000	1.650	-
CTSO INC 1 Platform Design Modeling and Simulation and Test	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	-		-		1.000	Apr 2023	-		1.000	0.000	1.000	-
CTSO INC 1 Sensor Performance Testing	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		-		0.500	Aug 2023	-		0.500	0.000	0.500	-
CTSO INC 1 User Jury 1	MIPR	Fort Hood : Fort Hood, TX	-	-		-		0.100	Jun 2023	-		0.100	0.000	0.100	-
CTSO INC 1 E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	-		-		0.300	Aug 2023	-		0.300	0.000	0.300	-
CTSO INC 1 Cyber tabletop Exercise and Cooperative Vulnerability Identification	MIPR	DEVCOM DAC : White Sands, NM	-	-		-		0.130	May 2023	-		0.130	0.000	0.130	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CTSO INC 1 Penetration Assessment	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen Proving Grounds, MD	-	0.087	Sep 2021	-		0.075	Jun 2023	-		0.075	0.000	0.162	-
CTSO INC 1 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		-		0.050	Oct 2022	-		0.050	0.000	0.050	-
CTSO INC 1 Test and Evaluation Support	MIPR	Army Environmental Support : Aberdeen Proving Grounds, MD	-	-		-		0.035	Oct 2022	-		0.035	0.000	0.035	-
CTSO INC 1 Cryptographic Module Validation Program	MIPR	DEVCOM DAC : White Sands, NM	-	-		-		0.100	Aug 2023	-		0.100	0.000	0.100	-
CTSO INC 1 Environmental and Transportation Test	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		-		0.300	Jul 2023	-		0.300	0.000	0.300	-
CTSO INC 1 Operational Integration Test	MIPR	DEVCOM C5ISR NVESD Center : Fort Belvoir, VA	-	-		-		0.075	Apr 2023	-		0.075	0.000	0.075	-
XM204 Operational Assessment	MIPR	Operational Test Command : Fort Hood, TX	-	0.289	Feb 2022	1.152	Dec 2021	-		-		-	0.000	1.441	-
CTSO INC 1 Procure Target Vehicles	MIPR	Target Management Office (TMO) : Huntsville, AL	-	0.927	Nov 2020	1.100	May 2022	-		-		-	0.000	2.027	-
XM204 Test and Evaluation Support	MIPR	Yuma Test Center : Yuma, AZ	0.025	2.794	Nov 2020	-		-		-		-	0.000	2.819	-
XM204 Electromagnetic Environmental Effects E3 Test	MIPR	White Sands Missile Range : White Sands, NM	0.035	0.184	Jan 2022	-		-		-		-	0.000	0.219	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM204 E3 Test Support	MIPR	Redstone Test Center : Huntsville, AL	-	0.211	Mar 2022	-		-		-		-	0.000	0.211	-
XM204 Dynamic Flight Test and Ground Sensor Evaluation	MIPR	Aberdeen Test Center : Aberdeen, MD	0.400	0.068	Dec 2020	-		-		-		-	0.000	0.468	-
XM204 Target Vehicle Refurbishment	MIPR	Yuma Proving Ground : Yuma Proving Ground, AZ	0.593	-		-		-		-		-	0.000	0.593	-
XM204 PAX2A type 1 for testing	MIPR	BAE SYSTEMS Ordnance Systems Inc : Kingsport, TN	0.220	-		-		-		-		-	0.000	0.220	-
XM204 PAX2A for Testing and Packaging, Crating & Handling	MIPR	Letterkenny Army Depot : Chambersburg, PA	-	0.002	Dec 2021	-		-		-		-	0.000	0.002	-
XM204 Operational Assessment	MIPR	Aberdeen Test Center : Aberdeen, MD	-	0.551	Aug 2021	-		-		-		-	0.000	0.551	-
Govt System Verification Test	MIPR	Aberdeen Test Center : Aberdeen, MD	-	-		0.484	Dec 2021	-		-		-	0.000	0.484	-
CTSO XM204 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		0.049	Mar 2022	-		-		-	0.000	0.049	-
CTSO XM204 E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	-		0.257	May 2022	-		-		-	0.000	0.257	-
Adversarial Asessment	MIPR	Letterkenny Army Depot : Chambersberg, PA	-	-		0.006	Apr 2022	-		-		-	0.000	0.006	-
Subtotal			1.273	5.113		3.048		4.315		-		4.315	0.000	13.749	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development				
	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	148.571	47.365		40.391		56.844	-	56.844	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development

Event Name	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													
XM204 Interim Top Attack Capability																																									
XM204 System Development	[Blue Bar]																																								
System Development																																									
XM204 SubSystem Integration Testing	[Blue Bar]																																								
SubSystem Integration Testing																																									
XM204 Critical Design Review					▲ 1																																				
Critical Design Review					▲ 1																																				
XM204 Government Qualification Testing					[Blue Bar]																																				
Government Qualification Testing																																									
XM204 Manufacturing Development					[Blue Bar]																																				
Manufacturing Development																																									
XM204 Production and Deployment Decision									▲ 2																																
Production and Deployment Decision									▲ 2																																
XM204 Operational Assessment Test													▲ 3																												
Operational Assessment Test													▲ 3																												
XM204 Production									[Blue Bar]																																
Production																																									
XM204 Urgent Material Release													▲ 5																												
Urgent Material Release													▲ 5																												
XM204 Initial Operational Capability																	▲ 8																								
Initial Operational Capability																	▲ 8																								
TSO Future Capability Evaluation																																									
TSO Development of Alternative Methods of Defeat	[Blue Bar]																																								
TSO Development of Alternative Methods of Defeat																																									

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development

Event Name	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		
Increment 1 Improved Top Attack Capability Development																														
INC 1 Top Attack Rapid Prototype Decision																													4	Rapid Prototype Decision
INC 1 Top Attack Rapid Prototype Phase																													5	Rapid Prototype Phase
INC 1 Top Attack User Jury 1																													6	User Jury 1
INC 1 Top Attack Preliminary Design Review																													7	PDR
INC 1 Top Attack User Jury 2																													9	User Jury 2
INC 1 Top Attack Qualification Testing																													10	CDR
INC 1 Top Attack Critical Design Review																													11	CDR
INC 1 MS C Decision																													12	INC 1 MS C Decision
INC 1 Type Classification																													15	INC 1 Type Classification
INC 1 Production and Deployment Phase																													16	INC 1 Production and Deployment Phase
INC 1 Full Material Release																													18	INC 1 Full Material Release
INC 2 Capability																														

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development

Event Name	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
INC 2 Rapid Prototype Decision																	▲ 11											
INC 2 Rapid Prototype Phase																					INC 2 Rapid Prototype Phase							
INC 2 User Jury 1																					▲ 13							
INC 2 User Jury 2																									▲ 16			
Full Network Capability																												
Full Network Rapid Prototype Decision																					▲ 14							
Full Network Prototype Phase																									Full Network Prototype Phase			
Full Network User Jury 1																									▲ 17			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
XM204 Interim Top Attack Capability	2	2025	2	2025
XM204 Materiel Development Decision	4	2015	4	2015
XM204 Model and Simulation Development	1	2016	4	2018
XM204 Concept Prototype Agreements Award(s)	2	2016	2	2016
XM204 Concept Prototype Build	2	2016	4	2016
XM204 Concept Prototype Test and Evaluation	1	2017	1	2017
XM204 Analysis of Alternatives	1	2016	4	2016
XM204 Materiel Solution Analysis	1	2017	3	2019
XM204 Munitions Delivery System Analysis	4	2018	4	2019
XM204 Development Decision	3	2019	3	2019
XM204 Capability Development Award	4	2019	4	2019
XM204 User Jury	4	2019	4	2019
XM204 System Development	4	2019	2	2022
XM204 Prototype Testing	1	2020	2	2020
XM204 SubSystem Integration Testing	2	2020	2	2021
XM204 Preliminary Design Review	3	2020	3	2020
XM204 Critical Design Review	3	2021	3	2021
XM204 Government Qualification Testing	4	2021	4	2022
XM204 Manufacturing Development	4	2021	1	2023
XM204 Production and Deployment Decision	3	2022	3	2022
XM204 Operational Assessment Test	4	2022	4	2022
XM204 Production	3	2022	4	2025

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
XM204 Urgent Material Release	2	2023	2	2023
XM204 Initial Operational Capability	4	2023	4	2023
TSO Future Capability Evaluation	2	2020	4	2021
TSO Development of Alternative Methods of Defeat	2	2020	4	2021
Increment 1 Improved Top Attack Capability Development	4	2022	4	2032
INC 1 Top Attack Rapid Prototype Decision	4	2022	4	2022
INC 1 Top Attack Rapid Prototype Phase	4	2022	1	2026
INC 1 Top Attack User Jury 1	3	2023	3	2023
INC 1 Top Attack Preliminary Design Review	4	2023	4	2023
INC 1 Top Attack User Jury 2	3	2024	3	2024
INC 1 Top Attack Qualification Testing	4	2024	3	2027
INC 1 Top Attack Critical Design Review	4	2024	4	2024
INC 1 MS C Decision	1	2026	1	2026
INC 1 Type Classification	4	2026	4	2026
INC 1 Production and Deployment Phase	1	2026	4	2033
INC 1 Full Material Release	4	2027	4	2027
INC 1 Initial Operational Capability	4	2028	4	2028
INC 2 Capability	2	2025	2	2033
INC 2 Rapid Prototype Decision	2	2025	2	2025
INC 2 Rapid Prototype Phase	3	2025	3	2028
INC 2 User Jury 1	2	2026	2	2026
INC 2 User Jury 2	2	2027	2	2027
Full Network Capability	3	2026	3	2028
Full Network Rapid Prototype Decision	2	2026	2	2026
Full Network Prototype Phase	3	2026	3	2028

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
Full Network User Jury 1	3	2027	3	2027
Full Network User Jury 2	3	2028	3	2028

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition
--	--

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	-	106.881	73.844	64.669	-	64.669	78.962	101.511	104.969	105.985	Continuing	Continuing
694: Medium Caliber Ammunition	-	12.000	-	-	-	-	-	-	-	-	0.000	12.000
BQ4: 155mm Artillery Propulsion XM654	-	15.131	-	-	-	-	-	-	-	-	0.000	15.131
CD8: Long Range Precision Munition (LRPM)	-	-	23.288	26.365	-	26.365	44.616	50.636	60.660	61.250	0.000	266.815
EB9: Aviation Airborne Expendable Countermeasures	-	4.332	5.529	-	-	-	-	-	-	-	0.000	9.861
EC3: Ammunition Logistics Prototyping	-	1.650	2.141	1.839	-	1.839	1.884	1.920	1.920	1.938	0.000	13.292
FA5: Assured Precision Weapons and Munitions	-	35.302	42.886	36.465	-	36.465	32.462	48.955	42.389	42.797	Continuing	Continuing
FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	38.466	-	-	-	-	-	-	-	-	0.000	38.466

A. Mission Description and Budget Item Justification

A portion of this funding line is directly aligned to each Future Vertical Lift (FVL) and Assured Positioning, Navigation, & Timing (APNT) Army Modernization Priorities. The Tank and Medium Caliber Ammunition Program Element encompasses a comprehensive program to develop, rapidly transition to production, and field advanced weapons and munitions for small, medium and large caliber munitions, tank ammunition, mortar ammunition, cannon artillery ammunition, and close combat system items. These Projects will ensure continued battlefield overmatch and lethality of United States maneuver forces against the full range of modern battlefield threats. To achieve this, Tank and Medium Caliber Ammunition projects will identify and develop promising technologies through competitive development and streamlined acquisition procedures.

Project 694 Medium Caliber Ammunition supports development of a 30 millimeter (mm) Multi-Mode Proximity Airburst (MMPA) munition and a Closed Loop Guided Munition System capable of defeating materiel, personnel, and Unmanned Aerial Systems (UAS) threats. Multi-Mode Proximity Airburst (MMPA) supports the Maneuver Short Range Air Defense (MSHORAD) directed requirement and is endorsed by the Air and Missile Defense Cross Functional Team (AMD CFT). The Guided Munition will support current and future ground platform with a 30mm weapon systems. These efforts will miniaturize and mature critical technologies in preparation to enter Engineering & Manufacturing Development (EMD). Critical technologies include airburst fuzing, guidance and navigation, communication with fire control, and advanced lethality.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>Project BQ4 155mm Artillery Propulsion: Supercharge is a stand-alone top-zone 155 millimeter (mm) propelling charge required to achieve maximum range requirements from the Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). Supercharge will achieve lethality overmatch out to 70 kilometers (km) with developmental extended range projectiles, and will potentially increase range with compatible legacy projectiles up to thirty percent. Supercharge is composed of an earlier bag variant and later combustible cartridge case, integral metal stub case, electrically initiated primer, and advanced artillery propellant. There is no FY 2023 budget request.</p> <p>Project CD8 - Army Aviation long range munition dominance and asymmetric advantage has eroded in recent years with peer adversaries expanding their capabilities by developing and fielding advanced systems designed to create physical stand-off especially in the realm of Anti-Access Area Denial (A2AD) and Integrated Air Defense Systems (IADS). Having operated in relatively uncontested environments for a number of years, the Joint Force has not kept pace with these peer and near peer developments and U.S. dominance is no longer assured. Army Aviation requires a Long Range Precision Munition (LRPM) that is integrated with the firing platform that can provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). LRPM will provide Army Aviation with an improved long range munition system that can rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an A2AD and positioning, navigation, and timing (PNT) denied environment. The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021. LRPM plans to leverage a capability demonstration and modular open system architecture to facilitate a reduction of costs and rapid development as threats continue to evolve.</p> <p>Project EB9 - Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.</p> <p>These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.</p> <p>Project EC3 Ammunition Logistics Prototyping: This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be used to further</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.</p> <p>Project FA5 - FA5 Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured- PNT (A-PNT) and Long Range Precision Fires (LRPF) Cross Functional Team (CFT) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and A-PNT/Space CFT programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&M) operating in a Navigation Warfare (NavWar) SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed A-PNT related PoR milestone and Army cross-functional modernization decisions.</p> <p>Project FG1 - Cannon-Delivered Area Effects Munitions (C-DAEM) Project will provide United States (U.S). ground forces with the capability to engage area personnel through armored targets, while denying threat forces full operational freedom within the targeted area. An Analysis of Alternatives (AoA) was completed in January 2018 to inform Army acquisition and investment decisions regarding replacement of the current stockpile of 155 millimeter (mm) Dual Purpose Improved Conventional Munitions (DPICM) with Department of Defense (DoD) policy compliant munitions and address anti-armor and extended range capability requirements. The Army validated two materiel solutions for C-DAEM to be pursued in parallel. C-DAEM Armor (Increment 1) will destroy moved and moving infantry fighting vehicles, self-propelled howitzers, and tanks. C-DAEM DPICM Replacement (Increment 2) will destroy personnel to light-skinned vehicles. This Project does not have a Fiscal Year (FY) 2023 budget request.</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	100.367	79.873	0.000	-	0.000
Current President's Budget	106.881	73.844	64.669	-	64.669
Total Adjustments	6.514	-6.029	64.669	-	64.669
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.910			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.514	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	64.669	-	64.669
• FFRDC Transfer	-	-0.119	-	-	-

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

Project: 694: *Medium Caliber Ammunition*

Congressional Add: *Development of Guided / Proximity Airburst Munition*

	FY 2021	FY 2022
	12.000	-
Congressional Add Subtotals for Project: 694	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.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) 694 / Medium Caliber Ammunition
--	--	---

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
694: Medium Caliber Ammunition	-	12.000	-	-	-	-	-	-	-	-	0.000	12.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 694 Medium Caliber Ammunition supports development of a 30 millimeter (mm) Multi-Mode Proximity Airburst (MMPA) munition and a Closed Loop Guided Munition System capable of defeating materiel, personnel, and Unmanned Aerial Systems (UAS) threats. Multi-Mode Proximity Airburst (MMPA) supports the Maneuver Short Range Air Defense (MSHORAD) directed requirement and is endorsed by the Air and Missile Defense Cross Functional Team (AMD CFT). The Guided Munition will support current and future ground platform with a 30mm weapon systems. These efforts will miniaturize and mature critical technologies in preparation to enter Engineering & Manufacturing Development (EMD). Critical technologies include airburst fuzing, guidance and navigation, communication with fire control, and advanced lethality.

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

	FY 2021	FY 2022
Congressional Add: Development of Guided / Proximity Airburst Munition	12.000	-
FY 2021 Accomplishments: Design, development, and maturation critical technologies that will conclude with a prototype demonstration.		
Congressional Adds Subtotals	12.000	-

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

N/A

Remarks

D. Acquisition Strategy

Other Transaction Agreement (OTA) contracts will be utilized for development, maturation and prototyping of critical fuzing and guidance technologies.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) 694 / Medium Caliber Ammunition
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Prototype Hardware	C/CPFF	Northrop Grumman Innovation Systems (NGIS) : Plymouth, MN	-	8.100	Mar 2021	-		-		-		-	0.000	8.100	-
Subtotal			-	8.100		-		-		-		-	0.000	8.100	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DEVCOM-AC Engineering Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny, NJ	-	3.900	Mar 2021	-		-		-		-	0.000	3.900	-
Subtotal			-	3.900		-		-		-		-	0.000	3.900	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		-	12.000	-	-	-	0.000	12.000	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 694 / <i>Medium Caliber Ammunition</i>

Event Name	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
Technology Maturation and Risk Reduction (TMRR)	[Redacted]																											
Engineering & Prototype Hardware Award	[Redacted]																											
Ammo Design Engineering Test 1 (DET)	[Redacted]																											
Ammo Design Engineering Test 2 (DET)	[Redacted]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 694 / <i>Medium Caliber Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation and Risk Reduction (TMRR)	2	2021	2	2022
Engineering & Prototype Hardware Award	2	2021	2	2021
Ammo Design Engineering Test 1 (DET)	4	2021	1	2022
Ammo Design Engineering Test 2 (DET)	3	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) BQ4 / 155mm Artillery Propulsion XM654
--	--	--

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
BQ4: 155mm Artillery Propulsion XM654	-	15.131	-	-	-	-	-	-	-	-	0.000	15.131
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Supercharge is a stand-alone top-zone 155 millimeter (mm) propelling charge required to achieve maximum range requirements from the Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). Supercharge will achieve lethality overmatch out to 70 kilometers (km) with developmental extended range projectiles, and will potentially increase range with compatible legacy projectiles up to thirty percent. Supercharge is composed of an earlier bag variant and later combustible cartridge case, integral metal stub case, electrically initiated primer, and advanced artillery propellant. There is no FY 2023 budget request.

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

	FY 2021	FY 2022	FY 2023
Title: 155mm Artillery Propulsion Supercharge	15.131	-	-
Description: The top-zone propelling charge for XM907E2 Extended Range Cannon with Slide-block breech for use with Extended Range Cannon Artillery (ERCA) to gain range overmatch for 155mm artillery.			
Accomplishments/Planned Programs Subtotals	15.131	-	-

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
• BQ3: 155mm Artillery Propulsion XM654	-	29.803	26.485	-	26.485	15.217	-	-	-	0.000	71.505

Remarks

In FY 2022, this Project will transition to Budget Activity 05, Program Element (PE) 0604802A Weapons and Munitions - Eng Dev Project BQ3 155mm Artillery Propulsion XM654. A Procurement of Ammunition, Army (PAA) funding line, Standard Study Number E99350, was established for transition to procurement FY 2022.

D. Acquisition Strategy

The Supercharge Project consists of critical technology prototyping, testing, and demonstration of two variants: (1) the UMR Supercharge (2-piece Bag configuration) to support the acceleration of the Extended Range Cannon Artillery (ERCA) to achieve precision lethality at 70km and greater in FY 2023 and follow-on UMR, and (2) the FMR Supercharge, which will address high technology and integration risks unique to achieving increased range.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) BQ4 / <i>155mm Artillery Propulsion XM654</i>
<p>The UMR Supercharge will utilize several competitively awarded Defense Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) Initiatives for the maturation and integration of components. These contracts will execute UMR Supercharge through qualification testing as well as transition to procurement of quantities required for FY 2023 Safety Release for First Unit Issued (FUI) of ERCA to perform Operational Assessment. Federal Acquisition Regulation (FAR) based production contract(s) will be awarded for UMR quantities.</p> <p>The FMR Supercharge will also utilize several competitively awarded DOTC OTA Initiatives for design risk reduction of the various new and existing Supercharge components, system integration, developmental testing and qualification. Propulsion risk reduction activities will be applied to address UMR Supercharge temperature sensitivity, energy, tube wear, rough handling robustness and muzzle pressure/ blast overpressure. FAR based production contract(s) will be awarded.</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) BQ4 / 155mm Artillery Propulsion XM654
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.042	0.008	Oct 2020	-		-		-		-	0.000	0.050	-
Subtotal			0.042	0.008		-		-		-		-	0.000	0.050	N/A

Remarks
Program Management reflects Supercharge travel and milestone documentation support.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Combustible Cartridge Cases	MIPR	DoD Ordnance Technology Consortium (DOTC) / Armtec : Coachella, California	0.840	3.651	Nov 2020	-		-		-		-	0.000	4.491	-
Load Assemble & Pack	MIPR	DoD Ordnance Technology Consortium (DOTC) / General Dynamics-Ordnance and Tactical Systems St. Petersburg : St. Petersburg, Florida	0.173	1.058	Nov 2020	-		-		-		-	0.000	1.231	-
Propellant	MIPR	DoD Ordnance Technology Consortium (DOTC) / General Dynamics-Ordnance and Tactical Systems Valleyfield : Salaberry-de-	2.724	2.454	Mar 2021	-		-		-		-	0.000	5.178	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army											Date: April 2022				
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition					Project (Number/Name) BQ4 / 155mm Artillery Propulsion XM654				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Valleyfield, QC, Canada													
Developmental Projectile/ Fuze Hardware	MIPR	Cornerstone / General Dynamics- Ordnance and Tactical Systems Wilkes-Barre : Wilkes-Barre, Pennsylvania	-	1.316	Mar 2021	-		-		-		-	0.000	1.316	-
Developmental Projectile/ Fuze Hardware	Reqn	American Ordnance LLC : Middletown, Iowa	-	0.006	Mar 2021	-		-		-		-	0.000	0.006	-
Software Engineering	Reqn	Leidos, Inc : Reston, Virginia	-	1.226	Sep 2021	-		-		-		-	0.000	1.226	-
Subtotal			3.737	9.711		-		-		-		-	0.000	13.448	N/A

Remarks
FY 2021 increase to support prototype maturation of two Supercharge variants to support Army modernization requirements to achieve lethality at 70 kilometers (km) with precision accuracy by FY 2023.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	1.295	3.884	Nov 2020	-		-		-		-	0.000	5.179	-
Subtotal			1.295	3.884		-		-		-		-	0.000	5.179	N/A

Remarks
Engineering support required for ongoing design risk reduction and prototype maturation efforts of two Supercharge variants.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) BQ4 / 155mm Artillery Propulsion XM654
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Supercharge Prototype Testing	MIPR	Army Test & Evaluation Command (ATEC) : Yuma, AZ	1.217	1.528	Mar 2021	-		-		-		-	0.000	2.745	-
Subtotal			1.217	1.528		-		-		-		-	0.000	2.745	N/A

Remarks
Additional FY 2021 testing activities required for ongoing design risk reduction and prototype maturation efforts of two Supercharge variants.

	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	6.291	15.131	-	-	-	-	0.000	21.422	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition		Project (Number/Name) BQ4 / 155mm Artillery Propulsion XM654	

Event Name	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
Supercharge 2-piece Bag (UMR Variant)																												
Prototype Development & Testing																												
Supercharge (FMR Variant)																												
Prototype Development																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) BQ4 / <i>155mm Artillery Propulsion XM654</i>

Note
Schedule reflects design risk reduction and prototype maturation efforts for two parallel Supercharge variants (2-piece bag and cased) required to support the concurrent development of the Extended Range Cannon Artillery (ERCA) Increased Range (accelerated to achieve precision accuracy at 70km range by FY 2023) and ERCA Increased Rate of Fire (with added automated loading system).

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) BQ4 / <i>155mm Artillery Propulsion XM654</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Supercharge 2-piece Bag (UMR Variant)	1	2020	3	2023
Prototype Development & Testing	2	2020	4	2021
Supercharge (FMR Variant)	1	2021	4	2021
Prototype Development	1	2021	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) CD8 / Long Range Precision Mmunition (LRPM)			
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
CD8: Long Range Precision Mmunition (LRPM)	-	-	23.288	26.365	-	26.365	44.616	50.636	60.660	61.250	0.000	266.815
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Army Aviation long range munition dominance and asymmetric advantage has eroded in recent years with peer adversaries expanding their capabilities by developing and fielding advanced systems designed to create physical stand-off especially in the realm of Anti-Access Area Denial (A2AD) and Integrated Air Defense Systems (IADS). Having operated in relatively uncontested environments for a number of years, the Joint Force has not kept pace with these peer and near peer developments and U.S. dominance is no longer assured. Army Aviation requires a Long Range Precision Mmunition (LRPM) that is integrated with the firing platform that can provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). LRPM will provide Army Aviation with an improved long range munition system that can rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an A2AD and positioning, navigation, and timing (PNT) denied environment. The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 03 June 2021. LRPM plans to leverage a capability demonstration and modular open system architecture to facilitate a reduction of costs and rapid development as threats continue to evolve.

The Fiscal Year (FY) 2023 dollars in the amount of \$26.365 million will continue the review and analysis of the FY 2022 Shoot-Off Capabilities Demonstration, technology maturation and risk reduction efforts, LRPM program acquisition and contract documentation preparation and coordination, and conduct downselect activities & technical evaluations leading to a contract award to mature and qualify the LRPM System.

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

	FY 2021	FY 2022	FY 2023
Title: Long Range Precision Mmunition	-	22.438	26.365
Description: This line funds the demonstration and validation of a munition system that will engage and render desired lethal effects on targets at ranges beyond line of sight. The LRPM development effort includes demonstration and validation of precision guided munitions with the capability to complete the assigned mission in environments that could include cyber-attack, countermeasures, counter precision guided munition systems and anti-access area denial environments. These efforts will include technical assessments, concept studies, performance of risk reduction efforts, technology maturation, engineering design, engineering / manufacturing development, test, demonstration of prototype hardware, integration of LRPM, and document preparation for associated contract efforts.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) CD8 / <i>Long Range Precision Munition (LRPM)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Initiate technology maturation and risk reduction efforts including an industry capabilities demonstration. Evaluate industry concepts utilizing test scoring criteria and laboratory analysis. LRPM program acquisition and contract documentation preparation.</p> <p>FY 2023 Plans: Complete review and analysis of the FY 2022 Shoot-Off Capabilities Demonstration. Technology maturation and risk reduction efforts continue. Continue LRPM program acquisition and contract documentation preparation and coordination. Conduct down-select activities & technical evaluations leading to a contract award to mature and qualify the LRPM System.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is due to the conduct of the LRPM Shoot-Off capabilities demonstration occurring in FY 2022.</p>				
<p>Title: SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>		-	0.850	-
Accomplishments/Planned Programs Subtotals		-	23.288	26.365
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>The LRPM Program plans to explore and leverage industry's ability to deliver the LRPM solution through a Shoot-Off Capability Demonstration. Selected vendors will deliver test assets in support of a United States Government Test in 2022. This demonstration will illustrate their design concepts and technical approaches to inform the LRPM Capability Development Document (CDD). Following the LRPM Shoot-Off Capability Demonstration event, the Army plans to continue refinement, maturation, and qualification efforts for the selected weapon system. The LRPM program will prepare required acquisition and contract documentation throughout FY 2022 and FY 2023 in support of a planned contract award in FY 2023 to mature and qualify the LRPM system.</p>				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) CD8 / Long Range Precision Munition (LRPM)
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering/ Program Management	Various	Various Performers : Various	-	-		2.560	Apr 2022	3.182	Nov 2022	-		3.182	0.000	5.742	-
Down Select / Technical Evaluations	Various	Multiple Activities : Redstone Arsenal, Alabama	-	-		-		2.046	Apr 2023	-		2.046	0.000	2.046	-
SBIR/STTR	C/TBD	Various : Various	-	-		0.850	Apr 2022	-		-		-	0.000	0.850	-
Subtotal			-	-		3.410		5.228		-		5.228	0.000	8.638	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LRPM Other Government Agency	MIPR	CCDC Redstone Arsenal, AL : Various	-	-		-		3.231	Nov 2022	-		3.231	0.000	3.231	-
System Development Maturation, Prototypes and Integration	C/TBD	TBD : TBD	-	-		-		14.765	Aug 2023	-		14.765	0.000	14.765	-
Engineering and Technical Support	Various	Various : Redstone Arsenal, Alabama	-	-		-		3.141	Jan 2023	-		3.141	0.000	3.141	-
Subtotal			-	-		-		21.137		-		21.137	0.000	21.137	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Testing	MIPR	To Be Determined : To Be Determined	-	-		14.382	Apr 2022	-		-		-	0.000	14.382	-
LRPM Other Government Agency	MIPR	Various Performers : Various	-	-		5.496	Apr 2022	-		-		-	0.000	5.496	-
Subtotal			-	-		19.878		-		-		-	0.000	19.878	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>			Project (Number/Name) CD8 / <i>Long Range Precision Munition (LRPM)</i>				
	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	-	-	23.288		26.365	-	26.365	0.000	49.653	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) CD8 / <i>Long Range Precision Munition (LRPM)</i>

Event Name	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
Technology Demonstration																												
Acquisition and Contract Preparation																												
Maturation, Qualification, and Testing																												
Materiel Development Decision									▲ 1																			
Production Decision																									▲ 2			

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) CD8 / <i>Long Range Precision Munition (LRPM)</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Demonstration	1	2022	1	2023
Acquisition and Contract Preparation	1	2022	3	2023
Maturation, Qualification, and Testing	4	2023	1	2027
Materiel Development Decision	2	2022	2	2022
Production Decision	1	2027	1	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures			
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
EB9: Aviation Airborne Expendable Countermeasures	-	4.332	5.529	-	-	-	-	-	-	-	0.000	9.861
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev.

A. Mission Description and Budget Item Justification

Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.

These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.

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

	FY 2021	FY 2022	FY 2023
Title: Expendable Countermeasures to Guided Missile Threats	4.332	5.327	-
Description: This program will develop expendable countermeasure decoys which will protect Army aircraft from surface-to-air missiles.			
FY 2022 Plans: Finalize XM20 flight testing in preparation for initial operational test and evaluation to support the Milestone C decision.			
FY 2022 to FY 2023 Increase/Decrease Statement: Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev.			
Title: FY 2022 SBIR/STTR Transfer	-	0.202	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures

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	4.332	5.529	-

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
• EP7: Aviation Airborne Expendable Countermeasures	4.313	7.526	6.363	-	6.363	-	-	-	-	0.000	18.202
• E49101: Flare, Aircraft Countermeasure, RF (Passive)	-	-	1.036	-	1.036	-	-	-	-	0.000	1.036

Remarks
Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunition transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev

D. Acquisition Strategy
During the Materiel Solution Analysis (MSA), Milestone A phase, prototypes developed by the US Government (USG) and contractors were tested and evaluated against initial CDD requirements. The contractor developed XM20 design and the USG developed XM215 design were selected to enter into Engineering and Manufacturing Development (EMD), Milestone B phase, to finalize the design based on lessons learned from the MSA flight test and CDD requirements. The USG starts the transition to industry via Other Transaction Authority (OTA) contract mechanism in FY 2021. Industry prototypes will undergo Developmental and Operational Testing and final XM20 and XM215 configurations to support Milestone C in FY 2022 and FY 2023 respectively.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EB9 / Aviation Airborne Expendable Countermeasures
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.202		-		-		-	0.000	0.202	-
Subtotal			-	-		0.202		-		-		-	0.000	0.202	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM20 Testing Hardware	C/FFP	Armtec : Lillington, NC	-	-		1.300	Apr 2022	-		-		-	0.000	1.300	-
XM20 Development	C/FFP	Armtec : Lillington, NC	2.691	-		-		-		-		-	0.000	2.691	-
XM215 Development	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	3.532	-		-		-		-		-	0.000	3.532	-
Subtotal			6.223	-		1.300		-		-		-	0.000	7.523	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM20 Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.180	0.554	Feb 2021	0.764	Apr 2022	-		-		-	0.000	2.498	-
XM20 Contractor Support	C/FFP	Booz Allen Hamilton : Aberdeen, MD	-	0.106	Apr 2021	0.250	May 2022	-		-		-	0.000	0.356	-
XM20 Engineering Support	MIPR	DEVCOM C5ISR : Aberdeen Proving Ground, MD	0.222	-		-		-		-		-	0.000	0.222	-
Subtotal			1.402	0.660		1.014		-		-		-	0.000	3.076	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army									Date: April 2022		
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>				Project (Number/Name) EB9 / <i>Aviation Airborne Expendable Countermeasures</i>			

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM20 Operational Test and Evaluation	MIPR	Various : Various	-	-		2.650	Aug 2022	-		-		-	0.000	2.650	-
XM20 Design Verification and Flight Testing	MIPR	Various : Various	0.739	3.340	Dec 2021	0.363	Apr 2022	-		-		-	0.000	4.442	-
XM20 Modeling & Simulation	C/FFP	Booz Allen Hamilton : McLean, VA	1.505	0.332	Apr 2021	-		-		-		-	0.000	1.837	-
XM215 Flight Test and Evaluation	MIPR	Various : Various	4.200	-		-		-		-		-	0.000	4.200	-
XM20 Flight Test and Evaluation	MIPR	Various : Various	2.560	-		-		-		-		-	0.000	2.560	-
Subtotal			9.004	3.672		3.013		-		-		-	0.000	15.689	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			16.629	4.332		5.529		-		-		-	0.000	26.490	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB9 / <i>Aviation Airborne Expendable Countermeasures</i>

Event Name	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
Radio Frequency (RF) Development																												
XM20 Technology Maturation and Risk Reduction	■																											
	XM20 TMRR																											
XM20 Data Analysis	■																											
	XM20 MS-B Prep																											
XM20 Milestone B	▲ 1																											
	XM20 MS-B																											
XM20 Development Contract	■				■																							
	XM20 EMD				■																							
XM20 Qualification Build	■				■																							
	XM20 Qual Build				■																							
XM20 Critical Design Review					▲ 2																							
					XM20 CDR																							
XM20 Developmental Testing					■																							
					XM20 DT																							
XM20 Milestone C									▲ 3																			
									XM20 MS-C																			
XM20 Test Hardware									■																			
									XM20 Test Hardware																			
XM20 Operational Test and Evaluation													■															
													XM20 OT&E															
XM20 Production																	■				■				■			
																	XM20 Production				■				■			
XM215 Development																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB9 / <i>Aviation Airborne Expendable Countermeasures</i>

Event Name	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							
XM215 Engineering and Manufacturing Development	[Redacted]																																		
	XM215 EMD																																		
XM215 Design Verification Test																																			
XM215 Flight Test																																			
XM215 Prototype Build																																			
XM215 Flight Test 2																																			
XM215 Developmental and Operational Testing																																			
XM215 Milestone C																																			
XM215 Production																																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB9 / <i>Aviation Airborne Expendable Countermeasures</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Radio Frequency (RF) Development	1	2019	4	2025
XM20 Milestone A	1	2019	1	2019
XM20 Prototype Development	1	2019	4	2019
XM20 Demonstrations	2	2019	3	2019
XM20 Technology Maturation and Risk Reduction	1	2020	2	2021
XM20 Flight Testing	2	2020	2	2020
XM20 Modeling and Simulation	3	2020	4	2020
XM20 Data Analysis	1	2021	2	2021
XM20 Milestone B	2	2021	2	2021
XM20 Development Contract	2	2021	4	2022
XM20 Qualification Build	2	2021	3	2022
XM20 Critical Design Review	2	2022	2	2022
XM20 Developmental Testing	2	2022	4	2022
XM20 Milestone C	4	2022	4	2022
XM20 Test Hardware	4	2022	2	2023
XM20 Operational Test and Evaluation	3	2023	3	2023
XM20 Production	3	2023	2	2028
XM215 Development	1	2019	4	2025
XM215 Milestone A	1	2019	1	2019
XM215 Prototyping	1	2019	2	2020
XM215 Down Select	3	2019	3	2019
XM215 Testing Efforts (Stability/Heat/Cold)	3	2019	2	2020

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB9 / <i>Aviation Airborne Expendable Countermeasures</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
XM215 Flight Testing	1	2020	2	2020
XM215 Milestone B	2	2020	2	2020
XM215 Engineering and Manufacturing Development	2	2020	4	2023
XM215 Design Verification Test	2	2021	3	2021
XM215 Flight Test	2	2021	2	2021
XM215 Prototype Build	3	2021	4	2023
XM215 Flight Test 2	1	2023	1	2023
XM215 Developmental and Operational Testing	2	2023	4	2023
XM215 Milestone C	4	2023	4	2023
XM215 Production	2	2024	2	2029

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EC3 / Ammunition Logistics Prototyping			
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
EC3: Ammunition Logistics Prototyping	-	1.650	2.141	1.839	-	1.839	1.884	1.920	1.920	1.938	0.000	13.292
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.

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

	FY 2021	FY 2022	FY 2023
Title: Munitions Health and Inventory Monitoring Systems	1.150	1.065	0.952
<p>Description: Performance and reliability of certain munitions can be degraded by the environmental exposure history they experience during their lifetime. This Project will develop simple to complex environmental health and inventory monitoring systems to improve reliability and asset visibility and enable effective Condition Based Management for Ammunition. All research and development initiatives will be supporting the Long Range Precision Fires (LRPF) & Solider Lethality (SL) Cross Functional Teams (CFTs) and the multi domain operations modernization objectives that consume, store or transport/distribute munitions and munition components in the maneuver formations.</p> <p>FY 2022 Plans: Develop technologies for monitoring the health of ammunition out of its standard depot pack after issuance from the wholesale ammunition system. Assess utility of providing actionable intelligence through use of the Tactical Ammunition Management Micro-Services (TAMMS).</p> <p>FY 2023 Plans: Develop and mature prototype systems to monitor munition exposure throughout the tactical distribution system. Develop systems to monitor large caliber projectiles, associated propellant, fuzes, and any other ammunition components as packaging</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
and transport/storage configurations evolve within the tactical distribution system. Integrate these monitoring systems with other ammunition management technologies. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to increase in maturity level of items shifting to BA 6.5.				
Title: Munitions Containerization Systems Description: For each family of munitions containers, optimize prototype container systems for automation compatibility, combat unit load quantity, sustainability/recyclability, Insensitive Munitions/explosives safety, environmental protection, load reconfiguration, unitization, and standardized interfaces. This will improve ammunition distribution efficiency while minimizing environmental and operational impacts. FY 2022 Plans: Pending PM CAS FY 2021 approval, conduct qualification testing on new inner and outer pack propellant charge containers/ consolidators that are designed to reduce unit logistics & soldier burden and interface with increasingly automated weapon and sustainment systems, for integration with ammunition items under development by PM CAS that support legacy BCT operations. Develop LRPF munition inner packaging barrier based on environmental assessment completed in FY 2021. FY 2023 Plans: Conduct qualification testing on plastic cylindrical injection molded containers and / or inner packaging components that are low cost, lightweight and incorporate features that will enable interoperability with future automated weapon and sustainment systems, for integration with ammunition items under development by PM CAS. Complete developmental testing on inner packaging barrier prototypes designed to protect new large caliber propellant items against environmental effects. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to increase in maturity level of items shifting to BA 6.5.		0.500	0.997	0.887
Title: 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		-	0.079	-
Accomplishments/Planned Programs Subtotals		1.650	2.141	1.839

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>

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

Remarks

D. Acquisition Strategy

Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EC3 / Ammunition Logistics Prototyping								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.079		-		-		-	0.000	0.079	-	
Subtotal			-	-		0.079		-		-		-	0.000	0.079	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Plastic Cylindrical Container	C/FFP	SAVIT : Rockaway, NJ	0.647	-		-		-		-		-	0.000	0.647	-	
Plastic Rectangular Container	C/FFP	SAVIT : Rockaway, NJ	0.505	0.051	Aug 2021	-		-		-		-	0.000	0.556	-	
Advanced Munitions Health Monitoring System	C/FFP	TBD : TBD	-	-		-		0.200	Jan 2023	-		0.200	0.000	0.200	-	
Tactical Munitions Health Monitoring System	C/FFP	Cybernet : Ann Arbor, MI	-	0.765	Sep 2021	0.984	Jan 2022	0.275	Jan 2022	-		0.275	0.000	2.024	-	
Large Caliber Automation Friendly Packaging	TBD	TBD : TBD	-	-		-		0.500	Mar 2023	-		0.500	0.000	0.500	-	
Subtotal			1.152	0.816		0.984		0.975		-		0.975	0.000	3.927	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Combat Capabilities Development Command Armaments Center (CCDC AC)	MIPR	Picatinny Arsenal : NJ	4.570	0.834	Dec 2020	0.878	Nov 2021	0.664	Nov 2021	-		0.664	0.000	6.946	-	
Subtotal			4.570	0.834		0.878		0.664		-		0.664	0.000	6.946	N/A	

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army											Date: April 2022				
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition					Project (Number/Name) EC3 / Ammunition Logistics Prototyping				

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Yuma Proving Ground	MIPR	Yuma : AZ	0.086	-		-		-		-		-	0.000	0.086	-
Test and Evaluation	MIPR	TBD : TBD	0.150	-		0.200	Mar 2022	0.200	Mar 2023	-		0.200	0.000	0.550	-
Subtotal			0.236	-		0.200		0.200		-		0.200	0.000	0.636	N/A
Project Cost Totals			5.958	1.650		2.141		1.839		-		1.839	0.000	11.588	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EC3 / Ammunition Logistics Prototyping

Event Name	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
Advanced Concept Development-Munitions Containerization-1A	[Redacted]				[Redacted]																							
	Munitions Containerization-Plastic Rectangular Container				[Redacted]																							
Tactical Munitions Health Monitoring System	[Redacted]				[Redacted]				[Redacted]																			
	[Redacted]				Tactical Munitions Health Monitoring System																							
Large Caliber Automation Friendly Packaging	[Redacted]				[Redacted]				[Redacted]				[Redacted]															
	[Redacted]				[Redacted]				Large Caliber Automation Friendly Packaging																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Concept Development-Munitions Containerization-1A	1	2020	4	2021
Advanced Concept Development-Munitions Health Monitoring-3	3	2017	4	2020
Tactical Munitions Health Monitoring System	1	2022	4	2024
Large Caliber Automation Friendly Packaging	1	2023	4	2025

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FA5 / Assured Precision Weapons and Munitions			
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
FA5: Assured Precision Weapons and Munitions	-	35.302	42.886	36.465	-	36.465	32.462	48.955	42.389	42.797	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Assured Precision Weapons and Munitions (APWM) - FA5 Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured-PNT (A-PNT) and Long Range Precision Fires (LRPF) Cross Functional Team (CFT) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and A-PNT/Space CFT programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&M) operating in a Navigation Warfare (NavWar) SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed A-PNT related PoR milestone and Army cross-functional modernization decisions.

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

	FY 2021	FY 2022	FY 2023
Title: APWM Integrated Product Support - Joint Lethality PNT SME Working Integrated Product Team (WIPT) & Program Management	3.526	3.600	3.744
Description: Provide APWM technical subject matter expertise and support to the Joint oversight board for APWM. Provide overall APWM Project Program Management support.			
FY 2022 Plans: The Subject Matter Experts (SMEs) will continue coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs including participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and munitions operating in a SoS multi-domain environment, and configuration management of the evolving Precision Guided Munition (PGM) Technical Requirements			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Document (TRD). Specific support focus includes requirements for Military GPS User Equipment (MGUE) Increment 2 and alternative PNT technology maturity.</p> <p>FY 2023 Plans: Provides overall Project Program Management support for 643639A-FA5. The Joint Lethality SMEs will continue to provide technical expertise and support to the Joint oversight board for Assured Precision Weapons and Munitions by coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs, participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and munitions operating in a Joint SoS multi-domain environment. Specific support focus includes requirements for MGUE Increment 2, resilient and survivable PNT technology maturation, and NavWar dependencies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: A slight increase in funding due the level of effort required in FY 2023 is slightly higher than FY 2022 due to Assured Position Navigation and Timing/Space (APNT/S) Cross Functional Team (CFT) and US Space Force's MGUE program efforts, maturing NavWar initiatives, and increasing complexity of multi-domain operations (MDOs) impacting collaborative efforts for the Joint Lethality community.</p>				
<p>Title: Assured PNT related Integration Risk Mitigation - NA2 for Weapons and Munitions Phase 2</p> <p>Description: Perform NA2 systems of systems capability integration and pre system qualification integration risk reduction activities. Improve initial prototype NA2 capability and initiate improved prototype for subsequent transition to corresponding PoRs. Inform future NavWar related weapons and munitions platform dependencies. Integrate and synchronize AltNav capability delivery within NA2 to meet A-PNT CFT AltNav Directed Requirement which summarizes the urgent need for AltNav initial operational capability in two Brigade Combat Teams NLT 1QFY 2024.</p>		3.700	-	-
<p>Title: Assured PNT related Integration Risk Mitigation - NA2 for Guided Rocket/Missile Launcher Systems</p> <p>Description: Perform software development and prototyping activities to demonstrate NA2 capability for Rocket/Missile artillery launcher systems. Integrate and demonstrate upgraded artillery launcher system into the NA2 SoS networked capability to reduce subsequent PoR fielding risks. Integrate and synchronize AltNav capability delivery within NA2 to meet A-PNT/Space CFT AltNav Directed Requirements which summarizes the urgent need for AltNav IOC in two BCTs NLT 1QFY 2024.</p>		2.000	-	-
<p>Title: Fires System-of-Systems APNT related AS and Navigation Warfare (NavWar)</p> <p>Description: Prototype PNT enabling technologies that are critical for executing Fires SoS NavWar missions to include munition-based offensive, defensive, and associated Command and Control (C2) functions. Prototyping efforts will focus on enabling combat lethality overmatch in PNT challenged environments for cannon and rocket/missile core missions. Prototype long range</p>		3.786	5.000	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
stand-off NavWar capability to penetrate contested A2/AD environments via use of long-range artillery, Fires SoS architectures enabling advanced NavWar attack, sense, and optimization, and advanced anti-jam/anti-spoof techniques for munitions.				
<p>FY 2022 Plans: Continue maturing initial prototypes for gun-hardened NavWar systems. Conduct integration activities of a gun-hardened NavWar system prototype and execute a Live Fire Test demonstration from a 155mm artillery cargo round. A technical report will document results of the gun-launched NavWar prototype. Identify and define the future Fires SoS MDO interdependencies to enable a suite of NAVWAR operational capabilities and develop near, mid, and long term MDO Fires and NAVWAR strategies to meet Army modernization imperatives.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funds were decreased due to Fires SoS APNT related AS and NavWar prototypes providing live fire demonstrations of capabilities in FY 2022 in order to meet Army modernization imperatives. This includes Munition Deployed NavWar (MDN) prototype live fire demonstration(s) and test reports, and virtual prototype of Fires SoS NavWar capability with concept of operation and resource plan for physical prototyping.</p>				
<p>Title: Next Generation PNT Technologies Phase 1</p> <p>Description: Continue prototyping APNT technologies to provide the next generation of APNT capability to weapons and munitions in a highly complex and fast paced battlefield. Will leverage prior Army Science & Technology (S&T), previous integrated demonstration events, information on threat advancement, and lessons learned to rapidly develop, integrate, prototype, and transition critical APNT technologies to weapons and munitions directly supporting LRPF and Air & Missile Defense (AMD) initiatives.</p> <p>FY 2022 Plans: Continue to mature and improve proven APNT technology for spiral development and integration into weapons and munitions to maintain combat lethality overmatch in highly contested PNT environments.</p> <p>FY 2023 Plans: Demonstrate resilient and survivable PNT solutions for weapons and munitions using results of phase 1 spiral APNT technology solutions in complex PNT threat environments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increased due to FY 2023 focusing on demonstration initiatives to outpace the threat and enable LRPF in a highly complex MDOs environment requiring from phase 1 spiral of next generation PNT technologies.</p>		-	1.216	2.268
<p>Title: Assured PNT related Weapons & Munitions Prototyping - AltNav Technologies (AltNav) Phase 2</p>		3.175	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Conduct rapid development and prototyping of AltNav receivers for PGMs and assess operational feedback (receivers, enterprise service, and integration) of solutions to maximize utility of AltNav for LRPF meeting the intent of paragraph 6 of the A-PNT/Space CFT AltNav Directed Requirement. Demonstrate and conduct performance assessments of potential hardware and software solutions to support Artillery integration efforts as well as inform future Space-based PNT related alternatives for the Land Combat domain.</p>				
<p>Title: Rocket/Missile Precision Guided Munition M-Code Prototyping</p> <p>Description: Directly supports M-Code public law by rapidly prototyping M-Code receivers for direct transfer to rocket/missile systems.</p> <p>FY 2022 Plans: Prototyping of Army NAVSTORM-M capability for Deep Fire Artillery PGMs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased as a result of FY 2022 being the final year of rapid NAVSTORM-M M-Code receiver prototyping for transition to PEO MS and JPEO AA. Completed PGM NavStorm-M M-Code PGM GPS receiver ready for integration across PEO MS and JPEO AA PoRs.</p>		-	6.000	-
<p>Title: Munition Deployed NavWar Countermeasures</p> <p>Description: Prototype, integrate, and experiment with initial increment of Munition Deployed NavWar Countermeasures (MDNC) and weapons and munitions System of Systems dependencies directly supporting APNT/Space CFT NavWar initiatives and LRPF initiative of penetrating, disrupting, and disintegrating Anti Access/Area Denial (A2/AD) environments to enable employment of precision weapons and munitions.</p> <p>FY 2022 Plans: Evaluate and experiment with MDN-C solutions and weapons and munitions system of systems dependencies to penetrate and disrupt enemy A2 / AD. Inform extended range cargo carrier and mid to long-term NavWar initiatives to deliver standoff countermeasure effects enabling freedom of operations and employment of precision weapons and munitions in A2/AD environments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding was decreased in FY23 as a result of accomplishing goals in FY22 Plans.</p>		-	6.000	-
<p>Title: Assured PNT related Weapons & Munitions Prototyping - PGM Software-Defined Receiver (SDRx)</p>		-	6.000	5.329

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Develop a prototype "All In One" (Global Positioning System (GPS), Global Navigation Satellite System (GNSS), Alternative Navigation (AltNav), Signals of Opportunity (SoO)) software defined radio frequency Assured Position, Navigation and Timing (A-PNT) receiver for a large portion of the Precision Guided Munition (PGM) portfolio.</p> <p>FY 2022 Plans: Develop diverse RF Basic Navigation functions required for a prototype PGM SDRx.</p> <p>FY 2023 Plans: Continue to develop diverse RF Basic Navigation functions required for a prototype PGM SDRx and initiate GPS security certification process.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding decrease due to focus on core navigation function prototype evaluation to reduce risk before adding advanced anti-jam and anti-spoof features to the receiver.</p>				
<p>Title: Army M-Code Technology Integration and Evaluation</p> <p>Description: Provide technical assessment, coordination, and engineering support related to the development, prototyping, integration, and evaluation of Air Force's MGUE technology deliverables across all Army Weapons and Munitions, including participation in design reviews, testing, evaluation, and formal feedback on technology, component-level, card-level, sub-system-level, and systems-level requirements and performance. Reduce risk, support, and inform M-Code GPS related Army cross-functional modernization decisions for weapons and munitions operating in a peer/near threat SoS environment as well as identifying complementary PNT and related solutions when M-Code GPS is not solely sufficient to enable Combat Overmatch.</p>		11.101	-	-
<p>Title: Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation</p> <p>Description: Provide technical assessment, coordination, and engineering support related to the development, prototyping, integration, and evaluation of US Space Force's MGUE technology deliverables across all Army Weapons and Munitions, including participation in design reviews, testing, evaluation, and formal feedback on technology, component-level, card-level, sub-system-level, and systems-level requirements and performance. Reduce risk, support, and inform M-Code GPS related Army cross-functional modernization decisions for weapons and munitions operating in a peer/near threat SoS environment as well as identifying complementary PNT and NavWar related solutions when M-Code GPS is not solely sufficient to enable Combat Overmatch.</p> <p>FY 2022 Plans: Continue to lead the Army M-Code GPS Weapons and Munitions IPT and influence the Air Force's MGUE technology investments via established requirements and performance based needs for Army Weapons and Munitions. Lead a centralized</p>		-	12.000	12.420

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Army evaluation, prototyping, and experimentation mechanism to assess the effectiveness of M-Code GPS focused weapon and munition platform capabilities as well as emerging NavWar related capabilities operating in a peer/near PNT threat SoS environment. Continue to lead the multi-organizational IPT to execute study, analysis, integration, and migration imperatives for the Army M-Code Task Force. Support high priority Army programs transitioning to M-Code to meet Army modernization objectives.</p> <p>FY 2023 Plans: Continues to support design reviews, experimentation, prototyping, testing, evaluation, and risk reduction of Army M-Code Inc2, AltNav, and NavWar by in-house government activities and OTA/IDIQ Contract efforts. Maintains an Army APNT and NavWar Weapons and Munitions IPT working directly with the APNT/S CFT and multiple PEOs. Facilitate weapon and munition APNT and NavWar experimentation in PNT Assessment (PNTAX) and Project Convergence type events to inform CONOPS and requirement generation processes.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 slight funding increase due to a level of effort required in FY 2023 is slightly higher than FY 2022 due to an increase in activity from various organizations and increased participation in joint demonstrations.</p>				
<p>Title: MGUE Increment 2 (Inc2) with Precision Guidance Kit - Anti Jam (LR PGK)</p> <p>Description: Influence next generation MGUE development to ensure precision guided munition needs and requirements are met with the Air Force's next generation MGUE. Integrate and test next generation MGUE into the Long Range Precision Guidance Kit (LR-PGK) as the DoD-selected representative Joint precision munition to verify and validate needs and requirements are met by next generation MGUE.</p>		1.500	-	-
<p>Title: MGUE Inc2 for JROC-directed PGM Lead Platform</p> <p>Description: Influence next generation MGUE development to ensure precision guided munition needs and requirements are met with the US Space Force (USSF) next generation MGUE. Evaluate the next generation MGUE using the Long Range Precision Guidance Kit (LR-PGK) as the DoD-selected representative Joint precision munition to verify and validate PGM needs and requirements are met by next generation MGUE.</p> <p>FY 2022 Plans: Perform M&S on GPS threat scenarios on MGUE designs to assess performance for PGM applications. Perform risk reduction analysis and activities of MGUE vendor designs. Draft Inc2 Next Generation Application Specific Integrated Circuit (ASIC) NGA TMA & IRA Report for PGMs.</p> <p>FY 2023 Plans:</p>		-	1.500	12.704

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Work directly with USSF and M-Code Inc2 GPS prime vendors to start virtually prototyping and conducting PGM application specific design trade studies to reduce risk of integration into LR PGK, as the JROC-approved selected representative PGM for next generation ASIC verification and validation ensuring PGM PNT-related needs and requirements are met by MGUE Inc2.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding will increase because the M-Code Inc2 vendors will have initial ASIC design mature enough to start virtual prototyping and design trade study analysis specific to addressing PGM requirements and needs significantly increasing the required effort from the previous year.</p>			
<p>Title: Accelerate NAVSTORM-M-Integration</p> <p>Description: The C-DAEM Armor Hit to Kill (HTK) development effort requires additional FY 2021 funding to initiate critical risk reduction activities supporting the integration of the NavStorm-M GPS Receiver into the HTK Full Materiel Release (FMR) variant. This requirement is supported by the director of the APNT/S CFT and the director of the LRPF CFT.</p>	6.514	-	-
<p>Title: SBIR/STTR</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>	-	1.570	-
Accomplishments/Planned Programs Subtotals	35.302	42.886	36.465

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

N/A

Remarks

D. Acquisition Strategy

Acquisition Strategy: The Assured Precision Weapons and Munitions Project will utilize a combination of Other Transaction Authority (OTA) contract mechanisms such as the Defense Ordinance Technology Consortium (DOTC) OTA and In-House government development and engineering capabilities to obtain prototypes and demonstrate/evaluate the maturity and integration risk of the M-Code GPS on Precision Munitions and Weapons, as well as other alternative PNT and NavWar related capabilities.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR	TBD	Various : Various	-	-		1.570		-		-		-	0.000	1.570	-
Subtotal			-	-		1.570		-		-		-	0.000	1.570	N/A

Remarks
In FY 2022, funding in the amount of \$0.450 million for manpower was realigned to Operations and Maintenance. Program support costs have been accurately updated to reflect the realignments.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Assured PNT related Weapons Integration Risk Mitigation	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	11.174	4.310	Dec 2020	-		-		-		-	0.000	15.484	-
Assured PNT related Weapons Integration Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	5.271	1.000	Dec 2020	-		-		-		-	0.000	6.271	-
Assured PNT related Munitions Integration Risk Mitigation	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	9.571	2.786	Dec 2020	-		-		-		-	0.000	12.357	-
Assured PNT related Munitions Integration Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	8.611	3.175	Dec 2020	5.000	Dec 2021	2.258	Dec 2022	-		2.258	0.000	19.044	-
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation	MIPR	Various : Various	6.521	6.101	Dec 2020	7.200	Dec 2021	9.900	Dec 2022	-		9.900	Continuing	Continuing	Continuing
Weapon & Munitions Prototyping & Integration Risk Mitigation	MIPR	DoD Ordnance Technology Consortium (DOTC)	-	-		15.666	Dec 2021	3.939	Dec 2022	-		3.939	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		- TBD; Various : Various													
MGUE Inc2 for JROC directed PGM Lead Platform Development	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	-	-		-		10.017	Dec 2022	-		10.017	Continuing	Continuing	Continuing
Accelerate NAVSTORM-M-Integration	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	-	6.514	Apr 2021	-		-		-		-	0.000	6.514	6.514
Subtotal			41.148	23.886		27.866		26.114		-		26.114	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Joint Program Executive Office Armaments and Ammunition (JPEO A&A) : Picatinny Arsenal, NJ	3.322	1.275	Dec 2020	1.250	Dec 2021	1.278	Dec 2022	-		1.278	Continuing	Continuing	Continuing
Assured Precision Weapons and Munitions IPT Support	MIPR	Various : Various	6.123	2.341	Dec 2020	2.400	Dec 2021	2.466	Dec 2022	-		2.466	Continuing	Continuing	Continuing
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation Support. (Multiple PEO Sup	MIPR	Various : Various	-	1.500	Dec 2020	5.200	Dec 2021	2.520	Dec 2022	-		2.520	Continuing	Continuing	Continuing
Assured Technologies Engineering Support	MIPR	DEVCOM : Picatinny Arsenal, NJ	2.696	1.100	Dec 2020	2.500	Dec 2021	1.000	Dec 2022	-		1.000	Continuing	Continuing	Continuing
Assured Technologies Engineering Support	MIPR	Communication Electronics	1.471	0.200	Dec 2020	0.400	Dec 2021	0.200	Dec 2022	-		0.200	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions
--	--	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Research, Development and Engineering Center (C5ISR) : Aberdeen Proving Ground, MD													
Assured Technologies Engineering Support	MIPR	Aviation and Missiles Center (AvMC) : Redstone Arsenal, AL	-	-		0.200	Dec 2021	0.200	Dec 2022	-		0.200	Continuing	Continuing	Continuing
Army M-Code Technology Integration and Evaluation Support	MIPR	Various : Various	2.421	3.500	Dec 2020	-		-		-		-	0.000	5.921	-
MGUE Inc2 for JROC-directed PGM Lead Platform Support	MIPR	Combat Capability Development Command Armament Center (CCDC AC) : Picatinny Arsenal, NJ	1.071	1.500	Dec 2020	1.500	Dec 2021	2.687	Dec 2022	-		2.687	Continuing	Continuing	Continuing
Subtotal			17.104	11.416		13.450		10.351		-		10.351	Continuing	Continuing	N/A

Remarks
Support consists of labor, travel and other non-labor costs in Fiscal Year (FY) 2022.

	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	58.252	35.302	42.886	36.465	-	36.465	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>

Event Name	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
Integrated Product Support - Joint Lethality PNT SME WIPT & Pr	[Redacted]																											
W&M Proto & Integration Risk Mitigation - NA2 for Weapons & M	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - NA2 for Guided RAMS	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - Fires SoS APNT relate	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - Next Gen PNT Technologies Phase 1	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - AltNav Technologies P	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - RAMS PGM M-Code Prototyping	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - Munition Deployed NavWar CM	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - PGM Software Defined Receiver Phase 1	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
W&M Proto & Integration Risk Mitigation - PGM Software Defined Receiver Phase 2	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Army APNT (incl M-Code) and NavWar Technology Integration a	[Redacted]																											
MGUE Inc2 for JROC-directed PGM Lead Platform	[Redacted]																											
W&M Proto & Integration Risk Mitigation - Next Gen NavWar Tech Phase 1	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>

Event Name	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
W&M Proto & Integration Risk Mitigation - Fires SoS NavWar MDO Phase 1																												
W&M Proto & Integration Risk Mitigation - Next Gen NavWar CM Tech Phase 1																												
W&M Proto & Integration Risk Mitigation - Fires SoS NavWar MDO Phase 2																												
W&M Proto & Integration Risk Mitigation - Next Gen PNT Technologies Phase 2																												
Accelerate NAVSTORM-M-Integration																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integrated Product Support - Joint Lethality PNT SME WIPT & Program Management	1	2017	4	2028
W&M Proto & Integration Risk Mitigation - APNT FASCAM Replacement	1	2019	4	2020
W&M Proto & Integration Risk Mitigation - NA2 for Weapons & Munitions Phase 2	1	2020	4	2021
W&M Proto & Integration Risk Mitigation - NA2 for Guided RAMS	1	2020	4	2021
W&M Proto & Integration Risk Mitigation - Fires SoS APNT related AS and NavWar	1	2021	4	2022
W&M Proto & Integration Risk Mitigation - Next Gen PNT Technologies Phase 1	1	2022	4	2023
W&M Proto & Integration Risk Mitigation - AltNav Technologies Phase 2	1	2020	4	2021
W&M Proto & Integration Risk Mitigation - Location Azimuth Determinations System	1	2020	4	2020
W&M Proto & Integration Risk Mitigation - RAMS PGM M-Code Prototyping	1	2022	4	2022
W&M Proto & Integration Risk Mitigation - Munition Deployed NavWar CM	1	2022	1	2023
W&M Proto & Integration Risk Mitigation ? PGM Software Defined Receiver Phase 1	1	2022	4	2023
W&M Proto & Integration Risk Mitigation ? PGM Software Defined Receiver Phase 2	1	2024	4	2025
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation	1	2020	4	2028
MGUE Inc2 for JROC-directed PGM Lead Platform	1	2020	4	2027
W&M Proto & Integration Risk Mitigation - Next Gen NavWar Tech Phase 1	1	2024	4	2025
W&M Proto & Integration Risk Mitigation - Fires SoS NavWar MDO Phase 1	1	2025	4	2026
W&M Proto & Integration Risk Mitigation - Next Gen NavWar CM Tech Phase 1	1	2027	4	2028
W&M Proto & Integration Risk Mitigation - Fires SoS NavWar MDO Phase 2	1	2027	4	2028
W&M Proto & Integration Risk Mitigation - Next Gen PNT Technologies Phase 2	1	2027	4	2028
Accelerate NAVSTORM-M-Integration	3	2021	3	2022

Note
Notes:

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>
Positioning, Navigation and Timing (PNT) Subject Matter Expert (SME) Working Integrated Product Team (WIPT) Network Assisted (NA) Assured Positioning, Navigation and Timing (APNT)		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)			
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
FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	38.466	-	-	-	-	-	-	-	-	0.000	38.466
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Cannon-Delivered Area Effects Munitions (C-DAEM) Project will provide United States (U.S). ground forces with the capability to engage area personnel through armored targets, while denying threat forces full operational freedom within the targeted area. An Analysis of Alternatives (AoA) was completed in January 2018 to inform Army acquisition and investment decisions regarding replacement of the current stockpile of 155 millimeter (mm) Dual Purpose Improved Conventional Munitions (DPICM) with Department of Defense (DoD) policy compliant munitions and address anti-armor and extended range capability requirements. The Army validated two materiel solutions for C-DAEM to be pursued in parallel. C-DAEM Armor (Increment 1) will destroy moved and moving infantry fighting vehicles, self-propelled howitzers, and tanks. C-DAEM DPICM Replacement (Increment 2) will destroy personnel to light-skinned vehicles. This Project does not have a Fiscal Year (FY) 2023 budget request.

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

	FY 2021	FY 2022	FY 2023
Title: C-DAEM Armor	38.466	-	-
Description: C-DAEM Armor will destroy infantry fighting vehicles, self-propelled howitzers, and tanks.			
Accomplishments/Planned Programs Subtotals	38.466	-	-

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
• FJ4: Cannon-Delivered Area Effects Munitions (C-DAEM)	20.079	85.997	92.402	-	92.402	86.869	70.359	55.644	56.185	0.000	467.535
• E68603: PROJ, ARTY, 155MM C-DAEM INCREMENT 1	-	-	-	-	-	-	-	-	-		

Remarks

In FY 2021, Project FG1 supports C-DAEM Armor efforts. C-DAEM Armor will transition to Budget Activity 05 PE 0604802A Weapons and Munitions - Eng Dev Project FJ4, Cannon-Delivered Area Effects Munitions (C-DAEM), in FY 2022. In FY 2023, C-DAEM Armor will transition to production. A Procurement of Ammunition, Army (PAA) funding line, Standard Study Number (SSN) E68603, PROJ, ARTY, 155MM C-DAEM INCREMENT 1, is established for this effort.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FG1 / <i>Cannon-Delivered Area Effects Munitions (C-DAEM)</i>

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<p>In FY 2021, the C-DAEM DPICM Replacement effort will transition to BA 05 PE 0604802A Weapons and Munitions - Eng Dev Project FJ4, Cannon-Delivered Area Effects Munitions (C-DAEM). A PAA funding line for C-DAEM DPICM Replacement, SSN E68604, PROJ, ARTY, 155MM C-DAEM INCREMENT 2, will be established in FY 2024 for this effort.</p>											

D. Acquisition Strategy

C-DAEM will employ an evolutionary acquisition approach to efficiently transition the unique ammunition products as they become available. The AoA completed on 31 January 2018 qualified a dramatic enhancement of operational Fires effectiveness, efficiency, and maneuver support when cannon artillery was equipped with a dedicated extended range, anti-armor projectile. The U.S. Government is currently reducing risk by executing prototype testing and evaluation efforts in parallel to decompose the AoA results into selection criteria. C-DAEM will use the selection criteria to sponsor a competitive demonstration for C-DAEM Armor to streamline the acquisition process by leveraging Section 815 of the FY 2016 National Defense Authorization Act (NDAA). C-DAEM will use the Defense Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) to further support the completion of the C-DAEM Armor competitive demonstration phase, in FY 2021, which will inform the Army's cluster munition replacement strategy. Upon completion of the competitive demonstration phase, C-DAEM will proceed to qualification testing of the most promising candidate(s) in accordance with the decisions granted at the Army Requirements Oversight Council (AROC), in April 2018.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	3.090	0.360	Oct 2020	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			3.090	0.360		-		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Armor TMRR Phase	MIPR	DoD Ordnance Technology Consortium (DOTC) : TBD	20.375	31.594	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			20.375	31.594		-		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Armor Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	2.722	5.229	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
Armor Engineering Support	MIPR	Combat Capabilities Development Command Data Analysis Center (CCDC DAC) : Aberdeen, MD	0.106	-		-		-		-		-	0.000	0.106	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)
--	--	--

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Armor Fire Control Software Integration	MIPR	U.S. Army Communications-Electronics Command (CECOM) : Aberdeen, MD	-	0.683	Jan 2021	-		-		-		-	0.000	0.683	-
DPICM Replacement Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	0.250	-		-		-		-		-	0.000	0.250	-
Subtotal			3.078	5.912		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Armor Test Targets	MIPR	Army Test and Evaluation Command (ATEC) - Yuma Proving Grounds : Yuma, AZ	0.694	-		-		-		-		-	0.000	0.694	-
Armor Testing	MIPR	Army Test & Evaluation Command (ATEC) : Yuma, AZ	-	0.600	Apr 2021	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			0.694	0.600		-		-		-		-	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		27.237	38.466	-	-	-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)
--	--	--

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

<u>Remarks</u>	
----------------	--

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FG1 / <i>Cannon-Delivered Area Effects Munitions (C-DAEM)</i>

Event Name	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
BONUS Deliveries (Bridging Strategy)																												
	<i>Bridging Strategy</i>																											
Armor TMRR																												
	<i>TMRR</i>																											
Armor Preliminary Design Review (PDR)	1 ▲ PDR																											
Armor Competitive Demonstration		2 ▲ Demo																										
Armor Milestone B			3 ▲ MS-B																									
Armor Engineering Manufacturing & Development (EMD)																												
					<i>EMD</i>																							
Armor Critical Design Review (CDR)						4 ▲ CDR																						
Armor Milestone C												5 ▲ MS-C																
DPICM Replacement Qualification and Testing																												
	<i>DPICM Replacement Qual & Testing</i>																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FG1 / <i>Cannon-Delivered Area Effects Munitions (C-DAEM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C-DAEM AoA, CDD, MS-A Efforts	1	2018	4	2019
Armor Milestone A	1	2019	1	2019
BONUS Deliveries (Bridging Strategy)	1	2020	4	2022
Armor TMRR	1	2019	4	2021
Armor Preliminary Design Review (PDR)	1	2021	1	2021
Armor Competitive Demonstration	3	2021	3	2021
Armor Milestone B	4	2021	4	2021
Armor Engineering Manufacturing & Development (EMD)	1	2022	4	2024
Armor Critical Design Review (CDR)	2	2022	2	2022
Armor Milestone C	4	2024	4	2024
DPICM Replacement Qualification and Testing	1	2021	4	2023

Note

Cannon-Delivered Area Effects Munitions (C-DAEM) Armor will destroy infantry fighting vehicles, self-propelled howitzers, and tanks. C-DAEM Dual Purposed Improved Conventional Munitions (DPICM) Replacement will destroy personnel to light-skinned vehicles. C-DAEM Armor and DPICM Replacement are being developed simultaneously.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - 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
Total Program Element	-	130.485	164.328	49.944	-	49.944	43.935	23.649	23.617	23.827	0.000	459.785
<i>EV7: Combat Vehicle Prototyping</i>	-	130.485	164.328	49.944	-	49.944	43.935	23.649	23.617	23.827	0.000	459.785

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Next Generation Combat Vehicle (NGCV) Army Modernization Priority. Armored System Modernization Advanced Development provides maturation of emerging Science and Technology (S&T) and industry technologies for potential integration to ground combat vehicles. The purpose of this Program Element's (PE) funding is to demonstrate new capabilities to meet current and future military needs and to determine integration potential across the Army portfolio of ground combat vehicles by testing and evaluating a variety of technologies.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program 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	138.685	170.590	0.000	-	0.000
Current President's Budget	130.485	164.328	49.944	-	49.944
Total Adjustments	-8.200	-6.262	49.944	-	49.944
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.250			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-8.200	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	49.944	-	49.944
• FFRDC Transfer	-	-0.012	-	-	-

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

Project: EV7: *Combat Vehicle Prototyping*

Congressional Add: *Program increase - Advanced Combat Engine*

Congressional Add Subtotals for Project: EV7

	FY 2021	FY 2022
	-	4.000
Congressional Add Subtotals for Project: EV7	-	4.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>
---	---

Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021		FY 2022
	Congressional Add Totals for all Projects	-		4.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>				Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>			
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
<i>EV7: Combat Vehicle Prototyping</i>	-	130.485	164.328	49.944	-	49.944	43.935	23.649	23.617	23.827	0.000	459.785
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Armored System Modernization Advanced Development will continue the maturation of emerging ground combat vehicle capabilities to provide a bridge from S&T investment to application on a vehicle platform, informing requirements through User Evaluations, identification of capability gaps and reduction of integration risks. Maturing emerging technologies like those in Project Convergence will enable ground combat platforms to meet the Army's strategy of fielding key Modernization efforts.

The funding will support virtual and physical concept development, trade studies, technical and operational analyses to assess future concepts and designs. This would also include the support for survivability, lethality and other soldier defined system requirements. In addition, this funding will provide program management, expertise and a business process for the maturation and transition of emerging Science and Technology systems, system integration labs, technology demonstration efforts risk reduction, maturation, testing and assessment, and develop and integrate systems for Ground Combat Systems (GCS) platforms.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.

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

	FY 2021	FY 2022	FY 2023
Title: Government Engineering & Program Management	15.162	8.097	6.226
Description: This effort will support Program Management Office (PMO) support that will cover the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to manage the experimental prototyping projects.			
FY 2022 Plans: This funding will support Government program management that will cover the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to manage the experimental prototyping program as well as the Program Management Office (PMO). This funding will be allocated for the program management support for Advanced Combat Powertrain, Advanced Combat Vehicle Concepts and Studies, Aided Target Recognition (AiTR), MET-D, and Bradley Hybrid Electric Vehicle (BHEV), XM913 and other combat vehicle technology advancement efforts. It will fund the management and support costs of experimental prototyping projects, continued technology maturation, and applicable software and data architecture updates.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>This funding will support Government oversight and project management of planned efforts which will cover government salaries, contractor labor, travel, training, supplies, equipment and facilities costs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from Fiscal Year (FY) 2022 to FY 2023 is due to the conversion of core government project management salaries to Operations and Maintenance, Army (OMA), Sub-Activity Group (SAG) 435, Acquisition Support to Program Executive Office (PEO) Ground Combat Systems (GCS).</p>				
<p>Title: Developmental Engineering</p> <p>Description: Efforts will include the continued development and maturation of advanced technology concepts for ground combat vehicles and related support equipment.</p> <p>FY 2022 Plans: This funding for the Ground Vehicle Systems Center (GVSC) will mature the Advanced Combat Engine (ACE) and the Advanced Combat Transmission (ACT) to be ready for production at the end of FY24. A potential target for this effort is the Optionally Manned Fighting Vehicle (OMFV) and other combat vehicle platforms.</p> <p>This funding continues the work to develop the hybrid electric vehicle based on a Bradley platform. The contractor will build, integrate and test a Bradley with components that make up a Hybrid Electric Vehicle. The benefit to the Warfighter is that this will improve survivability by reducing thermal and acoustic signature, provides acceleration, improves lethality, more onboard power for energy based-capabilities such as High Energy Lasers, improved operational endurance/fuel efficiency to start.</p> <p>Other efforts include but are not limited to Advanced Combat Vehicle Concepts and Studies, Aided Target Recognition (AiTR), MET-D and other combat vehicle technology advancement efforts.</p> <p>FY 2023 Plans: This funding will further refine Advanced Combat Powertrain (ACP) maturation, which is comprised of the Advanced Combat Engine (ACE) and the Advanced Combat Transmission (ACT), to support production by FY24. A potential transition partner for this effort is the Optionally Manned Fighting Vehicle (OMFV), but could be applied to other combat vehicle platforms. Other Developmental Engineering efforts include but are not limited to 2nd Source High Voltage Power Controller, MUM-T, OMT, Combat Vehicle Light-weighting, Project Origin, Data Architecture Efforts and other combat vehicle technology advancement efforts. These advanced development efforts will support performance analysis, trade space analysis, capabilities assessments, and hardware demonstrations to support the emerging technologies to support the Army's Modernization Strategy.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	79.591	23.737

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The decrease from Fiscal Year (FY) 2022 to FY 2023 is due to lower resourcing levels for the Advanced Combat Vehicle Concepts and Studies effort and completion of the MET-D (Phase II), Bradley Hybrid Electric Vehicle and XM913 efforts in FY22.				
<p>Title: Test & Evaluation</p> <p>Description: Test and Evaluation (T&E) activities include contractor and government testing of prototype vehicles and technologies as well as user evaluations. Testing will be conducted using United States Army test facilities.</p> <p>FY 2022 Plans: T&E efforts include but are not limited to: Advanced Combat Vehicle Concepts and Studies, Bradley Hybrid Electric Vehicle, MET-D, Next Generation Fire Control (NGFC) Technologies, Vehicle Protection Technology Demonstrator, XM913 and other emerging combat vehicle technology advancements.</p> <p>FY 2023 Plans: T&E efforts include but are not limited to: Project Origin soldier assessment efforts, Advanced Combat Powertrain Maturation, Combat Vehicle Light-weighting, High Voltage Power Controller, Tank Modernization, MUM-T, OMT, Aided Target Recognition (AiTR), and other emerging combat vehicle technology advancements. To assist in determining future requirements while evaluating maturation level and aid in determination of bridging to S&T efforts above to vehicle platforms.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from Fiscal Year (FY) 2022 to FY 2023 is due to lower resourcing levels for the Advanced Combat Vehicle Concepts and Studies effort and completion of the MET-D (Phase II), Bradley Hybrid Electric Vehicle and XM913 efforts in FY22.</p>		13.364	36.108	8.737
<p>Title: Modeling & Simulation</p> <p>Description: Modeling and simulation efforts will allow for the ability to experiment with various technologies in a virtual environment. Support will include reviewing studies conducted and determining any significant issues, areas of concern or potential differences to aid in decision making. The results will provide the analytical underpinnings to support development of requirements.</p> <p>FY 2022 Plans: Government support needed for MET-D Phase II for platform assessment thru modeling and analysis, conduct trade studies, and the ability to assess the platform in a virtual environments to aide in decision making.</p> <p>FY 2023 Plans: This funding will support Optionally Manned Tank (OMT) and other Combat Vehicle efforts to analyze and assess technologies in a virtual environment to aide in decision making.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		7.407	0.388	0.500

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored System Modernization - Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The increase from Fiscal Year (FY) 2022 to FY 2023 is due to Optionally Manned Tank requirements for supporting crew task analysis, vulnerability analysis, operational effectiveness modeling, performance and trade space analysis.				
<p>Title: Experimental Prototyping</p> <p>Description: Experimental prototyping allows for maturation of emerging S&T and industry technologies to inform requirements, identify mitigations for capability gaps and reduce technology integration and program risks for emerging technologies. The funding will support prototyping for XM913, Advanced Combat Powertrain, Advanced Combat Vehicle Concepts and Studies, Advanced Lightweight Track, High Voltage Power Controller, MET-D Phase II, Vehicle Protection Technology Demonstrator, Project Origin Soldier Operational Experiment Campaign, Data Architecture and Other Technology Advancements.</p> <p>FY 2022 Plans: This funding will support prototype builds for the following technologies: XM913, Advanced Combat Powertrain, Advanced Combat Vehicle Concepts and Studies, Advanced Lightweight Track, High Voltage Power Controller, MET-D Phase II, Vehicle Protection Technology Demonstrator and Other Technology Advancements.</p> <p>FY 2023 Plans: This funding will support prototype design, builds, validation/verification, and maintenance for MUM-T, OMT, Project Origin Soldier Operational Experiment (SOE) Campaign, 2nd Source High Voltage Power Controller and Other Technology Advancement efforts.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from Fiscal Year (FY) 2022 to FY 2023 is due to lower resourcing levels for the Advanced Combat Vehicle Concepts and Studies effort and completion of the MET-D (Phase II) and XM913 efforts in FY22.</p>		31.508	30.291	10.744
<p>Title: Powertrain Maturation</p> <p>Description: This effort will advance the Advanced Combat Engine (ACE) and the Advanced Combat Transmission (ACT) subsystem maturity and reduce engine and transmission cost and manufacturing time. The Ground Vehicle Systems Center (GVSC) will conduct maturation and demonstration activities to expedite technology transition from laboratory to operational use and prepare for low rate initial production of the advanced combat engine and transmission. This effort will conduct the evaluation of reliability, maintainability, and logistical analyses necessary to transition to a vehicle platform and conduct maturation to the components as a result of these evaluations. The ACE may increase Power Density, increase efficiency (> 48%), and decrease heat rejection (> 20%). The ACT will have advanced Multi-Speed Transmissions and be adaptable to a wide range of engine input speeds, flexible design configuration and packaging, high efficiency geared steering system and > 90% efficiency in all gears.</p>		4.000	-	-
Title: Other support & technology costs		59.044	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Description: This effort from the Ground Vehicle Systems Center is to support the Optionally Manned Tank and various technology sprints or advancements.			
Title: SBIR/STTR Transfer	-	5.853	-
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	130.485	160.328	49.944

	FY 2021	FY 2022
Congressional Add: Program increase - Advanced Combat Engine	-	4.000
FY 2022 Plans: This effort improves engine subsystem designs, optimizes performance, and funds engine units for vehicle demonstration.		
Congressional Adds Subtotals	-	4.000

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

N/A

Remarks

D. Acquisition Strategy

These level of efforts provide the focused investment for the development and demonstration of technology and prototyping for future combat vehicles in the battlefield. The intent of this funding is to mature the next generation of technology which will enable demonstration of capabilities developed in the S&T portfolio to meet emerging military needs across the current Army portfolio of ground vehicles.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		5.853		-		-		-	0.000	5.853	-
Subtotal			-	-		5.853		-		-		-	0.000	5.853	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGCV Contract(s)	C/Various	Various : Various	81.508	-		-		-		-		-	0.000	81.508	-
Prototyping with Industry	C/Various	Various : Various	95.019	-		-		-		-		-	0.000	95.019	-
Powertrain Maturation	Various	Various : Various	0.908	4.000	Jul 2021	-		-		-		-	Continuing	Continuing	Continuing
Other support & technology costs	Various	Various : Various	-	59.044	Jul 2021	-		-		-		-	Continuing	Continuing	Continuing
Experimental Prototyping	Various	Various : Various	-	31.508	Jul 2021	30.291	Jun 2022	10.744	Jun 2023	-		10.744	Continuing	Continuing	Continuing
Developmental Engineering	Various	Various : Various	-	-		79.591	Jun 2022	23.737		-		23.737	0.000	103.328	-
Program increase - Advanced Combat Engine	Various	Various : Various	-	-		4.000	Jun 2022	-		-		-	0.000	4.000	-
Subtotal			177.435	94.552		113.882		34.481		-		34.481	Continuing	Continuing	N/A

Remarks
 Program decrease experimental prototyping costs by \$15,464K in FY21.
 Congressional add \$8,200K for Next Generation Electrified Transmission in FY21.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	PM/PEO : Warren, MI	40.698	15.162	Jan 2021	8.097	Jan 2022	6.226	Jan 2023	-		6.226	Continuing	Continuing	Continuing
Subtotal			40.698	15.162		8.097		6.226		-		6.226	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Modeling & Simulation	MIPR	Various : Various	8.102	7.407		0.388		0.500		-		0.500	Continuing	Continuing	Continuing
Test & Evaluation	MIPR	Various : Various	9.388	13.364		36.108		8.737		-		8.737	Continuing	Continuing	-
Subtotal			17.490	20.771		36.496		9.237		-		9.237	Continuing	Continuing	N/A
Project Cost Totals			235.623	130.485		164.328		49.944		-		49.944	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping

Event Name	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
MET-D Phase 2 Build	[Redacted]																											
MET-D Phase 2 Testing					[Redacted]																							
MET-D Phase 2 Soldier Operational Evaluation (SOE)									3 SOE																			
MET-D Phase 2 Project Finish									5 MET-D Phase 2 Project Finish																			
XM913 Weapon Improvements and TDP Development	[Redacted]				[Redacted]				[Redacted]																			
XM913 Subscale Muzzle Brake Erosion Test (30mm)					[Redacted]																							
XM913 Environmental Testing					[Redacted]																							
Bradley Hybrid Electric Vehicle (BHEV) Development	[Redacted]				[Redacted]																							
Bradley Hybrid Electric Vehicle Prototype Build/Integration					[Redacted]																							
Bradley Hybrid Electric Vehicle APG Test									[Redacted]																			
Bradley Hybrid Electric Vehicle YPG Test									[Redacted]																			
Bradley Hybrid Electric Vehicle Transition Decision									6 Bradley Hybrid Electric Vehicle Transition Decision																			
Advanced Combat Vehicle Concepts and Studies	[Redacted]				[Redacted]				[Redacted]																			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping

Event Name	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
Advanced Lightweight Track (ALWT) Development																												
Advanced Lightweight Track (ALWT) Validation Testing																												
SPHS Lightweighting Prototype Development																												
SPHS Lightweighting Testing																												
High Voltage Power Controller (HVPC) Prototype																												
High Voltage Power Controller (HVPC) Testing																												
High Voltage Power Controller (HVPC) 2nd Source Development																												
High Voltage Power Controller 2nd Source Prototype Build																												
High Voltage Power Controller 2nd Source Test																												
High Voltage Power Controller 2nd Source Transition Decision																												
Advanced Combat Powertrain Production Design Mechanical Verification																												
Advanced Combat Powertrain Refinement																												
Advanced Combat Powertrain Design Refinement Build																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping

Event Name	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
Advanced Combat Powertrain Field Test Support and FACAR Review																												
Advanced Combat Powertrain Design Validation Plan																												
Advanced Combat Powertrain Design CAD																												
Advanced Combat Powertrain Field Test																												
Abrams Lightweight Running Gear Casting Prototype																												
Abrams Lightweight Running Gear Lab Prototype																												
Abrams Lightweight Running Gear Vehicle Prototype Set																												
MUM-T Manned Control Vehicles (MCV) Development																												
MUM-T Manned Control Vehicles (MCV) Prototypes																												
MUM-T Manned Control Vehicles (MCV) Test																												
MUM-T - Protected Comms (PCM) C5ISR Modular Open Suite of Standards (CMOSS)																												
MUM-T - Protected Comms (PCM) CMOSS Prototypes Build																												
MUM-T - Protected Comms (PCM) CMOSS Prototypes Test																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping	

Event Name	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
Stryker Energy Attenuating (EA) Seat Development					Stryker EA Seat Development																							
Stryker Energy Attenuating (EA) Seat Hardware Evaluation													Stryker EA Seat Hardware Evaluation															
Stryker Energy Attenuating (EA) Seat Transition Decision													10 Stryker EA Seat Down Select															
AMERCA-M Prototype Build									AMERCA-M Prototype Build																			
AMERCA-M Design									AMERCA-M Design																			
AMERCA-M Track and Suspension CDR									1 AMERCA-M Track and suspension CDR																			
AMERCA-M Powertrain CDR									2 AMERCA-M Powertrain CDR																			
AMERCA-M Build Complete													7 AMERCA-M Build Complete															
AMERCA-M Dynamometer Testing													AMERCA-M Dynamometer Testing															
AMERCA-M Test Site T&E																	AMERCA-M Test Site T&E											
Tank Modernization Design					Tank Modernization Design																							
Tank Modernization Build									Tank Modernization Build																			
Tank Modernization Test													Tank Modernization Test															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping	

Event Name	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
Soft Kill System Advancements - Countermeasure Development																												
Soft Kill System Advancements - Countermeasure Prototype Build																												
Soft Kill System Advancements - Countermeasure Test																												
Soft Kill System Advancements - Countermeasure Techniques Test																												
Soft Kill System Advancements - Countermeasure Transition Decision																												
Optionally Manned Tank (OMT) Development/Design/Modeling																												
Optionally Manned Tank (OMT) Build																												
Optionally Manned Tank (OMT) Soldier Touch Point																												
Optionally Manned Tank (OMT) Experiment																												
AiTR Phase II SW & Algorithm Improvements																												
AiTR Phase II Test																												
AiTR Phase II Data Collection																												
AiTR Phase II Algorithm Improvement																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping	

Event Name	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
AiTR Phase II Test 2					[Redacted]																							
AiTR Phase III 3GF Test & Evaluation					[Redacted]																							
Data Architecture Library					[Redacted]																							
Data Architecture Model					[Redacted]																							
Project Origin Soldier Experiments					[Redacted]																							

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MET-D Phase 2 Build	2	2020	2	2021
MET-D Phase 2 Testing	4	2021	3	2022
MET-D Phase 2 Soldier Operational Evaluation (SOE)	4	2022	4	2022
MET-D Phase 2 Project Finish	1	2023	1	2023
XM913 Weapon Improvements and TDP Development	4	2020	1	2023
XM913 Subscale Muzzle Brake Erosion Test (30mm)	3	2021	4	2021
XM913 Environmental Testing	1	2022	3	2022
Bradley Hybrid Electric Vehicle (BHEV) Development	3	2020	3	2022
Bradley Hybrid Electric Vehicle Prototype Build/Integration	4	2021	1	2022
Bradley Hybrid Electric Vehicle APG Test	3	2022	1	2023
Bradley Hybrid Electric Vehicle YPG Test	4	2022	1	2023
Bradley Hybrid Electric Vehicle Transition Decision	1	2023	1	2023
Advanced Combat Vehicle Concepts and Studies	2	2021	3	2023
Advanced Lightweight Track (ALWT) Development	4	2021	4	2022
Advanced Lightweight Track (ALWT) Validation Testing	3	2021	4	2021
SPHS Lightweighting Prototype Development	1	2022	3	2022
SPHS Lightweighting Testing	4	2022	4	2023
High Voltage Power Controller (HVPC) Prototype	2	2021	3	2022
High Voltage Power Controller (HVPC) Testing	3	2022	3	2023
High Voltage Power Controller (HVPC) 2nd Source Development	1	2023	4	2023
High Voltage Power Controller 2nd Source Prototype Build	4	2023	4	2023
High Voltage Power Controller 2nd Source Test	1	2024	2	2024

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
High Voltage Power Controller 2nd Source Transition Decision	2	2024	2	2024
Advanced Combat Powertrain Production Design Mechanical Verification	4	2021	1	2022
Advanced Combat Powertrain Refinement	4	2021	2	2022
Advanced Combat Powertrain Design Refinement Build	2	2022	4	2022
Advanced Combat Powertrain Field Test Support and FACAR Review	3	2022	4	2022
Advanced Combat Powertrain Design Validation Plan	4	2022	2	2023
Advanced Combat Powertrain Design CAD	2	2023	3	2023
Advanced Combat Powertrain Field Test	2	2023	2	2024
Abrams Lightweight Running Gear Casting Prototype	1	2023	3	2023
Abrams Lightweight Running Gear Lab Prototype	1	2024	2	2024
Abrams Lightweight Running Gear Vehicle Prototype Set	3	2024	1	2025
MUM-T Manned Control Vehicles (MCV) Development	2	2022	2	2024
MUM-T Manned Control Vehicles (MCV) Prototypes	3	2022	3	2024
MUM-T Manned Control Vehicles (MCV) Test	4	2022	2	2023
MUM-T- Protected Comms (PCM) C5ISR Modular Open Suite of Standards (CMOSS) Dev	1	2022	3	2022
MUM-T - Protected Comms (PCM) CMOSS Prototypes Build	2	2022	3	2022
MUM-T - Protected Comms (PCM) CMOSS Prototypes Test	4	2022	4	2022
Stryker Energy Attenuating (EA) Seat Development	1	2022	3	2023
Stryker Energy Attenuating (EA) Seat Hardware Evaluation	2	2023	2	2023
Stryker Energy Attenuating (EA) Seat Transition Decision	3	2023	3	2023
AMERCA-M Prototype Build	3	2022	1	2023
AMERCA-M Design	3	2022	4	2022
AMERCA-M Track and Suspension CDR	3	2022	3	2022
AMERCA-M Powertrain CDR	3	2022	3	2022
AMERCA-M Build Complete	1	2023	1	2023

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored System Modernization - Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
AMERCA-M Dynamometer Testing	1	2023	3	2023
AMERCA-M Test Site T&E	2	2023	4	2023
Tank Modernization Design	1	2021	2	2022
Tank Modernization Build	2	2022	4	2022
Tank Modernization Test	1	2023	4	2023
Soft Kill System Advancements - Countermeasure Development	4	2021	4	2022
Soft Kill System Advancements - Countermeasure Prototype Build	4	2021	2	2022
Soft Kill System Advancements - Countermeasure Test	3	2022	3	2022
Soft Kill System Advancements - Countermeasure Techniques Test	4	2022	4	2022
Soft Kill System Advancements - Countermeasure Transition Decision	4	2022	4	2022
Optionally Manned Tank (OMT) Development/Design/Modeling	4	2021	2	2023
Optionally Manned Tank (OMT) Build	2	2022	2	2023
Optionally Manned Tank (OMT) Soldier Touch Point	2	2023	2	2023
Optionally Manned Tank (OMT) Experiment	3	2023	3	2023
AiTR Phase II SW & Algorithm Improvements	4	2020	2	2021
AiTR Phase II Test	1	2022	2	2022
AiTR Phase II Data Collection	2	2022	2	2022
AiTR Phase II Algorithm Improvement	2	2022	2	2022
AiTR Phase II Test 2	3	2022	4	2022
AiTR Phase III 3GF Test & Evaluation	1	2023	3	2023
Data Architecture Library	1	2022	1	2023
Data Architecture Model	2	2022	4	2022
Project Origin Soldier Experiments	2	2022	4	2026

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>
---	--

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	-	5.312	2.897	4.060	-	4.060	3.625	4.237	4.239	4.280	0.000	28.650
610: <i>Food Adv Development</i>	-	3.028	2.897	4.060	-	4.060	3.625	4.237	4.239	4.280	0.000	26.366
C08: <i>Rapid Equipping Force</i>	-	2.284	-	-	-	-	-	-	-	-	0.000	2.284

A. Mission Description and Budget Item Justification

This Program Element (PE) supports component development and prototyping for organizational equipment, improved individual clothing and equipment that enhance Soldier battlefield effectiveness, survivability, and sustainment. This PE also supports the component development and prototyping of joint service food and combat feeding equipment designed to reduce logistics burden.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	5.712	2.897	0.000	-	0.000
Current President's Budget	5.312	2.897	4.060	-	4.060
Total Adjustments	-0.400	0.000	4.060	-	4.060
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.400	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.060	-	4.060

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>				Project (Number/Name) 610 / <i>Food Adv Development</i>			
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
610: <i>Food Adv Development</i>	-	3.028	2.897	4.060	-	4.060	3.625	4.237	4.239	4.280	0.000	26.366
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides for the advanced component development and prototyping of Joint Service combat ration components/platforms and field feeding equipment designed to improve warfighter performance and reduce the logistics burden of subsistence support. Efforts funded in this Project support all four Services, the Special Operations Command, and the Defense Logistics Agency. The Army serves as the Executive Agent for this Department of Defense (DoD) program, with oversight and coordination provided by the DoD Combat Feeding Research and Engineering Board as required by DoD Directive (DoDD) 3235.02E. Centralized execution of the DoD Combat Feeding Research and Engineering Program (CFREP) with Joint Service review and approval eliminates unnecessary duplication of efforts across the Services and maximizes use of common materiel solutions. Prototypes validated within this effort transition to 0604713A/Project 548 for System Development and Demonstration.

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

	FY 2021	FY 2022	FY 2023
Title: Joint Service Combat Ration Advanced Development	1.636	1.507	2.192
Description: This effort matures and integrates combat ration technologies and prototypes that enable warfighter maneuver, readiness and effectiveness during highly mobile, dispersed operations. Technologies are transitioned from RDTE Budget Activity 3 projects to provide individual and group combat rations and components with improved capabilities including improved warfighter physical and cognitive performance through optimized nutrition and a reduced logistics burden through weight and cube reduction.			
FY 2022 Plans: Will continue to validate and integrate S&T innovations and COTS/NDI candidate items into existing ration platforms to increase operational effectiveness; will conduct T&E of technologies for integration into 2nd iteration of the Close Combat Assault Ration (CCAR) as well as prototype EGRs to decrease the logistics burden and enable group feeding in austere environments; will conduct T&E of non-destructive sampling technologies to meet DHA Veterinary Services requirements for rapid detection of contaminants in food; and transition validated prototypes to PE 0604713A/Project 548 for operational testing and evaluation			
FY 2023 Plans: Will validate and integrate S&T ration packaging material innovations to enhance ration heating efficiency during heating and sterilization processing methods; validate and integrate calorically dense, low weight and volume products into existing ration platforms to increase operational effectiveness; Will conduct T&E of technologies for integration into the next generation of CCAR. Will conduct T&E of packaging prototypes and nutritionally optimized products to enable safe feeding capabilities in hazardous environments. Will transition validated prototypes to APE 0604713A/Project 548 for operational testing and evaluation (OT&E).			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Increase to support changes to validate and integrate ration packaging material innovations into Joint Services combat rations.				
Title: Joint Service Field Feeding Equipment and Menu Development		1.392	1.284	1.868
Description: This effort matures and integrates field feeding equipment technologies and prototypes in support of the Navy, Air Force, and Marine Corps that reduce the logistics burden, improve efficiency, and decrease operation and support costs as directed by the DoD CFREB. This effort also conducts test and evaluation (T&E) on Navy Standard Core Menu components and preparation techniques to enhance efficiency through standardization across the fleet and reduce labor requirements.				
FY 2022 Plans: Will continue T&E of energy conservation and other self-diagnostic technologies for USAF BEAR and other field kitchens; will continue T&E of upgrades to or new developments for Expeditionary Field Kitchens (EFKs) for use by deployed units in austere environments; will continue to conduct T&E of new products and food preparation techniques to enhance menu acceptance and reduce labor requirements; and will transition prototypes to PE 0604713A/Project 548 for OT&E.				
FY 2023 Plans: Will conduct T&E of USAF Basic Expeditionary Airfield Resources (BEAR) field kitchens to evaluate water and power requirements; will conduct T&E of wing wall kits and refrigeration prototypes for Expeditionary Field Kitchens (EFKs) for use by deployed units in austere environments; will conduct T&E of multi-capability food service equipment prototypes for USAF Joint Air-Containerized Kitchen Systems (JACKS) to reduce power and maintenance resources/costs; will continue to conduct T&E of bakery products and preparation techniques to enhance menu acceptance and reduce labor requirements; and will transition prototypes to APE 0604713A/Project 548 for OT&E.				
FY 2022 to FY 2023 Increase/Decrease Statement: Increase to support changes to T&E of food service equipment for Joint Service field feeding kitchens.				
Title: FY22 SBIR/STTR Transfer		-	0.106	-
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		3.028	2.897	4.060

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 548: <i>Mil Subsistence Sys</i>	2.734	1.658	1.566	-	1.566	2.270	1.652	1.653	1.669	0.000	13.202

Remarks

D. Acquisition Strategy

Validated prototypes will transition to System Development and Demonstration for operational test and evaluation.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Combat Feeding Program Management	Allot	CCDC Soldier Center, Natick, MA : Natick, MA	7.779	0.319	Oct 2020	0.333	Oct 2021	0.466	Oct 2022	-		0.466	Continuing	Continuing	Continuing
DLA Bill Pay (ABO Placeholder)	TBD	Various : Various	2.136	-		-		-		-		-	0.000	2.136	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.106	Mar 2022	-		-		-	0.000	0.106	-
Subtotal			9.915	0.319		0.439		0.466		-		0.466	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Joint Service Rations and Combat Feeding Equipment	Various	Various : Various	41.837	2.427	Oct 2020	2.167	Oct 2021	3.186	Oct 2022	-		3.186	Continuing	Continuing	Continuing
Subtotal			41.837	2.427		2.167		3.186		-		3.186	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Joint Service Rations and Combat Feeding Equipment	Allot	CCDC Soldier Center, Natick, MA : Natick, MA	1.289	0.282	Oct 2020	0.291	Oct 2021	0.408	Oct 2022	-		0.408	Continuing	Continuing	Continuing
Subtotal			1.289	0.282		0.291		0.408		-		0.408	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			53.041	3.028	2.897	4.060	-	4.060	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>	

Event Name	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
Evaluate individual and group ration enhancements and transition to TDPs																												
Conduct in-house T&E of OPRATS with improved lipid quality & transition to TDPs																												
Conduct in-house T&E of EGR and transition to SDD for OT&E																												
Conduct I-H T&E of non-destructive sampling technologies for food																												
Conduct in-house T&E of optimized CCAR and transition to SDD for OT&E																												
Provide USN w/CPI, evaluations and menu development to support																												
ID and evaluate advanced galley/scullery equipment for the USMC																												
Conduct T&E of Galley/Scullery equipment and transition to SDD																												
Conduct in-house T&E of energy conservation technologies for BEAR Kitchens																												
Conduct in-house T&E of EFK upgrades for USMC																												
Conduct in-house T&E of expeditionary kitchen systems for shore																												
Conduct T&E of food service equipment systems for USAF JACKS																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Evaluate individual and group ration enhancements and transition to SDD for OT&E	1	2017	4	2026
Conduct in-house T&E of CCAR and transition to SDD for OT&E	1	2019	4	2020
Conduct in-house T&E of optimized MRE and FSR w/ candidate CCAR components	1	2020	4	2020
Conduct in-house T&E of OPRATS with improved lipid quality & transition to TDPs	1	2022	4	2022
Conduct in-house T&E of EGR and transition to SDD for OT&E	1	2020	4	2022
Conduct I-H T&E of non-destructive sampling technologies for food contamination	1	2021	4	2022
Conduct in-house T&E of optimized CCAR and transition to SDD for OT&E	1	2024	4	2026
Provide USN w/CPI, evaluations and menu development to support NSCM upgrades	1	2017	4	2026
ID and evaluate advanced galley/scullery equipment for the USN	1	2017	4	2021
Conduct T&E of Galley/Scullery equipment and transition to SDD for OT&E	1	2017	4	2021
Conduct in-house T&E of JIMKE intuitive equipment and transition to SDD for OT&E	2	2019	4	2020
Conduct T&E on rapidly deployable refrigeration prototype	1	2020	4	2020
Conduct in-house T&E of mobile feeding galley and transition to SDD for OT&E	1	2019	1	2020
Award contract to fabricate IRefS prototype and conduct in-house T&E	1	2019	4	2020
Conduct in-house T&E of energy conservation technologies for BEAR Kitchens	1	2023	4	2024
Conduct in-house T&E of EFK upgrades for USMC	1	2022	4	2024
Conduct in-house T&E of expeditionary kitchen systems for shore-based Navy units	1	2020	4	2021
Conduct T&E of food service equipment systems for USAF JACKS	1	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
--	--	--

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
<i>C08: Rapid Equipping Force</i>	-	2.284	-	-	-	-	-	-	-	-	0.000	2.284
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Equipment mix and configuration may change based on changes in operational environment and circumstances.

A. Mission Description and Budget Item Justification

The REF has no FY22 RDTE funding request due to closure and discontinuation at the end of FY21, dated 30 Sep 2020, subject: HQDA EXORD 233-20 Discontinuation of the Rapid Equipping Force.

The REF is the Army's Quick Reaction Capability (QRC) with the ability to acquire, integrate and sustain Commercial-Off-The Shelf (COTS), Government Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and Non-Standard Equipment (NSE) solutions to meet urgent combat requirements for globally employed forces. It inserts selected future force technologies, capabilities, and surrogate materiel solutions into deployed, deploying, select-prepared to deploy, and transformational forces for operational evaluation, assessment, and evolutionary development. The REF assesses the provided capabilities to improve future solutions to inform materiel development for the future Army capability requirements and to potentially transition the capability to an Army acquisition program.

The REF is an enduring organization (Base funded) per Memorandum, Under Secretary of the Army, 30 Jan 2014, subject: Implementation Plan for Stabilization of the Rapid Equipping Force (REF).

The REF bridges the gap between the Army's traditional acquisition process and immediate equipping needs. The REF pursues tangible solutions that can be equipped rapidly with a goal of 180 days. The REF focuses on finding immediate and effective game-changing capabilities to increase Soldier Readiness, effectiveness, protection, and lethality in any operational environment. The REF 10-Liner process provides the ability to react quickly to an ever-changing enemy who changes in days and months, not years in a complex world. The REF coordinates with the Combatant Command (COCOMs) and Army Service Component Command (ASCCs) in theater to fully understand their urgent needs, for which the REF acquisition capability may identify, procure, deliver, and sustain solutions to the deployed units. Although the REF works directly with Operational Commanders at all levels, it focuses on Brigade level and below to equip solutions to identified capability gaps.

The Army Acquisition Executive designated Program Executive Office (PEO) Soldier as the Milestone Decision Authority (MDA) to institutionalize the acquisition authorities in support of the REF and to provide proper acquisition oversight while enhancing visibility of these efforts. The MDA will ensure flexibility and speed focused on the Soldier's needs serviced by the dedicated REF Program Management Office (PMO). This establishes a formal acquisition reporting chain that leverages existing reporting venues to ensure appropriate Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT)) visibility, oversight, and direction.

The REF capabilities cross all Warfighter Functions:

1. Mission Command

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
--	--	--

- 2. Movement and Maneuver
- 3. Intelligence
- 4. Fires
- 5. Sustainment
- 6. Protection

The RDT&E funding also provides the REF the flexibility to invest in near-term, and innovative solutions. RDT&E funds are necessary in the majority of all REF projects. Most importantly, REF requires RDT&E funds to conduct safety certification (testing) for non-standard equipment before it is equipped to the Soldier. This critical requirement exists to ensure that REF-provided equipment is safe for Soldiers to use and that any risks are identified and documented. The REF also requires RDT&E funds to integrate several different COTS/GOTS and NDI technologies into one capability that solves the tougher and more complex problems.

The REF requires RDT&E funds to modify, test, and evaluate existing technologies that were developed for one purpose, however may be suitable to solve another problem. REF will also fund deliberate projects in support of technology-solution-scouting to meet anticipated Army needs and to mitigate operational gaps. These efforts measure and identify current technologies, and provide information to better inform Army Training and Doctrine Command (TRADOC) and other communities of interest, with the intent of enlightening future Army requirements. Example efforts that may require RDTE include the following projects: Tactical Satellite Communications (SATCOM) and communications systems; tactical and small Combat Out Post/Forward Operating Base (COP/FOB) Intelligence, Surveillance, and Reconnaissance (ISR) and Force Protection systems; Counter Unmanned Aerial Systems (CUAS); Electronic Warfare (EW) systems; Non-Tactical Vehicles (NTV); Persistent Duration UAS, and Subterranean (SubT) Operations.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Rapid Equipping Force	2.284	-	-
Description: Funding is provided for the following effort.			
Accomplishments/Planned Programs Subtotals	2.284	-	-

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
• M80101: <i>Rapid Equipping Soldier Support Equipment</i>	0.077	-	0.000	-	0.000	-	-	-	-	0.000	0.077

Remarks

The REF has no FY22 OPA funding request due to closure and discontinuation at the end of FY21, dated 30 Sep 2020, subject: HQDA EXORD 233-20 Discontinuation of the Rapid Equipping Force.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>

D. Acquisition Strategy

The Rapid Equipping Force (REF) harnesses current and emerging technologies to provide rapid solutions to the urgently required capabilities of U.S. Army Forces employed globally. The REF focus is on rapidly placing capabilities into Soldiers' hands. This mission is accomplished in one of two ways: 1) rapidly adapting COTS/ GOTS/NDI equipment to meet operational needs, and 2) utilizing emerging deployable capabilities via interaction with research and development organizations and academia. All capabilities are safety tested prior to insertion into operational environments. Training and sustainment are provided for every capability until it is transitioned to an approved acquisition program or terminated through an approved Army process. Operational assessments are conducted to provide feedback in support of Army requirements generation and future capability development. REF capabilities routinely serve as a bridge to specific Operational Needs Statement, Joint Urgent Operational Need Statement and Joint Emergent Operational Needs Statement (ONS, JUONS, and JEONS) gaps to meet urgent operational requirements.

The REF has no FY22 RDTE funding request due to closure and discontinuation at the end of FY21, dated 30 Sep 2020, subject: HQDA EXORD 233-20 Discontinuation of the Rapid Equipping Force.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	0.126	-		-		-		-		-	0.000	0.126	-
Subtotal			0.126	-		-		-		-		-	0.000	0.126	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mission Command	C/FFP	Various : Various	0.226	0.010		-		-		-		-	0.000	0.236	-
Movement and Maneuver	C/FFP	Various : Various	0.468	0.030		-		-		-		-	0.000	0.498	-
Intelligence	C/FFP	Various : Various	0.497	0.050		-		-		-		-	0.000	0.547	-
Fires	C/FFP	Various : Various	0.018	0.005		-		-		-		-	0.000	0.023	-
Sustainment	C/FFP	Various : Various	0.304	0.011		-		-		-		-	0.000	0.315	-
Protection	C/FFP	Various : Various	0.763	0.071		-		-		-		-	0.000	0.834	-
Dismounted Improvised Explosive Device (IED) Defeat	C/FFP	Various : Various	2.889	-		-		-		-		-	Continuing	Continuing	Continuing
Dismounted Operations Support	C/FFP	Various : Various	4.796	-		-		-		-		-	Continuing	Continuing	Continuing
Intelligence, Surveillance, and Reconnaissance (ISR) Shortfalls in Environmentally Inhospitable OEs	C/FFP	Various : Various	5.951	-		-		-		-		-	Continuing	Continuing	Continuing
Small Combat Outpost (COP) / Patrol Base (PB) Force Protection and Sustainment	C/FFP	Various : Various	3.738	-		-		-		-		-	Continuing	Continuing	Continuing
Other-REF RIPL Priorities (5-10)	C/FFP	Various : Various	8.778	-		-		-		-		-	Continuing	Continuing	-
Other	C/FFP	Various : Various	2.208	-		-		-		-		-	0.000	2.208	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Base: Various Projects-Protect the Force in Counter Insurgency	C/FFP	Various : Various	11.841	-		-		-		-		-	0.000	11.841	-
Small Combat Outpost (COP)/Patrol Base (PB) Sustainment	C/FFP	Various : Various	1.506	-		-		-		-		-	0.000	1.506	-
Base: Various Projects-Enhance Intelligence Surveillance Recon	C/FFP	Various : Various	9.009	-		-		-		-		-	0.000	9.009	-
Small Combat Outpost (COP)/Patrol Base (PB) Force Protection	C/FFP	Various : Various	2.093	-		-		-		-		-	0.000	2.093	-
Dismounted Blue Force Tracking and Mission Command	C/FFP	Various : Various	0.528	-		-		-		-		-	0.000	0.528	-
Base: Various Projects-Logistics/Medical in Counterinsurgency Ops	C/FFP	Various : Various	1.639	-		-		-		-		-	0.000	1.639	-
Base: Various Projects-Timeliness of Analysis and Information Dissemination	C/FFP	Various : Various	6.961	-		-		-		-		-	0.000	6.961	-
Congressional Add-Squad Mission Support System (SMSS)	C/FFP	Various : Various	1.600	-		-		-		-		-	0.000	1.600	-
SSTR/Economic Assumptions/FFRDC and SBIR	C/FFP	Various : Various	1.090	-		-		-		-		-	0.000	1.090	-
OCO: Rapid Equipping Force	C/FFP	Various : Various	19.190	-		-		-		-		-	0.000	19.190	-
Subtotal			86.093	0.177		-		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>

Event Name	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
Rapid Equipping Force	[Redacted]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Rapid Equipping Force	2	2021	4	2024

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>
---	--

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	-	182.400	113.365	72.314	-	72.314	64.799	37.048	36.646	37.072	Continuing	Continuing
907: <i>Tactical Exploitation Of National Capabilities</i>	-	182.400	18.264	14.108	-	14.108	15.940	15.991	16.853	17.017	Continuing	Continuing
BX9: <i>Tactical Intel Targeting Access Node Adv Develop</i>	-	-	20.003	22.767	-	22.767	21.313	18.638	17.789	17.962	Continuing	Continuing
CC5: <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>	-	-	75.098	35.439	-	35.439	27.546	2.419	2.004	2.093	Continuing	Continuing

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

TENCAP exploits national capabilities to pace evolving threats in support of operations during conflict and competition. TENCAP systems and technologies provide deep sensing to support commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.). TENCAP systems and technologies support Theater-level fires and effects, TENCAP systems enable integrated Signals Intelligence (SIGINT) / Electronic Warfare (EW) / and Cyberspace operations. TENCAP supports Army modernization priorities including Long Range Precision Fires, Assured Position Navigation and Timing/Space (PNT/S), Future Vertical Lift (FVL), and Air Missile Defense (AMD). In summary, TENCAP is a key enabler to defeating peer competitor Anti-Access / Area-Denial (A2/AD) strategies.

Tactical Exploitation of National Capabilities (TENCAP) accomplishes the Army's Tactical Electronic Surveillance System Advance Development by leveraging National Intelligence Community (IC) capabilities through cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance and Reconnaissance (ISR) technologies/capabilities from the IC into Army systems and architectures. This PE includes three projects:

- 1) TENCAP Core project (907).
- 2) Tactical Intelligence Targeting Access Node (TITAN) (space) Pre-Prototype development project (BX9).
- 3) Low Earth Orbit ISR (LEO ISR) development project (CC5).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	182.400	113.365	0.000	-	0.000
Current President's Budget	182.400	113.365	72.314	-	72.314
Total Adjustments	0.000	0.000	72.314	-	72.314
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	72.314	-	72.314

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY2022 President's Budget request did not include out-year funding.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>			
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
907: <i>Tactical Exploitation Of National Capabilities</i>	-	182.400	18.264	14.108	-	14.108	15.940	15.991	16.853	17.017	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

TENCAP exploits national capabilities to pace evolving threats in support of operations during conflict and competition. TENCAP systems and technologies provide deep sensing to support commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.). TENCAP systems and technologies support Theater-level fires and effects, TENCAP systems enable integrated Signals Intelligence (SIGINT) / Electronic Warfare (EW) / and Cyberspace operations. TENCAP supports Army modernization priorities including Long Range Precision Fires, Assured Position Navigation and Timing/Space (PNT/S), Future Vertical Lift (FVL), and Air Missile Defense (AMD). In summary, TENCAP is a key enabler to defeating peer competitor Anti-Access / Area-Denial (A2/AD) strategies.

The Tactical Exploitation of National Capabilities (TENCAP) office serves as the Army's centralized lead to perform National Intelligence cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance and Reconnaissance (ISR) technologies/capabilities from the National Intelligence Community (IC) into Army systems and architectures.

TENCAP programs perform two vital functions for the Army's Warfighters: (1) ensures assured access to current and future National and Commercial sensors and supporting tactical architectures; and (2) exploits and influences new developments that focus on improving the Analysis and Tasking, Collection, Processing, Exploitation, Dissemination (TCPED) of intelligence data.

FY2023 Base funding in the amount of \$14.108 million provides for systems engineering and collaborative development and prototyping on multiple, validated National Intelligence Community (IC) advanced software and prototype developments that leverage upcoming National IC investments for Army use. This collaborative environment ensures continuous Army interoperability with National IC assets and architectures, exploits advances in commercial imagery and signal technologies, and develops prototypes that directly support the Army Warfighter.

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

	FY 2021	FY 2022	FY 2023
Title: TENCAP Cross-agency Core Engineering activities	10.845	14.729	10.528
Description: Funds cross-agency core engineering activities using organic and matrix engineering subject matter experts (SMEs). By utilizing these SMEs, TENCAP is able to collaborate, develop and exploit emerging multi-intelligence based			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
technologies to satisfy/accelerate Army Intelligence, Surveillance, Reconnaissance (ISR), Mission Command and Force Protection requirements.				
<p>FY 2022 Plans: SMEs will continue to incorporate Army requirements into earliest stages of National developments by ensuring Army access to sensors and multi-intelligence based capabilities, monitoring emerging technologies and systems, exploit advances in commercial imagery, signal technologies, and developing prototypes that improve Army intelligence products.</p> <p>FY 2023 Plans: Continue the Core Army TENCAP Mission, to work with and incorporate Army requirements into the earliest, most cost-effective stages of National developments; ensure Army continued access to sensors and multi-intelligence based capabilities; monitor National Agencies' emerging technologies and systems; exploit advances in commercial imagery and signal technologies; develop prototypes that directly support Army Warfighters.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease due to transition of funds from this effort into TITAN (space) Pre-Prototype development.</p>				
<p>Title: Air Vigilance - Advanced Development</p> <p>Description: Enhanced intelligence, force protection, and indications and warning capabilities under Army TENCAP program to pace the proliferation and rapid advances in threat and technology.</p> <p>FY 2022 Plans: Continues development of advanced signal and software enhancements for Air Vigilance (AV) Army Program of Record that support the programs Capability Drops.</p> <p>FY 2023 Plans: Continue to develop enhanced intelligence, force protection, and indications and warning capabilities under Army TENCAP program, to pace the proliferation and rapid advances in threat and technology.</p>		4.034	2.500	2.500
<p>Title: TENCAP Radio Frequency Exploitation (TRFE)</p> <p>Description: Prototype capability software that informs, influences and enhances Multi-Discipline sensor systems within PEO IEW&S such as Air Vigilance (AV), and Terrestrial Layer System (TLS) by targeting modern digital communications systems employed by near-peer nation state armies. Assists with Joint All-Domain Operations radio Frequency (RF) Characterization for modern communication environments with the intent to synchronize Signal Intelligence (SIGINT), Electronic Warfare, and Cyber operations. Utilizes commercial industry components and architectures to minimize hardware costs, risk and maximizes scalability/modularity.</p>		2.178	1.035	1.080

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: As a follow on to TENCAP Radio Frequency Exploitation (TRFE) prototype, develops the open, government-owned software framework enabling Signal Intelligence (SIGINT), Electronic Warfare and Cyber capabilities.</p> <p>FY 2023 Plans: Collaborate and exploit specific National investments and advances in Signal Intelligence (SIGINT), Electronic Warfare and Cyber capabilities for use and advancement of Army Warfighter capabilities.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase of \$.045 million in FY23 funding is due to inflation.</p>				
<p>Title: Advanced Miniaturized Data Acquisition System(AMDAS)/ AMDAS Dissemination Vehicle (ADV)</p> <p>Description: Continue advanced engineering and development efforts to ensure continued interoperability and effectiveness of Army Corp-level TENCAP subsystems that provide national data to the tactical warfighter via intelligence community partners classified national systems. Will become subsystem to Tactical Intelligence Targeting Access Node (TITAN) prototype.</p>		9.002	-	-
<p>Title: Tactical Intelligence Targeting Access Node (TITAN) Space Prototype System</p> <p>Description: Tactical Intelligence Targeting Access Node (TITAN) (space) pre-prototype system will provide timely assured intelligence for long range precision fires and maneuver in contested and Anti-Access / Area-Denial (A2/AD) environments; Assured access to Space Intelligence, Surveillance, and Recognizance (ISR): National, Army and Commercial; Software Analytics capability to enable the intelligence cycle with increased speed, precision and accuracy Automated/Assisted Sensor-to-Shooter workflows: speed, scalability, accuracy to support Long Range Precision Fires (LRPF) in an A2/AD environment; Modern and consolidated ground station for space and select national commercial theater sensors.</p> <p>TITAN (space) Pre-Prototype funds were realigned to Project BX9 effective FY2022.</p>		30.000	-	-
<p>Title: Multi-Domain Sensing System (MDSS)</p> <p>Description: The Multi Domain Sensor System (MDSS) will provide multiple sensing capabilities by developing and prototyping survivable sensor capabilities on higher altitude platforms that can perform effective stand-off operations. They include Electronic Intelligence (ELINT), Communications Intelligence (COMINT), Synthetic Aperture Radar (SAR), Moving Target Indicator (MTI), Cyber/EW, Air-Launched Effects (ALE) and Aircraft Survivability sensors.</p> <p>MDSS was aligned with its own PE 060403 Project BY9 effective FY2022.</p>		39.625	-	-
<p>Title: Low Earth Orbit Satellite Capability</p>		86.716	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: The Low Earth Orbit (LEO) effort will provide prototyping, development and experimentation of the Tactical Space Layer (TSL) sensors (electro optical, synthetic aperture radar, and radio frequency) which are designed to provide wide-area, responsive, deep-area sensing required for beyond-line-of-sight (BLOS) targeting and force maneuver, significantly reducing Sensor-to-Shooter (S2S) timelines. Follow-on, persistent, prototype tactical sensor capabilities will be integrated with the Army Tactical Intelligence Targeting Access Node (TITAN) ground station, which will provide direct tasking and assured access directly supporting live-fire, S2S demonstrations and assessments.</p> <p>LEO ISR funds were realigned to Project CC5 effective FY2022.</p>			
Accomplishments/Planned Programs Subtotals	182.400	18.264	14.108

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0605766A: <i>National Capabilities Integration (MIP)</i>	7.670	13.454	17.030	-	17.030	15.448	17.291	17.688	17.860	0.000	106.441
• OMA - 122021: <i>Contractor Logistics Support and Other Weapon Support</i>	-	11.360	11.401	-	11.401	11.469	11.513	11.536	11.651	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Army Tactical Exploitation of National Capabilities (TENCAP) Core mission is a Congressionally-mandated and chartered enduring requirement to leverage National Intelligence Community (IC) capabilities useful to the tactical Army. The Army TENCAP acquisition strategy is driven by an annual TENCAP General Officer Steering Group (TGOSG), co-chaired by the Army G-2, Army G-8, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology [ASA (ALT)]. The TGOSG membership includes representatives from the Army G-3, Army G-6, Army Futures Command Intelligence-Capability Development and Integration Directorate, Army Training and Doctrine Command (TRADOC), and the Program Executive Office for Intelligence, Electronic Warfare and Sensors (PEO IEW&S). The TGOSG reviews, validates, prioritizes, and guides Army TENCAP efforts, according to Army and Defense strategy. Based on the TGOSG guidance, Army TENCAP invests BA 6.4 RDTE in IC developments during the more cost-effective advanced development phase to ensure Army requirements are met with minimal redundancy to Army investments. Army TENCAP then uses BA 6.5 RDTE to manage the transition of these advanced development efforts through system development and integration into Army Programs of Record (POR). This strategy ensures these leveraged investments remain viable through multiple budget cycles, significantly increasing successful transition to recipient Army PORs. With acquisition discipline and oversight provided by PEO IEW&S, Army TENCAP executes the TGOSG-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 4	PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	907 / <i>Tactical Exploitation Of National Capabilities</i>

approved efforts through use of multiple contracts and agreements with the military, National Intelligence agencies, labs, industry partners and academia for the full duration required to complete development and transition these national capabilities into enduring Army programs.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TENCAP Intelligence Engineers (SETA)	Option/CPFF	Perspecta : Alexandria, VA	28.846	1.500	Jan 2021	1.500	Jan 2022	1.500	Jan 2023	-		1.500	0.000	33.346	Continuing
TENCAP Intelligence Engineers(Matrix Gov)	MIPR	Army Geospatial Cener (AGC) : Alexandria, VA	10.857	1.200	Jan 2021	1.500	Oct 2022	1.300	Oct 2022	-		1.300	0.000	14.857	-
TENCAP Intelligence Engineers (SETA) for TITAN Space prototype development (in Proj BX9 in FY22)	Option/CPFF	Perspecta : Alexandria, VA	-	1.307	Jan 2021	-		-		-		-	0.000	1.307	-
TENCAP Intelligence Engineers (Matrix Gov) for TITAN Space prototype dev (in Proj BX9 in FY22)	MIPR	Army Geospatial Center (AGC) : Alexandria, VA	-	0.900	Mar 2021	-		-		-		-	0.000	0.900	-
SETA Support MDSS (realigns to PE 0604036A, Proj BY9 in FY22)	C/CPFF	DHPC : Woodbridge, NJ	-	2.169	Mar 2021	-		-		-		-	0.000	2.169	-
SETA Support LEO (realigns to Proj CC5 in FY22)	C/FFP	A-PNT / TENCAP : Multiple locations	-	5.000	Jan 2021	-		-		-		-	0.000	5.000	-
Subtotal			39.703	12.076		3.000		2.800		-		2.800	0.000	57.579	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TENCAP core mission activities	Various	Multiple : Multiple	27.632	5.920	Feb 2021	8.129	Feb 2022	5.494	Feb 2023	-		5.494	0.000	47.175	Continuing
Air Vigilance advanced software development	MIPR	Classified : MIPR	20.217	4.034	Jan 2021	2.500	Jan 2021	1.800	Jan 2023	-		1.800	0.000	28.551	Continuing
AMDAS/ADV (capability transitions to TITAN space Prototype)	MIPR	Classified : MIPR	45.409	8.918	Jan 2021	-		-		-		-	0.000	54.327	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TRFE	MIPR	Classified : MIPR	7.968	2.178	Jan 2021	1.035	Jan 2022	0.850	Jan 2023	-		0.850	0.000	12.031	-
TITAN space Prototype Development (realigns to Proj BX9 in FY22)	C/FFP	Northrup Grumman : Aurora, CO	-	24.102	Jan 2021	-		-		-		-	0.000	24.102	-
MDSS (legacy) Sensor Improvements (LRR) (realigns to PE 0604036A, Proj BY9 in FY22)	SS/FFP	Northrup Grumman : Baltimore, MD	-	9.918	Feb 2021	-		-		-		-	0.000	9.918	-
MDSS SIGINT Demonstration (realigns to PE 0604036A, Proj BY9 in FY22)	C/FFP	L3 Harris and Raytheon : Greenville, TX Sunnyvale, CA	-	4.374	Jun 2021	-		-		-		-	0.000	4.374	-
MDSS SIGINT Prototypes (realigns to PE 0604036A, Proj BY9 in FY22)	C/FFP	L3 Harris and Raytheon : Greenville, TX and Sunnyvale, CA	-	19.116	Nov 2021	-		-		-		-	0.000	19.116	-
LEO Contracts (realigns to Proj CC5 in FY22)	MIPR	Various OTAs and CCDC Organizations : Multiple Locations	-	70.400	Jan 2021	-		-		-		-	0.000	70.400	-
Subtotal			101.226	148.960		11.664		8.144		-		8.144	0.000	269.994	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TENCAP Prgm Mgmt-Dir Gov,travel,etc.	Allot	Army TENCAP : Alexandria, VA	19.889	2.311	Jan 2021	2.500	Jan 2022	1.739	Oct 2022	-		1.739	0.000	26.439	Continuing
TENCAP Secured Facilities and IT support	MIPR	Army Geospatial Center (AGC) : Alexandria, VA	4.077	0.525	Jan 2021	0.700	Jan 2022	1.025	Nov 2022	-		1.025	0.000	6.327	Continuing
TENCAP Prgm Mgmt - TITAN Space prototype	Allot	Army TENCAP : Alexandria, VA	-	1.800	Jan 2021	-		-		-		-	0.000	1.800	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>
--	--	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
development (realigns to Proj BX9 in FY22)															
Prog Mgmt- MDSS (realigns to PE 0604036A, Proj BY9 in FY22)	MIPR	PM SAI : Aberdeen, MD	-	2.226	Mar 2021	-		-		-		-	0.000	2.226	-
LEO Prog Mgmt (realigns to Proj CC5 in FY22)	C/CPFF	T2S, Inc. : Huntsville, AL	-	3.400	Oct 2020	-		-		-		-	0.000	3.400	-
Subtotal			23.966	10.262		3.200		2.764		-		2.764	0.000	40.192	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TENCAP Lab Tests, Exercises, Simulations	MIPR	Multiple : Multiple	2.631	0.400	Jan 2021	0.400	Jan 2022	0.400	Jan 2023	-		0.400	0.000	3.831	Continuing
Test and Exercises - TITAN Space prototype development (realigns to Proj BX9 in FY22)	MIPR	Multiple : Multiple	-	0.880	Jan 2021	-		-		-		-	0.000	0.880	-
LEO Tests (realigns to Proj CC5 in FY22)	MIPR	A-PNT / TENCAP : Multiple Locations	-	8.000	Mar 2021	-		-		-		-	0.000	8.000	-
MDSS Open Architecture	C/CPFF	APG: MD : Multiple Locations	-	1.822	Mar 2021	-		-		-		-	0.000	1.822	-
Subtotal			2.631	11.102		0.400		0.400		-		0.400	0.000	14.533	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		167.526	182.400	18.264	14.108	-	14.108	0.000	382.298	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>

Event Name	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
Core TENCAP Cross-Agency Advanced Development and Engi	Development with Nat Intel Community																											
TGOSG - annual - guides FY23-27 POM	▲ 1																											
TGOSG - annual - guides FY24-28 POM			▲ 2																									
TGOSG - annual - guides FY25-29 POM								▲ 3																				
TGOSG - annual - guides FY26-30 POM												▲ 4																
TGOSG) - annual - guides FY27-31 POM																▲ 5												
TGOSG) - annual - guides FY28-32 POM																												
TGOSG - annual - guides FY29-33 POM																											▲ 7	
TGOSG - annual - guides FY30-34 POM																												▲ 8
Air Vigilance Advanced Development/System prototype efforts	Development with Nat Intel Community																											
Frequency Exploitation development and prototyping efforts	Development with Nat Intel Community																											
MDSS (realigned to PE 0604036A, Proj BY9 in FY22)	Development with Nat Intel Community				Development with Nat Intel Community																							
LEO ISR (realigned to Proj CC5 in FY22)	Development with Nat Intel Community				Development with Nat Intel Community																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Core TENCAP Cross-Agency Advanced Development and Engineering	1	2018	4	2027
TGOSG - annual - guides FY23-27 POM	2	2021	2	2021
TGOSG - annual - guides FY24-28 POM	4	2021	4	2021
TGOSG - annual - guides FY25-29 POM	4	2022	4	2022
TGOSG - annual - guides FY26-30 POM	4	2023	4	2023
TGOSG) - annual - guides FY27-31 POM	4	2024	4	2024
TGOSG) - annual - guides FY28-32 POM	4	2025	4	2025
TGOSG - annual - guides FY29-33 POM	4	2026	4	2026
TGOSG - annual - guides FY30-34 POM	4	2027	4	2027
Air Vigilance Advanced Development/System prototype efforts	3	2013	4	2027
Frequency Exploitation development and prototyping efforts	1	2018	4	2027
MDSS (realigned to PE 0604036A, Proj BY9 in FY22)	1	2021	4	2021
LEO ISR (realigned to Proj CC5 in FY22)	1	2021	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>			
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
BX9: <i>Tactical Intel Targeting Access Node Adv Develop</i>	-	-	20.003	22.767	-	22.767	21.313	18.638	17.789	17.962	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

This project funds development and prototyping of space-to-ground station capabilities to provide timely assured access to National and Commercial Space-Based Intelligence, Surveillance, and Reconnaissance (ISR) sensor data supporting commanders' situational understanding (patterns of life, threat intentions, etc.), indications & warnings (detection of enemy mobilization and hostile activity), and intelligence support to targeting (order of battle, electronic target folders, target detection, Battle Damage Assessment, etc.).

Funding for TITAN Advance Development funding will also prototype software analytic capabilities to increase the speed, precision and accuracy of the intelligence cycle through Automated/Assisted Sensor-to-Shooter (S2S) workflows. These capabilities will be integrated into the TITAN Ground Station Program of Record (POR).

FY2023 base funding in the amount of \$22.767 million provides for the continued development of the Space Ground Component Kit (SGCK). The SGCK is comprised of components utilized in the TITAN (space) Pre-Prototype systems that provide access to space capabilities. The SGCK consists of a small form-factor antenna, Automated Target Recognition tools, and enhanced interoperability with the fires architecture to support Army's #1 priority - LRPF. The SGCK will be integrated into the TITAN POR and will provide, rapid availability of National Reconnaissance Office (NRO) Overhead Systems (NOS) Geospatial Intelligence (GEOINT) and Signal Intelligence (SIGINT) data from Theater, National and Commercial sources.

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

	FY 2021	FY 2022	FY 2023
Title: Tactical Intelligence Targeting Access Node (TITAN) Adv Development Prototype System	-	20.003	22.767
Description: The SGCK, when integrated into the Tactical Intelligence Targeting Access Node (TITAN) POR, will provide the following capability to the Army:			
<ol style="list-style-type: none"> 1. Timely, assured intelligence for Long-Range Precision Fires (LRPF) and maneuver in contested and Anti-Access / Area-Denial (A2/AD) environments. 2. Assured access to ISR sensor data collected at Commercial and National levels. 3. Software analytics capability to enable the intelligence cycle with increased speed, precision, and accuracy. 4. Automated/Assisted S2S workflows with increased speed, scalability, and accuracy. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
5. Modern and consolidated ground station for National and Commercial sensors.			
<p>FY 2022 Plans: Continue the development of the Tactical Intelligence Targeting Access Node (TITAN) (space) Pre-Prototype system SGCK that will provide rapid availability of National Reconnaissance Office (NRO) Overhead Systems (NOS), Geospatial Intelligence (GEOINT), and Signal Intelligence (SIGINT) capabilities. Continue to integrate new emerging Low Earth Orbit (LEO) constellations, improved downlink, ingest and processing of commercial and government remote sensing data. Continue the development and refinement of automated/assisted target recognition along with enhanced interoperability into the fires architecture to support Army's #1 priority, Long Range Precision Fires (LRPF).</p> <p>FY 2023 Plans: Continue development of the SGCK (6.4 RDT&E funds) that will be integrated into the TITAN POR (6.5 RDT&E funds) and will provide rapid availability of National Reconnaissance Office (NRO) Overhead Systems (NOS), Geospatial Intelligence (GEOINT), and Signal Intelligence (SIGINT) capabilities. Funding will also support the continuation of the following related efforts: development and prototyping of emerging sensor analytics in the TITAN Integration Environment (TIE), development and refinement of small form-factor antenna, and development of Automated Target Recognition tools and enhanced interoperability with the fires architecture to support Army's #1 priority - LRPF.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase provides for development and continued compatibility of leveraged technologies from National and commercial overhead advancements for use by Army tactical operations through ground systems, as identified by the Army's Tactical Exploitation of National Capabilities (TENCAP) office and approved by the TENCAP General Officers' Steering Group (TGSOG).</p>			
Accomplishments/Planned Programs Subtotals	-	20.003	22.767

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
• 0605766A: <i>National Capabilities Integration (MIP)</i>	7.670	13.454	17.030	-	17.030	15.448	17.291	17.688	17.860	0.000	106.441

Remarks

D. Acquisition Strategy

The TITAN (space) Pre-Prototype requirement was validated by the TGOSG in April 2019. In order to maximize agility and innovation in acquisition, TENCAP worked with the Defense Innovation Unit (DIU) to establish an Other Transaction Authority (OTA) agreement to develop the TITAN (space) Pre-Prototype and follow-on SGCK capabilities. The TITAN (space) Pre-Prototype will provide a modernized, deployable, ground station capable of rapidly and semi-autonomously tasking, receiving,

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>

processing, exploiting, fusing, and disseminating space-based sensor data to provide networked situational awareness and direct tactical support to Army commanders at echelon. The TITAN (space) Pre-Prototype will reduce Sensor-to-Shooter (S2S) latency to allow timely intelligence support to the commander. The TITAN (space) Pre-Prototype will use an agile acquisition strategy, and will maximize non-proprietary / modular open system architectures (MOSA), to enable easy upgrade of software/firmware, analytics/algorithms, and ingest additional data streams as commercial vendors and national data become available. This OTA was preceded by Soldier touchpoints to inform this acquisition, and Soldier engagement is planned throughout the development and demonstration of the TITAN (space) Pre-Prototype. The capabilities successfully demonstrated in the TITAN (space) Pre-Prototype will be used to develop the SGCK that is integrated into the TITAN POR.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TITAN Engineering Services	MIPR	Army Geospatial Center (AGC) : Alexandria, VA	0.001	-		1.500	Jan 2022	1.500	Jan 2023	-		1.500	0.000	3.001	-
Subtotal			0.001	-		1.500		1.500		-		1.500	0.000	3.001	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TITAN (space) Pre-Prototype Development	C/FFP	Northrup Grumman : Aurora, CA	0.001	-		15.503	Jul 2020	18.102	Nov 2022	-		18.102	0.000	33.606	-
Subtotal			0.001	-		15.503		18.102		-		18.102	0.000	33.606	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TITAN (space) Pre-Prototype Program Management	MIPR	Army TENCAP : Alexandria, VA	0.001	-		2.000	Jan 2022	2.150	Oct 2022	-		2.150	0.000	4.151	-
Subtotal			0.001	-		2.000		2.150		-		2.150	0.000	4.151	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TITAN (space) Pre-Prototype Test and Exercises	MIPR	Multiple : Miltiple	0.001	-		1.000	Jan 2022	1.015	Jan 2023	-		1.015	0.000	2.016	-
Subtotal			0.001	-		1.000		1.015		-		1.015	0.000	2.016	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>				
	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	0.004	-	20.003		22.767	-	22.767	0.000	42.774	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>	

Event Name	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
Risk Reduction w/Legacy Ground Systems	█				█				█				█				█				█							
TITAN (space) Pre-Production Development	█				█				█				█				█				█							
TITAN (space) Pre-Prototype Delivery 1&2	█				▲ 4				█				█				█				█							
Continued advancement for Space capabilities via exercises	█				█				█				█				█				█							
Operational Leave Behind TITAN (space) Pre-Prototype 1 & 2	█				█				█				█				█				█							
National Overhead Systems (NOS) Integration	█				█				█				█				█				█							
Project Convergence 22 (Use Surrogate)	█				▲ 1				█				█				█				█							
Defender Pacific 22	█				▲ 2				█				█				█				█							
Northern Edge 22	█				▲ 3				█				█				█				█							
Dynamic Front 22	█				▲ 5				█				█				█				█							
Project Convergence 23	█				▲ 6				█				█				█				█							
Defender Pacific 23	█				█				▲ 7				█				█				█							
Northern Edge 23	█				█				█				▲ 8				█				█							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>	

Event Name	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
Dynamic Front 23													9															
National Overhead Systems (NOS) Integration Continues																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) BX9 / <i>Tactical Intel Targeting Access Node Adv Develop</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Risk Reduction w/Legacy Ground Systems	1	2020	4	2023
TITAN (space) Pre-Production Development	4	2020	4	2022
TITAN (space) Pre-Prototype Delivery 1& 2	4	2022	4	2022
Continued advancement for Space capabilities via exercises	1	2022	4	2027
Operational Leave Behind TITAN (space) Pre-Prototype 1 & 2	2	2023	4	2027
National Overhead Systems (NOS) Integration	1	2021	4	2027
Project Convergence 22 (Use Surrogate)	1	2022	1	2022
Defender Pacific 22	3	2022	3	2022
Northern Edge 22	3	2022	3	2022
Dynamic Front 22	4	2022	4	2022
Project Convergence 23	1	2023	1	2023
Defender Pacific 23	3	2023	3	2023
Northern Edge 23	4	2023	4	2023
Dynamic Front 23	1	2024	1	2024
National Overhead Systems (NOS) Integration Continues	1	2024	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>			
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
CC5: <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>	-	-	75.098	35.439	-	35.439	27.546	2.419	2.004	2.093	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT.

A. Mission Description and Budget Item Justification

Low Earth Orbit (LEO) Intelligence, Surveillance and Reconnaissance (ISR) directly supports the Army Assured Position Navigation and Timing/Space (APNT/S) and Long Range Precision Fires (LRPF) modernization priorities.

The LEO ISR effort will provide prototyping, development, and experimentation of High Altitude and Tactical Space Layer (TSL) sensors (including electro optical, synthetic aperture radar, radio frequency, and hyperspectral) and space-based Alternative Positioning, Navigation, and Timing (ALTPNT) systems, which are designed to provide wide-area, responsive, deep-area sensing and alternative signal sources required for beyond-line-of-sight (BLOS) targeting and force maneuver. The BLOS sensing will significantly reduce Sensor-to-Shooter (S2S) timelines and reliance on current, at-risk signal sources. Follow-on, persistent, prototype, tactical sensor and alternative signal capabilities will be integrated with the Army Tactical Intelligence Targeting Access Node (TITAN) ground station and theater gateways. The prototype sensor capabilities will provide direct tasking, assured access, and freedom of maneuver directly supporting live-fire, S2S demonstrations and assessments.

FY2023 Base funding in the amount of \$35.439 million provides prototyping, experimentation, and risk reduction activities to sensor prototypes and ALTPNT systems, supporting wide-area, responsive, and deep-area sensing and force maneuver. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments.

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

	FY 2021	FY 2022	FY 2023
Title: CC5 / Low Earth Orbit (LEO) Intel Surv Recon (ISR)	-	75.098	35.439
Description: The LEO ISR effort will provide prototyping, development and experimentation of High Altitude and Tactical Space Layer (TSL) sensors (including electro-optical, synthetic aperture radar, and radio frequency). These sensors are designed to provide wide-area, responsive, deep-area sensing required for beyond-line-of-sight (BLOS) targeting and force maneuver, and will significantly reduce S2S timelines. Follow-on persistent prototype tactical sensor capabilities will be integrated with the Army TITAN ground station and ATHENA gateways, which will provide direct tasking and assured access directly supporting live-fire S2S demonstrations and assessments.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surveillance Recon (ISR)</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Funding provides for follow-on prototype development and experimentation of High Altitude and Tactical Space Layer sensors, which will be integrated with the Army Tactical Intelligence Targeting Access Node (TITAN) ground station and theater gateways to provide direct tasking and assured access directly supporting live-fire Sensor to Shooter (S2S) demonstrations and assessments.</p> <p>FY 2023 Plans: Funding provides for follow-on prototype development and experimentation of High Altitude and Tactical Space Layer sensor test beds, which will be integrated with the Army TITAN ground station and ATHENA gateways, to provide direct tasking and assured access directly supporting live-fire STS demonstrations and assessments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY 2022 \$75.098 million down to FY 2023 \$35.439 million reflects achievement of objectives for Army influence of development on National assets and payloads through A-PNT CFT Campaign of Learning and AFC Project Convergence, and the realignment of PE 0603766A Project CC5 'LEO ISR' funds to PE 0604035A Project BX7 "Battle Management Command and Control (BMC2) and Ground Infrastructure (renamed from 'LEO Satellite Capability') to continued efforts in that area. Project CC5 "LEO ISR" is focused on the payload development and prototyping, and PE 0604035A Project BX7 ""Battle Management Command and Control (BMC2) and Ground Infrastructure is focused on the ground ingest/infrastructure development.</p>			
Accomplishments/Planned Programs Subtotals	-	75.098	35.439

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604035A: <i>Low Earth Orbit (LEO) Satellite Capability</i>	21.850	19.638	35.509	-	35.509	39.672	22.904	23.328	23.486	Continuing	Continuing

Remarks
Development by Project CC5 "LEO ISR" are in conjunction and complement efforts funded by Project BX7 "LEO Satellite Capability" . ref. PE 0604035A.BX7

D. Acquisition Strategy
The LEO ISR effort supports work with the Intelligence Community (IC), our Mission Partner, and the Space Development Agency on the prototyping, development, and experimentation of High Altitude and Tactical Space Layer (TSL) sensors (including electro optical, synthetic aperture radar, radio frequency, and hyperspectral), and Alternative Positioning, Navigation, and Timing (ALTPNT) systems. These sensors are designed to provide wide-area, responsive, deep-area sensing required for BLOS targeting and force maneuver, significantly reducing S2S timelines. Follow-on, persistent, prototype tactical sensor capabilities (FY 2023-2024) will be integrated with the Army TITAN ground station and ATHENA gateways, which will provide direct tasking, assured access, and freedom of maneuver directly supporting live-fire

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 4	PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	CC5 / <i>Low Earth Orbit (LEO) / Intel Surv Recon (ISR)</i>

S2S demonstrations and assessments. Existing Mission Partner contracts and Aviation & Missile Technology Consortium (AMTC) Other Transaction Authority (OTAs) will be used for prototype development, engineering services and test and evaluation support.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surveillance Recon (ISR)</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LEO Prototype Development and Engineering Services Support	C/FFP	A-PNT /S : Multiple Locations	-	-		5.000	Oct 2021	4.000	Jun 2023	-		4.000	0.000	9.000	-
Subtotal			-	-		5.000		4.000		-		4.000	0.000	9.000	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LEO Development (Classified)	MIPR	TBD : TBD	-	-		58.598	Jan 2022	26.939	Jan 2023	-		26.939	0.000	85.537	-
Subtotal			-	-		58.598		26.939		-		26.939	0.000	85.537	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LEO Program MGMT	TBD	APNT CFT/S : Huntsville, AL	-	-		3.500	Oct 2021	2.500	Jun 2023	-		2.500	0.000	6.000	-
Subtotal			-	-		3.500		2.500		-		2.500	0.000	6.000	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LEO Prototype Tests and Evaluations	TBD	Multiple : Multiple	-	-		8.000	Jan 2022	2.000	Jan 2023	-		2.000	0.000	10.000	-
Subtotal			-	-		8.000		2.000		-		2.000	0.000	10.000	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Surveillance Recon (ISR)</i>			
	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	-	-	75.098	35.439	-	35.439	0.000	110.537	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Sur Recon (ISR)</i>	

Event Name	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
LEO Prototyping, Development, and Experimentation																												
Sensor-to-Shooter Campaign of Learning																												
CC5 / Low Earth Orbit (LEO) / Intel Sur Recon (ISR)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) CC5 / <i>Low Earth Orbit (LEO) / Intel Sur Recon (ISR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LEO Prototyping, Development, and Experimentation	1	2020	4	2021
Sensor-to-Shooter Campaign of Learning	1	2022	4	2022
CC5 / Low Earth Orbit (LEO) / Intel Sur Recon (ISR)	1	2022	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced 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	-	15.179	62.820	18.048	-	18.048	75.231	35.374	36.095	36.446	Continuing	Continuing
BQ5: Visual Augmentation System Advanced Development	-	5.475	56.519	12.094	-	12.094	69.370	29.663	30.268	30.563	Continuing	Continuing
VT7: Soldier Maneuver Sensors - Adv Dev	-	7.039	3.777	3.909	-	3.909	3.808	3.661	3.777	3.813	Continuing	Continuing
VT8: SOLDIER PRECISION TARGETING DEVICES - ADV DEV	-	2.665	2.524	2.045	-	2.045	2.053	2.050	2.050	2.070	Continuing	Continuing

A. Mission Description and Budget Item Justification

A portion of this funding line is directly aligned to the Army Soldier Lethality Modernization Priority in support of situational awareness for the Close Combat Soldier. This Program Element focuses on efforts to evaluate and integrate technologies and representative prototype systems that facilitate the development of Soldier-borne sensor devices transitioning from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide enhanced Soldier products, giving them superiority on the battlefield.

Project BQ5 (Visual Augmentation System-Advanced Development) This project evaluates and integrates technologies and representative prototype systems transitioning from the Science and Technology (S&T) stage. It focuses on developing the next generation augmented vision and situational awareness system that provides the Soldier with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the development of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package and advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team. The total cost of the Integrated Visual Augmentation System Rapid Prototyping Middle Tier of Acquisition effort is \$863.9 million RDT&E from FY18 to FY23. The totality of the RDT&E is from the combined APEs of 603774A BQ5 and 604710A BQ6.

Project VT7 (Soldier Maneuver Sensors-Advanced Development) project enables development of emerging capabilities for the maneuver force, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and survive, day and night, in a multi- domain environment now and tomorrow". This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This effort focuses on capabilities that enable modernization of Soldier sensor and laser

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development
--	---

devices, including digital features and enhanced solutions including maneuver capabilities to detect, recognize and identify targets, and to provide target acquisition and handoff but not limited to capabilities to mitigate threats. The integration of higher performing multi-spectral sensors with smart processing will provide adjusted weapon sight reticles and leverage network connectivity for improved situational awareness/understanding. Additional project capabilities include advanced optical components and assemblies and techniques for signature management, resiliency across the electromagnetic spectrum, and integration of a modular design structure for target acquisition applications including support for wireless data transfer, passive range determination, technologies for working in a GPS contested environment, advanced GPS replacement technologies and mitigation of manned and unmanned threat sensor systems. This project supports efforts to evaluate and integrate technologies and representative prototype systems including Micro Electronics Modules (MEMS) technology with improved size, weight and power for development of modernized Soldier sensor capabilities transitioning from the S&T stage to operational use. This project includes costs for efforts associated with development, certification, verification and validation of interface products into the Adaptive Squad Architecture (ASA). This project also includes development of tools and emulators of ASA components. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

Project VT8 (Soldier Precision Targeting Devices - Advanced Development) enables development of emerging capabilities for the maneuvers and fires community, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Fires Center of Excellence (FCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and survive, day and night, in a multi- domain environment now and tomorrow." This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This project focuses on developing component technologies and representative prototype systems for Soldier portable precision targeting devices to continue improvements to system performance while reducing size, weight, and power required by those systems. The effort will consider emerging Micro-Electronic Modules (MEMs) technologies for improved efficiency and performance. Efforts will improve the Soldier's ability to precisely locate and designate targets across a broader range of operating environments, including all weather conditions, GPS-contested environments using active and passive methodologies and technologies. Component technology development will precede integration into specific systems and will include improved Precision Azimuth and Vertical Angle Measurement (PAVAM) devices; solid-state, improved lasers for range finding/designation/markings; novel passive target acquisition methods; electro-optical sensors such as infrared, near-infrared, ultra-violet, and visible spectrum imagers; sensor and data fusion; laser designator spot detection and imaging; integration of advanced power management technologies. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	15.429	18.000	0.000	-	0.000
Current President's Budget	15.179	62.820	18.048	-	18.048
Total Adjustments	-0.250	44.820	18.048	-	18.048
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.180			
• Congressional Rescissions	-	-			
• Congressional Adds	-	55.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.250	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	18.048	-	18.048

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

Project: BQ5: *Visual Augmentation System Advanced Development*

Congressional Add: *FY22 Congressional Add*

	FY 2021	FY 2022
	-	55.000
Congressional Add Subtotals for Project: BQ5	-	55.000
Congressional Add Totals for all Projects	-	55.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>				Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>			
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
BQ5: <i>Visual Augmentation System Advanced Development</i>	-	5.475	56.519	12.094	-	12.094	69.370	29.663	30.268	30.563	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project evaluates and integrates technologies and representative prototype systems transitioning from the Science and Technology (S&T) stage. It focuses on developing the next generation augmented vision and situational awareness system that provides the Soldier with the ability to fight, rehearse, train and win during multi-domain operations. Funded efforts will accelerate the development of components, terrain shared coordinate data and processing, algorithms including machine learning/artificial intelligence and demonstrations in support of the next generation augmented vision and situational awareness system. Efforts will provide rapid decision making and targeting capabilities with the integration of external video and data sources such as weapon sights, unmanned air and ground vehicles and other data sources enabled by tactical cloud package edge computing, "See Through" Armor and sharing information across on and off platform advanced network services. This project will provide data driven analytics to optimize unit performance and enhance lethality and to enable Synthetic Training Environment (STE) squad capability to perform live mixed reality training and rehearsing. This project includes costs for efforts associated with movement of information and high level processing, integration, and interface of products with the Soldiers' head, body, weapon, and transportation. Funding in this project aligns with the Army's priorities in support of the National Defense Strategy. This project supports the Soldier Lethality Cross Functional Team. The total cost of the Integrated Visual Augmentation System Rapid Prototyping Middle Tier of Acquisition effort is \$863.9 million RDT&E from FY18 to FY23. The totality of the RDT&E is from the combined APEs of 603774A BQ5 and 604710A BQ6.

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

	FY 2021	FY 2022	FY 2023
Title: Heads Up Display (HUD)	5.475	1.463	12.094
Description: Integrated Visual Augmentation System (IVAS) HUD provides a first generation single platform for Soldier/Marines to fight, rehearse, and train in day and night that provides increased lethality, mobility, and situational awareness necessary to achieve overmatch against our current and future adversaries.			
FY 2022 Plans:			
Develop technology improvements to IVAS focused on sensor performance (low light and high resolution binocular thermal), wireless communications, reduced weight, and improved usability (Soldier Authentication). Soldier Authentication capability was developed by the Government and improves Soldier experience and security. Develop advanced artificial intelligence/machine learning mission planning and performance tools using the IVAS Software Development Kits (SDKs). These tools will extend IVAS capabilities and be driven by Soldier Centered Design activities. Begin market research and technology assessments in			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
order to establish the acquisition strategy for the second generation of IVAS capability with consideration for classified usage, reduced size/weight and greater combat helmet and CBRNE integration. FY 2023 Plans: Integrate imagers, authentication tools, and hardware components and software into IVAS 1.2. Improve thermal and low light sensors, develop AI data integration, improve device authentication software. FY 2022 to FY 2023 Increase/Decrease Statement: Received a Congressional Mark in FY22 of \$10.18 million. Funding increased from \$1.463 million in FY22 to \$11.328 million in FY23 due to the maturation of IVAS 1.2 technology.			
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	-	0.056	-
Accomplishments/Planned Programs Subtotals	5.475	1.519	12.094

	FY 2021	FY 2022
Congressional Add: FY22 Congressional Add	-	55.000
FY 2022 Plans: Development of human factors and user experience updates to IVAS systems.		
Congressional Adds Subtotals	-	55.000

C. Other Program Funding Summary (\$ in Millions)			FY 2023	FY 2023	FY 2023						Cost To			
Line Item	FY 2021	FY 2022	Base	OCO	Total	FY 2024	FY 2025	FY 2026	FY 2027	Complete	Total Cost			
• K36402: <i>IVAS/Heads Up Display</i>	670.476	405.140	400.024	-	400.024	91.282	-	-	-	-	-	-	-	-
• BQ6: <i>Visual Augmentation System Eng Dev</i>	7.495	4.934	34.543	-	34.543	8.142	72.395	73.868	74.586	-	-	-	-	-

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>

D. Acquisition Strategy

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

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	VARIOUS : VARIOUS	-	2.758		-		1.266	Nov 2022	-		1.266	0.000	4.024	-
SBIR/STTR Transfer	TBD	To Be Determined : To Be Determined	-	-		0.056		-		-		-	0.000	0.056	-
Subtotal			-	2.758		0.056		1.266		-		1.266	0.000	4.080	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Heads Up Display (HUD)	C/FFP	Microsoft : Redmond, WA	185.328	0.019	Nov 2020	49.625		4.351	Nov 2022	-		4.351	0.000	239.323	-
Heads Up Display (HUD)	TBD	To Be Determined : To Be Determined	-	1.041		6.838		3.156		-		3.156	0.000	11.035	-
Vehicle Integration	C/TBD	TBD : TBD	-	-		-		3.321		-		3.321	0.000	3.321	-
Subtotal			185.328	1.060		56.463		10.828		-		10.828	0.000	253.679	N/A

Remarks
 For FY 2022, Product Development of the Heads Up Display (HUD) includes: binocular thermal development, low light sensor enhancements, and Mission planning/execution Tools (App development).

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems, Test and Evaluation	TBD	Various : Various	-	1.657		-		-		-		-	0.000	1.657	-
Subtotal			-	1.657		-		-		-		-	0.000	1.657	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development			Project (Number/Name) BQ5 / Visual Augmentation System Advanced Development				
	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	185.328	5.475	56.519		12.094	-	12.094	0.000	259.416	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>		Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>	

Event Name	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				
Technology Improvements to First Generation HUD	Development																															
HUD and System Improvements													Development																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) BQ5 / <i>Visual Augmentation System Advanced Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Heads Up Display (HUD)	4	2018	4	2020
Technology Improvements to First Generation HUD	1	2021	4	2023
HUD and System Improvements	1	2024	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>				Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>			
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
VT7: <i>Soldier Maneuver Sensors - Adv Dev</i>	-	7.039	3.777	3.909	-	3.909	3.808	3.661	3.777	3.813	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enables development of emerging capabilities for the maneuver force, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and survive, day and night, in a multi-domain environment now and tomorrow". This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This effort focuses on capabilities that enable modernization of Soldier sensor and laser devices, including digital features and enhanced solutions including maneuver capabilities to detect, recognize and identify targets, and to provide target acquisition and handoff but not limited to capabilities to mitigate threats. The integration of higher performing multi-spectral sensors with smart processing will provide adjusted weapon sight reticles and leverage network connectivity for improved situational awareness/understanding. Additional project capabilities include advanced optical components and assemblies and techniques for signature management, resiliency across the electromagnetic spectrum, and integration of a modular design structure for target acquisition applications including support for wireless data transfer, passive range determination, technologies for working in a GPS contested environment, advanced GPS replacement technologies and mitigation of manned and unmanned threat sensor systems. This project supports efforts to evaluate and integrate technologies and representative prototype systems including Micro Electronics Modules (MEMS) technology with improved size, weight and power for development of modernized Soldier sensor capabilities transitioning from the S&T stage to operational use. This project includes costs for efforts associated with development, certification, verification and validation of interface products into the Adaptive Squad Architecture (ASA). This project also includes development of tools and emulators of ASA components. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

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

	FY 2021	FY 2022	FY 2023
Title: Soldier Enhanced Sensing Capabilities	1.490	3.639	3.909
Description: Soldier Enhanced Sensing Capabilities provides the next generation vision capabilities for day and night that will reduce the Soldier's burden and allow hands free operation. Soldier Enhanced Sensing Capabilities will provide automatic adjustment of imagery and matched sensor fields of view. This effort will further enhance day/night Rapid Target Acquisition (RTA) capabilities by ensuring goggle connectivity to weapon sights, and improved situational capabilities by enabling day/night data display on the Soldier Warrior End User Device/Computer (EUD) and Soldier Borne Sensor systems. The goggle interfaced will be compatible with Integrated Vision Augmentation System (IVAS) displays. This effort considers methods for obtaining range estimates without the use of active laser devices and extends the ability to send/receive data to the EUD to support advanced EUD applications by processing of sensor video, integrating it with external data sources, and producing advanced processed imagery with overlay data display. This effort will review and consider improved antenna designs and placement to maximize			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

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

	FY 2021	FY 2022	FY 2023
<p>efficiencies of wireless communications. This effort will further work to reduce size, weight and power of sensor and laser components including consideration of MEMS technology and considers IVAS successes to explore integrated digital, low profile, conformal day/night displays. This effort considers alternatives to potentially replace or augmenting the aging fleet of fielded night vision devices with a digital Near-Infrared (NIR) device, a peripheral overlay device, a bi-focal lens vision device, an adjustable objective lens, a wide field of view device and/or a white phosphor night vision device.</p> <p>FY 2022 Plans: In addition to continuing unfinished work initiated in FY 2021, wireless integration and enhancements are expected in the Family of Weapon Sights and Small Tactical Optical Rifle Mounted programs of record including integration and evaluation of Intra Soldier Wireless (ISW) 256-bit encryption. In addition, NSA certified radio modules will be evaluated and considered for integration. FY22 includes technology development to improve robustness of the Augmented Reality (AR), Artificial Intelligence (AI) and Machine Learning (ML) capabilities in ENVG-B. Investments are expected to solidify and enhance the supply of organic light emitting diodes for existing and emerging programs while work continues on advanced displays including waveguides and projection systems. Investments continue in multi-spectral devices that provide Soldiers capabilities beyond near peer adversaries and help to determine the capabilities featured in the Night Vision Device-Next.</p> <p>FY 2023 Plans: Continue development and integration of Augmented Reality (AR), Artificial Intelligence (AI) and Machine Learning (ML) as they relate to Soldier Maneuver platforms. Integrate and analyze benefits versus size, weight and power impacts of emerging RTI technologies that immerse the individual Soldier in the Digital Battlefield.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase required as more opportunities for integration are available and will be explored including ENVG III, ENVG-B, and/or a Next Generation Night Vision Device.</p>			
<p>Title: Target Acquisition Laser Capabilities</p> <p>Description: Target Acquisition Capabilities develops modular laser components and representative prototype systems to support target acquisition for pointing, ranging, target hand-off, detection and mitigation of threat sensors. This effort continues to explore non-standard electro-magnetic spectrum waveforms for exploitation in Soldier borne devices. This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. Modules will be developed with full documentation, including specifications and interface control documents such that they support the Adaptive Soldier Architecture. This effort develops target acquisition capabilities to include, but is not limited to, augmented reality cues within target locators and target handoff capabilities that are less detectable, conducted wirelessly moving towards a covert target handoff, pointing, range finding capability, and technologies that enable self and target location in</p>	2.438	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
a GPS contested environment. This effort also includes individual Soldier laser event recording and laser warning devices. This effort enables refinement of pre-shot threat detection systems.			
Title: Advanced Sensor Development Description: Advanced Sensor Development is the next generation weapon target acquisition system for use on Next Generation Squad Weapons (NGSW). The increased Advanced Sensor Development of all digital capabilities includes, but is not limited to: wireless remote weapon sight viewing compatibility with the emerging goggle solutions Night Vision Systems (NVS) including Integrated Vision Augmentation System (IVAS)) to provide a heads up Rapid Target Acquisition (RTA) capability; wireless interface with the future Soldier processing component to exchange Mission Command information; day and night capabilities to image in multiple spectral bands; target interrogation; laser range finding; target handoff with coded sources; adjusted and displaced reticule; facial recognition capabilities at tactical ranges and connectivity to the intelligent / powered weapon rail.	2.471	-	-
Title: Adaptive Squad Architecture (ASA) Tools Description: This project contains tools and services that support the Adaptive Squad Architecture (ASA) integration effort. This project considers emerging products as well as legacy products for size, weight and power efficiencies. This project develops interface control documentation for integration into the ASA, Next Gen Squad Weapon power / intelligent rail and enables upgrades, enhancements, certifications, validation, verification of evolving Intra-Soldier Wireless products. ASA will pursue a common weapon remote to operate all weapon enablers. This project supports certification of new ISW encryption solutions requisite re-certification needs, ISW enhancement and costs associated with ISW bug fixes.	0.640	-	-
Title: SBIR/SSTR 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	-	0.138	-
Accomplishments/Planned Programs Subtotals	7.039	3.777	3.909

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• L67: <i>Soldier Night Vision Devices</i>	11.043	13.474	7.663	-	7.663	6.189	5.942	5.825	5.880	Continuing	Continuing
• K22002: <i>FWS-INDIVIDUAL</i>	83.820	147.271	150.273	-	150.273	135.562	153.900	109.025	108.973	0.000	888.824

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>
--	--	---

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• K22003: <i>FWS-CREW SERVED</i>	-	25.673	40.985	-	40.985	43.522	52.203	43.145	43.126	Continuing	Continuing
• K22004: <i>FWS-SNIPER</i>	2.569	11.201	11.000	-	11.000	10.350	10.237	5.236	5.233	Continuing	Continuing
• B53800: <i>Laser Target Locator Systems</i>	14.347	27.331	24.229	-	24.229	21.995	22.409	22.307	22.326	Continuing	Continuing
• K35110: <i>Small Tactical Optical Rifle Mounted MLRF</i>	7.715	21.103	11.357	-	11.357	26.057	11.332	11.528	11.523	Continuing	Continuing
• K36402: <i>IVAS/Heads Up Display</i>	670.476	405.140	400.024	-	400.024	91.282	-	-	-	Continuing	Continuing
• BQ5: <i>Visual Augmentation System Advanced Development</i>	5.475	56.519	12.094	-	12.094	69.370	29.663	30.268	30.563	Continuing	Continuing
• BQ6: <i>Visual Augmentation System Eng Dev</i>	7.495	4.934	34.543	-	34.543	8.142	72.395	73.868	74.586	Continuing	Continuing
• K36400: <i>Helmet Mounted Enhanced Vision Devices</i>	183.000	234.906	0.000	-	0.000	-	-	-	-	0.000	417.906

Remarks

D. Acquisition Strategy

The various developmental programs in this Project continue to exercise competitively awarded contracts using best value source selection procedures.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	Various : Various	1.131	0.279	Feb 2021	0.340	Jun 2022	0.350	Dec 2022	-		0.350	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.138		-		-		-	0.000	0.138	-
Subtotal			1.131	0.279		0.478		0.350		-		0.350	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Soldier Enhanced Sensing Capabilities	MIPR	RTI : FT BELVOIR, VA	7.153	-		3.151	Jan 2022	3.409	Jan 2023	-		3.409	Continuing	Continuing	-
Target Acquisition Laser Capabilities	MIPR	RTI : FT BELVOIR, VA	0.829	-		-		-		-		-	0.000	0.829	-
NVS AR4C ARA EMULATOR	MIPR	NVESD RTI : FT BELVOIR, VA	-	0.300	Mar 2021	-		-		-		-	0.000	0.300	-
LETHALITY SMART SYSTEM (LSS)	MIPR	NVESD RTI : FT BELVOIR, VA	-	3.970	Feb 2021	-		-		-		-	0.000	3.970	-
NVESD ISW ICD	MIPR	NVESD RTI : FT BELVOIR, VA	-	0.500	Mar 2021	-		-		-		-	0.000	0.500	-
NVG-Next	MIPR	NVESD RTI : FT BELVOIR, VA	-	1.866	Jul 2021	-		-		-		-	0.000	1.866	-
Subtotal			7.982	6.636		3.151		3.409		-		3.409	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Matrix Support	MIPR	NVESD : FT BELVOIR, VA	1.739	0.124	Mar 2021	0.148	Jun 2022	0.150	Dec 2022	-		0.150	Continuing	Continuing	-
Subtotal			1.739	0.124		0.148		0.150		-		0.150	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>				Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>			
	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	10.852	7.039	3.777	3.909	-	3.909	Continuing	Continuing	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advan</i> <i>ced Development</i>		Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>	

Event Name	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				
Soldier Enhanced Sensing Capabilities																																
Development																																
Target Acquisition Laser Capabilities																																
Development																																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Soldier Enhanced Sensing Capabilities	1	2019	4	2027
Target Acquisition Laser Capabilities	1	2019	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>				Project (Number/Name) VT8 / <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>			
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
VT8: <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>	-	2.665	2.524	2.045	-	2.045	2.053	2.050	2.050	2.070	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enables development of emerging capabilities for the maneuvers and fires community, that are envisioned by the Soldier Lethality Cross Functional Team, the Maneuver Center of Excellence (MCoE), the Fires Center of Excellence (FCoE), the Maneuver Capabilities Development Integration Directorate (MCDID), the Science and Technology (S&T) community, industry partners or the acquisition workforce that may provide the Soldier or Squad increased capability to "fight, win and survive, day and night, in a multi- domain environment now and tomorrow." This project also allows pursuit of technology breakthroughs that challenge current technical solutions and have the potential for providing increased Soldier performance. This project focuses on developing component technologies and representative prototype systems for Soldier portable precision targeting devices to continue improvements to system performance while reducing size, weight, and power required by those systems. The effort will consider emerging Micro-Electronic Modules (MEMs) technologies for improved efficiency and performance. Efforts will improve the Soldier's ability to precisely locate and designate targets across a broader range of operating environments, including all weather conditions, GPS-contested environments using active and passive methodologies and technologies. Component technology development will precede integration into specific systems and will include improved Precision Azimuth and Vertical Angle Measurement (PAVAM) devices; solid-state, improved lasers for range finding/designation/markings; novel passive target acquisition methods; electro-optical sensors such as infrared, near-infrared, ultra-violet, and visible spectrum imagers; sensor and data fusion; laser designator spot detection and imaging; integration of advanced power management technologies. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

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

	FY 2021	FY 2022	FY 2023
Title: Precision Pointing and Navigation Component Development	2.665	2.432	2.045
Description: This project supports development of advanced components and prototype systems for Soldier-borne precision targeting devices. Dismounted Soldiers will have the capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets and battlefield threats 24/7, across a broader range of operating environments such as in all weather conditions, in GPS-contested conditions using active and passive methodologies and technologies.			
FY 2022 Plans: Resources will continue the development of component technologies and mature sub-system integration for Precision Azimuth and Vertical Angle Measurement (PAVAM) devices to achieve reduced size, weight and power. These resources will also continue to develop technologies that allow precision targeting systems to operate in GPS-contested environments.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT8 / <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 resources will continue the development and initiate testing of component technologies and mature sub-system integration for PAVAM devices to achieve reduced size, weight and power. These resources will also continue to develop technologies that allow precision targeting systems to operate in GPS-contested environments.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 decrease in funding is due to Army program resource adjustments.			
<i>Title:</i> SBIR/STTR Transfer	-	0.092	-
<i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC 638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals	2.665	2.524	2.045

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
• L79: <i>Joint Effects Targeting Systems (JETS)</i>	5.363	5.116	11.434	-	11.434	13.519	6.318	6.609	6.006	0.000	54.365
• K32101: <i>JOINT EFFECTS TARGETING SYSTEM (JETS)</i>	54.206	62.082	10.304	-	10.304	49.938	70.355	70.269	70.891	0.000	388.045

Remarks

D. Acquisition Strategy

The various developmental programs in this project continue to exercise competitively awarded contracts using best value source selection procedures.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT8 / <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	PM SSL : Ft. Belvoir, VA 22060	0.041	0.089	Feb 2021	0.090	Nov 2021	0.092	Nov 2022	-		0.092	Continuing	Continuing	-
SBIR/STTR	TBD	Various : Various	-	-		0.092		-		-		-	0.000	0.092	-
Subtotal			0.041	0.089		0.182		0.092		-		0.092	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Precision Pointing and Navigation	C/FFP	Various : Various	1.314	2.102	Mar 2021	2.030	Jan 2022	1.645	Jan 2023	-		1.645	Continuing	Continuing	-
Subtotal			1.314	2.102		2.030		1.645		-		1.645	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Matrix Support	MIPR	NVESD : Ft. Belvoir, VA 22060	0.067	0.028	Feb 2021	0.071	Nov 2021	0.058	Nov 2022	-		0.058	Continuing	Continuing	-
Science and Engineering Support	SS/CPFF	Johns Hopkins University : Laurel, MD	-	0.446	Apr 2021	0.241	Apr 2022	0.250	Feb 2023	-		0.250	Continuing	Continuing	-
Subtotal			0.067	0.474		0.312		0.308		-		0.308	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			1.422	2.665	2.524	2.045	-	2.045	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>		Project (Number/Name) VT8 / <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>	

Event Name	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
Precision Pointing and Navigation Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT8 / <i>SOLDIER PRECISION TARGETING DEVICES - ADV DEV</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Precision Pointing and Navigation Development	3	2020	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603779A / Environmental Quality Technology - Dem/Val
--	--

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	-	20.906	22.921	31.249	-	31.249	25.335	22.510	21.201	20.692	0.000	164.814
035: National Defense Cntr For Enviro Excellence	-	8.086	11.313	6.661	-	6.661	6.826	6.890	6.963	7.031	0.000	53.770
E21: Environmental Quality Technology Dem/Val	-	12.820	11.608	24.588	-	24.588	18.509	15.620	14.238	13.661	0.000	111.044

A. Mission Description and Budget Item Justification

There is broad potential application for environmental quality technology (EQT) to be applied to multiple Army weapon systems and installations. However, technology must be demonstrated and validated (total ownership cost and performance data identified) before potential users will consider exploiting it. This Program Element (PE) includes Projects focused on validating the general military utility or cost reduction potential of technology when applied to different types of infrastructure, military equipment or techniques. It may include validations and proof-of-principle demonstrations in field exercises to evaluate upgrades or provide new operational capabilities. The validation of technologies will be in as realistic an operating environment as possible to assess performance or cost reduction potential. EQT demonstration/validation is systemic and applicable across Department of Army sites and installation problems (e.g. unexploded ordnance detection and discrimination). This PE supports the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. All work is endorsed by potential users and supported by a state-of-the-art assessment to determine when the technology can transition to the user for implementation.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	20.906	11.921	0.000	-	0.000
Current President's Budget	20.906	22.921	31.249	-	31.249
Total Adjustments	0.000	11.000	31.249	-	31.249
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	11.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	31.249	-	31.249

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

Project: 035: National Defense Cntr For Enviro Excellence

FY 2021	FY 2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>
---	---

<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>	FY 2021	FY 2022
Congressional Add: <i>Program increase - biopolymers for military infrastructure</i>	3.000	3.000
Congressional Add: <i>Program increase - underwater cut and capture demonstration</i>	-	3.000
Congressional Add Subtotals for Project: 035	3.000	6.000
Project: E21: <i>Environmental Quality Technology Dem/Val</i>		
Congressional Add: <i>Program increase - wire-arc additive manufacturing (DEVCOM)</i>	-	5.000
Congressional Add: <i>Environmental quality technology demonstration and validation: Congressional Add - High Pressure Waterjet Technology (USACE)</i>	5.000	-
Congressional Add Subtotals for Project: E21	5.000	5.000
Congressional Add Totals for all Projects	8.000	11.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>				Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>			
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
035: <i>National Defense Cntr For Enviro Excellence</i>	-	8.086	11.313	6.661	-	6.661	6.826	6.890	6.963	7.031	0.000	53.770
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The National Defense Center for Environmental Excellence (NDCEE) was established by Congress in 1990 with a directive to "serve as a national leadership organization to address high priority environmental problems for the Department of Defense (DoD), other government organizations, and the industrial community." In May 2008, the Program was re-designated from the National Defense Center for Environmental Excellence to the National Defense Center for Energy and Environment to ensure that the Center's mission recognizes and addresses the strategic interdependence of energy and environmental technology requirements within an overall sustainability framework in support of our installations, weapons systems and war fighters. This name change also directly supports the DoD's proactive implementation of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management." The NDCEE Program has evolved into a national resource for demonstrating, validating and transitioning innovative Environmental, Safety & Occupational Health and Energy (ESOHE) technologies. This Program is managed by the Army on behalf of the Assistant Secretary of Defense for Sustainment.

The United States (U.S.) Army's broadly encompassing and growing mobile, personal and stationary technological requirements include: infrastructure, alternative and synthetic energy, training lands, emerging contaminants, transportation, systems integration, personnel well-being, and others. Further, to train as we fight, validated ESOHE technologies need to be available and implemented at Army installations. The NDCEE will continue to demonstrate, validate, and transfer these technologies supporting our integrated environment, energy, safety, occupational health and energy objectives to enable mission, readiness, innovation, lethality and modernization to ensure our Soldiers maintain a technological advantage over our adversaries.

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

	FY 2021	FY 2022	FY 2023
Title: Conduct demonstration/validation of environmentally acceptable technologies that enhance military readiness and reduce production, operating, and/or disposal costs.	4.886	4.932	5.353
Description: NDCEE supports the demonstration and validation of mature (BA4) environment, safety, occupational health, and energy technologies that support the mission requirements. The objective is to invest in innovative technologies that support military mission/readiness, employ a high degree of technical fidelity, have a high potential for transition success, and align with modernization goals.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Funding will be provided for projects selected the previous year and still require funds; projects are generally completed within two years. The NDCEE Program Management Office will coordinate the project selection process for potential FY 2022 new project starts. Technologies will be selected by the NDCEE project selection committee and approved by the NDCEE Executive Agent.</p> <p>FY 2023 Plans: Funding will be provided for projects selected the previous year and still require funds; projects are generally completed within two years. The NDCEE Program Management Office will coordinate the project selection process for potential FY 2023 new project starts. Technologies will be selected by the NDCEE project selection committee and approved by the NDCEE Executive Agent.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding due to projected slight cost increases to support the demonstration and validation of mature (BA4) environment, safety, occupational health, and energy technologies that support the mission requirements.</p>				
<p>Title: NDCEE Government program management during contract negotiations and during project formulation, execution, and technology transfer.</p> <p>Description: Funds the NDCEE Government program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, and technology transition.</p> <p>FY 2022 Plans: Will fund the NDCEE program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, reporting, and technology transfer. Includes contracting office support for contract closeouts, travel to conduct program management oversight, and program coordination and education to DoD stakeholders.</p> <p>FY 2023 Plans: Will fund the NDCEE program management during comprehensive NDCEE lifecycle, including project cultivation and identification, screening, selection, execution, reporting, and technology transfer. Includes contracting office support for contract closeouts, travel to conduct program management oversight, and program coordination and education to DoD stakeholders.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Amount grows from 200K in 2022 to 1262K in 2023. The increase funds additional technology projects to address new PFAS and climate change requirements for the DOD. Scope of NDCEE Program also increased to include safety and occupational health as a result of NDCEE advisory board and OSD guidance.</p>		0.200	0.193	1.308
<p>Title: SBIR Title/ STTR Title Adjustment</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p>		-	0.188	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Environmental Excellence</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	5.086	5.313	6.661

	FY 2021	FY 2022
<i>Congressional Add:</i> Program increase - biopolymers for military infrastructure	3.000	3.000
<i>FY 2021 Accomplishments:</i> Biopolymers for military infrastructure		
<i>FY 2022 Plans:</i> Congressional Interest Item		
<i>Congressional Add:</i> Program increase - underwater cut and capture demonstration	-	3.000
<i>FY 2022 Plans:</i> Congressional Interest Item		
Congressional Adds Subtotals	3.000	6.000

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

Remarks

D. Acquisition Strategy

The NDCEE is a national asset focused on DoD applications that include technology transfer to appropriate DoD transition partners. The management strategy for the NDCEE ensures that all projects have a potential multi-service benefit and have a high potential for transition success. At the strategic level, the NDCEE Executive Advisory Board (EAB) is chaired by the DoD NDCEE Lead Agent on behalf of the Assistant Secretary of Defense for Sustainment and is representative of the services and DoD. The EAB and the Program Director are supported by the NDCEE Technical Advisory Group (TAG) to help ensure that NDCEE investments are maximized across DoD and the Services. At the tactical level, the three Focus Groups (environment, safety/occupational health, and energy) cultivate and recommend priority projects to the TAG and Project Selection Committee for funding. Transition Partners ensure that NDCEE's investments are carried forward in the next phases of the Research Development Test and Evaluation process, as identified in each funded project's Technology Transition Agreement.

NDCEE projects enable readiness for the Services under increasingly complex and demanding scenarios. The interdependency of national security with energy supply and costs, water supply and costs, environmental resiliency, and human health and safety are clear and NDCEE projects provide forward-looking solutions to these challenges. Failure to further fund and validate promising technologies that are at the mature or Commercial-off-the-Shelf stage, would result in lost modernization

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>

opportunities and validation before they go into a military environment. These initiatives need to be carried forward into an operational/realistic testing environment so that they can support mission readiness and training when ultimately fielded to the Services.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Environmental Excellence</i>
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	MIPR	AEC : San Antonio, TX	25.233	0.200	Nov 2018	0.204	Nov 2018	1.308	Oct 2022	-		1.308	Continuing	Continuing	Continuing
SBIR/STTR Transfer	TBD	Various : Various	-	3.000		0.188		-		-		-	0.000	3.188	-
Subtotal			25.233	3.200		0.392		1.308		-		1.308	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Testing and Evaluation	Various	Various : Various	46.337	4.886	Nov 2018	4.921	Nov 2018	5.353	Oct 2022	-		5.353	Continuing	Continuing	Continuing
Program Increase - biopolymers for military infrastructure	TBD	TBD : TBD	-	-		3.000	Sep 2022	-		-		-	0.000	3.000	-
Program Increase - underwater cut and capture demonstration	TBD	TBD : TBD	-	-		3.000	Sep 2022	-		-		-	0.000	3.000	-
Subtotal			46.337	4.886		10.921		5.353		-		5.353	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		71.570	8.086	11.313	6.661	-	6.661	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>	

Event Name	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
NDCEE Management and Operations (Enduring)																												
NDCEE Env, Safety, Occ Health, and Energy Technology Dem/A																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NDCEE Management and Operations (Enduring)	1	2019	4	2024
NDCEE Env, Safety, Occ Health, and Energy Technology Dem/Val (Enduring)	1	2019	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>				Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>			
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
E21: <i>Environmental Quality Technology Dem/Val</i>	-	12.820	11.608	24.588	-	24.588	18.509	15.620	14.238	13.661	0.000	111.044
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports Advanced Component Development and Prototypes of innovative environmental quality technologies that modernize materials and processes required for current and future operational sustainment and warfighter training capabilities. The Project showcases technologies that increase life safety, reduce Soldier and worker human health risks, enhance readiness and enable mission capabilities of the current and future force with a focus on eliminating the high priority issues associated with global warming, hexavalent chromium, cadmium and airborne lead through material substitution. The Project expedites technology transition from the laboratory to operational use by demonstrating modern materials and processes to fulfill or surpass the performance requirements outlined in Material Specifications, Depot Maintenance Work Requirements, Technical Manuals, Drawings and other technical data. Forward-looking materials and processes demonstrated under this project support the Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. Modernized materials and processes have the additional benefit of reducing the impacts due to climate change, future regulatory compliance and cleanup requirements while simultaneously increasing performance and standardization across the Army, resulting in significantly reduced life cycle costs incurred by acquisition, industrial base and installation end users.

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

	FY 2021	FY 2022	FY 2023
Title: Environmental quality technology demonstration and validation: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems (DEVCOM)	3.154	2.286	2.435
Description: Increase operational readiness and reduce Soldier and worker human health risks by reducing or eliminating the use of cancer-causing hexavalent chromium, cadmium and associated toxic materials used in surface finishing processes for the current and future force. These Safer Alternatives for Readiness (SAFR) technologies will be used to provide superior corrosion and wear protection for components used on Future Vertical Lift and Next Generation Combat Vehicles and enable increased performance/extended barrel life for Long Range Precision Fire systems.			
FY 2022 Plans: Will complete fatigue and performance testing needed to approve zinc-nickel alternatives to cadmium in aircraft components; will validate performance of hybrid additive manufacturing techniques using wear resistant materials and high strength alloys to replace hard chrome plating in crew-served machine guns.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Will demonstrate mixed mating of zinc-nickel and cadmium plated electrical connectors; will conduct testing to enable modernization of surface finishing and electroplating processes to support next generation clean manufacturing technologies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funds decrease reflects technology area ramping down toward completion in FY 2023.</p>				
<p>Title: Environmental quality technology demonstration and validation: Airborne Lead Reduction from Army Weapon Systems (DEVCOM)</p> <p>Description: Sustain Soldier training readiness, maintain/restore training capability at ranges closed due to dangerous levels of lead exposure and increase life safety and protection of human health on Army installations by reducing or eliminating the use of toxic lead compounds - which are known to cause damage to central nervous, cardiovascular and immune systems with long-term effects for children, as well as potential developmental impacts, including IQ loss, behavioral issues and hearing loss - in rocket and missile propellants and primary explosives (primers/detonators/initiators) for the current and future force. These Safer Alternatives for Readiness (SAFR) will provide a domestic, readily available source for lead-free primary explosives used in all Long Range Precision Fires and Soldier Lethality systems.</p> <p>FY 2022 Plans: Will demonstrate alternative fuze system using qualified lead-free primary explosives in artillery round configuration; will conduct flight-weight motor testing for lead-free minimum signature rocket propellants.</p> <p>FY 2023 Plans: Will demonstrate a lead-free primer in medium caliber ammunition; will support pilot production, static and ground flight test for lead-free extruded rocket motor.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase reflects technology area ramping up to include higher fidelity live-fire testing.</p>		2.232	2.326	4.365
<p>Title: Environmental quality technology demonstration and validation: Low Global Warming Potential (LGWP) Alternatives to Ozone Depleting Substances (ODS) (DEVCOM)</p> <p>Description: Evaluate low GWP ODS alternatives being developed by industry to assess their toxicity and flammability hazards and verify their acceptability in military unique refrigeration and fire suppression applications. These Safer Alternatives for Readiness (SAFR) technologies will support all Future Vertical Lift and Next Generation Combat Vehicle systems.</p> <p>FY 2022 Plans:</p>		0.226	0.221	0.262

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Will demonstrate alternative, low GWP refrigerant agents with high potential to meet safety and performance requirements for mobile refrigeration systems.</p> <p>FY 2023 Plans: Will demonstrate alternative, low/no GWP refrigerant agents with high potential to meet safety and performance requirements for next generation mobile air conditioning systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Economic Adjustment</p>				
<p>Title: Environmental quality technology demonstration and validation: Insensitive Munitions (IM) Wastewater Treatment (USACE)</p> <p>Description: Demonstrate and validate optimized scalable wastewater treatment system basic technology for the destructive treatment of existing and emerging insensitive munitions (IM) contaminated production wastewater generated during Army ammunition plant munitions production.</p>		0.905	-	-
<p>Title: Environmental quality technology demonstration and validation: Environmental Toolkit for Expeditionary Operations (USACE)</p> <p>Description: Conduct pilot-scale demonstration and validation studies to determine the effectiveness of basic technologies/methods developed for rapidly collecting environmental data in the field for the purposes of reducing impact of environmental requirements on installations. Demonstrate the ability of ETEO software to communicate easily with new, commercially available sensors through simple device driver (with minimal or no development). Assess available chemical databases on the new sensor for their ability to detect and quantify environmental contaminants. Demonstrate the operational ETEO software and sensors at designated locations.</p> <p>FY 2022 Plans: Will perform demonstrations of the ETEO sensor suite and software in austere locations. Will validate kits with USACE Forward Engineering Support Teams and National Guard units.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Completed task and finalized transition of product in FY22.</p>		0.505	0.539	-
<p>Title: Environmental quality technology demonstration and validation: Fate and Risk Evaluation System for Contaminants (FRESCO)</p>		0.798	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: FRESCO will ensure Solider readiness through reduction in training range down time. Validation of FRESCO will provide the capability to model and forecast contaminant fate and health risks associated with new military materials in the environment, pursuant to unfilled technology gap identified in DoD Instruction Number 4715.18.</p>			
<p>Title: Decontamination Effluent Treatment System (DETS) Demonstration/Validation (USACE)</p> <p>Description: Demonstrate and validate the Decontamination Effluent Treatment System (DETS), an optimized scalable system for the treatment of Chemical, Biological, Radioactive, & Nuclear (CBRN) decontamination wastewater, while exploring enhancements to improve performance.</p> <p>FY 2022 Plans: Will demonstrate Decontamination Effluent Treatment System and test it on simulants and actual chemical and radiological substrates. In addition, the DETS will be tested on biological constituents.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decontamination Effluent Treatment System (DETS) Demonstration/Validation (USACE) completed in FY22</p>	-	0.594	-
<p>Title: Engineered Technologies for Risk Mitigation and Management of Perfluorooctane Sulfonate and Perfluorooctanoic Acid (PFOS/PFOA) on Army Installations (USACE)</p> <p>Description: Demonstrate and validate technologies such as 3D printed composite structures and advanced materials for remediation and monitoring of PFAS, novel methods for PFAS destruction, rapid risk ?based classification and characterization computational models, and monitoring and extraction technologies including PFAS sensors.</p> <p>FY 2022 Plans: Will demonstrate capability of PFAS Effluent Treatment System (PETS) to decontaminate existing PFAS contaminated fire suppression infrastructure.</p> <p>FY 2023 Plans: Will validate PFAS Effluent Treatment System (PETS) to decontaminate existing PFAS contaminated fire suppression infrastructure and begin demonstration of capabilities such as Thermal Desorption, Soil Washing (Multiple Technologies) to effectively remove PFOS/PFOA contamination in a variety of matrices. Will Demonstrate PFOS/PFOA removal technologies across a variety of matrices comparing removal efficiency, cost balance, regulatory guidelines and limits of detection.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	0.400	4.190

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Increase in FY23 resources is to demonstrate Perfluorooctane sulfonic acid (PFOS) removal technology for additional Army installation for resources impacting readiness, affecting installation drinking water supplies, and impacting training lands.				
<p>Title: Carbon Sequestration Toolkit for DoD Lands (USACE)</p> <p>Description: Demonstrate and validate a comprehensive secure web-based toolkit for maximized carbon storage and management across the DOD landscape.</p> <p>FY 2023 Plans: Will demonstrate visualization model for carbon sequestration potential across DoD installation lands using spatial data, high-resolution data inputs, and terrain and soil analytics.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New effort selected to achieve the Army Climate Strategy goals.</p>		-	-	5.129
<p>Title: Standards for Additive Construction: Requirements, Assessment and Documentation (USACE)</p> <p>Description: Validate unified facility criteria and standards for additive construction of DoD infrastructure to meet structural, serviceability and resiliency requirements and evaluate the additive construction technology and materials for carbon reduction impacts.</p> <p>FY 2023 Plans: Will validate specifications and requirements for additive construction by conducting materials and structural testing with focus on meeting strength, serviceability and durability requirements.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase to demonstrate green construction technologies that assist the Army to achieve Climate Strategy goals.</p>		-	-	2.052
<p>Title: Mitigation of GHG Emissions for DOD Construction Materials and Infrastructure (USACE)</p> <p>Description: Demonstrate and validate sustainable and cost-effective DoD construction materials with 50% reduction in greenhouse gas emissions.</p> <p>FY 2023 Plans: Will evaluate drivers for embodied energy and provide action plans for criteria changes with positive quantifiable impacts on MILCON embodied energy.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	-	6.155

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding increase to demonstrate green construction technologies that help the Army achieve Climate Strategy goals.			
Title: FY 2022 SBIR/STTR Transfer	-	0.242	-
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	7.820	6.608	24.588

	FY 2021	FY 2022
Congressional Add: Program increase - wire-arc additive manufacturing (DEVCOM)	-	5.000
FY 2022 Plans: Congressional Interest Item		
Congressional Add: Environmental quality technology demonstration and validation: Congressional Add - High Pressure Waterjet Technology (USACE)	5.000	-
FY 2021 Accomplishments: Congressional Interest Item		
Congressional Adds Subtotals	5.000	5.000

C. Other Program Funding Summary (\$ in Millions)	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
• 06I: <i>Environmental Quality Technology Support</i>	0.428	0.444	0.491	-	0.491	0.306	-	-	-	0.000	1.669

Remarks

D. Acquisition Strategy
The project ultimately transitions successfully demonstrated environmental quality technologies to Army acquisition, industrial base and installation end users. All technology efforts address environmental requirements identified by the Army acquisition, industrial base and installation user communities. Efforts approved by senior Army environmental leadership receive Advanced Component Development and Prototype funding to fully demonstrate and validate the technology for transition to end users for follow on implementation.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603779A / Environmental Quality Tech nology - Dem/Val				E21 / Environmental Quality Technology Dem/Val								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.242	Mar 2022	-		-		-	0.000	0.242	-	
Subtotal			-	-		0.242		-		-		-	0.000	0.242	N/A	
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Conduct Demonstrations	MIPR	Varies : Varies	49.541	12.820	Oct 2020	6.366	Oct 2021	24.588	Oct 2022	-		24.588	Continuing	Continuing	Continuing	
Program Increase - Wire-arc additive manufacturing (DEVCOM)	TBD	TBD : TBD	-	-		5.000	Apr 2022	-		-		-	0.000	5.000	-	
Subtotal			49.541	12.820		11.366		24.588		-		24.588	Continuing	Continuing	N/A	
Project Cost Totals			49.541	12.820		11.608		24.588		-		24.588	Continuing	Continuing	N/A	
Remarks																

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>	

Event Name	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
Toxic Metals Reduction Demonstration/Validation	█				█				█																			
Airborne Lead Reduction Demonstration/Validation	█				█				█				█															
Insensitive Munitions (IM) Wastewater Treatment	█				█				█																			
Fate and Risk Evaluation System for Contaminants	█				█				█																			
Environmental Toolkit for Expeditionary Operations	█				█				█																			
Low Global Warming Potential Dem/Val	█				█				█				█															
Carbon Sequestration Toolkit for DoD Lands	█				█				█				█				█				█							
Standards for Additive Construction: Requirements, Assessment and Documentation	█				█				█				█				█				█							
Mitigation of GHG Emissions for DOD Construction Materials and Infrastructure	█				█				█				█				█				█							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>Environmental Quality Technology Dem/Val</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Toxic Metals Reduction Demonstration/Validation	1	2015	4	2023
Airborne Lead Reduction Demonstration/Validation	1	2015	4	2024
Insensitive Munitions (IM) Wastewater Treatment	1	2019	4	2022
Fate and Risk Evaluation System for Contaminants	1	2020	4	2021
Environmental Toolkit for Expeditionary Operations	1	2020	4	2022
Low Global Warming Potential Dem/Val	1	2019	4	2024
Carbon Sequestration Toolkit for DoD Lands	1	2023	4	2027
Standards for Additive Construction: Requirements, Assessment and Documentation	1	2023	4	2027
Mitigation of GHG Emissions for DOD Construction Materials and Infrastructure	1	2023	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603790A / NATO Research 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	-	4.589	3.777	3.805	-	3.805	3.875	3.926	3.980	4.056	0.000	28.008
691: <i>NATO Rsch & Devel</i>	-	4.589	3.777	3.805	-	3.805	3.875	3.926	3.980	4.056	0.000	28.008

A. Mission Description and Budget Item Justification

This Project implements the provisions of Title 10 United States (U.S.) Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the U.S. and our cooperative partners, including the North Atlantic Treaty Organization (NATO), U.S. major non-NATO allies and Friendly Foreign countries through technology sharing and joint equipment development, thereby reducing U.S. acquisition costs. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The Project focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Activities are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the U.S. work share that occurs in the United States at U.S. Government and U.S. contractor facilities.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	4.589	3.777	0.000	-	0.000
Current President's Budget	4.589	3.777	3.805	-	3.805
Total Adjustments	0.000	0.000	3.805	-	3.805
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.805	-	3.805

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel
--	---	---

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
691: NATO Rsch & Devel	-	4.589	3.777	3.805	-	3.805	3.875	3.926	3.980	4.056	0.000	28.008
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project implements the provisions of Title 10 United States (U.S.) Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the U.S. and our cooperative partners, including the North Atlantic Treaty Organization (NATO), U.S. major non-NATO allies and Friendly Foreign countries through technology sharing and joint equipment development, thereby reducing U.S. acquisition costs. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The Project focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Activities are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the U.S. work share that occurs in the United States at U.S. Government and U.S. contractor facilities.

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

	FY 2021	FY 2022	FY 2023
Title: Armaments Cooperation Enterprise Support	3.436	2.486	2.834
Description: Armaments Cooperation Enterprise Support/ International Online (IOL) Development and Implementation NATO/ International Cooperative R&D (AR 70-41) and International Acquisition (AR 70-1, AR 70-3). The goal of this activity is to expand worldwide allied standardization and interoperability through cooperative Research and Development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. The execution AR 70-41 responsibilities requires DASA (DE&C) to conduct engagement with key strategy foreign partners in all regions of the world through the SNR(A) program, international agreement negotiations, and other bilateral and multilateral forums involving DASA (DE&C) personnel. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the NATO Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding.			
FY 2022 Plans: Promotes more equitable sharing of International Cooperative conventional R&D costs through cooperative projects. Provides funds to conduct cooperative R&D projects, under international cooperative research, development and acquisition (ICRDA) agreements (MOU or Project Agreement/Arrangement [PA]), on defense equipment and munitions with NATO, NATO			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>organizations, major non-NATO allies, and other friendly foreign countries with senior representatives. Supports 9 CMEs with Armaments Cooperation Support with munitions, weapons, aviation and armaments.</p> <p>FY 2023 Plans: Supports 9 CMEs with Armaments Cooperation Support with munitions, weapons, aviation and armaments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is based on increased requirements and inflation.</p>				
<p>Title: Communications Interoperability, and Electronics Technologies</p> <p>Description: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leveraged national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>FY 2022 Plans: Include efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>FY 2023 Plans: Include efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is based on increased requirements and inflation.</p>		0.266	0.266	0.273
<p>Title: Senior National Representatives (Army) (SNR-(A))</p> <p>Description: Senior National Representatives (Army) (SNR-(A)) Projects (Partners: France, Germany, United Kingdom and Italy): Supports harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road-mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group 6, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability</p>		0.028	0.028	0.028

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
of participating NATO nations with a view to assisting future operational and materiel interoperability. Army support of NAAG studies, analysis and technology demonstrations.				
<p>FY 2022 Plans: Funds will be used to pursue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs.</p> <p>FY 2023 Plans: Funds will be used to pursue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs.</p>				
<p>Title: Weapons and Munitions Technologies</p> <p>Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2022 Plans: Weapons and munitions technologies (Partners: France, Germany, Italy, UK): The Participants in this program will develop an automated software interface between their national field artillery command and control systems. The nations will be able to receive and provide mutual fire support (i.e. cannon and rocket fire) in combined operations more rapidly and with minimal errors.</p> <p>FY 2023 Plans: The nations will be able to receive and provide mutual fire support (i.e. cannon and rocket fire) in combined operations more rapidly and with minimal errors</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is based on increased requirements and inflation</p>		0.214	0.214	0.219
<p>Title: Ground Systems Technologies</p> <p>Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility</p>		0.214	0.214	0.120

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2022 Plans: FY 2022 funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.</p> <p>FY 2023 Plans: funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is based on a projected slight decline in requirements.</p>				
<p>Title: Aviation Systems Technologies</p> <p>Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2022 Plans: FY 2022 funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).</p> <p>FY 2023 Plans: funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is based on a projected slight decline in requirements.</p>		0.431	0.431	0.331
<p>Title: FY22 SBIR/STTR Transfer</p>		-	0.138	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel
--	---	---

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: \$121K = SBIR Title 15 USC ?638(f)(1) \$17K = STTR Title 15 USC ?638(n)(1)(A)			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	4.589	3.777	3.805

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

Remarks

D. Acquisition Strategy
Acquisition Strategy:
The goal of this program is to expand worldwide allied standardization interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the of the U.S. Army.
All projects are test or technical demonstrations to feed into potential new requirements in support of Army Transformation to the Future Force or as product improvements to the Current Force.

List of the programs curently in place:
Communications, Interoperability, and Electronics Technologies
The goal of this project is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts under this project include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes projects formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.

Aviation Systems Technologies
The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel
--	---	---

superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.

Ground Systems Technologies

The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.

Weapons and Munitions Technologies

The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.

Armaments Cooperation Enterprise Support

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

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Development
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Armaments Cooperation Enterprise Support	MIPR	DASA DEC HQDA : Ft Belvoir, VA	0.010	-		-		-		-		-	0.000	0.010	-
Weapons and Munitions	TBD	CECOM : Aberdeen Proving Ground, MD	0.008	-		-		-		-		-	0.000	0.008	-
Communications Interoperability and Electronic Technologies Interoperability	MIPR	SPAWAR : Various	0.010	-		-		-		-		-	0.000	0.010	-
Ground Systems Technologies	MIPR	TARDEC : Warren, MI	0.010	-		-		-		-		-	0.000	0.010	-
Chemical and Biological Technologies	MIPR	Aberdeen Proving Ground : MD	0.010	-		-		-		-		-	0.000	0.010	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.138		-		-		-	0.000	0.138	-
Subtotal			0.048	-		0.138		-		-		-	0.000	0.186	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Missiles and Rocket Technologies	MIPR	APG, Redstone Arsenal : MD, AL	0.100	-		-		-		-		-	0.000	0.100	-
Communications, Interoperability, and Electronics Technologies	MIPR	CECOM, JTRS, COALWNW, JTNC, SPAWAR : San Diego, CA, various	0.529	-		-		-		-		-	0.000	0.529	-
Weapons and Munitions	Various	ARDEC, PEO AMMO, PM-CAS : VARIOUS	0.752	-		-		-		-		-	0.000	0.752	-
Aviation Systems Technologies	Various	AMRDEC : RED STONE, VARIOUS	0.175	-		-		-		-		-	0.000	0.175	-
Ground Systems Technology	FFRDC	Various : Various	0.125	-		-		-		-		-	0.000	0.125	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Development
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SNR(A)	C/TBD	ARDEC: Arlington, VA : Various	9.012	-		-		-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.118	-		-		-		-		-	0.000	0.118	-
Subtotal			10.811	-		-		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Armaments Cooperation Enterprise Support	C/FFP	LSS/GDIT : Fairfax, VA	11.033	2.357		2.486		2.834		-		2.834	Continuing	Continuing	Continuing
Missiles and Rocket Technologies	MIPR	APG, Redstone Arsenal : MD, AL	1.595	0.785		-		-		-		-	0.000	2.380	-
Communications, Interoperability, and Electronics Technologies	MIPR	Joint Tactical Radio (JTRS), JTNC, COALWNW, SPAWAR, CERDEC, ARDEC W1DF : San Diego, CA, Red Stone Arsenal	1.707	0.395		0.266		0.273		-		0.273	Continuing	Continuing	Continuing
Aviation Systems Technologies	MIPR	RDECOM/ AMRDEC : Red Stone Arsenal	1.558	0.395		0.431		0.331		-		0.331	Continuing	Continuing	Continuing
Ground Systems Technology	MIPR	TARDEC : Various	0.478	-		0.214		0.120		-		0.120	Continuing	Continuing	Continuing
Weapons and Munitions	Various	CECOM, ARDEC, AMMO, PEO C3T : Aberdeen Proving Ground, Various	2.284	0.657		0.214		0.219		-		0.219	Continuing	Continuing	Continuing
Soldier Technologies	TBD	Various : Various	0.346	-		-		-		-		-	0.000	0.346	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603790A / NATO Research and Development				691 / NATO Rsch & Development							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNR(A)	C/TBD	ARL, HQDA, JCGISR: Army : Various	2.318	-		0.028		0.028		-		0.028	Continuing	Continuing	Continuing
Chemical & Biological Defense Technologies	MIPR	ECBC : Edgewood, Aberdeen, MD	0.270	-		-		-		-		-	0.000	0.270	-
Subtotal			21.589	4.589		3.639		3.805		-		3.805	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Communications, Interoperability, and Electronics Technologies	Various	JTRN, JTNC, COALWNW, CERDEC, NIGHT VISION : SPAWAR	0.444	-		-		-		-		-	0.000	0.444	-
Weapons and Munitions	TBD	ARDEC, PEO AMMO, ASCA : Various	0.200	-		-		-		-		-	0.000	0.200	-
Aviation Systems Technologies	TBD	RDECOM, AMRDEC : RED STONE	0.080	-		-		-		-		-	0.000	0.080	-
Ground Systems Technologies	MIPR	TARDEC : Various	0.050	-		-		-		-		-	0.000	0.050	-
Subtotal			0.774	-		-		-		-		-	0.000	0.774	N/A
Project Cost Totals			33.222	4.589		3.777		3.805		-		3.805	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army					Date: April 2022				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development			Project (Number/Name) 691 / NATO Rsch & Devel			

	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																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
N/A	1	2017	4	2017

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603801A / <i>Aviation - Adv Dev</i>
---	---

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	-	694.296	1,178.460	1,162.344	-	1,162.344	1,221.900	1,738.159	1,490.745	1,843.447	Continuing	Continuing
B47: <i>Future Vertical Lift</i>	-	213.538	521.412	210.194	-	210.194	1,023.681	1,030.448	689.392	738.781	Continuing	Continuing
CK7: <i>FARA Ecosystem</i>	-	-	21.986	28.794	-	28.794	29.767	30.631	31.564	31.871	0.000	174.613
CS7: <i>FLRAA MTA</i>	-	-	-	483.441	-	483.441	16.885	6.880	-	-	0.000	507.206
F12: <i>Future Attack Reconnaissance Aircraft</i>	-	480.758	635.062	439.915	-	439.915	151.567	670.200	769.789	1,072.795	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Funding Line directly aligns to the Future Vertical Lift (FVL) Army Modernization Priority. Future Vertical Lift (FVL) is an initiative to develop a family of vertical lift aircraft for the United States Armed Forces. The Department of Defense (DOD) established FVL to focus vertical lift capabilities and technology development as well as retain long-term industrial base capabilities. The Deputy Secretary of Defense issued the FVL Strategic Plan in 2012 to outline a joint approach for the next generation vertical lift aircraft for all military services. The Strategic Plan provided a foundation for replacing the current fleet with advanced capability by shaping the development of vertical lift aircraft for the next 25 to 40 years. In Fiscal Year (FY) 2017, the Army identified FVL as one of the Army's six modernization priorities, and established the FVL Cross Functional Team. The FVL objectives are increased vertical lift maneuverability, range, speed, payload, survivability, and reliability while reducing the logistics footprint. This capability will provide critical vertical lift aviation capability in multi-domain operations to the joint warfighter and maneuver force.

The Future Long Range Assault Aircraft (FLRAA) program pursues FVL Capability Set 3 (CS3) and provides Combatant Commanders with deterrence, power projection, and tactical capabilities at operational and strategic distances. The Army plans to competitively award the weapon system development contract in FY 2022, using a hybrid acquisition approach. The FY 2022 contract award initiates Rapid Prototyping effort to execute a preliminary design and development of FLRAA Virtual Prototype, using Middle Tier Acquisition (MTA) authorities.

The total cost of the FLRAA Middle Tier of Acquisition effort is \$617.10 million RDT&E from FY22 to FY25. FLRAA MTA is fully funded across the Future Years Defense Program.

The Future Attack Reconnaissance Aircraft (FARA) Capability Set 1 (CS1) is a critical Army Aviation priority and will restore attack/reconnaissance dominance by mitigating enemy long range capabilities by creating lethal effects from outside enemy sensor/weapons range and allowing joint force commanders to maneuver from relative sanctuary.

Both FLRAA and FARA variants will integrate advanced technologies, using a modular open systems approach, and design configurations with appropriate trades to ensure affordability.

This resourcing funds both FLRAA and FARA.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603801A / <i>Aviation - Adv Dev</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	694.296	1,125.641	0.000	-	0.000
Current President's Budget	694.296	1,178.460	1,162.344	-	1,162.344
Total Adjustments	0.000	52.819	1,162.344	-	1,162.344
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-29.681			
• Congressional Rescissions	-	-			
• Congressional Adds	-	82.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	1,162.344	-	1,162.344

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

Project: B47: Future Vertical Lift

Congressional Add: *Competitive Demonstration Risk Reduction*

Congressional Add: *University Partnership and Model Based System Engineering*

Congressional Add: *FLRAA Program Increase*

Congressional Add Subtotals for Project: B47

Project: F12: Future Attack Reconnaissance Aircraft

Congressional Add: *FARA All Electrical Flight Controls*

Congressional Add Subtotals for Project: F12

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	90.500	-
	5.000	-
	-	77.500
Congressional Add Subtotals for Project: B47	95.500	77.500
	-	5.000
Congressional Add Subtotals for Project: F12	-	5.000
Congressional Add Totals for all Projects	95.500	82.500

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift			
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
B47: Future Vertical Lift	-	213.538	521.412	210.194	-	210.194	1,023.681	1,030.448	689.392	738.781	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Future Vertical Lift (FVL) Project's funding provides for the development of a Future Long Range Assault Aircraft (FLRAA) Capability Set Three weapon system within the FVL family of systems. FLRAA will conduct air assault, urban assault/security, maritime interdiction, medical evacuation, humanitarian assistance/disaster relief, tactical resupply, direct action, noncombatant evacuation operation, and combat search and rescue operations. FLRAA will support the Army, including Special Operations Command (USSOCOM) and the Joint Force, in a contested, near peer threat environment. The FLRAA weapon system will retain the Army's ability to project combat power with transformational increases in range, speed, mobility, and payload over current Army and USSOCOM aircraft.

FLRAA achieved a Materiel Development Decision approval in October 2016 and the Office of Secretary of Defense granted a sufficiency determination of the Analysis of Alternatives (AoA) in July 2019.

The Fiscal Year (FY) 2023 budget request funds the initiation of the of the FLRAA weapon system detailed design to include development of a digital backbone architected to meet Modular Open System Architecture (MOSA) objectives, procurement of prototype long lead materiel, and the initiation of developmental prototype assembly and integration for qualification and test.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering Services / Research Studies	109.941	365.709	21.349
Description: Provide engineering research, planning, modeling, and analysis. Perform Competitive Demonstration and Risk Reduction (CD&RR), Model Based System Engineering (MBSE) and design reviews. Document and review analysis supporting the FLRAA acquisition program. Continue effort to support enterprise data modeling to include MBSE, and MOSA efforts such as Key Interface Logical Architecture (KILA) updates. Continue to process updates for safety and cyber initiatives. Support development of Milestone B documentation.			
FY 2022 Plans: Continue MOSA efforts, complete CD&RR Phase II effort; support the SSEB, and award the Weapon Systems Development contract.			
FY 2023 Plans: Support engineering changes associated with refined requirements, continue studies and analyses to refine MOSA architectures, further enable MBSE in the Digital Environment, and develop Milestone B documentation.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Funding decreased from FY22 to FY23 due to the completion of the CD&RR efforts with two Project Agreement Holders (PAHs) currently accounted for in Engineering Services/Research Studies. Efforts will transition to the execution of the Weapons System Development Contract in 4QFY22 down selecting to one vendor. MTA-related efforts are accounted for in the Middle Tier Acquisition (MTA) Preliminary Design and Virtual Prototype Rapid Prototyping FY22 accomplishment, realigned to a separate Project CS7 in FY23.</p> <p>Title: Program Management</p> <p>Description: Oversight and Management of the FLRAA acquisition program. Program analysis of affordability, program performance, and schedule to ensure support of the Army mission. Guide, direct and manage program efforts through development phases of the lifecycle.</p> <p>FY 2022 Plans: Continue efforts to refine affordability, execute CD&RR Phase II effort, execute and complete SSEB, and award the Weapon Systems Development contract.</p> <p>FY 2023 Plans: Manage the execution of the Weapon System Development Contract and support efforts to achieve Milestone B Decision.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase supports the overall program growth and provides for necessary oversight and support requirements associated with the preparation, planning, management analysis and reviews needed to achieve a Milestone B decision.</p>		4.780	11.783	12.172
<p>Title: Supportability Analysis and Acquisition Support</p> <p>Description: Acquisition and supportability research, planning, modeling, analysis, documentation and reviews supporting the FLRAA acquisition program. Early design influence analysis to assess operational durability; emphasizing digital data thread, active health state awareness in Condition Based Maintenance (CBM+), and optimized human system interface for ease of operations and maintenance.</p> <p>FY 2022 Plans: Integrate supportability within Model-Based Systems Engineering design process and the modeling/simulations to influence requirements. Continue to expand the robustness of government baseline models; merging with both Model Base System Engineering (MBSE) and the Program Office Estimate (POE) / Independent Government Cost Estimate (IGCE) , and comparative evaluation of system design and support alternatives.</p> <p>FY 2023 Plans:</p>		3.317	4.048	3.929

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue integration of supportability modeling and analysis in direct support of Weapon System Development execution and supporting Milestone B decision, and operationalize the sustainment vision using a digital thread across the life cycle including design, build, and maintenance phases of the weapons system life cycle. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease from FY22 to FY23 to adjusting support for Weapon System Development efforts				
Title: Middle Tier Acquisition (MTA) Preliminary Design and Virtual Prototype Rapid Prototyping Description: The Preliminary Design and MTA Virtual Prototype Rapid Prototyping effort is executed under the Weapon System Development Base contract scoped to complete the system preliminary design and develop two FLRAA virtual prototypes consisting of a FLRAA Vehicle Dynamics Model (VDM) and a FLRAA Portable Crewstation (FPC) to support system and subsystem analysis and testing. FY 2022 Plans: Initiate the preliminary design and virtual prototype efforts of the Weapon Systems Development contract. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease from FY22 to FY23 reflects the transition of the FLRAA MTA efforts to Project CS7.		-	16.970	-
Title: Prototype Material and Manufacturing Development Description: Purchasing of materials required to meet EMD prototype delivery schedules and detailed design in support of Critical Design Review. FY 2022 Plans: Initiate material buy FY 2023 Plans: Support material acquisition for FLRAA EMD prototypes three through six, begin detailed design development engineering efforts, and begin integrating the first two FLRAA prototypes in support of developmental testing. FY 2022 to FY 2023 Increase/Decrease Statement: Increased material purchasing to support additional prototype aircraft builds and initiating Weapon System Development detailed design work.		-	29.199	172.744
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Description: SBIR/STTR amount in accordance with Title 15 USC 638. FY 2022 Plans:		-	16.203	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
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.			
Accomplishments/Planned Programs Subtotals	118.038	443.912	210.194

	FY 2021	FY 2022
Congressional Add: Competitive Demonstration Risk Reduction <i>FY 2021 Accomplishments:</i> Support execution of Competitive Demonstration Risk Reduction and MOSA efforts.	90.500	-
Congressional Add: University Partnership and Model Based System Engineering <i>FY 2021 Accomplishments:</i> Support Model Based System Engineering	5.000	-
Congressional Add: FLRAA Program Increase <i>FY 2022 Plans:</i> Increase supports extension of Competitive Demonstration Risk Reduction (CDRR) efforts. Additional risk reduction activities mitigate preliminary design risks to include subsystem and component-level risk reduction, MOSA architecture implementation; and cybersecurity. Increase supports mission systems Government Furnished Equipment (GFE) required for Weapon System Development (WSD) contract efforts aimed to mitigate schedule risk.	-	77.500
Congressional Adds Subtotals	95.500	77.500

C. Other Program Funding Summary (\$ in Millions)			FY 2023	FY 2023	FY 2023					Cost To	
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Complete</u>	<u>Total Cost</u>
• A12002: Future Long Range Assault Aircraft (FLRAA)	-	-	0.000	-	0.000	-	-	224.993	849.391	Continuing	Continuing
• CS7: FLRAA MTA	-	-	483.441	-	483.441	16.885	6.880	-	-	0.000	507.206

Remarks
 Program Element 0603465A Future Vertical Lift Advanced Technology includes Joint Multi-Role Technology Demonstration (JMR-TD); supported flying demonstrator activities providing knowledge transfer from flight test, data analysis, Soldier touch points, and risk reduction activities to the FLRAA program.

Project CS7 includes all FLRAA MTA efforts from FY 2023 and beyond, which was initiated as a planned accomplishment under Project B47 in FY 2022.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
--	--	--

D. Acquisition Strategy

The Army is executing a hybrid acquisition approach to design, develop, and deliver the FLRAA weapons system. In order to support the Army's modernization strategy and concept for multi-domain operations, the FLRAA program will deliver a first unit equipped in FY 2030. This hybrid approach builds on the JMR-TD efforts (ongoing since 2013); the Army's AoA (completed in July 2019); and multiple ongoing risk mitigation efforts.

The Army's risk mitigation activities ahead of the Weapon System Development include: (1) additional conceptual design and flight envelope expansion tasks on the existing JMR-TD TIA; (2) MOSA, FVL Architecture Collaboration Working Group (with participation from industry and academia) to establish a common architecture requirements framework for FLRAA and FARA system development; and (3) a CD&RR effort, awarded to two PAHs, using an Aviation Missile and Technology Consortium (AMTC) Other Transaction Authority (OTA) agreements to provide substantiating technical documentation on weapon system designs, requirements decompositions, trade-studies, and requirements feasibility for the FLRAA Weapon System Development.

These risk reduction activities have maintained industry engagement and momentum from the JMR-TD S&T program, inform capabilities and system requirements, and provided initial trade assessments for the final operational requirements. They also informed the final acquisition strategy, mature the Government's architecture requirements development, and transition appropriate S&T data and technologies to the PoR. CD&RR Phase II incorporates efforts leading to preliminary design using a digital engineering environment. In FY 2022, the Army plans to competitively award the Weapon System Development contract to one vendor with a hybrid acquisition approach. This approach includes the opportunity to employ new DoDI 5000.80 (Operation of the Middle Tier Acquisition (MTA)) authorities along with a tailored DoDI 5000.85 (Major Capability Acquisition) acquisition strategy.

Finally, the Army is also addressing life cycle affordability, sustainability, and maintainability early in the program. The FLRAA program is employing multiple strategies including: should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling. Additionally, FLRAA is one of the Army's pilot programs for life cycle intellectual property and data strategy development.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Various : Redstone Arsenal, AL	8.609	4.780	Dec 2020	11.783	Dec 2021	1.784	Dec 2022	-		1.784	Continuing	Continuing	Continuing
Program Management-Consolidated Support Contract	C/TBD	TBD : Redstone Arsenal, AL	-	-		-		5.916	Mar 2023	-		5.916	Continuing	Continuing	-
Program Management-Services Support	Various	Various : Redstone Arsenal, AL	-	-		-		4.472	May 2023	-		4.472	Continuing	Continuing	-
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		16.203		-		-		-	0.000	16.203	-
Subtotal			8.609	4.780		27.986		12.172		-		12.172	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Preliminary Design and Virtual Prototype Rapid Prototyping	C/TBD	TBD : TBD	-	-		16.970	Aug 2022	-		-		-	0.000	16.970	-
Prototype Material and Manufacturing Development	C/TBD	Various : Various	-	-		45.707	Aug 2022	172.744	Nov 2022	-		172.744	Continuing	Continuing	-
Subtotal			-	-		62.677		172.744		-		172.744	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Acquisition and Supportability Analysis	C/Various	Army Materiel Command / Army Contracting Command/Army Future Command : Redstone Arsenal, AL	6.266	3.317	Nov 2020	4.048	Nov 2021	3.929	Nov 2022	-		3.929	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
--	--	--

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
University Partnership / Model Based System Engineering (MBSE)	C/Various	Various : Various	5.000	5.000	Mar 2021	-		-		-		-	0.000	10.000	-
Engineering Services/ Competitive Demonstration Risk Reduction - Other	C/CS	Advanced Technology International; Sikorsky Aircraft Corp; Bell Textron Inc : Summerville, SC; Stratford, CT; Fort Worth, TX	75.600	174.265	Mar 2021	365.219	Nov 2021	-		-		-	0.000	615.084	-
Engineering Services / Research Studies - Other	Various	Various : Huntsville, AL	0.512	23.908	Mar 2021	8.173	Nov 2021	8.242	Nov 2022	-		8.242	Continuing	Continuing	Continuing
Engineering Services / Research Studies - Organic	MIPR	Various : Redstone Arsenal, AL	10.375	2.268	Feb 2021	5.910	Mar 2022	-		-		-	Continuing	Continuing	Continuing
Engineering Services / Research Studies - Other	C/Various	Various : Various	13.908	-		47.399	Dec 2021	-		-		-	Continuing	Continuing	Continuing
Engineering Services / Research Studies - Collaborative Efforts	MIPR	Aviation Missile Command : Huntsville, AL	-	-		-		5.435	Jan 2023	-		5.435	0.000	5.435	-
FY 2023 FLRAA PoR SBIR/STTR Transfer	TBD	Various : Various	-	-		-		7.672	Oct 2022	-		7.672	0.000	7.672	-
Subtotal			111.661	208.758		430.749		25.278		-		25.278	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		120.270	213.538	521.412	210.194	-	210.194	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
---	---	---

Event Name	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
System Specification Development	[Redacted]																											
	<i>System Spec Dev</i>																											
Program Documentation and Contracts Requirements Package	[Redacted]																											
	<i>Program Documentation & CRP</i>																											
Architecture Definition and Risk Reduction	[Redacted]																											
	<i>Architecture Definition and Risk Reduction</i>																											
Competitive Demonstration and Risk Reduction	[Redacted]																											
	<i>Competitive Demonstration and Risk Reduction</i>																											
Request for Proposal Release				▲ 1																								
				<i>RFP Release</i>																								
Proposal Preparation				■																								
				<i>Proposal Prep</i>																								
Source Selection Evaluation Board																												
Contract Award																												
Virtual Prototyping (MTA)																												
Preliminary Design (MTA) and Detail Design																												
Prototype Builds																												
Prototype Deliveries																												
Flight Testing																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Development Decision	1	2017	1	2017
Analysis of Alternatives	3	2017	4	2019
System Specification Development	2	2019	3	2021
Program Documentation and Contracts Requirements Package	2	2019	3	2021
Architecture Definition and Risk Reduction	3	2019	4	2026
Competitive Demonstration and Risk Reduction	2	2020	4	2022
Request for Proposal Release	4	2021	4	2021
Proposal Preparation	4	2021	4	2021
Source Selection Evaluation Board	4	2021	4	2022
Contract Award	4	2022	4	2022
Virtual Prototyping (MTA)	4	2022	4	2022
Preliminary Design (MTA) and Detail Design	4	2022	1	2025
Prototype Builds	3	2023	2	2026
Prototype Deliveries	3	2025	2	2028
Flight Testing	3	2025	4	2029

Note

Virtual Prototyping Middle Tier Acquisition (MTA) is funded in B47 for FY 2022 and realigns to Project CS7 in FY 2023.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CK7 / FARA Ecosystem			
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
CK7: FARA Ecosystem	-	-	21.986	28.794	-	28.794	29.767	30.631	31.564	31.871	0.000	174.613
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort was previously funded under the Future Attack Reconnaissance Aircraft (FARA) Project F12 and has been restructured to a unique Project to better support the cross-cutting capabilities demonstrated within this Project and provide transparency in modernization efforts.

A. Mission Description and Budget Item Justification

The Future Vertical Lift (FVL) Project's funding builds upon prior demonstrations and provides for early opportunities to validate technologies and requirement concepts and to off-ramp, maintain, or accelerate investments, which enable modernization at the speed of relevance.

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

	FY 2021	FY 2022	FY 2023
Title: FARA Ecosystems	-	21.183	28.794
Description: Funding for FARA Ecosystem supports prototyping demonstration with relevant technologies in a Joint All Domain Operations environment, which will inform FVL requirements including FARA, FLRAA, MOSA, and Air Launched Effects (ALE) and enable timely decisions to accelerate capabilities, develop new capabilities, or defer development based on actual demonstration outcomes and user feedback. The Army's Experimental Demonstration Gateway Event (EDGE) and Project Convergence will serve as the culminating events for FARA Ecosystem demonstrations.			
FY 2022 Plans: Continues FARA Ecosystem prototyping demonstration activities, previously conducted under Project F12, through primary surrogate platforms with multiple technologies to enable early opportunity to validate technologies and requirement concepts and to off-ramp, maintain, or accelerate investments in areas of interoperability, mission equipment, architecture, automation, autonomy, and interfaces (A3I), kinetic and non-kinetic effects, and sensors. Demonstration activities will include early Soldier touch points which will enable early feedback to inform requirements and concepts.			
FY 2023 Plans: Continues FVL Ecosystem prototyping demonstration activities through primary surrogate platforms with multiple technologies. Transitions available S&T items directly into prototyping and operationally relevant demonstration activities. Continues prototyping and demonstration of architecture, automation, autonomy, and interfaces (A3I), kinetic and non-kinetic effects, and sensors. Conducts Soldier touch points to facilitate early feedback to inform requirements and concepts.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CK7 / FARA Ecosystem
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to inflationary adjustments.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)	-	0.803	-
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.			
Accomplishments/Planned Programs Subtotals	-	21.986	28.794

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• F12: Future Attack Reconnaissance Aircraft	480.758	635.062	439.915	-	439.915	151.567	670.200	769.789	1,072.795	Continuing	Continuing

Remarks

D. Acquisition Strategy
The FVL CFT will utilize a number of U.S. Army Combat Capability Development Centers, Other Government Agencies, Test Centers, Project Management Offices and their respective procurement and scope execution instruments to execute capability demonstrations to assess the viability of technology and inform the Ecosystems requirements and concepts.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CK7 / FARA Ecosystem
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR	TBD	Various : Various	-	-		0.803	Apr 2022	-		-		-	0.000	0.803	-
Subtotal			-	-		0.803		-		-		-	0.000	0.803	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FARA Ecosystem Demonstration	Various	Multiple : Multiple	-	-		21.183	Nov 2021	28.794	Nov 2022	-		28.794	Continuing	Continuing	Continuing
Subtotal			-	-		21.183		28.794		-		28.794	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		-	-	21.986	28.794	28.794	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CK7 / FARA Ecosystem
--	--	--

Event Name	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				
FVL Acquisition Informed by Risk and Technology Opportunities																																
FY22 Experimental Demonstration Gateway Event					1 EDGE Demo																											
FY22 Project Convergence									2 PC Demo																							
FY23 Experimental Demonstration Gateway Event													3 EDGE Demo																			
FY23 Project Convergence													4 PC Demo																			
FY24 Experimental Demonstration Gateway Event																	5 EDGE Demo															
FY24 Project Convergence																	6 PC Demo															
FY25 Experimental Demonstration Gateway Event																					7 EDGE Demo											
FY25 Project Convergence																					8 PC Demo											
FY26 Experimental Demonstration Gateway Event																									9 EDGE Demo							
FY 26 Project Convergence																									10 PC Demo							
FY 27 Experimental Demonstration Gateway Event																													11 EDGE Demo			
FY 27 Project Convergence																													12 PC			

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CK7 / FARA Ecosystem
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FVL Acquisition Informed by Risk and Technology Opportunities	2	2022	4	2027
FY22 Experimental Demonstration Gateway Event	3	2022	3	2022
FY22 Project Convergence	4	2022	4	2022
FY23 Experimental Demonstration Gateway Event	3	2023	3	2023
FY23 Project Convergence	4	2023	4	2023
FY24 Experimental Demonstration Gateway Event	3	2024	3	2024
FY24 Project Convergence	4	2024	4	2024
FY25 Experimental Demonstration Gateway Event	3	2025	3	2025
FY25 Project Convergence	4	2025	4	2025
FY26 Experimental Demonstration Gateway Event	3	2026	3	2026
FY 26 Project Convergence	4	2026	4	2026
FY 27 Experimental Demonstration Gateway Event	3	2027	3	2027
FY 27 Project Convergence	4	2027	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) CS7 / FLRAA MTA			
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
CS7: FLRAA MTA	-	-	-	483.441	-	483.441	16.885	6.880	-	-	0.000	507.206
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The FLRAA MTA was initiated under PE 0603801A/B47 - Future Vertical Lift in FY 2022 and was restructured into the unique Project CS7 for FY 2023 through the remainder of the MTA Program.

A. Mission Description and Budget Item Justification

The Army's use of Middle Tier of Acquisition (MTA) authorities for Future Long Range Assault Aircraft (FLRAA) transitions work completed during the Competitive Demonstration and Risk Reduction effort to support three priority efforts: (1) completion of the rapid prototyping for the delta Preliminary Design Review; (2) deliver two virtual prototypes including a vehicle dynamic model and portable crewstation; and (3) support the requirements for Milestone B certification under 10 U.S.C. 2366b.

Funds will provide for the completion of the FLRAA weapon system preliminary design to include development of a digital backbone architecture to meet modular open system approach (MOSA) objectives. The development and delivery of two virtual prototypes will directly support early user involvement at the Air Maneuver Battle Lab (AMBL), the Combat Aviation Brigade Architecture Integration Lab (CABAIL), and also support system and subsystem analysis and testing.

The total cost of the FLRAA Middle Tier of Acquisition effort under this Project is \$617.10 million RDT&E from FY23 to FY25. The remainder of the FLRAA MTA is fully funded across the Future Years Defense Program.

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

	FY 2021	FY 2022	FY 2023
Title: Middle Tier of Acquisition (MTA) Preliminary Design and Virtual Prototype Rapid Prototyping	-	-	483.441
Description: The FLRAA MTA program supports finalization of the preliminary design through execution of the delta Preliminary Design Review (dPDR) to complete any outstanding tasks required to ensure any deficiencies identified during the Competitive Demonstration and Risk Reduction (CD&RR) effort are addressed, preliminary designs are sufficiently documented, and all mission system solutions are identified and incorporated into the design. Additionally, MTA efforts support design and development of two FLRAA virtual prototypes consisting of a FLRAA Vehicle Dynamics Model (VDM) and a FLRAA Portable Crewstation (FPC) to support system and subsystem analysis, testing, and training.			
FY 2023 Plans: Completes delta Preliminary Design Review work initiated under Project B47 and continues work on the FLRAA Virtual Prototypes.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 funding increased from \$0.000M to \$483.441M to complete the delta Preliminary Design Review work required to support a Milestone B decision. The FLRAA MTA was initiated under PE 0603801A/B47 - Future Vertical Lift in FY 2022 and was restructured into the unique Project CS7 for FY 2023.			
Accomplishments/Planned Programs Subtotals	-	-	483.441

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
• B47: Future Vertical Lift	213.538	521.412	210.194	-	210.194	1,023.681	1,030.448	689.392	738.781	Continuing	Continuing

Remarks
The FLRAA MTA was initiated under PE 0603801A/B47 - Future Vertical Lift in FY 2022 and was restructured into the unique Project CS7 for FY 2023 through the remainder of the MTA Program.

D. Acquisition Strategy
The Future Long Range Assault Aircraft (FLRAA), Future Vertical Lift (FVL) Capability Set Three (CS3) is the program that will develop the next generation of affordable vertical lift tactical assault / utility aircraft for the Army.

The FLRAA MTA program supports finalization of the preliminary design through execution of the delta Preliminary Design Review (dPDR) to complete any outstanding tasks required to ensure any deficiencies identified during the Competitive Demonstration and Risk Reduction (CD&RR) effort are addressed, preliminary designs are sufficiently documented, and all mission system solutions are identified and incorporated into the design. Additionally, FLRAA MTA efforts support design and development of FLRAA virtual prototypes consisting of a FLRAA VDM and a FPC. The VDM will be used in conjunction with an FPC prototype simulator integrated within the CABAIL and the AMBL capabilities. The VDM will perform hardware-in-the-loop tests during the design phase for early validation by offline simulation; conduct early Tactics, Techniques, and Procedures (TTPs) experimentation prior to user evaluations; and to participate in Army warfighting exercises for development of Multi-Domain Operation doctrine and concepts.

The follow-on physical weapons system development will leverage the outcomes of the FLRAA MTA program to provide the Joint Force with a capability that possesses transformational increases in speed, range, and maneuverability to allow the Army to retain the freedom of maneuver and win in Multi Domain Operations (MDO). This medium lift tactical assault and medical evacuation (MEDEVAC) aircraft will augment the Army's H-60 Black Hawk utility helicopter fleet to provide Combat Aviation Brigades with long-range, high-speed options that are survivable in contested environments.

The Army is executing a hybrid acquisition approach to design, develop, and deliver the FLRAA weapons system. In order to support the Army's modernization strategy and concept for multi-domain operations, the FLRAA program will deliver a first unit equipped in FY 2030. This hybrid approach builds on the Joint Multi-Role Technology Demonstration (JMR-TD) efforts (ongoing since 2013); the Army's AoA (completed in July 2019); and multiple ongoing risk mitigation efforts.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / <i>Aviation - Adv Dev</i>	Project (Number/Name) CS7 / <i>FLRAA MTA</i>
<p>The Army's risk mitigation activities ahead of the MTA and Weapon System Development include: (1) additional conceptual design and flight envelope expansion tasks on the existing JMR-TD TIA; (2) MOSA, FVL Architecture Collaboration Working Group (with participation from industry and academia) to establish a common architecture requirements framework for FLRAA and FARA system development; and (3) a CD&RR effort, awarded to two PAHs, using an AMTC OTA agreements to provide substantiating technical documentation on weapon system designs, requirements decompositions, trade-studies, and requirements feasibility for the FLRAA PoR. These risk reduction activities maintain industry engagement and momentum from the JMR-TD S&T program, inform capabilities and system requirements, and provide initial trade assessments for the final operational requirements. They also inform the final acquisition strategy, mature the Government's architecture requirements development, and transition appropriate S&T data and technologies to the PoR. CD&RR Phase II incorporates efforts leading to preliminary design using a digital engineering environment. In FY 2022, the Army plans to competitively award the Weapon System Development contract to one vendor with a hybrid acquisition approach.</p> <p>This approach includes the opportunity to employ new DoDI 5000.80 (Operation of the Middle Tier Acquisition (MTA)) authorities along with a tailored DoDI 5000.85 (Major Capability Acquisition) acquisition strategy. Finally, the Army is also addressing life cycle affordability, sustainability, and maintainability early in the program. The FLRAA program is employing multiple strategies including: should cost reduction opportunities, use of a digital thread from design through sustainment, and stochastic sustainment modeling. FLRAA is also one of the Army's pilot programs for life cycle intellectual property and data strategy development.</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FLRAA MTA Technical Support	MIPR	AvMC SRD : Huntsville, AL	-	-		-		7.155	Dec 2022	-		7.155	0.000	7.155	-
FLRAA MTA Program and Technical Support	C/CPFF	Torch : Huntsville, AL	-	-		-		5.916	Apr 2023	-		5.916	0.000	5.916	-
Subtotal			-	-		-		13.071		-		13.071	0.000	13.071	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FLRAA MTA delta Preliminary Design and Virtual Prototyping	C/CPIF	TBD : TBD	-	-		-		430.221	Nov 2022	-		430.221	Continuing	Continuing	Continuing
Subtotal			-	-		-		430.221		-		430.221	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR	TBD	Multiple : Multiple	-	-		-		16.691	Oct 2022	-		16.691	0.000	16.691	-
FLRAA MTA Technical Services	TBD	Various : Various	-	-		-		23.458	Mar 2023	-		23.458	0.000	23.458	-
Subtotal			-	-		-		40.149		-		40.149	0.000	40.149	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			-	-	-	483.441	-	483.441	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA
--	--	---

Event Name	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
FLRAA delta Preliminary Design (MTA)									Preliminary Design																			
FLRAA Virtual Prototyping (MTA)																	Virtual Prototyping											
FLRAA Portable Crewstation (FPC) Delivery 1													 FPC Delivery 1															
FLRAA Portable Crewstation (FPC) Delivery 2													 FPC Delivery 2															

Note
Middle Tier Acquisition (MTA) efforts are funded in Project B47 in FY2022. Funds are realigned to new budget project CS7 in FY23.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) CS7 / FLRAA MTA
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FLRAA delta Preliminary Design (MTA)	1	2023	4	2023
FLRAA Virtual Prototyping (MTA)	1	2023	1	2025
FLRAA Portable Crewstation (FPC) Delivery 1	1	2024	1	2024
FLRAA Portable Crewstation (FPC) Delivery 2	2	2024	2	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

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
F12: Future Attack Reconnaissance Aircraft	-	480.758	635.062	439.915	-	439.915	151.567	670.200	769.789	1,072.795	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort restructured funds within the FARA Ecosystem Project/CK7 to better support the cross-cutting capabilities demonstration and to provide transparency in modernization efforts.

A. Mission Description and Budget Item Justification

The Future Attack Reconnaissance Aircraft (FARA) Project's funding provides for the development of a Capability Set 1 aircraft system within the Future Vertical Lift (FVL) family of systems. FVL Capability Set 1 aircraft will conduct attack/reconnaissance missions in support of the Army's modernization objective of conducting Multi-Domain Operations (MDO). FARA will support the Army, including Special Operations Command (USSOCOM) and the Joint Force, in a contested, near peer threat environment. The FARA platform will fill the gap in capability for light weight attack/reconnaissance while significantly increasing speed, range, survivability, and lethality, providing Combatant Commanders with greatly increased tactical, operational and strategic capabilities.

Funding supports the development and integration of Government Furnished Equipment (GFE). FARA will be powered by Improved Turbine Engine (ITE), with minimum cruise airspeed greater than or equal to 180 KTAS (1.5x Apache), an integrated 20mm gun, Modular Effects Launcher (MEL) for Air Launched Effects (ALE) and Long Range Precision Munition (LRPM), Modular Open System Approach (MOSA) digital backbone, and the highest level of maneuverability and agility.

The FVL Capability Set 1 Initial Capabilities Requirements Document (ICRD) was approved in July 2018 under the name Future Attack Reconnaissance Aircraft (FARA). An Abbreviated Capability Development Document (A-CDD) was approved on 9 Apr 2021. The Acquisition Approach and Determination and Findings for Other Transaction Authority for Prototyping agreements were approved on 1 February 2019 by the Acting Under Secretary of Defense (Acquisition and Sustainment) to execute a Competitive Prototyping effort.

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

	FY 2021	FY 2022	FY 2023
Title: Future Attack Reconnaissance Aircraft	480.758	607.065	439.915
Description: Design, build, and test Competitive Prototype (CP) aircraft to rapidly develop and field a Multi-Domain Operations capable attack/reconnaissance vertical lift aircraft.			
FY 2022 Plans: Continues support of HW and SW development, component/subsystem AI&T, SW and HW In-the-Loop efforts, GFE planning and MOSA development in preparation for final AI&T for CP aircraft. Begins Inc #1 Air Vehicle design and mission systems			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
development. Continues support of documentation requirements for the Program of Record (POR) and supports an Engineering and Manufacturing Development (EMD) Request For Proposal (RFP) release. FY 2023 Plans: Continues support of hardware (HW) and software (SW) development, component/subsystem Assembly, Integration and Test (AI&T), SW and HW In-the-Loop efforts, GFE planning and MOSA development in preparation for final AI&T of the CP aircraft and supports CP Flight Demonstration. Continues Increment #1 Weapons System preliminary design (air vehicle and mission systems development) with two in-process design reviews. Supports the first of two Open Systems Verification Demonstrations that will verify each vendors compliance with MOSA standards. Continues support of documentation requirements for the Program of Record (POR) and supports an Engineering and Manufacturing Development (EMD) Request For Proposal (RFP) release. Initiates Source Selection Evaluation Board (SSEB) for EMD contract award and down selection to one vendor. FY 2022 to FY 2023 Increase/Decrease Statement: Funding requirements decrease in FY23 due to significant reduction in CP NRE requirements. NRE requirements reflect completion of CP design and build and transition to system testing.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (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.	-	22.997	-
Accomplishments/Planned Programs Subtotals	480.758	630.062	439.915

	FY 2021	FY 2022
Congressional Add: FARA All Electrical Flight Controls FY 2022 Plans: Support analysis of Flight Control Systems for FARA Air Vehicle / Weapon System Preliminary Design.	-	5.000
Congressional Adds Subtotals	-	5.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• B47: Future Vertical Lift	213.538	521.412	210.194	-	210.194	1,023.681	1,030.448	689.392	738.781	Continuing	Continuing
• A12001: Future Attack Recon Aircraft	-	-	0.000	-	0.000	-	-	-	83.812	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CK7: FARA Ecosystem	-	21.986	28.794	-	28.794	29.767	30.631	31.564	31.871	0.000	174.613

Remarks

The FARA Competitive Prototype effort was initiated in FY 2019 with a Congressional Add of \$75.400 million under Program Element (PE) 0603801A Aviation - Adv Dev Project B47 Future Vertical Lift, which was shared with Future Long Range Assault Aircraft. FARA requirements will be executed under PE 0603801A Aviation - Adv Dev Project F12 Future Attack Reconnaissance Aircraft from FY 2020 and beyond.

A12001: FARA funding line represents the follow on procurement effort associated with Army Program Element (APE) 0603801A.

D. Acquisition Strategy

The Future Attack Reconnaissance Aircraft (FARA) program is executing a streamlined acquisition approach leveraging modern tools, processes, and industry innovation, while employing efficiencies provided by the Army's modernization enterprise and Cross Functional Team (CFT) framework. The aircraft developed under this program will utilize a MOSA approach, which will enable more efficient and cost effective mission equipment integration throughout the lifecycle of the weapon system.

The Army is executing a two-phased FARA Competitive Prototyping (CP) effort from FY 2019 through Milestone B using Other Transaction Authority for Prototyping (OTAP). The scope of this effort includes prototype design and fabrication process refinement, subsystem development and representative system level testing, flight control and mission processor software development/testing, development of systems integration labs, development or modification of test fixtures and facilities, preparation of test plans and reports, the generation of airworthiness documentation, and testing of all processes and subsystems within the prototype aircraft.

The initial design and risk reduction phase was awarded in April 2019 to five industry performers. Phase two began in March 2020 with two of the five industry performers selected to proceed to final detailed design and the development, integration and test of a flyable prototype air vehicle. Phase two will culminate with flight testing of the FARA Competitive Prototypes to inform Milestone B and entry to EMD.

The Competitive Prototype effort will inform full FARA Weapon System requirements development process, and will develop the data needed to reduce the risks for full Weapon System design, integration, testing, and qualification to be completed during the FARA EMD phase.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		22.997	Apr 2022	17.597	Oct 2022	-		17.597	0.000	40.594	Continuing
PM FARA System Engineering and Program Mangement	Various	Various : Redstone Arsenal, AL	11.101	11.030	Mar 2021	17.031	Mar 2022	24.332	Mar 2023	-		24.332	Continuing	Continuing	Continuing
Subtotal			11.101	11.030		40.028		41.929		-		41.929	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Competitive Prototype (CP) Execution - Other Vendors	C/Various	CCDC AvMC : Redstone Arsenal, AL	24.016	-		-		-		-		-	0.000	24.016	-
Competitive Prototype (CP) Execution - Raider X	C/CS	Sikorsky Aircraft Corporation : Stratford, CT	152.000	201.500	Feb 2021	237.000	Oct 2021	159.500	Oct 2022	-		159.500	0.000	750.000	-
Competitive Prototype (CP) Execution - 360 Invictus	C/CS	Bell Textron, Inc. : Fort Worth, TX	135.849	187.499	Feb 2021	127.715	Oct 2021	76.157	Oct 2022	-		76.157	0.000	527.220	-
Inc #1 Air Vehicle / Weapons System Preliminary Design	C/Various	Sikorsky Aircraft Corporation and Bell Textron, Inc. : Stratford, CT and Fort Worth, TX	-	-		67.664	Dec 2021	76.992	Oct 2022	-		76.992	Continuing	Continuing	Continuing
Inc #1 Mission Systems Development	C/Various	Sikorsky Aircraft Corporation and Bell Textron, Inc. : Stratford, CT and Fort Worth, TX	-	8.335	Jul 2021	64.776	Dec 2021	21.716	Dec 2022	-		21.716	Continuing	Continuing	Continuing
GFE - Improved Turbine Engine Development - Single Engine Configuration	C/CPIF	PM ATE : Redstone Arsenal	13.298	13.442	Mar 2021	16.670	Dec 2021	7.412	Dec 2022	-		7.412	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GFE - Modular Effects Launcher Development	Various	CCDC AvMC : Redstone Arsenal, AL	4.524	9.744	Mar 2021	15.560	Dec 2021	12.535	Dec 2022	-		12.535	Continuing	Continuing	Continuing
GFE - 20mm Cannon Development	Various	CCDC AC : Picatinny Arsenal, NJ	13.812	6.930	Mar 2021	6.200	Dec 2021	5.900	Dec 2022	-		5.900	Continuing	Continuing	Continuing
GFE - Radar Development	Various	CCDC C5ISR : Aberdeen Proving Ground, MD	3.009	3.500	Mar 2021	8.052	Mar 2022	-		-		-	0.000	14.561	Continuing
Modular Open System Approach Development	Various	CCDC AvMC : Redstone Arsenal, AL	24.316	17.972	Mar 2021	23.602	Dec 2021	12.543	Dec 2022	-		12.543	Continuing	Continuing	Continuing
Subtotal			370.824	448.922		567.239		372.755		-		372.755	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Services Support - CP Air Vehicle Dev & Test	MIPR	Redstone Test Center, CCDC-AvMC: : Redstone Arsenal, AL	7.246	1.477	Mar 2021	3.715	Dec 2021	7.178	Dec 2022	-		7.178	0.000	19.616	Continuing
Engineering Services Support - CP Airworthiness	MIPR	CCDC-AvMC-SRD: : Redstone Arsenal, AL	7.127	14.112	Mar 2021	13.500	Mar 2022	13.500	Mar 2023	-		13.500	0.000	48.239	Continuing
Simulation, Studies, and Analysis	TBD	Various : Various	4.874	5.217	Mar 2021	5.580	Mar 2022	4.553	Mar 2023	-		4.553	Continuing	Continuing	Continuing
FARA All Electrical Flight Controls	TBD	Various : Various	-	-		5.000	Aug 2022	-		-		-	0.000	5.000	-
Subtotal			19.247	20.806		27.795		25.231		-		25.231	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		401.172	480.758	635.062	439.915	-	439.915	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

	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
 Under the Other Transaction Authorities for Prototyping (OTAP), five incrementally funded agreements were awarded in April 2019 which have payments based on performance milestones through Fiscal Year (FY) 2023. Funding will be incrementally added to the existing awards by modification as negotiated with each performer. In March 2020, two of the five performers were selected for continued execution through final design, prototype build, and flight testing; the other three performers were issued a stop work order and ceased to receive additional funding.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

Event Name	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								
OTAP CP Build (10 U.S.C. 2371b)																																				
<i>Competitive Prototype Build</i>																																				
OTAP CP Test (10 U.S.C. 2371b)																																				
<i>Competitive Prototype Test</i>																																				
Milestone B Documentation Dev. and Coord.																																				
<i>Milestone B Documentation Dev. & Coord.</i>																																				
Contract Requirement Package Development																																				
<i>EMD CRP Development</i>																																				
EMD Request for Proposal Release																																				
<i>EMD RFP Release</i>																																				
EMD Proposal Submission/Evaluation																																				
<i>EMD Proposal Submission/Evaluation</i>																																				
Weapons System PDR																																				
<i>Weapons System PDR</i>																																				
Milestone B																																				
<i>Milestone B</i>																																				
EMD Contract Award																																				
<i>EMD CA</i>																																				
EMD Phase																																				
<i>EMD Phase</i>																																				
Weapons System CDR																																				
<i>Weapons System CDR</i>																																				

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) F12 / Future Attack Reconnaissance Aircraft
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
OTAP Competitive Prototype (CP) Design (10 U.S.C. 2371b)	3	2019	2	2020
OTAP CP - Down Select to 2 Performers (10 U.S.C. 2371b)	2	2020	2	2020
OTAP CP Build (10 U.S.C. 2371b)	3	2020	4	2023
OTAP CP Test (10 U.S.C. 2371b)	4	2023	4	2024
Milestone B Documentation Dev. and Coord.	1	2021	2	2025
Contract Requirement Package Development	1	2021	2	2023
EMD Request for Proposal Release	2	2023	2	2023
EMD Proposal Submission/Evaluation	3	2023	1	2025
Weapons System PDR	4	2024	4	2024
Milestone B	2	2025	2	2025
EMD Contract Award	3	2025	3	2025
EMD Phase	3	2025	2	2032
Weapons System CDR	4	2026	4	2026

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - 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
Total Program Element	-	15.287	11.055	9.638	-	9.638	7.764	12.728	2.840	2.868	Continuing	Continuing
526: Marine Orien Log Eq Ad	-	0.809	2.493	2.475	-	2.475	2.485	2.477	2.840	2.868	Continuing	Continuing
EW8: Armored Engineer Vehicles	-	5.478	4.562	7.163	-	7.163	5.279	10.251	-	-	0.000	32.733
G11: Adv Elec Energy Con Ad	-	9.000	4.000	-	-	-	-	-	-	-	0.000	13.000

A. Mission Description and Budget Item Justification

This Program Element (PE) supports advanced component development and prototypes of new and improved technologies for combat support and combat service support equipment essential to sustaining combat operations. Advancements in bridging, armored engineer vehicles to include development of a robotic capability Remote Control System for the Assault Breacher Vehicle, electric power generators, material-handling, environmental control, shelter systems, cargo aerial delivery, field service systems, mortuary affairs equipment and petroleum equipment are necessary to improve safety and increase the tactical mobility, operational capability, lethality and survivability on the digital battlefield and to provide for greater sustainment while reducing the logistics support burden. Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, bulk fuel, water generation, regulatory compliance and reliability of existing systems.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	8.587	7.055	0.000	-	0.000
Current President's Budget	15.287	11.055	9.638	-	9.638
Total Adjustments	6.700	4.000	9.638	-	9.638
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.700	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.638	-	9.638

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

Project: G11: Adv Elec Energy Con Ad

Congressional Add: Contract Activity

Congressional Add: Maneuverable Lightweight Electric Weight Reducer (MLEWR)

FY 2021	FY 2022
4.000	4.000
5.000	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>
---	---

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

	FY 2021	FY 2022
Congressional Add Subtotals for Project: G11	9.000	4.000
Congressional Add Totals for all Projects	9.000	4.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) 526 / Marine Orien Log Eq Ad
--	--	--

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
526: Marine Orien Log Eq Ad	-	0.809	2.493	2.475	-	2.475	2.485	2.477	2.840	2.868	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project line supports the family of Army Ship to Shore (S2S) connectors that support Dynamic Force Repositioning (DFR) by providing the Combatant, Multi-Domain Operations (MDO) and Joint All Domain Operations (JADO) Commanders with the ability to access multiple entry points via littorals and inland waterways (waterborne corridor) IOT sustain forces within an anti-access/area denial (A2/AD) bubble. The family of S2S connectors include the Maneuver Support Vessel (Light) and the Ship to Shore / Over the Shore Logistics Vessel (SSLV), which are the Army's first digital architecture vessels (with improved draft, speed, and payload) and critical modernization efforts in support of the Army's Watercraft Systems Transformation Strategy (AWSTS). S2S connectors will provide Surge, Precision and Dispersed Logistics to move and maneuver tailored forces, combat ready troops, platforms, equipment, and supply bulk fuel and water across the full spectrum of operations. S2S connectors mitigate A2/AD threats by providing access to shallow coastal waters, rivers, in narrow inland waterways in support of dispersed force elements in austere environments and where mature ports or road networks are unavailable.

In general, all Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, and survivability while increasing the lethality, tactical mobility, and operational capability of the Army Mariner to preserve the Combatant Commanders requirement of "freedom of seas" access in all areas of the world particularly the littorals, to support maneuver operations in all Areas of Responsibility. All modification and services efforts are critical enablers for the success Army's Watercraft Systems Transformation Strategy (AWSTS) and continued fulfillment of the AWS Title 10 mission.

In addition, funded efforts will address critical gaps in these areas for the legacy fleet, while at the same time researching, developing and testing emergent technologies. To support future acquisitions and future fleet planning, funding efforts will include conducting trade studies, Business Case Analyses to inform the requirement development process, and support Analysis of Alternatives (AoA). The funding enables Army's compliance with the National Defense Authorization Act of 1996 and 502(6) of the Clean Water Act and compliance with Environmental protection Agency (EPA) emission standards.

FY 2023 RDTE dollars in the amount of \$2.475 million supports modernization of the legacy fleet by investigating technology insertions, including, but not limited to: force protection, prognostics & preventative maintenance, vessel electronics, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

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

	FY 2021	FY 2022	FY 2023
Title: Environmental Compliance Projects	0.062	0.045	0.060
Description: Environmental projects enable compliance with requirements as defined under in the law Uniform National Discharge Standards (UNDS) and Environmental Protection Agency (EPA) emissions standards. The EPA reviews the UNDS			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Code of Federal Regulations (CFR) language in five-year increments separated into three batches (types of discharge). This is an ongoing assessment of statutory language which may or may not result in material solution change.				
FY 2022 Plans: Batch Three, Phase III - Army UNDS Implementation documentation update				
FY 2023 Plans: Batch Three, Phase III - Army UNDS Implementation (training documentation)				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 increase is due to support needed to development of Acquisition, Training, Operation, and Maintenance Documentation as well as develop an Army Ballast Water Exchange Guidance Document.				
Title: Force Protection Capability		0.447	1.597	1.973
Description: Army Watercraft Systems (AWS) Force Protection capability is limited to defensive measures. Current efforts include development of gunner station and weapon station locations, integration of Common Remotely Weapon Station (CROWS) and non-lethal Escalation of Force (EoF). The EoF capability includes white light, green dazzler, an acoustic hailing device, percussion grenades, and Forward Looking Infra-Red (FLIR) cameras.				
FY 2022 Plans: Provide support to complete design, prototype install, test, and final TDP for the CROWS aboard LCU watercraft fleet. The EoF capabilities could include, but are not limited to, white light, green dazzler, an acoustic hailing device, percussion grenades, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.				
FY 2023 Plans: Support to complete testing and final TDP for the CROWS aboard LCU watercraft fleet. The EoF capabilities could include, but are not limited to, white light, green dazzler, an acoustic hailing device, percussion grenades, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 increase is due to complete testing and efforts to investigate sub-surface surveillance for CROWS.				
Title: Army Watercraft Program Support		0.300	0.307	0.442
Description: Matrix Salary Support includes Program Management and System Engineering resources required to manage the program projects and provide contractor oversight. It also includes benefits, travel, personnel training and other Government costs required to retain a professional acquisition workforce.				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) 526 / Marine Orient Log Eq Ad

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Provide engineering support for C5ISR Studies and Force Protection design work.</p> <p>FY 2023 Plans: Provide engineering support for C5ISR Studies and Force Protection design work.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 increase is due to test of CROWS aboard watercraft fleet.</p>			
<p>Title: Trade Studies and Business Analyses</p> <p>Description: Conduct Affordability and Feasibility Studies for concept development concept development for future vessel platforms.</p> <p>FY 2022 Plans: Initiation of human factor engineer analysis and initiation of electrical power studies to support Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C5ISR) upgrades and joint operation capabilities for legacy vessels.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 decrease is due to completion of trade studies.</p>	-	0.453	-
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.091	-
Accomplishments/Planned Programs Subtotals	0.809	2.493	2.475

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
• MA4501: MODIFICATION KITS	57.908	31.300	14.613	-	14.613	11.366	11.511	8.325	8.321	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	Total Cost
			Base	OCO	Total					Complete	
• MA4502: <i>INSTALLATION OF MODIFICATIONS</i>	6.969	5.574	6.957	-	6.957	5.948	8.510	5.807	5.805	Continuing	Continuing
• M11101: <i>Army Watercraft Esp</i>	44.660	58.009	47.889	-	47.889	30.809	30.818	30.892	30.877	0.000	273.954
• ML5355: <i>Items Less Than \$5.0M (Float/Rail)</i>	1.844	-	10.131	-	10.131	23.070	18.000	18.063	18.237	0.000	89.345

Remarks

FY 2021 Accomplishments:

- Completed government testing in support of Safety Confirmation and Transportability Certification for MCS SLEP
- Updated engineering drawings for the finalization of the TDP for MCS SLEP
- Initiated CROWS design for LCU 2000
- Developed draft Strategic Implementation Plan for Army Compliance with Uniform National Discharge Standards (UNDS)

D. Acquisition Strategy

Leverage government and public research centers Ground Vehicle Systems Center (GVSC), Naval Surface Warfare Center (NSWC) Philadelphia, AWS System Technical Support (STS) contractor (McKean Defense) and known public research institutes (Battelle) along with associated contract mechanisms to prototype, test, and evaluate component technologies that may be applicable to the current and future Army Watercraft fleet.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) 526 / Marine Oriented Log Eq Ad
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR	TBD	Various : Various	-	-		0.091		-		-		-	Continuing	Continuing	-
Subtotal			-	-		0.091		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Force Protection, Escalation of Force (EoF) Development (i.e. CROWS)	MIPR	TARDEC : Warren, MI	4.843	0.447	Nov 2020	1.597	Nov 2021	1.973	Nov 2022	-		1.973	Continuing	Continuing	-
At Sea Transfer Systems (Modular Warping Tug / Causeway Ferry)	SS/CPFF	TARDEC DTIC - I, Battelle : Fort Belvoir, VA	9.466	-		-		-		-		-	0.000	9.466	-
Environmental Compliance Uniform National Discharge Standards (UNDS)	MIPR	Carderock : Maryland and Pennsylvania	3.341	0.062	Nov 2020	0.045	Nov 2021	0.060	Oct 2022	-		0.060	Continuing	Continuing	-
Trade Study Analyses	TBD	TBD : TBD	-	-		0.453	Feb 2022	-		-		-	0.000	0.453	-
Subtotal			17.650	0.509		2.095		2.033		-		2.033	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Army Watercraft Program Support	MIPR	Detroit Arsenal PMs, TARDEC, NAVSEA Carderock : Maryland, Warren, MI	2.347	0.300	Dec 2020	0.307	Dec 2021	0.442	Dec 2022	-		0.442	Continuing	Continuing	-
Subtotal			2.347	0.300		0.307		0.442		-		0.442	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) 526 / Marine Oriented Log Eq Ad				
	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	19.997	0.809	2.493		2.475	-	2.475	Continuing	Continuing	N/A	

Remarks
 COVID19: The COVID19 pandemic is driving significant cost increases across the shipbuilding industry (absenteeism, demand for skilled trades, safety protocols, and reliance on sub-contractor TDY). Although vaccinations could potentially mitigate some risks, the Army will continue to monitor the situation closely.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>		Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>	

Event Name	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
Army Watercraft Program Support	[Redacted]																											
Force Protection: Common Remotely Operated Weapon Station	[Redacted]																											
Force Protection: CROWS on LSV Class	[Redacted]																											
Force Protection: CROWS on LCU Class	[Redacted]																											
At Sea Transfer Technology (MCS)	[Redacted]																											
Modular Warping Tug (MWT) / Causeway Ferry (CF)	[Redacted]																											
Environmental Compliance	[Redacted]																											
Uniformed National Discharge Standards (UNDS)	[Redacted]																											
UNDS Batch 3	[Redacted]																											
Trade Studies and Business Analyses	[Redacted]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Army Watercraft Program Support	1	2018	4	2027
Force Protection: Common Remotely Operated Weapon Station (CROWS)	1	2018	4	2027
Force Protection: CROWS on LSV Class	1	2018	2	2022
Force Protection: CROWS on LCU Class	1	2018	4	2023
At Sea Transfer Technology (MCS)	1	2018	1	2021
Modular Warping Tug (MWT) / Causeway Ferry (CF)	1	2018	1	2021
MWT / CF - SLEP Development Contract	4	2018	4	2018
MWT / CF - SLEP Prototype and Proof Concept	1	2018	4	2020
MWT / CF - SLEP Testing	1	2020	4	2020
Environmental Compliance	1	2018	4	2027
Uniformed National Discharge Standards (UNDS)	1	2018	4	2027
UNDS Batch 2	4	2020	4	2020
UNDS Batch 3	4	2022	4	2022
Trade Studies and Business Analyses	4	2019	2	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>			
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
EW8: <i>Armored Engineer Vehicles</i>	-	5.478	4.562	7.163	-	7.163	5.279	10.251	-	-	0.000	32.733
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the prototype development, test and evaluation of a robotic capability Remote Control System (RCS) for the Assault Breacher Vehicle (ABV), to include prototype fabrication, developmental testing, operational testing and logistics demonstration / user test events.

Funding supports modernization of Army Bridging and Armored Engineer Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, increased military load capacities, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes and testing to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

FY 2023 Base dollars in the amount of \$7.163 million supports the Assault Breacher Vehicle Robotic Control System (ABV RCS) Prototype Development and Fabrication, start of prototype testing, shipping of Government Furnished Equipment (GFE), ABV refurb at Anniston Army Depot and manpower.

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

	FY 2021	FY 2022	FY 2023
Title: Assault Breacher Vehicle (ABV) Remote Control System (RCS)	5.478	4.395	7.163
FY 2022 Plans: Funding supports the development and fabrication of RCS prototypes, SEPM matrix functional support and SBIR/STTR transfer (\$166,510.00).			
FY 2023 Plans: Funding will complete development and fabrication of 4 ABV RCS prototypes and begin the refurbishment of an additional ABV RCS prototype system. Also will fund the start of prototype testing on completed assets and shipment of GFE equipment to and from the test location to support test.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding requirements increased in FY 2023 due to start of test and planned refurbishment of another ABV asset as well as completion of the 4 ABV RCS prototypes			
Title: ABV RCS SBIR/STTR transfer	-	0.167	-
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
SBIR/STTR/ FFRDS transfer tax			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> SBIR/STTR/FFRDC transfer included in FY22.			
Accomplishments/Planned Programs Subtotals	5.478	4.562	7.163

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	
• G82925: <i>Assault Breacher Vehicle</i>	19.500	-	0.000	-	0.000	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Assault Breacher Vehicle (ABV) Remote Control System (RCS) program will pursue a competitive prototype development and testing strategy with multiple vendors to select an RCS materiel solution for production and integration into the ABV system. Anniston Army Depot (ANAD) is refurbishing 4 ABV assets to GFE two each to two (2) vendors. Prototypes will be developed and refined through one User Jury event in 2024. Competitive testing will be used to down-select to one design.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) EW8 / Armored Engineer Vehicles
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ABV RCS Matrix Functional Support	MIPR	Various : Various	0.929	0.020	Apr 2022	0.921	Nov 2021	0.990	Nov 2022	-		0.990	0.000	2.860	-
ABV RCS SBIR/STTR transfer	TBD	TBD : TBD	-	-		0.167		-		-		-	0.000	0.167	-
Subtotal			0.929	0.020		1.088		0.990		-		0.990	0.000	3.027	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AME Analysis of Alternatives (AOA)	C/FFP	TBD : TBD	1.285	-		-		-		-		-	0.000	1.285	-
JAB Force Protection Development and Fabrication	SS/FFP	DRS SUSTAINMENT SYSTEMS, INC. : SAINT LOUIS, MO	2.084	-		-		-		-		-	0.000	2.084	-
ABV RCS Prototype Development and Fabrication	C/TBD	TBD : TBD	-	-		3.474	Apr 2022	2.770	Oct 2022	-		2.770	0.000	6.244	-
ABV RCS Refurbishment of ABV assets for testing	MIPR	Anniston Army Depot : Anniston AL	-	5.438	Sep 2021	-		2.753	Apr 2023	-		2.753	0.000	8.191	-
ABV RCS shipping	TBD	TBD : TBD	-	0.020	Apr 2022	-		0.150		-		0.150	0.000	0.170	-
Subtotal			3.369	5.458		3.474		5.673		-		5.673	0.000	17.974	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JAB Initial Operational Test & Evaluation (IOTE)	MIPR	Operational Test Command : Ft. Hood, TX	5.214	-		-		-		-		-	0.000	5.214	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JAB Production Qualification Testing (PQT)	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	3.936	-		-		-		-		-	0.000	3.936	-
JAB Prototype Live Fire Validation	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	1.500	-		-		-		-		-	0.000	1.500	-
JAB Logistics Demonstration	TBD	Army Operational Test Command (AOTC) : Ft. Hood, TX	0.270	-		-		-		-		-	0.000	0.270	-
ABV RCS Test & Evaluation	MIPR	ATC : Aberdeen, MD	-	-		-		0.500	Jul 2023	-		0.500	0.000	0.500	-
Subtotal			10.920	-		-		0.500		-		0.500	0.000	11.420	N/A

Project Cost Totals	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
15.218	5.478	4.562	7.163	-	7.163	0.000	32.421	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) EW8 / Armored Engineer Vehicles	

Event Name	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
ABV RCS P Spec Development	[Redacted]				[Redacted]																							
ABV RCS Request for Prototype Proposals					▲ 1 ABV RCS RPP																							
ABV Overhaul (Qty of 2)					[Redacted] ABV Overhaul ANAD																							
ABV RCS Overhaul/ Refurb cont. (Qty of 1)									[Redacted] Additional ABV Refurb ANAD																			
ABV RCS Prototype Source Selection					[Redacted] ABV RCS Source Selection																							
ABV RCS Prototype OTA Awards 2 vendors					▲ 2 ABV RCS OTA Awards (2 vendors)																							
ABV RCS Prototype Development									[Redacted] ABV RCS Prototype Development																			
ABV RCS User Jury													▲ 3 ABV RCS User Jury															
ABV RCS Logistics Development									[Redacted] ABV RCS Logistics Development																			
ABV RCS Prototype Test													[Redacted] ABV RCS Prototype Test															
ABV RCS Developmental Test / Operational Test																	[Redacted] ABV RCS DT/OT/LFT&E											
ABV RCS Request For Proposals																	▲ 4 ABV RCS RFP											
ABV RCS Contract Award																					▲ 5 ABV RCS Award							

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
--	---	--

Event Name	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
ABV RCS Provisioning																												
ABV RCS Test Asset build																												
ABV RCS Early User Test																												
ABV RCS LRIP DO award																												
ABV RCS Production																												
ABV RCS Fieldings																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ABV RCS P Spec Development	1	2020	4	2021
ABV RCS Request for Prototype Proposals	1	2022	1	2022
ABV Overhaul (Qty of 2)	4	2021	2	2022
ABV RCS Overhaul/ Refurb cont. (Qty of 1)	4	2023	4	2023
ABV RCS Prototype Source Selection	2	2022	2	2022
ABV RCS Prototype OTA Awards 2 vendors	3	2022	3	2022
ABV RCS Prototype Development	3	2022	4	2023
ABV RCS User Jury	1	2024	1	2024
ABV RCS Logistics Development	4	2022	3	2023
ABV RCS Prototype Test	4	2023	2	2024
ABV RCS Developmental Test / Operational Test	1	2025	4	2025
ABV RCS Request For Proposals	3	2024	3	2024
ABV RCS Contract Award	1	2025	1	2025
ABV RCS Provisioning	1	2025	2	2028
ABV RCS Test Asset build	1	2025	4	2025
ABV RCS Early User Test	4	2025	1	2027
ABV RCS LRIP DO award	1	2027	1	2027
ABV RCS Production	2	2027	1	2029
ABV RCS Fieldings	2	2027	1	2029

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad
--	--	--

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
G11: Adv Elec Energy Con Ad	-	9.000	4.000	-	-	-	-	-	-	-	0.000	13.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Army Network Modernization Strategy Line of Effort #4, Command Post (CP). The technologies in this portfolio are specifically designed to target CP challenges to enable power resilience across the operational spectrum and to resolve issues with setup and tear-down times and with the CP mobility and footprint. Additionally, this project supports enablers of the Integrated Visual Augmentation System (IVAS) which is a priority technology for the Network and Soldier Lethality CFT's.

As the DoD's Lead Standardization Activity for Tactical Electric Power (TEP), Project Manager Expeditionary Energy & Sustainment Systems (PM E2S2) matures and integrates technology that will improve the next generation of standard tactical power sources in support of all Services. It supports technical maturation of TEP systems that will extend Army operational mission reach and duration in support of the Army Operating Concept and Multi-Domain Battle.

Funding supports modernization of the current Tactical Electric Power capability with technology insertions including, but not limited to hybrid capabilities, light-weight power solutions, vehicle/tactical microgrid interoperability and Tactical Microgrid Standards (TMS). Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment an operational energy concepts.

Funding supports the Maneuverable Lightweight Electric Weight Reducer (MLEWR) Assessment. This portfolio supports an innovative soldier load reducing system to include an all-terrain, tactically silent electric cart which has zero emissions. This system can carry twice its own weight over long distances and difficult terrain, including when climbing stairs and submerged in water. This analysis will inform an Army Buy-Try-Decide process.

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

	FY 2021	FY 2022
Congressional Add: Contract Activity	4.000	4.000
FY 2021 Accomplishments: Execution of FY21 congressional funding to develop lightweight, portable power generation.		
FY 2022 Plans: FY22 congressional funds to be executed on the continued development of lightweight, portable power generation.		
Congressional Add: Maneuverable Lightweight Electric Weight Reducer (MLEWR)	5.000	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022
<i>FY 2021 Accomplishments:</i> Execution of FY21 congressional funding to develop and integrate a soldier load reducing system.		
Congressional Adds Subtotals	9.000	4.000

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 194: <i>Engine Driven Gen Ed</i>	4.726	16.317	15.023	-	15.023	13.077	12.393	7.304	7.374	0.000	76.214
• MA9800: <i>Generators And Associated Equip</i>	101.239	105.892	54.400	-	54.400	80.713	87.635	96.284	96.257	Continuing	Continuing

Remarks

D. Acquisition Strategy

Complete advanced development pre-Milestone B technology assessments and analysis, and transition products to Engineering and Manufacturing Development (EMD) phase (Milestone B) and subsequent transition to production (Milestone C). Support concept development and demonstration efforts. Products and technologies supported include tactical power and energy sources, alternative/renewable energy systems, power distribution components, and power management and distribution control systems. Perform analysis of Operational Energy related impacts to future development programs to better direct United States Army Combat Capabilities Development Command (CCDC) efforts.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platoon Power Generation	MIPR	PM E2S2 : Ft. Belvoir, VA	0.100	-		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	MIPR	PM E2S2 : Fort Belvoir, VA	1.030	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	PM E2S2 : Ft. Belvoir, VA	1.019	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	PM E2S2 : Ft. Belvoir, VA	1.984	-		-		-		-		-	Continuing	Continuing	Continuing
Operational Energy	MIPR	PM E2S2 : Fort Belvoir, VA	1.810	-		-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Assessment	MIPR	GVSC : Warren, MI	-	0.440	Sep 2021	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			5.943	0.440		-		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platoon Power Generation	MIPR	CERDEC : Fort Belvoir, VA	0.750	-		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	Various	CERDEC : Fort Belvoir, VA	4.421	4.000		4.000		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	Various	Multiple Vendors : TBD	3.045	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	Various	CERDEC : Fort Belvoir, VA	6.270	-		-		-		-		-	Continuing	Continuing	Continuing
Operational Energy	TBD	TBD : TBD (FY15)	3.158	-		-		-		-		-	Continuing	Continuing	Continuing
Metering and Monitoring Demo	Various	TBD : TBD	0.455	-		-		-		-		-	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Tailored Log Support	MIPR	DLA : PHILADELPHIA,PA 19111	-	4.000	Sep 2021	-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Model & Simulation	Various	TBD : TBD	-	0.220		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			18.099	8.220		4.000		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Small Tactical Electric Power (STEP) Components	MIPR	CERDEC : Fort Belvoir, VA	2.495	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	2.255	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Control Systems	MIPR	CERDEC : Fort Belvoir, VA	2.932	-		-		-		-		-	Continuing	Continuing	Continuing
Platoon Power Generation	MIPR	CERDEC : Fort Belvoir, VA	0.101	-		-		-		-		-	Continuing	Continuing	Continuing
Modular Power	MIPR	Idaho National Labs; Air Force Civil Engineer Center : xxxx	3.000	-		-		-		-		-	Continuing	Continuing	Continuing
Operational Energy	MIPR	Dept of Energy Sandia National Labs : Washington DC	1.857	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			12.640	-		-		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platoon Power Generation (PPG)	MIPR	CERDEC : Fort Belvoir, VA	0.250	-		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	MIPR	CERDEC : Fort Belvoir, VA	1.969	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	1.410	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	CERDEC : Fort Belvoir, VA	2.011	-		-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Safety Release	MIPR	ABERDEEN TEST CENTER : ABERDEEN PROV GND,MD	-	0.140	Oct 2021	-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Limited User Assessment	MIPR	ARCIC CENTER : FORT EUSTIS, VA	-	0.200	Oct 2021	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			5.640	0.340		-		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			42.322	9.000		4.000		-		-		-	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

Event Name	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
PDISE Expansion																												
TMS interface & test methodology development	█																											
Lightweight portable power																												
Modeling, Development and Test of lightweight portable power			█																									
Maneuverable Lightweight Electric Weight Reducer (MLEWR)																												
MLEWR Operational Assessment			█																									
MLEWR System Integration			█																									

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SMALL TACTICAL ELECTRIC POWER (STEP) PROGRAM	1	2016	4	2020
Assess Technologies, such as STEP, to Meet Gaps-STEP	1	2016	2	2020
Develop prototypes for modular, scalable STEP systems	2	2020	4	2020
AMMPS Hybrid Power Integration	1	2020	2	2020
AMMPS Hybrid Technology Assessment	1	2020	2	2020
AMMPS Hybrid Prototype Development	3	2019	4	2020
PDISE Expansion	1	2017	2	2021
TMS interface & test methodology development	1	2019	2	2021
ASSESSMENT OF TECHNOLOGIES Across TEP line	1	2017	4	2020
Assess Technologies (remote start adapter) to Meet Gaps and Improve Efficiencies	1	2017	4	2020
OPERATIONAL ENERGY (OE)	1	2016	4	2019
Evaluation of OE-Related Impacts, Systems and Improvements	1	2016	4	2019
Lightweight portable power	2	2021	4	2022
Modeling, Development and Test of lightweight portable power	2	2021	4	2022
Maneuverable Lightweight Electric Weight Reducer (MLEWR)	4	2021	4	2022
MLEWR Operational Assessment	4	2021	4	2022
MLEWR System Integration	4	2021	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603807A / Medical Systems - 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
Total Program Element	-	36.006	37.053	0.598	-	0.598	1.619	0.589	1.037	1.048	0.000	77.950
808: DoD Drug & Vacc Ad	-	6.891	6.477	0.403	-	0.403	0.414	0.422	0.430	0.435	0.000	15.472
811: Mil HIV Vac&Drug Dev	-	7.740	-	-	-	-	-	-	-	-	0.000	7.740
836: Field Medical Systems Advanced Development	-	20.335	30.576	0.195	-	0.195	1.205	0.167	0.607	0.613	0.000	53.698
FF4: Counterdrug, DDR, Sys Development & Demonstration	-	0.749	-	-	-	-	-	-	-	-	0.000	0.749
VST: MEDEVAC Mission Equipment Package (MEP) - Adv Dev	-	0.291	-	-	-	-	-	-	-	-	0.000	0.291

A. Mission Description and Budget Item Justification

This Program Element (PE) funds development of medical materiel within the early system integration portion of the System Development and Demonstration phase of the acquisition life cycle using 6.4 (Advanced Component Development and Prototype) funding. Program efforts support transition of promising Science and Technology candidate medical technologies (drugs, vaccines, medical devices, diagnostics, and mechanisms for detection and control of disease carrying insects) to larger scale testing in humans for safety and effectiveness. Programs are aligned to meet future force requirements identified within concept documents and organizational structures. This PE also provides funding for Food and Drug Administration (FDA) regulated human clinical trials to gain additional information about safety and effectiveness on the path to licensure for use in humans. These efforts are managed by U.S. Army Medical Materiel Development Activity (USAMMDA) of the U.S. Army Medical Research and Development Command.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	33.085	22.071	0.000	-	0.000
Current President's Budget	36.006	37.053	0.598	-	0.598
Total Adjustments	2.921	14.982	0.598	-	0.598
• Congressional General Reductions	-	-	-	-	-
• Congressional Directed Reductions	-	-	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	15.000	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	2.921	-	-	-	-
• SBIR/STTR Transfer	-	-	-	-	-
• Adjustments to Budget Years	-	-	0.598	-	0.598

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>
---	--

• FFRDC Transfer	-	-0.018	-	-	-
------------------	---	--------	---	---	---

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

Project: 836: *Field Medical Systems Advanced Development*

Congressional Add: *Program increase - composite shelter*

Congressional Add: *Program increase - wearable medical device for TBI prevention*

Congressional Add: *Program increase - Freeze Dried Platelets*

Congressional Add Subtotals for Project: 836

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	5.500	-
	3.000	5.000
	-	10.000
Congressional Add Subtotals for Project: 836	8.500	15.000
Congressional Add Totals for all Projects	8.500	15.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 808 / DoD Drug & Vacc Ad			
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
808: DoD Drug & Vacc Ad	-	6.891	6.477	0.403	-	0.403	0.414	0.422	0.430	0.435	0.000	15.472
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds development of candidate medical countermeasures for endemic infectious diseases of military relevance. These efforts are in: vaccines, drugs, diagnostic kits/devices. These funds support human clinical effectiveness (capacity to produce a desired size of an effect under ideal or optimal conditions) trials of the drug/vaccine in larger groups that are designed to assess how well the drug/vaccine works and continue safety assessments in a larger group of volunteers. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of medical diagnostic kits and devices. This work, which is performed in military laboratories or civilian pharmaceutical firms, is directed toward the prevention of disease, early diagnosis, and accelerated recovery time once diagnosed to enhance battlefield readiness. All clinical trials are conducted in accordance with United States (U.S.) Food and Drug Administration (FDA) regulations, a mandatory obligation for all military products placed into the hands of medical providers or service members. Product development priorities are determined based upon four major factors: (1) the extent and threat of the disease within the Combatant Commands theater of operations, (2) the clinical severity of the disease, (3) the technical maturity of the proposed solution, and (4) the affordability of the solution (development and production). Products from this Project will transition to PE 0604807A/Project 849 at MS B.

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

	FY 2021	FY 2022	FY 2023
Title: DoD Drug and Vaccine Advanced Development	6.891	-	-
Description: Funding is provided for the development of candidate medical countermeasures for military relevant infectious disease focusing on prevention, early diagnosis and accelerated recovery time. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of drugs, vaccines, medical diagnostic kits and devices.			
Title: DoD Drug and Vaccine Advanced Development - Medical Readiness	-	1.141	0.403
Description: Funding is provided for the development of candidate medical countermeasures for military relevant infectious disease focusing on prevention to increase medical readiness. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of drugs, vaccines, medical diagnostic kits and devices			
FY 2022 Plans: Staphylococcus aureus Vaccine: Prepare for transition of a vaccine candidate from industry and begin planning for a Phase 2 safety and efficacy trial of the candidate in an endemic population and an adult military/traveler population. We will conduct market research, develop CRADA's with industry partners and initiate acquisition documentation.			
FY 2023 Plans: Staphylococcus aureus Vaccine: Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737) . Funding transferred to Program Element 0604110DHA, Project Code 374E.</p> <p>Support: Provides Civilian Manpower support for Warfighter Health, Performance and Evacuation Project Management Office</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Portion of Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737) . Funding transferred to Program Element 0604110DHA, Project Code 374E.</p>				
<p>Title: DoD Drug and Vaccine Advanced Development - Battlefield Care and Return to Fight</p> <p>Description: Funding is provided for the development of candidate medical countermeasures for military relevant infectious disease focusing on early diagnosis and accelerated recovery time. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of drugs, vaccines, medical diagnostic kits and devices</p> <p>FY 2022 Plans: Rapid Diagnostic and Detection Devices (Infectious Disease Diagnostics (Multiple)): Conduct initial clinical efficacy trials and manufacturing development of the Tropical Disease and Flu and Viral Infection Diseases (FLU-VID) diagnostic panels for a man-portable device.</p> <p>Treatment for Drug Resistant Battlefield Wound Infections: Will monitor technical maturity of candidate treatments for evidence of safety and efficacy in relevant animal models.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737) . Funding transferred to Program Element 0604110DHA, Project Code 374E.</p>		-	5.156	-
<p>Title: FY22 SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638.</p>		-	0.180	-
Accomplishments/Planned Programs Subtotals		6.891	6.477	0.403

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
--	--	---

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

N/A

Remarks

D. Acquisition Strategy

Test and evaluate in-house and commercially developed products in extensive commercial partner or government-managed clinical trials to gather data required for FDA licensure ensuring government (military) requirements are met with judicious investment.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 808 / DoD Drug & Vacc Ad
--	---	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	31.569	1.762		0.312		0.403		-		0.403	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	PO	General Dynamics Information Technology, : Frederick MD	8.467	2.987		0.605		-		-		-	0.000	12.059	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.180		-		-		-	0.000	0.180	-
Subtotal			40.036	4.749		1.097		0.403		-		0.403	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Rapid Human Diagnostics	C/Various	Inbios, Inc : Seattle WA	8.431	-		-		-		-		-	0.000	8.431	-
Rapid Human Diagnostics	Various	Cepheid : CA	-	2.142		2.092		-		-		-	0.000	4.234	-
Staphylococcus aureus Vaccine	Various	TBD : TBD	-	-		0.968		-		-		-	0.000	0.968	-
Treatment for Drug Resistant Battlefield Bacterial Wound Infections	Various	TBD : TBD	-	-		2.320		-		-		-	0.000	2.320	-
Subtotal			8.431	2.142		5.380		-		-		-	0.000	15.953	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Malaria Prophylaxis Clinical Trial	TBD	TBD : TBD	11.123	-		-		-		-		-	0.000	11.123	-
Subtotal			11.123	-		-		-		-		-	0.000	11.123	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army										Date: April 2022			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev			Project (Number/Name) 808 / DoD Drug & Vacc Ad					
	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	59.590	6.891		6.477		0.403		-		0.403	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
--	--	---

Event Name	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
Treatment for Drug Resistant Battlefield Fungal Wound Infections																												
Rapid Human Diagnostic																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Treatment for Drug Resistant Battlefield Fungal Wound Infections	3	2021	4	2022
Rapid Human Diagnostic	4	2017	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) 811 / <i>Mil HIV Vac&Drug Dev</i>			
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
811: <i>Mil HIV Vac&Drug Dev</i>	-	7.740	-	-	-	-	-	-	-	-	0.000	7.740
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

For Fiscal Year (FY) 2022 the program funding has transitioned to Program Element (PE) 0604807A Project 849.

A. Mission Description and Budget Item Justification

This Project funds development of militarily relevant human immunodeficiency virus (HIV) medical countermeasures. It provides for the planning and conduct of human clinical trials in a group of healthy volunteers to assess for safety and tolerability of medical countermeasures, how the drug/vaccine is distributed through, metabolized in, and excreted from the body, and to investigate the appropriate dose. Development efforts are focused on militarily unique needs affecting manning, mobilization, and deployment. The cumulative cost of treating HIV-positive DoD personnel is estimated to be \$16.6 billion for 3000 personnel over a 50-year lifetime. All clinical trials are conducted in accordance with U.S. FDA regulations.

Research efforts are coordinated with the National Institutes of Health and the National Institute of Allergy and Infectious Diseases (NIAID), Division of Acquired Immune Deficiency Syndrome (DAIDS).

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

	FY 2021	FY 2022	FY 2023
Title: Military HIV Vaccine & Drug Development	7.740	-	-
Description: This Project funds advanced development research to develop candidate HIV vaccines, assess their safety and effectiveness in evaluations with human subjects, and protect military personnel from risks associated with HIV infection.			
Accomplishments/Planned Programs Subtotals	7.740	-	-

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

N/A

Remarks

D. Acquisition Strategy

Test and evaluate commercially developed drug/vaccine candidates in government-managed trials.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 811 / Mil HIV Vac&Drug Dev
--	---	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Management Services Cost	TBD	Not Applicable : Not Applicable	4.315	0.386		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.315	0.386		-		-		-		-	Continuing	Continuing	N/A

Remarks
Not Applicable

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Cost	TBD	Not applicable : Not applicable	5.078	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			5.078	-		-		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	TBD	TBD : TBD	4.541	-		-		-		-		-	0.000	4.541	-
Subtotal			4.541	-		-		-		-		-	0.000	4.541	N/A

Remarks
Not Applicable

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development T&E Cost	TBD	Janssen : Not Applicable	33.257	5.075		-		-		-		-	0.000	38.332	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 811 / Mil HIV Vac&Drug Dev
--	---	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development T&E Cost	C/CPFF	PPD : Wilmington, NC	-	2.279		-		-		-		-	0.000	2.279	-
Subtotal			33.257	7.354		-		-		-		-	0.000	40.611	N/A

Remarks
Not Applicable

	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	47.191	7.740	-	-	-	-	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 811 / <i>Mil HIV Vac&Drug Dev</i>
--	--	---

Event Name	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
Global HIV (Ad26/Ad26+gp140) Phase 2B Clinical Trial	FY18-FY21																											

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 811 / <i>Mil HIV Vac&Drug Dev</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Global HIV (Ad26/Ad26+gp140) Phase 2B Clinical Trial	1	2019	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) 836 / Field Medical Systems Advanced 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
836: Field Medical Systems Advanced Development	-	20.335	30.576	0.195	-	0.195	1.205	0.167	0.607	0.613	0.000	53.698
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the demonstration and validation of medical products for enhanced combat casualty care and follow-on care. This Project funds human clinical trials to test the safety and effectiveness of biologics (products derived from living organisms) and devices necessary to meet medical requirements. The Project Manager (PM) also considers factors to reduce the medical logistics footprint through smaller weight, volume, and equipment independence from supporting materials. All clinical trials are conducted in accordance with U.S. FDA regulations. Products from this project will transition to PE 0604807A/Project 832.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Field Medical Systems Advanced Development - Program Management (PM) Warfighter Expeditionary Medicine and Treatment</p> <p>Description: Funding is provided for the development of medical devices in support of enhanced combat casualty care.</p>	10.782	-	-
<p>Title: Field Medical Systems Advanced Development - PM Warfighter Health, Performance and Evacuation</p> <p>Description: Funding is provided for the development of products that support the medical mission in combat casualty care and health care operations.</p>	1.053	-	-
<p>Title: Field Medical Systems Advanced Development - Medical Readiness</p> <p>Description: Funding is provided for engineering and manufacturing development of medical products for diagnostic devices and testing of medical devices for use in the field.</p> <p>FY 2022 Plans: Non-invasive Neuro Assessment Devices (NINAD): Will complete an analysis of alternatives report. Will award R&D contract for development of NINAD capability. Will initiate bench performance testing to demonstrate adequate performance in the laboratory. Will begin protocol development and infrastructure preparation for field evaluation / clinical trial(s) to demonstrate effectiveness in a defined Traumatic Brain Injury population to enable U.S. FDA approval.</p> <p>FY 2023 Plans: Soldier Optimization Decision Aids (SODA): Initiate Software Design, Development, Test Planning, Acquisition Documentation, and Life Cycle Support of Mission planning mobile software apps that give Commanders the tools capable of optimizing Soldier potential and reducing the risk of costly non-battle injuries</p>	-	4.103	0.195

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Non-invasive Neuro Assessment Devices (NINAD): Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737). Funding transferred to Program Element 0604110DHA, Project Code 374E.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737). Funding transferred to Program Element 0604110DHA, Project Code 374E.</p>			
<p>Title: Field Medical Systems Advanced Development - Battlefield Care and Return to Fight</p> <p>Description: Funding is provided for the development of the medical devices and blood products in support of enhanced combat casualty care.</p> <p>FY 2022 Plans: Temporary Corneal Repair: Will continue initial clinical trials and conduct activities to support FDA clearance of TCR product. Will perform developmental and military-relevant testing of product candidates. Extracorporeal Life Support - Lung/Renal: Closing out current contract activities in FY21. Candidate returned to technology base for refinement to meet MDO CONOPS. Burn Treatment Skin Repair- Burn Conversion Prevention: Will award prototyping agreements for products needed to treat severe burns in prolonged care scenarios Freeze Dried Platelets: Conduct market research, develop CRADA's with industry partners and initiate acquisition documentation for a candidate from industry and begin planning for a Phase 2 safety and efficacy trial of the candidate.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding and mission realigned as part of US Army Medical Research and Development Command transfer to the Defense Health Agency in order to meet Congressional intent as outlined in National Defense Authorization Act 2019 (Sections 711) and NDAA 2020 (Section 737). Funding transferred to Program Element 0604110DHA, Project Code 374E.</p>	-	5.819	-
<p>Title: Field Medical Systems Advanced Development - Field Hospital and Evacuation</p> <p>Description: Funding is provided for the development of medical devices in support of the medical mission field hospitalization and evacuation.</p> <p>FY 2022 Plans:</p>	-	5.149	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Transport Telemedicine Systems (TTS): Will start TTS MEDHUB (Medical Hands-Free Unified Broadcast) Increment 2, which will focus on FDA approval and development (ruggedization for a high vibration environment, etc) of peripheral medical devices that will communicate with MEDHUB. The peripheral medical devices include Drug Safety and Tracking System, Intravenous Pressure Infuser and Blood Pressure Monitor.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding due to termination of TTS effort as the result of a shift in Army priorities and contract closeout.</p>			
<p>Title: SBIR/STTR Tax</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638.</p>	-	0.505	-
Accomplishments/Planned Programs Subtotals	11.835	15.576	0.195

	FY 2021	FY 2022
<p>Congressional Add: Program increase - composite shelter</p> <p>FY 2021 Accomplishments: Started development and testing for advanced fully composite shelters to improve Hospital Center operations.</p>	5.500	-
<p>Congressional Add: Program increase - wearable medical device for TBI prevention</p> <p>FY 2021 Accomplishments: Funding reprogrammed from 6.5 to 6.4. Developed full and open solicitation and released for proposals to develop capability for US Military-unique needs.</p> <p>FY 2022 Plans: Continue development and systems engineering of ?Wearable TBI Device? to fulfill US Military-unique needs for TBI prevention; including developmental testing, pre-clinical testing and prototype refinement, environmental testing to ensure conformance to specs, FDA meeting(s), and Military Utility Assessment (MUA) activities.</p>	3.000	5.000
<p>Congressional Add: Program increase - Freeze Dried Platelets</p> <p>FY 2022 Plans: Will support a Phase 2a clinical trial in civilian trauma that translates to further prehospital studies with further use in combat to prevent loss of life. This study would provide the pilot data needed to</p>	-	10.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>
--	--	---

	FY 2021	FY 2022
support development and conduct of a pivotal Phase2/3 human clinical trial in trauma and the development of unique packaging for extreme environments.		
Congressional Adds Subtotals	8.500	15.000

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

N/A

Remarks

D. Acquisition Strategy

Develop in-house or industrial prototypes in government-managed programs to meet military and regulatory requirements for production and fielding.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development
--	---	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	48.310	0.572		1.564		-		-		-	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	C/IDIQ	Not applicable : Not applicable	2.295	-		0.150		-		-		-	0.000	2.445	-
FY22 SBIR/STTR Transfer	TBD	various : Various	-	-		0.505		-		-		-	0.000	0.505	-
Subtotal			50.605	0.572		2.219		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Temporary Corneal Repair	C/Various	Critical Innovations, LLC, GelMEDIX, Endomedix, Inc., Ashvattha Therapeutics, LLC , University of Southern California, Institute of Surgical Research : Inglewood, CA, Cambridge, MA, Montclair, NJ, Redwo	9.259	4.462		2.178		-		-		-	0.000	15.899	-
Extracorporeal Life Support (ECLS)	Various	Medical Technology Enterprise Consortium : Summerville SC	0.558	3.150		-		-		-		-	0.000	3.708	-
Non-invasive neuro assessment device (NINAD)	C/Various	TBD : TBD	0.800	-		1.471		-		-		-	0.000	2.271	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development
--	---	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Transport Telemedicine Systems (TTS) - MEDHUB Platform	TBD	Cooper Consulting Services : TBD	2.286	0.057		2.899		-		-		-	Continuing	Continuing	Continuing
Extremity Injury Repair - Vascular	TBD	SS/CPFF : HumaCyte: Morrisville, NC	6.610	2.531		-		-		-		-	Continuing	Continuing	Continuing
Burn Treatment Skin Repair	TBD	TBD : TBD	-	-		2.760		-		-		-	0.000	2.760	-
Platelet-Derived Hemostatic Agent	TBD	TBD : TBD	-	-		0.316		-		-		-	0.000	0.316	-
Program Increase - Wearable Medical Device for TBI prevention	TBD	TBD : TBD	-	3.000		5.000		-		-		-	0.000	8.000	-
Program increase - composite shelter	TBD	OSD-MRO : TBD	-	5.296		-		-		-		-	0.000	5.296	-
Program increase - Freeze Dried Platelets	TBD	TBD : TBD	-	-		10.000		-		-		-	0.000	10.000	-
Subtotal			19.513	18.496		24.624		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	Various	Not Applicable : Not applicable	51.199	1.173		1.842		-		-		-	Continuing	Continuing	Continuing
Program increase - composite shelter	TBD	TBD : TBD	-	0.094		-		-		-		-	0.000	0.094	-
Soldier Optimization Decision Aid	TBD	TBD : TBD	-	-		-		0.195		-		0.195	0.000	0.195	-
Subtotal			51.199	1.267		1.842		0.195		-		0.195	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development
--	---	--

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
No product/contract costs greater than \$1M individually.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Noninvasive Neuro-Assessment Devices (NINAD)	TBD	TBD : TBD	-	-		1.891		-		-		-	0.000	1.891	-
Subtotal			-	-		1.891		-		-		-	0.000	1.891	N/A

Remarks
No product/contract costs greater than \$1M individually.

	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	121.317	20.335	30.576	0.195	-	0.195	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>	

Event Name	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
Temporary Corneal Repair																												
	<i>R&D development</i>																											
Temporary Corneal Repair -Prototype Testing																												
	<i>Prototype Testing</i>																											
Temporary Corneal Repair- Clinical Study																												
	<i>Clinical Study</i>																											
Noninvasive Neuro Assessment Device development (NINAD)																												
	<i>R&D development</i>																											
Transport Telemedicine Systems (TTS)- MEDHUB Platform																												
Burn Treatment Skin Repair																												
					<i>Prototype Development</i>																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Temporary Corneal Repair	2	2016	4	2022
Temporary Corneal Repair -Prototype Testing	2	2018	4	2022
Temporary Corneal Repair- Clinical Study	2	2020	4	2022
Noninvasive Neuro Assessment Device development (NINAD)	1	2019	4	2022
Transport Telemedicine Systems (TTS)- MEDHUB Platform	3	2013	4	2022
Burn Treatment Skin Repair	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration			
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
FF4: Counterdrug, DDR, Sys Development & Demonstration	-	0.749	-	-	-	-	-	-	-	-	0.000	0.749
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Supports the Secretary of Defense approved counterdrug advanced development efforts used in a major re-design of the Forensic Toxicology Drug Testing Laboratory (FTDTL) information management system used to test urine samples for the presence of illegal drugs. The Drug Testing Program - Client Collection System (DTP-CSS) is comprised of several variations of a desktop application used to select service members for random drug testing, prepare labels for urine specimen bottles, and print corresponding chain-of-custody documents. This Project will standardize DTP-CSS across all services and migrate it to a Web-based system.

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

	FY 2021	FY 2022	FY 2023
Title: Forensic Toxicology Drug Testing Laboratory- Information Management System system.(FTDTL-IMS)	0.749	-	-
Accomplishments/Planned Programs Subtotals	0.749	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/UCA	Alliant Corps LLC : San Antonio, TX	15.196	0.749		-		-		-		-	0.000	15.945	-
Subtotal			15.196	0.749		-		-		-		-	0.000	15.945	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			15.196	0.749	-		-		-		-	0.000	15.945	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) FF4 / Counterdrug, DDR, Sys Development & Demonstration

	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
Determine Hosting requirements																												
Coding and Development Testing																												
User Testing																												

	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
Determine Hosting requirements																												
Coding and Development Testing																												
User Testing																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) FF4 / <i>Counterdrug, DDR, Sys Development & Demonstration</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Determine Hosting requirements	2	2017	2	2017
Coding and Development Testing	3	2017	1	2019
User Testing	1	2019	2	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) VS7 / <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>			
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
<i>VS7: MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>	-	0.291	-	-	-	-	-	-	-	-	0.000	0.291
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project is funded to achieve the required operational capability and common capability across the MEDEVAC fleet. The MEDEVAC MEP program modernizes and retrofits MEDEVAC legacy helicopters to achieve the medical capability provided by a limited number of mission specific MEDEVAC helicopters, to include Blackhawk and Future Vertical Lift. The Medevac Mission Equipment on the Army MEDEVAC helicopters is critical to maintaining high US troop survival rates during current and future conflicts by evacuating wounded troops quickly while providing good care enroute. To better meet operational needs, in 2009 the Vice Chief of Staff of the Army (VCSA) approved the force design update increasing the number of air frames for MEDEVAC companies. In 2010, the Army Medical Department (US Army) accepted life-cycle management of the MEDEVAC MEP from PEO Aviation. Ongoing research and design efforts are required to prepare and optimize the MEDEVAC fleet with mission equipment. All products from this Project will transition to PE 0604807A/Project VS8.

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

	FY 2021	FY 2022	FY 2023
Title: Medical Evacuation Development	0.291	-	-
Description: This effort involves Aeromedical Evacuation Cabin and Technology Research to determine the optimum space and configuration for performing necessary life-saving paramedic-level tasks. Efforts will develop patient handling system components and prototypes to ensure paramedic skills and tasks are performed to standard to save Soldiers' lives during point of injury MEDEVAC Missions.			
Accomplishments/Planned Programs Subtotals	0.291	-	-

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

N/A

Remarks

D. Acquisition Strategy

Develop in-house or industrial prototypes in government-managed programs to meet military MEDEVAC and regulatory requirements for production and fielding.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) VS7 / MEDEVAC Mission Equipment Package (MEP) - Adv Dev
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Services Cost	Various	APM MEDEVAC PEO Aviation : Huntsville, AL	3.665	0.291		-		-		-		-	0.000	3.956	-
Subtotal			3.665	0.291		-		-		-		-	0.000	3.956	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Cost	TBD	APM MEDEVAC PEO Aviation : Huntsville AL	4.651	-		-		-		-		-	0.000	4.651	-
Subtotal			4.651	-		-		-		-		-	0.000	4.651	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	TBD	APM MEDEVAC PEO Aviation : Huntsville, AL	0.911	-		-		-		-		-	0.000	0.911	-
Subtotal			0.911	-		-		-		-		-	0.000	0.911	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development T&E Cost	MIPR	APM MEDEVAC PEO Aviation : Huntsville, AL	0.199	-		-		-		-		-	0.000	0.199	-
Subtotal			0.199	-		-		-		-		-	0.000	0.199	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) VS7 / <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>				
	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	9.426	0.291		-		-		-		0.000	9.717	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) VS7 / <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>	

Event Name	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
Future Vertical Lift (FVL) and UH60 Aeromedical Evac Cabin Sp	Research and development																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) VS7 / <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Future Vertical Lift (FVL) and UH60 Aeromedical Evac Cabin Space and Technology	1	2017	4	2021

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced 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	-	23.905	25.925	25.971	-	25.971	28.265	30.578	32.881	33.195	Continuing	Continuing
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	2.449	3.077	3.858	-	3.858	3.766	3.802	4.064	4.103	0.000	25.119
ET8: <i>Personnel Airdrop System Development</i>	-	1.219	1.155	1.853	-	1.853	2.254	0.951	2.355	2.378	Continuing	Continuing
S53: <i>Clothing And Equipment</i>	-	1.742	6.504	4.578	-	4.578	4.799	8.312	8.957	9.044	Continuing	Continuing
S54: <i>Small Arms Improvement</i>	-	16.216	10.911	9.248	-	9.248	9.286	9.366	9.359	9.448	0.000	73.834
VS4: <i>Soldier Protective Equipment</i>	-	2.279	4.278	6.434	-	6.434	8.160	8.147	8.146	8.222	Continuing	Continuing

A. Mission Description and Budget Item Justification

A portion of this funding line is directly aligned to the Soldier Lethality Army Modernization Priority. This Program Element (PE), Advanced Component Development and Prototypes, manages the Soldier as a system to increase combat effectiveness, test and deliver tangible products that save Soldiers lives and improve combat capability. The PE provides funding for evaluating, developing, and testing emerging technologies and critical Soldier support systems to reduce technology risk.

CF2

The Integrated Squad effort includes the completion of the Adaptive Squad Architecture (ASA), Squad Performance Metrics (SPM) and the Soldier Integration Facility (SIF) programs. These efforts are Program Executive Office-Soldier (PEO-S) led and will develop a full system architecture for the Soldier and the Squad paired with a constructive and live integration capability with the SIF. This will be accomplished by developing Interface Control Documents (ICDs) in order to provide common established interfaces for internal and external stakeholders who will interface on or with the Soldier/Squad platforms. The critical elements are the development of the "Soldiers as Integrated Weapons Systems" and "Squad as an Integrated Combat Platform" vision based on threat, operational environment and collaboration with internal and external stakeholders to inform investment decisions out to Fiscal Year (FY) 2050. The ASA/SPM/SIF will develop a metric-based approach that will include virtual, constructive and live evaluations and tools across the Department of Defense (DoD), academia and industry which will be used for senior leaders to make deliberate decisions based on the analysis of Soldier/Squad performance.

ET8

Personnel Airdrop System improves Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement based on integration of new technology with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.

S53

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
---	---

This Project evaluates and integrates technologies and representative or prototype systems that help expedite Soldier Clothing and Individual Equipment technology transition from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide a modular, integrated uniform/clothing system from skin out and head-to-toe. It funds efforts to transition new technologies and domestically available fabrics with Flame Resistant (FR), moisture wicking, insect protection and camouflage technologies, including integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and arctic environments. New technologies are identified to monitor health and improve Soldier survivability, reduce weight, and improve affordability, mobility and comfort in combat and training/administrative environments. Includes integration and interface on the Soldier system.

S54

The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Budget Activity (BA) 3 Program Element 0603607A Joint Service Small Arms Program (JSSAP) Project 627 Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapon systems and technology. Small arm weapon systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.

VS4

This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	23.184	17.459	0.000	-	0.000
Current President's Budget	23.905	25.925	25.971	-	25.971
Total Adjustments	0.721	8.466	25.971	-	25.971
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.721	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	25.971	-	25.971
• FFRDC Transfer	-	-0.034	-	-	-

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
---	---

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

Project: S53: *Clothing And Equipment*

Congressional Add: *Congressional Add for Multi-spectral Signature Management*

Congressional Add Subtotals for Project: S53

Project: S54: *Small Arms Improvement*

Congressional Add: *New Weapon Systems Congressional Add*

Congressional Add Subtotals for Project: S54

Congressional Add Totals for all Projects

FY 2021	FY 2022
-	4.500
-	4.500
-	4.000
-	4.000
-	8.500

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>			
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
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	2.449	3.077	3.858	-	3.858	3.766	3.802	4.064	4.103	0.000	25.119
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Verify and maintain tools that provide Systems Engineering, Configuration Management, and Evaluations in a virtual and physical environment. Verify and maintain the Adaptive Squad Architecture (ASA) and Squad Performance Metrics (SPM) with emphasis on development of Interface Control Documents (ICDs), specifically to support the rapid integration of the Soldier Lethality Cross Functional Team (SL CFT) priority programs with all other dismounted Soldier equipment. Prototype capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.

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

	FY 2021	FY 2022	FY 2023
Title: Integrated Soldier Systems Prototyping	2.449	2.963	3.858
Description: Verify and maintain tools that provide Systems Engineering, Configuration Management, and Evaluations in a virtual and physical environment. Verify and maintain the ASA and SPM with emphasis on development of ICDs, specifically to support the rapid integration of the Soldier Lethality Cross Functional Team (SL CFT) priority programs with all other equipment the dismounted Soldier will use. Provide prototyping of capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team.			
FY 2022 Plans: Continue to develop components, algorithms, and demonstrations in support of Squad as an Integrated Combat Platform.			
FY 2023 Plans: Continue to develop components, algorithms, and demonstrations in support of Squad as an Integrated Combat Platform.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase supports ongoing development of the Adaptive Squad Architecture and Squad Performance Metrics, plus integration events in the Soldier Integration Facility.			
Title: FY 2022 SBIR/STTR Transfer	-	0.114	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>
--	---	--

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: FY 2022 SBIR/STTR Transfer in accordance with Title 15 USC ?638.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 SBIR/STTR Transfer in accordance with Title 15 USC ?638.			
Accomplishments/Planned Programs Subtotals	2.449	3.077	3.858

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CF3: <i>Integrated Soldier Systems (SL CFT)</i>	4.429	4.371	4.403	-	4.403	4.501	4.539	4.631	4.674	0.000	31.548

Remarks

D. Acquisition Strategy
Develop and validate the verification and operation of the ASA tools (Configuration Database (CD), Architectural Assessment Tool (AAT), Squad Performance Metrics (SPM)) under full and open competition. Attempt to utilize one vendor for, at a minimum, maintenance of the CD and AAT. Conduct evaluations to support the SPM, with the Government acting as the lead developer.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.114		-		-		-	0.000	0.114	-
Subtotal			-	-		0.114		-		-		-	0.000	0.114	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Squad Architecture (ASA) Squad Performance Metrics (SPM)	C/FFP	Various : Various	0.374	0.931	Jan 2021	0.607	Jan 2022	1.275	Jan 2023	-		1.275	Continuing	Continuing	Continuing
Subtotal			0.374	0.931		0.607		1.275		-		1.275	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ASA/SPM Test & Eval	C/FFP	Various : various	1.504	1.518	Dec 2020	2.356	Dec 2021	2.583	Jan 2023	-		2.583	Continuing	Continuing	Continuing
Subtotal			1.504	1.518		2.356		2.583		-		2.583	Continuing	Continuing	N/A
Project Cost Totals			1.878	2.449		3.077		3.858		-		3.858	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	

Event Name	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
ASA SPM Implementation																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ASA SPM Implementation	2	2020	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>			
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
ET8: <i>Personnel Airdrop System Development</i>	-	1.219	1.155	1.853	-	1.853	2.254	0.951	2.355	2.378	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. Project ET8, Personnel Airdrop System Development, improves Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement based on integration of new technology with the goal of enhancing the insertion capability and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and equipment. It will continue to support cross-service initiatives to improve commonality.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Personnel Airdrop System Development</p> <p>Description: Improve Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvements based on integration of new technology with the goal of enhancing the insertion and safety of the airborne soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.</p> <p>FY 2022 Plans: Continue evaluation of Low Altitude Static Line Reserve Parachute Automatic Activation Devices. Begin development and evaluation of Smart Universal Static Line Snap Hook (SUSH).</p> <p>FY 2023 Plans: Continue evaluation of Low Altitude Static Line Reserve Parachute Automatic Activation Devices. Mature form factor and operational concepts in addition to initial integration testing with the T-11 Reserve Single Pin.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase is due to an increased scope of testing.</p>	1.219	1.113	1.853
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638.</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	0.042	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>

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	1.219	1.155	1.853

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
• ES9: <i>Advanced Tactical Parachute System</i>	3.027	1.770	3.029	-	3.029	2.835	3.806	4.148	4.189	0.000	22.804
• MA7801: <i>Advanced Tactical Parachute System</i>	54.747	34.959	42.444	-	42.444	40.046	36.722	33.791	33.774	0.000	276.483

Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to system development and demonstration (SDD).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				ET8 / Personnel Airdrop System Development							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.042		-		-		-	0.000	0.042	-
Subtotal			-	-		0.042		-		-		-	0.000	0.042	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Contracts	C/FFP	TBD : TBD	0.255	0.700		0.355		0.650		-		0.650	2.588	4.548	-
Engineering Support	MIPR	CCDC Natick, MA : various	0.556	0.020		0.020		0.240		-		0.240	0.827	1.663	-
Subtotal			0.811	0.720		0.375		0.890		-		0.890	3.415	6.211	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Allot	PM SCIE : Belvoir	0.375	0.370		0.424		0.188		-		0.188	0.811	2.168	-
Subtotal			0.375	0.370		0.424		0.188		-		0.188	0.811	2.168	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	TBD : TBD	0.635	0.129		0.314		0.775		-		0.775	0.782	2.635	-
Subtotal			0.635	0.129		0.314		0.775		-		0.775	0.782	2.635	N/A
Project Cost Totals			1.821	1.219		1.155		1.853		-		1.853	5.008	11.056	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>			Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>				
	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

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>
--	---	---

Event Name	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															
Evaluate Component and Subsystem Technologies																																											
Develop Smart Universal Static line Hook (SUSH)																																											
T-11R AAD MDD																																											
Static Line T-11R AAD Development																																											
High Altitude Insertion Enhancements																																											
Next Generation Low Altitude Parachute System																																											

Note
High Altitude Insertion Enhancements includes the following: Glide Technology, Situational Awareness Aids, and GPS Denied Navigation Aid.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Evaluate Component and Subsystem Technologies	1	2019	4	2023
Develop Smart Universal Static line Hook (SUSH)	1	2024	4	2024
T-11R AAD MDD	1	2023	1	2023
Static Line T-11R AAD Development	3	2020	4	2023
High Altitude Insertion Enhancements	1	2024	4	2027
Next Generation Low Altitude Parachute System	1	2024	4	2026

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S53 / <i>Clothing And Equipment</i>			
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
S53: <i>Clothing And Equipment</i>	-	1.742	6.504	4.578	-	4.578	4.799	8.312	8.957	9.044	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this effort supports the Army's Cross Functional Teams (CFT) initiatives to evaluate and integrate technologies and prototypes that expedite Product Manager Soldier Clothing and Individual Equipment (PM SCIE) technology transitions from the laboratory to operational use. Efforts focus on achieving commonality across a broad spectrum of warfighters to provide footwear, uniforms and clothing systems consisting of all layers required to accommodate Warfighters in all environments resulting in Soldier as an integrated system. PM SCIE efforts include female Warfighter specific items and sizing. This effort funds the transition of new, improved technologies and domestically available fabrics with capabilities such as Flame Resistance (FR), moisture wicking, vector protection and innovative multi-service efforts to advance camouflage technologies to mitigate Near Infrared (NIR), Short Wave Infrared (SWIR), Mid-Wave Infrared (MWIR), and Ultraviolet (UV) detection. This effort also funds integration of fabrics for uniforms and equipment for use in all environments focusing on arctic and jungle. PM SCIE will transition capabilities from our Science and Technology partners to increase performance of Warfighter clothing and equipment and identify emerging technologies to integrate smart textile capabilities into combat uniforms and equipment. Additional advances on existing technologies to improve survivability by focusing on reducing weight and improving performance, mobility and comfort. PM SCIE will continue to support multi-service commonality initiatives through technology that enables combat operations in a gender integrated fighting force.

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

	FY 2021	FY 2022	FY 2023
Title: Soldier Uniforms and Clothing	0.765	1.543	3.250
Description: Develop superior and sustainable integrated clothing and footwear for the Soldier in a rapidly changing global environment.			
FY 2022 Plans:			
Funding supports the Secretary of the Army's directive to identify opportunities for commonality in Organizational Clothing and Individual Equipment (OCIE) across all Services (Army, Navy, Air Force, Marines, Coast Guard). Evaluate transitioned fabric and system designs that provide specific protection, enhanced camouflage and identification capability and improved comfort for inclusion in tactical and environmental clothing. Transition materials for incorporation into combat uniforms to enhance Identification Friend or Foe (IFF). Transition functional textiles to mitigate Ground Surveillance Radar (GSR) detection by opposing forces. Transition materials that will improve cooling/airflow for dismounted Soldiers and reduce thermal signature to further mitigate detection. Investigate and evaluate conductive textiles (fabric level). Transition materials that will protect against emerging microwave threats. Continue uniform, clothing, and footwear improvements with an emphasis on commonality. Analyze Flame Resistant garment upgrades and review/improve testing protocols. Continue to develop novel solutions for parachutist clothing above 25,000 feet. Develop enhanced Organizational Clothing and Individual Equipment capabilities for			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Soldiers operating all climatic zones and environments. Continue testing novel materials and processes to improve clothing and equipment for all climates. Improve size standardization for all individually sized items.</p> <p>FY 2023 Plans: Supporting the Secretary of the Army's directive to identify opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines, and Coast Guard). Evaluate fabric and system designs that provide improved vector protection, enhanced camouflage and identification capability, Flame Resistant (FR) protection and improved comfort for inclusion in tactical and environmental clothing. Focus on improvements for cold weather and extreme cold weather clothing and handwear. Transition government developed materials that meet SWIR requirement and reduces costs across all Services. Develop enhanced Aircrew uniforms utilizing enhanced, domestically available FR fabrics. Investigate and evaluate conductive textiles (fabric level). Supports The Chief of Staff Army's directives resulting from the Army Uniform Board held twice annually to include upgrades to clothing bag items. Transition materials to reduce spectral as well as thermal signature to further mitigate detection.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase from FY 2022 to FY 2023 due to anticipated transitions from the Science and Technology community to include spectral mitigation and signature management. Increase will be focused on multiservice commonality efforts.</p>				
<p>Title: Individual Equipment</p> <p>Description: Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment.</p> <p>FY 2022 Plans: Funding supports the Secretary of the Army's directive to identify opportunities for commonality in SCIE across all Services (Army, Navy, Air Force, Marines, Coast Guard). Evaluate new technology for the desalinization of salt water as part of the Individual Water Treatment Device program. Evaluate new technology to effectively camouflage and reduce thermal signature on exposed skin (face, neck, hands, etc) and technology to temporarily camouflage individual equipment. Evaluate materials and perform laboratory testing to support down-selection in support of Cold Weather Gear and Cold Weather Survival Blanket programs. Analyze current load carriage equipment to determine its ability to support the modernization of current individual weapons and situational awareness capabilities. Continue to optimize the capability of Load Carriage items to support modernization for weapons and tactical gear. Develop individual over the snow mobility and protection equipment.</p> <p>FY 2023 Plans: Supporting the Secretary of the Army's directive to identify opportunities for commonality in OCIE across all Services (Army, Navy, Air Force, Marines, and Coast Guard). Perform laboratory testing on novel materials to support Cold Weather Equipment programs. Evaluate current load carriage equipment to assess its ability to support the modernization of current individual weapons and situational awareness capabilities. Continue to optimize the capability of Load Carriage items to support</p>		0.977	0.388	1.328

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
modernization of weapons and tactical equipment. Evaluate new technology to effectively camouflage and reduce thermal signature on exposed skin (face, neck, hands, etc.) and enhance individual equipment camouflage. Investigate new technology for the desalinization of salt water as part of the Individual Water Treatment Device program.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase from FY 2022 to FY 2023 due to anticipated transitions from the Science and Technology community to include spectral mitigation and signature management. Increase will be focused on multiservice commonality efforts.			
Title: SBIR/STTR Transfer	-	0.073	-
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	1.742	2.004	4.578

	FY 2021	FY 2022
Congressional Add: Congressional Add for Multi-spectral Signature Management	-	4.500
FY 2022 Plans: Mature, incorporate and demonstrate infrared sensor detection mitigation technology into combat uniforms, body armor and operational clothing & individual equipment by conducting field tests of subsystem and system prototypes in relevant environments.		
Congressional Adds Subtotals	-	4.500

C. Other Program Funding Summary (\$ in Millions)	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
• S60: <i>Clothing & Equipment</i>	6.472	5.393	6.313	-	6.313	3.499	6.490	9.048	9.136	0.000	46.351

Remarks

D. Acquisition Strategy
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to Systems Development and Demonstration. This Project continues to exercise competitively awarded contracts using best value source selection procedures.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				S53 I Clothing And Equipment								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	TBD	PM SCIE : Ft. Belvoir, VA	16.076	0.287		0.836		0.445		-		0.445	Continuing	Continuing	Continuing	
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.073		-		-		-	0.000	0.073	-	
Subtotal			16.076	0.287		0.909		0.445		-		0.445	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Engineering Support	MIPR	NSRDEC : Natick, MA	18.106	0.344		1.534		1.085		-		1.085	Continuing	Continuing	Continuing	
Development Contracts	C/FFP	Various : Various	37.291	0.304		1.546		0.955		-		0.955	Continuing	Continuing	Continuing	
Subtotal			55.397	0.648		3.080		2.040		-		2.040	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program OfficeSupport Costs	MIPR	Natick,MA : Natick, MA	9.000	0.310		0.833		0.635		-		0.635	Continuing	Continuing	Continuing	
Subtotal			9.000	0.310		0.833		0.635		-		0.635	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Testing Costs	MIPR	Various : Various	29.195	0.497		1.682		1.458		-		1.458	Continuing	Continuing	Continuing	
Subtotal			29.195	0.497		1.682		1.458		-		1.458	Continuing	Continuing	N/A	

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S53 / <i>Clothing And Equipment</i>				
	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	109.668	1.742	6.504		4.578	-	4.578	Continuing	Continuing	N/A	

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>	

Event Name	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
UNIFORM CLOTHING																												
Flame Resistant Clothing Improvements																												
Improve Signature Mgmt Infrared (IR) Eval & Camo in Clothing &																												
Cold Weather/ Extreme Cold Weather (CW/ECW) Clothing Impr																												
Cold Weather/ Extreme Cold Weather (CW/ECW) Handwear																												
Novel Materials Development																												
Enhanced Aircrew Uniform																												
INDIVIDUAL EQUIPMENT																												
Multi-purpose Personal Hydration System (MPHS) Shelf-life Ext																												
Develop Water Treatment Device																												
Thermal Signature Reduction																												
Cold Weather Canteen																												
Load Carriage																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UNIFORM CLOTHING	1	2010	4	2027
Flame Resistant Clothing Improvements	1	2012	4	2024
Improve Signature Mgmt Infrared (IR) Eval & Camo in Clothing & Equipment	2	2012	4	2026
Cold Weather/ Extreme Cold Weather (CW/ECW) Clothing Improvements	1	2019	4	2025
Cold Weather/ Extreme Cold Weather (CW/ECW) Handwear	1	2020	3	2022
Novel Materials Development	1	2020	4	2027
Enhanced Aircrew Uniform	1	2024	4	2026
INDIVIDUAL EQUIPMENT	4	2015	4	2025
Multi-purpose Personal Hydration System (MPHS) Shelf-life Extension Evaluation	1	2019	4	2021
Develop Water Treatment Device	1	2022	4	2026
Thermal Signature Reduction	1	2021	4	2027
Cold Weather Canteen	1	2020	4	2021
Load Carriage	1	2020	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S54 / <i>Small Arms Improvement</i>			
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
S54: <i>Small Arms Improvement</i>	-	16.216	10.911	9.248	-	9.248	9.286	9.366	9.359	9.448	0.000	73.834
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Budget Activity (BA) 3 Program Element (PE) 0603607A Joint Service Small Arms Program (JSSAP) Project 627 Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapon systems and technology. Small Arms Improvement supports the Army Modernization priorities (Build a More Lethal Force) through enhancement of Joint Lethality in contested environments by minimizing and eliminating erosion of close combat capability relative to peer competitors in complex terrain as outlined in the National Defense Strategy (NDS). Small Arms weapon systems include weapons ranging up to 40 millimeter in caliber and recoilless rifles. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, ancillary items and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.

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

	FY 2021	FY 2022	FY 2023
Title: New Weapon Systems	3.311	0.336	1.000
Description: Development of new small arms weapon systems.			
FY 2022 Plans: Advanced Technologies for Machine Gun: Will conduct market research, evaluations, trade studies and assessments for new Medium Machine Gun technologies to address capability needs. These technologies may include, but are not limited to, novel recoil mitigation, alternative lightweight materials, barrel technologies, suppressor technologies, mounting and fire control interfaces.			
New and Legacy Weapon Systems Evaluation and Assessments: Will continue to perform initial and follow-on evaluations, assessments and integration of new weapons to include various new weapon system platforms.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Advanced Technologies for Machine Gun: Will conduct market research, evaluations, trade studies and assessments for new Medium Machine Gun technologies to address capability needs. These technologies may include, but are not limited to, novel recoil mitigation, alternative lightweight materials, barrel technologies, suppressor technologies, mounting and fire control interfaces.</p> <p>New Weapons and Enabling Technology Evaluation and Assessments: Will continue to perform initial and follow-on evaluations, assessments and integration of new weapons to include various new weapon system platforms.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New Weapons: Increase from FY2022 to FY2023 for the Advanced Technologies for Machine Gun program.</p>				
<p>Title: Small Arms Weapon Systems Enhancements</p> <p>Description: Enhancements and development of small arms weapon systems.</p> <p>FY 2022 Plans: Small Business Innovative Research (SBIR) Enhancements: Will continue future efforts to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Next Generation Weapons/Enhancements continue to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature, reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the Next Generation Squad Weapon Rifle (NGSW-R) and Next Generation Squad Automatic Rifle (NGSAR) or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others.</p> <p>Advanced Small Unit Technologies: Will continue to investigate and demonstrate advanced technologies to achieve capabilities identified as a capability gap for targets in defilade in the draft Tiered Capabilities Matrix (TCM) as well as potential use in future fire control and weapon modernization efforts.</p> <p>Enhanced System for Remote Weapon Stations & Kinetic Counter-UAS Weapons: Will evaluate the integration of an Inertial Navigation System (INS) to the CROWS to enhance the CROWS overall spatial environment awareness and improve accuracy in slewing to targets provided from external remote sources. i.e. off-board radar systems in support of network lethality operation. Also software development and integration to include BLADE CUAS kinetic defeat functionality into the CROWS Baseline software. Prototyping and testing of an enhanced CROWS slip ring to incorporate full 360 degree operation of BLADE CUAS kinetic defeat functionality on CROWS and provide ability to integrate other sensors and effectors onto the CROWS platform.</p>		8.058	2.223	3.148

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>

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

	FY 2021	FY 2022	FY 2023
<p>Non-Standard Weapons Assessments: Will continue to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Continue to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission of Regionally Aligned Forces, Security Force Assistance Brigades, and other Department of Defense (DOD) customers. Will continue to establish a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces and Security Force Assistance Brigade training missions. Will conduct safety assessments of limited distribution materiel systems considered for Table of Organization and Equipment (TOE) and Common Table of Allowances (CTA) approvals. Continue to conduct market research of commercially available weapon systems.</p> <p>Picatinny Smart Rail System Controller and Remote will continue to integrate different components together and then demonstrate its ability to control devices and manage data traffic. The completion of this effort will provide a path for future capability growth to systems such as, but not limited to Next Generation Squad Weapon Fire Control, Fire Control for M3E1, and Family of Weapon Sights ? Individual (FWS-I). This effort will be critical in ensuring we don't have duplicative hardware on weapon systems as well as ensuring the devices on the weapons can properly communicate with each other.</p> <p>Power and Data Integration onto Open Architecture Accessory Rails will continue to integrate power and data capability in a negative space rail system. This will have potential applicability to systems such as, but not limited to Next Generation Squad Weapon-Rifle/Automatic Rifle, Precision Sniper Rifle, and Next Generation Medium/Heavy Machine Gun.</p> <p>Current and Legacy Weapon Improvements will continue to assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.</p> <p>FY 2023 Plans: Small Business Innovative Research (SBIR) Enhancements will continue future efforts to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Enhanced System for Remote Weapon Stations & Kinetic Counter-Unmanned Aerial System (UAS) Weapons will down select to a candidate Inertial Navigation System (INS) and integrate it to the Common Remotely Operated Weapon Station (CROWS) to demonstrate enhanced CROWS overall spatial environment awareness and improve accuracy in slewing to targets provided from external remote sources. i.e. off-board radar systems in support of network lethality operation. Continue software development and integration to include Counter Unmanned Aerial System (CUAS) kinetic defeat functionality into the CROWS Baseline Tech Refresh Software. Continue integration of prototype slip rings to the CROWS system. Engineering and environmental level testing of enhanced slip ring.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Smart Rail System Controller and Remote will continue to integrate different components together and then demonstrate its ability to control devices and manage data traffic. The completion of this effort will provide a path for future capability growth to systems such as, but not limited to Next Generation Squad Weapon Fire Control, Fire Control for M3E1 Multi-purpose Anti-armor Anti-personnel Weapon System (MAAWS), and Family of Weapon Sights ? Individual (FWS-I). This effort will be critical in ensuring we don't have duplicative hardware on weapon systems as well as ensuring the devices on the weapons can properly communicate with each other.</p> <p>Power and Data Integration onto Open Architecture Accessory Rails will continue to integrate power and data capability in a negative space rail system. This will have potential applicability to systems such as, but not limited to Next Generation Squad Weapon-Rifle/Automatic Rifle, Precision Sniper Rifle, and Next Generation Medium/Heavy Machine Gun.</p> <p>Weapon Enhancements for Improved Ammunition will continue to enhancement weapons as ammunition is improved.</p> <p>New Weapons and Enabling Technology Evaluations and Assessments will continue to assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY2022 to FY2023 for Smart Rail System Controller and Remote, Power and Data Integration, and Weapon Enhancements.</p>				
<p>Title: Combat Optics</p> <p>Description: Improvement of small arms combat optics.</p> <p>FY 2022 Plans: Advanced Combat Optics (formerly called Next Generation Optics): Will continue to integrate current and emerging target acquisition component technologies such as, but not limited to rifle optics, binoculars and variable magnification spotting scopes. Will continue to evaluate state of the art advances in optical component technologies for inclusion in future combat optic products.</p> <p>FY 2023 Plans: Advanced Combat Optics will continue to integrate current and emerging target acquisition component technologies such as, but not limited to rifle optics, binoculars and variable magnification spotting scopes. Will continue to evaluate state of the art advances in optical component technologies for inclusion in future combat optic products.</p>		0.100	0.050	0.050
<p>Title: Fire Control</p>		4.000	4.000	5.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>

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

Description: Small arms fire control.

FY 2022 Plans:

Next Generation and Fire Control Technology Enhancements: Will continue to support technology integration with Next Generation Weapons addressing soldier aim error, engagement time, probability of hit, situational awareness, lethality, and soldier acceptance. Iterative prototyping will be utilized to develop component technologies to support future variants of the Next Generation Squad Weapon. Technology may include enhanced camera based technology, target tracking, automatic target detection, increased networked lethality, reduced signature, increased user acceptance, along with other emerging weapon, ammunition, and fire control technologies that will increase the lethality of the next generation squad weapons.

Small Arms Fire Control Enhancements / Wind Sensing: Will continue research test and evaluation efforts on laser based wind sensors, proof-of-concept devices, and other optical designs for prototypes that incorporate fire control sensors and ballistic solver software and integration of sensor input and communication with ammunition for all small arms weapon platforms. The purpose of this effort is to evaluate downrange wind sensing technologies for incorporation into future fire control systems. Downrange wind sensing is the largest unmeasured variable remaining in ballistic calculation.

FY 2023 Plans:

Next Generation Weapons/Enhancements will continue to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature, reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the Next Generation Squad Weapon Rifle (XM5) and Next Generation Squad Automatic Rifle (XM250) or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others.

Next Generation and Fire Control Technology Enhancements will continue to support technology integration with Next Generation Weapons addressing soldier aim error, engagement time, probability of hit, situational awareness, lethality, and soldier acceptance. Iterative prototyping will be utilized to develop component technologies to support future variants of the Next Generation Squad Weapon. Technology may include enhanced camera based technology, target tracking, automatic target detection, increased networked lethality, reduced signature, increased user acceptance, along with other emerging weapon, ammunition, and fire control technologies that will increase the lethality of the next generation squad weapons.

Small Arms Fire Control Enhancements will continue research test and evaluation efforts on laser based wind sensors, proof-of-concept devices, and other optical designs for prototypes that incorporate fire control sensors and ballistic solver software and integration of sensor input and communication with ammunition for all small arms weapon platforms. The purpose of this effort is

FY 2021	FY 2022	FY 2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
to evaluate downrange wind sensing technologies for incorporation into future fire control systems. Downrange wind sensing is the largest unmeasured variable remaining in ballistic calculation. FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY2022 to FY2023 for the Small Arms Fire Control Enhancements.				
Title: Research and Analysis Description: Research and analysis of small arms. FY 2022 Plans: Plan to continue Market Research and Benefit Analysis of 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research to include new technologies in emerging robotic and aerial armaments. FY 2023 Plans: Will continue Market Research and Benefit Analysis of new weapons and enabling technology evaluations and assessments to include, but not limited to 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research to include new technologies in emerging robotic and aerial armaments.		0.747	0.050	0.050
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: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Tax FY 2022 to FY 2023 Increase/Decrease Statement: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Tax		-	0.252	-
Accomplishments/Planned Programs Subtotals		16.216	6.911	9.248
Congressional Add: New Weapon Systems Congressional Add FY 2022 Plans: Lightweight C-sUAS Force Protection System: Will develop extremely lightweight and reliable externally powered weapon for arming small Unmanned Aerial Systems (sUAS). Integrate externally powered		-	4.000	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>
--	---	---

	FY 2021	FY 2022
weapon into a small UAS, then perform engineering and operational testing. Demonstrate armed sUAS capability for destroying enemy sUAS and providing force protection.		
Congressional Adds Subtotals	-	4.000

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• EW4: <i>Crew Served Weapons Engineering Development</i>	9.608	8.943	4.958	-	4.958	4.391	3.847	4.152	4.191	0.000	40.090
• FF2: <i>Small Arms Fire Control</i>	9.782	7.008	8.179	-	8.179	10.263	5.065	5.066	5.116	0.000	50.479
• FM4: <i>Next Generation Squad Weapons</i>	32.001	13.599	15.816	-	15.816	16.482	11.278	11.282	11.393	0.000	111.851
• S63: <i>Individual Weapons Engineering Development</i>	3.493	3.651	3.956	-	3.956	3.624	3.579	3.863	3.899	0.000	26.065
• FL4: <i>Small Caliber Ammo for Next Gen Squad Weapons</i>	26.483	28.372	25.558	-	25.558	12.058	12.168	12.172	12.291	0.000	129.102
• E06002: <i>NEXT GENERATION COMBAT ROUND</i>	14.386	59.496	23.523	-	23.523	36.816	39.040	71.884	71.876	0.000	317.021

Remarks

In support of Small Arms Initial Capability and Capability Development Requirements, advanced technology of small arms weapon systems is transitioned from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3) to Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4). After the technology is demonstrated and/or validated, the program transitions to Infantry Support Weapons, Program Element 0604601A, (Budget Activity 5) for engineering and manufacturing development.

D. Acquisition Strategy

Primary strategy is to study, develop, demonstrate and evaluate emerging technologies that ultimately lead to modernizing, enhancing and/or improving the small arms inventory.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				S54 / Small Arms Improvement							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Lethality : Picatinny Arsenal	7.886	0.560	Mar 2021	0.280	Mar 2022	0.357	Mar 2023	-		0.357	Continuing	Continuing	Continuing
SBIR / STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	0.282	-		0.252		-		-		-	Continuing	Continuing	Continuing
Subtotal			8.168	0.560		0.532		0.357		-		0.357	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	MIPR	DEVCOM AC : Multiple	47.058	10.639	Mar 2021	8.061	Mar 2022	5.711	Mar 2023	-		5.711	Continuing	Continuing	Continuing
Subtotal			47.058	10.639		8.061		5.711		-		5.711	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	DEVCOM AC : Multiple	30.213	2.240	Mar 2021	1.128	Mar 2022	1.663	Mar 2023	-		1.663	Continuing	Continuing	Continuing
Subtotal			30.213	2.240		1.128		1.663		-		1.663	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Army Test and Evaluation Centers, : Multiple	18.598	2.777	Mar 2021	1.190	Mar 2022	1.517	Mar 2023	-		1.517	Continuing	Continuing	Continuing
Subtotal			18.598	2.777		1.190		1.517		-		1.517	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S54 / <i>Small Arms Improvement</i>				
	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	104.037	16.216	10.911	9.248	-	9.248	Continuing	Continuing	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>	

Event Name	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
NEW WEAPON SYSTEMS																												
Advanced Technologies for Machine Gun																												
New Weapons and Enabling Technology Evaluation and Ass																												
Lightweight C-sUAS Force Protection System																												
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS																												
Advanced Small Unit Technology																												
Non-Standard Weapon Assessments																												
Weapon Enhancements for Improved Ammunition																												
Smart Rail System Controller and Remote																												
Power and Data Integration onto Open Architecture Accessor																												
Enhanced System for Remote Weapon Stations & Kinetic Co																												
Small Business Innovative Research																												
New Weapons and Enabling Technology Evaluations and Ass																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>	

Event Name	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
COMBAT OPTICS																												
Advanced Combat Optics																												
FIRE CONTROL																												
Small Arms Fire Control Enhancements																												
Formerly Small Arms Fire Control -Precision/Enhancements																												
Next Generation and Fire Control Technology Enhancements																												
RESEARCH AND ANALYSIS																												
Research and Analysis of Small Arms																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NEW WEAPON SYSTEMS	1	2008	4	2027
Advanced Technologies for Machine Gun	1	2022	4	2027
New Weapons and Enabling Technology Evaluation and Assessments	1	2020	4	2027
Lightweight C-sUAS Force Protection System	1	2022	4	2022
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS	1	2008	4	2027
Advanced Small Unit Technology	1	2021	4	2022
Non-Standard Weapon Assessments	1	2020	4	2022
Weapon Enhancements for Improved Ammunition	1	2023	4	2024
Smart Rail System Controller and Remote	1	2021	4	2024
Power and Data Integration onto Open Architecture Accessory Rails	1	2021	4	2024
Enhanced System for Remote Weapon Stations & Kinetic Counter-UAS Weapons	1	2020	4	2027
Small Business Innovative Research	1	2015	4	2027
New Weapons and Enabling Technology Evaluations and Assessments	1	2020	4	2027
COMBAT OPTICS	1	2008	4	2027
Advanced Combat Optics	1	2020	4	2027
FIRE CONTROL	1	2008	4	2027
Small Arms Fire Control Enhancements	1	2017	4	2024
Next Generation and Fire Control Technology Enhancements	1	2019	4	2027
RESEARCH AND ANALYSIS	1	2012	4	2027
Research and Analysis of Small Arms	1	2015	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>			
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
VS4: <i>Soldier Protective Equipment</i>	-	2.279	4.278	6.434	-	6.434	8.160	8.147	8.146	8.222	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams' (CFT) initiatives. This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and protective equipment. Project supports the Secretary of the Army's directive to identify opportunities for commonality across all Services (Army, Navy, Air Force, Marines, and Coast Guard).

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

	FY 2021	FY 2022	FY 2023
Title: Soldier Protective Equipment (SPE)	2.279	4.122	6.434
Description: Effort to increase Warfighter survivability and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).			
FY 2022 Plans: Project will continue Technology/Maturation and Risk Reduction efforts across the PPE portfolio: Torso and Extremity Protection (TEP); Vital Torso Protection (VTP); Integrated Head Protection System (IHPS); Next Generation (NG) IHPS, and Military Protective Eyewear Systems to support SPS requirements for lighter-weight ballistic materials with improved performance and manufacturing/ testing process improvements. When new materials are ready, the Product Management Office will evaluate upgrades and inform stakeholders of new operational capabilities and then incorporate them into SPS designs as appropriate. Continue efforts to characterize and increase durability, shelf life, and functional service life of existing personal protective systems at the subsystem/component level. Continue the development of improved measurement processes for existing systems and emerging requirements. Continue Head Protection efforts to pursue weight reduction through improved suspension systems and development of improved test and measurement devices supporting the Secretary of the Army's directive to identify opportunities for commonality across all Services (Army, Navy, Air Force, Marines, and Coast Guard). Product office will begin efforts to update gender geometric anatomy into models, such as Operational Requirements-based Casualty Assessment, to inform designs, sizing, and variations development and improvements to support Department of Defense (DoD) Soldier protection needs.			
FY 2023 Plans: With emerging innovations in materials and manufacturing, project will build on previously developed Technology/Maturation and Risk Reduction efforts across the PPE portfolio: Torso and Extremity Protection (TEP); Vital Torso Protection (VTP); Integrated Head Protection System (IHPS); Next Generation (NG) IHPS, and Military Protective Eyewear Systems to support SPS			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>requirements for lighter-weight ballistic materials with improved performance and manufacturing/ testing process improvements. Product Management Office will evaluate current and future material, processing upgrades, and inform stakeholders of new operational capabilities. These new future materials may come from S&T transitions, like Novel Fabric for Torso Protection. The Program will incorporate the new capabilities into SPS designs as appropriate. The Program will continue efforts to increase form, fit, and function of body armor for all Soldiers regardless of size and gender. The Program will also continue to develop conformal body armor and equipment to better accommodate female Soldiers. Maintain development initiatives to increase durability, shelf life, and functional service life of existing personal protective systems at the subsystem/component level. Continue the development of improved measurement, evaluation, and testing processes for existing systems and emerging requirements. Initiate Head Protection efforts to pursue Durable Anti-fog Coatings for Combat Eye Protection and Transparent Surfaces. Product office will begin efforts to update gender geometric anatomy into models, such as Operational Requirements-based Casualty Assessment, to inform designs, sizing, and variations development and improvements to support Department of Defense (DoD) Soldier protection needs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding change in Soldier Protective Equipment portfolio is due to increased testing in eyewear and torso protection in FY 2022 and FY 2023 that result in an increase level of effort to address improved materials and emerging threats.</p> <p>Title: SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>			
Accomplishments/Planned Programs Subtotals	2.279	4.278	6.434

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
• VS5: <i>Soldier Protective Equipment</i>	6.478	9.172	9.303	-	9.303	8.322	8.883	8.878	8.959	0.000	59.995

Remarks

D. Acquisition Strategy
Programs pursue technology transition from science and technology, maturation, and prototype development, culminating in the transition of mature technologies (Technology Readiness Levels (TRL) 6-7) to Engineering and Manufacturing Development. This Project continues to exercise competitively awarded contracts using best value source selection procedures where applicable.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				VS4 / Soldier Protective Equipment								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Allot	PM SSV Various : Various	3.446	0.482		0.798		1.472		-		1.472	Continuing	Continuing	Continuing	
SBIR/STTR	TBD	Various : Various	-	-		0.156		-		-		-	Continuing	Continuing	Continuing	
Subtotal			3.446	0.482		0.954		1.472		-		1.472	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Dev/Sys Engineering Spt	MIPR	CCDC-SC : Natick, MA	9.652	0.300		0.500		1.862		-		1.862	Continuing	Continuing	Continuing	
Dev/Integ Contracts	TBD	CCDC-SC : Natick, MA	78.961	1.147		2.190		1.225		-		1.225	Continuing	Continuing	Continuing	
Subtotal			88.613	1.447		2.690		3.087		-		3.087	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Misc Support Costs	MIPR	Various : Various	5.421	-		-		-		-		-	Continuing	Continuing	Continuing	
Subtotal			5.421	-		-		-		-		-	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Ballistic/Blast/Nonballistic Testing	MIPR	Various : Various	19.181	0.350		0.634		1.875		-		1.875	Continuing	Continuing	Continuing	
Subtotal			19.181	0.350		0.634		1.875		-		1.875	Continuing	Continuing	N/A	

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>				
	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	116.661	2.279	4.278	6.434	-	6.434	Continuing	Continuing	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

Event Name	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
SPS Technology Upgrade Insertion	[Redacted]																											
VTP Technology Upgrade Insertion	[Redacted]																											
TEP Technology Upgrade Insertion	[Redacted]																											
Military Protective Eyewear Systems Improvement	[Redacted]																											
Helmet Technology Upgrade Insertion	[Redacted]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SPS Technology Upgrade Insertion	1	2018	4	2027
VTP Technology Upgrade Insertion	1	2021	4	2027
TEP Technology Upgrade Insertion	1	2021	4	2027
Military Protective Eyewear Systems Improvement	1	2023	4	2027
Helmet Technology Upgrade Insertion	1	2021	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>
---	---

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	-	92.401	80.525	26.594	-	26.594	3.088	3.093	3.094	3.124	0.000	211.919
CF4: <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>	-	89.281	77.777	26.594	-	26.594	-	-	-	-	0.000	193.652
FD2: <i>Soldier Robotics Systems</i>	-	1.872	-	-	-	-	-	-	-	-	0.000	1.872
FD9: <i>Robotics Systems</i>	-	1.248	2.748	-	-	-	3.088	3.093	3.094	3.124	0.000	16.395

A. Mission Description and Budget Item Justification

Robotic Combat Vehicle (RCV) funding in this program element directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority.

The Robotic Combat Vehicle (RCV) development program will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV will transition from Manned Unmanned Teaming (MUM-T) experimentation to deliberate hardware and software focused development programs to include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV Experimentation includes initial hardware and software integration as well as Soldier Operational Experiments (SOE) to train, test, and evaluate the ability of Soldiers to perform missions using Mission Enabling Technology-Demonstrators (METDs) and Robotic Combat Vehicles (RCVs). Information gathered from the SOEs will be used to further inform MUM-T and which RCV(L) capabilities to develop.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping effort will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP).

The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP) effort. The SP LOE includes three design-upgrade-test cycles, each culminating in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE.

The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	
<p>System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.</p> <p>The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.</p> <p>Program Office Robotics Development (RD) improves robotic and autonomous program acquisition schedules and facilitating quicker delivery of emerging technology to warfighters by supporting the development of integrated and synchronized capability documents (e.g. JCIDS, Department Directed, etc.) and by maturing / transitioning robotics technology. Research Development Technology Evaluation (RDTE) funds enable support to capability development of emerging requirements. Activities include studies, assessments, and document development such as Technology Readiness Levels, Manufacturing Readiness Levels, Analysis of Alternatives / Letter of Sufficiency determinations, draft acquisition documents, and draft contract documents. Efforts include robotics and autonomous systems technology maturation / transition from Science & Technology (S&T) projects and Robotic Enhancement Program (REP) initiatives, Milestone Decision Documentation (MDD), and activities leading up to formal program initiation at Milestone B or C. The acquisition activities conducted under this line intend to reduce acquisition cost, schedule, and performance risk by conducting market surveys, technical risk assessments, developing performance specifications, scopes of work, acquisition strategies, systems engineering plans, test and evaluation master plans, lifecycle sustainment plans, engaging in early test planning, and prototype development activities. This line is for large robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits.</p> <p>Funding will expand Modeling and Simulation (M&S) including Continuous Autonomy Simulation Test Laboratory Environment (CASTLE) capability to test and evaluate Manned Unmanned teaming, combat scenarios or other emerging Robotics requirement needs. RD funding will utilize the M&S environment to mature and evaluate S&T for inclusion to program requirements, Engineering Change Proposals (ECPs) and/or technical insertions, utilize gaming technology in conjunction with Autonomy Software to develop Training, Tactics and Procedures (TTPs), requirements and Concepts of Operations (CONOPS). In addition, RD funds exploration and development of the Expedient Leader Follower (ExLF) Applique on additional systems (Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicles (FMTV) and 915 truck fleets) beyond the Palletized Load System (PLS). Funding supports Program management activities including inter-service support, travel, conducting Analysis of Alternatives (AoA), draft performance specifications, prototype demos, acquisition documents, payload demos, future payload maturation for Robotic Platforms and pre-MS B activities Obstacle Avoidance and Digital Modeling (OA&DM) activities.</p> <p>Funding also supports modernization of the current Ground Robotic fleets and current Army vehicles by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding will also support developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts. Funds will be utilized for infrastructure to support cloud based tools for development and deployment of Autonomy and Artificial Intelligence/ Machine Learning (AI/ML) software.</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	95.367	87.198	0.000	-	0.000
Current President's Budget	92.401	80.525	26.594	-	26.594
Total Adjustments	-2.966	-6.673	26.594	-	26.594
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-26.486			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.966	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	26.594	-	26.594
• FFRDC Transfer	-	-0.187	-	-	-

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

Project: CF4: *Robotic Combat Vehicle (RCV) NGCV-CFT*

Congressional Add: *RCV Medium*

Congressional Add Subtotals for Project: CF4

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	-	20.000
Congressional Add Subtotals for Project: CF4	-	20.000
Congressional Add Totals for all Projects	-	20.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>			
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
CF4: <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>	-	89.281	77.777	26.594	-	26.594	-	-	-	-	0.000	193.652
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Robotic Combat Vehicle (RCV) development effort will produce unmanned ground combat vehicle prototypes to aid Concepts of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTP) development, integrate and secure advanced autonomy and artificial intelligence algorithms, and inform follow-on production and fielding decisions. RCV will transition from Manned Unmanned Teaming (MUM-T) experimentation to deliberate hardware and software focused development programs to include a RCV Light (L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV Experimentation includes initial hardware and software integration as well as Soldier Operational Experiments (SOE) to train, test, and evaluate the ability of Soldiers to perform missions using Mission Enabling Technology-Demonstrators (METDs) and Robotic Combat Vehicles (RCVs). Information gathered from the SOEs will be used to further inform MUM-T and which RCV(L) capabilities to develop.

To solicit early Soldier feedback, the RCV(L) MTA Rapid Prototyping effort will be accomplished through two complimentary lines of effort (LOE) - Surrogate Prototypes (SP) and Full System Prototypes (FSP).

The RCV(L) Surrogate Prototypes (SP) LOE utilizes updated RCV experimental prototypes and new build SPs in an iterative design-upgrade-test approach that includes integration of a Minimum Viable Capability Release (MVCR) and follow-on Capability Releases (CR) from the RCV Software Acquisition Pathway (SWP). The SP LOE includes three design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE. The SP LOE will also serve to validate user requirements and assist in finalization of the RCV(L) Capabilities Development Document (CDD).

The RCV(L) Full System Prototypes (FSP) LOE will leverage mature capabilities from previous RCV experimentation and SP development efforts and integrate additional embedded software, perception sensors, user control interfaces, and communication links that will permit autonomous movement, tele-op movement, and increased battlefield situational awareness. The FSP acquisition strategy includes a full and open competition that will select up to five vendors to deliver bid samples to inform down select to a single vendor for prototype build. Developmental testing of prototypes will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.

The Robotic Combat Vehicle (RCV) Software Acquisition Pathway (SWP) focuses on embedded software development and sustainment activities including RCV autonomy software, control station software, and payload control software. A system integration laboratory (SIL) will be used in conjunction with RCV systems to verify

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>
--	---	--

and validate software capabilities in both virtual and live test environments. The RCV SWP will provide software capabilities to the Surrogate Prototypes (SP) and Full System Prototype (FSP) LOEs for integration. The RCV SWP will incorporate Soldier and integrator feedback into product roadmaps to guide the development and maturation of critical software capabilities.

This program directly aligns with the Next Generation Combat Vehicle (NGCV) Army Modernization Priority.

The total cost of the RCV(L) MTA Rapid Prototyping program is \$452.77 million (then-year dollars) RDT&E from FY 2022 to FY 2026. The RCV(L) MTA Rapid Prototyping program is fully funded across the Future Years Defense Program.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Development Engineering</p> <p>Description: RCV Experimentation Development Engineering encompasses initial hardware and software design and integration of RCV technologies, to include network, autonomy, sensors, aided target recognition, hostile fire detection and location, and pre-shot detection. RCV Experimentation Development Engineering also includes development or capabilities informed by Soldier feedback during Soldier Operational Experiments (SOE). RCV Experimentation Development Engineering is performed by the U.S. Army Combat Capabilities Development Command (DEVCOM) Ground Vehicle Systems Center (GVSC), DEVCOM Armaments Center (AC), DEVCOM Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center, and RCV contractors.</p> <p>FY 2022 Plans: Design and integration of RCV technologies into Experimental Prototypes, to include by-wire kit development, emergency stop maturation, autonomy software support, autonomy architecture, autonomy software maturation, Warfighter Machine Interface (WMI) software maturation, architectural products and support for inter-operability profile (IOP) installation updates for modular mission payloads, autonomous capability transition, perception improvements, human-robot interaction (HRI) and manned-unmanned teaming (MUM-T) control improvements. Additionally, RCV Experimentation Development efforts includes video management software development, system latency reduction, and development of system payload control software, to include targeting gimbals, unmanned aerial vehicle (UAV), marsupial unmanned ground vehicle (UGV), and lethality systems. RCV technologies will be assessed during the FY2022 Soldier Operational Experiment (SOE) II.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in funding from FY 2022 to FY 2023 is due to a completion of RCV Experimental Prototype development efforts in FY 2022.</p>	14.815	23.869	-
<p>Title: Prototype Platforms</p> <p>Description: Build of RCV Prototypes for use in Soldier Operational Experiments (SOE) that will create new CONOPS and refine requirements for unmanned combat vehicles. Additionally, includes build of RCV Surrogate Prototypes (SP) that consider</p>	35.134	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
lessons learned from previous RCV Experimentation efforts, and will be utilized during RCV Light (RCV(L)) Surrogate Prototyping FORSCOM Operational Pilots.				
<p>Title: Testing and Evaluation</p> <p>Description: Test and Evaluation includes Experimental Prototype and Surrogate Prototype (SP) shakedown testing, safety and performance testing at Government test sites, and the spares parts and technical support to execute Soldier Operational Experiments (SOE) using Experimental Prototypes. The SOEs will solicit Solder feedback, inform new doctrine for manned/ unmanned teaming based operations, validate user requirements, and aid in determination of capabilities ready for incorporation into future RCV designs and software releases.</p> <p>FY 2022 Plans: FY2022 efforts include Experimental Prototype and initial Surrogate Prototype safety and performance testing, to include test planning, inspection, human factors assessments, automotive performance, electromagnetic environmental effects (E3), network and software safety, fire control, and weapons firing. FY 2022 Test and Evaluation also includes Experimental Prototype and Surrogate Prototype shakedown testing, and execution of SOE II at Ft. Hood, TX.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in funding from FY 2022 to FY 2023 is due to a change in strategy and transition to budget activity 5. Surrogate Prototype Test and Evaluation efforts continue in program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.</p>		23.995	11.396	-
<p>Title: Modeling and Simulation</p> <p>Description: RCV Modeling and Simulation effort will produce the ability to experiment in a virtual environment to conduct data collection and results that will inform the physical testing learning objectives. This will provide the initial data set to inform the operational experimentation in the RCV Campaign of Learning as well as feed initial data to the Requirements Community as they build new MUM-T, CONOPS and Tactics, Techniques, and Procedures (TTP). As test data is collected, high fidelity simulations for unmanned operation of combat platforms will be refined in a virtual test environment to enable virtual test - fix - test cycles in a virtual developmental space.</p> <p>FY 2022 Plans: Conduct of virtual experiments and Basis Of Issue Plan (BOIP) development to inform the Soldier Operational Experiments and TTP development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		0.027	0.835	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The decrease in funding from FY 2022 to FY 2023 is due to a change in strategy and transition to budget activity 5. The program funding continues in program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.				
Title: Other Support Costs Description: Other support costs include industry analysis and feedback sessions, risk assessment and mitigation efforts, and PEO shared expenses.		7.326	-	-
Title: Surrogate Prototype (SP) - Product Development Description: Engineering design and development of the Surrogate Prototypes (SPs), to include integration of software capability updates from the Software Acquisition Pathway (SWP) line of effort. SP Product development also includes the design and integration of improvements for safety, cybersecurity, perception sensors, and reliability to support the Soldier user experiments and modeling and simulation (M&S) efforts. Additionally, SP Product Development provides engineering support to prototype build, in addition to on-site Field Service Representative (FSR) support and new equipment training (NET) for all phases of SP testing. FY 2022 Plans: FY 2023 SP Product Development includes Ground Vehicle Systems Center (GVSC), QinetiQ, and Textron engineering design efforts for user interfaces and crew augmentation, autonomy integration, safety and perception upgrades, and hybrid and bi-wire kits to be incorporated into the SP configuration for assessment in future United States Army Forces Command (FORSCOM) Operational Pilots. Additionally, FY 2023 SP Product Development includes GVSC engineering support to the initial FORSCOM Operational Pilot and OEM technical support and spare parts for SP testing. FY 2023 Plans: FY 2023 SP Product Development includes Ground Vehicle Systems Center (GVSC), QinetiQ, and Textron engineering design efforts for user interfaces and crew augmentation, autonomy integration, safety and perception upgrades, and hybrid and bi-wire kits. Additionally, FY 2023 SP Product Development includes GVSC engineering support to an initial United States Army Forces Command (FORSCOM) Pilot, and OEM technical support and spare parts for Government testing. FY 2022 to FY 2023 Increase/Decrease Statement: Increase in FY 2023 is due to Field Service Representative (FSR) support, New Equipment Training (NET), and spare parts procurement necessary to execute the initial FORSCOM operational pilot.		-	3.830	24.284
Title: Software Acquisition Pathway (SWP) - Software Engineering Development		-	6.827	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Software Acquisition Pathway (SWP) Software Engineering Development focuses on embedded software development and sustainment activities including Robotic Combat Vehicle (RCV) autonomy software, control station software, payload control software, and cybersecurity hardening. SWP Software Engineering Development will deliver annual software capability releases (CR) to both the Surrogate Prototype (SP) and Full System Prototype (FSP) lines of effort. Developed software will also be delivered to the SWP systems integration laboratory (SIL) for live and virtual software testing.</p> <p>FY 2022 Plans: FY 2023 efforts will focus on transitioning software development and information technology (IT) operations into cloud-based Continuous Deployment (CD) pipelines for Autonomous Movement, Payload Control, and User Interface software. Additionally, FY 2022 software engineering efforts will initiate development of a Minimum Viable Capability Release (MVCR) for integration and assessment during future Surrogate Prototype FORSCOM Operation Pilots.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in funding from FY 2022 to FY 2023 is due to a change in strategy and transition to budget activity 5. The program funding continues in program element 604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.</p>			
<p>Title: Program Management</p> <p>Description: Government project management to RCV development programs. Includes salaries, travel, training, supplies, facilities, and equipment.</p> <p>FY 2022 Plans: Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract management, and operations support necessary to manage Experimentation development and SOE execution, Surrogate Prototyping shakedown and testing, and initial Software Acquisition Pathway development efforts. Includes salaries, training, travel, supplies, facilities, and equipment.</p> <p>FY 2023 Plans: Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract management, and operations support necessary to manage Surrogate Prototyping efforts. Includes salaries, training, travel, supplies, facilities, and equipment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	7.984	8.904	2.310

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
The decrease in FY 2023 is due to transition of Program Management for RCV(L) Surrogate Prototypes (SP) build, RCV(L) Full Systems Prototypes (FSP), Software Acquisition Pathway (SWP) efforts to program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.			
Title: SBIR/STTR Transfer	-	2.116	-
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	89.281	57.777	26.594

	FY 2021	FY 2022
Congressional Add: RCV Medium	-	20.000
FY 2022 Plans: RCV Medium build, development engineering, and testing.		
Congressional Adds Subtotals	-	20.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604641A: <i>Tactical Unmanned Ground Vehicle (TUGV)</i>	-	-	115.986	-	115.986	145.128	145.188	145.228	146.641	0.000	698.171

Remarks
 Robotic Combat Vehicle Light (RCV(L)) development and RCV Software Acquisition Pathway (SWP) efforts are continued in program element 0604641A / Tactical Unmanned Ground Vehicle (TUGV), CF5 / Robotic Combat Vehicle (BA5) NGCV-CFT.

D. Acquisition Strategy
 RCV development includes an RCV(L) Middle-Tier Acquisition (MTA) Rapid Prototyping program as well as a Software Acquisition Pathway (SWP) program.

RCV(L) Acquisition Strategy:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>
<p>On 10 February 2022, the Army Acquisition Executive (AAE) approved the execution of RCV(L) Rapid Prototyping effort under authorities granted by under authorities granted under Section 804 of the 2016 NDAA (PL 114-92). The RCV(L) MTA Rapid Prototyping effort will be accomplished in two complementary lines of effort (LOE), Surrogate Prototypes (SP) and Full System Prototypes (FSP).</p> <p>The SP LOE will utilize an existing Other Transaction Authority (OTA) contact with QinetiQ North America to both update existing RCV experimental prototypes to Surrogate Prototype configuration as well as procure new build Surrogate Prototypes. The Surrogate Prototypes will support three design-upgrade-test cycles that include FORSCOM operational pilots to collect Soldier feedback and demonstrate improved capabilities related to autonomous software, system safety, and cyber and spectrum resiliency. Each design-upgrade-test cycle will culminate in a Knowledge Point (KP) to review program process and determine SP capabilities ready for incorporation into the FSP LOE.</p> <p>The FSP acquisition strategy includes a full and open competition that will select up to five vendors to deliver bid samples to inform down select to a single vendor for prototype build. Developmental testing of FSPs will include safety, Reliability, Availability and Maintainability (RAM), lethality, survivability, and Electromagnetic Environmental Effects (E3) testing. Additionally, Operational Testing (OT) in the form of Limited User Tests (LUT) will be executed to evaluate system suitability and effectiveness.</p> <p>Upon successful completion of the RCV(L) Rapid Prototyping effort, an MTA Outcome Determination (OD) will determine if the program will transition to a MTA Rapid Fielding effort aimed at fielding RCV(L) FSPs to selected unit(s) for Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policies (DOTMLPF-P) analysis and integration of Manned-Unmanned Teaming (MUM-T) operations.</p> <p>Software Acquisition Pathway (SWP) Acquisition Strategy: The SWP Acquisition Decision Memorandum (ADM), signed 3 August 2021, directs the use of the draft Cross Functional Team (CFT) Next Generation Combat Vehicle (NGCV) Robotic and Optionally Manned Autonomous (ROMA) Capabilities Needs Statement (CNS) as the base user capabilities document from which to derive capabilities for the RCV SWP. The RCV SWP will provide government furnished software to RCV SP and FSP efforts. The RCV SWP will implement a Government - Contractor hybrid development approach to mature, integrate, and secure software capabilities from the science and technology base. The RCV SWP will incorporate software contracting best practices to support the transition of software capabilities into secure code base required for the resilient operation of RCVs in contested environments.</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604017A / Robotics Development				CF4 / Robotic Combat Vehicle (RCV) NGCV-CFT							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Various	5.954	7.984	Mar 2021	8.904	Oct 2021	2.310	Nov 2022	-		2.310	0.000	25.152	-
SBIR/STTR Transer	TBD	Various : Vairous	-	-		2.116		-		-		-	0.000	2.116	-
Subtotal			5.954	7.984		11.020		2.310		-		2.310	0.000	27.268	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Engineering	Various	GVSC; Various : Warren, MI; Various	7.646	14.815	May 2021	34.526	Dec 2021	24.284	Nov 2022	-		24.284	0.000	81.271	-
Prototype Platforms	TBD	TBD : TBD	46.865	35.134	Jun 2021	-		-		-		-	0.000	81.999	-
RCV Medium	TBD	TBD : TBD	-	-		20.000		-		-		-	0.000	20.000	-
Subtotal			54.511	49.949		54.526		24.284		-		24.284	0.000	183.270	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Support Costs	TBD	TBD : TBD	5.163	7.326	Jun 2021	-		-		-		-	0.000	12.489	-
Subtotal			5.163	7.326		-		-		-		-	0.000	12.489	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Modeling and Simulation	MIPR	TBD : TBD	4.092	0.027	Dec 2020	0.835	Jan 2022	-		-		-	0.000	4.954	-
Testing and Evaluation	MIPR	TBD : TBD	5.606	23.995	Dec 2020	11.396	Dec 2021	-		-		-	0.000	40.997	-
Subtotal			9.698	24.022		12.231		-		-		-	0.000	45.951	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>			Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT				
	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	75.326	89.281		77.777		26.594	-	26.594	0.000	268.978	N/A

Remarks
 FY 2023 funding for Development Engineering support Surrogate Prototype Product Development efforts.

FY 2023 Program Management efforts include Government engineering, financial management, acquisition planning, risk assessment and mitigation, contract management, and operations support necessary necessary to manage Surrogate Prototype Product Development.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>

Event Name	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
DEVCOM Experimental Prototype Build	[Redacted]				DEVCOM Experimental Prototype Build																							
DEVCOM Experimental Prototype Testing					DEVCOM Experimental Prototype Testing																							
Soldier Operational Experiment (SOE) II					SOE II																							
Surrogate Prototype (SP) OTA Contract Development/Modification	[Redacted]				SP OTA Contract Development/Modification																							
Surrogate Prototype (SP) Contract Build #1	1				SP Contract Build #1																							
Surrogate Prototype (SP) Contract Build #2					3				SP Contract Build #2																			
Surrogate Prototype (SP) Design/Build					[Redacted]				SP Design/Build																			
Middle-Tier Acquisition Rapid Prototyping (MTA-RP) Start					2				MTA-RP Start																			
Surrogate Prototype (SP) Testing					[Redacted]				SP Testing																			
Surrogate Prototype (SP) Design/Upgrade/Test									[Redacted]				SP Design/Upgrade/Test															
Surrogate Prototype (SP) FORSCOM Pilots									[Redacted]				SP FORSCOM Pilots															
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #1									5				RCV(L) KP #1															
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #2													8				RCV(L) KP #2											


UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV) NGCV-CFT</i>

Event Name	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
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #3																												
Full System Prototype (FSP) Solicitation Development																												
Full System Prototype (FSP) Request for Proposal (RFP) Release																												
Full System Prototype (FSP) Bid Sample Contract Award (CA)																												
Full System Prototype (FSP) Source Selection (SSEB)/Bid Sample Testing																												
Full System Prototype (FSP) Contract Award																												
Full System Prototype (FSP) Design/Build																												
Full System Prototype (FSP) Test																												
RCV(L) Outcome Determination (OD)																												
Software Acquisition Pathway (SWP) Software (SW) Design/Build/Test																												
Software Acquisition Pathway (SWP) Minimum Viability Capability Release (MVCR)																												
Software Acquisition Pathway (SWP) Capability Release (CR) #2																												
Software Acquisition Pathway (SWP) Capability Release (CR) #3																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT	

Event Name	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
Software Acquisition Pathway (SWP) Capability Release (CR) #4																									 SWP CR #4			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DEVCOM Experimental Prototype Build	1	2021	2	2021
DEVCOM Experimental Prototype Testing	3	2021	3	2022
Soldier Operational Experiment (SOE) II	3	2022	4	2022
Surrogate Prototype (SP) OTA Contract Development/Modification	2	2021	4	2021
Surrogate Prototype (SP) Contract Build #1	4	2021	4	2021
Surrogate Prototype (SP) Contract Build #2	1	2023	1	2023
Surrogate Prototype (SP) Design/Build	4	2021	4	2023
Middle-Tier Acquisition Rapid Prototyping (MTA-RP) Start	2	2022	2	2022
Surrogate Prototype (SP) Testing	3	2022	4	2022
Surrogate Prototype (SP) Design/Upgrade/Test	1	2023	3	2025
Surrogate Prototype (SP) FORSCOM Pilots	1	2023	3	2025
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #1	4	2023	4	2023
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #2	4	2024	4	2024
Robotic Combat Vehicle Light (RCV(L)) Knowledge Point (KP) #3	4	2025	4	2025
Full System Prototype (FSP) Solicitation Development	1	2023	2	2023
Full System Prototype (FSP) Request for Proposal (RFP) Release	3	2023	3	2023
Full System Prototype (FSP) Bid Sample Contract Award (CA)	4	2023	4	2023
Full System Prototype (FSP) Source Selection (SSEB)/Bid Sample Testing	4	2023	3	2024
Full System Prototype (FSP) Contract Award	4	2024	4	2024
Full System Prototype (FSP) Design/Build	4	2024	1	2026
Full System Prototype (FSP) Test	1	2026	4	2026
RCV(L) Outcome Determination (OD)	2	2027	2	2027

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) CF4 / <i>Robotic Combat Vehicle (RCV)</i> NGCV-CFT
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Acquisition Pathway (SWP) Software (SW) Design/Build/Test	4	2022	4	2027
Software Acquisition Pathway (SWP) Minimum Viability Capability Release (MVCR)	1	2024	1	2024
Software Acquisition Pathway (SWP) Capability Release (CR) #2	1	2025	1	2025
Software Acquisition Pathway (SWP) Capability Release (CR) #3	1	2026	1	2026
Software Acquisition Pathway (SWP) Capability Release (CR) #4	1	2027	1	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>			
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
FD2: <i>Soldier Robotics Systems</i>	-	1.872	-	-	-	-	-	-	-	-	0.000	1.872
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Soldier Robotics Systems for Robotics Development (RD) improves robotic and autonomous program acquisition schedules by supporting the development of integrated and synchronized capability documents (e.g. Joint Capabilities Integration and Development System (JCIDS), Department Directed, Robotic & Autonomous Strategy (RAS), etc.) and by maturing/transiting technology. Activities include studies, assessments, and document development such as Technology Readiness Levels, Manufacturing Readiness Levels, Analysis of Alternatives/Letter of Sufficiency determinations, draft acquisition documents, and draft contract documents. Efforts include robotics and autonomous systems technology maturation/transition from Science & Technology (S&T) demonstration projects, Milestone Decision Documentation (MDD), and activities leading up to formal program initiation at Milestone B or C. The pre-acquisition activities conducted under this line intend to reduce acquisition cost, schedule, and performance risk by conducting market surveys, technical risk assessments, developing performance specifications, scopes of work, acquisition strategies, systems engineering plans, test and evaluation master plans, lifecycle sustainment plans, engaging in early test planning, and prototype development activities. This line is for robotic systems that are transported by vehicle and maneuver under their own power. Funding supports modernization of the current Ground Robotic fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

Funding supports modernization of the current Ground Robotic fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

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

	FY 2021	FY 2022	FY 2023
Title: Soldier Borne Sensor (SBS) / Exoskeleton	0.136	-	-
Description: The SBS provides the small unit a "quick look" capability with improved Situational Awareness of routes, buildings, tunnels, obstacles blocking line of sight, and similar concealed threat locations. The budget activity enables payload improvements including camera enhancements, target identification algorithms, display/controller improvements and user notifications for specific items of interest. Soldier Exoskeleton variants, ranging from Commercial-Off-The-Shelf solutions, will be capable of operating in a wide range of environments enhancing combat operations.			
Title: Unmanned Ground Vehicle (UGV) Soldier Robotics Development	1.736	-	-
Description: Soldier Robotics Development is designed to facilitate the transition of robotics and autonomous systems technology into Programs of Record. It informs the acquisition process beforehand allowing the Maneuver Center of Excellence, Sustainment Center of Excellence, Maneuver Support Center of Excellence, and the Cyber Center of Excellence the ability to make integration			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
decisions and affordability trades while writing requirements. Robotics Development will fund Common Robotics System (Vehicle), Common Robotic System (Light Reconnaissance) Robot (LRR) (CRS(LR)), Common Robotic System (Communication Link) (CRS(CL)), Common Robotic System (Mission Command/Artificial Intelligence) (CRS(MS/AI)), Render Safe - Sets, Kits and Outfits (RS-SKO), Enhanced Robotics Payload (ERP), payload technology maturation efforts, Chemical, Biological, Radiological, and Nuclear (CBRN); small, pocket sized, airborne sensors, etc.			
Accomplishments/Planned Programs Subtotals	1.872	-	-

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
• W63798: <i>Soldier Borne Sensor (SBS)</i>	18.907	18.654	20.376	-	20.376	23.005	22.372	-	-	Continuing	Continuing

Remarks
For Project FD2 Soldier Robotics Systems, the primary program funded in FY 2021 was Enhanced Robotic Payloads which has a new FY 2022 POR line under PE 0605053A Project BS9 Robotic Payloads.

D. Acquisition Strategy
Soldier Robotics Systems will utilize a Robotics Development funding for internal systems engineering, requirements and architecture analysis, AoAs and Technology Readiness Assessments with S&T partners, technology maturation efforts, and studies and analysis in support of program initiation with industry.

Initial exoskeleton efforts will continue to assess Industry's and DoD emerging exoskeleton initiatives performance through Soldier demonstrations/feedback to inform capability requirement generation, technology maturation, studies and analysis to support acquisition activities leading to program initiation.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UGV Program Management Support	MIPR	Multiple : Multiple	1.858	0.484	Oct 2020	-		-		-		-	0.000	2.342	Continuing
SBS and Exoskeleton Program Management Support	Various	Various : Multiple	3.264	0.136	Jul 2020	-		-		-		-	0.000	3.400	Continuing
Subtotal			5.122	0.620		-		-		-		-	0.000	5.742	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AoA CRS(H)	MIPR	Multiple : Various	0.258	-		-		-		-		-	0.000	0.258	-
AoA ERP	MIPR	Multiple : Various	0.506	-		-		-		-		-	0.000	0.506	-
AoA CRS(LR)	MIPR	Multiple : Various	0.049	-		-		-		-		-	0.000	0.049	-
Capability Development Studies, Demonstration (payload)	Various	Various : Multiple	0.157	-		-		-		-		-	0.000	0.157	-
JCAUS IOP V4	MIPR	ARDEC : Picatinny, NJ	0.050	-		-		-		-		-	0.000	0.050	-
SBIR /STTR Transfer	TBD	TBD : TBD	0.048	0.064		-		-		-		-	0.000	0.112	-
Subtotal			1.068	0.064		-		-		-		-	0.000	1.132	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Performance Spec Dev	MIPR	Various : Multiple	-	0.563	Feb 2021	-		-		-		-	0.000	0.563	-
RFP and Acq Documentation	MIPR	Various : Multiple	-	0.625	Apr 2021	-		-		-		-	0.000	0.625	-
Subtotal			-	1.188		-		-		-		-	0.000	1.188	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>			Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>				
	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	6.190	1.872	-	-	-	-	0.000	8.062	N/A		

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>
--	---	---

Event Name	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
UGV Robotics Development (ERP, CBRN, CRS-LR, etc.)	UGV																											
SBS Analysis of Alternatives / Letter of Sufficiency	AoA/LoS																											
SBS Market Survey	Market Survey																											
SBS Request for Proposal (Development/Staffing)	RFP (Development/Staffing)																											
SBS Studies/Analysis	Study/Analysis																											
Exoskeleton Industry Demonstration & Analysis	Industry Demonstration & Analysis																											
Exoskeleton Market Survey / Request For Information	Market Survey /RFI																											
Exoskeleton Capability Requirement Analysis	AoA, CBA, C-BA																											
Exoskeleton Materiel Development Decision																												
UGV Robotics Development ERP Risk Reduction	UGV RD																											

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UGV Robotics Development (ERP, CBRN, CRS-LR, etc.)	1	2018	4	2022
SBS MDD	1	2018	1	2018
SBS Analysis of Alternatives / Letter of Sufficiency	1	2018	4	2022
SBS Market Survey	1	2018	4	2022
SBS Request for Proposal (Development/Staffing)	1	2018	4	2022
SBS RFP Release Decision	2	2019	2	2019
SBS SSEB	3	2019	1	2020
SBS MS B/C	4	2019	4	2019
SBS Studies/Analysis	1	2018	4	2022
Exoskeleton Industry Demonstration & Analysis	1	2020	4	2021
Exoskeleton Market Survey / Request For Information	1	2021	4	2021
Exoskeleton Capability Requirement Analysis	1	2021	4	2021
Exoskeleton Materiel Development Decision	4	2021	4	2021
UGV Robotics Development ERP Risk Reduction	1	2020	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) FD9 / <i>Robotics Systems</i>			
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
FD9: <i>Robotics Systems</i>	-	1.248	2.748	-	-	-	3.088	3.093	3.094	3.124	0.000	16.395
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program Office Robotics Development (RD) improves robotic and autonomous program acquisition schedules and facilitating quicker delivery of emerging technology to warfighters by supporting the development of integrated and synchronized capability documents (e.g. JCIDS, Department Directed, etc.) and by maturing / transitioning robotics technology. Research Development Technology Evaluation (RDTE) funds enable support to capability development of emerging requirements. Activities include studies, assessments, and document development such as Technology Readiness Levels, Manufacturing Readiness Levels, Analysis of Alternatives / Letter of Sufficiency determinations, draft acquisition documents, and draft contract documents. Efforts include robotics and autonomous systems technology maturation / transition from Science & Technology (S&T) projects and Robotic Enhancement Program (REP) initiatives, Milestone Decision Documentation (MDD), and activities leading up to formal program initiation at Milestone B or C. The acquisition activities conducted under this line intend to reduce acquisition cost, schedule, and performance risk by conducting market surveys, technical risk assessments, developing performance specifications, scopes of work, acquisition strategies, systems engineering plans, test and evaluation master plans, lifecycle sustainment plans, engaging in early test planning, and prototype development activities. This line is for large robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits.

Funding will expand Modeling and Simulation (M&S) including Continuous Autonomy Simulation Test Laboratory Environment (CASTLE) capability to test and evaluate Manned Unmanned teaming, combat scenarios or other emerging Robotics requirement needs. RD funding will utilize the M&S environment to mature and evaluate S&T for inclusion to program requirements, Engineering Change Proposals (ECPs) and/or technical insertions, utilize gaming technology in conjunction with Autonomy Software to develop Training, Tactics and Procedures (TTPs), requirements and Concepts of Operations (CONOPS). In addition, RD funds exploration and development of the Expedient Leader Follower (ExLF) Applique on additional systems (Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicles (FMTV) and 915 truck fleets) beyond the Palletized Load System (PLS). Funding supports Program management activities including inter-service support, travel, conducting Analysis of Alternatives (AoA), draft performance specifications, prototype demos, acquisition documents, payload demos, future payload maturation for Robotic Platforms and pre-MS B activities Obstacle Avoidance and Digital Modeling (OA&DM) activities.

Funding also supports modernization of the current Ground Robotic fleets and current Army vehicles by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding will also support developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts. Funds will be utilized for infrastructure to support cloud based tools for development and deployment of Autonomy and Artificial Intelligence/ Machine Learning (AI/ML) software, tools to support auto testing of Autonomy Software in a DEVSECOPS process and transition of prior program software modules to the Robotic Technology Kernel (RTK) and Robotic Operating System (ROS) library for future reuse.

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

	FY 2021	FY 2022	FY 2023
Title: Emerging Robotics Systems	1.248	2.648	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022			
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023	
<p>Description: Validation and verification of incremental system software capability upgrades for emerging robotic requirements through M&S Software-in-the-loop (SIL) and Hardware-in-the-loop (HIL) allowing for transition into Program of Record.</p> <p>FY 2022 Plans: FY 2022 funding will expand Modeling and Simulation including CASTLE capabilities to provide a Live/Virtual component. A Live/Virtual capability will allow for testing with fewer assets, increase the live testing safety space and expand current autonomous test capabilities for RAS programs. RD funding will utilize the CASTLE environment to mature and evaluate vendor technologies, autonomy software and payload software in support of Continuous Integration and/or Development to Operations (DEV/OPS) for RAS programs and to develop interfaces and profiles to support machine learning and AI training. RD funding will support necessary infrastructure to conduct Continuous Integration, DEV/OPS and data collection/mining necessary in lieu of an existing enterprise solution. RD funding will utilize gaming technology in conjunction with Autonomy Software to develop Training, Tactics and Procedures (TTPs), requirements and CONOPS and continue validating simulation scenarios to expand test capability. Funding will support Rapid prototyping to inform emerging requirements with a Buy, Try, Decide strategy and to include Robotic payloads. Funds will be used to support maturation of autonomy Software and autonomous Architecture for various Robotic programs. Funding may also include supporting PM activities to include drafting performance specs, prototype demos, acquisition document preparation, payload demonstrations, future payload maturation for Robotic platforms. Also Request for proposal documentation on Enhanced Robotic Payload (ERP) programs, Chemical Biological Radiological and Nuclear (CBRN), Common Robotic System (Light Reconnaissance) Robot (LRR) (CRS(LR)), and future robotic platforms. SBIR/STTR transfer (\$100,003.00).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: 0604017 FD9 has no funding request in FY 2023.</p>					
<p>Title: RD SBIR/STTR transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>		-	0.100	-	
Accomplishments/Planned Programs Subtotals		1.248	2.748	-	
C. Other Program Funding Summary (\$ in Millions)					
N/A					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

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

Remarks

Pre-acquisition program activities funded by this line transition to a separate Program Element and Project prior to their first program acquisition Milestone (B or C).

D. Acquisition Strategy

Robotics Development (RD) is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into programs of record. It informs the acquisition process early in the development cycle allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements.

The Program Office builds upon the CCDC GVSC Expedient Leader Follower (ExLF) Operational Technology Demonstration (OTD) to provide a limited autonomous vehicle capability to Tactical Wheeled Vehicles including the Palletized Load System (PLS) A1, Heavy Expanded Mobility Tactical Truck (HEMTT), Family of Medium Tactical Vehicle (FMTV). Efforts include Capabilities Document input, close analysis of OTD activities that feed cost estimates, capture technical and test data, provide test support, develop Modeling and Simulation (M&S) capabilities, and develop a Software Integration Lab (SIL). Efforts may support Rapid prototyping to inform emerging requirements and other Army systems. A "buy/lease, try and inform" methodology may be used to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making.

Robotic Combat Vehicle (RCV) funding supports Systems Engineering, Requirements, Cost Analysis, Joint Capabilities Technology Demonstration (JCTD) support, and technology transition plans.

Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center (GVSC) funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation.

Robotic Combat Vehicle (RCV) Experimental Unit Prototyping will provide unmanned combat vehicles to enable users to assess the capability of the platforms and created new CONOPS and doctrine for manned/unmanned teaming based operations. Efforts will inform new CONOPS, identified system limitations and benefits and provide an achievable, analytically backed basis for future RCV requirements documents to drive future acquisition programs.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PM FP PdM RAS	MIPR	PM FP : Warren, MI	4.223	-		0.500	Oct 2021	-		-		-	0.000	4.723	-
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	N/A : N/A	0.028	-		-		-		-		-	0.000	0.028	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	0.139	-		-		-		-		-	0.000	0.139	-
SBIR/STTR Transfer	TBD	TBD : TBS	-	-		0.100	Apr 2022	-		-		-	0.000	0.100	-
Subtotal			4.390	-		0.600		-		-		-	0.000	4.990	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RCV/ACO M&S SIL	MIPR	CCDC GVSC : Warren, MI	1.100	-		-		-		-		-	0.000	1.100	-
SMET Modular Mission Payloads	TBD	TBD : TBD	1.000	-		-		-		-		-	0.000	1.000	-
Leader Follower (CCDC GVSC) Tech Demo A Kit	C/CPFF	Robotic Research : Baltimore, MD	25.944	-		-		-		-		-	0.000	25.944	-
Leader Follower (CCDC GVSC) Tech Demo B Kit	C/CPFF	Oshkosh : Oshkosh, WI	21.423	-		-		-		-		-	0.000	21.423	-
Leader Follower (CCDC GVSC) Integrated System Integrator	C/CPFF	Lockheed Martin : Dallas, TX	7.699	-		-		-		-		-	0.000	7.699	-
Leader Follower (CCDC GVSC) Warfighter Machine Interface	C/CPFF	DCS Corp : Boston, MA	6.977	-		-		-		-		-	0.000	6.977	-
RCV Risk Reduction Platform Development (CCDC GVSC)	C/CPFF	To Be Determined : To Be Determined	18.540	-		-		-		-		-	0.000	18.540	-
RD M&S SIL	MIPR	CCDC GVSC and various : Warren, MI	0.800	0.466	Jul 2020	1.383	Oct 2021	-		-		-	0.000	2.649	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ABV RCS Safety Requirements, Visualization tool	TBD	GVSC : Warren, MI	0.175	-		-		-		-		-	0.000	0.175	-
ERP Payload Maturation	MIPR	CCDC GVSC : Warren, MI	-	-		0.200	Nov 2021	-		-		-	0.000	0.200	-
Subtotal			83.658	0.466		1.583		-		-		-	0.000	85.707	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PdM SEPM Support	MIPR	Various : Multiple locations	8.246	0.647	Apr 2021	0.565	Oct 2021	-		-		-	0.000	9.458	-
SMET Modular Mission Payloads	MIPR	PdM ALUGS : Warren, MI	0.550	-		-		-		-		-	0.000	0.550	-
Technology Demo support (CCDC GVSC)	MIPR	CCDC GVSC : Warren, MI	2.978	-		-		-		-		-	0.000	2.978	-
Subtotal			11.774	0.647		0.565		-		-		-	0.000	12.986	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Leader Follower (CCDC GVSC) Tech Demo Testing	MIPR	ATEC : Aberdeen, MD	0.700	-		-		-		-		-	0.000	0.700	-
Leader Follower (CCDC GVSC) Tech Demo Data Logger	MIPR	ATEC : Aberdeen, MD	0.700	-		-		-		-		-	0.000	0.700	-
Leader Follower (CCDC GVSC) Testing	MIPR	Army Test and Evaluation Command (ATEC) :	3.933	-		-		-		-		-	0.000	3.933	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army	Date: April 2022
--	------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / Robotics Development	Project (Number/Name) FD9 / Robotics Systems
---	---	---

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Aberdeen Proving Ground, MD													
Leader Follower (CCDC GVSC) Data Logger	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.750	-		-		-		-		-	0.000	0.750	-
PdM RD ATEC support	MIPR	ATEC : Aberdeen, MD	0.150	-		-		-		-		-	0.000	0.150	-
IOP testing	MIPR	GVSC : Warren, MI	-	0.135	Feb 2021	-		-		-		-	0.000	0.135	-
Subtotal			6.233	0.135		-		-		-		-	0.000	6.368	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			106.055	1.248		2.748		-		-		-	0.000	110.051	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

Event Name	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
Robotics Development																												
RD (ERP, CBRN, CRS-LR, etc.)																												
RD Future Payload Maturation																												
RD MODELING & SIMULATION (M&S)																												
RD M&S																												
RD MODELING & SIMULATION (M&S) cont.																												
RD M&S Data Source Matrix Development																												
RD M&S Data Source Matrix Development cont.																												
RD M&S Developmental testing																												
RD M&S DEV testing																												
RD M&S Development Testing cont.																												
RD M&S Use Case Development																												
RD M&S Use Case Development cont.																												
RD M&S Validation, Verification Accreditation																												
RD Ver/Val/Accreditation																												
RD M&S Validation, Verification Accreditation cont.																												
M&S Risk Reduction																												
Risk Reduction																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

Event Name	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
RD M&S Risk Reduction cont																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Robotics Development	1	2017	4	2022
RD (ERP, CBRN, CRS-LR, etc.)	1	2021	4	2021
RD MODELING & SIMULATION (M&S)	1	2017	4	2022
RD MODELING & SIMULATION (M&S) cont.	1	2024	4	2027
RD M&S Initial Capability Development	4	2017	4	2020
RD M&S Data Source Matrix Development	1	2017	4	2022
RD M&S Data Source Matrix Development cont	1	2024	4	2027
RD M&S Developmental testing	2	2018	4	2022
RD M&S Development Testing cont	1	2024	4	2027
RD M&S Use Case Development	1	2018	4	2022
RD M&S Use Case Development cont	1	2024	4	2027
RD M&S Validation, Verification Accreditation	4	2018	4	2022
RD M&S Validation, Verification Accreditation cont	1	2024	4	2027
M&S Risk Reduction	1	2021	4	2022
RD M&S Risk Reduction cont	1	2024	4	2027
MMP Experimental Unit Prototyping - Contract Award	1	2019	1	2019
MMP - ATEC Safety Testing	4	2019	2	2020
ABV RCS market research	3	2020	4	2020

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>
---	---

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	-	-	27.872	220.820	-	220.820	144.936	36.312	0.000	0.000	0.000	429.940
BU9: <i>IFPC High Energy Laser</i>	-	-	8.258	177.843	-	177.843	133.534	32.208	-	-	0.000	351.843
CO6: <i>IFPC High Power Microwave (HPM)</i>	-	-	19.614	42.977	-	42.977	11.402	4.104	-	-	0.000	78.097

Note

Work in this project continues from the work done under PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).

This PE supports transitioning the High Energy Laser -Tactical Vehicle Demonstration S&T effort to manufacturing four rapid prototype systems for delivery in FY 2024, with transition to a program of record in FY 2025.

Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser has been restructured to transfer all funds for IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification

These funding lines are directly aligned to the Army Air and Missile Defense Modernization Priority.

Work in this PE, the Expanded Mission Area Missile (EMAM) program, supports the Integrated Air and Missile Defense (IAMD) architecture and provides Directed Energy - Indirect Fire Protection Capability (DE-IFPC) intercept capability to defeat Cruise Missiles (CM), Unmanned Aircraft System (UAS), and Rocket, Artillery, and Mortar (RAM) threats.

The DE-IFPC is an Air Defense capability consisting of the IFPC-High Energy Laser (HEL) and the IFPC-High Power Microwave (HPM). IFPC-HEL will provide a ground-based weapon system designed to acquire, track, engage, and defeat the CM, UAS, and RAM threats. The IFPC-HEL requirement consists of a vehicle, 300 kW class laser subsystem, power and thermal subsystem, and a beam control subsystem integrated with a battle management command, control and communication software. IFPC-HEL provides much needed protection against adversarial threat systems capable of targeting U.S. and Allied forward operating bases, convoys, and other critical assets.

IFPC-HPM will provide a ground-based weapon system designed to acquire, track, engage, and defeat UAS swarms. The IFPC-HPM requirement consists of a HPM source, power and thermal subsystem, and an antenna subsystem interoperable with a battle management command, control and communication software. IFPC-HPM provides much needed protection against adversarial UAS swarms capable of targeting and overwhelming U.S. and Allied air defense systems.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>
---	---

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

Work in this PE is performed by the United States Army Rapid Capabilities and Critical Technologies Office (RCCTO).

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	50.674	0.000	-	0.000
Current President's Budget	0.000	27.872	220.820	-	220.820
Total Adjustments	0.000	-22.802	220.820	-	220.820
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-22.802			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	220.820	-	220.820

Change Summary Explanation

The planned prototype contract award dates supporting both Projects BU9 and CO6 were moved to late 4th quarter FY 2022. As such, the FY 2022 PPB was decremented \$22.802M to align funding need with the new contract award dates.

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>
--	---	---

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
<i>BU9: IFPC High Energy Laser</i>	-	-	8.258	177.843	-	177.843	133.534	32.208	-	-	0.000	351.843
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Work in this project continues the work done under PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).

This PE supports transitioning the High Energy Laser -Tactical Vehicle Demonstration S&T effort to manufacturing four rapid prototype vehicles for delivery in FY 2024, with transition to a program of record in FY 2025.

Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser TVD has been restructured to transfer all funds for IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Directed Energy Indirect Fire Protection Capability (DE-IFPC) - High Energy Laser (HEL) is an Air Defense capability consisting of IFPC - HEL 300kW class laser experimental prototypes with residual combat capability at the IFPC Battery Level in support of Multi-Domain Operations (MDO). IFPC-HEL will provide the Army prototype weapon systems for defense of fixed and semi-fixed sites from Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. This project will deliver an operationally effective rapid prototype capability in the near- and mid-terms. Efforts will include accelerated materiel development and competitive prototyping. IFPC-HEL funds an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, and the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

Work is performed by the United States (US) Army Rapid Capabilities and Critical Technologies Office (RCCTO).

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

	FY 2021	FY 2022	FY 2023
Title: IFPC-High Energy Laser	-	7.957	177.843

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: This effort will provide for the planning, prototype manufacturing, and testing of 4 IFPC-HEL rapid prototypes with residual combat capability to support the IFPC mission. The IFPC-HEL is a 300 kilowatt (kW) modularized laser weapon system that can be integrated onto a Heavy Expanded Mobility Tactical Truck (HEMTT) Palletized Load System (PLS) to defend fixed and semi-fixed sites from Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats delivered with residual combat capability at the Platoon Level in FY 2024 as part of the Indirect Fire Protection Capability (IFPC) Battery in support of Multi-Domain Operations (MDO). IFPC-HEL builds on the technology maturation and demonstration from PE 0602150A (Air and Missile Defense Technology) / Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology) and PE 0603466A (Air and Missile Defense Advanced Technology) / Project AD1 (High Energy Laser Tactical Vehicle Demo Advanced Technology).</p> <p>FY 2022 Plans: These funds will provide systems engineering, program management, engineering, and technical support to transition the High Energy Laser Tactical Vehicle Demonstrator from Science and Technology into rapid prototyping, complete the competitive source selection, award the prototype contract in late FY 2022, and conduct planning to transition to the program of record beginning in FY 2025.</p> <p>FY 2023 Plans: Will continue systems engineering, program management, engineering, and technical support, for weapon system prototyping. Fabrication will commence immediately upon contract award to include hardware integration and assembly.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase from FY 2022 to FY 2023 due to four prototype buys on new OTA prototype contract award.</p>				
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>		-	0.301	-
Accomplishments/Planned Programs Subtotals		-	8.258	177.843
C. Other Program Funding Summary (\$ in Millions)				
N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Mi ssile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>

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

Remarks

D. Acquisition Strategy

The Army RCCTO capitalizes on current and emerging technologies to provide near-term and mid-term solutions to address emerging threats and high impact capability opportunities for the U.S. Army Forces deployed globally. A demonstration effort has been initiated for this capability that will culminate in an integrated laboratory demonstration in 4th Quarter FY 2022. Given a favorable outcome, four prototype weapon systems will be delivered with residual combat capability at the Platoon level in FY 2024 as part of the IFPC Battery in support of Multi-Domain Operations (MDO). Soldier touchpoints will be conducted to provide feedback in support of Army requirements generation/soldier centered design, prototype maturation, fielding, and future capability development. Performance characteristics will be utilized to establish a Program of Record within PEO Missiles and Space.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>
--	---	---

Event Name	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
IFPC-HEL Source Evaluation					██████████																							
IFPC-HEL Award Prototype Contract					██████████				██████████																			
IFPC-HEL Prototype Fabrication					██████████				██████████				██████████															
IFPC-HEL Prototype Delivery					██████████				██████████				██████████															
IFPC-HEL Contractor Logistics Support					██████████				██████████				██████████				██████████											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) BU9 / <i>IFPC High Energy Laser</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IFPC-HEL Source Evaluation	2	2022	4	2022
IFPC-HEL Award Prototype Contract	4	2022	4	2022
IFPC-HEL Prototype Fabrication	2	2023	4	2024
IFPC-HEL Prototype Delivery	4	2024	4	2024
IFPC-HEL Contractor Logistics Support	1	2025	4	2025

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Missile (EMAM)				Project (Number/Name) CO6 / IFPC High Power Microwave (HPM)			
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
CO6: IFPC High Power Microwave (HPM)	-	-	19.614	42.977	-	42.977	11.402	4.104	-	-	0.000	78.097
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project BU9 Indirect Fire Protection Capability (IFPC)- High Energy Laser has been restructured to transfer all funds for IFPC-High Power Microwave (HPM) effort to Program Element (PE) 0604019A Expanded Mission Area Missile (EMAM) Project CO6 IFPC-HPM.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Indirect Fire Protection Capability (DE-IFPC) - High Power Microwave (HPM) is an Air Defense capability consisting of the IFPC-HPM experimental prototype with residual combat capability at the IFPC Battery Level in support of Multi-domain Operations (MDO). IFPC-HPM will provide the Army with High Powered Microwave prototype weapon systems for the short-range defense of fixed and semi-fixed sites from Unmanned Aircraft System (UAS) swarms. This project will deliver an operationally effective rapid prototype capability in the near- and mid-terms. Efforts will include accelerated materiel development and competitive prototyping. IFPC-HPM funds an improved mechanism to effectively confront emerging threats and advance America's military dominance in accordance with the National Defense Strategy. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, and the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

Work is performed by the United States (US) Army Rapid Capabilities and Critical Technologies Office (RCCTO).

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

	FY 2021	FY 2022	FY 2023
Title: IFPC-High Power Microwave	-	18.898	42.977
Description: This effort will provide for the development, planning, prototype manufacturing, and testing of 4 IFPC-HPM rapid prototypes with residual combat capability to support the IFPC mission. The IFPC-HPM is a containerized HPM weapon system that can be transported by common brigade combat team equipment to defend fixed and semi-fixed sites against Group 1-2 UAS swarms. IFPC-HPM is common with other Services and the Joint Counter-UAS Office HPM effectors for countering UAS. IFPC-HPM leverages previous HPM technology demonstrations and experimentation campaigns such as the Tactical High-Power Responder (THOR).			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) CO6 / <i>IFPC High Power Microwave (HPM)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>These funds will provide systems engineering, program management, engineering, and technical support to transition HPM Science and Technology demonstrators into rapid prototyping. US Services contracts will be leveraged to complete the development and prototyping of the common HPM system, delivering 4 prototypes in FY 2024. Funding will also be utilized to conduct planning to transition to the program of record beginning in FY 2025.</p> <p>FY 2023 Plans: Continuation of fabricating and producing prototypes of the common HPM system, delivering 4 prototypes in FY 2024.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase from FY2022 to FY2023 to integrate initial prototype and complete the platoon with additional prototypes in FY2023.</p>			
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.716	-
Accomplishments/Planned Programs Subtotals	-	19.614	42.977

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

N/A

Remarks

D. Acquisition Strategy

The Army RCCTO capitalizes on current and emerging technologies to provide near-term and mid-term solutions to address emerging threats and high impact capability opportunities for U.S. Army Forces deployed globally. DE-IFPC will utilize streamlined acquisition methods, processes and techniques to rapidly acquire the capability. IFPC-HPM will leverage US Air Force contracts to provide prototypes. Soldier touchpoints will be conducted to provide feedback in support of Army requirements generation, prototype maturation, fielding residual combat capability to a unit of action, and future capability development.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army											Date: April 2022					
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
2040 / 4				PE 0604019A / Expanded Mission Area Missile (EMAM)					CO6 / IFPC High Power Microwave (HPM)							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Various	Various : Various	-	-		1.889		2.840	Dec 2022	-		2.840	0.000	4.729	-	
FY2022 SBIR / STTR Transfer	TBD	Various : Various	-	-		0.716		-		-		-	Continuing	Continuing	-	
Subtotal			-	-		2.605		2.840		-		2.840	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Indirect Fire Protection Capability - High Power Microwave (IFPC-HPM)	TBD	TBD : TBD	-	-		17.009		40.137	Nov 2022	-		40.137	Continuing	Continuing	-	
Subtotal			-	-		17.009		40.137		-		40.137	Continuing	Continuing	N/A	
Project Cost Totals			-	-		19.614		42.977		-		42.977	Continuing	Continuing	N/A	
Remarks																

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604019A / Expanded Mission Area Mi ssile (EMAM)		Project (Number/Name) CO6 / IFPC High Power Microwave (HPM)	

Event Name	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
IFPC-HPM Army Decision Point					▲ 1																							
IFPC-HPM Prototype Fabrication																												
IFPC-HPM Prototype Delivery																	▲ 2											
IFPC-HPM Contractor Logistic Support																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604019A / <i>Expanded Mission Area Missile (EMAM)</i>	Project (Number/Name) CO6 / <i>IFPC High Power Microwave (HPM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IFPC-HPM Army Decision Point	4	2022	4	2022
IFPC-HPM Prototype Fabrication	2	2023	4	2024
IFPC-HPM Prototype Delivery	4	2024	4	2024
IFPC-HPM Contractor Logistic Support	1	2025	4	2025

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604020A / <i>Cross Functional Team (CFT) Advanced Development & Prototyping</i>
---	---

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	-	-	-	106.000	-	106.000	0.000	0.000	0.000	0.000	0.000	106.000
DC8: <i>Army Experimentation and Prototyping</i>	-	-	-	106.000	-	106.000	-	-	-	-	0.000	106.000

Note

This is a new start in FY 2023.

In Fiscal Year 2023 (FY23) this is a New Start Program Element (PE) in FY23.

A. Mission Description and Budget Item Justification

This Program Element (PE) is the Army led scope of the Rapid Defense Experimentation Reserve (RDER) initiative. To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify "best of breed" capabilities developed among the DoD prototyping programs, and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component - involving Joint Services, International partners and/or other government agencies - and link to one or more of the four key supporting concepts ("functional battles") of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

Army lead experimentation outcomes will be designed to validate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that effect changes throughout the Department

The cited work is consistent with the Under Secretary of Defense, Research and Engineering science and the JWC.

Work in this PE is performed by the United States (U.S.) Army and other Service laboratories and research centers, U.S. Army and Joint Program Executive Offices and Program Management Offices.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604020A / <i>Cross Functional Team (CFT) Advanced Development & Prototyping</i>
---	---

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	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	106.000	-	106.000
Total Adjustments	0.000	0.000	106.000	-	106.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	106.000	-	106.000

Change Summary Explanation

FY2023 funding increase reflects the fact that the FY2022 President's Budget request did not include out year funding.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping				Project (Number/Name) DC8 / Army Experimentation and Prototyping			
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
DC8: Army Experimentation and Prototyping	-	-	-	106.000	-	106.000	-	-	-	-	0.000	106.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2023 (FY23) this is a New Start Project in FY23.

A. Mission Description and Budget Item Justification

The Army led Olympus Project is a Joint All Domain Operations concept portfolio applicable across multiple COCOMs which addresses OUSD R&E priority scenarios (specifically INDOPACOM). Olympus will establish or optimize the architecture spanning remote sensing and C2 to support long range precision fires across a large disperse battlespace. Sufficiently mature technologies will be further matured to TRL7+ prototypes to support Soldier operated culmination test events in INDOPACOM (or other COCOMs) to evaluate advanced capabilities for sensing, target identification / target paring, multi-layer networks / data share, and advanced command and control. Technologies in the portfolio will go through risk reduction evaluations prior to the culmination testing event. Successful evaluations of the prototype efforts will lead to follow-on OSD, Army, or other Service efforts for accelerated transition of the technologies to COCOM required operations.

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

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

	FY 2021	FY 2022	FY 2023
Title: Olympus	-	-	86.000
Description: Mature technologies to TRL7+ prototypes for Soldier evaluations in INDOPACOM as primary experiment event in FY 2024. Efforts will include advanced capabilities for sensing, target identification / target paring, multi-layer networks / data share, and advanced command and control. The Olympus portfolio will initiate prototyping, integration and risk reduction activities to facilitate integrated and interoperable capabilities that leverage layered ISR and autonomy with advanced communications and architectures to enable AI-infused analytics and Layered Effects.			
FY 2023 Plans: Conduct systems design, hardware procurement, systems prototyping, software maturation and systems integration for Layered ISR and autonomy systems and communications and architectures within the Olympus portfolio. Efforts will prototype and integrate terrestrial and aerial ISR systems for evaluation on relevant test networks for a COCOM relevant scenario. Advanced communications and architectures will be prototyped and integrated to assess and refine concept of employment and associated use cases within a primary risk reduction event (FY 2023) and lead into the primary experimentation event in FY 2024.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
New Start Effort in FY 2023				
Title: Army RDER Project Description: Army Rapid Defense Experimentation Reserve (RDER) Project FY 2023 Plans: The Rapid Defense Experimentation Reserve initiative budget line includes development of system prototypes for field demonstrations or experiments and/or tests in operational environments. Efforts provide proof of technological feasibility and assessment of system operability that demonstrate viability to accelerate prototype to Milestone B and insertion into existing Programs of Record or identify and demonstrate prototype capabilities that can be delivered in scale. FY 2022 to FY 2023 Increase/Decrease Statement: New start project in FY 2023		-	-	20.000
Accomplishments/Planned Programs Subtotals		-	-	106.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Layered ISR and autonomy systems design	Option/TBD	Multiple : Various	-	-		-		4.000		-		4.000	0.000	4.000	-
Layered ISR and autonomy systems hardware procurement	Option/TBD	Multiple : Various	-	-		-		21.000		-		21.000	0.000	21.000	-
Layered ISR and autonomy systems prototyping	Option/TBD	Multiple : Various	-	-		-		7.000		-		7.000	0.000	7.000	-
Layered ISR and autonomy software maturation	Option/TBD	Multiple : Various	-	-		-		4.000		-		4.000	0.000	4.000	-
Layered ISR and autonomy systems integration	Option/TBD	Multiple : Various	-	-		-		4.000		-		4.000	0.000	4.000	-
Communications and architectures Systems Design	C/TBD	Multiple : Various	-	-		-		5.000		-		5.000	0.000	5.000	-
Communications and architectures hardware procurement	Option/TBD	Multiple : Various	-	-		-		9.000		-		9.000	0.000	9.000	-
Communications and architectures systems prototyping	Option/TBD	Multiple : Various	-	-		-		6.000		-		6.000	0.000	6.000	-
Communications and architectures software maturation	Option/TBD	Multiple : Various	-	-		-		7.000		-		7.000	0.000	7.000	-
Communications and architectures systems integration	Option/TBD	Multiple : Various	-	-		-		5.000		-		5.000	0.000	5.000	-
Lab Based Risk Reduction activities	Option/TBD	Multiple : Various	-	-		-		5.000		-		5.000	0.000	5.000	-
Risk Reduction and Evaluation Events	Option/TBD	Multiple : Various	-	-		-		9.000		-		9.000	0.000	9.000	-

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping


Event Name	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
Olympus																												
Layered ISR and autonomy systems design									■																			
Layered ISR and autonomy systems hardware procurement									■																			
Layered ISR and autonomy systems prototyping													■															
Layered ISR and autonomy software maturation													■				■											
Layered ISR and autonomy systems integration																	■											
Communications and architectures systems design									■																			
Communications and architectures hardware procurement									■																			
Communications and architectures systems prototyping													■															
Communications and architectures software maturation													■				■											
Communications and architectures systems integration																	■											
Lab Based Risk Reduction activities													■				■											
Risk Reduction and Evaluation Event 1																												



UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / Cross Functional Team (CFT) Advanced Development & Prototyping	Project (Number/Name) DC8 / Army Experimentation and Prototyping
--	--	--

Event Name	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
Risk Reduction and Evaluation Event 2 Army RDER Project													 Final Evaluation															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604020A / <i>Cross Functional Team (CFT) Advanced Development & Prototyping</i>	Project (Number/Name) DC8 / <i>Army Experimentation and Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Olympus	1	2023	4	2024
Layered ISR and autonomy systems design	1	2023	3	2023
Layered ISR and autonomy systems hardware procurement	1	2023	3	2023
Layered ISR and autonomy systems prototyping	2	2023	1	2024
Layered ISR and autonomy software maturation	2	2023	4	2024
Layered ISR and autonomy systems integration	3	2023	4	2024
Communications and architectures systems design	1	2023	3	2023
Communications and architectures hardware procurement	1	2023	3	2023
Communications and architectures systems prototyping	2	2023	1	2024
Communications and architectures software maturation	2	2023	4	2024
Communications and architectures systems integration	3	2023	4	2024
Lab Based Risk Reduction activities	1	2023	4	2024
Risk Reduction and Evaluation Event 1	4	2023	4	2023
Risk Reduction and Evaluation Event 2	4	2024	4	2024
Army RDER Project	1	2023	4	2024

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>
---	---

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	-	15.034	-	-	-	-	0.000	0.000	0.000	0.000	0.000	15.034
AW7: <i>Electronic Warfare Technology Maturation</i>	-	15.034	-	-	-	-	-	-	-	-	0.000	15.034

Note

PE 0604021A has no FY2023 Funding Request.

A. Mission Description and Budget Item Justification

Terrestrial Layer System Brigade Combat Team (TLS BCT) provides Army maneuver forces integrated full spectrum Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling non-kinetic offensive operation options to Brigade Combat Team (BCT) and Expeditionary-Military Intelligence Brigade (EMIB) commanders. TLS BCT's information superiority provides Indications and Warnings, Force Protection and Situational Awareness to influence the commander's decision cycle, improve targeting timeliness and accuracy, and provide the maneuver commander with electronic attack and offensive cyber warfare options to deny, degrade, disrupt, or otherwise manipulate the targeted force. TLS BCT employs technologically advanced systems with a modular open-system approach for multiple operation configurations that can be efficiently sustained and effectively upgraded to provide capabilities against changing near peer and emerging threats to address multi-domain capability gaps.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	15.034	0.000	0.000	-	0.000
Current President's Budget	15.034	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	-	-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>				Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>			
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
AW7: <i>Electronic Warfare Technology Maturation</i>	-	15.034	-	-	-	-	-	-	-	-	0.000	15.034
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Terrestrial Layer System Brigade Combat Team (TLS BCT) provides Army maneuver forces integrated full spectrum Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling non-kinetic offensive operation options to Brigade Combat Team (BCT) and Expeditionary-Military Intelligence Brigade (EMIB) commanders. TLS BCT's information superiority provides Indications and Warnings, Force Protection and Situational Awareness to influence the commander's decision cycle, improve targeting timeliness and accuracy, and provide the maneuver commander with electronic attack and offensive cyber warfare options to deny, degrade, disrupt, or otherwise manipulate the targeted force. TLS BCT employs technologically advanced systems with a modular open-system approach for multiple operation configurations that can be efficiently sustained and effectively upgraded to provide capabilities against changing near peer and emerging threats to address multi-domain capability gaps.

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

	FY 2021	FY 2022	FY 2023
Title: Technical / Program Management	0.719	-	-
Description: Funds will provide for technical engineering and program management.			
Title: Systems Engineering and Component Prototyping	14.315	-	-
Description: Funds will provide for, but are not limited to development, engineering and evaluation of component level technologies to include antennas, radios, software architecture and other Signals Intelligence (SIGINT), Electronic Warfare Support (ES), Electronic Attack (EA) and Cyber enabling components to mature technical feasibility and reduce Critical Technology Element (CTE) risks. Funds will support, but are not limited to the development capabilities to enhance and integrate Signals of Interest, develop system level designs, reduce Size, Weight and Power (SWaP), to mature components into an emerging Program of Record (PoR) level technology maturation level, and to support the evaluation environment to conduct required developmental events.			
Accomplishments/Planned Programs Subtotals	15.034	-	-

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
• FJ5: <i>Terrestrial Layer System</i>	38.105	50.624	21.468	-	21.468	12.419	-	-	-	0.000	122.616

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>	Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• B97610: <i>TERRESTRIAL LAYER SYSTEM BCT</i>	8.081	39.240	88.915	-	88.915	168.612	188.341	188.870	188.767	0.000	870.826

Remarks

D. Acquisition Strategy

A competitive acquisition approach for component development and prototyping is planned for TLS BCT using a tailored acquisition strategy to rapidly deliver an initial integrated signals intelligence, electronic warfare and cyber capability to the Army. These efforts will be used, but are not limited to identify, develop, prototype, evaluate, analyze, and demonstrate potential capabilities and alternative solutions. These efforts will quantify the respective maturity and effectiveness to mitigate capability gaps against changing near peer representative enemy target sets and operational scenarios. Enhanced capability and other technologies to provide overmatch capabilities will be evaluated for merit and will provide increased performance for production of TLS BCT systems in FY 2022.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>	Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering and Prototyping	C/Various	TBD : TBD	15.761	14.315	Feb 2021	-		-		-		-	0.000	30.076	-
Counter drone RF-signal based targeting	C/Various	TBD : TBD	5.000	-		-		-		-		-	0.000	5.000	-
Subtotal			20.761	14.315		-		-		-		-	0.000	35.076	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technical / Program Management	C/CPFF	AASKI Technology : Tinton Falls, NJ	1.141	0.500	Nov 2020	-		-		-		-	0.000	1.641	-
Technical / Program Management	MIPR	Various Matrix Support Organizations : Aberdeen Proving Grounds, MD	1.141	0.219	Nov 2020	-		-		-		-	0.000	1.360	-
Subtotal			2.282	0.719		-		-		-		-	0.000	3.001	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	23.043	15.034	-	-	-	-	0.000	38.077	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>	Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>

Event Name	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
Component Engineering and Prototyping	█																											
Integration on Stryker					█																							
Field Test 1																												
Field Test 2																												
Long Lead Component Procurement					█																							
Rapid Fielding or MS C Decision Point																												
Production on Stryker Variant									█																			
First Unit Equipped with TLS on Stryker																												
IOT&E / Log Demo																												
Integration & Evaluation on AMPV					█																							
TLS BCT Production on AMPV													█															
Integration & Evaluation on IBCT Platform													█															
TLS BCT Production on IBCT Platform																	█											

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>		Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>	

Event Name	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
Iterative Prototyping																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604021A / <i>Electronic Warfare Technology Maturation (MIP)</i>	Project (Number/Name) AW7 / <i>Electronic Warfare Technology Maturation</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone A	2	2020	2	2020
Component Engineering and Prototyping	3	2020	2	2021
Mid Tier Acquisition Approval	3	2020	3	2020
Integration on Stryker	2	2021	1	2022
Field Test 1	4	2021	4	2021
Field Test 2	4	2021	1	2022
Long Lead Component Procurement	2	2021	1	2022
Rapid Fielding or MS C Decision Point	1	2023	1	2023
Production on Stryker Variant	2	2022	4	2024
First Unit Equipped with TLS on Strkyer	4	2022	4	2022
IOT&E / Log Demo	1	2023	1	2023
Integration & Evaluation on AMPV	2	2022	4	2023
TLS BCT Production on AMPV	4	2023	1	2025
Integration & Evaluation on IBCT Platform	2	2023	4	2024
TLS BCT Production on IBCT Platform	1	2025	4	2026
Iterative Prototyping	1	2022	1	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Satellite Capability
--	--

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	-	21.850	19.638	35.509	-	35.509	39.672	22.904	23.328	23.486	Continuing	Continuing
<i>BX7: Low Earth Orbit (LEO) Satellite Capability</i>	-	21.850	19.638	35.509	-	35.509	39.672	22.904	23.328	23.486	Continuing	Continuing

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, DoD, commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	21.850	19.638	0.000	-	0.000
Current President's Budget	21.850	19.638	35.509	-	35.509
Total Adjustments	0.000	0.000	35.509	-	35.509
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	35.509	-	35.509

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>				Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>			
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
<i>BX7: Low Earth Orbit (LEO) Satellite Capability</i>	-	21.850	19.638	35.509	-	35.509	39.672	22.904	23.328	23.486	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In an Army Budget memorandum dated, 21 September 2020, the Army changed the name of this Project from 'Low Earth Orbit (LEO) Satellite Capability' to 'Battle Management Command and Control (BMC2) and Ground Infrastructure for FY22 and beyond.'

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, Department of Defense (DoD), commercial Space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The Low Earth Orbit (LEO) Battle Management Command and Control (BMC2) and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at the tactical edge to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

FY2023 Base funding in the amount of \$35.509 million provides prototyping, experimentation, and risk reduction activities for the Army Tactical Intelligence Targeting Access Node (TITAN) and Army Theater-Level Access Node (ATHENA) ground station architectures. This supports wide-area, responsive, and deep-area sensing and force maneuver. It will also enable ground stations to dynamically task, receive and disseminate data to directly support live-fire, S2S demonstrations and assessments.

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

	FY 2021	FY 2022	FY 2023
Title: LEO Satellite Capability	17.100	18.922	35.509
Description: The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, DoD, commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED)			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>
--	---	---

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

	FY 2021	FY 2022	FY 2023
<p>required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.</p> <p>The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.</p> <p>FY 2022 Plans: Continues the demonstration and validation of ground architecture, evaluating ability to provide wide-area, responsive, and deep-area sensing required for BLOS targeting and force maneuver, significantly reducing S2S timelines. Ground architecture will be evaluated through multiple events including the Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. These will provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance, and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), Battle Management Command and Control (BMC2), and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical Warfighter. This will be executed through the S2S Demo/Experimentation Plan which began with the first Positioning, Navigation and Timing (PNT) Assessment Exercise (PNTAX) in FY19, working through three Live Fire Exercises and follow on exercises in Europe and the Pacific, and culminating with the Project Convergence series of exercises. This Demo/Experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is being correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.</p> <p>FY 2023 Plans: Battle Management and Control (BMC2) and Ground Infrastructure (renamed from LEO Satellite Capability) continues the demonstration and validation of ground architecture, evaluating ability to provide wide-area, responsive, and deep-area sensing required for BLOS targeting and force maneuver, significantly reducing S2S timelines. Ground architecture will be evaluated through multiple assessment events including the Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. These will provide a realistic operational environment to evaluate the integrated ISR, Positioning, Navigation and Timing (PNT), Battle Management Command and Control (BMC2), and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical Warfighter. This will be executed through the S2S Demo/ Experimentation Plan which began with the first Positioning, Navigation</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Sate llite Capability	Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>and Timing (PNT) Assessment Exercise (PNTAX) in FY19, working through three Live-Fire Exercises and follow-on exercises in Europe and the Pacific, and culminating with a FY 2023 Project Convergence exercise. This Demo/Experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is being correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY 2022 (\$19.638 million) to FY 2023 (\$35.509 million) reflects achieved objectives for Army influence on development of National assets and payloads through A-PNT CFT Campaign of Learning and AFC Project Convergence. The increase also reflects the realignment of PE 0603766A Project CC5 "LEO ISR" funds to PE 0604035A Project BX7 "Battle Management Command and Control (BMC2) and Ground Infrastructure" (renamed from 'LEO Satellite Capability') to continue efforts in this area. Project CC5 "LEO ISR" is focused on the payload development and prototyping, and PE 0604035A Project BX7 ?Battle Management Command and Control (BMC2) and Ground Infrastructure? is focused on the ground ingest/ infrastructure development.</p>				
<p>Title: APNT Integrated Space Communications</p> <p>Description: Development of a unique advanced space communications capability to explore advanced ground based space communications technologies and concepts utilizing bi-static Radio Frequency (RF) scattering and propagation with precision frequency, phase, and power management. This space communications capability will develop and demonstrate multiple advanced Army LEO space communications concepts and will also assess interfacing with multiple Joint Service space communication missions</p>		4.750	-	-
<p>Title: SBIR/STTR</p> <p>Description: FY22 SBIR/STTR fund transfer.</p> <p>FY 2022 Plans: In FY22, \$.628 million in SBIR and \$.088 million transferred to STTR.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is due to no planned SIBR/STTR costs in PB 2023.</p>		-	0.716	-
Accomplishments/Planned Programs Subtotals		21.850	19.638	35.509

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0603766A: <i>Tactical Electronic Surveillance System - Adv Dev</i>	182.400	113.365	72.314	-	72.314	64.799	37.048	36.646	37.072	Continuing	Continuing

Remarks

Development by Project BX7 'LEO Battle Command and Control (BMC2) and Ground Infrastructure' is in conjunction and complement Project CC5 'LEO ISR'. ref. PE 0603766A.CC5

D. Acquisition Strategy

The Army signed a Memorandum of Agreement (MOA) with the Mission Partner on November 19, 2019, at the direction of Under Secretary of Defense (Intelligence) (USD(I)) and Office of Management and Budget (OMB). This relationship has shown promise to build and deliver capacity for the Army. The MOA will allow the Army to leverage orbit experimental ISR satellites that will accelerate the Army's development of Concept of Operations (CONOPs), Tactics, Techniques and Procedures (TTPs), and refine requirements necessary to mitigate the deep-sensing gap, shorten the S2S timeline and improve situational awareness for Warfighters at both the operational and tactical levels.

This funding will enable the Army to utilize on-orbit demonstrations and numerous large-scale exercises within United States European Command (EUCOM) and U.S. Indo-Pacific Command (INDOPACOM) areas of responsibility (AORs). These demonstrations will help define the Army's tactical requirements, CONOPs, and TTPs for leveraging on-demand/direct link theater access, at echelon, to space-based ISR capabilities with trained/certified Soldiers. This will turn previously "opportunistic" collection into "assured" collection to support dynamic targeting and enhanced situational awareness. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. Existing Mission Partner contracts and Aviation & Missile Technology Consortium (AMTC) OTAs will be used for Prototype Development, Engineering Services and Test and Evaluation Support.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604035A / Low Earth Orbit (LEO) Sate llite Capability				BX7 / Low Earth Orbit (LEO) Satellite Capability							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Gov/SETA Support LEO	C/FFP	Multiple : Multiple Locations	-	3.000	Oct 2020	-		-		-		-	0.000	3.000	Continuing
Matrix Gov/SETA Support APNT Integrated Space Communications	TBD	Multiple : Multiple Locations	-	1.000	Oct 2020	-		-		-		-	0.000	1.000	Continuing
Prototype Development and Engineering Services Support	C/FFP	Multiple : Multiple	-	-		3.930	Oct 2021	24.690	Oct 2022	-		24.690	0.000	28.620	-
SBIR/STTR	TBD	HQDA : Pentagon, Arlington, VA	-	-		0.716	Mar 2022	-		-		-	0.000	0.716	-
Subtotal			-	4.000		4.646		24.690		-		24.690	0.000	33.336	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Satellite Infrastructure Capabilities Development	TBD	Multiple : Multiple	-	14.100	Feb 2021	10.992	Jan 2022	6.454	Jan 2023	-		6.454	0.000	31.546	Continuing
APNT Integrated Space Communications	C/FFP	Classified : Classified	-	3.750	Jan 2021	-		-		-		-	0.000	3.750	Continuing
Subtotal			-	17.850		10.992		6.454		-		6.454	0.000	35.296	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LEO Infrastructure Test and Evaluation	TBD	Multiple : TBD	-	-		4.000	Jan 2022	4.365	Jan 2023	-		4.365	0.000	8.365	-
Subtotal			-	-		4.000		4.365		-		4.365	0.000	8.365	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>				Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>			
	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	-	21.850	19.638	35.509	-	35.509	0.000	76.997	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>	

Event Name	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
BMC2 and Ground Infrastructure																												

Note
LEO activities transitioned to this PE 0604035A Project BX7 in FY2022 from previous PE 1206308A, Project FE5 Space And Missile Defense Integration.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BMC2 and Ground Infrastructure	1	2021	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604036A / <i>Multi-Domain Sensing System (MDSS) Adv Dev</i>
---	---

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	-	-	50.548	49.932	-	49.932	10.482	4.310	1.583	1.599	Continuing	Continuing
BY9: <i>Multi-Domain Sensing System Adv Dev</i>	-	-	50.548	49.932	-	49.932	10.482	4.310	1.583	1.599	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Multi Domain Sensing System (MDSS) provides advanced aerial intelligence sensing capabilities for Multi-Domain Operations (MDO) against peer and near-peer adversaries. Initial MDSS development focuses on the High Accuracy Detection and Exploitation System (HADES) which is a globally deployable fixed-wing jet providing MDO-relevant sensing at extended ranges for indications and warnings, electronic order of battle, and patterns of life for the competition phase of MDO, and target development for the transition to conflict. During conflict, HADES operates at standoff distances for survivability against enemy integrated air defense systems (IADS) and anti-access/area denial (A2AD) systems. HADES sensors include electronic intelligence (ELINT), communications intelligence (COMINT), and synthetic aperture radar (SAR)/moving target indicator (MTI) in its first increment. Future increments will add cyber/electronic warfare (EW) systems and use air-launched effects (ALE) to extend sensing ranges. These capabilities will enable ground commanders to detect, locate, identify, track, and target critical enemy assets on the ground and support tactical consumers like Long Range Precision Fires (LRPF).

FY 2023 base dollars in the amount of \$49.932 million support the continued development and prototyping of ELINT, COMINT, and SAR/MTI sensors for HADES.

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	50.548	0.000	-	0.000
Current President's Budget	0.000	50.548	49.932	-	49.932
Total Adjustments	0.000	0.000	49.932	-	49.932
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	49.932	-	49.932

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604036A / Multi-Domain Sensing System (MDSS) Adv Dev				Project (Number/Name) BY9 / Multi-Domain Sensing System 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
BY9: Multi-Domain Sensing System Adv Dev	-	-	50.548	49.932	-	49.932	10.482	4.310	1.583	1.599	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multi Domain Sensing System (MDSS) provides advanced aerial intelligence sensing capabilities for Multi-Domain Operations (MDO) against peer and near-peer adversaries. Initial MDSS development focuses on the High Accuracy Detection and Exploitation System (HADES) which is a globally deployable fixed-wing jet providing MDO-relevant sensing at extended ranges for indications and warnings, electronic order of battle, and patterns of life for the competition phase of MDO, and target development for the transition to conflict. During conflict, HADES operates at standoff distances for survivability against enemy integrated air defense systems (IADS) and anti-access/area denial (A2AD) systems. HADES sensors include electronic intelligence (ELINT), communications intelligence (COMINT), and synthetic aperture radar (SAR)/moving target indicator (MTI) in its first increment. Future increments will add cyber/electronic warfare (EW) systems and use air-launched effects (ALE) to extend sensing ranges. These capabilities will enable ground commanders to detect, locate, identify, track, and target critical enemy assets on the ground and support tactical consumers like Long Range Precision Fires (LRPF).

FY 2023 base dollars in the amount of \$49.932 million support the continued development and prototyping of ELINT, COMINT, and SAR/MTI sensors for HADES.

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

	FY 2021	FY 2022	FY 2023
Title: SAR/MTI Development and Prototyping	-	26.320	21.300
Description: SAR/MTI development and prototyping to expand sensor performance to address HADES requirements and ability to exploit near-peer threats.			
FY 2022 Plans: Development of software for Range Enhancement, Automatic Target Recognition (ATR), and Electronic Protection (EP) capability, continued development of prototypes, and conduct of experimentation, integration, and test.			
FY 2023 Plans: Acquisition of SAR/MTI test articles, critical spares, and long lead items and Original Equipment Manufacturer (OEM) engineering support to integrate SAR/MTI sensors into the HADES Mission Equipment Package (MEP).			
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 decrease is due to completion of SAR/MTI enhancements in FY 2022.			
Title: Prototype Component Acquisition	-	-	4.082

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / Multi-Domain Sensing System (MDSS) Adv Dev	Project (Number/Name) BY9 / Multi-Domain Sensing System Adv Dev		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Acquisition of Processing, Exploitation, and Dissemination (PED) Communications and Workstation prototype components.</p> <p>FY 2023 Plans: Acquisition of required PED software, radios, satellite communications equipment, operator workstations, server equipment, and ground station equipment components in support of system integration in a secure sensor integration lab.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 increase provides for the acquisition of additional components.</p>				
<p>Title: Architecture Development</p> <p>Description: Development of the HADES integrated systems architecture to ensure end-to-end compatibility and sensor fusion.</p> <p>FY 2022 Plans: Develop an Integrated systems architecture design to ensure all components functionally and physically integrate into the HADES system.</p> <p>FY 2023 Plans: Manage and enforce the integrated systems architecture design to ensure all components functionally and physically integrate into the HADES system.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 decrease is due to the completion of the initial system architecture design in FY 2022.</p>		-	1.796	0.500
<p>Title: SIGINT Development and Prototyping</p> <p>Description: ELINT/COMINT (SIGINT) development, prototyping, and demonstration to expand sensor performance and sensitivity to address HADES requirements and ability to exploit near-peer threats.</p> <p>FY 2022 Plans: Development of SIGINT sensor enhancements to increase capability and sensor sensitivity to close identified HADES capability gaps while in parallel developing prototypes and conducting experimentation, integration, and test.</p> <p>FY 2023 Plans: Acquisition of ELINT/COMINT test articles, critical spares, and long lead items and Original Equipment Manufacturer (OEM) engineering support to integrate ELINT/COMINT sensors into the HADES Mission Equipment Package (MEP).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	18.064	17.800

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / <i>Multi-Domain Sensing System (MDSS) Adv Dev</i>	Project (Number/Name) BY9 / <i>Multi-Domain Sensing System Adv Dev</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The FY 2023 increase is due to acquisition of ELINT/COMINT spares and components to support HADES prototyping.				
Title: Engineering Support		-	2.214	2.040
Description: Engineering Support for MDSS development and prototype demonstration efforts.				
FY 2022 Plans: Support SIGINT, SAR/MTI, and Open Architecture development, prototyping, and demonstration.				
FY 2023 Plans: Engineering support for HADES prototype development and prototyping.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 decrease is due to staffing adjustments.				
Title: Program Management		-	2.154	2.550
Description: Program Management support for MDSS development and prototype demonstration efforts.				
FY 2022 Plans: Support SIGINT, SAR/MTI and Open Architecture development, prototyping, and demonstration.				
FY 2023 Plans: Program Management support for HADES prototype development and prototyping.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 increase is due to staffing adjustments.				
Title: Secure Sensor System Integration Lab (SIL)		-	-	1.660
FY 2023 Plans: Establish a secure SIL environment to support integration and testing of Mission Equipment Package (MEP) sensors and Processing, Exploitation, and Dissemination (PED) equipment as a coherent whole.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 is the first year a SIL will be required.				
Accomplishments/Planned Programs Subtotals		-	50.548	49.932

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / <i>Multi-Domain Sensing System (MDSS) Adv Dev</i>	Project (Number/Name) BY9 / <i>Multi-Domain Sensing System Adv Dev</i>

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0603766A: <i>Tactical Electronic Surveillance System - Adv Dev</i>	182.400	113.365	72.314	-	72.314	64.799	37.048	36.646	37.072	Continuing	Continuing

Remarks

D. Acquisition Strategy

MDSS development continues ELINT/COMINT and SAR/MTI sensor and open architecture development and prototyping efforts that began in FY 2021 on 0603766A Tactical Support Development - Adv Dev and transitioned in FY 2022 to 0604036A MDSS - Adv Dev. MDSS-HADES requirements were approved by the Army Requirements Oversight Council (AROC) on 26 August 2020 and signed by the Commanding General, Army Futures Command on 18 September 2020. An Acquisition Decision Memorandum directing sensor prototyping activities for HADES was signed on 16 November 2020. With the funding and acquisition authority allocated for HADES in FYs 2021 and 2022, the MDSS program office has pursued an agile acquisition strategy, maximizing prototyping and experimentation to choose best-of-breed sensors, and leveraging a non-proprietary, open system architecture to enable easy upgrades of software and hardware. The MDSS program office will take advantage of lessons learned from past and current quick reaction HADES-like capabilities to develop operational context and validate the capabilities described in the HADES requirements. These "path of learning" efforts, and others, will collectively inform MDSS subsystem development and integration. The MDSS program's demonstration and development cycle will be executed in parallel to the path of learning above and will be informed by those efforts and related Army strategic decisions. Prototyping will include Soldier touchpoints throughout the process in order to help refine requirements.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / Multi-Domain Sensing System (MDSS) Adv Dev	Project (Number/Name) BY9 / Multi-Domain Sensing System Adv Dev
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support Services	TBD	ACC APG : APG, MD	-	-		2.214	Jan 2022	2.040	Nov 2022	-		2.040	Continuing	Continuing	-
Subtotal			-	-		2.214		2.040		-		2.040	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SAR/MTI Development and Prototyping	C/IDIQ	DMEA : Sacramento, CA	-	-		26.320	Jun 2022	21.300	Dec 2022	-		21.300	Continuing	Continuing	-
SIGINT Development and Prototyping	SS/TBD	ACC APG : APG, MD	-	-		18.064	Jun 2022	17.800	Jan 2023	-		17.800	0.000	35.864	Continuing
PED Software and Component Acquisition	Various	ACC APG : APG, MD	-	-		-		4.082	Dec 2022	-		4.082	Continuing	Continuing	-
Architecture Development and Management	TBD	AVMC : Redstone, AL	-	-		1.796	Mar 2022	0.500	Nov 2022	-		0.500	0.000	2.296	-
Secure Sensor SIL	C/TBD	APG ACC : APG MD	-	-		-		1.660	Oct 2022	-		1.660	Continuing	Continuing	-
Subtotal			-	-		46.180		45.342		-		45.342	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	RO	Various : APG, MD	-	-		2.154	Nov 2021	2.550	Nov 2022	-		2.550	Continuing	Continuing	-
Subtotal			-	-		2.154		2.550		-		2.550	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			-	-	50.548	49.932	-	49.932	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / Multi-Domain Sensing System (MDSS) Adv Dev	Project (Number/Name) BY9 / Multi-Domain Sensing System Adv Dev	

Event Name	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
SAR/MTI Development and Prototyping																												
SIGINT Sensor Evaluation																												
SIGINT Development and Prototyping																												
HADES Systems Architecture Development																												
Prototype System Acquisition and Integration																												
Prototype System Qualification, Test, and Evaluation																												
Military User Assessment																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / <i>Multi-Domain Sensing System (MDSS) Adv Dev</i>	Project (Number/Name) BY9 / <i>Multi-Domain Sensing System Adv Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SAR/MTI Development and Prototyping	2	2021	4	2023
SIGINT Sensor Evaluation	2	2021	2	2022
SIGINT Development and Prototyping	4	2021	4	2023
HADES Systems Architecture Development	3	2021	4	2023
Prototype System Acquisition and Integration	2	2023	4	2027
Prototype System Qualification, Test, and Evaluation	2	2024	2	2026
Military User Assessment	2	2026	4	2028

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604037A / Tactical Intel Targeting Access Node (TITAN) 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
Total Program Element	-	-	28.347	0.863	-	0.863	0.594	4.336	4.133	4.173	0.000	42.446
BY4: Tactical Intelligence Targeting Access Node	-	-	28.347	0.863	-	0.863	0.594	4.336	4.133	4.173	0.000	42.446

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the Tactical Intelligence Targeting Access Node (TITAN). TITAN is a scalable and expeditionary intelligence ground station that supports commanders across the entire Multi-Domain Operations (MDO)/Joint All Domain Operations (JADO) battlefield framework with capabilities tailored to echelon. TITAN leverages Space, High Altitude, Aerial and Terrestrial layer sensors to provide targetable data to fires networks as well as multi-discipline intelligence support to targeting and Situation Awareness/Situation Understanding (SA/SU) in support of mission command.

TITAN is the future Army Intelligence, Surveillance, and Reconnaissance (ISR) ground station that will consolidate the sensor processing capabilities in the current Distributed Common Ground System-Army (DCGS-A) Operational-Intelligence Ground Station (OGS), Tactical-Intelligence Ground Station (TGS), the Advanced Miniaturized Data Acquisition System Dissemination Vehicle (ADV) and the Remote Ground Terminal (RGT). Additionally, TITAN will have the access and sensor tasking or control capabilities of the future Tactical Space Layer assets, National assets, the Multi-Domain Sensing Systems (MDSS) as well as commercial overhead sensors. Consequently, the TITAN ground station will be able to conduct deep sensing operations with the abilities to Task, Collect, Process, Exploit, and Disseminate (TCPED) information from Space, High Altitude, Aerial, and Terrestrial Layer sensors in support of Long Range Precision Fires (LRPF) operations.

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	28.347	0.000	-	0.000
Current President's Budget	0.000	28.347	0.863	-	0.863
Total Adjustments	0.000	0.000	0.863	-	0.863
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.863	-	0.863

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>				Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>			
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
BY4: <i>Tactical Intelligence Targeting Access Node</i>	-	-	28.347	0.863	-	0.863	0.594	4.336	4.133	4.173	0.000	42.446
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Intelligence Targeting Access Node (TITAN) directly addresses the U.S. Army Combined Arms Center's (USACAC) Multi-Domain Operations (MDO) Gap #1: Lack of echelons above corps (EAC) multi-domain deep sensing, analysis, and processing, exploitation and dissemination (PED) for indications & warning (I&W) and anti-access/area denial (A2/AD) targeting. Furthermore, TITAN indirectly addresses MDO Gap 2: No theater detect, decide, deliver, assess (D3A) and convergence of Long Range Precision Fires (LRPF) to disintegrate A2/AD and MDO Gap #3: Lack of EAC LRPF capacity to dis-integrate A2/AD and shape the deep fight. TITAN supports these MDO gaps by providing the sensor data receipt and control, analysis, exploitation, and dissemination functions needed to enable LRPF. The system is postured to provide the fighting force with improved capacity and capability to "stimulate, see, and strike the enemy."

The FY23 RDTE Dollars in the amount of \$0.863M will fund continued support efforts to prototype high altitude, aerial and terrestrial sensor data feeds and processing.

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

	FY 2021	FY 2022	FY 2023
Title: Development and Prototyping of Critical RF Technologies	-	15.721	0.313
<p>Description: Fund initial Prototyping and Advanced Development of TITAN critical technologies on a representative platform. Development and prototyping of critical RF technologies and technology which currently does not exist or needs significant enhancements to meet TITAN requirements. Fund technology maturation and prototyping of critical TITAN RF technologies including Multi-Link Antennas and CMOSS implementations. Multi-link RF systems will support the simultaneous ingest of multiple sensor data streams in a tactical configuration/footprint Prototype high altitude, aerial and terrestrial sensor data feeds.</p> <p>FY 2022 Plans: Fund initial Prototyping and Advanced Development of TITAN critical RF technologies on a representative platform. Prototype high altitude, aerial and terrestrial sensor data feeds and processing. Fund technology maturation of critical TITAN technologies to include Multi-Link Antennas and CMOSS.</p> <p>FY 2023 Plans: Continued maturation of technologies which will be incorporated into TITAN operational prototypes.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding decrease in this PE as prototype integration and systems engineering ramps up in Budget Activity (BA) 5; however, enduring requirement for prototyping will remain constant to support new technology and sensors			
Title: Development and Prototyping of Critical Automated Processing Technologies	-	12.626	0.550
Description: Fund technology maturation of critical TITAN processing technologies including hyper-computing solutions, AI/ML algorithms to enhance targeting automation, stimulation capabilities and the generation of ML training data. Fund maturation of existing technology that needs minor enhancements to meet Army needs. This includes AI/ML algorithms that will transition to TITAN from various programs across the DoD and IC and need to be tuned for Army use cases. Fund the generation of new training data to aid in automated targeting. Funding will be used to integrate other technology transitioned from the research and development centers across the army to increase the accuracy and precision of TITAN. Existing modeling and simulation tools will be enhanced to account for the additional sensor modalities (EO/IR/SAR/FMV) that TITAN needs to process, which will allow the PM to automate more of the testing at the same time allowing units to run their own training exercises to maintain proficiency.			
FY 2022 Plans: Fund initial Prototyping and Advanced Development of TITAN critical technologies on a representative platform. Prototype high altitude, aerial and terrestrial sensor data feeds and processing. Fund technology maturation of critical TITAN technologies including hyper-computing and AI/ML algorithms.			
FY 2023 Plans: Continued maturation of technologies with will be incorporated into TITAN operational prototypes.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease in this PE as prototype integration and systems engineering ramps up in Budget Activity (BA) 5; however, enduring requirement for prototyping will remain constant to support new technology and sensors			
Accomplishments/Planned Programs Subtotals	-	28.347	0.863

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BY5: <i>Tactical Intelligence Targeting Access Node EMD</i>	-	54.972	58.087	-	58.087	36.013	31.949	31.494	31.801	0.000	244.316
• K57311: <i>TITAN GROUND STATION</i>	-	-	84.821	-	84.821	298.935	372.787	409.469	350.556	0.000	1,516.568

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>
--	---	--

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks
0605148A BY5 funding supports development and system engineering for TITAN

D. Acquisition Strategy

The TITAN program acquisition strategy is to leverage Middle-Tier of Acquisition (MTA) for Rapid Prototyping. This strategy allows the program to rapidly develop and field a capability that address multi-domain operations gap. The capabilities will be refined through soldier touchpoints and demonstrations/exercises, and inform final TITAN requirements and Concept of Operations (CONOPS). Demonstrating the objective capability in an operational environment will inform a decision point to transition to an MTA Rapid Fielding effort or tailored Milestone C for production. TITAN's open-system architecture approach ensures the system will be tailorable and scalable, with the ability to provide increased intelligence capabilities, additional sensor data and processing throughput over time to keep pace with new technology and changing threat. TITAN's MTA approval is based on an Abbreviated CDD (A-CDD) with an Army Requirements Oversight Council (AROC), which was approved in 1QFY22. The MTA decision point is scheduled for 2QFY22.

An Other Transaction Authority (OTA) contract was awarded under the 10 U.S.C. 2371b and the 2016 National Defense Authorization Act (NDAA), Section 815, for TITAN Rapid Prototyping. This innovative approach enables acceleration of the TITAN Ground Station capabilities to the Warfighter. The TITAN OTA approach is a multi-phased contract vehicle designed to scope each phase separately based on maturing requirements and informed by risk reduction efforts in prior phases. The initial phase, Ground Station Modernization, was competitive risk-reduction effort between two vendors to build system-level designs and mature a Software (SW) baseline. The next phase will be awarded in 3QFY22 and is focused on competitive prototyping between both vendors. The Competitive Prototyping Phase includes further SW baseline refinement to ensure functionality and then begin Hardware (HW) integration within a shelter and on a representative vehicle platform. The TITAN program includes two variants, Advanced and Basic, with Advanced featuring direct downlink (DDL) access to space data and enhanced storage capabilities, and Basic tailored for lower echelons and more expeditionary. At the conclusion of Competitive Prototyping, both vendors will be evaluated against technical feasibility and ability to meet TITAN requirements, which will inform up-select to one vendor. The selected vendor will move on to the final prototyping phase, Prototype maturation, which includes increasing capability of their prototypes to inform final TITAN requirements and support a Production decision. Multiple Soldier Touchpoints and demonstration of capability in the operational force, to ensure usability and inform requirements and CONOPS, will highlight the OTA phases for Rapid Prototyping. TITAN Production may be executed through Major Capability Acquisition (MCA) Milestone C or MTA for Rapid Fielding, and future FAR-based contracts will support both production and sustainment.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>
--	---	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development and Prototyping of Critical RF Technologies	C/FP	Contractor (Pending Selection) : PEO IEW&S (APG) and Contractor Facility (TBD)	-	-		15.721	Nov 2021	0.313	Jan 2023	-		0.313	Continuing	Continuing	Continuing
Subtotal			-	-		15.721		0.313		-		0.313	Continuing	Continuing	N/A

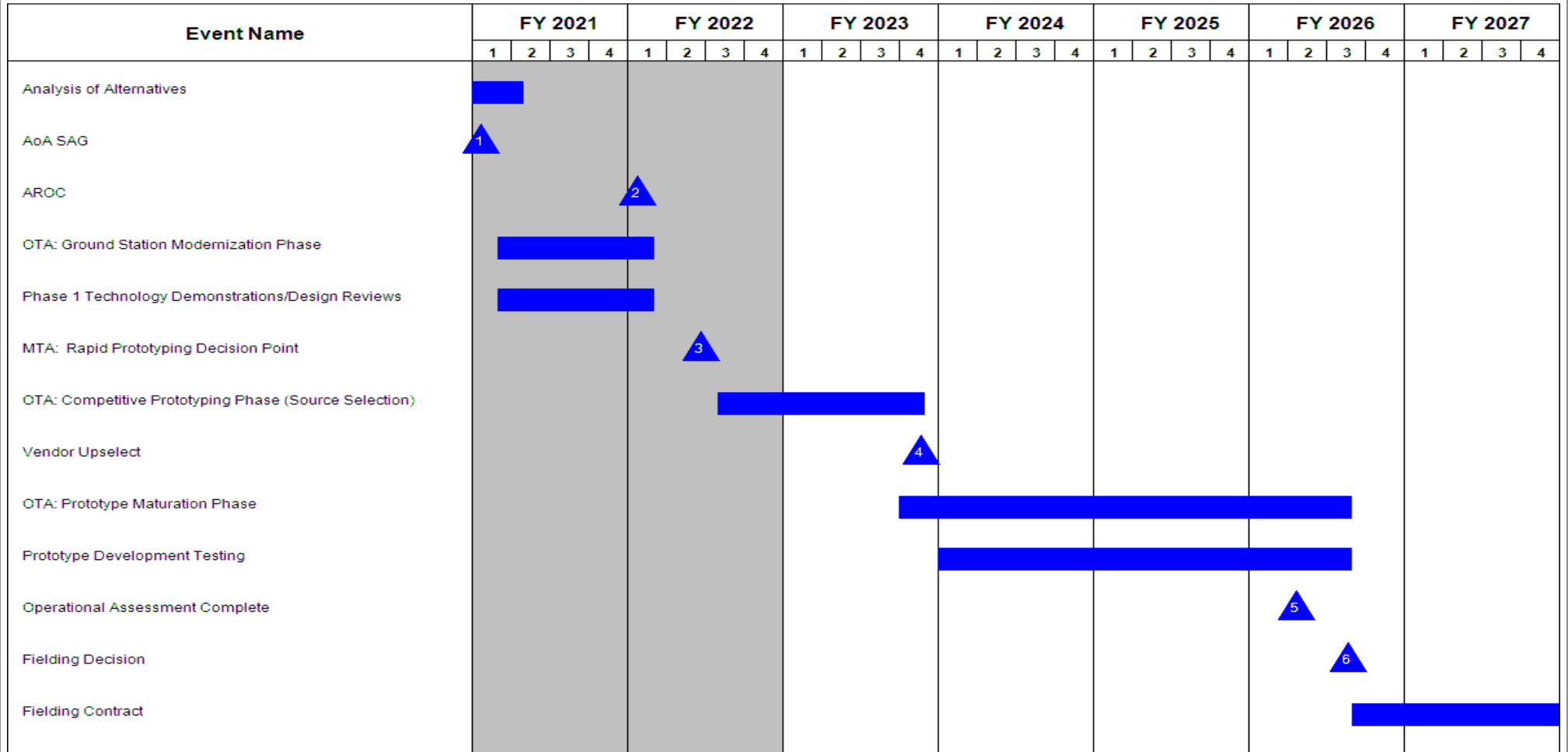
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development and Prototyping of Critical Automated Processing Technologies	C/FP	Contractor (Pending Selection) : Various: APG, Ft. Bragg, JBLM, YPG, CTR FAC (TBD)	-	-		12.626	Nov 2021	0.550	Jan 2023	-		0.550	Continuing	Continuing	Continuing
Subtotal			-	-		12.626		0.550		-		0.550	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			-	-	28.347	0.863	-	0.863	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>



UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>		Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>	

Event Name	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
Follow-on OTA Contract for future prototyping																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604037A / <i>Tactical Intel Targeting Access Node (TITAN) Adv Dev</i>	Project (Number/Name) BY4 / <i>Tactical Intelligence Targeting Access Node</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDD	2	2020	2	2020
Analysis of Alternatives	3	2020	1	2021
AoA SAG	1	2021	1	2021
AROC	1	2022	1	2022
OTA: Ground Station Modernization Phase	1	2021	1	2022
Phase 1 Technology Demonstrations/Design Reviews	1	2021	1	2022
MTA: Rapid Prototyping Decision Point	2	2022	2	2022
OTA: Competitive Prototyping Phase (Source Selection)	3	2022	4	2023
Vendor Upselect	4	2023	4	2023
OTA: Prototype Maturation Phase	4	2023	3	2026
Prototype Development Testing	1	2024	3	2026
Operational Assessment Complete	2	2026	2	2026
Fielding Decision	3	2026	3	2026
Fielding Contract	3	2026	4	2027
Follow-on OTA Contract for future prototyping	3	2026	4	2027

Note

Schedule Detail notes.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>
---	---

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	-	9.714	10.091	10.659	-	10.659	11.046	11.148	11.152	11.261	0.000	75.071
EC7: <i>Analysis Of Alternatives</i>	-	9.714	10.091	10.659	-	10.659	11.046	11.148	11.152	11.261	0.000	75.071

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funding for analytical support of Analysis of Alternatives. Analyses of Alternatives are statutory requirements for Major Defense Acquisition Programs and regulatory for all other programs. Based on Department of Defense Instruction (DoDI) 5000.02, Analyses of Alternatives are required to be completed for a new start program prior to its first Milestone Decision. The PE provides analytical capability for Pre-Milestone A programs that emerge outside the normal budget or POM cycles. Normally these programs are without program managers and require analysis to support Congressional, Defense and Army Senior Leader's requirement and acquisition needs and priorities. The Analyses of Alternatives support the preparation of the Capability Development Document, Key Performance Parameters and Thresholds values and tradeoff analysis. The cited work is consistent with the Army Futures Command Science and Technology priority focus areas and the Army Modernization Strategy and Guidance. Work in this PE is performed by analytical agencies such as The Research and Analysis Center and Data and Analysis Center. The Army is projecting to start work on multiple Analyses of Alternatives beginning in Fiscal Year (FY) 2022, and will assess and fund the highest Congressional, Defense and Army Senior Leader's priorities during the year of execution.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	9.714	10.091	0.000	-	0.000
Current President's Budget	9.714	10.091	10.659	-	10.659
Total Adjustments	0.000	0.000	10.659	-	10.659
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	10.659	-	10.659

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>				Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>			
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
EC7: <i>Analysis Of Alternatives</i>	-	9.714	10.091	10.659	-	10.659	11.046	11.148	11.152	11.261	0.000	75.071
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funding for analytical support of Analysis of Alternatives. Analyses of Alternatives are statutory requirements for Major Defense Acquisition Programs and regulatory for all other programs. Based on Department of Defense Instruction (DoDI) 5000.02, Analyses of Alternatives are required to be completed for a new start program prior to its first Milestone Decision. The PE provides analytical capability for Pre-Milestone A programs that emerge outside the normal budget or POM cycles. Normally these programs are without program managers and require analysis to support Congressional, Defense and Army Senior Leader's requirement and acquisition needs and priorities. The Analyses of Alternatives support the preparation of the Capability Development Document, Key Performance Parameters and Thresholds values and tradeoff analysis. The cited work is consistent with the Army Futures Command Science and Technology priority focus areas and the Army Modernization Strategy and Guidance. Work in this PE is performed by analytical agencies such as The Research and Analysis Center and Data and Analysis Center. The Army is projecting to start work on multiple Analyses of Alternatives beginning in Fiscal Year (FY) 2023, and will assess and fund the highest Congressional, Defense and Army Senior Leader's priorities during the year of execution.

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

	FY 2021	FY 2022	FY 2023
Title: Analysis of Alternatives	9.714	9.723	10.659
Description: This Project provides funding for analytical support for efforts such as: Common Tactical Truck, Ship to Shore Logistics Vessel, and Counter-small Unmanned Aircraft Systems. In addition, several Analyses of Alternatives started in FY 2022 will continue to require analysis funding into FY 2023, to include Long Range Precision Munition, Directed Energy Maneuver-Short Range Air Defense, Vehicle Protection Systems, and Project Convergence.			
FY 2022 Plans: FY 2022 funding supports analysis for new start programs that do not yet have a program manager assigned and to augment program manager funds where requirement decisions drive changes in scope or increased fidelity to achieve Congressional, Defense and Army Senior Leader's priority intent and interest. The analysis initiation, scope, and fidelity are determined in accordance with the U.S. Army Futures Command processes prior to the Materiel Development Decision and synchronized to support Joint and Army Requirement Oversight Councils (JROC and AROC) and Acquisition Executive/Program decisions.			
FY 2023 Plans: FY 2023 funding continues to supports the analysis for new start programs that do not yet have a program manager assigned and to augment program manager funds where requirement decisions drive changes in scope or increased fidelity to achieve Congressional, Defense and Army Senior Leader's priority intent and interest. The analysis initiation, scope, and fidelity are			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>	Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
determined in accordance with the U.S. Army Futures Command processes prior to the Materiel Development Decision and synchronized to support JROC, AROC and Acquisition Executive/Program decisions.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY23 increase reflects a standard cost increase due to economic assumptions and inflation			
<i>Title:</i> FY22 SBIR/STTR Transfer <i>Description:</i> Funding transferred in accordance with Title 15 USC ?638	-	0.368	-
<i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC ?638 <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	9.714	10.091	10.659

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

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604100A / Analysis Of Alternatives	Project (Number/Name) EC7 / Analysis Of Alternatives
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.368	Mar 2022	-		-		-	0.000	0.368	-
Subtotal			-	-		0.368		-		-		-	0.000	0.368	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	0.357	-		-		-		-		-	0.000	0.357	-
Subtotal			0.357	-		-		-		-		-	0.000	0.357	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering (Analysis of Alternative)	MIPR	TRADOC Analysis Center : Fort Leavenworth, KS	9.026	-		-		-		-		-	0.000	9.026	-
System Engineering (Analysis of Alternative)	MIPR	Army Materiel Systems Analysis Activity : Aberdeen Proving Ground, MD	7.320	-		-		-		-		-	0.000	7.320	-
Analytical Support for Analyses of Alternatives	MIPR	TBD : TBD	33.383	9.714		9.723		10.659		-		10.659	0.000	63.479	-
Subtotal			49.729	9.714		9.723		10.659		-		10.659	0.000	79.825	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		50.086	9.714	10.091	10.659	-	10.659	0.000	80.550	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>	Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>
--	---	---

Event Name	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
Identify Candidates for FY21 AoA funding																												
Issue FY 21 AoA Funding																												
Identify Candidates for FY22 AoA funding																												
Issue FY 22 AoA Funding																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>	Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Identify Candidates for FY19 AoA funding	4	2018	3	2019
Issue FY19 AoA Funding	1	2020	4	2020
Identify Candidates for FY20 AoA funding	4	2019	3	2020
Issue FY 20 AoA Funding	1	2020	4	2020
Identify Candidates for FY21 AoA funding	4	2020	3	2021
Issue FY 21 AoA Funding	1	2021	4	2021
Identify Candidates for FY22 AoA funding	4	2021	3	2022
Issue FY 22 AoA Funding	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>
---	---

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	-	1.328	0.926	1.425	-	1.425	1.801	1.832	1.833	1.851	Continuing	Continuing
BR6: <i>Small Unmanned Aircraft System (6.4)</i>	-	1.328	0.926	1.425	-	1.425	1.801	1.832	1.833	1.851	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Rucksack Portable Unmanned Aircraft System (RPUAS) Family of Small Unmanned Aircraft System (FoSUAS) provides battalion and below ground maneuver elements with critical situational awareness and enhanced force protection. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

The RPUAS FoSUAS provides the battalion and below ground maneuver elements with an organic, on-demand, asset to develop situational awareness, enhance force protection, and secure routes, points, and areas. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. The RPUAS FoSUAS includes a combination of three separate hand-launched mission specific configurable aircraft that do not require an improved launch/recovery. The three separate mission specific configurable Unmanned Aircraft (UA) are the Short Range Reconnaissance (SRR), the Medium Range Reconnaissance (MRR), and the Long Range Reconnaissance (LRR). In addition to the aircraft, the system contains ground control equipment, which includes an interoperable handheld ground control station (H-GCS) which incorporates the Tactical Open Government Owned Architecture (TOGA). The FoSUAS mission specific capability for MRR will utilize existing RQ-11 systems. The SRR capability will utilize the upcoming RQ-28A SRR. The LRR capability is under development.

The total cost of the Short Range Reconnaissance (SRR) Middle Tier of Acquisition effort is \$34.20 million of RDT&E on from FY20 to FY24. The remainder of the SRR program is fully funded across the Future Years Defense Program.

Justification: FY 2023 Research, Development, Test, and Evaluation (RDT&E) Base funding of \$1.425 million to meet Capabilities Production Document (CPD) Increment II Block II related requirements. Specifically, to conduct advanced component development activities for SRR prototype systems in high fidelity and realistic operating environments.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	1.328	0.926	0.000	-	0.000
Current President's Budget	1.328	0.926	1.425	-	1.425
Total Adjustments	0.000	0.000	1.425	-	1.425
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	1.425	-	1.425

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>				Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>			
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
BR6: <i>Small Unmanned Aircraft System (6.4)</i>	-	1.328	0.926	1.425	-	1.425	1.801	1.832	1.833	1.851	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Family of Small Unmanned Aircraft System (FoSUAS) provides battalion and below ground maneuver elements with critical situational awareness and enhanced force protection. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. Other compatible receivers, such as the One System Remote Video Terminal and appropriately equipped manned platforms may also receive the FoSUAS products.

The Rucksack Portable Unmanned Aircraft Systems (RPUAS) FoSUAS provides the battalion and below ground maneuver elements with an organic, on-demand, asset to develop situational awareness, enhance force protection, and secure routes, points, and areas. The system provides the small unit commander an organic and responsive reconnaissance and targeting capability with real-time Full Motion Video and sensor data. The RPUAS FoSUAS includes a combination of three separate hand-launched mission specific configurable aircraft that do not require an improved launch/recovery. The three separate mission specific configurable Unmanned Aircraft (UA) are the Short Range Reconnaissance (SRR), the Medium Range Reconnaissance (MRR), and the Long Range Reconnaissance (LRR). In addition to the aircraft, the system contains ground control equipment, which includes an interoperable handheld ground control station (H-GCS) which incorporates the Tactical Open Government Owned Architecture (TOGA). The FoSUAS mission specific capability for MRR will utilize existing RQ-11 systems. The SRR capability will utilize the upcoming RQ-28A SRR. The LRR capability is under development.

The total cost of the Short Range Reconnaissance (SRR) Middle Tier of Acquisition effort is \$34.20 million of RDT&E on from FY20 to FY24. The remainder of the SRR program is fully funded across the Future Years Defense Program.

Justification: FY 2023 Research, Development, Test, and Evaluation (RDT&E) Base funding of \$1.425 million to meet Capabilities Production Document (CPD) Increment II Block II related requirements. Specifically, to conduct advanced component development activities for SRR prototype systems in high fidelity and realistic operating environments.

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

	FY 2021	FY 2022	FY 2023
Title: Component Development and Integration	0.542	0.400	0.616
Description: Engineering to develop and to integrate new, advanced components into SRR.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>	Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Advanced component development efforts for SRR. FY 2023 Plans: Advanced component development efforts for SRR. FY 2022 to FY 2023 Increase/Decrease Statement: Increase due to additional effort to complete integration with Tranche 2 SRR				
Title: System Engineering Program Management Description: System Engineering Program Management support during development and integration of components for SRR air vehicles. FY 2022 Plans: System Engineering and Program Management support of advanced component development activities for SRR. FY 2023 Plans: System Engineering and Program Management support of advanced component development activities for SRR. FY 2022 to FY 2023 Increase/Decrease Statement: Increase due to efforts to complete integration and testing of components for Tranche 2 SRR		0.136	0.069	0.106
Title: System Test and Evaluation Description: Testing to Evaluate components for the SRR air vehicle. FY 2022 Plans: Integration, test, and evaluation of advanced components for the SRR system. FY 2023 Plans: Integration, test, and evaluation of advanced components for the SRR system. FY 2022 to FY 2023 Increase/Decrease Statement: Increase due to evaluation efforts for components for Tranche 2 SRR.		0.650	0.423	0.703
Title: FY22 SIBR/STTR Transfer FY 2022 Plans: SIBR/STTR Transfer from the FY22 Enactment. FY 2022 to FY 2023 Increase/Decrease Statement:		-	0.034	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>	Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
SBIR/STTR amount in accordance with Title 15 USC 638.			
Accomplishments/Planned Programs Subtotals	1.328	0.926	1.425

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
• BR7: <i>Small Unmanned Aircraft System (6.5)</i>	5.780	2.275	6.530	-	6.530	9.254	3.097	3.098	3.129	Continuing	Continuing
• A00010: <i>SMALL UNMANNED AIRCRAFT SYSTEM</i>	16.551	16.005	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• A12511: <i>SHORT RANGE RECONNAISSANCE</i>	-	-	10.598	-	10.598	20.666	20.817	20.917	20.816	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>	Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering Program Management	Various	Various : Various	-	0.136		0.069		0.106	Oct 2022	-		0.106	Continuing	Continuing	Continuing
SIBR/STTR Transfer	TBD	TBD : TBD	-	-		0.034	Apr 2022	-		-		-	0.000	0.034	-
Subtotal			-	0.136		0.103		0.106		-		0.106	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Component development and Integration	Various	ACC Redstone : Redstone Arsenal	-	0.542	Jun 2021	0.400	Jun 2022	0.616	Feb 2023	-		0.616	Continuing	Continuing	Continuing
Subtotal			-	0.542		0.400		0.616		-		0.616	Continuing	Continuing	N/A

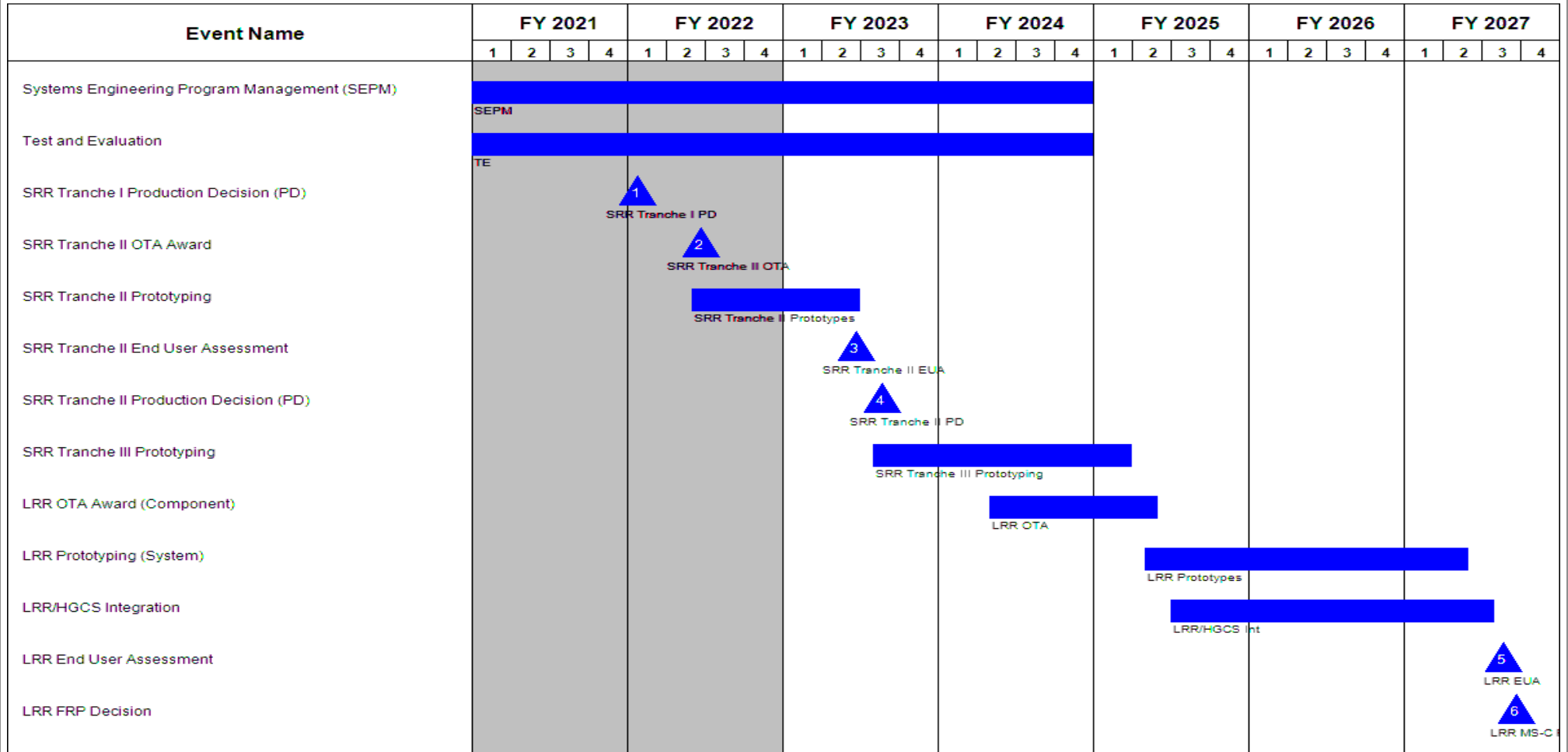
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Test and Evaluation	Various	ACC Redstone : Redstone Arsenal	-	0.650	Aug 2021	0.423	Aug 2022	0.703	Aug 2023	-		0.703	Continuing	Continuing	Continuing
Subtotal			-	0.650		0.423		0.703		-		0.703	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			-	1.328	0.926	1.425	-	1.425	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>	Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604101A / <i>Small Unmanned Aerial Vehicle (SUAV) (6.4)</i>	Project (Number/Name) BR6 / <i>Small Unmanned Aircraft System (6.4)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Tactical Open Government Owned Architecture Development	4	2014	4	2014
Tactical Open Government Architecture Test Event 2	3	2015	3	2015
Systems Engineering Program Management (SEPM)	2	2018	4	2024
SRR Tranche I OTA Award	3	2019	3	2019
SRR Tranche I Prototyping	3	2018	4	2019
Test and Evaluation	4	2018	4	2024
SRR/HGCS Integration	2	2018	4	2020
SRR Tranche I End User Assessment	4	2020	4	2020
SRR Tranche I Production Decision (PD)	1	2022	1	2022
SRR Tranche II OTA Award	2	2022	2	2022
SRR Tranche II Prototyping	2	2022	2	2023
SRR Tranche II End User Assessment	2	2023	2	2023
SRR Tranche II Production Decision (PD)	3	2023	3	2023
SRR Tranche III Prototyping	3	2023	1	2025
LRR OTA Award (Component)	2	2024	2	2025
LRR Prototyping (System)	2	2025	2	2027
LRR/HGCS Integration	3	2025	3	2027
LRR End User Assessment	3	2027	3	2027
LRR FRP Decision	3	2027	3	2027

Note
Schedule events shown prior to Fiscal Year (FY) 2021 are for informational purposes only.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>
---	---

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	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing
EX8: <i>Future Unmanned Aircraft System (FUAS)</i>	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Future Unmanned Aircraft System (FUAS) is a critical system in the Multi-Domain Operations (MDO) concept that will employ MDO capabilities at all echelons and allow ground based forces to project power from land into other domains to defeat highly capable enemies, secure terrain, and consolidate gains. FUAS encompasses an array of capabilities from platoon soldiers to Division Commanders. The Army Requirements Oversight Council (AROC) approved the FUAS Initial Capabilities Document (ICD) on 6 Mar 2019. The FUAS ICD includes requirements for Future Tactical UAS (FTUAS), Air Launched Effects (ALE), and Scalable Control Interface (SCI). Manned, optionally-manned, and unmanned systems will penetrate defense-in-depth environments by employing ALE with teaming and swarming effects to detect, decoy, jam radar and communications, conduct cyber-attack, spoof and jam Global Positioning System (GPS), and kinetic engagement.

The Future Vertical Lift Cross Functional Team (FVL CFT) FUAS line of effort is comprised of multiple components including the FTUAS for the Brigade Combat Team (BCT), and ALE. The FTUAS seeks to replace the RQ-7Bv2 Shadow assets within the BCTs. Key attributes of the FTUAS BCT focus on Rapid Deployability, Expeditionary Maneuver, and Mobility for adaptive and agile operations. FTUAS will consist of an aircraft subsystem that will include the airframe, propulsion, avionics, communications, navigation, and software systems; aircraft-specific ground support equipment including power generation, transportation, or command and control equipment; aircraft software; and required engineering, logistics, programmatic support.

ALE extends tactical and operational reach, lethality, and protection to the advanced team as an attritable or optionally recoverable aerial capability that detects, identifies, locates, and reports threats; represents a credible decoy; disrupts threat communication, targeting and acquisition systems; and delivers lethal and non-lethal effects against those threats across Multi-Domain Operations.

Justification: Fiscal Year (FY) 2023 FTUAS Research Development Technology & Evaluation (RDT&E) Base funding of \$95.719 million will be utilized for the following:

- 1) \$40.372 million to support FTUAS component development,
- 2) \$20.587 million to initiate FTUAS competitive prototyping and integration efforts,
- 3) \$30.477 million to support ALE Systems Integration,
- 4) \$4.283 million provides Systems Engineering and Program Management (SEPM) to support FTUAS

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	57.083	69.697	0.000	-	0.000
Current President's Budget	59.183	76.349	95.719	-	95.719
Total Adjustments	2.100	6.652	95.719	-	95.719
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.348			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.100	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	95.719	-	95.719

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

Project: EX8: *Future Unmanned Aircraft System (FUAS)*

Congressional Add: *Program Increase- Future Unmanned Aircraft Systems*

Congressional Add: *Program Increase- Micro-IFF for FTUAS*

Congressional Add Subtotals for Project: EX8

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	-	15.000
	-	5.000
Congressional Add Subtotals for Project: EX8	-	20.000
Congressional Add Totals for all Projects	-	20.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>				Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>			
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
EX8: <i>Future Unmanned Aircraft System (FUAS)</i>	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Future Unmanned Aircraft System (FUAS) is a critical system in the Multi-Domain Operations (MDO) concept that will employ MDO capabilities at all echelons and allow ground based forces to project power from land into other domains to defeat highly capable enemies, secure terrain, and consolidate gains. FUAS encompasses an array of capabilities from platoon soldiers to Division Commanders. The Army Requirements Oversight Council (AROC) approved the FUAS Initial Capabilities Document (ICD) on 6 Mar 2019. The FUAS ICD includes requirements for Future Tactical UAS (FTUAS), Air Launched Effects (ALE), and Scalable Control Interface (SCI). Manned, optionally-manned, and unmanned systems will penetrate defense-in-depth environments by employing ALE with teaming and swarming effects to detect, decoy, jam radar and communications, conduct cyber-attack, spoof and jam Global Positioning System (GPS), and kinetic engagement.

The Future Vertical Lift Cross Functional Team (FVL CFT) FUAS line of effort is comprised of multiple components including the FTUAS for the Brigade Combat Team (BCT), and ALE. The FTUAS seeks to replace the RQ-7Bv2 Shadow assets within the BCTs. Key attributes of the FTUAS BCT focus on Rapid Deployability, Expeditionary Maneuver, and Mobility for adaptive and agile operations. FTUAS will consist of an aircraft subsystem that will include the airframe, propulsion, avionics, communications, navigation, and software systems; aircraft-specific ground support equipment including power generation, transportation, or command and control equipment; aircraft software; and required engineering, logistics, programmatic support.

ALE extends tactical and operational reach, lethality, and protection to the advanced team as an attritable or optionally recoverable aerial capability that detects, identifies, locates, and reports threats; represents a credible decoy; disrupts threat communication, targeting and acquisition systems; and delivers lethal and non-lethal effects against those threats across Multi-Domain Operations.

Justification: Fiscal Year (FY) 2023 FTUAS Research Development Technology & Evaluation (RDT&E) Base funding of \$95.719 million will be utilized for the following:

- 1) \$60.959 million to support FTUAS component development and competitive prototyping and integration efforts,
- 2) \$30.477 million to support ALE Systems Integration,
- 3) \$4.283 million provides Systems Engineering and Program Management (SEPM) to support FTUAS

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

	FY 2021	FY 2022	FY 2023
Title: Air Launched Effects (ALE) Systems Analysis	22.100	20.000	30.477
Description: ALE Systems Analysis, Tech Maturation, and Integration in preparation for a Materiel Development Decision (MDD), and to inform requirements. The PM will conduct market research, systems engineering analyses and an assessment of how the			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>proposed candidate materiel solution approaches are technically feasible and have the potential to effectively address capability gaps, desired operational attributes, and associated external dependencies. This will be followed by System Integration of the Prototype ALE and integration of the system onto a host launch platform.</p> <p>FY 2022 Plans: Continue to fund the ALE Prototype (Increment 1A) demonstrations, engineering analysis, prototyping and begin integration of proposed material solution approaches in support of host platform. Continue to support the development of the Modular Open Systems Architecture and SCI required for ALE.</p> <p>FY 2023 Plans: Continue to fund the ALE Prototype (Increment 1A) demonstrations, engineering analysis, prototyping and continue integration of proposed material solution approaches in support of host platform integration. Fund integration of prototype ALE onto launch platform and fund required testing in support of platform integration. Continue to support the development of the Modular Open Systems Architecture and SCI required for ALE.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Transition to host launch platform integration will increase costs due to an associated increase in launch platform coordination and integration and associated required testing in support of the integration.</p>				
<p>Title: System Engineering/Program Management</p> <p>Description: SEPM</p> <p>FY 2022 Plans: Funding to continue SEPM to support FUAS milestone decision requirements and program execution.</p> <p>FY 2023 Plans: Funding to continue SEPM to support FTUAS milestone decision requirements and program execution.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Development and testing efforts increase in FY23 resulting in increased manpower.</p>		3.325	1.500	4.283
<p>Title: Future Tactical Unmanned Aircraft System (FTUAS)</p> <p>Description: The FTUAS will be a runway independent Group 3 unmanned aircraft that provides the Brigade Combat Teams with expeditionary, intelligence, surveillance, and reconnaissance (ISR) with improved target location and designation.</p> <p>FY 2022 Plans:</p>		33.758	34.849	60.959

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funds the award of competitive prototypes and continues to fund the development / integration of required FTUAS components (Artificial Intelligence, Miniaturized Mode 5/S IFF, Scalable Control Interface (SCI), Communications Relay Payloads).			
FY 2023 Plans: Continues to fund competitive prototypes, development / integration, and test of required FTUAS components (Artificial Intelligence, Miniaturized Mode 5/S IFF, Scalable Control Interface (SCI), Communications Relay Payloads) and systems.			
FY 2022 to FY 2023 Increase/Decrease Statement: Competitive prototype effort with multiple vendors will award late FY22 and ramp up significantly in FY23.			
Accomplishments/Planned Programs Subtotals	59.183	56.349	95.719

	FY 2021	FY 2022
Congressional Add: Program Increase- Future Unmanned Aircraft Systems	-	15.000
FY 2022 Plans: Continues to funds the award of competitive prototypes and development / integration of required FTUAS components.		
Congressional Add: Program Increase- Micro-IFF for FTUAS	-	5.000
FY 2022 Plans: Micro Identify Friend/Foe (Micro-IFF) adds new capabilities to the existing model ZPX-C capability.		
Congressional Adds Subtotals	-	20.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• A01311: <i>Future Tactical Unmanned Aircraft System (TUAS)</i>	1.100	-	0.000	-	0.000	56.750	92.670	126.854	126.391	0.000	403.765
• A00511: <i>Air Launched Effects</i>	-	-	0.000	-	0.000	24.178	40.440	102.821	102.446	Continuing	Continuing

Remarks

D. Acquisition Strategy
The Aviation Platform - Requirements Development Division (AP-RDD) prepared an Initial Capabilities Document (ICD) that was approved by the AROC on 6 Mar 2019.

The FVL CFT oversaw a demonstration effort in FY 2019 - 2021 that informed the FTUAS requirement to develop capability that will ultimately replace the RQ-7Bv2 Shadow TUAS within the BCT formation. The 12-month demonstration included 20 Soldier touchpoints (new equipment training, field training exercises, and Combat

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>
<p>Training Center rotations) across five BCTs and included the training of 61 operators and 56 maintainers. The demonstration resulted in over 1,500 flight hours across more than 500 separate flights to inform the FTUAS Abbreviated Capability Development Document (A-CDD) which was approved by the AROC in 4QFY2021. As part of the program development, the program will request Middle Tier Acquisition authority in 3QFY2022 to conduct Rapid Prototyping.</p> <p>AP-RDD - Prepared ALE Initial Capability Refinement Document (ICRD) that was approved by GEN John M. Murray, CG, AFC on 21 Oct 2019.</p> <p>The plan to acquire ALE is through an incremental approach that allows rapid prototyping and fielding of technology to field available capabilities while continuing S&T efforts to mature and transition emerging technologies to fully realize required capabilities. This is accomplished through multiple prototype development activities for the air vehicle, payloads, and mission system architecture through, experiments, simulations, and demonstrations conducted in parallel and/or sequential timelines. The objective of this incremental effort is to develop and exhibit multiple ALE prototypes to enable a rapid transition from prototype to operational implementation in the force.</p> <p>The ALE Prototyping effort will be a COTS/GOTS system to enable technology maturation, systems integration, and potential initial capabilities. The ALE program of record will be purpose built utilizing parallel efforts informed by S&T investments and information learned from the demonstration and testing of the ALE Prototyping effort. Additional increments will leverage the mission system architecture, payload technologies and interfaces from the initial increment and seek to extend the range of ALE for missions in support of LRPF.</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
2040 / 4				PE 0604113A / Future Tactical Unmanned Aircraft System (FTUAS)					EX8 / Future Unmanned Aircraft System (FUAS)						
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management (SEPM)	Various	PM TUAS : Redstone Arsenal	4.259	3.325		1.500		4.283	Dec 2022	-		4.283	Continuing	Continuing	-
Subtotal			4.259	3.325		1.500		4.283		-		4.283	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Launched Effects (ALE) Systems Analysis	Various	PM TUAS : Redstone Arsenal	20.000	22.100		20.000		30.477	Nov 2022	-		30.477	Continuing	Continuing	-
Future Tactical Unmanned Aircraft System (FTUAS)	Various	PM TUAS : Redstone Arsenal	-	33.758		54.849		60.959	Oct 2022	-		60.959	Continuing	Continuing	-
Subtotal			20.000	55.858		74.849		91.436		-		91.436	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi Domain Task Force (MDTF) UAS Demonstration	Various	Various : Various	28.879	-		-		-		-		-	0.000	28.879	-
Subtotal			28.879	-		-		-		-		-	0.000	28.879	N/A
Project Cost Totals			53.138	59.183		76.349		95.719		-		95.719	Continuing	Continuing	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Event Name	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
FTUAS System Engineering/Program Management (SEPM)	[Blue bar]																											
FTUAS Demo	[Blue bar]				[Grey bar]																							
FTUAS CDD AROC					▲ 2 FTUAS CDD AROC																							
FTUAS MTA					▲ 4 FTUAS MTA																							
FTUAS CP													[Blue bar]															
FTUAS PV																	[Blue bar]											
FTUAS Op Eval																	▲ 8 FTUAS Op Eval											
FTUAS RFD																	▲ 7 FTUAS RFD											
FTUAS FRP																					[Blue bar]							
ALE TA	[Blue bar]																											
ALE MV Demo	[Blue bar]				[Grey bar]																							
ALE RFI 2	▲ 1 ALE RFI 2																											
ALE OTA 2					▲ 3 ALE OTA 2																							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Event Name	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								
ALE System Integration					[Redacted]																															
ALE Small Rapid Fielding MTA Decision Point					ALE SI												5 ▲ ALE RF MTA DP																			
ALE RFP																	6 ▲ ALE RFP																			
ALE Milestone B																					9 ▲ ALE MS B															
ALE Engineering and Manufacturing Development																					[Redacted]															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	Project (Number/Name) EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTUAS Multi Domain Task Force Demonstration (MDTF)	1	2019	4	2020
FTUAS System Engineering/Program Management (SEPM)	1	2019	4	2025
FTUAS Demonstration (APA Funded)	3	2020	2	2021
FTUAS A- CDD AROC	4	2021	4	2021
FTUAS Middle Tier Acquisition (MTA) Decision FTUAS	3	2022	3	2022
FTUAS Competitive Prototyping	1	2023	1	2025
FTUAS Production Validation	1	2025	4	2025
FTUAS Operational Evaluation	3	2025	3	2025
FTUAS MTA Rapid Fielding Decision	2	2025	2	2025
FTUAS Full Rate Production	2	2026	4	2032
ALE RFI	2	2019	2	2019
ALE A-CDD AROC	3	2020	3	2020
ALE OTA 1	4	2020	4	2020
ALE Technical Assessment	4	2020	4	2022
ALE Multi-Vendor Demonstrations	4	2020	4	2021
ALE RFI 2	2	2021	2	2021
ALE OTA 2 Award	2	2022	2	2022
ALE System Integration	2	2022	2	2024
ALE Small Rapid Fielding MTA Decision Point	3	2024	3	2024
ALE RFP	4	2024	4	2024
ALE Milestone B	3	2025	3	2025
ALE Engineering and Manufacturing Development	3	2025	3	2028

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604114A / <i>Lower Tier Air Missile Defense (LTAMD) Sensor</i>
---	--

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	-	308.805	297.629	382.147	-	382.147	89.187	89.984	90.002	90.874	Continuing	Continuing
EX2: <i>Lower Tier Air Missile Defense (LTAMD) Capability</i>	-	308.805	297.629	382.147	-	382.147	89.187	89.984	90.002	90.874	Continuing	Continuing

Note

LTAMDS 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.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority. Lower Tier Air Missile Defense Sensor (LTAMDS) program will provide the required sensing capabilities, surveillance and fire control in the lower tier portion of the Army Integrated Air and Missile Defense (IAMD) of the ballistic missile defense battlespace. The acquisition program competitively selected the LTAMDS prime vendor in 1st Quarter (Q) Fiscal Year (FY) 2020 to build six Prototype sensors under the authority of Section 804 Rapid Prototyping. The sensor/radar set (RS) replaces the baseline PATRIOT RS (AN/MPQ-65A) in an IBCS enabled PATRIOT Battalion mitigating the risk associated with threat changes while also addressing growing obsolescence and increasing Operational & Support (O&S) cost. The LTAMDS capability addresses critical capability gaps, modernizes technology, and increases reliability and maintainability. The LTAMDS capability increases sensor/radar performance to maximize the inherent PATRIOT Advanced Capability (PAC-3) Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats.

LTAMDS will provide 4 prototype sensors under Urgent Materiel Release (UMR) in FY23. Pre-Planned Product Improvement (P3I) efforts will bridge known capability gaps leading to an Initial Operational Test and Evaluation (IOT&E) in FY26 and Full Rate Production in FY27. FY2023 UMR tasks include acquiring remaining targets for testing, completing Contractor Verification Test, Developmental Test and Evaluation, and Operational Assessment. P3I tasks include acquiring up to two P3I prototypes, targets for testing, and additional capability development. Other FY2023 tasks include Large Tactical Power System (LTPS) development and integration activities with the Integrated Air and Missile Defense Battle Command System (IBCS) and PATRIOT family of interceptors (PAC-2 GEM-T, PAC-3, PAC-3 MSE) in support of Integrated Fires and Multi-domain Operations.

The total cost of the LTAMDS Middle Tier of Acquisition effort is \$1,524.8 million RDT&E from FY19 to FY24.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604114A / <i>Lower Tier Air Missile Defense (LTAMD) Sensor</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	308.805	327.690	0.000	-	0.000
Current President's Budget	308.805	297.629	382.147	-	382.147
Total Adjustments	0.000	-30.061	382.147	-	382.147
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-30.061			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	382.147	-	382.147

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor				Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability			
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
EX2: Lower Tier Air Missile Defense (LTAMD) Capability	-	308.805	297.629	382.147	-	382.147	89.187	89.984	90.002	90.874	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Lower Tier Air and Missile Defense Sensor (LTAMDS) satisfies the Warfighter's capability requirements in the Integrated Air and Missile Defense domain. The program provides the required sensing capabilities in the lower tier portion of the air and missile defense battlespace and expands the battlespace for the PATRIOT Advanced Capability (PAC-3) Missile Segment Enhancement (MSE) interceptor, and will be upgradable for the Future Interceptor. The Army Requirements Oversight Council (AROC) approved LTAMDS requirements in April 2016. The Army competitively selected the LTAMDS, which will counter air and missile defense threats using state-of-the-art technology, while reducing operating and sustainment costs, mitigating obsolescence, and increasing reliability and maintainability .

LTAMDS will provide 4 prototype sensors under Urgent Materiel Release (UMR) in FY23. Pre-Planned Product Improvement (P3I) efforts will bridge known capability gaps leading to an Initial Operational Test and Evaluation (IOT&E) in FY26 and Full Rate Production in FY27. LTAMDS Fiscal Year (FY) FY2023 funding for UMR include acquiring remaining targets for testing, completing Contractor Verification Test, Developmental Test and Evaluation, and Operational Assessment. P3I tasks include acquiring up to two P3I prototypes, targets for testing, and additional capability development such as non-cooperative target recognition and electronic protect. Other FY2023 tasks include Large Tactical Power System (LTPS) development and integration activities with the Integrated Air and Missile Defense Battle Command System (IBCS) and PATRIOT family of interceptors (PAC-2 GEM-T, PAC-3, PAC-3 MSE) in support of Integrated Fires and Multi-domain Operations.

The total cost of the LTAMDS Middle Tier of Acquisition effort is \$1,524.8 million RDT&E from FY19 to 1QFY24.

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

	FY 2021	FY 2022	FY 2023
Title: Lower Tier Missile Defense Sensor	308.805	286.766	382.147
Description: Provides the required sensing capabilities in the lower tier portion of the air and missile defense battlespace and expands the battlespace for the PAC-3 MSE interceptor.			
FY 2022 Plans:			
- Continue LTAMDS Urgent Materiel Release (UMR) Prototypes			
- Conduct Developmental Test and Evaluation			
- Conduct Qualification testing			
- Initiate development of P3I sensors			
- Acquire targets and interceptors for P3I testing			
- Continue integration with IAMD Battle Command System (IBCS)			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Continue integration with PATRIOT family of interceptors (PAC-2 GEM-T, PAC-3, PAC-3 MSE) <p>FY 2023 Plans:</p> <p>UMR</p> <ul style="list-style-type: none"> - Provide four prototypes under UMR - Complete prototype Developmental Test and Evaluation - Complete Operational Demonstration - Complete Operation Assessment <p>P3I</p> <ul style="list-style-type: none"> - Buildup of P3I Test Assets to support DT/OT and IOTE - Software Development Activities to include Non-Cooperative Target Recognition, Electronic Protection, and continue software development tasks with IBCS. - Activities needed to support a MS C decision in FY24 - Digital Modeling and Simulation activities - Support Large Tactical Power System (LTPS) development - Critical Design Review of P3I configuration <p>Integration</p> <ul style="list-style-type: none"> - Continue integration with IBCS - Continue integration with PATRIOT family of interceptors (PAC-2, GEM-T, PAC-3, PAC-3 MSE) - Continue Development and integration of Large Tactical Power System (LTPS) <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding to procure Production Representative Units to support DT/OT testing in FY25/FY26.</p>				
<p>Title: FY22 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638.</p> <p>FY 2022 Plans: FY22 SBIR/STTR \$10.863M transferred in accordance with Title 15 USC ?638.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY22 SBIR/STTR \$10.863M transferred in accordance with Title 15 USC ?638.</p>		-	10.863	-
Accomplishments/Planned Programs Subtotals		308.805	297.629	382.147

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• C12101: Lower Tier Air and Missile Defense Sensor	-	33.473	13.460	-	13.460	619.165	368.041	581.767	584.309	Continuing	Continuing

Remarks

D. Acquisition Strategy

To enhance the Warfighter's lethality, survivability, and combat effectiveness, the Army used full and open competitive processes within Other Transactions Authority (OTA) agreements for rapid prototyping, qualification, and initial fielding efforts to meet the intent of FY 2018 National Defense Authorization Act (NDAA) Congressional language. Middle Tier Acquisition (MTA) rapid prototyping approach (Section 804, FY 2016 NDAA) authorities were leveraged in conjunction with the OTA to facilitate and accelerate traditional defense contractor involvement, cost sharing arrangements, and accelerate schedules. A FedBizOpps (FBO) announcement and subsequent LTAMDS Industry Day generated government-contractor dialogue, provided contractor cost and schedule estimates, verified industry technology and manufacturing readiness, and informed stakeholders on design approaches and potential materiel solutions. This approach also provides senior leader decision points along the way to make informed decisions based on industry ability to meet threshold requirements. The Sense-Off conducted in 3rd Quarter (Q) FY 2019, along with industry proposals, enabled the selection of an LTAMDS single vendor with the subsequent award of the OTA Agreement in 1Q FY 2020.

The MTA LTAMDS program will produce six prototypes and conduct contractor and Government testing through 3Q FY 2023. An LTAMDS Operational Assessment will be conducted 3Q FY 2023 during an Army Integrated Air and Missile Defense (IAMD) Integrated Fires Test Campaign event. Upon successful prototype demonstration, four prototypes will be immediately provided under Urgent Materiel Release (UMR), which includes the 400kW Mobile Electric Power (MEP)-Power Unit (PU)-810 as an interim power source. The LTAMDS program will then transition from a MTA program to a Major Capabilities Acquisition (MCA) Program with entry at Milestone C in 1Q FY 2024.

The LTAMDS Pre-Planned Product Improvement (P3I) efforts will bridge known capability gaps in the UMR prototypes and will include necessary qualification testing to comply with Type Classification and Full Materiel Release requirements. In addition, development of the 500kW Large Tactical Power System (LTPS) begins with the release of the Request for Prototype Proposal in FY 2022. The LTPS is a critical component of the LTAMDS sensor, allowing LTAMDS to support the full kinematic range of the PAC-3 Missile Segment Enhancement (MSE) interceptor.

On 11 August 2020, the LTAMDS Long Term Power General Officer Steering Committee directed the Expeditionary Energy & Sustainment Systems (E2S2) Project Office to pursue a new Army standard generator that would meet LTAMDS power requirements. The Search, Track, Acquire, Radiate, Eliminate (STARE) Project Office partnered with the E2S2 Project Office to develop and deliver the LTPS during the LTAMDS Production and Deployment Phase. The E2S2 Project Office will release a Request for Prototype Proposal in 2Q FY 22. LTAMDS will provide approximately \$57M for Research, Development, Test and Evaluation (RDT&E) funding across FY 2022-2025 for LTPS development and testing. A two-vendor prototyping effort begins in FY 2023, producing eight prototypes to conduct developmental testing (DT) and operational testing (OT) sufficient to award the single-vendor production contract planned in FY 2025. The schedule outlines a two-vendor test-off and single-vendor down-select process resulting in prototype selection in 2Q FY 2024. LTAMDS will conduct a combined DT/OT event in FY 2025 to validate LTAMDS performance functionality using prototype LTPS as the threshold power source. The first four LTPSs are projected for delivery 1Q FY 2026 to support LTAMDS New Equipment Training, Collective Training, and Initial Operational Test & Evaluation (IOT&E). A Full Rate Production decision is anticipated in FY 2027, subsequent to the Full Materiel Release.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / <i>Lower Tier Air Missile Defense (LTAMD) Sensor</i>	Project (Number/Name) EX2 / <i>Lower Tier Air Missile Defense (LTAMD) Capability</i>
--	--	--

LTAMDS is a component of an integrated fires development effort that includes survivability, resiliency, and effectiveness improvements against advanced threats from near-peer adversaries. This effort includes integration with an evolving common fires mission command, common development tools and processes, and annual test and evaluation to provide data supporting program assessments and progress toward closure of performance gaps.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Program Management	MIPR	Various : Redstone Arsenal, AL	16.665	4.100	Oct 2020	4.250	Oct 2021	4.780	Oct 2022	-		4.780	Continuing	Continuing	-
Systems Engineering and Technical Assistance (SETA)	Various	Systems Engineering and Technical Assistance : Huntsville, AL	16.509	6.000	Oct 2020	7.500	Oct 2021	7.655	Oct 2022	-		7.655	Continuing	Continuing	-
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		10.863		-		-		-	0.000	10.863	-
Subtotal			33.174	10.100		22.613		12.435		-		12.435	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Concept Definition	C/CPFF	Raytheon, Lockheed Martin, Technovative Applications, Northrop Grumman : Andover MA; Liverpool NY; Brea CA; Linthicum MD	74.817	-		-		-		-		-	0.000	74.817	-
Product Development Support	C/Various	University Affiliated Research Center (UARC); MIT; The Federally Funded Research and Development Center (FFRDC) : Various	9.349	7.500	Oct 2020	12.500	Oct 2021	12.880	Oct 2022	-		12.880	Continuing	Continuing	-
OGA Development and Integration Activities	C/Various	Various : Various	-	-		34.319	Dec 2021	54.430	Dec 2022	-		54.430	Continuing	Continuing	-
Rapid Prototyping	C/FFP	Raytheon : Various	345.069	211.106	Feb 2021	103.461	Feb 2022	14.650	Feb 2023	-		14.650	Continuing	Continuing	-
Pre-Planned Product Improvements (Raytheon)	Various	Raytheon : Various	-	-		59.556	Jan 2022	201.790	Jan 2023	-		201.790	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Engineering/ Contractor SEPM & Test	MIPR	CCDC WDI; Various : Picatinny Arsenal; Various	-	63.499		-		-		-		-	Continuing	Continuing	-
Subtotal			429.235	282.105		209.836		283.750		-		283.750	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/Various	Army Laboratories, S3I System Integration Laboratory, CCDC : Various	2.454	-		8.920	Dec 2021	8.930	Dec 2022	-		8.930	Continuing	Continuing	-
Subtotal			2.454	-		8.920		8.930		-		8.930	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Planning/Targets/ Interceptors/U.S. Other Government Agencies (OGAs)	MIPR	RDEC, SED, WSMR-T&E Support : Huntsville, AL; White Sands, NM	75.484	16.600	Feb 2021	56.260	Feb 2022	77.032	Feb 2023	-		77.032	Continuing	Continuing	-
Subtotal			75.484	16.600		56.260		77.032		-		77.032	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			540.347	308.805	297.629	382.147	-	382.147	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability	

Event Name	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						
Production Representative Unit Manufacturing	[Redacted]																																	
Qualification Testing																																		
Developmental Test & Evaluation																																		
Operational Demonstration Test Event																																		
Residual Operational Capability (Urgent Materiel Release)																																		
Operational Assessment / Integrated Fires FY23 Campaign																																		
Milestone C Decision																																		
P3I AMTC Contract																																		
P3I Dev Testing/Operational Testing/Initial Operational T&E (DT/OT/NOTE)																																		
Large Tactical Power System (LTPS)																																		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Concept Definition	4	2017	4	2019
Select Single Vendor	1	2020	1	2020
Production Representative Unit Manufacturing	1	2021	4	2023
Qualification Testing	4	2022	1	2023
Developmental Test & Evaluation	3	2022	3	2023
Operational Demonstration Test Event	2	2023	2	2023
Residual Operational Capability (Urgent Materiel Release)	4	2023	4	2023
Operational Assessment / Integrated Fires FY23 Campaign	3	2023	4	2023
Milestone C Decision	1	2024	1	2024
P3I AMTC Contract	4	2022	3	2025
P3I Dev Testing/Operational Testing/Initial Operational T&E (DT/OT/IOTE)	4	2025	1	2027
Large Tactical Power System (LTPS)	4	2022	2	2025

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604115A / Technology Maturation Initiatives
--	---

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	-	141.109	132.561	269.756	-	269.756	255.077	255.061	255.146	257.629	0.000	1,566.339
AX3: Technology Maturation Initiatives	-	15.638	12.109	220.050	-	220.050	255.077	255.061	255.146	257.629	0.000	1,270.710
AX5: Next Generation Close Combat Missile	-	4.813	3.000	-	-	-	-	-	-	-	0.000	7.813
AX6: Active Protection Systems Integration	-	3.000	-	-	-	-	-	-	-	-	0.000	3.000
AX7: Multi-Mission High Energy Laser (MMHEL) Sys Demo	-	7.844	-	-	-	-	-	-	-	-	0.000	7.844
AX8: Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)	-	14.500	24.700	23.421	-	23.421	-	-	-	-	0.000	62.621
AX9: Adv Mobility Experimental Prototype Adv Tech	-	15.209	12.500	15.234	-	15.234	-	-	-	-	0.000	42.943
AY2: Army Operational Fires	-	17.336	37.832	11.051	-	11.051	-	-	-	-	0.000	66.219
AY3: Strategic Long Range Cannon	-	62.769	-	-	-	-	-	-	-	-	0.000	62.769
CE4: Emerging Technology Initiatives Development	-	-	42.420	-	-	-	-	-	-	-	0.000	42.420

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the Technology Maturation Initiative (TMI), which matures and integrates component technologies into early system and sub-system experimental prototypes for demonstration in relevant environments and tactical/operational scenarios. The Technology Maturation Initiative takes emerging Science and Technology (S&T) Technology Readiness Level (TRL) 6 products to a goal of TRL 7, integrating them into technology demonstrators and experimental prototypes that meet existing Program of Record (PoR) requirements and reduce the risk of technology insertion for future acquisition programs. This Initiative streamlines the development and insertion of mature technologies that support advanced ground systems; aviation systems; command, control, communication and reconnaissance systems and equipment; precision and hypersonic weapons; navigation and situational awareness systems; and Soldier equipment. It provides the Army an improved mechanism for incorporating innovative technologies and advanced capabilities in the early stages of acquisition program planning, and more closely aligns high-priority S&T products and Programs of Record modernization plans.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>
---	--

This PE also provides a tiered evaluation and feasibility application of innovation and disruptive technologies to Army capability gaps at any stage in a technology's lifecycle. The project will partner with academia, small, non-traditional companies, and the defense industrial base to incubate ideas, stage pilot evaluations and to ensure more rapid integration and prototyping of the best, most innovative solutions into Army systems. Project teams comprise of both Science and Technology Subject Matter Experts (SMEs) and PoR technical leads to develop the project concept, execute the program, fabricate and evaluate the prototype, and develop the acquisition plan for incorporating the technology into the PoR upon successful evaluation of the prototype.

Through the Army's Technology Maturation Board, Army senior leadership approves Technology Maturation Initiative projects prior to budget year programming based on priority and opportunity, ensuring that demonstrations have a high potential for filling capability gaps, and the project's plan for transitioning to Army PoRs. Approved Technology Maturation Initiative projects are typically 2-4 years in duration and are budgeted under Projects AX3, AX5, AX8, AX9, AY2, and CE4.

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

Work in this Project is performed by Assistant Secretary of the Army for Acquisition, Logistics and Technology and the Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	141.109	270.124	0.000	-	0.000
Current President's Budget	141.109	132.561	269.756	-	269.756
Total Adjustments	0.000	-137.563	269.756	-	269.756
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-137.563			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	269.756	-	269.756

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.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>				Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>			
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
<i>AX3: Technology Maturation Initiatives</i>	-	15.638	12.109	220.050	-	220.050	255.077	255.061	255.146	257.629	0.000	1,270.710
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the Technology Maturation Initiative (TMI), which matures and integrates component technologies into early system and sub-system experimental prototypes for demonstration in relevant environments and tactical/operational scenarios. The focus is to improve technology transition to Programs of Record (PoRs) supporting 3 categories of projects: (1) Supersystem projects that prototype, integrate, and demonstrate emerging technologies that fill requirements across traditional PEO/PoR boundaries. (2) Technology Product Prototyping projects that mature technologies from S&T BA3 that have demonstrated at TRL6, but are experimental prototypes with higher risk (but potentially greater impact) than the baseline approach currently taken by a PoR, (3) Emerging / Disruptive Technology Opportunity projects (from S&T, industry, or non-traditional sources) that require out-of-cycle funding to prototype and evaluate disruptive impact against PoR requirements (threshold or objective).

This Initiative streamlines the development and insertion of mature technologies that support advanced ground systems; aviation systems; command, control, communication and reconnaissance systems and equipment; precision and hypersonic weapons; navigation and situational awareness systems; and Soldier equipment. It provides the Army an improved mechanism for incorporating innovative technologies and advanced capabilities in the early stages of acquisition program planning, and more closely aligns high-priority S&T products and Programs of Record modernization plans.

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

Work in this Project is performed by Assistant Secretary of the Army for Acquisition, Logistics and Technology and the Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Future Vertical Lift (FVL) Helmet Mounted Display	5.961	-	-
Description: This task integrates and demonstrates a TRL 7 rotorcraft Helmet Mounted Display (HMD) compatible with current 56P helmets and FVL distributed aperture systems (DASs). This enables heads up, eyes out pilotage and improve situational awareness (SA) and maneuver for FVL pilots in all conditions. The HMD has a head tracker system that is self-contained and self-calibrating.			
Title: Large Caliber Armament System Prototype	9.677	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Description: This task completes fabrication of turret and ammunition handling systems; integrates the weapon system components including the gun, turret, ammunition handling system, fire control and targeting sensor; and characterize munitions to establish expected performance.			
Title: Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms		-	2.996
<p>Description: This effort leverages the technologies developed under the IVAS (Integrated Vision Augmented System) program and applies them for use on Air and Ground vehicle platforms. Air: This architecture will enable better situational awareness for the air crew (pilots and rear crew) and passenger warfighters in the air platform with augmented reality data system for displaying 360 degree sensors, pilotage and targeting sensors, blue/red force tracking data, communications, mission data, and vehicle flight data. Ground Vehicle: This architecture will enable better situational awareness for the crew (commander, gunner, driver, and vehicle crew) and passenger warfighters in the ground platform with augmented reality data system for displaying 360 degree sensors, driver, commander, and targeting sensors, blue/red force tracking data, communications, mission data, and vehicle data. The system will interface to ATLAS (ground system) and other architecture systems.</p> <p>FY 2022 Plans: Will complete definitions of the IVAS technologies and architecture for use on Air and Ground Platforms. Will fabricate mid program prototyping of Air and Ground A/R prototyping to for Warfighter touch points on the technologies and design to increase capability and reduce risk in the FY23 prototypes. Effort is being funded by AX3 and a reallocation of funds from the CE4 Emerging Technology Initiatives Development effort.</p> <p>FY 2023 Plans: Mature Augmented Reality (A/R) technologies and optimize A/R performance. Assess A/R effectiveness at Soldier touch points. Demonstrate A/R capabilities for air and ground vehicle users and applications. Mature and demonstrate end-state vehicle computing and information processing capabilities in both air and ground platforms. Mature and demonstrate networked enabled operations in mission-based operational scenarios. Demonstrate improved line of sight head tracking capability with existing aviation head mounted display systems. Mature and demonstrate applications to IVAS tactical heads up display software to enable seamless transition from dismounted to mounted on-the-move operations. Mature and transition a government-owned hardware, software and interface baseline</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding from FY22 to FY23 reflects substantial hardware design maturation, long-lead purchases and delivery of ruggedized processing solutions in FY22, and FY23</p>			41.170
Title: Universal MDO Fire Control and SA Systems		-	8.672
			34.700

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: This effort supports experimental prototypes to demonstrate high priority capability to provide mid to large caliber weapon platforms a real time 360-degree situational awareness (SA) and sensor input to the targeting / firing control systems. This effort will prototype a common architecture and interface kit containing infrared/radio frequency (IR/RF) sensors to ensure interoperability and sustainment across platforms. This effort is needed to enable a timely start of common architecture and interface definitions and interface hardware development that supports a platform agnostic prototype demonstration of 360-degree sensing system for fire control and SA across dynamic battlefield conditions. The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.</p> <p>FY 2022 Plans: Will develop an initial architecture and interface specification that is compatible with installation and interface to multiple mid to larger caliber weapons platforms. Will prototype universal sensing modules and architecture functionality on a mid or large caliber weapon platform for evaluation in a dynamic battlefield environment. Effort is being funded by AX3 and a reallocation of funds from the AX5 Next Generation Close Combat Missile.</p> <p>FY 2023 Plans: Mature and assess multiple vendor Universal 360 multi-spectral sensing system prototypes including day, low-light, and thermal technologies with on-sensor Aided Target Recognition (AiTR) capabilities. Mature and document the government controlled, platform-agnostic data framework, architecture, and interface specifications. Demonstrate and assess through virtual prototyping the sensor data structure, Universal 360 sensor bandwidth, and intelligent data sharing/distribution. Evaluate scalability of the Universal 360 sensor system and architecture across multiple ground vehicle system requirements. Mature Artificial Intelligence (AI) software architecture, AI-enabled tracking, and advanced data and target location capabilities focusing on near-vehicle threats and driving obstacles. Integrate Advance Targeting Lethality Automated Systems (ATLAS) Technology Maturation Initiative AiTR algorithms. Evaluate AiTR detection, identification, and tracking effectiveness in the AiTR evaluation lab. Mature vehicle crew helmet mounted display technologies and assess effectiveness through data collection at Warfighter touch points. Improve head tracking hardware and software to enable precise tracking for visual information display to enable see through armor and improved situational awareness. Integrate the Integrated Vision Augmented System Ground Technology Maturation Initiative hardware, software, architecture/interface baseline and helmet mounted display crew user experiences. Demonstrate Universal 360 sensor data on select crew, troop, and fire control systems. Fabricate and integrate mid-program prototypes of platform-agnostic Universal 360 sensors, architecture, and display technologies on ground vehicle platforms.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding from FY22 to FY23 reflects fabrication and integration of platform agnostic Universal 360 sensors, architecture, and display technologies on ground vehicle platforms.</p>				
Title: Tactical Navigation Warfare (NAVWAR) Plexus		-	-	8.580

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Tactical Navigation Warfare (NAVWAR) Plexus supports the technology maturation and integration of NAVWAR Situational Awareness technologies into Electronic Warfare and field artillery systems. This effort incorporates NAVWAR sensors, data fusion algorithms, and decision making software to maintain Army Fires capabilities in Global Positioning System degraded and denied environments. NAVWAR sensor interfaces will be modernized to comply with open system standards and their data will be processed through fusion algorithms to produce a real time Common Operating Picture (COP) of the NAVWAR environment. This COP will be distributed to the Fires Command and Control system to optimize the performance of field artillery in degraded environments.</p> <p>FY 2023 Plans: Will initiate modernization of the NAVWAR sensor interface for integration with data fusion algorithms. Will complete development of the heat map algorithms for displaying degraded and denied areas. Will integrate the heat map algorithms into Electronic Warfare (EW) software system to create the COP. Will also initiate interface integration of the field artillery system to the EW software system.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.</p>				
<p>Title: Anubis Software Defined Chipset for M-Code and Advanced PNT Applications</p> <p>Description: This effort will demonstrate M-Code Global Positioning System (GPS) receiver capability on a commercially available System on Chip (SoC). It will prototype mounted, dismounted, and munition GPS receiver reference designs to be used for testing, evaluation, and insertion into Army Programs of Record. This effort will also include security certification through U.S. Space Force in order to handle the required encryption keys. The cited work is consistent with the Army Modernization Strategy.</p> <p>FY 2023 Plans: Initiate security certification process with U.S. Space Force and enable M-Code capability on core SoC components. Develop initial GPS receiver reference designs for selected form factor (mounted, dismounted, or munition).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding due to the need for security certificates and development of different reference designs supporting transitions to three (3) Program Executive Offices.</p>		-	-	21.700
<p>Title: Assured Navigation for Future Tactical Unmanned Aerial Systems (FTUAS)</p> <p>Description: This effort will build on previous Defense Advanced Research Projects Agency (DARPA) All Source Positioning and Navigation (ASPN), and Seeker Cost Transformation (SECTR) vision based navigation technology efforts, as well as the Army Aviation and Missile Center's (AvMC) current efforts under the Future Vertical Lift Cross Functional Team (FVL CFT) and</p>		-	-	5.700

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Program Executive Office Aviation's efforts focused on low altitude vision based navigation (VBN) to deliver a full government owned navigation system in small size, weight, and power for tactical Unmanned Aerial Systems. DARPA SECTR is a production prototype that has been demonstrated in cross country flight and currently works at altitudes of 1000+feet. This effort will extend the technology to all operational altitudes, and miniaturize and ruggedize the technology. This effort will be part of an overall Assured Position Navigation and Timing solution that will enable the use of FTUAS and Air Launched Effects in GPS denied environments.</p> <p>FY 2023 Plans: Initiate maturation of low altitude vision based navigation, and determine sensor requirements. Begin miniaturization of the prototype sensor package and processing module that will be designed, tested, and transitioned. Begin optimization of VBN algorithms for low-altitude applications.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.</p>			
<p>Title: Air Launched Effects (ALE) Off-board Survivability</p> <p>Description: This effort will develop a new variant of the ALE Family of Systems focused on protection of the manned helicopter fleet in contested environments. The effort will mature multispectral payloads that offload survivability and targeting functions from manned platforms.</p> <p>FY 2023 Plans: Implement multiple survivability and targeting payloads using off-board ALE platforms to relay critical information to manned systems for battlespace situational awareness and tactics execution. Complete system architecture development and optimization including required communications and artificial intelligence/machine learning-based data fusion backbone. Mature high payoff payload technologies that perform survivability and targeting functions in low-Size, Weight and Power (SWaP) packages suitable for off-board use and demonstrate payloads and associated tactics, techniques and procedures on test bed platform. Development air vehicle prototype including a digital twin for sizing and payload optimization analyses followed by SWaP-optimized integration of payloads to demonstrate performance and tactics in free flight test flights in operationally relevant environments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.</p>	-	-	28.530
<p>Title: Target Seeking (TS) - Extended Range (ER) Seeker (TS-ER)</p> <p>Description: The TS-ER Seeker will combine advances made by the Strategic Capabilities Office, Defense Advanced Research Projects Agency, Air Force, and Army in the fields of airframes, electronics, and seeker technologies to enable: extended range</p>	-	-	17.820

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>performance from 70km to 150km by integrating with advanced airframes; decrease risk of performance against red force countermeasures from medium to low by improving Automatic Target Recognition capability; improve munition terminal effects against armored targets and Integrated Air Defense Systems by enhancing munition accuracy. These seeker technologies will be integrated with the XM1155 Extended Range Artillery Projectile, with the requirement to prosecute moving or relocated targets in Global Positioning System denied environments at extended ranges (150km in accordance with the Cannon Delivered Area Effects Munition draft Capabilities Development Document). Enhanced seeker technologies will be critical in enabling munition performance at these ranges with high target location error.</p> <p>FY 2023 Plans: Mature and integrate seeker hardware. Perform open-loop testing of seeker hardware. Perform live fire gun hardening All-Up-Round testing. Will demonstrate integrated seeker performance in open-loop and closed-loop demonstrations. Perform live fire gun hardening all round up testing. Demonstrate integrated seeker performance in open-loop and closed-loop demonstrations. Deliver an integrated terminal seeker.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New start effort in FY 2023 approved by the Technology Maturation Board.</p>				
<p>Title: Tactical Analytics Architecture (TA2)</p> <p>Description: This effort will prototype AI software/algorithms and hardware for AI-enabled Command and Control (C2) common operating picture (COP) / decision-support for Multi-Domain Operations at multiple echelons. Increased Speed and Accuracy of decision making will be demonstrated thru integration of AI-enabled decision support technologies that are emerging from Science and Technology programs and existing C2 systems used across warfighting functions and domains.</p> <p>FY 2023 Plans: Develop Software/Hardware (SW/HW) Prototype COP that integrates data, information and knowledge-sharing across echelon and function including Maneuver, Integrated Air and Missile Defense, Fires, Intel, Logistics, etc. Using emerging data fabrics and processing frameworks, develop necessary application programming interfaces to demonstrate sharing of data, algorithms and Machine learning tools; and translate across different architectures and standards. Transition/mature emerging COP visualization SW/HW, and AI-enabled decision support tools being developed under Project Convergence. Incorporate synthetic training environment One World Terrain, Integrated Visual Augmentation Systems, and other real-time sensor updates for dynamic situation understanding pay-offs that include fast, accurate automated recommendations for target development, target selection, target/weapons pairing, synchronization of fires, air space and target de-confliction, route planning, automated integration and</p>		-	-	22.400

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
assessment of voice and chat data, AI-enabled electronic warfare for assured interoperability between radio frequency (RF) systems, classification of RF emitters, and automated battle damage assessments. FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.				
Title: Common Hypersonic Glide Body (CHGB) Seeker Integration Description: The Army Long Range Hypersonic Weapon (LRHW) Common Hypersonic Glide Body (CHGB) Seeker Integration activities are leveraging development efforts that were executed with prior year 6.3 S&T funding, supporting Seeker Component Development. The 6.3 S&T CHGB Seeker Component Development will continue through FY27, and will transition mature technologies to the 6.4 CHGB Seeker Integration efforts. Per the TMI Board decision in May 2021, the TMI program will fund these 6.4 CHGB Seeker Integration efforts in FY23. Starting in FY24, the RCCTO Transition Partner, Program Executive Office Missiles and & Space, will continue CHGB Seeker Integration efforts to support the development timeline for implementation into future LRHW batteries. FY 2023 Plans: Will integrate sensor hardware, update flight software, and integrate capability into weapon control and mission planning software and tools. FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.		-	-	15.450
Title: Autonomous Operations for Unmanned Aerial Systems (UAS) Description: Autonomous Operations for Unmanned Aerial Systems (UAS) will provide Army aircraft reconnaissance, targeting and weapon options to engage and defeat threat targets at standoff. It will provide manned and unmanned aircraft capabilities to operate dispersed as part of the larger collaborative lethality network or as autonomous contributors for reconnaissance, surveillance, and target acquisition (RSTA). FY 2023 Plans: Transition products to enable autonomous operations for RSTA missions using 5 or more Air Launched Effects (ALE) collaborating under a single human supervisor while operating in contested environments. Identify candidate Science and Technology (S&T) products and integrate and align them to the Program Manager's (PM) Unmanned Aerial Systems (UAS) Family of Systems Architecture and Requirements Specification for ALE, Gray Eagle and Scalable Control Interface (SCI) Programs of Record. Analyze, test and integrate ALE S&T autonomy software and platform components to meet PM's UAS Requirements Specification for ALE. Develop an Integration and Test Plan to standardize approach and metrics to integrate ALE S&T components aligned to Abbreviated- Capability Development Document (A-CDD) for ALE and ALE Use Cases. Perform		-	-	12.700

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
flight test risk reduction efforts of S&T autonomy software and control interfaces in operationally relevant environments against pacing threats. Perform communications testing to determine communications waveforms, link budgets and other requirements to support the autonomy and control interfaces. Integrate into the Army network through integration activities and Project Convergence 21.				
FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.				
Title: Reconfigurable Aperture Precision Targeting Radar (RAPTR) for Vehicle and Dismount Exploitation Radar (VADER) (RADER)		-	-	11.300
Description: The current RADAR sensor (VADER) on Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS-V) was designed for counterinsurgency operations limiting the effectiveness against near-peer threats. This effort will mature wide-band, multi-function RF, aperture technology developed under Army Science and Technology (S&T) to deliver an advanced payload that significantly increases range, accuracy and survivability of current airborne surveillance radar systems. This effort will integrate an advanced payload into a digital radar pod to address performance deficiencies related to Multi-Domain Operations, address sustainability, and provide performance growth across all synthetic aperture radar (SAR) / moving target indication (MTI) capabilities. The additional RAPTR capabilities will make EMARSS-V more effective in Multi-Domain Operations extending the platforms relevance to support future missions.				
FY 2023 Plans: Initiate design and build of a dual band Active Electronically Scanned Array (AESA) to augment current surveillance radar range, accuracy and survivability. Initiate design and production of integrated circuit chip package optimized to address performance and manufacturing deficiencies from S&T chip spins. Initiate open architecture hardware and software upgrades to accommodate upgraded signal processor and enable sharable digital interface for multifunction aperture. Initiate long lead material procurement to support fabrication, unit test, and integration.				
FY 2022 to FY 2023 Increase/Decrease Statement: New Start effort in FY 2023 approved by the Technology Maturation Board.				
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)		-	0.441	-
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		15.638	12.109	220.050

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

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

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.441		-		-		-	0.000	0.441	-
Subtotal			-	-		0.441		-		-		-	0.000	0.441	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms	C/Variou	Various : Various	-	-		2.996		-		-		-	0.000	2.996	-
Universal 360 MDO Fire Control and SA Systems	C/Variou	Various : Various	-	-		8.672		-		-		-	0.000	8.672	-
Target Seeking - Extended Range (ER) Seeker (TS-ER)	TBD	PEO Ammo : Picatinny Arsenal, NJ	-	-		-		17.820		-		17.820	0.000	17.820	-
Common Hypersonic Glide Body (CHGB) Seeker Integration	C/Variou	RCCTO : Various : Various	-	-		-		15.450		-		15.450	0.000	15.450	-
Artificial Intelligence (AI) Enabled Operations	TBD	AFC : TBD	-	-		-		22.400		-		22.400	0.000	22.400	-
Anubis: COTS-based M-Code GPS Receiver	TBD	DEVCOM-ARL : TBD	-	-		-		21.700		-		21.700	0.000	21.700	-
Air Launched Effects (ALE) Off-board Survivability	TBD	DEVCOM AvMC : TBD	-	-		-		28.530		-		28.530	0.000	28.530	-
Assured NAV for FTUAS	TBD	PEO Aviation : TBD	-	-		-		5.700		-		5.700	0.000	5.700	-
Tactical NAVWAR Plexus	TBD	DEVCOM C5ISR : TBD	-	-		-		8.580		-		8.580	0.000	8.580	-
Universal 360 MDO Sensor Prototypes	TBD	C5ISR Ft. Belvoir : TBD	-	-		-		4.283		-		4.283	0.000	4.283	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Universal 360 MDO Common Architecture & Data Framework	TBD	C5ISR Ft. Belvoir : TBD	-	-		-		2.494		-		2.494	0.000	2.494	-
Mature AI software architecture & prototype ATR	TBD	C5ISR Ft. Belvoir : TBD	-	-		-		4.011		-		4.011	0.000	4.011	-
Mature & Demonstrate Crew Station, Crew HMD, Troop HMD, and Fire Control	TBD	C5ISR Ft. Belvoir : TBD	-	-		-		8.784		-		8.784	0.000	8.784	-
Platform Prototyping, Integration & Demonstration	TBD	C5ISR Ft. Belvoir : TBD	-	-		-		15.127		-		15.127	0.000	15.127	-
IVAS - Design Platform Augmented Reality (AR) Architecture	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		1.123		-		1.123	0.000	1.123	-
IVAS - AR Architecture Implementation, Integration, and Fabrication	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		12.620		-		12.620	0.000	12.620	-
IVAS - Systems Engineering - Interfaces, Head Pose Tracking, Position, Navigation, Timing, Power	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		10.112		-		10.112	0.000	10.112	-
IVAS - Software Engineering - AR User Experiences	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		4.028		-		4.028	0.000	4.028	-
IVAS - Software/Hardware Integration - IVAS and Pilot / Crew Helmet Mounted Displays	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		11.911		-		11.911	0.000	11.911	-
IVAS - Capability Demonstration	TBD	C5ISR Fort Belvoir, VA; : TBD	-	-		-		1.377		-		1.377	0.000	1.377	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Autonomous Operations for Unmanned Aerial Systems (UAS)	TBD	DEVCOM AvMC : TBD	-	-		-		12.700		-		12.700	0.000	12.700	-
Reconfigurable Aperture Precision Targeting Radar (RAPTR) for Vehicle and Dismount Exploitation Rada	TBD	DEVCOM C5ISR : TBD	-	-		-		11.300		-		11.300	0.000	11.300	-
Subtotal			-	-		11.668		220.050		-		220.050	0.000	231.718	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Future Vertical Lift Helmet Mounted Display (FVL HMD)	C/Various	AFC : Fort Belvoir, VA	-	5.961		-		-		-		-	13.000	18.961	-
Large Caliber Armament System Prototype	C/Various	AFC : Picatinny, NJ	-	9.677		-		-		-		-	18.400	28.077	-
Subtotal			-	15.638		-		-		-		-	31.400	47.038	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			-	15.638	12.109	220.050	-	220.050	31.400	279.197	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
Large Caliber Armament System Prototype	█				█																							
Fabricate Turret	█				█																							
Fabricate Ammunition Handling System	█				█																							
Characterize munitions					█																							
Integration of Weapon System Components					█																							
FVL Helmet Mounted Display	█				█																							
Display System Design	█				█																							
Head Tracker Design	█				█																							
AIR IVAS Mid-Point Prototype with Soldier Touch Point 1									▲ 2																			
Ground IVAS Mid-Point Vehicle Prototype for crew with Soldier Touch Point 1									▲ 3																			
Fabricate wireless crew sensor/data share prototype for Soldier Touchpoint 1.					█																							
Wireless crew sensor/data share prototype - Soldier Touchpoint 1.									▲ 4																			
Fabricate full IVAS for Air system for vehicle									█																			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
Optimize IVAS Air Architecture post Soldier Touch Point#1									█	█	█	█																
Optimize IVAS Ground Architecture post Soldier Touch Point#1									█	█	█	█																
Fabricate full IVAS for Ground system for vehicle									█	█	█	█																
Demo/Evaluation: 4QFY23 Full prototype/Soldier Touch Point#2																												
Universal 360 MDO Fire Control and SA Systems																												
U360 Sensor Maturation									█	█	█	█																
U360 Architecture									█	█	█	█																
Aided Target Recognition									█	█	█	█																
Vehicle Integration									█	█	█	█																
Vehicle Excursion – Demonstrate Baseline U360																												
U360 Soldier Touch Point -Virtual Prototype #1									█	█	█	█																
U360 Soldier Touch Point -Virtual Prototype and U360 Demonstration on Stryker																												
U360 Soldier Touch Point -Virtual Prototype #2																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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				
U360: Vehicle Excursion-Demonstrate Full 360																																
Common Hypersonic Glide Body (CHGB) Seeker Integration																																
Flight Software Development																																
Hardware Integration																																
Weapon Control and Mission Planning Integration																																
Target Seeking - Extended Range (ER) Seeker (TS-ER)																																
AUR HWIL Synthetic Scene Generation Maturation																																
RF Convergence Technology Maturation																																
RF Convergence Technology Maturation Demonstration																																
Integrated Flight M&S Evaluation																																
Seeker Hardware and Aperture Integration																																
Captive Carry Test																																
Electronics Gun Hardening Maturation																																

15
User Experience

7

8
Test & Evaluation

12
Test & Evaluation

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
AUR Gun Hardness Test													13 Test & Evaluation															
Seeker Performance Improvements													14 Test & Evaluation															
AUR GFT w/ Open Loop Seeker Test													16 Demonstration															
AUR GFT w/ Closed Loop Seeker Demonstration																												
Anubis Software Defined Chipset for M-Code and Advanced PNT Applications																												
M-Code Functionality and Software Implementation:													9 Demonstration															
Security Certification													17 Demonstration															
CMOSS Card Reference Design													21															
CMOSS Card Demonstration																												
IVAS Module Reference Design																												
NavWar Module Reference Design																												
NavWar Module Benchtop Demonstration																												
NavWar Module Live Fire Demonstration																												


UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
Air Launched Effects (ALE) Off-board Survivability																												
ALE Off-Board Survivability (OBS) Payload Maturation																												
OBS System Architecture Definition																												
OBS Integration and Flight Tests and Demonstrations																												
OBS HW Integration on ALE Demo Platforms																												
OBS Capability Demonstration and Flight Tests																												
Tactical Navigation Warfare (NAVWAR) Plexus																												
EWPMT NAVWAR COP																												
Sensor/Client Interface Modernization																												
PLASMA-X Integration																												
Fires Command and Control																												
NAVWAR COP Demonstration																												
Multi Domain Sensor Fusion Demo																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
Integrated NAVWAR Situational Awareness Demo																												
Assured Navigation (NAV) for Future Tactical Unmanned Aerial Systems (FTUAS)																												
Develop Low Altitude SW									██████████																			
Conduct Sensor Trade Study									██████████																			
Build Prototype									██████████				██████████															
Test Prototype																	██████████											
IVAS - AR Architecture Definition and Integration																												
Identify Processing Approach(es)			██████████																									
Hardware/Software Architecture Definition (SysML digital model-based)					██████████																							
Partial Platform Architecture Integration (w/ Baseline User Experiences)									██████████																			
Final Platform Architecture Integration (w/ Optimized User Experiences)									██████████																			
IVAS - AR Processing Ruggedization, SWAP reduction and Platform Integration																												
AR Processing Ruggedization, SWAP reduction and Platform Integration			██████████		██████████																							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
AR Processing Ruggedization, SWAP reduction and Platform Integration Spiral #2																												
IVAS - AR User Experience Development																												
Extensions to IVAS API/SDKs																												
Baseline 'SEE' and 'Worldview' Visualizations and Rendering																												
Optimized 'SEE' and 'Worldview' Visualizations and Rendering																												
Enhanced 'SEE' and 'Worldview' Visualizations and Rendering																												
Air/Ground Vehicle Tailored User Experience Development and Demo																												
IVAS - Line-of-Sight (LOS) Tracking and Helmet Mounted Display (HMD) Maturation																												
Initial Hybrid Optical Inertial LOS Tracker Maturation and Demo																												
Integration/Demo of Hybrid LOS Tracker w/ WFOV Aviation HMD																												
Helmet Display and Tracking System (HDTS) Integration/Demo w/ AR Architecture																												
Enhanced HDTS Integration/Demo																												
Autonomous Operations for Unmanned Aircraft Systems System Demo																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
UAS - Common Mission Systems Architecture Development for Autonomous Ops																												
UAS - Autonomous Operations Component Maturation																												
UAS - Autonomous Operations Performance Integration and Demonstration																												
UAS - Autonomous Operations Demonstration and User Evaluations																												
Reconfigurable Aperture Precision Targeting Radar for VADER (RADER)																												
RADER - Design and Documentation																												
RADER - Transmitter/Receiver Chip Production Spin																												
RADER - Radar System NRE (HW and SW)																												
RADER - Aperture Range Testing and Demonstration																												
RADER - Platform Integration and Testing																												
RADER - System Flight Testing and Demonstration																												
Tactical Analytics Architecture (TA2)																												
Intel Support to Fires																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Event Name	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
AI COA Recommender																												
ARCANE Fire +																												
Firestorm																												
LEAP / LTAC																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Large Caliber Armament System Prototype	1	2021	4	2021
Fabricate Turret	1	2021	4	2021
Fabricate Ammunition Handling System	1	2021	4	2021
Characterize munitions	4	2021	4	2021
Integration of Weapon System Components	4	2021	4	2021
FVL Helmet Mounted Display	1	2021	4	2021
Display System Design	1	2021	3	2021
Head Tracker Design	2	2021	4	2021
AIR IVAS Mid-Point Prototype with Soldier Touch Point 1	1	2023	1	2023
Ground IVAS Mid-Point Vehicle Prototype for crew with Soldier Touch Point 1	1	2023	1	2023
Fabricate wireless crew sensor/data share prototype for Soldier Touchpoint 1.	1	2022	4	2022
Wireless crew sensor/data share prototype - Soldier Touchpoint 1.	1	2023	1	2023
Fabricate full IVAS for Air system for vehicle	1	2023	4	2023
Optimize IVAS Air Architecture post Soldier Touch Point#1	1	2023	4	2023
Optimize IVAS Ground Architecture post Soldier Touch Point#1	1	2023	4	2023
Fabricate full IVAS for Ground system for vehicle	1	2023	4	2023
Demo/Evaluation: 4QFY23 Full prototype/Soldier Touch Point#2	4	2023	4	2023
Universal 360 MDO Fire Control and SA Systems	2	2022	4	2024
U360 Sensor Maturation	2	2022	1	2024
U360 Architecture	3	2022	2	2024
Aided Target Recognition	4	2022	2	2024
Vehicle Integration	4	2022	4	2024

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
Vehicle Excursion ? Demonstrate Baseline U360	4	2022	4	2022
U360 Soldier Touch Point -Virtual Prototype #1	1	2023	2	2023
U360 Soldier Touch Point -Virtual Prototype and U360 Demonstration on Stryker	4	2023	4	2023
U360 Soldier Touch Point -Virtual Prototype #2	1	2024	1	2024
U360: Vehicle Excursion-Demonstrate Full 360	4	2024	4	2024
Common Hypersonic Glide Body (CHGB) Seeker Integration	1	2023	4	2023
Flight Software Development	1	2023	4	2023
Hardware Integration	1	2023	4	2023
Weapon Control and Mission Planning Integration	1	2023	4	2023
Target Seeking - Extended Range (ER) Seeker (TS-ER)	1	2023	4	2023
AUR HWIL Synthetic Scene Generation Maturation	1	2023	4	2023
RF Convergence Technology Maturation	1	2023	4	2023
RF Convergence Technology Maturation Demonstration	4	2023	4	2023
Integrated Flight M&S Evaluation	4	2023	4	2023
Seeker Hardware and Aperture Integration	1	2023	1	2024
Captive Carry Test	2	2024	2	2024
Electronics Gun Hardening Maturation	1	2023	2	2024
AUR Gun Hardness Test	2	2024	2	2024
Seeker Performance Improvements	4	2023	4	2024
AUR GFT w/ Open Loop Seeker Test	3	2024	3	2024
AUR GFT w/ Closed Loop Seeker Demonstration	4	2024	4	2024
Anubis Software Defined Chipset for M-Code and Advanced PNT Applications	3	2022	4	2025
M-Code Functionality and Software Implementation:	3	2022	4	2025
Security Certification	1	2023	3	2025
CMOSS Card Reference Design	2	2023	3	2024

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
CMOSS Card Demonstration	1	2024	1	2024
IVAS Module Reference Design	3	2023	4	2024
NavWar Module Reference Design	3	2023	4	2024
NavWar Module Benchtop Demonstration	4	2024	4	2024
NavWar Module Live Fire Demonstration	4	2025	4	2025
Air Launched Effects (ALE) Off-board Survivability	1	2023	3	2024
ALE Off-Board Survivability (OBS) Payload Maturation	2	2023	3	2024
OBS System Architecture Definition	2	2023	3	2023
OBS Integration and Flight Tests and Demonstrations	4	2023	3	2024
OBS HW Integration on ALE Demo Platforms	1	2024	2	2025
OBS Capability Demonstration and Flight Tests	2	2024	3	2024
Tactical Navigation Warfare (NAVWAR) Plexus	1	2023	4	2025
EWPMT NAVWAR COP	1	2023	2	2024
Sensor/Client Interface Modernization	3	2023	2	2025
PLASMA-X Integration	1	2024	4	2025
Fires Command and Control	3	2023	2	2025
NAVWAR COP Demonstration	1	2024	1	2024
Multi Domain Sensor Fusion Demo	2	2025	2	2025
Integrated NAVWAR Situational Awareness Demo	3	2025	3	2025
Assured Navigation (NAV) for Future Tactical Unmanned Aerial Systems (FTUAS)	1	2023	4	2025
Develop Low Altitude SW	1	2023	1	2024
Conduct Sensor Trade Study	2	2023	2	2024
Build Prototype	2	2023	1	2025
Test Prototype	1	2025	4	2025
IVAS - AR Architecture Definition and Integration	3	2021	4	2023

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
Identify Processing Approach(es)	3	2021	4	2021
Hardware/Software Architecture Definition (SysML digital model-based)	1	2022	4	2022
Partial Platform Architecture Integration (w/ Baseline User Experiences)	3	2022	4	2022
Final Platform Architecture Integration (w/ Optimized User Experiences)	1	2023	4	2023
IVAS - AR Processing Ruggedization, SWAP reduction and Platform Integration	1	2023	4	2023
AR Processing Ruggedization, SWAP reduction and Platform Integration Spiral #1	3	2021	3	2022
AR Processing Ruggedization, SWAP reduction and Platform Integration Spiral #2	3	2022	4	2023
IVAS - AR User Experience Development	3	2021	4	2023
Extensions to IVAS API/SDKs	1	2022	3	2023
Baseline ?SEE? and ?Worldview? Visualizations and Rendering	3	2021	4	2021
Optimized ?SEE? and ?Worldview? Visualizations and Rendering	1	2022	4	2022
Enhanced ?SEE? and ?Worldview? Visualizations and Rendering	1	2023	4	2023
Air/Ground Vehicle Tailored User Experience Development and Demo	3	2022	4	2023
IVAS - Line-of-Sight (LOS) Tracking and Helmet Mounted Display (HMD) Maturation	4	2021	4	2023
Initial Hybrid Optical Inertial LOS Tracker Maturation and Demo	4	2021	4	2022
Integration/Demo of Hybrid LOS Tracker w/ WFOV Aviation HMD	1	2023	4	2023
Helmet Display and Tracking System (HDTs) Integration/Demo w/ AR Architecture	4	2021	4	2022
Enhanced HDTs Integration/Demo	1	2023	3	2023
Autonomous Operations for Unmanned Aircraft Systems Sys Demo	1	2023	4	2025
UAS - Common Mission Systems Architecture Development for Autonomous Ops	1	2024	2	2024
UAS - Autonomous Operations Component Maturation	1	2023	1	2026
UAS - Autonomous Operations Performance Integration and Demonstration	1	2024	4	2024
UAS - Autonomous Operations Demonstration and User Evaluations	1	2025	4	2025
Reconfigurable Aperture Precision Targeting Radar for VADER (RADER)	1	2023	4	2025
RADER - Design and Documentation	1	2023	4	2025

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX3 / <i>Technology Maturation Initiatives</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
RADER - Transmitter/Receiver Chip Production Spin	1	2023	2	2024
RADER - Radar System NRE (H/W and S/W)	3	2023	3	2025
RADER - Aperture Range Testing and Demonstration	4	2024	4	2024
RADER - Platform Integration and Testing	3	2025	4	2025
RADER - System Flight Testing and Demonstration	4	2025	4	2025
Tactical Analytics Architecture (TA2)	1	2023	4	2025
Intel Support to Fires	1	2023	1	2025
AI COA Recommender	1	2023	2	2025
ARCANE Fire +	1	2023	2	2025
Firestorm	1	2023	4	2025
LEAP / LTAC	1	2023	4	2025

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>			Project (Number/Name) AX5 / <i>Next Generation Close Combat Missile</i>				
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
AX5: <i>Next Generation Close Combat Missile</i>	-	4.813	3.000	-	-	-	-	-	-	-	0.000	7.813
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort completes in Fiscal Year (FY) 2022

A. Mission Description and Budget Item Justification

This Project demonstrates a prototype close combat missile with a multi-pulse, boost-sustain flight propulsion system providing extended range and decreased time of flight. Activities mature proof-of-principle hardware into an integrated tactical-representative design, and demonstrate a prototype missile with lethality overmatch of emerging threats.

Work in this PE complements PE 0603462A (Next Generation Combat Vehicle Advanced Technology).

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

Work in this Project is performed by Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Next Generation Close Combat Missile	4.813	2.891	-
Description: This effort demonstrates a prototype close combat missile with a multi-pulse, boost-sustain flight propulsion system providing extended range and decreased time of flight.			
FY 2022 Plans: Will complete fabrication of prototype missile system using the advanced propulsion system components and conduct flight evaluation of the final missile prototype with participation with the transition partner - Program Executive Office Missiles and Space. Funding is being used to support AX3 Universal MDO Fire Control and SA Systems efforts.			
FY 2022 to FY 2023 Increase/Decrease Statement: Effort ends in FY 2022.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)	-	0.109	-
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX5 / <i>Next Generation Close Combat Missile</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
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		4.813	3.000	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX5 / <i>Next Generation Close Combat Missile</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.109		-		-		-	0.000	0.109	-
Subtotal			-	-		0.109		-		-		-	0.000	0.109	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Universal MDO Fire Control and SA Systems	TBD	DEVCOM-ARL : TBD	-	-		2.409		-		-		-	0.000	2.409	-
Subtotal			-	-		2.409		-		-		-	0.000	2.409	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Next Generation Close Combat Missile	Various	AvMC : Huntsville, AL	5.630	4.813		0.482		-		-		-	0.000	10.925	-
Subtotal			5.630	4.813		0.482		-		-		-	0.000	10.925	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		5.630	4.813	3.000	-	-	-	13.443	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX5 / <i>Next Generation Close Combat Missile</i>	

Event Name	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
Next Generation Close Combat Missile																												
Fabricate prototype missile																												
4QFY22 Test Firing / Flight Evaluation																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX5 / <i>Next Generation Close Combat Missile</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Next Generation Close Combat Missile	1	2019	4	2022
Fabricate prototype missile	1	2022	4	2022
4QFY22 Test Firing / Flight Evaluation	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX6 / <i>Active Protection Systems Integration</i>
--	--	--

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
<i>AX6: Active Protection Systems Integration</i>	-	3.000	-	-	-	-	-	-	-	-	0.000	3.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures, integrates, and demonstrates protection and survivability technologies as part of active protection systems (APS) prototyping for the Army's combat vehicles. Activities integrate complimentary survivability technologies to enable layers of enhanced protection capability, providing greater survivability against current and emerging advanced threats. This Project demonstrates a suite of technologies on a fielded combat vehicle platform using an APS common architecture, and defines component interface standards and specifications that enable adaptive APS solutions. Activities support the Army's APS strategy to maintain or reduce vehicle weight by reducing reliance on armor with other means such as sensing, warning, hostile fire detection, and active countermeasures.

Work in this Project is coordinated with PE 0603462A (Next Generation Combat Vehicle Advanced Technology) and transitions to PE 0604852A (Suite of Vehicle Protection Systems - EMD).

Funding has been realigned to reflect the FY20 financial restructure and Army Modernization Priorities.

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

Work in this Project is performed by Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Agile Layered Protection: APS Integration Advanced Technology Demonstrator	3.000	-	-
Description: Activities integrate and demonstrate mature APS technologies layered through a common architecture on an Army ground combat vehicle platform, addressing technical and integration challenges for a system designed to address both current and emerging advanced threats. Selects and integrates mature component technologies that are best suited to optimize added capability for the Active Technology Demonstrator platform. Demonstrates a suite of APS technologies and effects that optimize performance levels for survivability and protection through advanced threat detection, multiple threat defeat systems, and improved situational awareness.			
Accomplishments/Planned Programs Subtotals	3.000	-	-

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

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX6 / <i>Active Protection Systems Integration</i>

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

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX6 / <i>Active Protection Systems Integration</i>

Event Name	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
Active Protection Systems Integration	█				█																							
Integration of Added APS Layered Protection Technologies	█				█																							
Validation of Added APS Layered Protection Technologies	█				█																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX6 / <i>Active Protection Systems Integration</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Active Protection Systems Integration	1	2019	4	2021
Integration of Added APS Layered Protection Technologies	1	2021	3	2021
Validation of Added APS Layered Protection Technologies	3	2021	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>			Project (Number/Name) AX7 / <i>Multi-Mission High Energy Laser (MMHEL) Sys Demo</i>				
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
<i>AX7: Multi-Mission High Energy Laser (MMHEL) Sys Demo</i>	-	7.844	-	-	-	-	-	-	-	-	0.000	7.844
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures and demonstrates an integrated a 50 kilowatt (kW)-class laser weapon system into a Stryker platform, providing a system-level, High Energy Laser (HEL) experimental prototype for demonstration in realistic operating environments. These demonstrations will inform requirements, decrease risk for future Army HEL acquisition programs, and support the future development of warfighter Tactics/Techniques/Procedures and Concept of Operations. HEL weapon systems are expected to complement conventional offensive and defensive weapons at a lower cost-per-shot than current systems and without the need to stockpile ordnance. A 50 kW-class laser weapon system has the potential to engage and defeat rockets, artillery, mortars (RAM); unmanned aerial vehicles (UAVs); sensors; and optics for maneuvering. Demonstrations will also inform potential future capability to defeat both fixed and rotary wing manned aircraft. Leveraging Government investments and Industry technology advancements, will review and select existing HEL subsystem designs for integration into a Stryker combat vehicle; will conduct integration and demonstration of a system-level HEL experimental prototype; and will provide assessment of technical performance in an operational environment. This effort informs application of laser weapons to other combat platforms and rapid prototyping to units-of-action to meet emerging threats expressed in the National Defense Strategy.

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

Work in this Project is performed by the Rapid Capabilities and Critical Technologies Office (RCCTO).

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

	FY 2021	FY 2022	FY 2023
Title: Multi-Mission High Energy Laser (MMHEL) Integration and Demonstration	7.844	-	-
Description: This effort matures, integrates, and demonstrates HEL technologies on Army Stryker vehicles to inform Maneuver-Short Range Air Defense (M-SHORAD) requirements and reduce risk for M-SHORAD. The goal is to protect maneuvering forces from RAM and Unmanned Aerial System (UAS) threats.			
Accomplishments/Planned Programs Subtotals	7.844	-	-

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

N/A

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX7 / <i>Multi-Mission High Energy Laser (MMHEL) Sys Demo</i>

D. Acquisition Strategy
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX7 / <i>Multi-Mission High Energy Laser (MMHEL) Sys Demo</i>	

Event Name	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
MMHEL – Firing Doctrine and Exp Prototype System S/W																												
MMHEL – Experimental Prototype System Dem / Assessment																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX7 / <i>Multi-Mission High Energy Laser (MMHEL) Sys Demo</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MMHEL ? Firing Doctrine and Exp Prototype System S/W	1	2019	3	2021
MMHEL ? Experimental Prototype System Dem / Assessment	4	2020	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>				Project (Number/Name) AX8 / <i>Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>			
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
<i>AX8: Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>	-	14.500	24.700	23.421	-	23.421	-	-	-	-	0.000	62.621
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Under the Advanced Targeting and Lethality Automated System (ATLAS) effort, this Project matures and integrates advanced Artificial Intelligence/Machine Learning (AI/ML) algorithms to enable aided target detection/recognition capability for NGCV using next generation, multi-spectral electro-optical and infrared (EO/IR) targeting sensors. AI/ML algorithms are integrated with real-time intelligent fire control and mission planning interfaces to demonstrate automated turret capabilities, and provide overmatch via reduced target acquisition and engagement timelines.

Work in this Project is related to and fully integrated with the efforts funded in PE 0603462A (Next Generation Combat Vehicle Advanced Technology) / Project BF5 (Adv Lethality & Accuracy Sys for Med Cal Adv Tech); and Project BG1 (Sensors for Auto Oper and Survivability Adv Tech).

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

Work in this Project is performed by Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Advanced Targeting and Lethality Automated System (ATLAS)	14.500	23.799	23.421
Description: The ATLAS effort matures, integrates, and demonstrates novel algorithms and sensor enhancements for Next Generation Combat Vehicle (NGCV) manned or unmanned vehicle platforms. It integrates autonomous, wide-area search sensors and gimballed targeting sensors with real-time computer aided detection, recognition, and identification of threats for significantly decreased time to engagement. It integrates target acquisition with intelligent fire control systems to demonstrate an end-to-end engagement system on NGCV platforms, and enable experimentation and soldier touch-points for manned, unmanned, or optionally manned platforms.			
FY 2022 Plans: Will integrate on the move target ID capability into the ATLAS system and perform data collection of the prototype system. Will begin interfacing the ATLAS system to the IVAS for Ground and vehicle video/data architecture systems.			
FY 2023 Plans: Integrate and demonstrate ATLAS aided target acquisition capabilities from a ground vehicle while on-the-move in complex scenarios. Mature aided target acquisition algorithms and threat training data sets to improve target detection and recognition			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX8 / <i>Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
performance against real targets. Embed real-time algorithms into integrated, ruggedized processing approaches optimized for next generation digital sensors and integration on to ground combat platforms. Finalize interface control documentation updates for the sensor and aided targeting algorithm modules. FY 2022 to FY 2023 Increase/Decrease Statement: Funding represents planned lifecycle of effort.				
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		-	0.901	-
Accomplishments/Planned Programs Subtotals		14.500	24.700	23.421
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) <i>AX8 / Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.901		-		-		-	0.000	0.901	-
Subtotal			-	-		0.901		-		-		-	0.000	0.901	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ALAS-MC: Procure Ammo Rounds H/W	C/Variou	ARDEC : Picatinny, NJ	3.524	-		-		-		-		-	0.000	3.524	-
ALAS-MC: Control Unit	C/Variou	ARDEC : Picatinny, NJ	0.286	-		-		-		-		-	0.000	0.286	-
ALAS-MC: Test Hardware	TBD	ARDEC : Picatinny, NJ	0.191	-		-		-		-		-	0.000	0.191	-
ATLAS: System Design	TBD	CERDEC : Fort Belvoir, VA	4.762	4.900		-		-		-		-	0.000	9.662	-
ATLAS: Artificial Intelligence/Machine Learning Development	TBD	CERDEC : Fort Belvoir, VA	6.191	-		23.799		-		-		-	0.000	29.990	-
ATLAS: Data Collection and Synthetic Data	TBD	CERDEC : Fort Belvoir, VA	7.682	-		-		-		-		-	0.000	7.682	-
ATLAS: Vehicle Integration and Test	TBD	C5ISR Ft. Belvoir : TBD	1.333	1.600		-		1.355		-		1.355	0.000	4.288	-
ATLAS: System Design	TBD	C5ISR Ft. Belvoir VA : TBD	-	-		-		5.853		-		5.853	0.000	5.853	-
ATLAS: Artificial Intelligence/Machine Learning Development	TBD	C5ISR Ft. Belvoir VA : TBD	-	4.400		-		7.463		-		7.463	0.000	11.863	-
ATLAS: Data Collection and Labeling	TBD	C5ISR Ft. Belvoir VA : TBD	-	1.100		-		2.455		-		2.455	0.000	3.555	-
ATLAS: Synthetic Imagery Development and Perception Studies	TBD	C5ISR Ft. Belvoir VA : TBD	-	0.600		-		1.465		-		1.465	0.000	2.065	-

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) <i>AX8 / Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>

Event Name	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																				
ATLAS																																																
Optimize ATLAS Target ID Algorithm for on the move																																																
Fabricate ATLAS Prototype for on move Target ID and eval via Soldier Touch Pt																																																
Prototype for on move Target ID and evaluation - Soldier Touch Pt																																					▲ 1											
3GEN FLIR B-Kit Evaluation and Design																																																
Interface Control Document (ICD) and Algorithm Programming Interface (API) Deve																																																
Field Data Collections for Algorithm Training																																																
Tethered Processing Definition and Integration																																																
Processor Maturation and Testing																																																
Vehicle Integration and Demonstration Events (PC22, OTM, etc)																																																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX8 / <i>Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ATLAS	1	2020	4	2022
System Design	1	2020	4	2020
Optimize ATLAS Target ID Algorithm for on the move	1	2022	4	2022
Fabricate ATLAS Prototype for on move Target ID and eval via Soldier Touch Pt	1	2022	4	2022
Prototype for on move Target ID and evaluation - Soldier Touch Pt	1	2023	1	2023
3GEN FLIR B-Kit Evaluation and Design	1	2022	2	2023
Interface Control Document (ICD) and Algorithm Programming Interface (API) Devel	1	2022	2	2023
Field Data Collections for Algorithm Training	1	2022	4	2022
Tethered Processing Definition and Integration	1	2022	2	2023
Processor Maturation and Testing	2	2022	4	2023
Vehicle Integration and Demonstration Events (PC22, OTM, etc)	1	2022	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>				Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>			
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
<i>AX9: Adv Mobility Experimental Prototype Adv Tech</i>	-	15.209	12.500	15.234	-	15.234	-	-	-	-	0.000	42.943
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project integrates and demonstrates advanced powertrain, power generation, and running gear technologies into a prototype ground combat vehicle. Advanced Mobility Experimental Prototype (AMEP) activities will demonstrate increased mobility, increased maneuver speeds, reduced fuel demands, and onboard power generation available for advanced lethality and protection technologies. The experimental prototype will be evaluated in realistic operating environment to validate performance and capability enhancements to inform ground combat vehicle programs of record.

This work is coordinated with PE 0603462A (Next Generation Combat Vehicle Advanced Technology) / BG4 (Adv Mobility Experimental Prototype Adv Tech Demo).

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

Work in this Project is performed by Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Advanced Mobility Experimental Prototype	15.209	12.044	15.234
Description: Efforts integrate advanced powertrain and onboard electrical power generation into a ground combat vehicle to demonstrate reduced percentage of no-go terrain, increased acceleration and maneuver speeds across all traversable terrain, increased electrical payload capabilities and, reduced fuel consumption. These technologies improve operational capabilities by extending time between resupply, improving operational range and tactical maneuver options and, increase onboard electrical power generation for electrical subsystems and payloads. This effort provides advanced powertrain technology mitigating performance and maneuver limitations imposed by legacy powertrains, providing drive-by-wire engine, transmission, generator and thermal management systems enabling multi-domain operational maneuver capabilities for current and future ground combat vehicles. Effort will integrate, mature, and demonstrate an automated main gun and ammunition handling system to reduce time to engage, increase speed of battle, and increase platform lethality.			
FY 2022 Plans: Will test the 1000hp AMEP powertrain and enhancements of the turret system. Will install AMEP powertrain on a Bradley Fighting Vehicle and perform extended Soldier trials/evaluations (1,000+hrs of driving) to evaluate performance, endurance, and			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>compliance to environmental requirements (temperature range, dust/dirt, vibration, etc). Will prototype and evaluate the enhanced turret system with advanced munition loading capability and improved crew performance.</p> <p>FY 2023 Plans: Develop, mature and integrate control systems, air induction and filtration, exhaust system, cooling, final drives, and controls into the AMEP experimental prototype. Integrate higher-capacity Advanced Combat Engine and Advanced Combat Transmission into a medium weight-class combat vehicle for performance demonstration. Integrate breech automation, autoloader magazine, and transfer mechanism with fire control. Mature and optimize both hardware and software. Integrate and demonstrate advances in ammunition handling systems and armament automation to evaluate system performance for transition of materiel solutions to Abrams upgrade, next generation main battle tank, and robotic combat vehicle programs of record.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Normal progression of the effort. Funding supports testing and evaluation of the prototype system.</p>			
<p>Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.456	-
Accomplishments/Planned Programs Subtotals	15.209	12.500	15.234

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

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.456		-		-		-	0.000	0.456	-
Subtotal			-	-		0.456		-		-		-	0.000	0.456	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Design and Integration of Components	C/Various	GVSC : Warren, MI	0.909	6.100		4.818		-		-		-	5.000	16.827	-
Develop air handling, cooling system, final drives & controls	C/Various	GVSC : Warren, MI	2.909	-		-		-		-		-	0.000	2.909	-
Fabricate Powertrain Technologies	C/Various	GVSC : Warren, MI	3.409	-		-		1.134		-		1.134	0.000	4.543	-
Fabricate Advanced Running Gear	C/Various	GVSC : Warren, MI	2.409	-		-		-		-		-	0.000	2.409	-
Design Integration for Surrogate Platform	C/Various	GVSC : Warren, MI	0.432	-		-		-		-		-	0.000	0.432	-
Component Fabrication	TBD	GVSC : Warren, MI	-	6.729		-		-		-		-	7.700	14.429	-
Capability Demonstration	TBD	GVSC : Warren, MI	-	2.380		-		3.600		-		3.600	5.000	10.980	-
Turret Enhancements	TBD	GVSC : Warren, MI	-	-		7.226		10.500		-		10.500	0.000	17.726	-
Subtotal			10.068	15.209		12.044		15.234		-		15.234	17.700	70.255	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		10.068	15.209	12.500	15.234	-	15.234	17.700	70.711	N/A

Remarks


UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>

Event Name	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
Powertrain																												
Perform Design, Fab. & Int. for 850 hp Propulsion and Leader/Follower capability																												
Demonstrate Technologies and Leader/Follower capability																												
Demonstrate Drive-by-Wire Technologies Phase 2 vehicle																												
Perform Design, Fab, & Int. of 1000 hp Powertrain, Electrical & Control Systems																												
Demonstrate Technologies (Camp Grayling) Phase 3 vehicle																												
Perform Fine tuning, Controls development, upgrades Phase 3 vehicle																												
Demonstrate Technologies (YPG) Phase 3 vehicle																												
Data Analysis and Final Report																												
Large Caliber Armament System (LCAS)																												
LCAS - Large Caliber Armament System (LCAS) TMI System Level 1																												
LCAS - Armament Automation Integration																												
LCAS - Autoloader Integration																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>	

Event Name	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
LCAS – Fire Control Integration	[Redacted]				[Redacted]																							
LCAS - Turret Integration	[Redacted]				[Redacted]																							
LCAS - Integration Demonstration	[Redacted]				[Redacted]								 Demonstration															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AX9 / <i>Adv Mobility Experimental Prototype Adv Tech</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Powertrain	1	2020	4	2023
Perform Design, Fab. & Int. for 850 hp Propulsion and Leader/Follower Capability	2	2020	3	2021
Demonstrate Technologies and Leader/Follower capability	3	2021	4	2021
Demonstrate Drive-by-Wire Technologies Phase 2 vehicle	2	2021	3	2021
Perform Design, Fab, & Int. of 1000 hp Powertrain, Electrical Power Phase 3	1	2021	3	2023
Demonstrate Technologies (Camp Grayling) Phase 3 vehicle	3	2022	4	2022
Perform Fine tuning, Controls development, upgrades Phase 3 vehicle	4	2022	2	2023
Demonstrate Technologies (YPG) Phase 3 vehicle	3	2023	4	2023
Data Analysis and Final Report	4	2022	4	2023
Large Caliber Armament System (LCAS)	1	2023	4	2023
LCAS - Large Caliber Armament System (LCAS) TMI System Level Design	2	2021	3	2022
LCAS ? Armament Automation Integration	2	2021	3	2023
LCAS ? Autoloader Integration	2	2021	2	2023
LCAS ? Fire Control Integration	2	2021	2	2023
LCAS - Turret Integration	2	2022	4	2023
LCAS - Integration Demonstration	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY2 / <i>Army Operational Fires</i>
--	--	---

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
AY2: <i>Army Operational Fires</i>	-	17.336	37.832	11.051	-	11.051	-	-	-	-	0.000	66.219
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures and demonstrates a ground-launched, treaty-compliant weapon system capable of destroying critical relocatable, time critical targets in contested Anti-Access/Area Denial (A2/AD) environments. Activities include system-level prototyping to extend the range of Army fires well beyond 499km to complement other fires developments.

Work in this Project complements PE 0604182A (Hypersonics).

Army senior leadership approves Technology Maturation Initiative projects prior to budget year programming based on priority and opportunity, ensuring that demonstrations have a high potential for filling capability gaps and transitioning.

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

Work in this Project is performed by the Rapid Capabilities and Critical Technologies Office (RCCTO).

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

	FY 2021	FY 2022	FY 2023
Title: Army Operational Fires	17.336	36.451	11.051
Description: This Project matures and demonstrates a ground-launched, treaty-compliant weapon system capable of destroying critical relocatable, time critical targets in contested Anti-Access/Area Denial (A2/AD) environments. Activities include system-level prototyping to extend the range of Army fires well beyond 499km to complement other fires developments.			
FY 2022 Plans: Mature Hypersonic Missile All-Up-Round (AUR) Hardware-in-the-Loop (HWIL) technology improvements. Integrate AUR hardware with launch platform simulation, simulators, and actual equipment. Demonstrate and update Rapid Trajectory Generator (RTG) fire control software for the hypersonic weapon system. Mature AUR missile booster stack for increased missile performance through weight reduction. Achieve Short Hot Launch (SHOTL) test objectives through conduct of a series of canister egress missile and solid rocket booster tests. Continue maturation of ruggedized All Up Round (AUR) Electronic Ground Support Equipment (EGSE).			
FY 2023 Plans: Complete and transition ruggedized All Up Round (AUR) Electronic Ground Support Equipment (EGSE). Implement updates and demonstrate Command and Control (C2) algorithms for the Rapid Trajectory Generation (RTG). Transition and field improved			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY2 / <i>Army Operational Fires</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
capability concurrent with the fielding of LRHW in FY23. Demonstrate Performance Improvements through Modeling and Simulation.				
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding is due to the completion of SHOTL test development, SHOTL test series and Missile Booster Thermal Protection Manufacturing Tech Maturation.				
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)		-	1.381	-
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		17.336	37.832	11.051
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY2 / <i>Army Operational Fires</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.381		-		-		-	0.000	1.381	-
Subtotal			-	-		1.381		-		-		-	0.000	1.381	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Army Operational Fires	C/CPIF	Lockheed-Martin - Denver : Denver	18.122	17.336		36.451		11.051		-		11.051	52.700	135.660	-
Subtotal			18.122	17.336		36.451		11.051		-		11.051	52.700	135.660	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		18.122	17.336	37.832	11.051	-	11.051	52.700	137.041	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY2 / <i>Army Operational Fires</i>

Event Name	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
AUR HWIL Prototype Tech Maturation																												
Short Hot Launch Test Development																												
Missile Booster Thermal Protection Manufacturing Tech Maturation																												
Rapic Trajectory Generator (RTG) Maturation																												
SHOTL Test Series																												
RTG Demonstration					▲ 1																							
Tech Maturation for Performance Improvement																												
Ground Spt Equipment Tech Maturation																												
GSE Tech Maturation Demonstration #1									▲ 2																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY2 / <i>Army Operational Fires</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AUR HWIL Prototype Tech Maturation	3	2020	2	2022
Short Hot Launch Test Development	4	2020	3	2022
Missile Booster Thermal Protection Manufacturing Tech Maturation	1	2021	4	2022
Rapic Trajectory Generator (RTG) Maturation	4	2020	2	2023
SHOTL Test Series	1	2022	4	2022
RTG Demonstration	2	2022	2	2022
Tech Maturation for Performance Improvement	1	2022	3	2023
Ground Spt Equipment Tech Maturation	1	2022	4	2023
GSE Tech Maturation Demonstration #1	3	2022	3	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY3 / <i>Strategic Long Range Cannon</i>
--	--	--

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
AY3: <i>Strategic Long Range Cannon</i>	-	62.769	-	-	-	-	-	-	-	-	0.000	62.769
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures and integrates long-range armament technologies for both weapons and munitions to demonstrate potential deep strike objective capabilities from future cannon artillery systems. It will demonstrate revolutionary performance to support Long Range Fires by further developing, integrating, and demonstrating enhanced lethality and range extension solutions for cannon system performance with maximum effects. Strategic Long Range Cannon (SLRC) activities include integrating component technologies into sub-system and system-level experimental prototypes for novel cannon, munition, and fire control, including guidance and propulsion.

Extended Range Cannon Artillery (ERCA) activities mature, integrate, and demonstrate a novel sub-system for ammunition handling and a long-range artillery projectile to support prototyping and experimentation of a next-generation, extended range armaments system that will provide significantly increased range and accuracy without an increase in platform weight.

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

Work in this Project is performed by Army Research, Development, Test and Evaluation (RDT&E) Enterprise.

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

	FY 2021	FY 2022	FY 2023
Title: Strategic Long Range Cannon	62.769	-	-
Description: This effort will integrate and prototype subsystem technologies to further enhance range, lethality, and precision enablers for extended range cannon and munition systems.			
Accomplishments/Planned Programs Subtotals	62.769	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY3 / <i>Strategic Long Range Cannon</i>	

Event Name	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
Strategic Long Range Cannon Hardware Contracting Activities																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) AY3 / <i>Strategic Long Range Cannon</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Strategic Long Range Cannon Hardware Contracting Activities	2	2020	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>				Project (Number/Name) CE4 / <i>Emerging Technology Initiatives Development</i>			
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
CE4: <i>Emerging Technology Initiatives Development</i>	-	-	42.420	-	-	-	-	-	-	-	0.000	42.420
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort completes in Fiscal Year (FY) 2022

A. Mission Description and Budget Item Justification

Emerging Technology Initiative Development projects address out-of-cycle advanced technologies that have emerged from DoD labs and centers, industry partners, Program Executive Offices, and non-traditional vendors that potentially address existing Programs of Record requirements and require funding to expedite their transition for operational use. Funding will rapidly and efficiently prototype and demonstrate emerging technologies such as machine learning, human machine teaming, directed energy, hypersonics, advanced weapon systems, detection systems, and energy generation and storage.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Emerging Technology Initiatives Development</p> <p>Description: Emerging technologies from the DoD enterprise or non-traditional vendors that require funding to expedite their transition to Programs of Record (PoRs) that are directed by the Army Technology Maturation Board could include machine learning, human machine teaming, directed energy, hypersonics, advanced weapon systems, detection systems, and energy generation and storage. Effort will evaluate and confirm component and subsystem maturation for integration in major systems to provide a strategic effect that addresses near-term and mid-term threats</p> <p>FY 2022 Plans: Funds will support 3-Star Technology Maturation Board approved Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms, and Anubis Software Defined Chipset for M-Code and Advanced PNT Applications efforts within PE0604115A / AX3.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding is being realigned to PE0604115A / AX3 Technology Maturation Initiatives efforts.</p>	-	33.646	-
<p>Title: Rapid Capabilities and Critical Technology Office (RCCTO) Innovation Funding</p> <p>Description: Projects approved by the Army Rapid Capabilities and Critical Technology Office (RCCTO) Army Senior Leadership Board of Directors that address Army needs by integrating nontraditional innovators with the Army's research and development ecosystem and accelerating transition to rapid fielding of their technology. Innovative Funding will fund technical scouting,</p>	-	7.226	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) CE4 / <i>Emerging Technology Initiatives Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>concept incubation, staged pilot evaluations, and prototype development in Army-wide disciplines through rigorous technical assessment, Soldier feedback, and mentorship. Technology focus areas include machine learning, artificial intelligence, human-machine teaming, directed energy, hypersonics, advanced weapon systems, detection systems, weapon systems cyber resiliency, advanced offensive and defensive cyber, multi-domain command and control, edge processing technologies, electronic warfare, sensor to shooter capabilities, autonomy & robotics, unmanned aerial and terrestrial sensors, resilient and open standard communications, advanced network operation tools, counter unmanned aerial systems, quantum computing, quantum sensing, advanced manned/unmanned aerial systems, and energy generation and storage. These efforts will provide strategic effects that address near-term and mid-term threats.</p> <p><i>FY 2022 Plans:</i> Will conduct RCCTO sponsored Innovation Outreach Days and prize competitions with academia, small/non-traditional companies and the Defense Industrial Base seeking to apply their technology to prescribed Army capability gaps; execute pilot evaluations and/or prototype development for selected technology concepts.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding is being realigned to PE0604115A / AX3 Technology Maturation Initiatives efforts.</p>			
<p><i>Title:</i> Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p><i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC ?638</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638</p>	-	1.548	-
Accomplishments/Planned Programs Subtotals	-	42.420	-

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p> <p>D. Acquisition Strategy Based on projects selected and approved, efforts leverage a variety of contract vehicles, including Other Transaction Authority Agreements to complete the projects.</p>
--

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) CE4 / <i>Emerging Technology Initiatives Development</i>	

Event Name	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
Rapid Capabilities and Critical Technology Office Innovation Funding																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>Technology Maturation Initiatives</i>	Project (Number/Name) CE4 / <i>Emerging Technology Initiatives Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Rapid Capabilities and Critical Technology Office Innovation Funding	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>
---	--

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	-	5.776	39.376	225.147	-	225.147	461.536	519.511	252.825	271.364	Continuing	Continuing
CR9: <i>Directed Energy M-SHORAD / M-SHORAD Inc 2</i>	-	-	-	207.588	-	207.588	248.884	212.212	78.942	61.771	0.000	809.397
CS1: <i>M-SHORAD Inc 3</i>	-	-	-	7.196	-	7.196	202.249	296.906	163.486	199.199	0.000	869.036
FI4: <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	-	5.776	39.376	10.363	-	10.363	10.403	10.393	10.397	10.394	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Maneuver-Short Range Air Defense (M-SHORAD) capability provides air protection to the maneuvering forces by defeating, destroying, or neutralizing Rotary-Wing (RW), Fixed-Wing (FW), Unmanned Aircraft Systems (UAS), and Rockets, Artillery and Mortar (RAM) threats. This capability will be provided through a multi-phase, Family of Systems (FoS) approach, to include the rapidly fielded M-SHORAD Increment 1 (Inc. 1) and follow-on M-SHORAD Increments 2 and 3 (Inc. 2 & 3). Increments 2 and 3 will develop nascent capability and support Army demonstration and test initiatives to increase integrated offensive and defensive capability across warfighter functions and multiple domains.

(FI4) Inc. 1 (formally known as Initial Maneuver Short Range Air Defense (IM-SHORAD)) is an Air Defense weapon system consisting of multiple ground-to-air missile launchers, sensors, and a gun integrated on a Stryker Combat Vehicle. The Inc. 1 system will provide the Army improved capabilities for defense of maneuver formations and other tactical echelons from low altitude air attack and surveillance. The system is in response to an adaptive suite of airborne threat capabilities, supported by an integrated mix of surface-to-air and surface-to-surface shooters that threaten the ability of maneuver forces to conduct operations. Specifically, maneuver formations require the Inc. 1 air defense identification and defeat capabilities to counter FW, RW, and UAS threats. The Army definitized the production contract for 124 MSHORAD INC 1 systems on 4 February 2022. The negotiated prices resulted in a change in procurement quantities for all three years. Updated quantities by FY are, Prior Year (29 qty.), FY21 (62 qty.) and FY22 (33 qty.)

(CR9) Inc. 2 will provide a 50-kilowatt (kW)-class laser capability integrated onto a Stryker Combat Vehicle to provide an air defense capability to defeat RW, UAS, RAM, and Intelligence, Surveillance, and Reconnaissance (ISR) threats to the maneuvering forces.

(CS1) Inc. 3 will provide next generation defeat capabilities with increased range and lethality, providing increased protection to the maneuver formations. Additionally, Inc. 3 will be compatible with the existing M-SHORAD Inc. 1 platform and will provide a Soldier Portable Capability (SPC) to meet the need for dismounted air defense.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	4.813	39.376	0.000	-	0.000
Current President's Budget	5.776	39.376	225.147	-	225.147
Total Adjustments	0.963	0.000	225.147	-	225.147
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.963	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	225.147	-	225.147

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>				Project (Number/Name) CR9 / <i>Directed Energy M-SHORAD / M-SHORAD Inc 2</i>			
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
CR9: <i>Directed Energy M-SHORAD / M-SHORAD Inc 2</i>	-	-	-	207.588	-	207.588	248.884	212.212	78.942	61.771	0.000	809.397
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project is a continuation of work previously justified in PE 0604117A/Project FI4 and PE 0605054A/Project FI3.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

Maneuver Short Range Air Defense Increment 2 (M-SHORAD Inc. 2) is a 50 kW-class laser weapon system integrated onto a Stryker Combat Vehicle. The system will provide air defense capability to defeat Rotary Wing (RW); Groups 1-3 Unmanned Aircraft Systems (UAS); Rocket, Artillery, and Mortar (RAM); and Intelligence, Surveillance, and Reconnaissance (ISR) threats to a maneuver unit. M-SHORAD Inc. 2 will transition from the Army Rapid Capabilities and Critical Technologies Office (RCCTO) to the Program Executive Office Missiles and Space (PEO M&S) M-SHORAD Product Office in FY 2025.

FY 2023 (CR9) funding in the amount of \$207.588 million ensures M-SHORAD Inc. 2 system development and maturation will allow transition of effort from RCCTO to PEO M&S.

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

	FY 2021	FY 2022	FY 2023
Title: M-SHORAD Inc. 2 RCCTO Prototype Efforts	-	-	186.970
FY 2023 Plans: The RCCTO will use a portion of the FY 2023 funds (\$186.970 million) to continue building and integrating prototype vehicles for deliveries through FY 2024 and conduct Contractor Logistic Support (CLS) for a prototype platoon.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 funding was previously captured in FI4. Funding increase is due to integration costs associated with producing additional prototype vehicles.			
Title: M-SHORAD Inc. 2 PEO MS Transition Efforts	-	-	20.618
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) CR9 / <i>Directed Energy M-SHORAD / M-SHORAD Inc 2</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
The M-SHORAD Product Office will use a portion of the FY 2023 funds (\$20.618 million) to initiate acquisition and contract documents to support a competitive production decision and conduct a user assessment with the prototype platoon delivered in FY 2022. <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2022 funding was previously captured in FI4. Funding increase is due to program planning costs and transition efforts.			
Accomplishments/Planned Programs Subtotals	-	-	207.588

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

N/A

Remarks

D. Acquisition Strategy

Increment 2 will transition from the Army RCCTO to the PEO M&S M-SHORAD Product Office in FY 2025. The RCCTO will utilize an Other Transaction Authority (OTA) contract to buy additional vehicle prototypes; the M-SHORAD Product Office will initiate acquisition and contract documents to support a competitive production decision.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) CR9 / Directed Energy M-SHORAD / M-SHORAD Inc 2
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Management Inc. 2	TBD	Trident, Intuitive Research and others : Huntsville, AL	-	-		-		2.698	Oct 2022	-		2.698	Continuing	Continuing	-
Subtotal			-	-		-		2.698		-		2.698	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Development, Prototypes and Integration Inc. 2	TBD	RCCTO OTA : Various	-	-		-		166.950	Jan 2023	-		166.950	Continuing	Continuing	-
User Assessment	TBD	OGA : Multiple	-	-		-		12.930	Oct 2022	-		12.930	0.000	12.930	-
Subtotal			-	-		-		179.880		-		179.880	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Contractor Logistics Support (CLS) Inc. 2	TBD	To Be Determined : Various	-	-		-		20.020	Jan 2023	-		20.020	Continuing	Continuing	-
Support Costs	TBD	OGA : Multiple	-	-		-		4.990	Oct 2022	-		4.990	0.000	4.990	-
Subtotal			-	-		-		25.010		-		25.010	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			-	-	-	207.588	-	207.588	Continuing	Continuing	N/A

Remarks
FY 2022 cost data for CR9 Directed Energy M-SHORAD / M-SHORAD Inc 2 is shown in the R-3 Exhibit for F14 (M-SHORAD Inc.1).

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) CR9 / Directed Energy M-SHORAD / M-SHORAD Inc 2	

Event Name	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
M-SHORAD Inc. 2 Other Transaction Authority (OTA) Award					▲ 1																							
M-SHORAD Inc. 2 Prototyping																												
M-SHORAD Inc. 2 Prototype Platoon Second Unit Issued													▲ 3															
M-SHORAD Inc. 2 Contractor Logistics Support (CLS)																												
M-SHORAD Inc. 2 User Assessment													▲ 2															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) CR9 / <i>Directed Energy M-SHORAD / M-SHORAD Inc 2</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M-SHORAD Inc. 2 Other Transaction Authority (OTA) Award	2	2022	2	2022
M-SHORAD Inc. 2 Prototyping	2	2022	4	2024
M-SHORAD Inc. 2 Prototype Platoon Second Unit Issued	4	2024	4	2024
M-SHORAD Inc. 2 Contractor Logistics Support (CLS)	1	2023	4	2025
M-SHORAD Inc. 2 User Assessment	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>				Project (Number/Name) CS1 / <i>M-SHORAD Inc 3</i>			
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
CS1: <i>M-SHORAD Inc 3</i>	-	-	-	7.196	-	7.196	202.249	296.906	163.486	199.199	0.000	869.036
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
This project is a continuation of work previously justified in PE0604117A/Project F14.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

Maneuver Short Range Air Defense Increment 3 (M-SHORAD Inc. 3) will provide next generation defeat capabilities with increased range and lethality, providing increased protection to the maneuver formations. Additionally, Inc. 3 will be compatible with the existing M-SHORAD Inc.1 platform and will provide a Soldier Portable Capability (SPC) to meet the need for dismounted air defense.

FY 2023 funding (CS1) in the amount of \$7.196 million supports Inc. 3 program initiation in second quarter FY 2023 with a competitive source selection evaluation to initiate technology verification for the next generation interceptor. The funding also initiates the prototype and development effort with contract award(s) scheduled for fourth quarter FY 2023.

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

	FY 2021	FY 2022	FY 2023
Title: M-SHORAD Inc. 3 Materiel Development/Integration	-	-	7.196
FY 2023 Plans: Conduct program initiation activities to include technical evaluations, development of appropriate milestone documentation, and initiation of contract award activities for planned Inc. 3 prototyping and development contract award scheduled for late FY23.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase due to establishing new project code for M-SHORAD Inc. 3 in FY 2023.			
Accomplishments/Planned Programs Subtotals	-	-	7.196

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

N/A

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) CS1 / M-SHORAD Inc 3

D. Acquisition Strategy

Increment 3 will replace the current Stinger capability with a new Short Range Air Defense Missile that is both Soldier-portable and compatible with existing Stinger Universal Vehicle Launchers, in addition to adding 30mm Multi-Mode Proximity Ammunition. FY23 is program initiation, solicitation, and contract award.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) CS1 / <i>M-SHORAD Inc 3</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Management Inc. 3	C/T&M	Trident, Intuitive Research and others : Huntsville, AL	-	-		-		1.389	Oct 2022	-		1.389	Continuing	Continuing	-
Subtotal			-	-		-		1.389		-		1.389	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering & Technical Support Inc. 3	SS/T&M	Combat Capabilities Command : Redstone Arsenal, AL	-	-		-		2.083	Oct 2022	-		2.083	Continuing	Continuing	-
Systems Development and Integration Inc. 3	TBD	Contractor : Multiple	-	-		-		3.724	May 2023	-		3.724	Continuing	Continuing	-
Subtotal			-	-		-		5.807		-		5.807	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			-	-	-	7.196	-	7.196	Continuing	Continuing	N/A

Remarks
 FY 2022 CS1 cost data for M-SHORAD Inc. 3 is shown in the R-3 Exhibit for F14 (M-SHORAD Inc.1).

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)		Project (Number/Name) CS1 / M-SHORAD Inc 3	

Event Name	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
M-SHORAD Inc. 3 Industry Collaboration																												
M-SHORAD Inc. 3 Prototype contract award(s)																												
M-SHORAD Inc. 3 Design, Development, Prototype Building & Performance Assessment																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) CS1 / <i>M-SHORAD Inc 3</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M-SHORAD Inc. 3 Industry Collaboration	2	2022	4	2022
M-SHORAD Inc. 3 Prototype contract award(s)	4	2023	4	2023
M-SHORAD Inc. 3 Design, Development, Prototype Building & Performance Assessment	4	2023	4	2028

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>				Project (Number/Name) FI4 / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>			
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
FI4: <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	-	5.776	39.376	10.363	-	10.363	10.403	10.393	10.397	10.394	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Army definitized the production contract for 124 MSHORAD INC 1 systems on 4 February 2022. The negotiated prices resulted in a change in procurement quantities for all three years. Updated quantities by FY are, Prior Year (29 qty.), FY21 (62 qty.) and FY22 (33 qty.)

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Maneuver Short Range Air Defense (M-SHORAD) Increment 1 (Inc.1) systems add commensurate mobility and survivability to the maneuvering forces through protection against enemy air threats. The system consists of existing capabilities integrated onto a Stryker A1 Double-V Hull (DVH) Infantry Carrier Vehicle (ICV). The Reconfigurable Integrated-weapons Platform (RIWP) and Mission Equipment Package (MEP) house multiple missile and gun effectors integrated onto the Stryker A1 DVH vehicle.

The Army definitized the production contract for 124 MSHORAD INC 1 systems on 4 February 2022. The negotiated prices resulted in a change in procurement quantities for all three years. Updated quantities by FY are, Prior Year (29 qty.), FY21 (62 qty.) and FY22 (33 qty.)

FY 2023 funding (FI4) in the amount of \$10.363 million supports upgrades for the M-SHORAD Inc. 1 systems through individual materiel changes to address operational lessons-learned and other system performance improvements/enhancements providing capability overmatch against emerging threats.

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

	FY 2021	FY 2022	FY 2023
Title: Initial M-SHORAD Materiel Development/Integration	5.776	37.939	10.363
FY 2022 Plans: Inc.1. (\$13.600 million) Engineering & Technical Support- This RDTE funding supports OTA contracts for engineering design, analysis integration, and systems modifications for obsolescence associated with internal radar and command and control systems. Additionally, other product improvements are required to advance the discharge of 30mm munitions and modernize GPS equipment for GPS-denied environments. (\$8.674 million) Technical Support- This RDTE funding supports personnel assigned to government organizations to manage the various product improvements associated with OTA contracts. (\$3.479 million)			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Inc.2. (\$24.600 million) Program Management (PM) - Personnel in support of M-SHORAD Product Office (contractor support). FY 2022 PM costs support Inc. 2 planning. Current funding for Inc. 2 supports personnel currently working in the Inc. 2 Product Office (PO). The PO plans to transition the Inc. 2 team in FY 2024 to M-SHORAD PO. (\$3.000 million) System Development, Prototypes and Integration - RDTE dollars placed through Rapid Capabilities and Critical Technologies Office (RCCTO) Other Transaction Authority contract for vendors that produce components and integrate prototype systems. (\$21.600 million)</p> <p>Inc.3. (\$1.186 million) Prepare Requests for Information, conduct Industry Day, review white papers for Next Generation Interceptors. Industry Day will provide information for qualified contractors for a competitive shoot-off.</p> <p>FY 2023 Plans: Continue Engineering & Technical Support to ensure support of future planning for M-SHORAD Inc.1 technology insertions, upgrades through individual materiel changes to address operational lessons learned, and other system performance improvements/enhancements to provide overmatch capability against emerging threats. The M-SHORAD PO also plans to conduct an Expeditionary Operational Assessment (EOA) in late FY23 to assess constraints/limitations of the M-SHORAD Inc. 1 system. Data from this event will support follow-on Program of Record Requirements.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease due to completion of Developmental Testing and Operational Assessment improvements and transition to continuous technical insertions/upgrades to keep pace with the evolving threat.</p>				
<p>Title: FY22 SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>		-	1.437	-
Accomplishments/Planned Programs Subtotals		5.776	39.376	10.363

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• C14301: <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	517.287	331.575	135.747	-	135.747	58.336	-	-	-	Continuing	Continuing

Remarks

The Army definitized the production contract for 124 MSHORAD INC 1 systems on 4 February 2022. The negotiated prices resulted in a change in procurement quantities for all three years. Updated quantities by FY are, Prior Year (29 qty.), FY21 (62 qty.) and FY22 (33 qty.)

D. Acquisition Strategy

M-SHORAD Increment 1 is a Rapid Acquisition Program responding to a Directed Requirement signed by the Vice Chief of Staff of the Army (VCSA) on 21 February 2018 to provide a short-term solution to address the lack of air defense capability in current maneuver formations. Prototyping and integration activities were conducted with three vendors utilizing three separate Other Transaction Authority (OTA) contracts. The M-SHORAD PO awarded a production IDIQ Undefinitized Contract Action (UCA) on September 30, 2020 to field four M-SHORAD Battalions. The production contract was definitized on 4 February 2022.

Initially, logistics and maintenance support for Inc. 1 systems will be provided through Interim Contractor Support (ICS) using the Production Indefinite Delivery, Indefinite Quantity (IDIQ) Contract. A Business Case Analysis (BCA) will be performed during the ICS phase to determine the most economical and beneficial way to support the production units in the out years through either CLS, Organic Depot support, or a hybrid of Contractor Logistics Support (CLS)/Organic logistics and maintenance support. Recurring RDT&E in FY 2023 and beyond provides for the upgrade of the M-SHORAD Inc. 1 systems through individual materiel changes and upgrades to address operational lessons-learned and other system performance improvements/enhancements to provide overmatch capability against emerging threats.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) F14 / Maneuver - Short Range Air Defense (M-SHORAD)
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Management Inc. 1	Various	Trident, Intuitive Research and others : Huntsville, Alabama	5.704	0.376	Apr 2021	-		0.350	Oct 2021	-		0.350	Continuing	Continuing	-
FY 2020 SBIR/STTR Transfer Inc. 1	TBD	Various : Various	1.210	-		-		-		-		-	0.000	1.210	-
Product Management Inc. 2	TBD	Trident, Intuitive Research and others : Huntsville, Alabama	-	-		2.300	Oct 2021	-		-		-	0.000	2.300	-
SBIR/STTR TRANSFER	SS/TBD	Various : Various	-	-		1.437		-		-		-	0.000	1.437	-
Subtotal			6.914	0.376		3.737		0.350		-		0.350	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering & Technical Support Inc. 1	MIPR	Combat Capabilities Development Command : Redstone Arsenal, AL	3.148	-		-		1.912	Oct 2022	-		1.912	Continuing	Continuing	-
System Development, Prototypes and Integration Inc. 1	C/CPIF	Defense Ordnance Technology Consortium (DOTC) : Various	135.387	2.000	Mar 2021	-		-		-		-	0.000	137.387	-
Government Furnished Equipment (GFE) Inc. 1	MIPR	Program Executive Officer Missiles and Space : Various	8.079	-		-		-		-		-	0.000	8.079	-
Product Improvements - Inc. 1	TBD	To Be Determined : Huntsville, AL	-	-		3.479	Oct 2021	5.261	Oct 2022	-		5.261	Continuing	Continuing	-
Next Gen M-SHORAD Interceptor Inc. 3	Various	Contractor : TBD	-	-		1.186	Oct 2021	-		-		-	0.000	1.186	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) F14 / Maneuver - Short Range Air Defense (M-SHORAD)
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Changes from M-SHORAD (Inc. 1) Fielding	Various	Contractor : TBD	-	1.000		8.674	Feb 2022	-		-		-	0.000	9.674	-
System Development, Prototypes and Integration Inc. 2	Various	Defense Ordnance Technology Consortium (DOTC) : Various	-	-		22.300	Jan 2022	-		-		-	0.000	22.300	-
Subtotal			146.614	3.000		35.639		7.173		-		7.173	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support Costs Inc. 1	MIPR	Aviation and Missiles Command (AMCOM) : Redstone Arsenal, AL	5.570	1.000	May 2021	-		-		-		-	0.000	6.570	-
Subtotal			5.570	1.000		-		-		-		-	0.000	6.570	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Testing Inc. 1	MIPR	Redstone Test Center (RTC) and White Sands Missile Range (WSMR) : Redstone, AL and WSMR, NM	12.573	-		-		-		-		-	0.000	12.573	-
Test Support Inc. 1	MIPR	RTC, WSMR, Target Management Office and others :	14.931	1.400	Mar 2021	-		2.840	Oct 2020	-		2.840	0.000	19.171	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) FI4 / Maneuver - Short Range Air Defense (M-SHORAD)
--	---	---

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Redstone, AL and WSMR, NM													
Subtotal			27.504	1.400		-		2.840		-		2.840	0.000	31.744	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		186.602	5.776	39.376	10.363	-	10.363	Continuing	Continuing	N/A

Remarks
 To provide more detail, funding for Inc. 2 and Inc. 3 were broken out (CR9 and CS1) in FY 2023. Prior Year cost data for CR9 Directed Energy M-SHORAD / M-SHORAD Inc. 2 and CS1 M-SHORAD Inc. 3 is shown in the R-3 Exhibit for FI4 (M-SHORAD Inc.1).

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Maneuver - Short Range Air Defense (M-SHORAD)	Project (Number/Name) F14 / Maneuver - Short Range Air Defense (M-SHORAD)

Event Name	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
M-SHORAD (Inc. 1) Testing	[Redacted]																											
M-SHORAD (Inc. 1) Contract Definitization	M-SHORAD (Inc. 1) Testing				M-SHORAD (Inc. 1) Contract Definitization																							
M-SHORAD (Inc. 1) Urgent Materiel Release (UMR)	M-SHORAD (Inc. 1) Urgent Materiel Release (UMR)				M-SHORAD (Inc. 1) Contract Definitization																							
M-SHORAD (Inc. 1) First Unit Equipped (FUE)	M-SHORAD (Inc. 1) Urgent Materiel Release (UMR)				M-SHORAD (Inc. 1) First Unit Equipped (FUE)																							
Engineering and Technical Support	M-SHORAD (Inc. 1) First Unit Equipped (FUE)				Engineering and Technical Support																							
Expeditionary Operational Assessment (EOA)	Engineering and Technical Support				Engineering and Technical Support				Expeditionary Operational Assessment (EOA)																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Maneuver - Short Range Air Defense (M-SHORAD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Directed Requirement	2	2018	2	2018
M-SHORAD Increment 1 (Inc. 1) Material Development/Integration	4	2018	1	2020
M-SHORAD (Inc. 1) Testing	4	2019	1	2021
M-SHORAD (Inc. 1) Contract Definitization	2	2022	2	2022
M-SHORAD (Inc. 1) Urgent Materiel Release (UMR)	3	2021	3	2021
M-SHORAD (Inc. 1) First Unit Equipped (FUE)	3	2021	3	2021
Engineering and Technical Support	1	2022	4	2027
Expeditionary Operational Assessment (EOA)	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604119A / Army Advanced Component Development & Prototyping
--	---

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	-	167.990	189.483	198.111	-	198.111	160.412	205.454	165.656	147.847	0.000	1,234.953
BR2: Advanced Component Development & Prototyping	-	167.990	189.483	198.111	-	198.111	160.412	205.454	165.656	147.847	0.000	1,234.953

A. Mission Description and Budget Item Justification

The Advance Component Development & Prototype budget line includes multiple efforts across the Army's Battlefield Operational Systems necessary to evaluate integrated technologies in the most high fidelity and realistic operating environment as possible to assess the performance or cost reduction potential of advanced technology.

Projects focus on proving component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives. Efforts also includes advanced technology demonstrations to expedite technology transition from the laboratory to operational use, with the goal of transitioning systems into the acquisition process within the FYDP.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	172.990	189.483	0.000	-	0.000
Current President's Budget	167.990	189.483	198.111	-	198.111
Total Adjustments	-5.000	0.000	198.111	-	198.111
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.000	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	198.111	-	198.111

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>
---	---

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	-	115.688	83.952	43.797	-	43.797	25.256	33.421	14.307	7.930	Continuing	Continuing
BV4: <i>Area Protection and Alt Nav Technology Development</i>	-	18.152	16.402	17.617	-	17.617	-	-	-	-	0.000	52.171
ED5: <i>Assured Positioning, Navigation and Timing (PNT)</i>	-	25.459	20.629	-	-	-	-	-	-	-	0.000	46.088
EH8: <i>DISMOUNTED</i>	-	15.313	12.253	10.452	-	10.452	11.126	10.484	6.591	0.958	Continuing	Continuing
EJ2: <i>MOUNTED</i>	-	56.764	34.668	15.728	-	15.728	14.130	22.937	7.716	6.972	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Assured Positioning, Navigation and Timing modernization priority.

The Assured Positioning, Navigation and Timing (APNT) provides Army ground maneuver forces access to assured PNT under conditions where Global Positioning Systems (GPS) may be limited or denied (jammed and spoofed) in support of the National Defense Authorization Act guidance. APNT products are ruggedized tactical systems that enable Army forces the ability to shoot, move, communicate, thereby allowing forces to maneuver from operational and strategic distances to close with, destroy, and exploit the enemy with sufficient combat power, tempo, and momentum. APNT addresses two critical capability gaps: Access and Integrity. Access is the ability to retrieve accurate PNT information in a contested Electronic Warfare/Cyber environment. Integrity is the ability to trust the PNT information. PNT is a critical enabler of many Army Maneuver, Fires, and Command and Control systems that are dependent on accurate Position and Timing, and a foundational Multi-Domain Battle capability to support: calibrated force posture (position and maneuver across strategic distances); multi-domain formations (operate in contested spaces against near-peer adversaries); convergence (continuous integration of capabilities in all domains).

The APNT Program in FY 2023 consists of three Projects; (BV4) Area Protection and Alternative Navigation (ALTNAV) Technology Development, (EH8) Dismounted APNT System (DAPS), and (EJ2) Mounted APNT System (MAPS). There are no Fiscal Year (FY) 2023 Base Research, Development, Test & Evaluation funds requested for Assured Positioning Navigation and Timing (ED5).

Approved Requirements: The Dismounted APNT System (DAPS) Capabilities Development Document (CDD) was Joint Requirements Oversight Council (JROC) approved on 28 January 2022. The Army Requirements Oversight Council (AROC) approved the Mounted APNT System (MAPS) CDD on 12 September 2020. MAPS and DAPS are implementing Congressional and OSD guidance to develop and field Military Code (M-Code) Global Positioning System (GPS) Ground user Equipment. The AROC approved the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Modular Open Suite of Standards (CMOSS) Mounted Form Factor (CMFF) Abbreviated Capabilities Development Document (A-CDD) on 04 January 2021. In support of House Report 116-442, 2020, the program will prototype modular cards and software according to the Modular Open System Approach (MOSA) standards, for future modernization and new weapons systems. On 31 January, 19 March, and 10 August 2019, the MAPS, DAPS, and Alternative Navigation (ALTNAV) Directed Requirements were approved, respectively. An abbreviated Capabilities Development Document (A-CDD) for the ALTNAV capability is drafted and in staffing. Joint Requirements Oversight

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>
---	---

Council Memo (JROCM) 049-10, dated 05 April 2010, approved the PNT Assurance Initial Capabilities Document and designated the Army as the Lead Component for Assured PNT.

(BV4) - The Area Protection and Alternative Navigation (ALTNAV) Technology Development project enables the effective transition of technologies from industry, academia, and government Science & Technology organizations, and consequent development of alternative and complementary PNT technologies for integration into Mounted APNT System (MAPS) and Dismounted APNT System (DAPS) to pace or overmatch current and evolving threats and in support of the National Defense Authorization Act (NDAA) Guidance (2021 NDAA: Section 1611). Area Protection & ALTNAV Technologies will be developed in order to demonstrate Modular Open System Approach (MOSA), Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Modular Open Suite of Standards (CMOSS), ALTNAV, and Science & Technology emerging complementary PNT.

(EH8) - The DAPS meets congressional (10 USC 2281) and Department of Defense guidance to provide resilient, survivable, M-Code Global Positioning System (GPS) capable Ground User Equipment (MGUE) receivers. The DAPS will provide Soldiers Assured PNT (APNT) information utilizing various sources of PNT data to address multiple threats and ensure mission success where Global Positioning System (GPS) may be limited or denied. DAPS will deliver APNT in an optimized form factor that supports dismounted mission profiles in denied environments.

(EJ2) - The MAPS meets congressional (10 USC 2281) and Department of Defense guidance to provide resilient, survivable, M-Code Global Positioning System (GPS) capable Ground User Equipment (MGUE) receivers. The MAPS will deliver systems that provide the Army's combat forces access to assured PNT information under conditions where space-based GPS may be limited or denied to enable Army forces the ability to move, shoot, communicate, and provide situational awareness.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	115.688	96.679	0.000	-	0.000
Current President's Budget	115.688	83.952	43.797	-	43.797
Total Adjustments	0.000	-12.727	43.797	-	43.797
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-11.884			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	43.797	-	43.797
• FFRDC Transfer	-	-0.843	-	-	-

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) BV4 / Area Protection and Alt Nav Technology 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
BV4: Area Protection and Alt Nav Technology Development	-	18.152	16.402	17.617	-	17.617	-	-	-	-	0.000	52.171
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The primary focus of Area Protection and Alt Nav Technology Development is to enable the effective transition of incremental and disruptive technologies to fieldable Positioning, Navigation and Timing (PNT) solutions to pace or overmatch current and evolving threats in support of the National Defense Authorization Act (NDAA) Guidance (2021 NDAA: Section 1611).

This project supports the Alternative Navigation (ALTNAV) capability and complementary PNT technologies. ALTNAV provides frequency and source diversity that enables Army users access to accurate and assured position and time information in GPS denied environments. An Abbreviated Capabilities Development Document (A-CDD) for the ALT NAV capability is drafted and in staffing. Complementary PNT technology includes network integration, installation and testing of the infrastructure capability and user equipment. Other efforts include the continuation of situational awareness development, spectrum modification for PNT solutions, and modeling and simulation support.

Program activities include component maturation, prototyping, and demonstration to bridge the gap between advanced technology development (S&T and Industry) and fieldable products. These activities demonstrate the military utility to enable effective transitions and synergize development across products. Military Global Positioning System (GPS) is limited to specific frequency bands that can be defeated by our enemies.

Modular card prototyping and software development are conducted in accordance with the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Modular Open Suite of Standards (CMOSS) (Reference House Report 116-442, 2020). Hardware and software technologies will transition to Mounted Assured PNT System (MAPS) and Dismounted Assured PNT System (DAPS) programs of record. These technologies comply with the PNT Reference Architecture and Modular Open System Approach (MOSA) compliant hardware; CMOSS and software frameworks (PNT Operating System (pntOS)), to ensure a plug and play capability.

Fiscal Year (FY) 2023 Base funds in the amount of \$17.617 Million support ALTNAV Enterprise Ground Control Segment Development and Testing, CMOSS PNT card prototyping, and development, engineering demonstrations and testing.

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

	FY 2021	FY 2022	FY 2023
Title: Area Protection & Alt Nav Technology Development	18.152	15.799	17.617
Description: The effort supports complementary and Alternative Navigation (ALTNAV) PNT capabilities.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) BV4 / <i>Area Protection and Alt Nav Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Fiscal Year (FY) 2022 Base funds in the amount of \$15.799 Million support ALTNAV Enterprise Ground Control Segment Development and Testing, CMOSS PNT card prototyping, and development, engineering demonstrations and testing.</p> <p>FY 2023 Plans: Fiscal Year (FY) 2023 Base funds in the amount of \$17.617 Million support ALTNAV Enterprise Ground Control Segment Development and Testing, CMOSS PNT card prototyping, and development, engineering demonstrations and testing.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increased from \$15.799 Million in FY 2022 to \$17.617 Million in FY 2023 for Alternative Navigation (ALTNAV) Ground Control Segment Development and Testing.</p>			
<p>Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 Base funds in the amount of \$0.603 Million will support Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased from \$0.603 Million in FY 2022 to \$0.000 Million in FY 2023. This decrease is due to Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction.</p>	-	0.603	-
Accomplishments/Planned Programs Subtotals	18.152	16.402	17.617

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• EH8: <i>DISMOUNTED</i>	15.313	12.253	10.452	-	10.452	11.126	10.484	6.591	0.958	0.000	67.177
• EJ2: <i>MOUNTED</i>	56.764	34.668	15.728	-	15.728	14.130	22.937	7.716	6.972	Continuing	Continuing
• AW6: <i>Modular GPS Independent Sensors Advanced Tech</i>	10.684	6.791	10.131	-	10.131	12.289	16.702	14.629	20.609	0.000	91.835
• AV8: <i>Navigation Warfare (NAVWAR) Advanced Technology</i>	2.535	1.927	1.949	-	1.949	6.002	3.958	5.985	-	0.000	22.356
• 0603639A: <i>Tank and Medium Caliber Ammunition</i>	106.881	73.844	64.669	-	64.669	78.962	101.511	104.969	105.985	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) BV4 / <i>Area Protection and Alt Nav Technology Development</i>
--	---	---

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks
The project matures prototyping or other demonstrations to prove out technology before it is integrated into a Program of Record (PoR). This is solidified by the following linkage:

- Modular GPS Independent Sensors (AW6)
- Navigation Warfare (AV8)
- Tank and Medium Caliber Ammunition (0603639A)

Linked to:

Area Protection and Alternative Navigation (ALTNAV) technology development (BV4)

Linked to:

Dismounted Assured PNT Systems (EH8)
Mounted Assured PNT Systems (EJ2)

D. Acquisition Strategy

Alternative Navigation (ALT NAV) and PNT card Technology Development will utilize prototyping, modeling & simulation and test fix test to assess the military utility of advanced component capabilities through critical Soldier touchpoints, laboratory, and field assessments to determine technology maturation for integration into Mounted Assured Positioning, Navigation, and Timing System (MAPS) and Dismounted Assured Positioning, Navigation, and Timing System (DAPS). Alternative Navigation (ALTNAV) Enterprise Capability for both ALT NAV and PNT Cards will be implemented by utilizing a mix of competitive Other Transaction Authority (OTA)'s and Federal Acquisition Regulation contracts. This will rapidly provide incremental capability to use and inform future MAPS and DAPS requirements.

Requirement documents include:

- Abbreviated Capabilities Development Document (A-CDD) for the ALT NAV capability is drafted and in staffing.
- DAPS Capabilities Development Document (CDD), Joint Requirements Oversight Council (JROC) Approved, 28 January 2022.
- Abbreviated Capabilities Development Document (A-CDD) for the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Modular Open Suite of Standards (CMOSS) Mounted Form Factor, Army Requirements Oversight Council (AROC) approved on 4 January 2021.
- MAPS Capabilities Development Document (CDD), Army Requirements Oversight Council (AROC) Approved, 12 September 2020.
- Alternative Navigation (ALTNAV) DR, 10 August 2019.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) BV4 / Area Protection and Alt Nav Technology Development
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Project Management Support	Various	Various : Various	-	0.835	Nov 2020	1.088	Nov 2021	1.112	Nov 2022	-		1.112	0.000	3.035	-
FY 2022 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.603	Mar 2022	-		-		-	0.000	0.603	-
Subtotal			-	0.835		1.691		1.112		-		1.112	0.000	3.638	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ALTNAV Enterprise Ground Control Segment	Various	Various : Various	-	1.291	Dec 2020	1.557	Dec 2021	6.883	Dec 2022	-		6.883	0.000	9.731	-
Modular Open System Approach (pntOS & CMOSS)	Various	Various : Various	-	9.309	Nov 2020	6.112	Nov 2021	3.268	Nov 2022	-		3.268	0.000	18.689	-
Subtotal			-	10.600		7.669		10.151		-		10.151	0.000	28.420	N/A

Remarks
 ALTNAV Enterprise Ground Control Segment increases from \$1.5 Million in FY2022 to \$6.883 Million in FY2023 due to all ALTNAV Enterprise activities are now consolidated under Project BV4. Prior to FY23 ALTNAV Enterprise efforts were funded, depending on the scope of work, under either BV4 or ED5 funds.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Services - Government	Various	C5ISR : Various	-	0.238	Nov 2020	0.123	Nov 2021	0.265	Nov 2022	-		0.265	0.000	0.626	-
Engineering and Technical Services - Contractor	Various	DCS Corporation / MITRE / DOTC : APG, MD	-	4.844	Nov 2020	3.344	Nov 2021	3.760	Nov 2022	-		3.760	0.000	11.948	-
Subtotal			-	5.082		3.467		4.025		-		4.025	0.000	12.574	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) BV4 / Area Protection and Alt Nav Technology Development
--	--	--

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluations	Various	Various : Various	-	1.635	Dec 2020	3.575	Dec 2021	2.329	Dec 2022	-		2.329	0.000	7.539	-
Subtotal			-	1.635		3.575		2.329		-		2.329	0.000	7.539	N/A

Remarks
 Test and Evaluation include Open Innovation Lab (OIL), System Integration Lab (SIL), and ALTNAV testing. The Open Innovation Lab (OIL) conducts a recurring series of data driven demonstrations and evaluations of high Technical Readiness Level (TRL) operationally effective PNT solutions that transition to production easily in order to pace/overmatch enemy PNT threat systems.

	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	-	18.152	16.402	17.617	-	17.617	0.000	52.171	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) BV4 / <i>Area Protection and Alt Nav Technology Development</i>	

Event Name	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
ALTNAV Enterprise Ground Control Segment																												
ALTNAV Enterprise Ground Control Segment																												
PNT Technical Demonstrations & Testing																												
Tech Demonstrations & Testing																												
Modular Opens Systems Approach, PNT Operating System & C																												
MOSA, pntOS, CMOSS																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) BV4 / <i>Area Protection and Alt Nav Technology Development</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ALTNAV Enterprise Ground Control Segment	2	2019	4	2023
PNT Technical Demonstrations & Testing	1	2020	4	2023
Modular Opens Systems Approach, PNT Operating System & CMOSS	1	2021	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)			
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
ED5: Assured Positioning, Navigation and Timing (PNT)	-	25.459	20.629	-	-	-	-	-	-	-	0.000	46.088
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Assured Positioning, Navigation and Timing (PNT) project funds the Resiliency and Software Assurance Measures (RSAM) which provides increased capability and situational awareness for fielded legacy military Global Positioning System (GPS) receivers supporting systems and soldiers through at least 2035. Legacy GPS receivers targeted for RSAM enhancements, include but are not limited to, 226,000 Defense Advanced GPS Receiver (DAGR) and 200,000+ embedded Ground Based-GPS Receiver Applications Module (GB-GRAM). RSAM software upgrades mitigate threats to legacy DAGR and GB-GRAM Selective Availability and Anti-Spoof Module (SAASM) based military GPS receivers. RSAM provides an interim solution in a GPS-challenged operational environment until future Positioning, Navigation and Timing (PNT) solutions are fully deployed. RSAM will coordinate integrated software testing with military system managers and the test community to validate software and synchronize RSAM deployment to the user. Additionally, the Assured PNT project supports the Alternative Navigation (ALTNAV) capability that will provide positioning and timing information for navigation for the Army, which completes critical timing and equipment upgrades, and key certification activities. These connections, upgrades, and certification activities are critical to operationalizing ALTNAV as an effective and suitable contingency source of PNT data in the event GPS is denied.

There are no Base funds for project Assured PNT (ED5) in FY 2023. RSAM is transitioning into fielding and sustainment. The ALTNAV ground segment efforts for FY 2023 will transition to Area Protection & Alt Nav Technology (BV4).

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

	FY 2021	FY 2022	FY 2023
Title: Resiliency and Software Assurance Measures (RSAM)	15.206	13.335	-
Description: Funding supports the following efforts:			
FY 2022 Plans:			
FY 2022 base funds in the amount of \$13.335 Million will complete development of RSAM DAGR Update 2 and RSAM GB-GRAM Update 2, to include prototype testing, formal qualification testing, and risk mitigation efforts. RSAM DAGR and RSAM GB-GRAM receiver integration testing efforts for this update will be performed in association with military vehicles and systems.			
FY 2022 to FY 2023 Increase/Decrease Statement:			
There are no Base funds for project Assured PNT (ED5) in FY 2023. Effort ends in FY 2023.			
Title: Assured PNT Enablers	10.253	6.521	-
Description: Assured PNT Enablers.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: FY 2022 base funds in the amount of \$6.521 million will support development of Assured PNT enablers to include network integration and certification of ALTNAV ground segment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There are no Base funds for project Assured PNT (ED5) in FY2023.</p>			
<p>Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>Description: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 Base funds in the amount of \$0.773 Million will support Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased from \$0.773 Million in FY 2022 to \$0.000 Million in FY 2023. There are no Base funds for Assured PNT (ED5) in FY 2023. Efforts end in FY 2022.</p>	-	0.773	-
Accomplishments/Planned Programs Subtotals	25.459	20.629	-

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• K49010: Mounted/ Dismounted Receivers	5.894	1.990	2.127	-	2.127	2.406	2.429	2.435	2.433	Continuing	Continuing

Remarks
K49010 / Mounted/Dismounted Receivers is an OPA subset of Line Item Number K49000 / Assured Positioning, Navigation and Timing.

D. Acquisition Strategy
Resiliency and Software Assurance Measures (RSAM) will provide software improvements to legacy military GPS receivers by awarding contracts to the original equipment manufacturer and leverage the test community to develop and characterize prototypes and final software solutions.

Assured PNT enablers will provide build, integrate and test the ALTNAV enterprise by utilizing a mix of competitive Other Transaction Authority (OTA)'s and Federal Acquisition Regulation contracts.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Project Management Support	Various	Various : Various	2.693	0.921	Nov 2020	1.456	Nov 2021	-		-		-	0.000	5.070	-
FY 2022 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.773	Mar 2022	-		-		-	0.000	0.773	-
Subtotal			2.693	0.921		2.229		-		-		-	0.000	5.843	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RSAM - DAGR Software Development	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	1.168	5.750	Nov 2020	2.655	Oct 2021	-		-		-	0.000	9.573	-
RSAM - GB-GRAM Software Development	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	2.902	4.736	Nov 2020	6.117	Nov 2021	-		-		-	0.000	13.755	-
Assured PNT Enablers	Various	Various : Various	5.177	10.253	Nov 2020	6.521	Nov 2021	-		-		-	0.000	21.951	-
RSAM - MicroGRAM Software Development	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	2.158	-		-		-		-		-	0.000	2.158	-
Subtotal			11.405	20.739		15.293		-		-		-	0.000	47.437	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Contracting Services	C/FFP	DCS Corp : APG, MD	9.445	1.558	Jan 2021	0.921	Oct 2021	-		-		-	0.000	11.924	-
Engineering and Technical Government Services	MIPR	Various : Various	3.049	1.141	Dec 2020	0.998	Nov 2021	-		-		-	0.000	5.188	-
Subtotal			12.494	2.699		1.919		-		-		-	0.000	17.112	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)

Event Name	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
RSAM Update 1	[Bar]				[Bar]																							
RSAM GB-GRAM Software Development & Testing Update 1	[Bar]				[Bar]																							
Platform Integration Testing Update 1	[Bar]				[Bar]																							
RSAM GB-GRAM Update 1 Software Release	[Bar]				[Bar]																							
RSAM Update 2	[Bar]				[Bar]																							
RSAM DAGR Software Development and Testing Update 2	[Bar]				[Bar]																							
RSAM GB-GRAM Software Development and Testing Update 2	[Bar]				[Bar]																							
Platform Integration Testing Update 2	[Bar]				[Bar]																							
RSAM DAGR Update 2 Software Release	[Bar]				[Bar]																							
RSAM GB-GRAM Update 2 Software Release	[Bar]				[Bar]																							
Assured PNT Enablers	[Bar]				[Bar]																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
RSAM Update 1	1	2019	2	2021
RSAM DAGR Software Development and Testing Update 1	1	2018	4	2020
RSAM GB-GRAM Software Development & Testing Update 1	1	2019	2	2021
Platform Integration Testing Update 1	1	2019	2	2021
RSAM DAGR Software Release Update 1	4	2020	4	2020
RSAM GB-GRAM Update 1 Software Release	2	2021	2	2021
RSAM Update 2	4	2019	4	2022
RSAM DAGR Software Development and Testing Update 2	2	2020	4	2022
RSAM GB-GRAM Software Development and Testing Update 2	4	2020	4	2022
Platform Integration Testing Update 2	3	2021	4	2022
RSAM DAGR Update 2 Software Release	2	2023	2	2023
RSAM GB-GRAM Update 2 Software Release	4	2023	4	2023
Assured PNT Enablers	1	2019	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH8 / DISMOUNTED
--	--	--

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
EH8: <i>DISMOUNTED</i>	-	15.313	12.253	10.452	-	10.452	11.126	10.484	6.591	0.958	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Dismounted Assured PNT (APNT) System (DAPS) will meet congressional (10 USC 2281) and Department of Defense guidance to provide and field Military Code (M-Code) Global Positioning System (GPS) to dismounted Soldiers, Commanders, and applicable End User Devices to provide assured timing and position data necessary to effectively engage targets, share data across the network, and conduct mission command functions. DAPS will deliver APNT in an optimized form factor that supports dismounted mission profiles in denied environments and use cases where mounted APNT solutions are not available. DAPS includes the development of hardware and software to integrate M-Code, GPS, Alternative Navigation (ALTNAV) signals, non-radio frequency (RF) sensors, and other PNT sources to generate and distribute a fused APNT data.

Fiscal Year (FY) 2023 Base funds in the amount of \$10.452 Million will support the completion of engineering development, production and manufacturing readiness as well as Production Qualification Testing (PQT) and Initial Operational Test and Evaluation (IOT&E) in preparation for Full Rate Production Decision 2Q FY2024. Additionally, the DAPS program will develop a Full and Open Competitive Contract Request for Proposal for the next iteration of the DAPS (DAPS Modular Open Systems Approach (MOSA)) form factor.

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

	FY 2021	FY 2022	FY 2023
Title: Dismounted APNT System (DAPS)	15.313	11.805	10.452
Description: This effort supports the DAPS hardware and software development, system engineering and client integration, development and operational testing, and program management efforts.			
FY 2022 Plans: FY 2022 Base funds in the amount of \$11.805 Million will support continued engineering development, production and manufacturing readiness, and Limited User Test in preparation for Milestone C scheduled for 2Q FY 2023.			
FY 2023 Plans: Fiscal Year (FY) 2023 Base funds in the amount of \$10.452 Million supports the completion of engineering development, production and manufacturing readiness for DAPS Program of Record. The Production Qualification Testing (PQT) and Initial Operational Test and Evaluation (IOT&E) will begin in preparation for Full Rate Production Decision 2Q FY2024. Additionally, the DAPS program will develop a Full and Open Competitive Contract Request for Proposal for the next iteration of the DAPS (DAPS Modular Open Systems Approach (MOSA)) form factor.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased from \$11.805 Million in FY 2022 to \$10.452 Million in FY 2023. This decrease is due to completion of engineering development and production and manufacturing readiness.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)	-	0.448	-
Description: 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 decreased from \$0.448 Million in FY 2022 to \$0.000 Million in FY 2023. This decrease is due to Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction for FY22 in accordance with Title 15 USC ? 638			
Accomplishments/Planned Programs Subtotals	15.313	12.253	10.452

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
• K49020: <i>Dismounted Hub</i>	48.449	30.143	26.769	-	26.769	16.897	65.872	62.201	71.034	Continuing	Continuing
• BV4: <i>Area Protection and Alt Nav Technology Development</i>	18.152	16.402	17.617	-	17.617	-	-	-	-	0.000	52.171

Remarks
K49020 / Dismounted Hub is an OPA subset of Line Item Number 9897K49000 / Assured Positioning, Navigation and Timing.

Risk reduction prototyping efforts from 0604120A BV4 Area Protection and Alt Nav Technology Development will transition PNT Modernization/complementary PNT capabilities to the Dismounted Assured PNT System (DAPS).

D. Acquisition Strategy
The DAPS acquisition strategy consists of an iterative development security operations (DevSecOps) methodology for the development, testing, production and fielding of a material solution that implements Congressional guidance for M-Code capability (10 USC 2281), Modular Open Systems Approach (Reference House Report 116-442, 2020), and the DAPS Capability Development Document (CDD) (signed 28 January 2022) performance requirements. The DAPS strategy leverages competitive Other Transaction Authority (OTA) agreements and Small Business Innovative Research (SBIR) contracts to assess industry capabilities, develop prototypes, and mature technology upgrades. Developmental test and operational assessment results informed a best value decision in November 2021 for the selected material solution for final engineering development, production and manufacturing readiness, and Limited User Test (LUT). LUT results will inform a major capabilities

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>
<p>acquisition program Milestone C decision in 2Q FY 2023. Following a successful Milestone C decision, the Dismounted Assured PNT (APNT) System (DAPS) program will conduct production qualification testing and an Initial Operational Test and Evaluation (IOT&E) in 1Q FY 2024 to support a Full Rate Production Decision in 2Q FY 2024.</p> <p>The DAPS program will develop a Full and Open Competitive Contract Request for Proposal for the next iteration of the DAPS (DAPS Modular Open Systems Approach (MOSA) form factor. The DAPS Modular Open System Approach (MOSA) form factor is a follow on iteration of the DAPS. The DAPS MOSA form factor will increase the modularity of the DAPS. The increase modularity enables accelerated integration of new and innovative PNT capabilities to pace the threat at reduced non-recurring engineering costs. The DAPS MOSA will use industry small form factor MOSA standards for plug and play capabilities.</p> <p>DAPS requirement documents include:</p> <p>Quick Reaction Capability (QRC): DAPS Directed Requirement (19 Mar 2019), Alternative Navigation Directed Requirement (10 August 2019), APNT Requirements Trace and Concurrence for DAPS with ALTNAV Handheld Devices memorandum (16 April 2020) and DAPS Directed Requirement Addendum (18 May 2021).</p> <p>Program of Record (POR): DAPS Capabilities Development Document (CDD) was Joint Requirements Oversight Council (JROC) approved (28 January 2022).</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)						EH8 / DISMOUNTED					
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support	Various	Various : Various	-	0.279	Dec 2020	0.127	Dec 2021	0.113	Dec 2022	-		0.113	Continuing	Continuing	Continuing
FY 2022 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.448	Mar 2022	-		-		-	0.000	0.448	-
Subtotal			-	0.279		0.575		0.113		-		0.113	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAPS Prototyping & Engineering Development, Production & Manufacturing Readiness	MIPR	Various : Various	-	9.469	Dec 2020	5.487	Nov 2021	1.674	Dec 2022	-		1.674	Continuing	Continuing	Continuing
Engineering and Technical Product Development	MIPR	C5ISR : APG, MD	-	1.315	Dec 2020	1.185	Dec 2021	1.298	Dec 2022	-		1.298	Continuing	Continuing	Continuing
Subtotal			-	10.784		6.672		2.972		-		2.972	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services - Government	Various	C5ISR : Various	-	0.280	Nov 2020	0.251	Nov 2021	0.319	Nov 2022	-		0.319	Continuing	Continuing	Continuing
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	-	0.232	Dec 2020	0.165	Dec 2021	0.293	Dec 2022	-		0.293	Continuing	Continuing	Continuing
Subtotal			-	0.512		0.416		0.612		-		0.612	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>
--	---	---

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluations	MIPR	Various : Various	-	3.738	Dec 2020	4.590	Dec 2021	6.755	Mar 2023	-		6.755	Continuing	Continuing	Continuing
Subtotal			-	3.738		4.590		6.755		-		6.755	Continuing	Continuing	N/A

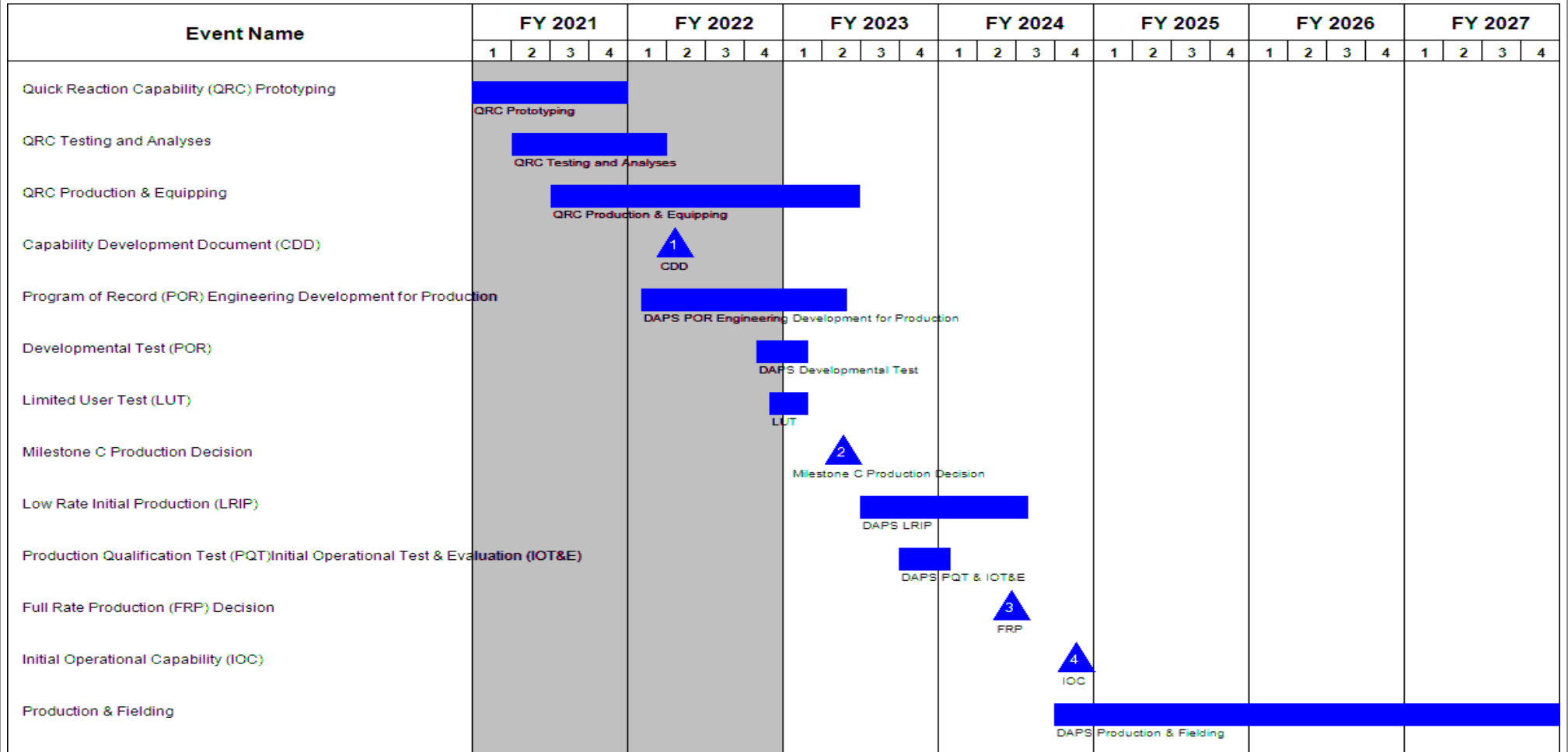
Remarks
Test and Evaluation costs in FY23 increased for Production Qualification Testing (PQT) and Initial Operational Test and Evaluation (IOT&E) in preparation for Full Rate Production 2Q FY2024

	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	-	15.313	12.253	10.452	-	10.452	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>



UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>

Event Name	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
DAPS Modular Open System Approach (MOSA) Form Factor Prototype Development																												
DAPS MOSA Form Factor Production Maturation																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Quick Reaction Capability (QRC) Prototyping	2	2019	4	2021
QRC Testing and Analyses	2	2021	1	2022
QRC Production & Equipping	3	2021	2	2023
Capability Development Document (CDD)	2	2022	2	2022
Program of Record (POR) Engineering Development for Production	1	2022	2	2023
Developmental Test (POR)	4	2022	1	2023
Limited User Test (LUT)	4	2022	1	2023
Milestone C Production Decision	2	2023	2	2023
Low Rate Initial Production (LRIP)	3	2023	3	2024
Production Qualification Test (PQT)Initial Operational Test & Evaluation (IOT&E)	4	2023	1	2024
Full Rate Production (FRP) Decision	2	2024	2	2024
Initial Operational Capability (IOC)	4	2024	4	2024
Production & Fielding	4	2024	4	2028
DAPS Modular Open System Approach (MOSA) Form Factor Prototype Development	3	2024	2	2025
DAPS MOSA Form Factor Production Maturation	3	2025	1	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / 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
EJ2: MOUNTED	-	56.764	34.668	15.728	-	15.728	14.130	22.937	7.716	6.972	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mounted Assured Positioning, Navigation and Timing System (MAPS) meets congressional (10 USC 2281) and Department of Defense guidance to provide resilient, survivable, M-Code Global Positioning System (GPS) capable Ground User Equipment (MGUE) receivers. The MAPS will deliver systems that provide the Army's combat forces access to assured PNT information under conditions where space-based GPS may be limited or denied to enable Army forces the ability to move, shoot, communicate, and provide situational awareness. MAPS addresses two critical capability gaps: Access and Integrity. Access is the ability to retrieve PNT information in a contested Electronic Warfare/Cyber environment. Integrity is the ability to trust the PNT information. PNT is a critical enabler of many Army Maneuver, Fire and Command and Control systems that are dependent on accurate Position and Timing. The MAPS will provide PNT when GPS is degraded or denied through military code (M-code) GPS, Alternative Navigation (ALTNV) signals, timing, sensor fusion, anti-jam antenna, and beam steering. This capability will deliver distributed assured PNT capabilities to Armored Stryker and Infantry Brigade Combat Team platforms in an iterative and affordable manner that allows for future modernization.

Fiscal Year (FY) 2023 Base dollars in the amount of \$15.728 Million support MAPS system engineering and management support, production qualification and Initial Operational Test and Evaluation in preparation for Full Rate Production.

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

	FY 2021	FY 2022	FY 2023
Title: Mounted APNT System (MAPS)	56.764	33.398	15.728
Description: Funding supports MAPS hardware and software development, systems engineering, platform and client system integration, development and operational testing, and program management efforts.			
FY 2022 Plans: FY 2022 Base dollars in the amount of \$33.398 Million supports software integration, client system and platform integration and testing efforts supporting 35 platform variants, completion of production maturation and program management activities. Milestone C is scheduled for 3Q FY 2022.			
FY 2023 Plans: Fiscal Year (FY) 2023 Base dollars in the amount of \$15.728 Million support MAPS system engineering and management support, production qualification and Initial Operational Test and Evaluation in preparation for Full Rate Production Decision 2Q FY2024. Complete final RDT&E integration efforts.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased from \$33.398 Million in FY 2022 to \$15.728 Million in FY 2023. This decrease is due to completion of product manufacturing readiness and transition of platform integration to OPA.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)	-	1.270	-
Description: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR).			
FY 2022 Plans: FY 2022 Base dollars in the amount of \$1.270 Million will support Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased from \$1.270 Million in FY 2022 to \$0.000 Million in FY 2023. This decrease is due to Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) reduction.			
Accomplishments/Planned Programs Subtotals	56.764	34.668	15.728

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
• K49030: <i>Mounted Hub A-PNT</i>	86.610	80.658	156.015	-	156.015	182.146	128.501	132.689	132.614	Continuing	Continuing
• BV4: <i>Area Protection and Alt Nav Technology Development</i>	18.152	16.402	17.617	-	17.617	-	-	-	-	0.000	52.171

Remarks
 K49030 / Mounted Hub APNT is an OPA subset of Line Item Number 9897K49000 / Assured Positioning, Navigation and Timing.
 0604120A BV4 Area Protection and Alt Nav Technology Development will transition PNT Modernization/complementary PNT capabilities to the MAPS.

D. Acquisition Strategy
 The Mounted Assured Positioning, Navigation and Timing System (MAPS) acquisition strategy consists of an iterative development operations methodology for the development, testing, production and fielding of a material solution that implements Congressional guidance for M-Code capability (10 USC 2281), modular open systems approach (Reference House Report 116-442, 2020), and the MAPS Capability Development Document (approved 12 September 2020) performance requirements. The MAPS strategy leveraged competitive Other Transaction Authority (OTA) agreements to assess industry capabilities, develop prototypes, and mature technology upgrades. Developmental test and operational assessment results informed a best value decision in September 2020 of the selected material solution for final engineering development, production and manufacturing readiness, and Limited User Test (LUT). LUT results will inform a major capabilities acquisition program Milestone C decision in 3Q FY 2022. A follow-on hybrid fixed priced indefinite duration indefinite quantity FAR production contract will be awarded providing production

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 4	PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	EJ2 / <i>MOUNTED</i>

test articles for Initial Operational Test and Evaluation (IOT&E) in FY 2023 and demonstrate production ramp-up. The IOT&E supports fielding to Armored, Stryker Brigade Combat Teams (BCTs) and the full rate production decision in 2Q FY 2024. FY 2024 follow on test and evaluation will demonstrate capability for remaining key leader and key combat platforms.

The Mounted Assured Positioning, Navigation and Timing System (MAPS) Modular Open System Approach (MOSA) is a follow on iteration of MAPS and provides an Assured PNT solution with M-Code GPS and Anti-Jam Antenna for use in a common platform chassis to reduce non-recurring engineering costs. Maturation, integration and testing of the MAPS MOSA will be initiated in FY 2025 followed by an Operational Assessment (OA).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Project Management Support	C/CPFF	Various : Various	-	1.812	Nov 2020	1.039	Nov 2021	0.890	Jan 2023	-		0.890	Continuing	Continuing	Continuing
FY 2022 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.270	Mar 2022	-		-		-	0.000	1.270	-
Subtotal			-	1.812		2.309		0.890		-		0.890	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Manufacturing Readiness (Product Maturation) Contract	C/FFP	Collins Aerospace : APG, MD	-	21.195	Nov 2020	1.407	Nov 2021	-		-		-	0.000	22.602	-
Mounted PNT Integration - Combat Platforms	C/CPFF	Various : Various	-	19.544	Mar 2021	12.782	Mar 2022	3.655	Dec 2022	-		3.655	0.000	35.981	-
Mounted PNT Integration - Combat Support Platforms	C/CPFF	Various : Various	-	0.407	Nov 2020	4.207	Jan 2022	0.175	Feb 2023	-		0.175	0.000	4.789	-
Mounted PNT Integration - Combat Services Support Platforms	Various	Various : Various	-	-		2.179	Feb 2022	-		-		-	0.000	2.179	-
Client Software Integration (Various)	MIPR	AvMC / S3l : Huntsville, AL	-	0.805	Feb 2021	0.400	Apr 2022	0.805	Feb 2023	-		0.805	0.000	2.010	-
Subtotal			-	41.951		20.975		4.635		-		4.635	0.000	67.561	N/A

Remarks
 FY2023 Client and Software Integration supports software integration for Victory and Mounted Mission Command.

 FY2023 Mounted PNT Integration completes all platforms initiated with RDTE in prior years (incrementally funded). The remaining platform and client integration will be funded by OPA.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED
--	--	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Services - Government	Various	C5ISR : Various	-	0.979	Oct 2020	1.800	Nov 2021	0.514	Nov 2022	-		0.514	Continuing	Continuing	Continuing
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	-	4.913	Nov 2020	5.608	Jan 2022	1.934	Jan 2023	-		1.934	Continuing	Continuing	Continuing
Subtotal			-	5.892		7.408		2.448		-		2.448	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Field Testing / Development Test	MIPR	Various : TBD	-	7.109	Dec 2020	3.976	Jan 2022	-		-		-	0.000	11.085	-
Production Qualification Test & Initial Operational Test & Evaluation (IOT&E)	TBD	Various : TBD	-	-		-		7.755	Dec 2022	-		7.755	0.000	7.755	-
Subtotal			-	7.109		3.976		7.755		-		7.755	0.000	18.840	N/A

Remarks
FY2023 Production Qualification Test & Initial Operational Test & Evaluation (IOT&E) testing validates performance against the MAPS Capability Development Document approved 12 September 2020.

	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	-	56.764	34.668	15.728	-	15.728	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED

Event Name	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										
Client and Platform Integration (RDT&E)	[Redacted]																																					
Client and Platform Integration (OPA)					[Redacted]																																	
Production Maturation - Phase 3	[Redacted]																																					
Development Test									[Redacted]																													
Limited User Test																																						
Milestone C Low Rate Initial Production (LRIP) Decision																																						
Production Contract Award																																						
LRIP / Full Rate Production (FRP) and Fielding									[Redacted]																													
Production Qualification Test & Initial Operational Test & Evaluation																																						
Full Rate Production Decision																																						
Follow on Test and Evaluation																																						
Initial Operational Capability																																						
Modular Open System Approach - PNT & AJ Development and Test																					[Redacted]																	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Client and Platform Integration (RDT&E)	3	2019	3	2023
Client and Platform Integration (OPA)	2	2022	4	2025
Mounted APNT Prototyping and Testing - Phase 1	1	2019	4	2019
Mounted APNT Prototyping and Testing - Phase 2	4	2019	4	2020
Operational Tech Demonstration	4	2020	4	2020
Direct Requirement Decision Selected Material Solution	4	2020	4	2020
Production Maturation - Phase 3	4	2020	3	2022
Development Test	3	2021	3	2022
Limited User Test	4	2021	4	2021
Milestone C Low Rate Initial Production (LRIP) Decision	3	2022	3	2022
Production Contract Award	3	2022	3	2022
LRIP / Full Rate Production (FRP) and Fielding	4	2022	1	2028
Production Qualification Test & Initial Operational Test & Evaluation	1	2023	4	2023
Full Rate Production Decision	2	2024	2	2024
Follow on Test and Evaluation	3	2024	3	2024
Initial Operational Capability	3	2024	3	2024
Modular Open System Approach - PNT & AJ Development and Test	1	2025	4	2027

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refinement & Prototyping
--	---

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	-	112.093	206.335	166.452	-	166.452	101.495	84.727	51.885	118.956	0.000	841.943
CR2: STE Information Systems (TSS, TMT)	-	-	102.443	111.385	-	111.385	50.665	36.198	35.800	35.099	0.000	371.590
CR3: STE Live	-	-	30.000	27.396	-	27.396	24.343	34.084	14.613	82.371	0.000	212.807
CR4: STE One World Terrain (OWT)	-	-	32.388	1.387	-	1.387	2.932	1.444	1.472	1.486	0.000	41.109
CR5: STE Reconfigurable Virtual Trainer (RVCT)	-	-	25.216	20.726	-	20.726	15.605	-	-	-	0.000	61.547
CR6: STE Squad Immersive Virtual Trainer (SiVT)	-	-	5.000	-	-	-	-	-	-	-	0.000	5.000
CR7: STE Soldier Virtual Trainer (SVT)	-	-	11.288	5.558	-	5.558	7.950	13.001	-	-	0.000	37.797
FD6: Synthetic Training Environment Refine & Prototype	-	105.354	-	-	-	-	-	-	-	-	0.000	105.354
SV1: Soldier/Squad Virtual Trainer	-	6.739	-	-	-	-	-	-	-	-	0.000	6.739

Note

In FY 2022, all requirements from Project FD6 - Synthetic Training Environment Refine & Prototype were realigned to Projects CR2 (STE Information Systems [TSS, TMT]), CR3 (STE Live), CR4 (STE One World Terrain [OWT]), CR5 (STE Reconfigurable Virtual Trainer [RVCT]), and CR7 (STE Soldier Virtual Trainer [SVT]).

In FY 2022, all requirements from Project SV1 - Soldier/Squad Virtual Trainer were realigned to Projects CR4 (STE One World Terrain [OWT]) and CR6 (STE Squad Immersive Virtual Trainer [SiVT]).

A. Mission Description and Budget Item Justification

These funding lines are directly aligned to the Army Synthetic Training Environment (STE) Modernization Priority.

The Synthetic Training Environment (STE) is the next generation holistic combined arms collective training capability that will enable leaders, Soldiers, and units from Squad through Army Service Component Command to train where they will fight, with the partners they will fight with, and in complex operational environments in support of Multi-Domain Operations (MDO). STE will revolutionize Army training by providing the repetition necessary at the Point of Need (PoN) for improved proficiency prior to live training or operations- improving Soldier lethality and survivability. The STE program has five Other Transaction Authority (OTA) contracts

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>
---	--

awarded in support of prototyping capabilities to an Initial Operating Capability (IOC) of FY 2023, and will implement an incremental fielding approach leveraging the Software Acquisition pathway. The STE will be available where training occurs (home station, combat training centers, armories, institutions, and deployed locations).

The STE is comprised of five main signature efforts: 1) STE-Information System (STE-IS); 2) Reconfigurable Virtual Collective Trainers (RVCT); 3) Squad Immersive Virtual Trainer (SiVT, in partnership with Solider Lethality's IVAS program); 4) STE Live; and 5) Solider Virtual Trainer. STE-IS is comprised of Synthetic Training Environment training capability consisting of One World Terrain (OWT), Training Simulation Software (TSS), and Training Management Tools (TMT). The RVCT will allow units to collectively train, using proponent developed Combined Arms Training Strategies (CATS), on a simulated, fully interactive, real-time battlefield. Squad Immersive Virtual Trainer (SiVT) is the immersive training capability delivered as part of the Integrated Visual Augmentation System (IVAS) for the close combat Squads that enables IVAS to be a fight, rehearse, and training platform. STE Live focuses on the development of twelve engagement types and five instrumentation enablers. The twelve engagement types are direct fire, counter-defilade fire, indirect fire, dropped objects, placed objects, thrown objects, guided weapons, autonomous weapons, cyber, directed energy, radiant energy, and plume; the five instrumentation enablers are calculations, networks, sensors, terrains, and transmitters. SVT, will provide training to Soldiers Army wide by providing a Weapons Skills Development (WSD), Joint Fires Trainer (JFT) and Use of Force (UoF). A future STE line of effort includes Next Generation Constructive (NGC) that will be scaled up from what the vendor is able to deliver through the STE-IS platform.

FY 2023 Projects CR2 through CR7 Base RDTE dollars in the amount of \$166.452 million funds significant development efforts in the STE-Information System (STE-IS), One World Terrain (OWT), Reconfigurable Virtual Collective Trainer (RVCT), Squad Immersive Virtual Trainer (SiVT), Soldier Virtual Trainer (SVT), and STE Live. NOTE - Projects CR2, CR3, CR4, CR6 and CR7 are not new starts; efforts were previously captured under projects FD6 and SV1.

The total cost of the STE Live (CR3) Middle Tier of Acquisition (MTA) effort is \$100.50 million RDT&E from FY2020 to FY2024.

The total cost of the RVCT (CR5) MTA effort is \$92.00 million RDT&E from FY 2022 to FY 2024. The remainder of STE RVCT is fully funded across the FYDP.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	112.093	194.195	0.000	-	0.000
Current President's Budget	112.093	206.335	166.452	-	166.452
Total Adjustments	0.000	12.140	166.452	-	166.452
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.460			
• Congressional Rescissions	-	-			
• Congressional Adds	-	14.600			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	166.452	-	166.452

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>
---	--

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

Project: CR3: STE Live

Congressional Add: *Congressional Add: Next generation MILES*

Congressional Add Subtotals for Project: CR3

Project: CR4: STE One World Terrain (OWT)

Congressional Add: *Congressional Add: Multi-Sensor Terrain Capture & Processing*

Congressional Add Subtotals for Project: CR4

Project: FD6: Synthetic Training Environment Refine & Prototype

Congressional Add: *Congressional Add for STE-LIVE - (Army requested transfer from WTCV line 5)*

Congressional Add Subtotals for Project: FD6

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	-	10.000
	-	10.000
	-	4.600
	-	4.600
	10.400	-
	10.400	-
	10.400	14.600

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>					Project (Number/Name) CR2 / <i>STE Information Systems (TSS, TMT)</i>			
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	
CR2: <i>STE Information Systems (TSS, TMT)</i>	-	-	102.443	111.385	-	111.385	50.665	36.198	35.800	35.099	0.000	371.590	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Training Simulation Software/Training Management Tools (TSS/TMT) will provide 2 of the 3 core functions for the Synthetic Training Environment - Information Systems (STE-IS). TSS/TMT will converge our current live, virtual, gaming and constructive environments to provide a single, unified training & management environment where units from Soldier/Squad to Army Service Component Command (ASCC) train in one or multiple live, virtual, gaming and constructive environments simultaneously.

The Training Simulation Software (TSS), the core STE simulation engine, provides the physical and behavior models necessary to replicate the operational environment to enable collective training from Soldier/Squad through ASCC. The TSS provides entity, aggregate, and common services, as well as adjudicates STE-IS interactions at the entity level (e.g., Computer-Generated Forces (CGF), and synthetic equipment). The Training Management Tool (TMT) is the capability that enables units to quickly plan collective training events, prepare training events; execute and monitor events, and assess event results and readiness. TMT provides an easy to use interface, combined with an Intelligent Tutor to reduce help-desk support, time, and manpower required for a training event. TMT will provide training management (data) services and authoritative data sources to enable training on demand to users regardless of geographic location.

In FY 2021, TSS/TMT adopted the execution of the Software Acquisition Pathway, tailored for software intensive systems. TSS/TMT plans to facilitate rapid and iterative delivery of its capabilities through Minimal Viable Products (MVP) and Minimum Viable Capability releases (MVCR) to support Squad (Sq) to Brigade (Bde) level training through 4QFY2023.

FY 2023 Base RDTE dollars in the amount of \$111.385 million for TSS/TMT will continue with the development of Minimal Viable Product (MVP) and delivery of Minimal Viable Capability Releases (MVCR) for the STE-IS to achieve a Battalion to Brigade level training capability. Base funding will also continue the implementation of DEVSECOPS process and software production pipeline to support STE-IS capability releases by echelons. Also, base funding will continue the development and integration of Avionics Software Emulation (AvSE) with TSS/TMT software baseline to support the RVCT Air capability.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for STE-IS	-	98.704	111.385
FY 2022 Plans: Funding supports the STE-IS TSS/TMT continued prototype development of the Minimal Viable Products (MVPs), testing and release of capability releases to achieve Squad through Company training capability. Continued prototype development and testing will focus in the following areas:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR2 / <i>STE Information Systems (TSS, TMT)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>-- Architecture: continue with the development of a scalable/flexible Modular Open System Approach (MOSA) architecture to deliver collective training capability at the Point of Need (PoN). Continue development of open/common interface to support technology insertion and interoperability with STE lines of effort (i.e. - OWT, RVCT-Air, RVCT-Ground, RVCT-Soldier and SVT).</p> <p>-- TMT: continue with the development of the user interfaces that would enable Commanders and Leaders at the Squad through Company echelons to design exercises/scenarios</p> <p>-- TSS: continue with the development of the STE core simulation engine to provide a synthetic environment which enable collective training from Squad through Company across the Fires, Movement and Maneuver, and Mission Command warfighting functions.</p> <p>-- Integration: Continue the integration of TSS, TMT, OWT, RVCT-Air, RVCT-Ground, RVCT-Soldier, Avionics Software Emulation (AvSE) and Mission Command Information Systems (MCIS) to deliver and integrated, training capable STE-IS system to support Squad through Company collective training tasks.</p> <p>-- Test/Evaluation: Conduct evaluation of the TSS/TMT MVPs through technical assessments, Soldier Touch Points, Early User Test and test planning events to provide STE-IS capability by echelons.</p> <p>-- Continue the implementation of the DEVSECOPS process and software production pipeline to support STE-IS capability releases by echelons.</p> <p>-- Continue the development and integration of AvSE with TSS/TMT software baseline to ensure that the RVCT-Air capability is concurrent with Aviation platform systems.</p> <p>FY 2023 Plans: Funding supports the STE-IS TSS/TMT continued prototype development of the Minimal Viable Products (MVPs), testing and release of capability releases to achieve Battalion to Brigade training capability. Continued prototype development and testing will focus in the following areas:</p> <p>-- Architecture: continue with the development of a scalable/flexible Modular Open System Approach (MOSA) architecture and Platform Development Kit (PDK) to deliver collective training capability at the Point of Need (PoN). Continue development of open/common interface to support technology insertion and interoperability with STE lines of effort (i.e. - OWT, RVCT-Air, RVCT-Ground, RVCT-Soldier, SVT and Live).</p> <p>-- TMT: continue with the development of the user interfaces that would enable Commanders and Leaders at the Company through Brigade echelons to Plan, Prepare, Execute and Assess (PPEA) training exercises/scenarios</p> <p>-- TSS: continue with the development of the STE core simulation/game engine to provide a synthetic environment which enable collective training from Company through Brigade across the Fires, Movement and Maneuver, and Mission Command warfighting functions.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR2 / <i>STE Information Systems (TSS, TMT)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
-- Integration: Continue the integration of TSS, TMT, OWT, RVCT-Air, RVCT-Ground, RVCT-Soldier, Avionics Software Emulation (AvSE), Mission Command Information Systems (MCIS), and Live, Virtual, Constructive ? Integration Architecture (LVC-IA) to deliver and integrate a training capable STE-IS system to support Squad through Brigade collective training tasks. -- Test/Evaluation: Conduct evaluation of the TSS/TMT MVPs through technical assessments, Soldier Touch Points, Early User Test, test planning events, and Operational Assessments to provide STE-IS capability by echelons. -- Continue the implementation of the DEVSECOPS process and the Continuous Integration/Continuous Delivery (CI/CD) software production pipeline to support STE-IS capability releases by echelons. -- Continue with the development and integration of AvSE with TSS/TMT software baseline to ensure that the RVCT-Air capability is concurrent with Aviation platform systems. -- Continue with the development and integration of Common Software Library (CSL) with TSS/TMT software baseline to ensure that the RVCT-G capability is concurrent with Ground platform systems. -- Continue enhancing the TSS/TMT software baseline based on Soldier/User feedback collected at Soldier Touch Points, Early User Test and Operational Assessments FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY2022 to FY2023 is due continued development of TSS/TMT to achieve Battalion to Brigade training capability.			
Title: 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	-	3.739	-
Accomplishments/Planned Programs Subtotals	-	102.443	111.385

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
• NA2016: STE INFO SYSTEMS (TSS/TMT)	-	-	9.722	-	9.722	9.837	10.036	10.265	10.261	0.000	50.121

Remarks
 Procurement dollars for Training Simulation Software/Training Management Tools (TSS/TMT) will provide Interim Contracting Support to conduct software updates, modifications, Risk Management Framework (RMF) concurrency, Problem Troubleshoot Reports (PTRs), and help desk support for fielded TSS/TMT capability.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR2 / <i>STE Information Systems (TSS, TMT)</i>

D. Acquisition Strategy

The TSS/TMT will be deployed as a software intensive program leveraging the Software Acquisition Pathway. To ensure speed and agility to deliver and modernize STE, a modular open systems architecture (MOSA) will also be used to enable the Army to exploit rapid advancements in cutting-edge commercial technologies. Other acquisition elements such as testing, contracting, and technology transition will consider any and all means available to innovate and incorporate complementary support to add momentum in this approach.

The TSS/TMT requirements are codified in the STE-IS Abbreviated Capabilities Development Document (A-CDD) version 2, approved 2 June 2020. TSS/TMT was one of five (5) OTAs awarded in FY 2019 in support of the STE prototype initiatives which include: TSS/TMT, OWT, RVCT, Live (market research only), and SVT Weapons Optimization (market research only). Prime(s) and Sub-vendors will execute the STE agreement(s) through an Agile development process with established success criteria and their DevSecOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the modular design effort in order to support success of the product(s) being developed for the STE.

The initial TSS/TMT OTA, awarded in FY2019, commenced the prototype development and evaluation of Minimal Viable Products (MVP) through technical assessments, Soldier Touch Points, and test planning events. Additionally, the initial agreement allowed the Government to fully understand and decompose the requirements, establish/describe interfaces between TSS/TMT and RVCT, Avionics Software Emulation (AvSE) and OWT capabilities, and exposed the Government to the readiness of additional technologies that will enable the delivery of an integrated STE. These lesson learned, along with incorporating the revised A-CDD updates, forms the basis of the new TSS/TMT follow-on OTA awarded in June 2021. The TSS/TMT follow-on OTA will continue prototype development and evaluation of MVPs through technical assessments, Soldier Touch Points, Early User Test, test planning events, and Operational Assessments to provide a Squad (Sq) to Brigade (Bde) training capability, in addition to, providing Minimum Viable Capability Releases (MVCR) in support of RVCT capability.

STE Increment 1 IOC is programmed for 4Q FY 2023 and is defined as the first fielding and acceptance of the STE-IS capability at installations identified IAW the distribution plan. Increment 1 fielded STE systems will include the following attributes: STE-IS capabilities in support of RVCT and the Soldier Virtual Trainer (SVT) IOC in FY 2023; meeting Information Assurance and Risk Management Framework requirements. New Equipment Training (NET) will include the capability to support the RVCT, and the ability to provide initial sustainment via interim contractor support (ICS). Soldiers will interface with the STE-IS through the Training Management Tools, and the Reconfigurable Virtual Collective Trainer (RVCT).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refinement & Prototyping	Project (Number/Name) CR2 / STE Information Systems (TSS, TMT)
--	---	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		3.739		-		-		-	Continuing	Continuing	Continuing
Subtotal			-	-		3.739		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TSS/TMT Prototype Development	Option/ FFP	Cole Engineering Services : Orlando, FL	-	-		87.429	Oct 2021	99.693	Oct 2022	-		99.693	Continuing	Continuing	Continuing
AvSE Development/ Integration	Various	CCDC AvMC/ PEO Aviation : Redstone Arsenal, AL	-	-		8.000	Jan 2022	8.790	Jan 2023	-		8.790	Continuing	Continuing	Continuing
Subtotal			-	-		95.429		108.483		-		108.483	Continuing	Continuing	N/A

Remarks
 Increase in TSS/TMT Prototype Development from FY2022 to FY2023 is due to focusing development effort to provide Battalion and Brigade capability.
 Increase in AvSE Development/Integration from FY2022 to FY2023 is due to finalizing developmental effort to ensure that the RVCT-Air capability is concurrent with Aviation platform systems.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MVCR	Various	Multiple : Orlando, FL	-	-		2.575	Feb 2022	2.108	Jul 2023	-		2.108	Continuing	Continuing	Continuing
TSS/TMT Test Support	Various	ATEC : Orlando, FL	-	-		0.700	Mar 2022	0.794	Oct 2022	-		0.794	Continuing	Continuing	Continuing
Subtotal			-	-		3.275		2.902		-		2.902	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refinement & Prototyping	Project (Number/Name) CR2 / STE Information Systems (TSS, TMT)

Event Name	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
STE-IS Capability Development	Development/Integration/Test																											
STE-IS MVCR	<div style="display: flex; align-items: center;"> ▲ 1 Squad/Company/Platoon </div>																											
STE-IS MVCR - Software Update R1	<div style="display: flex; align-items: center;"> ▲ 2 Battalion/Brigade </div>																											
STE-IS Production	Production																											
STE-IS Interim Contracting Support (ICS)	Support																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR2 / <i>STE Information Systems (TSS, TMT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
STE-IS Revised A-CDD (19 Jun 20)	3	2020	3	2020
STE-IS Capability Development	3	2019	4	2027
STE-IS MVCR	1	2023	1	2023
STE-IS MVCR - Software Update R1	4	2023	4	2023
STE-IS Production	1	2024	4	2032
STE-IS Interim Contracting Support (ICS)	1	2023	4	2025

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) CR3 / <i>STE Live</i>			
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
CR3: <i>STE Live</i>	-	-	30.000	27.396	-	27.396	24.343	34.084	14.613	82.371	0.000	212.807
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Element was previously funded from PE 604121A, Project FD6.

A. Mission Description and Budget Item Justification

The Synthetic Training Environment (STE) Live program develops live training systems in concert with the Cross Functional Team STE initiatives. The STE Live program converges live training with the STE, providing units the necessary training components to accelerate and sustain combined arms maneuver proficiency in support of Multi-Domain Operations (MDO). The STE Live program focuses on the development of next generation live training architecture that leverages innovative technologies and standards to enable the realistic exercise of unit combat weapons up to brigade level in Multi Domain Operation Environments. The challenge today is the Army cannot train as it fights since 40% of BCT platforms weapons effects are currently not simulated by today's live training system (Multiple Integrated Laser Engagement System (MILES)). STE Live next generation systems will replicate the following new engagement types, improve sensory feedback, increase realism of direct fire engagement, increase realism of battle damage assessments, improve after action reviews and improve instrumentation at the Combat Training Centers and Home Stations: Indirect Fire, Counter-Defilade (M320, MK-19), Place Object (Mines), Thrown Objects (Grenades), Dropped Objects (Bombs), Guided Weapon (Missiles), Autonomous Weapon (Missiles, Smart Munitions), Direct Energy (laser), Radiant Energy (Sonic, Microwave), CBRNE Plumes and Cyber.

FY 2023 Base RDTE dollars in the amount of \$27.396 million furthers development of STE Live prototype(s) to replicate the Tactical Engagement Simulation Systems (TESS) for multiple engagement scenarios (direct, indirect, counter-defilade, dropped, information warfare, CBRNE Plumes). These systems will replace up to six systems reaching end of useful life and enhance Soldier capability and training value. FY 2023 funds will also continue to revolutionize Soldier Simulation and Training systems to include a Synthetic Training Environment for 12 engagement types: Direct Fire, Counter-Defilade Fire, Indirect Fire, Dropped Objects, Placed Objects, Thrown Objects, Guided Weapons, Autonomous Weapons, Cyber, Directed Energy, Radiant Energy, and Plume. The 5 instrumentation enablers are Calculations, Networks, Sensors, Terrains, and Transmitters.

The total cost of the STE Live (CR3) Middle Tier of Acquisition (MTA) effort is \$100.50 million RDT&E from FY2020 to FY2024.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for STE Live	-	19.270	27.396
Description: Direct engineering development, support and test of the STE Live program through awarded OTA vehicles.			
FY 2022 Plans:			
FY 2022 Base RDTE dollars in the amount of \$19.270 million furthers development of STE Live prototype(s) into simulation training systems to replicate the training aid weapon systems for multiple engagement scenarios (direct, indirect, & counter-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR3 / <i>STE Live</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>defilade). These systems will replace up to six systems reaching End of Useful life and enhance Soldier capability and training value. FY 2022 funds will continue to revolutionize Soldier Simulation and Training systems to include a Synthetic Training Environment for 12 engagement types are Direct Fire, Counter-Defilade Fire, Indirect Fire, Dropped Objects, Placed Objects, Thrown Objects, Guided Weapons, Autonomous Weapons, Cyber, Directed Energy, Radiant Energy, and Plume. The 5 instrumentation enablers are Calculations, Networks, Sensors, Terrains, and Transmitters.</p> <p>FY 2023 Plans: FY 2023 Base RDTE dollars in the amount of \$27.396 million furthers development of STE Live prototype(s) to replicate the TESS for multiple engagement scenarios (direct, indirect, counter-defilade, dropped, information warfare, CBRNE Plumes). These systems will eventually replace up to six systems reaching End of Useful life and enhance Soldier capability and training value. FY 2023 funds will continue to revolutionize TESS and the 5 instrumentation enablers (Calculations, Networks, Sensors, Terrains, and Transmitters).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease of \$1.874 million from FY 2022 to FY 2023 is due to the earlier STE Live vendor prototyping award(s) relating to non-laser technology development and testing efforts. STE Live planned to address a hybrid approach to replace the existing laser-based TESS direct fire engagement capability in FY 2023. The initial award(s) that were planned for FY 2023 are now being awarded in FY 2022.</p>				
<p>Title: SBIR/STTR Transfer</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>		-	0.730	-
Accomplishments/Planned Programs Subtotals		-	20.000	27.396
		FY 2021	FY 2022	
<p>Congressional Add: Congressional Add: Next generation MILES</p> <p>FY 2022 Plans: FY 2022 Congressional Add RDTE dollars in the amount of \$10.000 million furthers development of STE Live prototype(s) into simulation training systems to replicate the training aid weapon systems for multiple engagement scenarios (direct, indirect, & counter-defilade). These systems will replace up to six systems reaching End of Useful life and enhance Soldier capability and training value. FY 2022 funds will continue to revolutionize Soldier Simulation and Training systems to include a Synthetic Training Environment for 12 engagement types are Direct Fire, Counter-Defilade Fire, Indirect Fire, Dropped Objects, Placed Objects,</p>		-	10.000	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR3 / <i>STE Live</i>
--	--	---

	FY 2021	FY 2022
Thrown Objects, Guided Weapons, Autonomous Weapons, Cyber, Directed Energy, Radiant Energy, and Plume. The 5 instrumentation enablers are Calculations, Networks, Sensors, Terrains, and Transmitters.		
Congressional Adds Subtotals	-	10.000

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

N/A

Remarks

D. Acquisition Strategy

To accelerate the live training modernization program, a STE Live Force on Force Modular Open System Approach compliant architecture will be developed starting with direct fire, indirect fire and counter-defilade force on force engagement systems plus the five instrumentation enablers. STE Live will leverage innovative technologies in areas of integrated internet of things, intelligent sensors, augmented reality and haptics to realize these capabilities. STE Live will be acquired using rapid prototyping with objective to achieve production ready solutions within 2 to 3 years after award. STE Live OTA on track for IOC in FY 2026 and production of FOC quantities in FY 2030.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR3 / STE Live

Event Name	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
STE Live OTA 21 (DF Small Arms, IDF)																												
STE Live OTA 21 (CDF)																												
STE Live OTA 22 (Mine, Grenade, Bomb)																												
STE Live OTA 23 (DF Vehicles, IW, Plume)																												
STE Live OTA 24 (DF Vehicles, Guided & Autonomous Munitions)																												
STE Live OTA 25 (DE, RE)																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR3 / <i>STE Live</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
STE Live OTA 21 (DF Small Arms, IDF)	4	2021	3	2025
STE Live OTA 21 (CDF)	4	2021	3	2025
STE Live OTA 22 (Mine, Grenade, Bomb)	3	2022	3	2026
STE Live OTA 23 (DF Vehicles, IW, Plume)	2	2023	4	2027
STE Live OTA 24 (DF Vehicles, Guided & Autonomous Munitions)	2	2024	2	2027
STE Live OTA 25 (DE, RE)	2	2026	1	2029

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) CR4 / <i>STE One World Terrain (OWT)</i>			
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
CR4: <i>STE One World Terrain (OWT)</i>	-	-	32.388	1.387	-	1.387	2.932	1.444	1.472	1.486	0.000	41.109
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

One World Terrain (OWT) is one of three core functions of the Synthetic Training Environment-Information Systems (STE-IS). OWT provides a 3D global terrain capability and associated information services that support virtual replication of the physical Earth and complexities of the operational environment in support Multi-Domain Operations (MDO) and training at the Point of Need (PoN). OWT will enable leaders, Soldiers, and units to train in complex operational environments, such as dense urban, woodland, jungle, desert, and subterranean areas before the first fight begins.

Capabilities developed by OWT automatically process raw terrain data into a well-formed format that is editable and consumable by standard commercial tools and technologies. It provides the tools to incorporate approved geospatial information updates and local terrain surveys into the OWT foundational repository and will be used by STE and tactical applications.

In FY 2021, OWT adopted the Software Acquisition Pathway employed by the STE-IS program that is tailored for software intensive systems. OWT plans to facilitate rapid and iterative delivery of its capabilities through integration with STE-IS Minimal Viable Products (MVP) and Minimum Viable Capability releases (MVCR) that support Squad (Sq) through Brigade (Bde) level training until 4QFY2023.

FY 2023 Base RDTE dollars in the amount of \$1.387 million for OWT will support completion of prototype development and integration with the TSS/TMT portion of the STE-IS, and remaining cybersecurity compliance testing.

The OWT requirements are codified in the STE-IS abbreviated Capabilities Development Document (A-CDD) version 2, approved 2 June 2020.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for OWT	-	26.774	1.387
FY 2022 Plans: Funding supports continued development and evaluation of OWT prototype processes to create the prototype terrain. OWT base funding will continue development of additional feature extraction algorithms, automated test tools, and efforts to fully integrate OWT 3D terrain data into the TSS/TMT portion of the STE-IS. Base funding will complete development of capabilities started in FY21, and begin development of prototype tactical terrain and additional revised A-CDD requirements such as automated building interiors and integration of Soldier-collected 3D hi-res terrain captures. Lastly, funding will support delivery of products for the			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR4 / <i>STE One World Terrain (OWT)</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
STE-IS minimal viable capability release (MVCR), technical assessments, additional cybersecurity tests, and test planning for events leading up to the MVCR. FY 2023 Plans: Funding will support completion of prototype development and integration efforts with the TSS/TMT portion of the STE-IS, and remaining cybersecurity compliance testing. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY 2022 to FY 2023 is due to completing prototype terrain efforts, and revised A-CDD requirements such as automated building interiors and integration of Soldier-collected 3D hi-res terrain captures.			
Title: 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	-	1.014	-
Accomplishments/Planned Programs Subtotals	-	27.788	1.387

	FY 2021	FY 2022
Congressional Add: Congressional Add: Muti-Sensor Terrain Capture & Processing FY 2022 Plans: Funding support the development, integration and test efforts to achieve a software capability to ingest data collected at the Squad level by a Terrain Capture Kit.	-	4.600
Congressional Adds Subtotals	-	4.600

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• NA2015: STE ONE WORLD TERRAIN	-	20.000	0.000	-	0.000	-	-	-	-	0.000	20.000

Remarks
Base Procurement dollars for One World Terrain (OWT) will procure commercial terrain data (approx. 2 million square kilometers) required to increase the global 3D terrain coverage that replicates complex operational environments.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refinement & Prototyping	Project (Number/Name) CR4 / STE One World Terrain (OWT)

D. Acquisition Strategy

The OWT requirements are codified in the STE-IS abbreviated Capabilities Development Document (A-CDD) version 2, approved 2 June 2020. OWT was one of five (5) OTAs awarded in FY 2019 in support of the STE prototype initiatives which included: STE-IS (TSS/TMT, OWT), RVCT, Live (market research only), and SVT Weapons Optimization (market research only). The Prime(s) and Sub-vendors will execute the STE agreement(s) through an Agile development process with established success criteria and their DevSecOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the modular design effort in order to support success of the product(s) being developed for the STE.

As a component of the STE-IS, OWT was designated a software intensive program leveraging the Software Acquisition Pathway in June 2021 when the new TSS/TMT follow-on OTA was awarded. OWT began conducting prototype development and evaluation of Minimal Viable Products (MVP) with the TSS/TMT follow-on OTA that continued prototype development and evaluation of minimal viable products (MVP) through technical assessments, Soldier Touch Points, Early User Test, test planning events, and Operation Assessments to provide a Squad (Sq) to Brigade (Bde) training capability. Additionally, as an integrated STE-IS capability, OWT will provide Minimum Viable Capability Releases (MVCR) in support of the RVCT (A/G/S) capability. Soldiers will interface with OWT through the STE-IS Training Management Tools.

OWT supports STE Increment 1 IOC, which is programmed for 4QFY2023, and is defined as the first fielding and acceptance of the STE-IS capability at installations identified in accordance with the distribution plan. OWT will be delivered as part of the integrated STE-IS capability, and will meet Information Assurance and Risk Management Framework requirements. OWT will conduct minor updates and sustainment of the prototype capability via the follow-on OTA.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR4 / <i>STE One World Terrain (OWT)</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.014		-		-		-	Continuing	Continuing	Continuing
Subtotal			-	-		1.014		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
OWT Capability Development	Option/ FFP	Maxar Technologies (formerly VRICON) : Westminster, CO	-	-		26.774	Dec 2021	1.387	Dec 2022	-		1.387	Continuing	Continuing	Continuing
Congressional Add: Multi-Sensor Terrain Capture & Processing	SS/TBD	Maxar Technologies (formerly VRICON) : Westminster, CO	-	-		4.600	Jun 2022	-		-		-	0.000	4.600	-
Subtotal			-	-		31.374		1.387		-		1.387	Continuing	Continuing	N/A

Remarks
 OWT Capability Development: OWT awarded its prototype OTA on June 2019. FY 2023 Base RDTE funding will support the completion of prototyping activities for the OWT OTA.
 Note: VRICON was acquired by Maxar Technologies on 1 July 2020.

	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		-	-	32.388	1.387	1.387	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR4 / <i>STE One World Terrain (OWT)</i>

Event Name	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				
OWT OTA	[Blue bar spanning FY 2021 Q1 to FY 2024 Q2]																															
	Current OTA																															
STE-IS MVCR																																
STE-IS MVCR - Software Update R1																																
OWT Capability Development	[Blue bar spanning FY 2021 Q1 to FY 2027 Q4]																															
	Capability Development																															
Prototype Terrain Deliveries	[Blue bar spanning FY 2021 Q1 to FY 2022 Q2]																															
OWT Technical Assessment 2 - 4/5	[Blue bar]																															
OWT Technical Assessment 6 - 8		[Blue bar]																														
OWT Technical Assessments 9 - 10																																
OWT Technical Assessments 11 - 13																																
OWT OTA Follow-On																																
OWT Interim Contractor Support (ICS)																																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR4 / <i>STE One World Terrain (OWT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
OWT OTA	3	2019	1	2024
STE-IS MVCR	1	2023	1	2023
STE-IS MVCR - Software Update R1	4	2023	4	2023
OWT Capability Development	3	2019	1	2029
Prototype Terrain Deliveries	2	2020	2	2022
OWT Technical Assessment 2 - 4/5	2	2020	1	2021
OWT Technical Assessment 6 - 8	2	2021	1	2022
OWT Technical Assessments 9 - 10	2	2022	1	2023
OWT Technical Assessments 11 - 13	2	2023	1	2024
OWT OTA Follow-On	2	2024	1	2029
OWT Interim Contractor Support (ICS)	1	2023	1	2029

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) CR5 / <i>STE Reconfigurable Virtual Trainer (RVCT)</i>			
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
CR5: <i>STE Reconfigurable Virtual Trainer (RVCT)</i>	-	-	25.216	20.726	-	20.726	15.605	-	-	-	0.000	61.547
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The STE-IS and RVCT requirements, which are codified in abbreviated Capabilities Development Documents (A-CDD) version 2 approved 2 June 2020, directly support the Army Collective Training Environment - Initial Capabilities Document (ACTE-ICD) as the Army's cornerstone for replicating the Operational Environment (OE) during training events enabling the Army to train as it fights. Separate, but interoperable, RVCT systems are required for both air and ground collective training. The Air RVCT will represent the U.S. Army, Army National Guard, and Army Reserves fleet of rotary wing aircraft. The Ground RVCT will represent ground track and wheeled vehicles from the U.S. Army and Army National Guard.

The Reconfigurable Virtual Collective Trainer (RVCT) is the Army's next generation Virtual Training System for conducting collective maneuver training, collective gunnery training, mission rehearsal, and pre-deployment training; that will prepare units for Multi-Domain Operations (MDO). The RVCT includes aviation platforms (RVCT-A), ground platforms (RVCT-G), and dismounted infantry (RVCT-S) devices. The RVCT is transportable to the Point of Need (PoN) allowing units to train anywhere in the world. The RVCT will be enabled using the Synthetic Training Environment-Information Systems (STE-IS) software, which provides a fully interactive, real time simulated battlefield.

FY 2023 Base RDTE dollars in the amount of \$20.726 million for RVCT is to complete integration lab assets, and develop Generation 3 (GEN 3) configuration kits based on Soldier feedback emerging from FY 2022 Soldier Touchpoints (STP) and Operational Assessment #1 (OA #1).

The total cost of the RVCT (CR5) Middle Tier of Acquisition (MTA) effort is \$92.00 million RDT&E from FY 2022 to FY 2024. The remainder of STE RVCT is fully funded across the FYDP.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for RVCT	-	24.296	20.726
Description: Direct engineering development, support and test of the Reconfigurable Virtual Collective Trainer (RVCT) program through awarded OTA vehicles.			
FY 2022 Plans: FY 2022 Base RDTE dollars in the amount of \$24.296 million for RVCT is to finalize the technical development and demonstration of prototype designs to establish First Unit Equipped (FUE) at Ft. Hood, followed by a LUT and Milestone C.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR5 / <i>STE Reconfigurable Virtual Trainer (RVCT)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
FY 2023 Base RDTE dollars in the amount of \$20.726M for RVCT is to complete integration lab assets and develop GEN 3 configuration kits based on Soldier feedback emerging from FY 2022 STPs and OA.				
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease of \$3.57 million from FY 2022 to FY 2023 Base RDTE dollars is due to decreased scope development.				
Title: SBIR/STTR Transfer		-	0.920	-
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		-	25.216	20.726
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>The United States Army has identified requirements for a training capability that provides a Synthetic Training Environment (STE), which includes immersive air and ground Reconfigurable Virtual Collective Trainers (RVCT), and a semi-immersive training capability for dismounted soldiers (RVCT-Soldier). The RVCT contributes significantly to the mitigation of four critical capability gaps identified in the Army's Capabilities Needs Analysis (CNA). As part of the STE Systems of Systems (SoS), the RVCT effort will deliver adaptable, low-overhead, hardware agnostic, training simulators that enable collective combined arms training in a realistic training environment that is a high-fidelity representation of current and future complex operational environments.</p> <p>This STE simplified acquisition management plan targets a Rapid Fielding (RF) decision for RVCT NLT 4QFY 2022; followed by a 4QFY 2023 Initial Operational Capability (IOC) and a Middle Tier of Acquisition (MTA) RF Production decision. The 4QFY 2022 RF decision date is driven by several contributing factors; the aging legacy Training Aids Devices Simulators, and Simulations (TADSS), the widening of their respective concurrency gaps, and advanced technology developments in the field of Modeling & Simulation (M&S), that now allow the US Army to realize a level of training realism that is not possible with the current generation of legacy TADSS.</p> <p>STE will enter MTA RF NLT 4th quarter Fiscal Year 2022 (4QFY 2022); followed by a 4th quarter Fiscal Year 2023 Initial Operational Capability (IOC). The 4QFY 2022 MTA RF timeline is driven by several contributing factors: the aging legacy Training Aids Devices Simulators, and Simulations (TADSS), the widening of their respective concurrency gaps; and advanced technology developments in the field of Modeling & Simulation (M&S) that now allow the US Army to realize a level of training realism that is not possible with the current generation of legacy TADSS.</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR5 / <i>STE Reconfigurable Virtual Trainer (RVCT)</i>
<p>RVCT is executing an MTA RP as of 29 November 2021 in accordance with DoDi 5000.80, "Operation of Middle Tier of Acquisition (MTA), dtd 30 December 2019. Program Executive Officer for Simulation, Training, and Simulation (PEO) is the Milestone Decision Authority for the approved MTA RP. The MDA for the MTA RF will be determined in 4Q FY2022.</p> <p>The Phase 1 RVCT First Article (FA) prototyping phase conducted an iterative discovery and development process that included close collaboration between Soldier stakeholders, customers, industry, and the development engineering community. The RVCT FA prototyping phase provided users with multiple feedback points, using pre-planned Synthetic Training Environment-Information System (STE-IS) Minimum Viable Product (MVP) software capability drops to facilitate Soldier Centric Design principles. Throughout the FA prototyping phase the RVCT PMO prioritized requirements as a trade-off for delivery, affordability, and risk reduction.</p> <p>The RVCT Phase 2 is producing prototype GEN2 RVCT A/G systems, for delivery to Ft Hood, TX; including New Equipment Training (NET), establishment of an initial RVCT Product Support capability and infrastructure, and initiation of Interim Contractor logistics (ICS).</p> <p>An Operational Assessment of the RVCT GEN2 prototypes will be conducted 4QFY 2022 at Ft Hood, TX. The Operational Assessment will determine whether the RVCT systems are operationally effective, suitable, survivable, and safe for intended use to support a 4QFY 2022 RVCT entry into MTA RF. The RVCT LUT will be conducted on production representative RVCT hardware running the STE-IS Minimum Viable Capability Release (MVCR) Company level software capability.</p> <p>The Phase 2 RVCT prototyping phase will complete the iterative discovery and development process that entails close collaboration between Soldier stakeholders, customers, industry, and the development engineering community. The follow-on production effort will include a 4QFY 2022 production decision to establish the initial RVCT production base. A combined STE-IS & RVCT Operational Demonstration will be conducted 3QFY 2023. This event will inform a 4QFY 2023 RVCT IOC.</p>		

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR5 / <i>STE Reconfigurable Virtual Trainer (RVCT)</i>

Event Name	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
RVCT PH2, Complete Prototypes																												
RVCT FUE																												
RVCT MDD																												
RVCT Army Requirements Oversight Council																												
RVCT NET																												
RVCT OA																												
RVCT MTA RF																												
RVCT IOT&E																												
RVCT IOC																												
RVCT Rapid Fielding																												
RVCT Continued Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR5 / <i>STE Reconfigurable Virtual Trainer (RVCT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
RVCT PH2, Complete Prototypes	3	2021	3	2022
RVCT FUE	3	2022	3	2022
RVCT MDD	1	2022	4	2024
RVCT Army Requirements Oversight Council	4	2022	4	2022
RVCT NET	4	2022	4	2022
RVCT OA	4	2022	4	2022
RVCT MTA RF	4	2022	4	2022
RVCT IOT&E	3	2023	3	2023
RVCT IOC	4	2023	4	2023
RVCT Rapid Fielding	4	2023	4	2028
RVCT Continued Development	1	2024	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) CR6 / <i>STE Squad Immersive Virtual Trainer (SiVT)</i>			
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
CR6: <i>STE Squad Immersive Virtual Trainer (SiVT)</i>	-	-	5.000	-	-	-	-	-	-	-	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Squad Immersive Virtual Trainer (SiVT) is the immersive training capability delivered as part of the Integrated Visual Augmentation System (IVAS) for the close combat Squads that enables IVAS to be a fight, rehearse, and training platform. SiVT provides a single platform for Soldiers/Marines to Fight, Rehearse, and Train with day and night capability, providing increased lethality, mobility, and situational awareness necessary to achieve overmatch against our current and future adversaries. SiVT provides the Close Combat Force a mechanism to modernize in a comprehensive, deliberate pathway; A readiness tool for Squad Lethality and Human Performance assessment; Transformative ability to access and exploit data across domains and levels of command and a Synthetic Training Environment (STE) tool enabling on-demand squad training.

The SiVT program will not be requesting BASE RDTE funding in FY 2023.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for SiVT	-	4.817	-
FY 2022 Plans: Funding will finalize the prototype development and demonstration of production representative articles to support First Unit Issue (FUI).			
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY2022 to FY2023 is due to finalizing the prototype development and demonstration of production representative articles to support First Unit Issue (FUI).			
Title: SBIR/STTR Transfer	-	0.183	-
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	-	5.000	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR6 / <i>STE Squad Immersive Virtual Trainer (SiVT)</i>
--	--	---

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• NA2020: <i>Synthetic Training Environment (STE)</i>	13.063	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• NA2211: <i>STE SiVT (IVAS TRAINER)</i>	-	69.266	36.131	-	36.131	-	-	-	-	0.000	105.397

Remarks
Base Procurement dollars for Squad immersive Virtual Trainer (SiVT) will conduct the procurement of hardware associated with the SiVT Kits, in addition to, conducting Technology Insertion Engineering Change Proposals (TIECPs) for Outdoor Capability. Lastly funds will provide New Equipment Training and associated fielding support.

D. Acquisition Strategy

Integrated Visual Augmentation System (IVAS) prototype OTA was awarded November 2018 to provide Soldiers the Fight, Rehearse, and Train capability to the close combat Soldiers. Squad Immersive Virtual Trainer (SiVT) provides the training capability for home station training. The SiVT capabilities developed during the prototype effort was assessed through Soldier Touch Points and feedback in support of the follow on production efforts. Currently, the Synthetic Training Environment Cross Functional Team (STE CFT) and the Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) are working closely with Soldier Lethality CFT and PEO Soldier to leverage their production OTA contract for an anticipated 2nd QTR FY 2022 award in order to meet First Unit Issued in 1st Quarter FY 2023 and an incremental approach to First Unit Equipped (FUE) in FY 2024. The Production and Fielding OTA will be a five-year effort fielding to all active and reserve components close combat units.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refinement & Prototyping	Project (Number/Name) CR6 / STE Squad Immersive Virtual Trainer (SiVT)	

Event Name	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
SiVT Proptotype Development																												
First Unit Issued									▲ 1																			
IOC													▲ 2															
SiVT Development/Concurrency																												
SiVT Production																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR6 / <i>STE Squad Immersive Virtual Trainer (SiVT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SiVT Proptotype Development	1	2019	4	2021
First Unit Issued	1	2023	1	2023
IOC	1	2024	1	2024
SiVT Development/Concurrency	4	2021	4	2027
SiVT Production	2	2022	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) CR7 / <i>STE Soldier Virtual Trainer (SVT)</i>			
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
CR7: <i>STE Soldier Virtual Trainer (SVT)</i>	-	-	11.288	5.558	-	5.558	7.950	13.001	-	-	0.000	37.797
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Virtual Trainer (SVT) is enabled by the Synthetic Training Environment (STE) and is a virtual immersive trainer that combines and integrates several individual Soldier training capabilities: Weapon Skills Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF). (1) WSD provides immersive capability to meet individual/crew weapons training in support of Army integrated weapon training strategies. (2) JFT provides certification and qualification of Joint Fires Observers (JFO). This includes the training of types II and III close air support according to the JFO Memorandums of Agreement. (3) UoF training enables Soldiers to replicate current Non-Lethal (NL) devices, munitions that demand the user to determine the appropriate level of force, select the correct device, and comply with doctrine, legal policy, and guidance for NL device employment. SVT will take a phased acquisition approach in developing the three capabilities beginning with WSD, UoF, and JFT respectively. SVT's acquisition strategy implementation and award will reduce impact of replacing currently fielded sustained Program of Records (Engagement Skills Trainer II (EST II) and Call for Fire Trainer III (CFFT III)). EST and CFFT PoRs are currently in sustainment awaiting to be replaced by SVT.

FY 2023 Base RDTE dollars in the amount of \$5.558 million for SVT will be used for the technical development prototype design for the SVT core and Weapons Skills Development (WSD). The prototype designs will inform; requirements, technology readiness level maturity, design of the SVT core and WSD, and level of effort to integrate with the common synthetic environment.

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

	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for SVT	-	10.876	5.558
Description: Direct engineering development, support and test of the Soldier Virtual Trainer (SVT) program through awarded OTA vehicles.			
FY 2022 Plans: FY 2022 Base RDTE dollars in the amount of \$10.876 million will be used for the technical development and demonstration of prototype designs for the Weapons Skills Development (WSD), Joint Fires Training (JFT) and Use of Force (UoF) capabilities. The prototype solution will assess industry and academia's technical readiness.			
FY 2023 Plans: FY 2023 Base RDTE dollars in the amount of \$5.558 million will be used for the continued technical development prototype design for the SVT core and Weapons Skills Development (WSD) capability. The prototype solution will assess industry and academia's technical readiness.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR7 / <i>STE Soldier Virtual Trainer (SVT)</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
\$5.318 million decrease in funding will ensure the SVT development prioritization remains in sequence with the other aspects of the STE portfolio. Initial focus is SVT Core and Weapons Skills Development.			
Title: SBIR/STTR Tansfer	-	0.412	-
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	-	11.288	5.558

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

Remarks

D. Acquisition Strategy

The SVT uses the Synthetic Training Environment (STE) modular open systems architecture via virtual interface and hardware standards. SVT optimizes training delivery through the employment of a combination of Operational Environment (OE) mixed reality visualization and Natural User Interface (NUI) technologies to maximize efficiencies for the integration of system capabilities. The SVT system design combines and integrates several individual Soldier and squad training capabilities, Weapon Skill Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), into a single capability that can be conducted simultaneously or individually and enable physical movement/exertion related to the execution of a Soldier individual and squad collective training tasks. The system is required to be person transportable and deployable worldwide. It delivers training at the Point of Need (PoN) supporting Army-wide formations such as artillery, Military Police, and units for weapons skills development.

Status: SVT is currently planning to enter the Middle Tier of Acquisition Rapid Prototyping Pathway in 3QFY2022. Acquisition planning is in progress for an OTA award in 2QFY2022. Solider Touch points (STPs) and an Operational Assessment (OA) will be conducted during the development phase to ensure Warfighter feedback is incorporated and facilitate acceptance. SVT will take a phased acquisition approach in developing the three capabilities beginning with WSD, UoF, and JFT respectively.

A Soldier/Squad Virtual Trainer OTA was awarded in FY 2019 in support of STE prototype initiatives and SVT: S/SVT Weapons Optimization (market research only). Confidence events and evaluations were built into the OTA in determining the readiness and availability of technology in support of FY 2024 IOC.

The SVT OTA's Prime(s) and Sub-vendors will execute the STE agreement(s) through an Agile development process with established success criteria and their DevSecOps processes and develop prototypes to prove out the three SVT capabilities: WSD, UoF, and JFT. SVT Vendors will continually include the Government and all stakeholders (Internal and external) in the SVT Hardware prototype development and the STE-IS Agile development integration process. This process will ensure all

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR7 / <i>STE Soldier Virtual Trainer (SVT)</i>

parties have transparency and early input into the modular design effort in order to support success of the product(s) being developed for the SVT and interacting with the STE-IS. Other acquisition elements such as testing, contracting, and technology transition will consider any and all means available to innovate and incorporate complementary support to add momentum in this approach.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR7 / <i>STE Soldier Virtual Trainer (SVT)</i>

Event Name	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																																												
SVT Development/STPs																																																																								
SVT OA																																																																								
SVT IOC																																																																								
SVT Production																																																																								

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) CR7 / <i>STE Soldier Virtual Trainer (SVT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SVT Development/STPs	2	2022	4	2026
SVT OA	3	2024	4	2024
SVT IOC	4	2024	4	2024
SVT Production	1	2025	4	2028

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>			
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
FD6: <i>Synthetic Training Environment Refine & Prototype</i>	-	105.354	-	-	-	-	-	-	-	-	0.000	105.354
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, all requirements from PE 0604121A, Project FD6 - Synthetic Training Environment Refine & Prototype were realigned to Projects CR2 (STE Information Systems [TSS, TMT]), CR3 (STE Live), CR4 (STE One World Terrain [OWT]), CR5 (STE Reconfigurable Virtual Trainer [RVCT]), and CR7 (STE Soldier Virtual Trainer [SVT]).

A. Mission Description and Budget Item Justification

The STE will be a single, yet comprehensive interconnected training system that provides a Synthetic Training Environment, in which air and ground units from Solider/ crew/section through Army Service Component Command (ASCC) conduct realistic multi-echelon / multi-domain combined arms maneuver, air ground integration, and mission command training. All of these components are interconnected and based off of a standard, modular and open system architecture model.

The STE-Information System (STE-IS) consists of three core functions: Training Management Tool (TMT), Training Simulation Software (TSS), and One World Terrain (OWT). The Training Management Tool (TMT) is the capability that enables units to quickly plan collective training events, prepare training events; execute and monitor events, and assess event results and readiness. The Training Simulation Software (TSS), the core STE simulation engine, provides the physical and behavior models necessary to replicate the operational environment to enable collective training from Soldier/Squad through ASCC. The STE-IS is a dynamic, digital representation of the Operational Environment (OE) and the military capabilities in the scenario. The TSS provides entity, aggregate, and common services, as well as adjudicates STE-IS interactions at the entity level (e.g., Computer-Generated Forces (CGF), and synthetic equipment). One World Terrain (OWT) is a 3-Dimensional global terrain capability and associated information services that supports the virtual replication of the physical Earth and complexities of the Operational Environment in support of training in the STE. In FY2021, the STE-IS adopted the execution of the Software Acquisition Pathway, tailored for software intensive systems. The STE-IS plans to facilitate rapid and iterative delivery of the TSS/TMT and OWT capabilities through Minimal Viable Products (MVP) and Minimum Viable Capability releases (MVCR) to support Squad (Sq) to Brigade (Bde) level training through 4QFY2023.

The STE-IS and RVCT requirements, which are codified in Abbreviated Capabilities Development Documents (A-CDD) version 2 approved 2 June 2020, directly support the Army Collective Training Environment - Initial Capabilities Document (ACTE-ICD) as the Army's cornerstone for replicating the Operational Environment (OE) during training events enabling the Army to train as it fights. Separate, but interoperable, RVCT systems are required for both air and ground collective training. The Air RVCT will represent the U.S. Army, Army National Guard, and Army Reserves fleet of rotary wing aircraft, and specified U.S. Marine Corps (USMC) aircraft. The Ground RVCT will represent ground/amphibious track and wheeled vehicles from the U.S. Army, Army National Guard, Special Operations Units and the USMC.

The Reconfigurable Virtual Collective Trainer (RVCT) is the Army's next generation Virtual Training System for conducting collective maneuver training, collective gunnery training, mission rehearsal, and pre-deployment training; that will prepare units for multi-domain operations (MDO). The RVCT includes aviation platforms

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>
--	--	--

(RVCT-A), ground platforms (RVCT-G), and dismounted infantry (RVCT-S) devices. The RVCT is transportable to the point of need allowing units to train anywhere in the world. The RVCT will be enabled using the Synthetic Training Environment-Information Systems (STE-IS) software, which provides a fully interactive, real time simulated battlefield. The RVCT hardware is modular in design and will accommodate the integration of new technologies and future weapon systems, and will interoperate with the current Constructive and Live Training Environments.

The Soldier Virtual Trainer (SVT) is enabled by the Synthetic Training Environment (STE) and is a virtual immersive trainer that combines and integrates several individual Soldier training capabilities: Weapon Skills Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF). (1) WSD provides immersive capability to meet individual/crew weapons training in support of Army integrated weapon training strategies. (2) JFT provides certification and qualification of Joint Fires Observers (JFO). This includes the training of types II and III close air support according to the JFO Memorandums of Agreement. (3) UoF training enables Soldiers to replicate current Non-Lethal (NL) devices, munitions that demand the user to determine the appropriate level of force, select the correct device, and comply with doctrine, legal policy, and guidance for NL device employment. Weapon Skills Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), into a single capability that can be used simultaneously or individually.

The Synthetic Training Environment (STE) Live program develops live training systems in concert with the Cross Functional Team STE initiatives. The STE Live program converges live training with the STE, providing units the necessary training components to accelerate and sustain combined arms maneuver proficiency in support of multi-domain operations. The STE Live program focuses on the development of the 12 engagement types and 5 instrumentation enablers ("12+5"). The 12 engagement types are Direct Fire, Counter-Defilade Fire, Indirect Fire, Dropped Objects, Placed Objects, Thrown Objects, Guided Weapons, Autonomous Weapons, Cyber, Directed Energy, Radiant Energy, and Plume. The 5 instrumentation enablers are Calculations, Networks, Sensors, Terrains, and Transmitters.

In FY 2022, all requirements from Project FD6 - Synthetic Training Environment Refine & Prototype were realigned to Projects CR2 (STE Information Systems [TSS, TMT]), CR3 (STE Live), CR4 (STE One World Terrain [OWT]), CR5 (STE Reconfigurable Virtual Trainer [RVCT]), and CR7 (STE Soldier Virtual Trainer [SVT]).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation for STE-IS	62.120	-	-
Description: Direct engineering development, support and test of the TSS/TMT and OWT capability through awarded OTA vehicles.			
Title: Engineering, Support, Test & Evaluation for RVCT	32.834	-	-
Description: Direct engineering development, support and test of the Reconfigurable Virtual Collective Trainer (RVCT) program through awarded OTA vehicles.			
Accomplishments/Planned Programs Subtotals	94.954	-	-
	FY 2021	FY 2022	
Congressional Add: Congressional Add for STE-LIVE - (Army requested transfer from WTCV line 5)	10.400	-	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>

	FY 2021	FY 2022
FY 2021 Accomplishments: FY 2021 Base RDTE dollars in the amount of \$10.400 million heavily focuses on the development and prototype solutions of the STE Live Force of Force Direct/Indirect/Counter-defilade capabilities. Funds support the continued development and assessment of technical capabilities through technical assessments and user assessments, and test planning events. FY 2021 will complete the development prototype activities on the training solutions through Other Transactions agreement. The funds will be used to develop mature and more capable direct fire prototype solution to replace some of the systems reaching end of life and accelerate the maturation of key technologies needed to introduce indirect fire and counter defilade force on force engagement enablers into the live training environment.		
Congressional Adds Subtotals	10.400	-

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• NA2000: <i>Synthetic Training Environment (STE)</i>	13.063	92.266	255.670	-	255.670	222.527	173.692	335.411	253.509	Continuing	Continuing

Remarks

D. Acquisition Strategy

STE will be developed and acquired as an incrementally deployed software intensive program leveraging accelerated acquisition authorities when appropriate. To ensure speed and agility to deliver and modernize STE, a modular open systems architecture (MOSA) will be developed enabling the Army to exploit rapid advancements in cutting-edge commercial visualization and immersion technologies. STE will employ a combined approach to enable agile development of the STE-IS with parallel incremental development of the RVCT A/G, SiVT and SVT. This model facilitates leveraging commercial and Government technology development that are necessary for future Live and Constructive centered increments. Other acquisition elements such as testing, contracting, and technology transition will consider any and all means available to innovate and incorporate complementary support to add momentum in this approach.

STE Increment 1 IOC is programmed for 4Q FY 2023. IOC is defined as the first fielding and acceptance of the STE-IS capability at installations identified IAW the distribution plan. IOC fielded STE systems will include the following attributes: verification, validation and accreditation process complete; STE-IS capabilities in support of RVCT A/G and Squad Immersive Virtual Trainer (SiVT) IOC in FY 2023 and ultimately the Soldier Virtual Trainer (SVT) IOC in FY 2024; meeting Information Assurance and Risk Management Framework requirements. New Equipment Training (NET) will include the capability to support the RVCT, and the ability to provide initial sustainment via interim contractor support (ICS). Soldiers will interface with the STE-IS through the Training Management Tools, the Reconfigurable Virtual Collective Trainer (RVCT) and SiVT via the Integrated Visual Augmentation System (IVAS).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>
<p>Future phases currently under market research will provide Soldier Virtual Trainer (SVT) capabilities and integrate Live training components as well as Next Generation Constructive (NGC).</p> <p>Five (5) OTAs were awarded in FY 2019 in support of STE prototype initiatives: STE-IS (TSS/TMT, OWT), RVCT, Live (market research only), and SVT Weapons Optimization (market research only). Confidence events and evaluations were built into the OTAs to determine the readiness and availability of technology in support of FY 2023 IOC. Prime(s) and Sub-vendors will execute the STE agreement(s) through an Agile development process with established success criteria and their DevSecOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the modular design effort in order to support success of the product(s) being developed for the STE.</p> <p>The initial TSS/TMT OTA allowed the Government to fully understand and decompose the requirements, establish/describe interfaces between TSS/TMT and RVCT, Avionics Software Emulation (AvSE) and OWT capabilities, and exposed the Government to the readiness of additional technologies that will enable the delivery of an integrated STE. These lesson learned, along with the incorporating the revised A-CDD updates forms the basis of the new TSS/TMT follow-on competition planned for award in 3QFY21.</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604121A / Synthetic Training Environ ment Refinement & Prototyping				FD6 / Synthetic Training Environment Refine & Prototype							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Orlando, FL	7.062	-		-		-		-		-	0.000	7.062	12.454
Subtotal			7.062	-		-		-		-		-	0.000	7.062	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development STE-IS/ TSS/TMT	C/FP	MAK Technologies : Cambridge, MA	35.750	5.618	Oct 2020	-		-		-		-	0.000	41.368	41.368
Product Development STE-IS/ TSS/TMT Follow-on	C/TBD	ACC-Orlando : Orlando, FL	-	13.300	May 2021	-		-		-		-	Continuing	Continuing	Continuing
STE-IS AvSE Development/Integration	Various	PEO STRI : Orlando, FL	-	7.361	Mar 2021	-		-		-		-	Continuing	Continuing	Continuing
Product Development STE-IS/One World Terrain	C/FP	Maxar Technologies (formerly VRICON) : Westminster, CO	25.582	35.841	Dec 2020	-		-		-		-	Continuing	Continuing	Continuing
Product Development Reconfigurable Virtual Collective Trainers	C/FP	Cole Engineering Services Inc : Orlando, FL	53.538	32.834	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
Product Development STE-LIVE	C/FP	Multiple (Raytheon, Cubic, Amentum) : Orlando, FL	0.100	-		-		-		-		-	Continuing	Continuing	Continuing
Congressional Add - STE-LIVE	C/FP	Multiple : Orlando, FL	-	10.400	Jun 2021	-		-		-		-	0.000	10.400	10.400
Product Development Soldier/Squad Virtual Trainer (IVAS)	C/FP	Microsoft : Redmond, WA	39.228	-		-		-		-		-	0.000	39.228	34.792
Small Business Innovation/Tech Insertion	Various	Various : Orlando, FL	3.270	-		-		-		-		-	0.000	3.270	3.270
Subtotal			157.468	105.354		-		-		-		-	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
A-CDD	3	2020	3	2020
FOC	4	2027	4	2027
Other Transaction Authority 1	3	2019	2	2026
OTA Tech Insertion	1	2020	4	2026
Production	4	2022	4	2027
STE-IS Capability Development	3	2019	4	2027
STE-IS MVCR	1	2022	1	2022
STE-IS MVCR - Software Update R1	1	2023	1	2023
STE-IS MVCR - Software Update R2	4	2023	4	2023
STE-IS Production	1	2024	4	2026
STE-IS Interim Contracting Support (ICS)	2	2022	4	2025

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>				Project (Number/Name) SV1 / <i>Soldier/Squad Virtual Trainer</i>			
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
SV1: <i>Soldier/Squad Virtual Trainer</i>	-	6.739	-	-	-	-	-	-	-	-	0.000	6.739
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, all requirements from Project SV1 - Soldier/Squad Virtual Trainer were realigned to Projects CR4 (STE One World Terrain [OWT]) and CR6 (STE Squad Immersive Virtual Trainer [SiVT]).

A. Mission Description and Budget Item Justification

The United States Army identified a near term requirement for a Soldier and Squad Virtual Trainer (S/SVT) to address the small unit collective training gaps, and to merge the Engagement Skills Trainer (EST) II, Call for Fire Trainer (CFFT) III, and the current non program of record Use-of-Force trainer into a single program starting in FY 2021. The S/SVT is the next generation trainer that enables Soldiers/Marines to conduct squad, weapons, and joint fires training, as well as rehearse lethal and non-lethal use-of-force interactions prior to live events to measure the unit's Mission Essential Task List proficiency, which will then provide a unit's Standards for Training Proficiency.

S/SVT is comprised of Squad Immersive Trainer (SiVT); also commonly referred to as both the IVAS and the Soldier Virtual Trainer (SVT) capabilities. The first increment of the S/SVT, which is the Squad immersive Virtual Trainer (SiVT) capability, integrates into the Heads Up Display (HUD) 3.0 as part of the Integrated Visual Augmentation System (IVAS). Increments 2 and 3 of S/SVT combines individual Soldier and squad training into a single capability and includes STE Squad Capability (SSC), Weapon Skill Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), which integrate the NEXTGEN Marksmanship and the NEXTGEN Call For Fire Artillery Virtual Training capability into the STE baseline.

The second phase; the SVT system design combines and integrates several individual Soldier and squad training capabilities, Weapon Skills Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF).

SVT is dependent and interconnected through the STE-IS software baseline . The STE-IS core cross-cutting capabilities will deliver software, application(s) and services that optimize cloud-enabled capability simulation processing to Reconfigurable Virtual Collective Trainer (RVCT), Solider Virtual Trainer (SVT), and the future Next Generation Constructive (NGC) capability to include Force-on-Force (FoF) and Force-on-Target (FoT) Live training instrumentation .

FY 2021 funding of \$6.739 million reinitiates the market research and prototype solutions for the SVT solution assessing industry and academia's technical readiness and availability around Weapons Skills Development, Joint Fires and Use of Force.

In FY 2022, all requirements from Project SV1 - Soldier/Squad Virtual Trainer were realigned to Projects CR4 (STE One World Terrain [OWT]) and CR6 (STE Squad Immersive Virtual Trainer [SiVT]).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) SV1 / <i>Soldier/Squad Virtual Trainer</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering, Support, Test & Evaluation	6.739	-	-
Description: Market Research and Prototype Assessment of Soldier Virtual Trainer capabilities.			
Accomplishments/Planned Programs Subtotals	6.739	-	-

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	Total Cost
			Base	OCO	Total					Complete	
• NA2000: <i>Synthetic Training Environment (STE)</i>	13.063	92.266	255.670	-	255.670	222.527	173.692	335.411	253.509	Continuing	Continuing

Remarks

D. Acquisition Strategy

The S/SVT uses the Synthetic Training Environment (STE) modular open systems architecture via virtual interface and hardware standards. S/SVT optimizes training delivery through the employment of a combination of Operational Environment (OE) mixed reality visualization and Natural User Interface (NUI) technologies to maximize efficiencies for the integration of system capabilities. The S/SVT system design combines and integrates several individual Soldier and squad training capabilities, Weapon Skill Development (WSD), Joint Fires Training (JFT), and Use of Force (UoF), into a single capability that can be conducted simultaneously or individually and enable physical movement/exertion related to the execution of Soldier/Marine individual and squad collective training tasks. The system is required to be man transportable and deployable worldwide. It delivers training at the Point of Need (PoN) supporting Army-wide formations such as artillery, Military Police, and units for weapons skills development.

Two (2) OTAs awarded in FY 2019 in support of S/SVT prototype initiatives: SiVT (IVAS) Holistic Joint with Soldier Lethality, and SVT Weapons Optimization (market research only). Confidence events and evaluation criteria were built into the OTAs to determine technical availability and readiness in support of 4Q 2021 IOC. Prime(s) and Sub-vendors will execute the agreement(s) through an Agile development process with established success criteria and their DevOps processes. Vendors will continually include the Government and all stakeholders (Internal and external) in the Agile development process. This process will ensure all parties have transparency and early input into the design effort and success of the product(s) being developed for the STE.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) SV1 / <i>Soldier/Squad Virtual Trainer</i>

Event Name	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
IVAS/HUD 3.0 (Squad Immersive)	[Bar]																											
SVT (Soldier Virtual)	[Bar]																											
IOC									▲ 1																			
FOC																	▲ 2											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refinement & Prototyping</i>	Project (Number/Name) SV1 / <i>Soldier/Squad Virtual Trainer</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IVAS/HUD 3.0 (Squad Immersive)	2	2018	1	2021
SVT (Soldier Virtual)	2	2019	4	2021
IOC	4	2021	4	2021
FOC	4	2025	4	2025

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604134A / Counter Improvised-Threat Demonstration, Prototype Development, and Testing
--	---

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	-	13.326	13.379	15.840	-	15.840	16.773	17.650	17.655	17.827	0.000	112.450
CD4: Counter Improvised-Threat Demonstration	-	13.326	13.379	15.840	-	15.840	16.773	17.650	17.655	17.827	0.000	112.450

A. Mission Description and Budget Item Justification

This Program Element (PE) develops prototypes and demonstrates technology for detecting and defeating Improvised Explosive Devices (IED). The goal of this Project is to mature technology to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and increase the rate of advance of route clearance missions. Additionally the objective is to positively neutralize or mitigate the effects of IEDs with minimal collateral damage. Driven by the current threat facing deployed U.S. forces, this PE enables rapid development and delivery of capabilities that enable the detection, neutralization, and risk mitigation of IEDs and their effects. These technologies are intended to be matured and demonstrated for integration onto existing Department of Defense weapon systems.

This PE is coordinated with the Under Secretary of Defense for Research and Engineering (USD/R&E) including the Defense Threat Reduction Agency (DTRA).

Work in this PE was previously conducted under PE 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	13.326	13.379	0.000	-	0.000
Current President's Budget	13.326	13.379	15.840	-	15.840
Total Adjustments	0.000	0.000	15.840	-	15.840
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	15.840	-	15.840

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>				Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>			
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
CD4: <i>Counter Improvised-Threat Demonstration</i>	-	13.326	13.379	15.840	-	15.840	16.773	17.650	17.655	17.827	0.000	112.450
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project develops prototypes and demonstrates technology for detecting and defeating Improvised Explosive Devices (IED). The goal of this Project is to mature technology to increase the ability of deployed forces to positively identify IEDs with minimal false alarms and increase the rate of advance of maneuver forces. Additionally the objective is to positively neutralize IEDs with minimal collateral damage. Driven by the current threat facing deployed U.S. forces, this Project enables rapid development and delivery of capabilities that enable the detection, neutralization, and mitigation of IEDs and their effects.

This Project is coordinated with the Under Secretary of Defense for Research and Engineering (USD/R&E) including the Defense Threat Reduction Agency (DTRA).

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

	FY 2021	FY 2022	FY 2023
Title: Vehicle Borne IED Detection Technology Demonstration	1.903	-	-
Description: This effort conducts technology demonstration of sensing technologies to detect IEDs at entry control points for fixed bases. This effort uses nuclear quadropole resonance detection sensors matured in FY 2020 by the Defense Threat Reduction Agency to detect Vehicle Borne IEDs at vehicle check point with minimal false alarms.			
Title: Vehicle Borne IED Warnings and Indicators Technology Demonstration	1.292	-	-
Description: This effort demonstrates fusion of existing sensing technologies to provide warnings and indicators for the presence of Vehicle Borne IEDs in areas surrounding fixed sites. This effort uses detection techniques matured in FY 2020 by the Defense Threat Reduction Agency to predict the presence of Vehicle Borne IEDs using information collected by sensor systems located in the vicinity of fixed sites.			
Title: Radio Controlled IED Detection Technology Demonstration	2.500	1.883	1.892
Description: This effort demonstrates Radio Controlled IED detection exploiting advanced network techniques. This effort demonstrates the ability to detect Radio Controlled IEDs with minimal false alarms.			
FY 2022 Plans: Will continue evaluation of advanced network techniques to identify Radio Controlled IEDs at standoff distances.			
FY 2023 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Will demonstrate advanced network techniques to identify Radio Controlled IEDs at standoff distances. Will demonstrate flexible modular open systems to mitigate IED's without impacting other electro-magnetic systems on the platform. FY 2022 to FY 2023 Increase/Decrease Statement: Minor increase due to economic assumptions				
Title: Anti-Armor IED Detection Technology Demonstration Description: This effort demonstrates anti-armor IED detection using technologies to include high resolution electro-optical / infrared and other sensors to detect component characteristics to identify the location of IEDs prior to detonation. FY 2022 Plans: Will conduct an integrated vehicle demonstration of the use of advanced electro-optical / infrared sensor processing techniques to detect component characteristics to identify the location potential anti-armor IEDs at a standoff distance while moving. Will perform test and evaluation of the integrated vehicle system. FY 2023 Plans: Will conduct an integrated demonstration of a multi-sensor system including advanced electro-optical, infrared, lidar, and radio-frequency sensor processing techniques to detect and geo-locate anti-armor IEDs at a standoff distance. Will perform test and evaluation of the integrated multi-sensor system. FY 2022 to FY 2023 Increase/Decrease Statement: Decreased funding as a result of the effort will be completed in FY 2023.		2.489	1.739	1.597
Title: Mitigation of Anti-Armor IED Technology Demonstration Description: This effort demonstrates mitigation of Anti-Armor IED effects using technologies developed by the Defense Threat Reduction Agency in FY 2020. This effort will demonstrate the use of physical countermeasure technology to mitigate the effects of explosively formed penetrators and other explosively driven IED threats.		0.530	-	-
Title: Booby Trap Structure IEDs Detection Technology Demonstration Description: This effort demonstrates detection techniques developed by DTRA in FY 2020 using small unmanned aerial systems (UAS) with compact sensor technologies including light detection and ranging (LIDAR) to develop high resolution imagery of structures with the ability to inspect multi-level structures for the presence of IEDs. This effort demonstrates the ability to develop high fidelity mapping of multi-level structures to identify potential locations of IEDs. FY 2022 Plans:		2.444	1.210	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Will continue development of compact sensor technologies for use on individual Soldiers to detect concealed IED components in urban environments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: This effort will be completed in FY 2022.</p>				
<p>Title: Personnel Borne IED Detection Technology Demonstration</p> <p>Description: This effort demonstrates Personnel Borne IED (PBIED) detection aggregating information from a network of small, inexpensive sensor technologies including electro-optical and millimeter wave radar subgarment imagers to sense the presence of PBIEDs attached to personnel through thin walls. This effort demonstrates the ability to aggregate sensor data to identify PBIEDs with minimal false alarms.</p> <p>FY 2022 Plans: Will continue to mature integrated (fused) multi-mode sensor technologies to identify concealed Personnel Borne IEDs in various environments. Will continue to perform test and evaluation of the prototype sensor technology and document for urgent material release purposes.</p> <p>FY 2023 Plans: Will demonstrate multi-mode sensor technologies integrated to increase the probability of detecting concealed Personnel Borne IEDs in various environments. Will perform test and evaluation of the prototype sensor technologies and document for urgent material release purposes.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase in FY 2023 to complete testing of integrator sensor system in a relevant environment.</p>		2.168	2.641	4.457
<p>Title: Off-Route IED Detection Technology Demonstration</p> <p>Description: This effort will demonstrate a proof of concept IED detection system using miniaturized sensors developed in the Counter-Improvised Threat Simulation Program Element 0603134A integrated with unmanned aerial systems to detect off-route IEDs to support combat maneuver forces.</p> <p>FY 2022 Plans: Will integrate miniature detection sensors such as hyper-spectral imaging and ground penetrating radar with unmanned aerial systems. Will develop plans for aerial route detection proof of concept experimentation to be conducted in FY 2023.</p> <p>FY 2023 Plans:</p>		-	3.173	2.891

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Will conduct multi-mode sensor unmanned air and ground systems off-route detection proof of concept demonstration. Will optimize sensor technologies to increase rate of advance and standoff detection range. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease reflects decreased planned progression of effort to conduct proof of concept demonstration.			
Title: Water-Borne IED Detection Technology Demonstration Description: This effort conducts a technology demonstration to evaluate the performance of IED detection technologies in coastal water and water gap crossings. The focus is on detecting devices in water using detection mechanisms at standoff distances to protect troop landings and water gap crossings for the military. FY 2022 Plans: Will integrate mature sensor technologies on a platform capable of operating ahead of formations in both troop landings and water gap crossings. Will plan a demonstration for FY 2024 using the demonstration platform to detect IED threats in both a coastal and water crossing scenario. FY 2023 Plans: Will continue to mature sensor technologies and autonomous behaviors for a platform capable of operating ahead of formations in both troop landings and water gap crossings. Will continue to develop plans for an FY 2024 demonstration to detect IED threats in both a coastal and water crossing scenario. FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase represents higher planned lifecycle of this effort.	-	2.245	3.409
Title: Teamed IED Detection Technology Demonstration Description: This effort demonstrates the teaming of small unmanned aerial and ground systems to cooperatively detect IED emplacements and indicators of IED emplacements. This effort optimizes unmanned system teaming to increase the confidence in IED detection using multiple platforms with multiple sensor modes, and integrating their information. This effort will conduct a demonstration in FY 2025 using multiple heterogenous platforms to reduce false alarms for IED detection. FY 2023 Plans: Will mature unmanned system behaviors to optimize IED detection using multiple systems for detection, including including orthogonal detections for confirmation. Will mature sensor processing techniques to integrate information from multiple sensor	-	-	1.594

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
systems to reduce the likelihood of false alarms. Will develop scenario plans to demonstrate value of multi-sensor detection schemes to be conducted in FY 2025. FY 2022 to FY 2023 Increase/Decrease Statement: Increased funding for this effort represents a progression of and expands the capability of the unmanned aerial systems and sensor technologies developed in the "Off-Route IED Detection Technology Demonstration" effort in this Project.			
Title: 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	-	0.488	-
Accomplishments/Planned Programs Subtotals	13.326	13.379	15.840

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

N/A

Remarks

D. Acquisition Strategy

The Army will coordinate plans with USD (R&E), DTRA, and other Services to prototype and demonstrate CIED technologies, with Army and Service Laboratories and/or industry performing the demonstration activities. The Army will use existing and new contracts to perform these efforts with selected industry partners based on solicitations issued. The Army will continue promising technology demonstrations started in FY20 by DTRA based on review with DTRA, USD (R&E) and other Services.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	C/TBD	TBD : TBD	-	-		0.488		-		-		-	0.000	0.488	-
Subtotal			-	-		0.488		-		-		-	0.000	0.488	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Vehicle Borne IED Detection Technology Demonstration	C/TBD	To Be Determined : To Be Determined	-	1.903	Dec 2020	-		-		-		-	0.000	1.903	-
Vehicle Borne IED Warnings and Indicators Technology Demonstration	C/TBD	TBD : TBD	-	1.292		-		-		-		-	0.000	1.292	-
Remote Controlled IED Detection Technology Demonstration	C/TBD	C/TBD; PEO IEW&S : Aberdeen, MD	-	2.500	Dec 2020	1.883	Dec 2021	1.892	Jan 2023	-		1.892	0.000	6.275	-
Anti-Armor IED Detection Technology Demonstration	C/TBD	TBD : TBD	-	2.489	Dec 2020	1.739	Dec 2021	1.597	Feb 2023	-		1.597	0.000	5.825	-
Mitigation of Anti-Armor IED Technology Demonstration	C/TBD	TBD : TBD	-	0.530		-		-		-		-	0.000	0.530	-
Booby Trap Structure IEDs Detection Technology Demonstration	Various	TBD : TBD	-	2.444		1.210	Dec 2021	-		-		-	0.000	3.654	-
Personnel Borne IED Detection Technology Demonstration	C/TBD	DEVCOM CBC : Aberdeen, MD	-	2.168		2.641	Dec 2021	4.457	Dec 2022	-		4.457	0.000	9.266	-
Off-Route IED Detection Technology Demonstrator	TBD	TBD : TBD	-	-		3.173	Feb 2022	2.891	Dec 2022	-		2.891	0.000	6.064	-
Water-Borne IED Detection Technology Demonstration	TBD	Office of Naval Research (ONR) : Arlington, VA	-	-		2.245	Feb 2022	3.409	Jan 2023	-		3.409	0.000	5.654	-

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / Counter Improvised-Threat Demonstration, Prototype Development, and Testing	Project (Number/Name) CD4 / Counter Improvised-Threat Demonstration

Event Name	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
Vehicle Borne IED Detection Technology Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
VBIED Detection Integration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
VBIED Detection Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Vehicle Borne IED Warnings and Indicators Technology Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Radio Controlled IED Detection Technology Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Radio Controlled IED Detection Technique Maturation	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Radio Controlled IED Detection Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Radio Controlled IED Detection Phase 2 Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Anti-Armor IED Detection Technology Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Anti-Armor IED Detection Technique Maturation	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Anti-Armor IED Detection Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Mounted Anti-Armor IED Detection Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Anti-Armor Multi-Sensor IED Detection Technology Demonstration	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / Counter Improvised-Threat Demonstration, Prototype Development, and Testing	Project (Number/Name) CD4 / Counter Improvised-Threat Demonstration

Event Name	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
Mitigation of Anti-Armor IED Technology Demonstration																												
Booby Trap Structure IEDs Detection Technology Demonstration																												
Personnel Borne IED Detection Technology Demonstration																												
Personnel Borne IED Detection Demonstration																												
Off-Route IED Detection Technology Demonstration																												
Off-Route IED Demonstration																												
Water-Borne IED Detection Technology Demonstration																												
Teamed IED Detection Technology Demonstration																												
Unmanned System Teaming Integration																												
Teamed IED Detection Demonstration																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Vehicle Borne IED Detection Technology Demonstration	1	2021	4	2021
VBIED Detection Integration	1	2021	3	2021
VBIED Detection Demonstration	4	2021	4	2021
Vehicle Borne IED Warnings and Indicators Technology Demonstration	1	2021	4	2021
Radio Controlled IED Detection Technology Demonstration	1	2021	4	2023
Radio Controlled IED Detection Technique Maturation	1	2021	4	2021
Radio Controlled IED Detection Demonstration	4	2021	4	2021
Radio Controlled IED Detection Phase 2 Demonstration	1	2022	4	2023
Anti-Armor IED Detection Technology Demonstration	1	2021	4	2022
Anti-Armor IED Detection Technique Maturation	1	2021	3	2021
Anti-Armor IED Detection Demonstration	3	2021	4	2021
Mounted Anti-Armor IED Detection Demonstration	1	2022	4	2022
Anti-Armor Multi-Sensor IED Detection Technology Demonstration	2	2023	4	2025
Mitigation of Anti-Armor IED Technology Demonstration	2	2021	3	2021
Booby Trap Structure IEDs Detection Technology Demonstration	1	2021	4	2022
Personnel Borne IED Detection Technology Demonstration	1	2021	4	2023
Personnel Borne IED Detection Demonstration	4	2023	4	2023
Off-Route IED Detection Technology Demonstration	1	2022	4	2023
Off-Route IED Demonstration	4	2023	4	2023
Water-Borne IED Detection Technology Demonstration	1	2022	4	2023
Teamed IED Detection Technology Demonstration	2	2023	4	2025

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604134A / <i>Counter Improvised-Threat Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) CD4 / <i>Counter Improvised-Threat Demonstration</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
Unmanned System Teaming Integration	2	2023	4	2023
Teamed IED Detection Demonstration	1	2024	4	2025

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>
---	--

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	-	-	-	404.291	-	404.291	32.226	0.000	0.000	0.000	0.000	436.517
MR2: <i>Mid-Range Capability Ground Support Equipment</i>	-	-	-	159.698	-	159.698	22.558	-	-	-	0.000	182.256
MR3: <i>Mid-Range Capability (MRC) Missiles</i>	-	-	-	148.116	-	148.116	-	-	-	-	0.000	148.116
MR4: <i>Mid-Range Cap Launcher Payload Deployment System</i>	-	-	-	96.477	-	96.477	9.668	-	-	-	0.000	106.145

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

The work in this PE supports the research, development, prototype, test and evaluation of technology to rapidly and efficiently procure, transition, and/or field critical enabling technologies and capabilities that address near-term, and mid-term threats and is directly aligned to the Army Long Range Precision Fires modernization priority.

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023. This funds the US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort and continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S. The mission of the MRC Prototype Weapon System is to provide Combatant Commanders with a strategic, ground-mobile, offensive missile capability. The MRC Prototype Weapon System will leverage existing SM-6 and Tomahawk missiles for ground launch, to provide a responsive, highly accurate, deep strike capability designed to destroy high value, high payoff targets. MRC is optimized for the penetration/dis-integration phase of Multi-Domain Operations (MDO) by defeating enemy Anti-Access / Area Denial (A2/AD) systems allowing the Combatant Commander freedom to maneuver during the exploitation phase.

The MRC Prototype Weapon System leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events. MRC provides the Launchers and Battery Operations Center (BOC) which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets. The first MRC Prototype Weapon System deliverable quantity is one residual combat MRC prototype battery consisting of four Launchers and one BOC, to be fielded NLT 4Q FY 2023 as the First Unit of Issue (FUI). Delivery of follow-on batteries will occur annually thereafter.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	
<p>FY 2023 Base funding in the amount of \$404.291 million to was moved from PE 0604644A to PE 0604135A and funds the integration of design requirements to complete and field the prototype battery, and to support fabrication of subsequent prototype batteries. Base funding allows for integration and evaluation of required characteristics to ensure safe and effective operational fielding of the prototype battery. Base funding also allows for purchasing and receiving hardware and materials to implement prototype fabrication, and to support component-level and system-level qualification. The \$5.016 million was moved from RCCTO PE 0604644A to PEO M&S PE 0605235A in support of the transition from RCCTO to PEO M&S.</p> <p>PE 0604644A Mobile Medium Range Missile Project MR1 Mobile Intermediate Range Missile was moved to PE 0604135A Strategic Mid-Range Fires in FY 2023 and split into the following 3 Projects:</p> <p>MR2 - Mid-Range Capability Ground Support Equipment The MRC Ground Support Equipment (GSE) leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the GSE. This includes the Battery Operations Center (BOC), prime movers, trailers, generators, cabling, and support vehicles. The MRC BOC houses the federated Command and Control systems which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets.</p> <p>MR3 - Mid-Range Capability Missile MRC funds buys missiles and associated missile support equipment needed for the operational fielding of the MRC prototype Battery. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. MRC provides Government Systems Engineering and Program Management for missile buys.</p> <p>MR4 - Mid-Range Capability Launcher Payload Deployment System The MRC Launcher Payload Deployment System (PDS) leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the MRC PDS. The MRC Launcher PDS stows and fires missiles. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage desired targets. The MRC Launcher PDS Project delivers four PDSs for each MRC Battery.</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>
---	--

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	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	404.291	-	404.291
Total Adjustments	0.000	0.000	404.291	-	404.291
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	404.291	-	404.291

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>				Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>			
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
MR2: <i>Mid-Range Capability Ground Support Equipment</i>	-	-	-	159.698	-	159.698	22.558	-	-	-	0.000	182.256
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

The MRC Ground Support Equipment (GSE) leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the GSE. This includes the Battery Operations Center (BOC), prime movers, trailers, generators, cabling, and support vehicles. The MRC BOC houses the federated Command and Control systems which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets.

The FY 2023 Base funding in the amount of \$159.698 million was moved from PE 0604644A to PE 0604135A and funds the fabrication, integration of design requirements, and test and evaluation for the MRC Ground Support Equipment (GSE) and MRC BOC to enable completion and fielding of the prototype battery. Base funding allows for integration of design requirements and evaluation of MRC GSE and BOC required characteristics to ensure safe and effective operational fielding of the prototype battery. This funds the Original Equipment Manufacturer's (OEM) effort to purchase hardware and materials and receive Government Furnished Equipment (GFE) to fabricate the MRC GSE and BOC and to support component-level and system-level qualification for MRC GSE and BOC. Base funding also allows for the System Engineering and Program Management of integration across military branches to include the OEM contractor and Other Government Agencies (OGA) in order to ensure a common MRC GSE. Funding provides for the Government and Contractor coordination required to perform systems engineering for integration efforts, verify cybersecurity requirements, manage software development, verify transportation requirements, and plan and execution of test and evaluation events to support initial fielding. Integration efforts include wireless communication, improved mobility, weight reduction, and M-Code implementation. This effort completes the design and fabrication of the initial MRC prototype battery, and continues the fabrication and integration of subsequent prototype batteries in support to transition to PEO M&S. PE 0604644A funded \$5.016 million that was moved to PEO M&S PE 0605235A in support of the transition from RCCTO to PEO M&S.

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

	FY 2021	FY 2022	FY 2023
Title: MR2 - Mid-Range Capability Ground Support Equipment	-	-	159.698
Description: The MRC Ground Support Equipment (GSE) leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the GSE. This includes the Battery Operations Center (BOC), prime movers, trailers, generators, cabling, and support vehicles. The MRC BOC houses the federated Command and Control systems.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Funding the FY 2020, FY 2021, FY 2022 is located in PE 0604644A.				
<p><i>FY 2023 Plans:</i> The FY 2023 Base funding in the amount of \$159.698 million was moved from PE 0604644A and funds the fabrication, integration of design requirements, and test and evaluation for the MRC Ground Support Equipment (GSE) and MRC BOC to enable completion and fielding of the prototype battery. Base funding allows for integration of design requirements and evaluation of MRC GSE and BOC required characteristics to ensure safe and effective operational fielding of the prototype battery. This funds the Original Equipment Manufacturer?s (OEM) effort to purchase hardware and materials and receive Government Furnished Equipment (GFE) to fabricate the MRC GSE and BOC and to support component-level and system-level qualification for MRC GSE and BOC. Base funding also allows for the System Engineering and Program Management of integration across military branches to include the OEM contractor and Other Government Agencies (OGA) in order to ensure a common MRC GSE. Funding provides for the Government and Contractor coordination required to perform systems engineering for system integration and check out, verify cybersecurity requirements, manage software development, verify transportation requirements, and plan and execute test and evaluation events to support initial fielding. Additional integration efforts include wireless communication, improved mobility, weight reduction, and M-Code implementation. This effort completes the design and fabrication of the initial MRC prototype battery, and continues the fabrication and integration of subsequent prototype battery GSE and BOC in supporting transition to PEO M&S. PE 0604644A funding of \$5.016 million was moved to PEO M&S PE 0605235A Mid-Range Capability in support of the transition.</p>				
<p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> An increase in funding is required from FY 2022 (PE 0604644A) to FY 2023 (PE 0604135A) to complete system integration and fielding of GSE and BOC for the initial MRC prototype battery, execute test and evaluation of GSE and BOC for the initial MRC prototype battery, while initiating hardware procurement and fabrication of GSE and BOC in support of the transition to the PEO M&S (PE 0605235A) for subsequent prototype batteries in support of the transition to PEO M&S. FY 2022 for MRC GSE (MR2) was funded under Program Element (PE) 0604644A / Mobile Medium Range Missile and moved to PE 0604135A / Strategic Mid-Range Fires in FY 2023. PE 0604644A funding of \$5.016 million was moved to PEO M&S PE 0605235A Mid-Range Capability in support of the transition.</p>				
Accomplishments/Planned Programs Subtotals		-	-	159.698
C. Other Program Funding Summary (\$ in Millions)				
N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>

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

Remarks

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

D. Acquisition Strategy

The MRC project will develop, integrate, and produce MRC specific analysis, design, development, and integration through a RCCTO prototype Other Transaction Authority (pOTA), which was awarded to Lockheed Martin (LM) in November 2020. Additionally, the pOTA will leverage the Strategic Capabilities Office (SCO), Navy, and US Marine Corps (USMC) investments in weapon system development since 2016 by providing a body of data including Technical Data Packages (TDP), Critical Design Review (CDR) artifacts, and active production lines. The MRC project will leverage existing contract vehicles to procure supporting items currently in production through a combination of Army and Navy contracts. Using these contracts, the MRC project retains commonality in production, training, logistics, and sustainment with the SCO and the Navy.

US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) APE 0605235A in FY 2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering and Program Management	Various	TBD : Huntsville, AL; National Capitol Region	-	-		-		9.907		-		9.907	0.000	9.907	-
Subtotal			-	-		-		9.907		-		9.907	0.000	9.907	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Original Equipment Manufacturer (OEM)	SS/CPFF	Lockheed Martin : various	-	-		-		86.928		-		86.928	0.000	86.928	-
Government Furnished Equipment (GFE)	Various	Various : Various	-	-		-		23.972		-		23.972	0.000	23.972	-
Other Government Agencies (OGA)	TBD	various : various	-	-		-		4.036		-		4.036	0.000	4.036	-
Subtotal			-	-		-		114.936		-		114.936	0.000	114.936	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cyber, Software, Transportation	Various	Various : Various	-	-		-		14.564		-		14.564	0.000	14.564	-
Subtotal			-	-		-		14.564		-		14.564	0.000	14.564	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	Various	various : Various	-	-		-		20.291		-		20.291	0.000	20.291	-
Subtotal			-	-		-		20.291		-		20.291	0.000	20.291	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>				Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>				
	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	-	-	-	159.698	-	159.698	0.000	159.698	N/A		

Remarks
 The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>

Event Name	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
MRC Ground Support Equipment (GSE) Assembly					██████████				██████████																			
MRC Battery Operation Center (BOC) Assembly									██████████																			
Initial System Integration and Check Out									██████████																			
New Materiel in Brief (NMIB)									████																			
Initial Fielding Prototype													████															
Obtain Release to Train													██████████															
Net													██████████															
TRR													████															
Obtain Release to Field Prototype													████															
SM-6 Missile Test													████															
Tomahawk Missile Test													████															
Subsequent Batteries GSE									██████████				██████████															
First Unit of Issue (FUI)																	▲											

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>	

Event Name	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
CLS																												

Note
 The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR2 / <i>Mid-Range Capability Ground Support Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MRC Ground Support Equipment (GSE) Assembly	1	2022	1	2023
MRC Battery Operation Center (BOC) Assembly	1	2022	1	2023
Initial System Integration and Check Out	3	2022	1	2023
New Materiel in Brief (NMIB)	3	2022	3	2022
Initial Fielding Prototype	1	2023	1	2023
Obtain Release to Train	1	2023	4	2023
Net	2	2023	3	2023
TRR	2	2023	2	2023
Obtain Release to Field Prototype	3	2023	3	2023
SM-6 Missile Test	3	2023	3	2023
Tomahawk Missile Test	3	2023	3	2023
Subsequent Batteries GSE	3	2022	4	2023
First Unit of Issue (FUI)	4	2023	4	2023
CLS	1	2024	4	2024

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604135A / Strategic Mid-Range Fires				Project (Number/Name) MR3 / Mid-Range Capability (MRC) Missiles			
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
MR3: Mid-Range Capability (MRC) Missiles	-	-	-	148.116	-	148.116	-	-	-	-	0.000	148.116
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

MRC funds buys missiles and associated missile support equipment needed for the operational fielding of the MRC prototype Battery. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. MRC provides Program Management and Systems Engineering for missile buys. The FY 2023 Base funding in the amount of \$148.116 million was moved from PE 0604644A to PE 0604135A and continues buying missiles in FY 2023. Details at a higher classification.

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

	FY 2021	FY 2022	FY 2023
Title: MR3 - Mid-Range Capability (MRC) Missile	-	-	148.116
Description: MRC missiles and associated missile support equipment buy is needed for operational fielding of the MRC Prototype Battery. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. MRC provides Government Systems Engineering and Program Management for missile buys.			
FY 2023 Plans: The FY 2023 Base funding in the amount of \$148.116 million was moved from PE 0604644A to PE 0604135A and continues buying missiles and associated missile support equipment in FY 2023. Details at a higher classification.			
FY 2022 to FY 2023 Increase/Decrease Statement: An increase in funding is required from FY 2022 (PE 0604644A) to FY 2023 (PE 0604135A) to purchase more missiles in different quantities. FY 2022 for MRC Missiles (MR3) was funded under Program Element (PE) 0604644A / Mobile Medium Range Missile and moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires in FY 2023.			
Accomplishments/Planned Programs Subtotals	-	-	148.116

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

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army Date: April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR3 / <i>Mid-Range Capability (MRC) Missiles</i>
--	--	--

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

Remarks

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

D. Acquisition Strategy

The MRC project will develop, integrate, and produce MRC specific analysis, design, development, and integration through a RCCTO prototype. The MRC Weapon System will leverage existing contract vehicles to procure supporting items currently in production through a combination of Army and Navy contracts. Using these contracts, the MRC Prototype Weapon System retains commonality in production, training, logistics, and sustainment with the SCO and the Navy.

US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A in FY 2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR3 / <i>Mid-Range Capability (MRC) Missiles</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering and Program Management	Various	TBD : Huntsville, AL; National Capitol Region	-	-		-		0.441		-		0.441	0.000	0.441	-
Subtotal			-	-		-		0.441		-		0.441	0.000	0.441	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Missiles	Various	TBD : Huntsville, AL; National Capitol Region	-	-		-		147.675		-		147.675	0.000	147.675	-
Subtotal			-	-		-		147.675		-		147.675	0.000	147.675	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						
		Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost									
Project Cost Totals											-	-	-	148.116	-	148.116	0.000	148.116	N/A

Remarks
 The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR3 / <i>Mid-Range Capability (MRC) Missiles</i>
--	--	--

Event Name	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
Missile Buy																												
SM-6 Missile Test																												
Tomahawk Missile Test																												
First Unit of Issue (FUI)													▲															
Missile Delivery																	▲ 2											

Note
The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR3 / <i>Mid-Range Capability (MRC) Missiles</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Missile Buy	3	2022	4	2023
SM-6 Missile Test	3	2023	3	2023
Tomahawk Missile Test	3	2023	3	2023
First Unit of Issue (FUI)	4	2023	4	2023
Missile Delivery	3	2025	3	2025

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>				Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>			
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
MR4: <i>Mid-Range Cap Launcher Payload Deployment System</i>	-	-	-	96.477	-	96.477	9.668	-	-	-	0.000	106.145
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

The MRC Launcher PDS leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the MRC Payload Deployment System. The MRC Launcher PDS stows and fires a mix of missiles types to include SM-6 and Tomahawk. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage desired targets. The MRC Launcher PDS Project delivers four PDSs for each MRC Battery. Additional missiles may be integrated to the MRC Launcher PDS capability needs.

The FY 2023 Base funding in the amount of \$96.477 million was moved from PE 0604644A / Mobile Medium Range Missiles to PE 0604135A / Strategic Mid-Range Fires and funds the fabrication, integration of design requirements, and test and evaluation for the initial four prototype MRC Launcher PDS. The FY 2023 base funding also provides for the OEMs effort to obtain materials and sub-assemblies and to fabricate the MRC Launcher Payload Deployment System for subsequent prototype batteries in support to transition to PEO M&S. This provides for additional design, development, and integration of required characteristics to ensure safe and effective operational fielding of the MRC Launcher PDS solution through Technology Insertion Points. Launcher integration ensures that the system is stable during launch and meets transportation requirements. Provides for the Government and Contractor coordination and support to plan and execute Test and Evaluation events. Additional integration efforts include improved communications, rapid reloading, improved mobility, weight reduction, and M-Code implementation. Provides for cyber security, software development, and transportation required to deliver the prototype battery.

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

	FY 2021	FY 2022	FY 2023
Title: MR4 - Mid-Range Capability Launcher Payload Deployment System (PDS)	-	-	96.477
Description: The MRC Launcher PDS leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the MRC Launcher PDS. The MRC Launcher PDS stows and fires a mix of missiles types to include SM-6 and Tomahawk missiles. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage desired targets. The MRC Launcher PDS project delivers four PDSs for each MRC Battery. Additional missiles may be integrated to the MRC Launcher PDS to meet capability needs.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0650235A in FY2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.</p> <p>FY 2023 Plans: The FY 2023 Base funding in the amount of \$96.477 million was moved from PE 0604644A to PE 0604135A and funds the OEMs effort to obtain materials and sub-assemblies and to fabricate the MRC Launcher. Provides for the continued integration of design requirements and test and evaluation for the four prototype MRC Launcher PDS. This funding supports the additional design, development, and integration of required characteristics to ensure safe and effective operational fielding of the MRC Launcher PDS solution through Technology Insertion Points. Launcher integration ensures that the system is stable during launch and meets transportation requirements. Provides for the Government and Contractor coordination required to plan and execute Test and Evaluation events. Additional integration efforts include improved communications, rapid reloading, improved mobility, weight reduction, and M-Code implementation. Provides Systems Engineering and Government Program Management for the MRC Launcher PDS project. Provides for cyber security, software development, and transportation required to deliver the prototype battery to a combat unit.</p> <p>US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A in FY 2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: An increase in funding is required from FY2022 (PE 0604644A) to FY2023 (PE 0604135A) to complete system integration and fielding of the Launcher PDS for the initial MRC prototype battery, execute test and evaluation of the Launcher PDS for the initial MRC prototype battery, while initiating hardware procurement and fabrication of the MRC Launcher PDS in support of the transition to PEO M&S (PE 0605235A) for subsequent prototype batteries. FY 2022 for MRC Launcher PDS (MR4) was funded under Program Element (PE) 0604644A / Mobile Medium Range Missile and moved from PE0604644A to PE 0604135A / Strategic Mid-Range Fires in FY 2023.</p>				
Accomplishments/Planned Programs Subtotals		-	-	96.477
C. Other Program Funding Summary (\$ in Millions) N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>

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

Remarks

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

D. Acquisition Strategy

The MRC project will develop, integrate, and produce MRC specific analysis, design, development, and integration through a RCCTO prototype Other Transaction Authority (pOTA), which was awarded to Lockheed Martin (LM) in November 2020. Additionally, the pOTA will leverage the Strategic Capabilities Office (SCO), Navy, and US Marine Corps (USMC) investments in weapon system development since 2016 by providing a body of data including Technical Data Packages (TDP), Critical Design Review (CDR) artifacts, and active production lines. The MRC project will leverage existing contract vehicles to procure supporting items currently in production through a combination of Army and Navy contracts. Using these contracts, the MRC project retains commonality in production, training, logistics, and sustainment with the SCO and the Navy.

US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A in FY 2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering and Program Management (SEPM)	Various	TBD : Huntsville, AL; National Capitol Region	-	-		-		6.567		-		6.567	0.000	6.567	-
Subtotal			-	-		-		6.567		-		6.567	0.000	6.567	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Original Equipment Manufacturer (OEM)	SS/CPFF	Lockheed Martin : various	-	-		-		74.607		-		74.607	0.000	74.607	-
Subtotal			-	-		-		74.607		-		74.607	0.000	74.607	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cyber, Software, Transportation	Various	Various : Various	-	-		-		6.491		-		6.491	0.000	6.491	-
Subtotal			-	-		-		6.491		-		6.491	0.000	6.491	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	Various	various : Various	-	-		-		8.812		-		8.812	0.000	8.812	-
Subtotal			-	-		-		8.812		-		8.812	0.000	8.812	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>				Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>			
	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	-	-	-	96.477	-	96.477	0.000	96.477	N/A		

Remarks

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>

Event Name	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
MRC Launcher Payload Deployment System (PDS) Assembly					████████████████				████████████████																			
Initial System Integration and Check Out					████████████████				████████████████																			
New Materiel in Brief (NMIB)					████████████████				████████████████																			
Initial Fielding Prototype					████████████████				████████████████																			
Obtain Release to Train					████████████████				████████████████																			
Net					████████████████				████████████████																			
TRR					████████████████				████████████████																			
Obtain Release to Field Prototype					████████████████				████████████████																			
SM-6 Missile Test					████████████████				████████████████																			
Tomahawk Missile Test					████████████████				████████████████																			
Subsequent Batteries Launcher PDS					████████████████				████████████████																			
First Unit of Issue (FUI)					████████████████				████████████████																			
CLS					████████████████				████████████████																			

Note
 The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604135A / <i>Strategic Mid-Range Fires</i>	Project (Number/Name) MR4 / <i>Mid-Range Cap Launcher Payload Deployment System</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MRC Launcher Payload Deployment System (PDS) Assembly	1	2022	1	2023
Initial System Integration and Check Out	3	2022	1	2023
New Materiel in Brief (NMIB)	3	2022	3	2022
Initial Fielding Prototype	1	2023	1	2023
Obtain Release to Train	1	2023	4	2023
Net	2	2023	3	2023
TRR	2	2023	2	2023
Obtain Release to Field Prototype	3	2023	3	2023
SM-6 Missile Test	3	2023	3	2023
Tomahawk Missile Test	1	2023	4	2023
Subsequent Batteries Launcher PDS	3	2022	4	2023
First Unit of Issue (FUI)	4	2023	4	2023
CLS	1	2024	4	2024

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>
---	--

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	-	841.666	315.131	173.168	-	173.168	43.244	28.014	0.000	0.000	0.000	1,401.223
HX1: <i>Long-Range Hypersonic Weapon</i>	-	841.666	315.131	-	-	-	-	-	-	-	0.000	1,156.797
HX3: <i>All Up Round and Canister (AUR+C)</i>	-	-	-	45.233	-	45.233	-	-	-	-	0.000	45.233
HX4: <i>Common Hypersonic Glide Body (CHGB)</i>	-	-	-	40.710	-	40.710	-	-	-	-	0.000	40.710
HX5: <i>Ground Support Equipment (GSE)</i>	-	-	-	72.842	-	72.842	43.244	28.014	-	-	0.000	144.100
HX6: <i>Test and Evaluation</i>	-	-	-	14.383	-	14.383	-	-	-	-	0.000	14.383

Note

This funding will transition the Budget Activity (BA) 4 activities managed by the Rapid Capabilities and Critical Technologies Office (RCCTO) within Program Element (PE) 0604182A / Hypersonics to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

A. Mission Description and Budget Item Justification

The work in this PE supports the research, development, prototype, test and evaluation of technology to rapidly and efficiently procure, transition, and/or field critical enabling technologies and capabilities that address near-term, and mid-term threats and is directly aligned to the Army Long Range Precision Fires modernization priority.

The Program Element (PE) 0604182A Hypersonics funds the Rapid Capabilities and Critical Technologies Office (RCCTO) hypersonic effort. This includes the development and prototype fielding of a Long Range Hypersonic Weapon to suppress adversary Long Range Fires and engage other high payoff/time critical targets. This encompasses the growth, testing and transition of Long Range Fires technologies.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	832.166	300.928	0.000	-	0.000
Current President's Budget	841.666	315.131	173.168	-	173.168
Total Adjustments	9.500	14.203	173.168	-	173.168
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-34.480			
• Congressional Rescissions	-	-			
• Congressional Adds	-	49.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	9.500	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	173.168	-	173.168
• FFRDC Transfer	-	-0.317	-	-	-

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

Project: HX1: *Long-Range Hypersonic Weapon*

Congressional Add: *Program increase - hypersonic glide body risk reduction*

Congressional Add: *Program increase - hypersonic and strategic materials and structures*

Congressional Add: *Program Increase - Near Net Shape Materials*

Congressional Add Subtotals for Project: HX1

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	50.000	44.000
	10.000	-
	-	5.000
Congressional Add Subtotals for Project: HX1	60.000	49.000
Congressional Add Totals for all Projects	60.000	49.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

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
HX1: <i>Long-Range Hypersonic Weapon</i>	-	841.666	315.131	-	-	-	-	-	-	-	0.000	1,156.797
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Previously, the Rapid Capabilities and Critical Technologies Office (RCCTO) Hypersonics funding (FY20-FY25) was captured within Program Element (PE) 0604182A / Hypersonics, Project HX1 / Long-Range Hypersonic Weapon. Beginning in FY23, all funding is realigned from Project HX1 to Project HX3, HX4, HX5 and HX6 beneath PE 0604182A / Hypersonics.

This funding, along with the realigned funding to the project codes beneath PE 0604182A / Hypersonics, will transition the Budget Activity (BA) 4 activities managed by the RCCTO to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

A. Mission Description and Budget Item Justification

Funds the RCCTO to field an experimental prototype Hypersonic Weapon System with residual combat capability at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations by the end of FY 2023. Initial fielding of all ground support equipment and training canisters, less live rounds, was completed in FY 2021. The Long Range Hypersonic Weapon (LRHW) system will provide the Army a prototype strategic attack weapon system to defeat Anti Access/ Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. Common with the Navy, the LRHW system includes a Common Hypersonic Glide Body (CHGB) and common 34.5 inch booster. Additionally, the LRHW will use an existing Command and Control (C2) Network, the Advanced Field Artillery Tactical Data System (AFATDS).

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

	FY 2021	FY 2022	FY 2023
Title: Long Range Hypersonic Weapon	772.166	-	-
Description: Funding is provided for planning, prototype manufacturing and testing of the Long Range Hypersonic Weapon.			
Title: Common Hypersonic Glide Body (CHGB)	-	20.593	-
Description: This effort is the development, purchase of hardware, integration, assembly, test and delivery of the Common Hypersonic Glide Body (CHGB) system for the All Up Round and Canister (AUR+C).			
FY 2022 Plans: In FY 2022, Common Hypersonic Glide Body fabrication and assembly will significantly increase effort to support the delivery of flight test and fielded CHGB assets. Primary efforts include material purchases, manufacturing, assembly, integration, test, and checkout of CHGB components, subsystems, and systems. Additional investments in facilities, tooling, and resources required to meet production rates will occur in FY 2022. Thermal Protection System (TPS) Integrator will begin material purchases, facilities			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
investments, and shadowing current performers as a part of the leader-follower construct to transition production responsibility to the industrial base. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is due to the funding being realigned to Project HX4 / Common Hypersonic Glide Body (CHGB) under PE 0604182A / Hypersonics.				
Title: All Up Round and Canister (AUR+C) Description: This effort is the development, purchase of hardware, integration, assembly, test and delivery of the All Up Round and Canister (AUR+C). FY 2022 Plans: Continue fabrication and begin assembly of AUR+C prototypes for flight testing and FY 2023 fielding. Continue maturation of software and hardware technologies. Conduct pre-test planning, execution, and post-test analysis. Begin Insensitive Munition and Hazard Classification (IM/HC) testing. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is due to the funding being realigned to Project HX3 / All Up Round and Canister (AUR+C) under PE 0604182A / Hypersonics.		-	97.132	-
Title: Ground Support Equipment (GSE) Description: This funding is provided for planning, manufacturing and integration efforts for the Battery Operations Center (BOC), Transporter Erector Launcher (TEL), the Fielding and Transition efforts as well as the overall Systems Integration with the All Up Round and Canister (AUR+C) for the LRHW program. FY 2022 Plans: Supports execution of training and logistics for fielded equipment including maintenance and repair/replacement of system components in order to maintain operational readiness. Includes systems integration activities in lab and field environment of the All-Up Round and Canister (AUR+C), Transporter Erector Launcher (TEL) and Battery Operations Center (BOC) hardware and software. Planning and execution of ground and flight test events utilizing TEL and BOC followed by post-test data analysis and evaluation of test results. Software development and maintenance to incorporate design changes resulting from test events as well as user feedback. Development of the product-level technical data package documenting the design of the TEL and BOC. Includes engineering support for technology insertion to the weapon system driving hardware and software changes to the system. FY 2022 to FY 2023 Increase/Decrease Statement:		-	86.867	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
The decrease is due to the funding being realigned to Project HX5 / Ground Support Equipment (GSE) under PE 0604182A / Hypersonics.			
<p>Title: Test and Evaluation</p> <p>Description: Test and evaluation includes test planning, execution and analysis of 3 major flight tests. Also provides required support for environmental testing.</p> <p>FY 2022 Plans: JFC-1 requirements include Post Flight Test analysis, Transportation of equipment and Soldier TDY. JFC-2 requirements include range costs at Cape Canaveral Space Force Station (CCSFS), integration efforts at Lockheed Martin (LM), data collection infrastructure, mission planning, execution costs and Soldier TDY. JFC-3 requirements include mission objective development and range integration costs. Will support Environmental testing.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is due to the funding being realigned to Project HX6 / Test and Evaluation under PE 0604182A / Hypersonics.</p>	-	51.814	-
<p>Title: Reprogramming - Data Links Integration</p> <p>Description: Incorporation of Data links: - Complete Requirements, Concept of Operations (CONOPS), Architecture and Interfaces for data links - Initiate integration of an UltraScale+ (US+) Advanced Computer into the CHGB</p>	9.500	-	-
<p>Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	9.725	-
Accomplishments/Planned Programs Subtotals	781.666	266.131	-

	FY 2021	FY 2022
Congressional Add: Program increase - hypersonic glide body risk reduction	50.000	44.000
FY 2021 Accomplishments: Common Hypersonic Glide Body (CHGB) production will ramp up with the purchase of additional equipment. RCCTO will purchase critical spare parts to offset risk for flight tests. RCCTO will further develop critical skills and infrastructure to increase CHGB rate production and accommodate upgrades and will improve supplier base and manufacturing capabilities. RCCTO will develop automated test		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

	FY 2021	FY 2022
equipment and design and develop CHGB test articles for use in CHGB or AUR risk reduction and safety testing. The production engineering effort to make design more affordable will continue.		
FY 2022 Plans: Furthers efforts executed under FY21 109 \$50.000M ?Hypersonic Glidebody Risk Reduction?. RCCTO will purchase additional equipment for Common Hypersonic Glidebody (CHGB) production ramp up, purchase critical spare parts to offset risk for flight tests, improve supplier base and manufacturing capabilities, develop test equipment and continue production engineering efforts to make design more affordable.		
Congressional Add: Program increase - hypersonic and strategic materials and structures	10.000	-
FY 2021 Accomplishments: Data inputs for the National Hypersonic Materials Database will be provided. Environments and design test matrices will be defined. Materials and fabricate specimens will be purchased. Framework for database will be initialized. Metal materials will be characterized and initial non-metal characterized. Additive manufacturing (metals) research will be conducted. Develop and characterize materials for the Common Hypersonic Glide Body (CHGB) Thermal Protection System (TPS) including Carbon-Carbon and other extreme hi-temp materials will be conducted.		
Congressional Add: Program Increase - Near Net Shape Materials	-	5.000
FY 2022 Plans: This effort focuses on optimizing the use of 3 Dimensional Carbon-Carbon (3DCC) in the Thermal Protection System (TPS). The intent is to decrease waste, improve producibility and reduce overall cost.		
Congressional Adds Subtotals	60.000	49.000

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

N/A

Remarks

D. Acquisition Strategy

The Army will field an experimental prototype Hypersonic Weapons System with residual operational capability NLT FY 2023 at the Battery Level as part of the Strategic Fires Battalion in support of Multi-domain Operations. Contractor Logistics Support (CLS) will be provided for one year following the delivery of the first battery. RCCTO uses a combination of Other Transaction Authority's (OTA's) and the Navy Conventional Prompt Strike (CPS) contract with Lockheed Martin. Long-lead procurement is required 2 years prior to delivery resulting in a significant ramp up of funding in FY 2021 to meet the FY 2022 manufacturing and FY 2023 fielding requirement. Quick awards of the OTA and Navy CPS contracts ensure procurements are executed with adequate time to execute the funds and program requirements. A SETA contract provides support to the Government Project Office. The PEO M&S transition team is currently embedded within RCCTO to ensure an efficient transition in FY 2024 as a program of record.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / Hypersonics	Project (Number/Name) HX1 / Long-Range Hypersonic Weapon
--	---	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	24.823	28.606		-		-		-		-	0.000	53.429	-
CHGB: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		3.580		-		-		-	0.000	3.580	-
AUR+C: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		5.847		-		-		-	0.000	5.847	-
GSE: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		7.206		-		-		-	0.000	7.206	-
Test: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		4.373		-		-		-	0.000	4.373	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		9.725		-		-		-	0.000	9.725	-
Subtotal			24.823	28.606		30.731		-		-		-	0.000	84.160	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Contracts for technology development, and weapon design, integration, prototyping and testing	C/Various	various : multiple	369.796	813.060		-		-		-		-	0.000	1,182.856	-
CHGB: Dynetics Technical Solution (DTS)	C/CPFF	Manufacturing of the CHGB : Huntsville, AL	-	-		23.600		-		-		-	0.000	23.600	-
TPS: Dynetics Technical Solutions (DTS)	C/CPFF	Manufacturing of TPS : Huntsville, AL	-	-		18.099		-		-		-	0.000	18.099	-
CHGB: Various	Various	CHGB/TPS : Huntsville, AL	-	-		24.315		-		-		-	0.000	24.315	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUR+C: Lockheed Martin	C/Various	Manufacturing and delivery of the LRHW booster and canister : Denver, CO	-	-		83.903		-		-		-	0.000	83.903	-
AUR+C: Various	Various	AUR+C : Multiple	-	-		7.382		-		-		-	0.000	7.382	-
GSE: Lockheed Martin	C/CPFF	Software development and maintenance, weapons systems integration, test planning and execution support for JFC-2 and JFC-3 : Huntsville, AL	-	-		76.531		-		-		-	65.642	142.173	-
GSE: Various	Various	Ground Spt Equipment : Huntsville, AL	-	-		3.129		-		-		-	0.992	4.121	-
Subtotal			369.796	813.060		236.959		-		-		-	66.634	1,486.449	N/A

Remarks
The CHGB contractor, DTS, will be funded by additional customers of the Common Hypersonic Glide Body.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test: Flight Test Planning and Execution	Various	Flight Test Planning and Execution : Various	-	-		47.441		-		-		-	0.000	47.441	-
Subtotal			-	-		47.441		-		-		-	0.000	47.441	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

	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	394.619	841.666	315.131	-	-	-	66.634	1,618.050	N/A

Remarks
Original breakout of the form is expanded to show more detail. Contracts for technology development and weapon design, integration, prototyping and testing cost category captured under Product Development is broken out into multiple cost categories. Additionally, Government Personnel and Operations Support captured under Management Services is broken out into multiple cost categories.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

Event Name	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
GSE Critical Design Review	▲1																											
CHGB Long Lead/Production	██████████				██████████																							
Launcher Design/Manufacturing	██████████				██████████																							
Canisters Delivered for training			██████	██████	██████████																							
LRHW AUR+C Booster and Canister Deliveries			██████	██████	██████████																							
Delivery of Prototypes Launchers			██████	██████	██████████																							
Contractor Logistics Support (CLS)					██████████																							
New Equipment Training					██████████																							
Initial Fielding of BOC and TELs				▲2	██████████																							
FT-3 Test					██████████																							
JFC-1 Test					██████████																							
JFC-2 Test					██████████																							

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX1 / <i>Long-Range Hypersonic Weapon</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integration Systems Requirement Review	1	2020	1	2020
AUR+C Preliminary Design Review	2	2020	2	2020
GSE Preliminary Design Review	2	2020	2	2020
Launcher Preliminary Design Review	3	2020	3	2020
GSE Critical Design Review	1	2021	1	2021
CHGB Long Lead/Production	1	2020	4	2022
Launcher Design/Manufacturing	1	2020	4	2021
Canisters Delivered for training	3	2021	4	2021
LRHW AUR+C Booster and Canister Deliveries	3	2021	4	2022
Delivery of Prototypes Launchers	4	2021	4	2021
Contractor Logistics Support (CLS)	1	2022	4	2022
New Equipment Training	1	2022	2	2022
Initial Fielding of BOC and TELs	4	2021	4	2021
FT-3 Test	1	2022	1	2022
JFC-1 Test	3	2022	3	2022
JFC-2 Test	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX3 / <i>All Up Round and Canister (AUR+C)</i>
--	--	--

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
HX3: <i>All Up Round and Canister (AUR+C)</i>	-	-	-	45.233	-	45.233	-	-	-	-	0.000	45.233
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Work in this project continues the work done under PE 0604182A / Hypersonics, Project HX1 / Long-Range Hypersonic Weapon.

Previously, the Rapid Capabilities and Critical Technologies Office (RCCTO) Hypersonics funding (FY20-FY25) was captured within Program Element (PE) 0604182A / Hypersonics under Project HX1 / Long-Range Hypersonic Weapon. Beginning in FY23, all remaining funding for All Up Round and Canister (AUR+C) RCCTO requirements was realigned to Project HX3 / All Up Round and Canister (AUR+C).

This funding will transition the Budget Activity (BA) 4 AUR+C activities managed by the RCCTO to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

A. Mission Description and Budget Item Justification

Funds the RCCTO to field an experimental prototype Hypersonic Weapon System with residual combat capability at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations by the end of FY 2023. Initial fielding of all ground support equipment and training canisters, less live rounds, was completed in FY 2021. The Long Range Hypersonic Weapon (LRHW) system will provide the Army a prototype strategic attack weapon system to defeat Anti Access/ Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. Common with the Navy, the LRHW system includes a Common Hypersonic Glide Body (CHGB) and common 34.5 inch booster. Additionally, the LRHW will use an existing Command and Control (C2) Network, the Advanced Field Artillery Tactical Data System (AFATDS).

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

	FY 2021	FY 2022	FY 2023
Title: All Up Round and Canister (AUR+C)	-	-	45.233
Description: This effort is the development, purchase of hardware, integration, assembly, test and delivery of the All Up Round and Canister (AUR+C).			
FY 2023 Plans: Technologies will continue to be updated based on FY 2022 test outcomes. Complete All Up Round and Canister (AUR+C) assembly, integration, acceptance testing and delivery. Support test preparation, execution, and post-flight analysis. Complete Insensitive Munition / Hazard Classification tests.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX3 / <i>All Up Round and Canister (AUR+C)</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Increase is due to the funding being realigned from Project HX1 / Long-Range Hypersonic Weapon to Project HX3 / All Up Round and Canister (AUR+C).			
Accomplishments/Planned Programs Subtotals	-	-	45.233

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

N/A

Remarks

D. Acquisition Strategy

The RCCTO has a program level acquisition strategy that will field an experimental prototype Hypersonic Weapons System with residual operational capability NLT FY 2023 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations. Contractor Logistics Support (CLS) will be provided for one year following the delivery of the first battery. RCCTO uses a combination of Other Transaction Authority's (OTA's) and the Navy Conventional Prompt Strike (CPS) contract with Lockheed Martin. The AUR+C is currently embedded into this strategy as a project. Long lead procurement is required 2 years prior to delivery resulting in a significant ramp up of funding in FY 2021 to meet the FY 2022 manufacturing and FY 2023 fielding requirement. Quick awards of the OTA and Navy CPS contracts ensure procurements are executed with adequate time to execute the funds and program requirements. A SETA contract provides support to the Government Project Office. The PEO M&S transition team is currently embedded within RCCTO to ensure an efficient transition in FY 2024 as a program of record.

The detailed acquisition strategy specific to AUR+C will be defined by PEO M&S to support the follow on AUR+C requirements currently funded in PE 0605232A / Hypersonics Weapon (LRHW), Project HX2.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX3 / <i>All Up Round and Canister (AUR+C)</i>
--	--	--

Event Name	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
Army Canister Deliveries									██████████																			
LRHW AUR+C Booster Deliveries									██████████																			
JFC-3 Test									▲ 1																			
IM/HC Testing													██████████															
LRHW FUI																	▲ 2											

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX3 / <i>All Up Round and Canister (AUR+C)</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Army Canister Deliveries	1	2023	4	2023
LRHW AUR+C Booster Deliveries	1	2023	4	2023
JFC-3 Test	2	2023	2	2023
IM/HC Testing	3	2023	4	2023
LRHW FUI	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>				Project (Number/Name) HX4 / <i>Common Hypersonic Glide Body (CHGB)</i>			
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
HX4: <i>Common Hypersonic Glide Body (CHGB)</i>	-	-	-	40.710	-	40.710	-	-	-	-	0.000	40.710
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Work in this project continues the work done under PE 0604182A / Hypersonics, Project HX1 / Long-Range Hypersonic Weapon.

Previously, the Rapid Capabilities and Critical Technologies Office (RCCTO) Hypersonics funding (FY20-FY25) was captured within Program Element (PE) 0604182A / Hypersonics under Project HX1 / Long-Range Hypersonic Weapon. Beginning in FY23, all remaining funding for Common Hypersonic Glide Body (CHGB) RCCTO requirements was realigned to Project HX4 / Common Hypersonic Glide Body (CHGB).

This funding will transition the Budget Activity (BA) 4 CHGB activities managed by the RCCTO to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

A. Mission Description and Budget Item Justification

Funds the RCCTO to field an experimental prototype Hypersonic Weapon System with residual combat capability at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations by the end of FY 2023. Initial fielding of all ground support equipment and training canisters, less live rounds, was completed in FY 2021. The Long Range Hypersonic Weapon (LRHW) system will provide the Army a prototype strategic attack weapon system to defeat Anti Access/ Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. Common with the Navy, the LRHW system includes a Common Hypersonic Glide Body (CHGB) and common 34.5 inch booster. Additionally, the LRHW will use an existing Command and Control (C2) Network, the Advanced Field Artillery Tactical Data System (AFATDS).

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

	FY 2021	FY 2022	FY 2023
Title: Common Hypersonic Glide Body (CHGB)	-	-	40.710
Description: This effort is the development, purchase of the hardware, integration, assembly, test and delivery of the Common Hypersonic Glide Body (CHGB) system for the missile.			
FY 2023 Plans:			
In FY 2023, fabrication and assembly of Common Hypersonic Glide Body (CHGB) prototypes will ramp up to JFC-3 flight test, qualification testing and fielding of the first LRHW battery. Primary efforts include manufacturing, assembly, test and checkout of the CHGB components and subsystems. Additional efforts include sub-assembly activities and integration, assembly and test			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX4 / <i>Common Hypersonic Glide Body (CHGB)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
of complete CHGBs for the Army's first LRHW battery. The new industry Thermal Protection System (TPS) integrator will begin integration, assembly and test efforts and continue long lead material procurements to support future deliveries.				
FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to the funding being realigned from Project HX1 / Long-Range Hypersonic Weapon to Project HX4 / Common Hypersonic Glide Body (CHGB).				
Accomplishments/Planned Programs Subtotals		-	-	40.710
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>The RCCTO has a program level acquisition strategy that will field an experimental prototype Hypersonic Weapons System with residual operational capability NLT FY 2023 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations. Contractor Logistics Support (CLS) will be provided for one year following the delivery of the first battery. RCCTO uses a combination of Other Transaction Authority's (OTA's) and the Navy Conventional Prompt Strike (CPS) contract with Lockheed Martin. The CHGB is currently embedded into this strategy as a project. Long lead procurement is required 2 years prior to delivery resulting in a significant ramp up of funding in FY 2021 to meet the FY 2022 manufacturing and FY 2023 fielding requirement. Quick awards of the OTA and Navy CPS contracts ensure procurements are executed with adequate time to execute the funds and program requirements. A SETA contract provides support to the Government Project Office. The PEO M&S transition team is currently embedded within RCCTO to ensure an efficient transition in FY 2024 as a program of record.</p> <p>The detailed acquisition strategy specific to CHGB will be defined by PEO M&S to support the follow on CHGB requirements currently funded in PE 0605232A / Hypersonics Weapon (LRHW), Project HX2.</p>				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604182A / Hypersonics				HX4 I Common Hypersonic Glide Body (CHGB)							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CHGB: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		-		6.703		-		6.703	0.000	6.703	-
Subtotal			-	-		-		6.703		-		6.703	0.000	6.703	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CHGB: Dynetics Technical Solutions (DTS)	C/CPFF	Manufacturing of the CHGB : Huntsville, AL	-	-		-		27.424		-		27.424	0.000	27.424	-
CHGB: Various	Various	Manufacturing of the CHGB : Huntsville, AL	-	-		-		6.583		-		6.583	0.000	6.583	-
Subtotal			-	-		-		34.007		-		34.007	0.000	34.007	N/A
Project Cost Totals			-	-		-		40.710		-		40.710	0.000	40.710	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX4 / <i>Common Hypersonic Glide Body (CHGB)</i>	

Event Name	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
CHGB Deliveries																												
JFC-3 Test									▲ 1																			
LRHW FUI													▲ 2															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX4 / <i>Common Hypersonic Glide Body (CHGB)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CHGB Deliveries	1	2023	3	2023
JFC-3 Test	2	2023	2	2023
LRHW FUI	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX5 / <i>Ground Support Equipment (GSE)</i>
--	--	---

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
HX5: <i>Ground Support Equipment (GSE)</i>	-	-	-	72.842	-	72.842	43.244	28.014	-	-	0.000	144.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Work in this project continues the work done under PE 0604182A / Hypersonics, Project HX1 / Long-Range Hypersonic Weapon.

Previously, the Rapid Capabilities and Critical Technologies Office (RCCTO) Hypersonics funding (FY20-FY25) was captured within Program Element (PE) 0604182A / Hypersonics under Project HX1 / Long-Range Hypersonic Weapon. Beginning in FY23, all remaining funding for Ground Support Equipment (GSE) RCCTO requirements was realigned to Project HX5 / Ground Support Equipment (GSE).

This funding will transition the Budget Activity (BA) 4 GSE activities managed by the RCCTO to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

FY25 funding will be re-aligned to PE 0605232A / Hypersonics EMD due to transition to a Program of Record managed by PEO Missiles and Space.

A. Mission Description and Budget Item Justification

Funds the RCCTO to field an experimental prototype Hypersonic Weapon System with residual combat capability at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations by the end of FY 2023. Initial fielding of all ground support equipment and training canisters, less live rounds, was completed in FY 2021. The Long Range Hypersonic Weapon (LRHW) system will provide the Army a prototype strategic attack weapon system to defeat Anti Access/ Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. Common with the Navy, the LRHW system includes a Common Hypersonic Glide Body (CHGB) and common 34.5 inch booster. Additionally, the LRHW will use an existing Command and Control (C2) Network, the Advanced Field Artillery Tactical Data System (AFATDS).

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

	FY 2021	FY 2022	FY 2023
Title: Ground Support Equipment (GSE)	-	-	72.842
Description: This funding is provided for planning, manufacturing and integration efforts for the Battery Operations Center (BOC), Transporter Erector Launcher (TEL), the Fielding and Transition efforts as well as the overall Systems Integration with the All Up Round and Canister (AUR+C) for the LRHW program.			
FY 2023 Plans: Supports execution of training and logistics for fielded equipment including maintenance and repair/replacement of system components (Contractor Logistics Support (CLS)) in order to maintain operational readiness. Includes systems integration activities in lab and field environment of the All-Up Round and Canister (AUR+C), Transporter Erector Launcher (TEL) and Battery			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX5 / <i>Ground Support Equipment (GSE)</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Operations Center (BOC) hardware and software. Planning and execution of ground and flight test events utilizing TEL and BOC followed by post-test data analysis and evaluation of test results. Software development and maintenance to incorporate design changes resulting from test events as well as user feedback. Development of the product-level technical data package documenting the design of the TEL and BOC. Includes engineering support for technology insertion to the weapon system driving hardware and software changes to the system. Complete a delta New Equipment Training (NET) event to cover hardware and software changes as well as Soldier rotations.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase is due to the funding being realigned from Project HX1 / Long-Range Hypersonic Weapon to Project HX5 / Ground Support Equipment (GSE).</p>			
Accomplishments/Planned Programs Subtotals	-	-	72.842

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

N/A

Remarks

D. Acquisition Strategy

The RCCTO has a program level acquisition strategy that will field an experimental prototype Hypersonic Weapons System with residual operational capability NLT FY 2023 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations. Contractor Logistics Support (CLS) will be provided for one year following the delivery of the first battery. RCCTO uses a combination of Other Transaction Authority's (OTA's) and the Navy Conventional Prompt Strike (CPS) contract with Lockheed Martin. The GSE is currently embedded into this strategy as a project. Long lead procurement is required 2 years prior to delivery resulting in a significant ramp up of funding in FY 2021 to meet the FY 2022 manufacturing and FY 2023 fielding requirement. Quick awards of the OTA and Navy CPS contracts ensure procurements are executed with adequate time to execute the funds and program requirements. A SETA contract provides support to the Government Project Office. The PEO M&S transition team is currently embedded within RCCTO to ensure an efficient transition in FY 2024 as a program of record.

The detailed acquisition strategy specific to GSE will be defined by PEO M&S to support the follow on GSE requirements currently funded in PE 0605232A / Hypersonics Weapon (LRHW), Project HX2.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX5 / <i>Ground Support Equipment (GSE)</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GSE: Government Personnel and Operations Support	Various	Project Office Support : Huntsville, AL	-	-		-		9.324		-		9.324	0.688	10.012	-
Subtotal			-	-		-		9.324		-		9.324	0.688	10.012	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GSE: Lockheed Martin	C/CPFF	Software development and maintenance, weapons systems integration, test planning and execution support for JFC-2 and JFC-3. : Huntsville, AL	-	-		-		53.531		-		53.531	67.613	121.144	-
GSE: Various	Various	Ground Support Equipment : Huntsville, AL	-	-		-		9.987		-		9.987	2.957	12.944	-
Subtotal			-	-		-		63.518		-		63.518	70.570	134.088	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		-	-	-	72.842	-	72.842	71.258	144.100	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX5 / <i>Ground Support Equipment (GSE)</i>
--	--	---

Event Name	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
Contractor Logistics Support (CLS)																												
JFC-3 Test									▲ 1																			
Delta New Equipment Training													■															
LRHW FUI													▲ 2															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX5 / <i>Ground Support Equipment (GSE)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contractor Logistics Support (CLS)	1	2023	4	2025
JFC-3 Test	2	2023	2	2023
Delta New Equipment Training	4	2023	4	2023
LRHW FUI	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>				Project (Number/Name) HX6 / <i>Test and Evaluation</i>			
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
HX6: <i>Test and Evaluation</i>	-	-	-	14.383	-	14.383	-	-	-	-	0.000	14.383
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Work in this project continues the work done under PE 0604182A / Hypersonics, Project HX1 / Long-Range Hypersonic Weapon.

Previously, the Rapid Capabilities and Critical Technologies Office (RCCTO) Hypersonics funding (FY20-FY25) was captured within Program Element (PE) 0604182A / Hypersonics under Project HX1 / Long-Range Hypersonic Weapon. Beginning in FY23, all remaining funding for Test and Evaluation RCCTO requirements was realigned to Project HX6 / Test and Evaluation.

This funding will transition the Budget Activity (BA) 4 Test and Evaluation activities managed by the RCCTO to a Program of Record managed by Program Executive Office (PEO) Missiles and Space within PE 0605232A / Hypersonics EMD.

A. Mission Description and Budget Item Justification

Funds the RCCTO to field an experimental prototype Hypersonic Weapon System with residual combat capability at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations by the end of FY 2023. Initial fielding of all ground support equipment and training canisters, less live rounds, was completed in FY 2021. The Long Range Hypersonic Weapon (LRHW) system will provide the Army a prototype strategic attack weapon system to defeat Anti Access/ Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. Common with the Navy, the LRHW system includes a Common Hypersonic Glide Body (CHGB) and common 34.5 inch booster. Additionally, the LRHW will use an existing Command and Control (C2) Network, the Advanced Field Artillery Tactical Data System (AFATDS).

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

	FY 2021	FY 2022	FY 2023
Title: Test and Evaluation	-	-	14.383
Description: Test and evaluation includes test planning, execution, and analysis of 2 major flight tests. Also provides required support for environmental testing.			
FY 2023 Plans: JFC-2 requirements include Post Flight Test analysis. JFC-3 requirements include data collection infrastructure, execution costs, Soldier TDY and Post Flight Test analysis.			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to the funding being realigned from Project HX1 / Long-Range Hypersonic Weapon to Project HX6 / Test and Evaluation.			
Accomplishments/Planned Programs Subtotals	-	-	14.383

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / Hypersonics	Project (Number/Name) HX6 / Test and Evaluation

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

N/A

Remarks

D. Acquisition Strategy

The RCCTO has a program level acquisition strategy that will field an experimental prototype Hypersonic Weapons System with residual operational capability NLT FY 2023 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-domain Operations. Contractor Logistics Support (CLS) will be provided for one year following the delivery of the first battery. RCCTO uses a combination of Other Transaction Authority's (OTA's) and the Navy Conventional Prompt Strike (CPS) contract with Lockheed Martin. Test is currently embedded into this strategy as a project. Long lead procurement is required 2 years prior to delivery resulting in a significant ramp up of funding in FY 2021 to meet the FY 2022 manufacturing and FY 2023 fielding requirement. Quick awards of the OTA and Navy CPS contracts ensure procurements are executed with adequate time to execute the funds and program requirements. A SETA contract provides support to the Government Project Office. The PEO M&S transition team is currently embedded within RCCTO to ensure an efficient transition in FY 2024 as a program of record.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX6 / <i>Test and Evaluation</i>
--	--	--

Event Name	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
JFC-2 Post Flight Analysis																												
JFC-3 Test									▲ 1																			
LRHW FUI													▲ 2															

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604182A / <i>Hypersonics</i>	Project (Number/Name) HX6 / <i>Test and Evaluation</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JFC-2 Post Flight Analysis	1	2023	2	2023
JFC-3 Test	2	2023	2	2023
LRHW FUI	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604403A / <i>Future Interceptor</i>
---	---

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	-	-	6.895	8.179	-	8.179	8.210	8.202	8.205	8.285	Continuing	Continuing
FM3: <i>Future Interceptor</i>	-	-	6.895	8.179	-	8.179	8.210	8.202	8.205	8.285	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 Missile Segment Enhancement (MSE) program.

The warfighter community is actively developing operational requirements for the Future Interceptor that will defend against current and emerging near-peer threats. The Future Interceptor will complement current sensor programs and is required to be employed in 2028. The Future Interceptor program will provide operational effectiveness against current and evolving air, missile, and hypersonic threats within the lower tier portion of the ballistic missile defense battlespace. The future interceptor will increase Air and Missile Defense (AMD) capability through increased velocity, attitude, and maneuverability. Current funding provides refinements/updates to drafted Architecture Design/Concept Definitions, Performance Study Reports, Program Feasibility/Acquisition Strategy documents already delivered to the USG as part of Phase I. It also continues Virtual Missile Model (VMM) development to support rapid prototyping and concept definition. Products from the Future Interceptor concept definition phase support rapid prototyping technologies that will be used in future efforts to competitively down select to a single vendor.

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	7.895	0.000	-	0.000
Current President's Budget	0.000	6.895	8.179	-	8.179
Total Adjustments	0.000	-1.000	8.179	-	8.179
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	8.179	-	8.179

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604403A / <i>Future Interceptor</i>				Project (Number/Name) FM3 / <i>Future Interceptor</i>			
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
FM3: <i>Future Interceptor</i>	-	-	6.895	8.179	-	8.179	8.210	8.202	8.205	8.285	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The warfighter community is actively developing operational requirements for the Future Interceptor that will defend against current and emerging near-peer threats. The Future Interceptor will complement current sensor programs and is required to be employed in 2028. The Future Interceptor program will provide operational effectiveness against current and evolving air, missile, and hypersonic threats within the lower tier portion of the ballistic missile defense battlespace. The future interceptor will increase Air and Missile Defense (AMD) capability through increased velocity, attitude, and maneuverability. Current funding provides refinements/updates to drafted Architecture Design/Concept Definitions, Performance Study Reports, Program Feasibility/Acquisition Strategy documents already delivered to the USG as part of Phase I. It also continues Virtual Missile Model (VMM) development to support rapid prototyping and concept definition. Products from the Future Interceptor concept definition phase support rapid prototyping technologies that will be used in future efforts to competitively down select to a single vendor.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Program Development and Support</p> <p>Description: Provide program development and support for the Future Interceptor program, including technical work, concept definition, modeling & simulation work, and other related efforts.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> -Complete execution of concept definitions through Other Transactions Agreements (OTA) -Complete simulation-based performance assessments of concept definitions -Develop Acquisition Strategy -Support development and execution of Analysis of Alternatives (AoA) and Capability Development Document <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Refinements/updates to drafted Architecture Design/Concept Definitions - Performance Study Reports - Program Feasibility/Acquisition Strategy documents - Virtual Missile Model (VMM) development <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to inflation and planned lifecycle of the program.</p>	-	6.643	8.179
<p>Title: FY22 SBIR/STTR Transfer</p> <p>FY 2022 Plans:</p>	-	0.252	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604403A / <i>Future Interceptor</i>	Project (Number/Name) FM3 / <i>Future Interceptor</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i>			
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	-	6.895	8.179

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• C53101: <i>MSE Missile</i>	678.148	771.696	1,037.093	-	1,037.093	978.741	982.922	991.265	1,002.608	Continuing	Continuing

Remarks

D. Acquisition Strategy

To provide improved operational effectiveness, the Army will use the Defense Ordnance Technology Consortium (DOTC) OTA to execute a competitive initial concept definition (CD) with two contractors. From the CD phase, rapid prototype development approaches will utilize detailed modeling and simulation of the future interceptor as well as conduct prototype development of high-risk hardware technologies. The prototype technologies and detailed simulation based interceptor design will be used to competitively down select to a single vendor. This approach and the resulting technologies and designs will inform the selection of Acquisition Strategy most advantageous for this project. This submission presents R-4 and R-4a schedule information in 804 Middle Tier terminology that will be updated if necessary.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604403A / <i>Future Interceptor</i>	Project (Number/Name) FM3 / <i>Future Interceptor</i>
--	---	---

Event Name	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
DOTC Concept Development																												
Abbreviated Capability Development Document																												
Down-Select to Single Integrator																												
Future Interceptor CDD																												
LTFM Rapid Capability Increment 1 Development (MTA)																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604403A / <i>Future Interceptor</i>	Project (Number/Name) FM3 / <i>Future Interceptor</i>
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DOTC Concept Development	1	2020	4	2023
Abbreviated Capability Development Document	2	2023	2	2023
Down-Select to Single Integrator	2	2023	4	2025
Future Interceptor CDD	1	2024	1	2024
LTFM Rapid Capability Increment 1 Development (MTA)	1	2025	4	2029

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced 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	-	-	19.148	35.110	-	35.110	39.314	24.350	7.787	6.569	0.000	132.278
CQ5: C-sUAS Joint New Capabilities Development	-	-	7.918	26.229	-	26.229	30.721	17.023	1.456	-	0.000	83.347
CQ6: C-sUAS Joint Enabling Capabilities Development	-	-	11.230	8.881	-	8.881	8.593	7.327	6.331	6.569	0.000	48.931

A. Mission Description and Budget Item Justification

The Secretary of Defense (SecDef) designated the Secretary of the Army (SA) as the Department of Defense's (DoD) Executive Agent (EA) for Counter-small Unmanned Aircraft Systems (C-sUAS). The EA is tasked with leading, directing, and synchronizing DoD efforts to counter small Unmanned Aircraft System (sUAS) threats while minimizing unnecessary duplication and redundancy. The C-sUAS efforts are in response to the DoD Joint Requirements Oversight Council Memorandum (JROC-M) requirement for identification, development, testing, evaluation, and integration of technologies to defeat sUAS threats across the DoD. The C-sUAS efforts provide warfighters the ability to comprehensively detect, track, identify, and defeat enemy Group 1, 2 and 3 UAS platforms. The efforts will be joint development efforts to provide integrated solutions to meet the needs of the Military Services and DoD Agencies against emerging threats.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	19.148	0.000	-	0.000
Current President's Budget	0.000	19.148	35.110	-	35.110
Total Adjustments	0.000	0.000	35.110	-	35.110
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	35.110	-	35.110

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development				Project (Number/Name) CQ5 / C-sUAS Joint New Capabilities 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
CQ5: C-sUAS Joint New Capabilities Development	-	-	7.918	26.229	-	26.229	30.721	17.023	1.456	-	0.000	83.347
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter- small Unmanned Aircraft Systems (C-sUAS) effort will demonstrate, prototype, and conduct experiments with technologies and concepts to enable and/or accelerate their transition to acquisition programs. The efforts will address the gap between initial technology or concept development and quickly move into a warfighter capability. Efforts will explore new concepts and their applications in potential future operating environments within a systems-of-systems context. These joint prototypes will inform future requirements and acquisition to address the evolving Small Unmanned Aircraft System threats and new environments to which C-sUAS systems must be deployed.

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

	FY 2021	FY 2022	FY 2023
Title: C-sUAS Prototyping New Joint Capabilities	-	7.629	26.229
<p>Description: Prototyping detection and identification; defeat; and command and control technologies to meet the C-sUAS capability gaps. Prototypes will address operational requirements identified by the JROCM 078-20 and prioritized critical capability gaps identified by the DoD EA Governance.</p> <p>FY 2022 Plans: Prototype development of joint capabilities to address capability gaps in detected, identified, defeat, and enhance command and control. Technology include prototyping of High Power Microwave Ground; Command and Control Decision aids to include Automation, Autonomy, and Human-Machine Teaming; Electronic Warfare detect and defeat; High Energy Lasers; and C- sUAS Interceptors.</p> <p>FY 2023 Plans: Continue the prototype development of joint capabilities to address capability gaps in detection, identification, defeat, and enhance command and control. Technology includes the prototyping of High Power Microwave Ground; Command and Control Decision aids to include Automation, Autonomy, and Human-Machine Teaming; Electronic Warfare detect and defeat; High Energy Lasers; and Combating Emerging C- sUAS Threats.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY2023 increase of \$18.600 million supports the prototype development of joint capabilities to combat current and emerging sUAS threats</p>			
Title: FY22 SBIR/STTR Transfer	-	0.289	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / <i>Counter - Small Unmanned Aircraft Systems Advanced Development</i>	Project (Number/Name) CQ5 / <i>C-sUAS Joint New Capabilities Development</i>
--	---	--

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: FY22 funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	-	7.918	26.229

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

N/A

Remarks

D. Acquisition Strategy

The Joint C-sUAS new capability prototyping will address the Joint Requirements Oversight Council Memorandum (JROCM) 078-20 and be approved by the Department of Defense C-sUAS Executive Agent (EA) Governance. The C-sUAS EA Governance will approve the prototyping effort to meet identified gap and the joint capability will be funded under this Program Element. The Joint Counter-sUAS Office will identify new technologies within industry and Government S&T organization and leverage the flexibility of the Adaptive Acquisition Framework, and Service Acquisition Policies, and pursue a combination of acquisition pathways to deliver prototypes for evaluation and future decisions. Prototypes may be deployed for additional combat evaluations and provide residual capabilities to the warfighter.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development	Project (Number/Name) CQ5 / C-sUAS Joint New Capabilities Development
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.289	Apr 2022	-		-		-	0.000	0.289	-
Subtotal			-	-		0.289		-		-		-	0.000	0.289	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
High Power Microwave Ground Increment 1	TBD	Air Force Research Laboratory : Kirtland AFB, NM	-	-		3.711		-		-		-	Continuing	Continuing	Continuing
Command and Control Decision Aids	TBD	Army PEO Missiles and Space : Huntsville, AL	-	-		3.918		8.419		-		8.419	Continuing	Continuing	Continuing
Low Collateral Effects Interceptor Development and Integration	TBD	Not Specified : Various	-	-		-		4.950		-		4.950	Continuing	Continuing	Continuing
Software Defined Radio Identification Enhancement	TBD	Not Specified : Various	-	-		-		2.000		-		2.000	Continuing	Continuing	Continuing
High Energy Laser - Ground	TBD	Not Specified : Various	-	-		-		10.860		-		10.860	Continuing	Continuing	Continuing
Subtotal			-	-		7.629		26.229		-		26.229	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	-	-	7.918	26.229	-	26.229	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development	Project (Number/Name) CQ5 / C-sUAS Joint New Capabilities Development

Event Name	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
HPM Ground Increment 1 Prototyping																												
HPM Ground Increment 1 System Test																												
HPM Ground Increment 1 Prototype Delivery																												
C2 Decision Aids Prototyping																												
SDR ID Enhancement Design Study																												
SDR ID Enhancement Development and Integration																												
LCEI Inc 2 Design and Development																												
LCEI Inc 2 Testing																												
HEL Prototyping and Data Collection																												
HEL Development and Improvements																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / <i>Counter - Small Unmanned Aircraft Systems Advanced Development</i>	Project (Number/Name) CQ5 / <i>C-sUAS Joint New Capabilities Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
HPM Ground Increment 1 Prototyping	2	2022	2	2023
HPM Ground Increment 1 System Test	2	2023	3	2023
HPM Ground Increment 1 Prototype Delivery	1	2024	1	2024
C2 Decision Aids Prototyping	2	2022	2	2026
SDR ID Enhancement Design Study	1	2023	3	2023
SDR ID Enhancement Development and Integration	3	2023	4	2024
LCEI Inc 2 Design and Development	1	2023	4	2024
LCEI Inc 2 Testing	3	2024	4	2024
HEL Prototyping and Data Collection	1	2023	2	2025
HEL Development and Improvements	1	2023	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development				Project (Number/Name) CQ6 / C-sUAS Joint Enabling Capabilities 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
CQ6: C-sUAS Joint Enabling Capabilities Development	-	-	11.230	8.881	-	8.881	8.593	7.327	6.331	6.569	0.000	48.931
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter- small Unmanned Aircraft Systems (C-sUAS) enabling efforts will support the Joint C-sUAS Office in the identification and prioritization joint gaps and solutions; support Military Service program management members in conducting joint development, acquisition, and sustainment; and identify key technologies available for transition to the warfighter, while minimizing duplication and redundancy across the Services. These joint enabling efforts will inform future requirements and acquisitions of C-sUAS to address the evolving Small Unmanned Aircraft System threats and new environments to which systems must be deployed.

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

	FY 2021	FY 2022	FY 2023
Title: Joint Studies and Analysis	-	3.310	1.090
Description: Execution of JCO studies to analyze current and future capability needs to aid the advancement and transition of advanced technologies by providing the credible evidence decision makers need to make sound strategic decision and investment choices. Concepts to be analyzed included, but not limited to, application of C-sUAS technologies in new environments, analysis of joint systems architectures, artificial intelligence and machine learning applications, directed energy weapons application, and integration into multi-domain operations. Studies and Analysis will improve the effectiveness of C-sUAS operation by developing concepts that generate new information to address challenging threats of the future and aid in identifying advanced technologies for prototyping and development.			
FY 2022 Plans: Execute studies to explore promising concepts and enabling technologies. Activities may include analysis, studies, experimentation, modeling and simulation, virtual prototyping, and workshops. Specific studies are not detailed until late FY21 to ensure they are relevant to FY22 and FY23 decisions.			
FY 2023 Plans: Continue the executions of joint studies to explore promising concepts and enabling technologies. Activities may include analysis, studies, experimentation, modeling and simulation, virtual prototyping, and workshops. Specific studies are not detailed until late FY22 to ensure they are relevant to FY23 and FY24 decisions.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY2023 decrease of \$2.22 million as studies complete and new topics are explored			
Title: Common Test Range	-	3.520	2.630

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / <i>Counter - Small Unmanned Aircraft Systems Advanced Development</i>	Project (Number/Name) CQ6 / <i>C-sUAS Joint Enabling Capabilities Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Execution of JCO prototyping and experimentation of a Department of Defense common test ranges to explore new concepts and application in current and future operating environments. Test ranges must adapt to uncertainty of the evolving threat, military application of C-sUAS, and new commercial technology impacts to the battlefield environment. This ensures C-sUAS technology is adequately assessed against a realistic environment and deliver reliable capabilities to the warfighter. These advances in ranges will support the Department of Defense testing activities for C-sUS programs. This also includes updates to the DoD C-sUAS Common Test protocol to be used in all Joint C-sUAS testing activities to ensure consistency of data collection before being deployed.</p> <p>FY 2022 Plans: Execute test range equipment prototyping of urban environmental conditions to include 5G technology, complex electro-magnetic environment, and urban terrain. Activities include prototyping range equipment, experimentation, and analysis of the effectiveness of tactics, techniques, and procedures. This will include iterative updates to the C-sUAS Test protocol.</p> <p>FY 2023 Plans: Continue to execute test range equipment prototyping of urban environmental conditions to include 5G technology, complex electro-magnetic environment, and urban terrain. Activities include prototyping range equipment, experimentation, and analysis of the effectiveness of tactics, techniques, and procedures. This will include iterative updates to the C-sUAS Test protocol.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY2023 decrease of \$0.890 million to support iterative updates to prototyping range equipment, experimentation, and analysis of the effectiveness of tactics, techniques, and procedures.</p>			
<p>Title: Joint Assessments and Demonstrations</p> <p>Description: Execute demonstrations and assessments of new C-sUAS technology to explore new concepts, new applications of existing systems, and new industry technologies. New concepts and technologies demonstrations will address future capability gaps and acquisition programs to maintain pace with evolving threats and employment environments.</p> <p>FY 2022 Plans: Execute semi-annual demonstrations and assessments of C-sUAS technology. Demonstrations will focus on capability gaps identified by the JCO and the Executive Agent C-sUAS Governance.</p> <p>FY 2023 Plans: Continue the execution semi-annual demonstrations and assessments of C-sUAS technology. Demonstrations will focus on capability gaps and emerging threats identified by the JCO and the Executive Agent C-sUAS Governance.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	3.990	5.161

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / <i>Counter - Small Unmanned Aircraft Systems Advanced Development</i>	Project (Number/Name) CQ6 / <i>C-sUAS Joint Enabling Capabilities Development</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY2023 increase of \$1.171 million to support emerging requirements for Joint Demonstrations			
Title: FY22 SBIR/STTR Transfer	-	0.410	-
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	-	11.230	8.881

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

Remarks

D. Acquisition Strategy

The Joint C-sUAS enabling efforts will be approved by the Department of Defense C-sUAS Executive Agent (EA) Governance. The C-sUAS EA Governance will approve efforts supporting future DoD decisions and identify gaps in current systems. The Joint Counter-sUAS Office will identify key efforts that support the mission and minimize redundancy among the Services. The Army Rapid Capabilities and Critical Technology Office (RCCTO) has been identified to provide material and acquisition support to the JCO to address enabling capability needs. Army RCCTO will semi-annually solicit industry solutions against the C-sUAS gaps and hold demonstrations at an identified C-sUAS common test range. Identified solutions from the Semi-annual Demonstration can potentially transition and/or inform existing C-sUAS programs, create new programs for development under PE0605531A CQ7, identify and create prototyping projects under PE0604531A CQ5, or transition to Service Science and Technology projects for further maturation. The Army RCCTO will acquire necessary equipment and evaluate new environmental conditions for the C-sUAS test ranges to ensure testing consistency and realistic conditions. Once established and validated as a test range capability, the JCO will transition long term sustainment to the DoD's Test Resource Management Center.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development	Project (Number/Name) CQ6 / C-sUAS Joint Enabling Capabilities Development
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	TBD	US Army Rapid Capabilities and Critical Technology Office : Fort Belvoir, VA	-	-		0.470		-		-		-	Continuing	Continuing	Continuing
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.410	Apr 2022	-		-		-	0.000	0.410	-
Subtotal			-	-		0.880		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Common Test Range	TBD	Army Rapid Capabilities and Critical Technologies Office : Fort Belvoir, VA	-	-		3.520		2.630		-		2.630	Continuing	Continuing	Continuing
Subtotal			-	-		3.520		2.630		-		2.630	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Joint Studies and Analysis	TBD	Army Rapid Capabilities and Critical Technologies Office : Fort Belvoir, VA	-	-		3.310		1.090		-		1.090	Continuing	Continuing	Continuing
Subtotal			-	-		3.310		1.090		-		1.090	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / Counter - Small Unmanned Aircraft Systems Advanced Development	Project (Number/Name) CQ6 / C-sUAS Joint Enabling Capabilities Development

Event Name	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
Joint Studies																												
Common Test Range																												
Joint Assessment and Demos																												
Joint Assessment and Demo #3																												
Joint Assessment and Demo #4																												
Joint Assessment and Demo #5																												
Joint Assessment and Demo #6																												
Joint Assessment and Demo #6																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604531A / <i>Counter - Small Unmanned Aircraft Systems Advanced Development</i>	Project (Number/Name) CQ6 / <i>C-sUAS Joint Enabling Capabilities Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Joint Studies	1	2022	4	2027
Common Test Range	1	2022	4	2025
Joint Assessment and Demos	1	2022	4	2027
Joint Assessment and Demo #3	3	2022	3	2022
Joint Assessment and Demo #4	4	2022	4	2022
Joint Assessment and Demo #5	3	2023	3	2023
Joint Assessment and Demo #6	4	2023	4	2023

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>
---	--

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	-	39.192	35.172	36.966	-	36.966	37.123	37.295	37.306	37.670	Continuing	Continuing
BT2: <i>Command Post Mobility/Survivability</i>	-	9.373	8.418	8.729	-	8.729	8.762	8.759	8.762	8.847	Continuing	Continuing
BT3: <i>Common Operating Environment (COE)</i>	-	7.866	7.049	7.335	-	7.335	7.367	7.376	7.378	7.450	Continuing	Continuing
BT5: <i>Integrated Tactical Network/Enterprise Network</i>	-	21.953	19.705	20.902	-	20.902	20.994	21.160	21.166	21.373	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Cross Functional Team. Unified Network Transport is directly aligned to the Army Network Modernization Strategy Line of Effort 1 (LOE 1) Unified Network; LOE 2, Common Operating Environment (COE), LOE 3, Interoperability; and LOE 4, Command Post Mobility and Survivability. These efforts support advanced component development activities that are aligned to the Army's Tactical Network Capability Set development and fielding plans.

The Program Executive Office Command, Control, Communications-Tactical (PEO C3T) is responsible for prioritizing, programming, managing and executing these projects and ensuring these funds are prioritized to support the Network Cross-Functional Team (N-CFT) Army modernization priorities and prototyping. The N-CFT and PEO C3T prioritize technology demonstrations, focused evaluations, and expert analyses to inform future requirements, mature technologies, and deliver new capabilities. Efforts funded from these projects will inform technology transitions, research and development, and user assessments, and then rapidly transition to appropriate Programs of Record or be established as a new program.

Unified Network Transport provides the ground domain network connectivity of Joint All Domain Command and Control (JADC2) and enables Unified Action Partner interoperability through integration with the Mission Partner Environment (MPE). Interoperability is the ability to routinely act together coherently, effectively and efficiently to achieve tactical, operational, and strategic objectives. Interoperability between disparate forces allows coalitions to produce greater combat power than the sum of their parts by leveraging relative strengths while mitigating relative weaknesses.

FY 2023 funds will support identification, maturation, demonstration, and evaluation of Technology Readiness Level (TRL) 6+ systems and subsystem components including, but not limited to, resilient Line of Site (LOS) and beyond Line of Sight (BLOS) communications, information systems and information management; cyber electromagnetic activities (CEMA) situational understanding and operations; intelligence fusion, cloud technologies, virtual augmentation, artificial intelligence/machine learning (AI/ML), and data convergence and analytics in the Common Operating Environment to inform the Integrated Tactical Network/Enterprise Network and Enabling Functions, Computing Environments, Interoperability and Command Posts. Successful solutions identified through evaluation in a high fidelity and realistic operating environment will be transitioned to Programs of Record for integration and fielding. Funds will also support integration with solutions identified in the other Modernization CFT efforts to ensure network dependencies are addressed.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	39.192	35.409	0.000	-	0.000
Current President's Budget	39.192	35.172	36.966	-	36.966
Total Adjustments	0.000	-0.237	36.966	-	36.966
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	36.966	-	36.966
• FFRDC Transfer	-	-0.237	-	-	-

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>				Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>			
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
BT2: <i>Command Post Mobility/Survivability</i>	-	9.373	8.418	8.729	-	8.729	8.762	8.759	8.762	8.847	Continuing	Continuing
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. Project BT2, Command Post Mobility/Survivability, is directly aligned to the Army Network Modernization Strategy Line of Effort 4 (LOE 4), Command Post Mobility and Survivability. These efforts support advanced component development activities that are directly aligned to the Army's Tactical Network Capability Set development and fielding plans.

This project supports mobile Command Post efforts that may transition to sponsoring programs that get integrated in Command Post Integrated Infrastructure (CPI2) platforms. The technical maturation and evaluation allow for Command Post disaggregation capabilities to inform future designs and support Command Post survivability against near peer competitors. Spectrum obfuscation and assessments of antenna remoting will support the Command Post efforts for CPI2 Increment 1 and beyond.

FY2023 funds will be used to mature, prototype, and evaluate emerging technologies that will inform design choices for the Army's Command Post infrastructure. Funds also support identification, maturation, demonstration, and evaluation of Technology Readiness Level (TRL) 6+ systems and subsystem components leading to a desired end state of resilient communications, adaptable computing and infrastructure, integrated power, electromagnetic signature management, and electromagnetic signature awareness to support Joint and Coalition Interoperability requirements in addition to Multi-Domain Operations (MDO) in Disconnected, Intermittent, and Limited (DIL) conditions. Successful solutions identified through evaluation in a high fidelity and realistic operating environment will be transitioned to Programs of Record for integration and fielding. Funds will also support integration with solutions identified in other Modernization Cross Functional Team (CFT) efforts to ensure network dependencies are addressed.

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

	FY 2021	FY 2022	FY 2023
Title: BT2 Command Post Mobility and Survivability	9.373	8.111	8.226
Description: This funding is used to identify and acquire technologies for evaluation that address gaps associated with LOE 4, Command Post (CP), in the overall Integrated Tactical Network. The CP LOE will focus on developing and obtaining approval of requirements for integrated command posts, then delivering these integrated command post designs to Army units. LOE 4 addresses the operational requirement of Deployable, Integrated, and Mobile Command Post and integrates Knowledge Management.			
FY 2022 Plans: Funds will be used to mature, prototype, and evaluate emerging technologies that will inform design choices for the Command Post Integrated Infrastructure (CPI2) Increment 1 and beyond. Effort includes evaluation for tactically employable Command Post (CP) disaggregation capabilities and will also allow for the integration of spectrum obfuscation modes of employment			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>for limited radio frequency emissions capabilities into a tactically deployable CP. Efforts also include assessment of antenna remoting solutions and will enable integration of Mission Partner Environment hardware components into the CP. These efforts will be demonstrated and evaluated with FORSCOM and inform the program technical baseline and DOTMLPF. Technical Exchange Meetings (TEM) with Industry will lead to the assessment, demonstration, prototyping and integration of emerging industry solutions to mature Command Post capabilities. Efforts will inform the requirements for a survivable and effective mobile Command Post in a contested and congested environment.</p> <p>FY 2023 Plans: Funds will be used to mature, prototype, and evaluate emerging technologies relating to mobile and survivable Command Posts in a contested and congested environment. Effort includes maturing integrated power capabilities to provide redundancy in power generation that will inform design choices for the Army's Command Post infrastructure. Effort also includes creating signature awareness, reducing total electromagnetic signature, creating the means to disperse CP nodes and retaining effective Commander-Staff collaboration against near peer competition. These efforts will be demonstrated and evaluated with FORSCOM and inform the program technical baseline and DOTMLPF. Innovative industry prototyping and evaluation associated with Technical Exchange Meetings (TEM) will lead to the assessment, demonstration, prototyping and integration of emerging industry solutions. Requirements for Command Post Mobility and Survivability will align with prioritization of science & technology and industry innovation efforts in support of Army Capability Set development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to inflation.</p>				
<p>Title: Program Management</p> <p>Description: Program management includes overall management of program execution, major events, reporting, funding execution, and contract management. Includes participation in program planning and Integrated Product Team meetings with key stakeholders including the Network Cross Functional Team (N-CFT).</p> <p>FY 2023 Plans: Funds will be used to provide overall management in support of Unified Network Transport efforts, including contractor personnel and contract management support via Army Contracting Command.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to decision to separate out program management costs for improved visibility and slight increase in overall program costs.</p>		-	-	0.503
<p>Title: SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p>		-	0.307	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638 for FY22			
Accomplishments/Planned Programs Subtotals	9.373	8.418	8.729

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

N/A

Remarks

N/A

D. Acquisition Strategy

Network Cross Functional Team (N-CFT) will coordinate on technologies to be evaluated with appropriate Program Management (PM) offices where there is an opportunity for technology insertion. Technologies that are determined to address technology gaps and require further evaluation will be documented in a Product Plan that authorizes a plan of execution for each capability being pursued. The various prototyping technologies will be pursued via competitively awarded contracts using best value source selection procedures. Identified Technology Readiness Level (TRL) 6 technologies will be matured, demonstrated, tested, and evaluated in realistic environments to achieve TRL 7. Selected technologies will be integrated into existing Programs of Record. A Transition Agreement (TA) is completed between the receiving Program Executive Office (PEO) and the Science and Technology (S&T) community no later than halfway between the project start date and the project's first anticipated transition of any product(s) to a PEO/PM.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>
--	--	--

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Office Support	TBD	BAH/ACC/NIWC-LANT : APG, MD	-	-		-		0.503	Dec 2022	-		0.503	0.000	0.503	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.307		-		-		-	0.000	0.307	-
Subtotal			-	-		0.307		0.503		-		0.503	0.000	0.810	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Science & Technology - Surv Cmd Post	TBD	CCDC/Polaris Alpha/AASKI : APG, MD/Fredericksburg, VA/APG, MD	3.187	5.373	Nov 2020	1.293	Nov 2021	-		-		-	0.000	9.853	-
Science & Technology - Spectrum Obfuscation	TBD	BAH : Mclean, VA	1.088	4.000	Feb 2021	2.000	Dec 2021	-		-		-	0.000	7.088	-
Science & Technology Maturation Prototyping & Evaluation	TBD	DEVCOM C5ISR / PEO C3T : APG, MD	-	-		-		4.500	Dec 2022	-		4.500	0.000	4.500	-
Industry Innovation Prototyping & Evaluation	TBD	TBD : TBD	1.047	-		4.818	Feb 2022	3.726	Feb 2023	-		3.726	0.000	9.591	-
Subtotal			5.322	9.373		8.111		8.226		-		8.226	0.000	31.032	N/A

Remarks
FY 2021 cost data updated to reflect actuals.

	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		5.322	9.373	8.418	8.729	-	8.729	0.000	31.842	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>
--	--	--

Event Name	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
Survivable Command Post																												
Spectrum Obfuscation																												
Mobile and Survivable Command Posts (MASCP)																												
Industry Innovation Prototyping & Evaluation																												

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT2 / <i>Command Post Mobility/Survivability</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Survivable Command Post	2	2020	4	2022
Spectrum Obfuscation	2	2020	4	2022
Mobile and Survivable Command Posts (MASCP)	2	2023	2	2028
Industry Innovation Prototyping & Evaluation	4	2020	1	2028

Note

Industry Innovation Prototyping and Evaluation projects are awarded following Technical Exchange Meetings (TEM) and are continuous activities; Network Cross Functional Team (N-CFT) and Program Executive Office Command, Control, Communications-Tactical (PEO C3T) will reach out to industry partners in order to assess and demonstrate the latest emerging technologies which will reduce capability gaps and provide rapid software/hardware insertions into Programs of Records.

Changes from PB22 Schedule:

- Science and Technology (S&T) projects are evaluated based on ongoing forums with the S&T community. N-CFT and PEO C3T track changes to the S&T efforts, including but not limited to, titles, descriptions, Technology Readiness Level (TRL), planned program transition and transfer agreement status. N-CFT and PEO C3T utilize this information to prioritize the S&T projects by fiscal year.
- The schedule for Mobile and Survivable Command Posts (MASCP) is inclusive of multiple sub-efforts.
- The schedule for Industry Innovation Prototyping & Evaluation extends through FY27 to reflect the continuous nature of industry engagements.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>				Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>			
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
BT3: <i>Common Operating Environment (COE)</i>	-	7.866	7.049	7.335	-	7.335	7.367	7.376	7.378	7.450	Continuing	Continuing
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. Project BT3, Common Operating Environment (COE), is directly aligned to the Army Network Modernization Strategy Line of Effort 2 (LOE 2), Common Operating Environment (COE). These efforts support advanced component development activities that are aligned to the Army's Tactical Network Capability Set development and fielding plans.

This project will inform future network, applications and data capability sets by evaluating and maturing the use of cloud technologies, virtual augmentation, artificial intelligence, data convergence and analytics in the Common Operating Environment. This includes processing and storage to improve the architecture support for mobile, secure and distributed operations. Common Operating Environment (COE), creates an approved set of standards, computing technologies, integrated data and databases, common graphics and a unified set of mission command applications. It allows warfighters to adapt and configure the network as conditions change which is outlined in the approved COE requirements documents.

FY2023 funds will be used to mature technologies to assess and evaluate the technical feasibility of solutions for enhanced planning and execution capabilities that enable rapid decision making at the speed of relevance. Funds will also support identification, maturation, demonstration, and evaluation of Technology Readiness Level (TRL) 6+ systems and subsystem components including data discovery, synchronization, security, and analysis across multiple data silos and disparate data platforms to efficiently converge data types to support Joint and Coalition Interoperability requirements. Funds will also support integration with solutions identified in other Modernization Cross Functional Team (CFT) efforts to ensure network dependencies are addressed.

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

	FY 2021	FY 2022	FY 2023
Title: BT3 Common Operating Environment	7.039	6.791	6.912
Description: This funding is used to identify and acquire technologies to address gaps associated with LOE 2, Common Operating Environment (COE), in the overall Integrated Network. This LOE creates an approved set of standards, computing technologies, integrated data and databases and common graphics and a unified set of mission command applications. It will also support collaboration using a common picture with joint and coalition mission partners. This LOE delivers an integrated body of requirements that meet operational needs.			
FY 2022 Plans:			
Funds will be used to mature technologies that capture, correlate, and present data from available sources such as spectrum, electronic warfare (EW), red and gray space for visualization for cyber situational understanding. Funds will also be used			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>to evaluate the technical feasibility of solutions for expanded computing in tactical environments, data convergence, sensor integration across identified platforms, and flexible and scalable computing hardware/software as well as efforts with Industry partners resulting from Technical Exchange Meetings that will lead to potential solutions to assess, demonstrate, prototype, and integrate emerging industry solutions to mature Common Operating Environment capabilities.</p> <p>FY 2023 Plans: Funds will be used to continue efforts to mature technologies that capture, correlate, present data and enable rapid decision making at the speed of relevance using Artificial Intelligence/Machine Learning (AI/ML) and Automated Data Processing capabilities. Funds will also be used to evaluate the technical feasibility of solutions for expanded computing in tactical environments, data convergence, data fabric, sensor integration across identified platforms, flexible and scalable computing hardware/software, and applications security to inform command post computing environment tactical cloud/server infrastructure as well as efforts for innovative industry prototyping and evaluation associated with Technical Exchange Meetings (TEM) that will lead to potential solutions to assess, demonstrate, prototype, and integrate emerging industry solutions to mature Common Operating Environment capabilities. Requirements for Common Operating Environment will align with prioritization of science & technology and industry innovation efforts in support of Army Capability Set development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to inflation.</p>				
<p>Title: Program Management</p> <p>Description: Program management includes overall management of program execution, major events, reporting, funding execution, and contract management. Includes participation in program planning and Integrated Product Team meetings with key stakeholders including the Network Cross Functional Team (N-CFT).</p> <p>FY 2023 Plans: Funds will be used to provide overall management in support of Unified Network Transport efforts, including contractor personnel and contract management support via Army Contracting Command.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to decision to separate out program management costs for improved visibility and slight increase in overall program costs.</p>		0.827	-	0.423
<p>Title: FY22 SBIR/STTR Transfer</p> <p>Description: FY22 SBIR/STTR Transfer in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans:</p>		-	0.258	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638				
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i>				
Funding transferred in accordance with Title 15 USC ?638				
Accomplishments/Planned Programs Subtotals		7.866	7.049	7.335
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
N/A				
D. Acquisition Strategy				
<p>Network Cross Functional Team (N-CFT) will coordinate on technologies to be evaluated with appropriate Program Management (PM) offices where there is an opportunity for technology insertion. Technologies that are determined to address technology gaps and require further evaluation will be documented in a Product Plan that authorizes a plan of execution for each capability being pursued. The various prototyping technologies will be pursued via competitively awarded contracts using best value source selection procedures. Identified Technology Readiness Level (TRL) 6 technologies will be matured, demonstrated, tested, and evaluated in realistic environments to achieve TRL 7. Selected technologies will be integrated into existing Programs of Record. A Transition Agreement (TA) is completed between the receiving Program Executive Office (PEO) and the Science and Technology (S&T) community no later than halfway between the project start date and the project's first anticipated transition of any product(s) to a PEO/PM.</p>				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>
--	--	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Office Support	TBD	BAH/ACC/NIWC-LANT : APG, MD	-	0.827	Jun 2021	-		0.423	Dec 2022	-		0.423	0.000	1.250	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.258		-		-		-	0.000	0.258	-
Subtotal			-	0.827		0.258		0.423		-		0.423	0.000	1.508	N/A

Remarks
FY 2021 cost data updated to reflect actuals.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Science & Technology (S&T) Maturation - Spectrum Awareness	TBD	CCDC/BAH/MITRE : APG, MD	1.000	-		-		-		-		-	0.000	1.000	-
S&T Maturation - Cyber Situational Awareness	TBD	CCDC/MITRE/CACI/ MIT LL : APG, MD, Various	2.145	1.355	Nov 2020	-		-		-		-	0.000	3.500	-
S&T Maturation - Modular RF	TBD	DEVCOM AvMC/ SAIC : Huntsville, AL	-	1.883	Aug 2021	-		-		-		-	0.000	1.883	-
S&T Maturation - C5ISR Modular Open Suite of Standards	TBD	CCDC/Spectranetix : APG, MD/Sunnyvale, CA	-	0.157	Dec 2021	-		-		-		-	0.000	0.157	-
Science & Technology Maturation Prototyping & Evaluation	TBD	DEVCOM C5ISR, PEO C3T : APG, MD	-	-		3.669	Dec 2021	4.000	Dec 2022	-		4.000	0.000	7.669	-
Industry Innovation - Common Data Fabric	TBD	Palantir : Palo Alto, CA	0.131	3.644	May 2021	-		-		-		-	0.000	3.775	-
Industry Innovation Prototyping & Evaluation	TBD	TBD : TBD	0.895	-		3.122	Feb 2022	2.912	Feb 2023	-		2.912	0.000	6.929	-
Subtotal			4.171	7.039		6.791		6.912		-		6.912	0.000	24.913	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
FY 2021 cost data updated to reflect actuals.

	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	4.171	7.866	7.049	7.335	-	7.335	0.000	26.421	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>

Event Name	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
Cyber Situational Understanding																												
Spectrum Awareness																												
Hardened Transport																												
Modular RF																												
Rainmaker																												
Applications Security-Containers (AppSec-C)																												
Information Trust																												
Industry Innovation Prototyping & Evaluation																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Cyber Situational Understanding	2	2020	1	2022
Spectrum Awareness	2	2020	2	2021
Hardened Transport	4	2020	1	2021
Modular RF	4	2021	4	2024
Rainmaker	3	2022	1	2024
Applications Security-Containers (AppSec-C)	3	2022	3	2024
Information Trust	2	2024	2	2027
Industry Innovation Prototyping & Evaluation	4	2020	1	2028

Note

Industry Innovation Prototyping and Evaluation projects are awarded following Technical Exchange Meetings (TEM) and are continuous activities; Network Cross Functional Team (N-CFT) and Program Executive Office Command, Control, Communications-Tactical (PEO C3T) will reach out to industry partners in order to assess and demonstrate the latest emerging technologies which will reduce capability gaps and provide rapid software/hardware insertions into Programs of Record.

Changes from PB22 Schedule:

- Science and Technology (S&T) projects are evaluated based on ongoing forums with the S&T community. N-CFT and PEO C3T track changes to the S&T efforts, including but not limited to - titles, descriptions, Technology Readiness Level (TRL), planned program transition and transfer agreement status. N-CFT and PEO C3T utilize this information to prioritize the S&T projects by fiscal year.
- Modular RF, previously captured on the BT5 schedule, is now captured under funding project BT3, Common Operating Environment (COE); the effort's 6.4 RDTE start date accelerated to FY21 in support of future Capability Set development and fielding.
- Every Receiver A Sensor (ERASe)/Rainmaker is now referred to as Rainmaker, and the corresponding 6.4 RDTE start date accelerated to FY22 in support of future Capability Set development and fielding.
- Convergence Tools for Tactical Environments & Commander's Visualization is removed from the schedule and now known as the distinct efforts for Modular RF and ERASe/Rainmaker.
- Applications Security-Containers (AppSec-C) is planned to commence an effort in FY22 in support of COE.
- Information Trust is now projected to begin in FY24.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT3 / <i>Common Operating Environment (COE)</i>

- Autonomous Cyber, previously captured on BT3 schedule, is now captured under funding project BT5, Integrated Tactical Network/Enterprise Network, and is projected to commence in FY24.
- The schedule for Industry Innovation Prototyping & Evaluation extends through FY27 to reflect the continuous nature of industry engagements.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>				Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>			
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
BT5: <i>Integrated Tactical Network/Enterprise Network</i>	-	21.953	19.705	20.902	-	20.902	20.994	21.160	21.166	21.373	Continuing	Continuing
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. Project BT5, Integrated Tactical Network/Enterprise Network (ITN/IEN), is directly aligned to the Army Network Modernization Strategy Line of Effort 1 (LOE 1), Unified Network. These efforts support advanced component development activities that are aligned to the Army's Tactical Network Capability Set development and fielding plans.

This project enables a converged Mission Command Network that operates seamlessly worldwide and in any environment. It includes the development of a standards-based network architecture that unifies enterprise and deployed network capabilities and features a unified transport layer, network operations and other enabling functions that allows integration of disparate networks. The Army network will provide resiliency through path diversity and dynamic routing to ensure tactical units can communicate in hostile environments. It will provide multiple ways to communicate and give commanders the ability to have a network that delivers the right information and data at the right time during operations. It fully incorporates cyber and electronic warfare capabilities that support the employment of the network as a weapon system.

FY 2023 funding will be used to inform design decisions for future tactical network capability sets in the areas of Aerial Tier, resilient wideband satellite communications capabilities, non-traditional waveforms, implementation of Automated Primary Alternate Contingency and Emergency (PACE) communications through evaluation and technical maturation. Funds also support identification, maturation, demonstration, and evaluation of Technology Readiness Level (TRL) 6+ systems and subsystem components including Cyber Electromagnetic Activities (CEMA) situational understanding and operations Interoperability functions. Successful solutions identified through evaluation in a high fidelity and realistic operating environment will be transitioned to Programs of Record for integration and fielding. Funds will also support integration with solutions identified in other Modernization Cross Functional Team (CFT) efforts to ensure network dependencies are addressed.

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

	FY 2021	FY 2022	FY 2023
Title: Project BT5: Integrated Tactical Network/Integrated Enterprise Network	21.608	18.768	19.697
Description: This funding is used to identify and acquire technologies to address gaps associated with LOE 1, Unified Network, for evaluation and demonstration in the overall Integrated Network. The Unified Network LOE enables a converged Mission Command Network that operates seamlessly worldwide and in any environment. This will require the creation of a standards-based network architecture that effectively integrates enterprise and deployed network capabilities across domains and environments, and features a unified transport layer that permits "plug and play" for specific network capabilities. LOE 1 addresses the following operational requirements: Converged Mission Command Network, Network Augmentation / Extension, and Synthetic Training Environment.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p><i>FY 2022 Plans:</i> Funds will be used for science and technology evaluation and prototyping solutions to support approved requirements documents and critical network modernization efforts to accelerate Next Generation Tactical radios, Air to ground integration, Secure LTE capabilities for mounted/ dismounted soldiers and solutions for a hardened, resilient network. Efforts will include evaluation of artificial intelligence and other advanced solutions for communications network processing, transport, and operations to support resiliency in a contested and congested environment. Funding will allow the Army to identify and prototype solutions to mature the network transport and gateway components of the Mission Partner Environment (MPE) and share network operations information through warfighting assessments and evaluations that will inform Capability Set 23 and beyond. Funds will also be used for innovative industry prototyping and evaluation effort associated with Technical Exchange Meetings to assess, demonstrate, prototype, and integrate emerging industry solutions to mature unified network capabilities to include integration of government and commercial Low Earth Orbit (LEO), Mid Earth Orbit (MEO) and Geosynchronous Earth Orbit (GEO) high throughput satellite communications. These efforts directly support the Army's tactical network acquisition strategy roadmap submitted to Congress.</p> <p><i>FY 2023 Plans:</i> Funds will be used to continue science and technology evaluation and prototyping solutions to support approved requirements documents and critical network modernization efforts to accelerate/integrate Next Generation Tactical radios, Air to ground integration, commercial 5G capabilities for mounted/dismounted soldiers and solutions for a hardened, resilient network. Efforts will include evaluation of artificial intelligence and other advanced solutions for communications network processing, transport, and operations to support resiliency in a distributed environment. Funding will allow the Army to identify and prototype solutions to mature the implementation of Automated Primary Alternate Contingency and Emergency (PACE) communications, network transport and gateway components of the Mission Partner Environment (MPE) and share network operations information through warfighting assessments and evaluations that will inform future capability sets. Funds will also be used for innovative industry prototyping and evaluation efforts associated with Technical Exchange Meetings (TEM) to assess, demonstrate, prototype, and integrate emerging industry solutions to mature unified network capabilities to include integration of commercial 5G and high throughput resilient wideband satellite communications. Requirements for Integrated Tactical Network/Integrated Enterprise Network will align with prioritization of science & technology and industry innovation efforts in support of Army Capability Set development.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase is due to inflation</p>				
<i>Title:</i> Program Management		0.345	0.209	1.205

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: Program management includes overall management of program execution, major events, reporting, funding execution, and contract management. Includes participation in program planning and Integrated Product Team meetings with key stakeholders including the Network Cross Functional Team (N-CFT).</p> <p>FY 2022 Plans: Funds will be used to provide overall management in support of Unified Network Transport efforts, including contractor personnel and contract management support via Army Contracting Command.</p> <p>FY 2023 Plans: Funds will be used to provide overall management in support of Unified Network Transport efforts, including contractor personnel and contract management support via Army Contracting Command.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to decision to separate out program management costs for improved visibility and slight increase in overall program costs.</p>			
<p>Title: FY22 SBIR/STTR Transfer</p> <p>Description: FY22 SBIR/STTR Transfer in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.728	-
Accomplishments/Planned Programs Subtotals	21.953	19.705	20.902

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks N/A</p> <p>D. Acquisition Strategy Network Cross Functional Team (N-CFT) will coordinate on technologies to be evaluated with appropriate Program Management (PM) offices where there is an opportunity for technology insertion. Technologies that are determined to address technology gaps and require further evaluation will be documented in a Product Plan that authorizes a plan of execution for each capability being pursued. The various prototyping technologies will be pursued via competitively awarded contracts using</p>
--

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>

best value source selection procedures. Identified Technology Readiness Level (TRL) 6 technologies will be matured, demonstrated, tested, and evaluated in realistic environments to achieve TRL 7. Selected technologies will be integrated into existing Programs of Record. A Transition Agreement (TA) is completed between the receiving Program Executive Office (PEO) and the Science and Technology (S&T) community no later than halfway between the project start date and the project's first anticipated transition of any product(s) to a PEO/PM.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army											Date: April 2022				
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>					Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>				

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Project Management Office Support	MIPR	CCDC/BAH/ACC/NIWC-LANT : APG, MD/North Charleston, SC	0.019	0.345	Jan 2021	0.209	Nov 2021	1.205	Dec 2022	-		1.205	0.000	1.778	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.728		-		-		-	0.000	0.728	-
Subtotal			0.019	0.345		0.937		1.205		-		1.205	0.000	2.506	N/A

Remarks
FY 2021 cost data updated to reflect actuals.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Science & Technology (S&T) Maturation - Soldier Authentication	Various	CCDC/FlexTech Alliance : APG, MD	2.029	1.971	Mar 2021	-		-		-		-	0.000	4.000	-
S&T Maturation - INB2	Various	CodeMettle : Atlanta, GA	4.021	3.508	Nov 2020	-		-		-		-	0.000	7.529	-
S&T Maturation - AppSecC	MIPR	CCDC : APG, MD	2.800	-		-		-		-		-	0.000	2.800	-
S&T Maturation - TSM IC	Various	CCDC/BAH/CACI : APG, MD/Mclean, VA/Arlington, VA	1.008	-		-		-		-		-	0.000	1.008	-
S&T Maturation - Next Generation High Frequency	TBD	CCDC/MIT-LL : APG, MD/Lexington, MA	-	3.696	Dec 2020	-		-		-		-	0.000	3.696	-
S&T Maturation - Non-traditional Waveforms	TBD	CCDC/BAH/CACI : APG, MD	-	1.454	Dec 2020	-		-		-		-	0.000	1.454	-
S&T Maturation - Protected Comms for Manned-Unmanned Teaming	TBD	CCDC/BAH/CACI : APG, MD	-	2.500	Jan 2021	-		-		-		-	0.000	2.500	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
S&T Maturation - Resilient Wideband SATCOM Interference Cancellation	TBD	CCDC/BAE : APG, MD/Burlington, MA	-	2.000	Jun 2021	-		-		-		-	0.000	2.000	-
S&T Maturation - CMOSS Mounted Form Factor	TBD	CCDC/Polaris Alpha/Spectranetix : APG, MD/Sunnyvale, CA	-	1.355	Apr 2021	-		-		-		-	0.000	1.355	-
Science & Technology (S&T) Maturation Prototyping & Evaluation	TBD	DEVCOM C5ISR / PEO C3T : APG, MD	-	-		14.255	Nov 2021	11.755	Dec 2022	-		11.755	0.000	26.010	-
Industry Innovation - C5ISR Modular Open Suite of Standards	MIPR	Trellisware/Spectranetix : San Diego, CA/Sunnyvale, CA	1.584	3.598	Oct 2021	-		-		-		-	0.000	5.182	-
Industry Innovation - Intra-CP Node Wireless	MIPR	L3Harris/BATS, Inc : Rochester, NY/Indianapolis, IN	-	1.526	Sep 2021	-		-		-		-	0.000	1.526	-
Industry Innovation Prototyping & Evaluation	TBD	TBD : TBD	0.261	-		4.513	Feb 2022	7.942	Feb 2023	-		7.942	0.000	12.716	-
Subtotal			11.703	21.608		18.768		19.697		-		19.697	0.000	71.776	N/A

Remarks
FY 2021 cost data updated to reflect actuals.

	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	11.722	21.953	19.705	20.902	-	20.902	0.000	74.282	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>

Event Name	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
Application Security with Containers (AppSec-C)	██████████																											
Integrated Network Operations Battalion and Below (INB2)	████████████████████																											
Tactical Scalable Mobile Ad-hoc Networking (MANET) Interferenation	██████████																											
Tactical IdAM – Soldier Authentication	████████████████																											
C5ISR/EW Modular Open Suite of Standards (CMOSS)	██████																											
Protected Comms for Manned-unmanned teaming (MUM-T)	████████████████████████████																											
Next Generation High Frequency (NGHF)	██																											
Non-traditional Waveforms	██																											
CMOSS Mounted Form Factor (CMFF)	██████████																											
Aerial Tier Experimentation					████████████████████████████████																							
CMOSS Reference Architecture					████████████████																							
Secured Handheld on Assured Resilient Networks at the Tactical Edge (SHARE)					████████████████████																							
Resilient Wideband SATCOM Interference Cancellation					████████████████																							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>

Event Name	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				
Resilient Wideband SATCOM - OTM & ATH																																
High-Altitude: WGS Ka Band Surrogate (HAWKS)																																
Autonomous Cyber																																
Industry Innovation Prototyping & Evaluation																																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Application Security with Containers (AppSec-C)	2	2020	2	2021
Integrated Network Operations Battalion and Below (INB2)	2	2020	2	2022
Tactical Scalable Mobile Ad-hoc Networking (MANET) Interference Cancellation	4	2020	2	2021
Tactical IdAM -- Soldier Authentication	2	2020	4	2021
C5ISR/EW Modular Open Suite of Standards (CMOSS)	4	2020	1	2021
Protected Comms for Manned-unmanned teaming (MUM-T)	1	2021	1	2023
Next Generation High Frequency (NGHF)	1	2021	1	2025
Non-traditional Waveforms	1	2021	1	2026
CMOSS Mounted Form Factor (CMFF)	2	2021	1	2022
Aerial Tier Experimentation	2	2022	2	2024
CMOSS Reference Architecture	2	2022	2	2023
Secured Handheld on Assured Resilient Networks at the Tactical Edge (SHARE)	2	2022	2	2023
Resilient Wideband SATCOM Interference Cancellation	3	2021	3	2022
Resilient Wideband SATCOM - OTM & ATH	2	2024	2	2026
High-Altitude: WGS Ka Band Surrogate (HAWKS)	2	2026	2	2027
Autonomous Cyber	2	2024	2	2027
Industry Innovation Prototyping & Evaluation	4	2020	4	2027

Note

Industry Innovation Prototyping and Evaluation projects are awarded following Technical Exchange Meetings (TEM) and are continuous activities; Network Cross Functional Team (N-CFT) and Program Executive Office Command, Control, Communications-Tactical (PEO C3T) will reach out to industry partners in order to assess and demonstrate the latest emerging technologies which will reduce capability gaps and provide rapid software/hardware insertions into Programs of Record.

Changes from PB22 Schedule:

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604541A / <i>Unified Network Transport</i>	Project (Number/Name) BT5 / <i>Integrated Tactical Network/Enterprise Network</i>
<ul style="list-style-type: none"> - Science and Technology (S&T) projects are evaluated based on ongoing forums with the S&T community. N-CFT and PEO C3T track changes to the S&T efforts, including but not limited to - titles, descriptions, Technology Readiness Level (TRL), planned program transition and transfer agreement status. N-CFT and PEO C3T utilize this information to prioritize the S&T projects by fiscal year. - Integrated Network Operations Battalion and Below (INB2) continues technology integration efforts into mid-FY22. - Tactical Identify Access Management (IdAM)-Soldier Authentication 6.4 RDTE efforts concluded in FY21. - The schedule for Next Generation High Frequency (NGHF) is inclusive of multiple sub-efforts completing in 1QFY25. - The schedule for Non-traditional Waveforms (NTW) is inclusive of multiple sub-efforts. - Aerial Tier Networking is renamed Aerial Tier Experimentation to better specify the nature of the effort commencing in FY22. - CMOSS Reference Architecture was identified as a 6.4 RDTE effort commencing in FY22. - Secured Handheld on Assured Resilient Networks at the Tactical Edge (SHARE) was identified as a 6.4 RDTE effort commencing in FY22. - Protected SATCOM is renamed Resilient Wideband SATCOM Interference Cancellation to specify the nature of the effort completing in FY22. - Resilient Wideband SATCOM - On-the-Move & At-the-Halt is added to the schedule and is projected to start in FY24. - WGS Ka-Band Surrogate is renamed High Altitude: WGS Ka-Band Surrogate (HAWKS) and is projected to start in FY26. - Autonomous Cyber, previously captured on BT3 schedule, is now captured under funding project BT5, Integrated Tactical Network/Enterprise Network, and is projected to commence in FY24. - Geospatial Repository & Data Management (GRiD) Tactical is removed from the schedule; the effort does not fall under the purview of PEO C3T. - Narrowband SATCOM is removed from the schedule pending future technology maturation. - Modular RF, previously captured on BT5 schedule, is now captured under funding project BT3, Common Operating Environment (COE). - The schedule for Industry Innovation Prototyping & Evaluation extends through FY27 to reflect the continuous nature of industry engagements. 		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>
---	--

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	-	88.100	286.445	-	-	-	0.000	0.000	0.000	0.000	0.000	374.545
MR1: <i>Mobile Intermediate Range Missile</i>	-	88.100	286.445	-	-	-	-	-	-	-	0.000	374.545

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Long-Range Precision Fires Modernization Priority. The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023. This funds the US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort and continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0655235A. Four MRC batteries will be developed and deployed; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S. The mission of the MRC Prototype Weapon System is to provide Combatant Commanders with a strategic, ground-mobile, offensive missile capability. The MRC Prototype Weapon System will leverage existing SM-6 and Tomahawk missiles for ground launch, to provide a responsive, highly accurate, deep strike capability designed to destroy high value, high payoff targets. MRC is optimized for the penetration/dis-integration phase of Multi-Domain Operations (MDO) by defeating enemy Anti-Access / Area Denial (A2/AD) systems allowing the Combatant Commander freedom to maneuver during the exploitation phase.

The MRC Prototype Weapon System leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events. MRC provides the Launchers and Battery Operations Center (BOC) which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets. The first MRC Prototype Weapon System deliverable quantity is one residual combat MRC prototype battery consisting of four Launchers and one BOC, to be deployed NLT 4Q FY 2023 as the First Unit of Issue (FUI). Delivery of follow-on batteries will occur annually thereafter.

FY 2023 Base funding of the PE 0604644A in the amount of \$404.291 million has been moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires in the amount of \$404.291 million and funds the integration of design requirements to complete and deploy the prototype battery, and to support fabrication of subsequent prototype batteries. Base funding allows for integration and evaluation of required characteristics to ensure safe and effective operational fielding of the prototype battery. Base funding also allows for purchasing and receiving hardware and materials to implement prototype fabrication, and to support component-level and system-level qualification. PE 0604644A funded the \$5.016 million that was moved to PEO M&S PE 0605235A in support of the transition from RCCTO to PEO M&S.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	88.100	286.457	0.000	-	0.000
Current President's Budget	88.100	286.445	0.000	-	0.000
Total Adjustments	0.000	-0.012	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC Transfer	-	-0.012	-	-	-

Change Summary Explanation

FFRDC took 12 from the budget.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604644A / Mobile Medium Range Missile				Project (Number/Name) MR1 / Mobile Intermediate Range Missile			
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
MR1: Mobile Intermediate Range Missile	-	88.100	286.445	-	-	-	-	-	-	-	0.000	374.545
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

A. Mission Description and Budget Item Justification

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023. This funds the US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort and continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A. Four MRC batteries will be developed and fielding; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S. The mission of the MRC Prototype Weapon System is to provide Combatant Commanders with a strategic, ground-mobile, offensive missile capability. The MRC Prototype Weapon System will leverage existing SM-6 and Tomahawk missiles for ground launch, to provide a responsive, highly accurate, deep strike capability designed to destroy high value, high payoff targets. MRC is optimized for the penetration/dis-integration phase of Multi-Domain Operations (MDO) by defeating enemy Anti-Access / Area Denial (A2/AD) systems allowing the Combatant Commander freedom to maneuver during the exploitation phase.

The MRC Prototype Weapon System leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events. MRC provides the Launchers and Battery Operations Center (BOC) which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets. The first MRC Prototype Weapon System deliverable quantity is one residual combat MRC prototype battery consisting of four Launchers and one BOC, to be deployed NLT 4Q FY 2023 as the First Unit of Issue (FUI). Delivery of follow-on batteries will occur annually thereafter.

FY 2023 Base funding in the amount of \$404.291 million was moved from PE 0604644A to PE 0604135A and funds the integration of design requirements to complete and field the prototype battery, and to support fabrication of subsequent prototype batteries. Base funding allows for integration and evaluation of required characteristics to ensure safe and effective operational fielding of the prototype battery. Base funding also allows for purchasing and receiving hardware and materials to implement prototype fabrication, and to support component-level and system-level qualification. PE 0604644A funded the \$5.016 million that was moved to PEO M&S PE 0655235A in support of the transition from RCCTO to PEO M&S.

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

	FY 2021	FY 2022	FY 2023
Title: Mobile Intermediate Range Missile (MIRM) MR1	88.100	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>	Project (Number/Name) MR1 / <i>Mobile Intermediate Range Missile</i>

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

	FY 2021	FY 2022	FY 2023
<p>Description: The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023. This funds the US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort and continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO MS) PE 0605235A. Four MRC batteries will be developed and fielded; the MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO MS. The mission of the MRC project is to provide Combatant Commanders with a strategic, ground-mobile, offensive missile capability. The MRC Project will leverage existing SM-6 and Tomahawk missiles for ground launch, to provide a responsive, highly accurate, deep strike capability designed to destroy high value, high payoff targets. MRC is optimized for the penetration/dis-integration phase of Multi-Domain Operations (MDO) by defeating enemy Anti-Access / Area Denial (A2/AD) systems allowing the Joint Force Commander freedom to maneuver during the exploitation phase.</p> <p>The MRC project leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events. MRC provides the Launchers and Battery Operations Center (BOC) which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets. The MRC project deliverable quantity is one residual combat MRC prototype battery consisting of four Launchers and one BOC, to be fielded NLT 4Q FY 2023 as the First Unit of Issue (FUI).</p> <p>The MRC Launcher Payload Deployment System project leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the MRC Payload Deployment System. MRC Launcher PDS stows and fires a mix of missile types to include SM-6 and Tomahawk. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. The MRC Launcher PDS Project delivers four PDSs for each MRC Battery. Additional missiles may be integrated to the MRC Launcher PDS capability needs.</p> <p>The MRC Ground Support Equipment project leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the Ground Support Equipment. The Ground Support Equipment includes the Battery Operations Center, prime movers, trailer, generators, cabling, and support vehicles.</p> <p>The MRC Missiles project funds missiles and associated missile support equipment needed for the operational fielding of the MRC prototype Battery. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets.</p>			
<p>Title: Mid-Range Capability (MRC) Launcher Payload Deployment System (PDS)</p> <p>Description: The MRC Launcher Payload Deployment System (PDS) project leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the MRC PDS. MRC Launcher PDS stows and fires a mix</p>	-	43.165	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>	Project (Number/Name) MR1 / <i>Mobile Intermediate Range Missile</i>

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

of missile types to include SM-6 and Tomahawk. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. The MRC Launcher PDS Project delivers four PDSs for each MRC Battery. Additional missiles may be integrated to the MRC Launcher PDS capability needs.

FY 2022 Plans:

The FY 2022 Base funding in the amount of \$46.490 million funds the fabrication, integration of design requirements, and test and evaluation for the four MRC Launcher PDS. Base funding ensures safe and effective operational fielding of the MRC Launcher PDS. This funds the OEMs effort to obtain materials and sub-assemblies and to fabricate the MRC Launcher Payload Deployment System. This effort completes the design, development, and integration of required characteristics to ensure safe and effective operational fielding of the MRC Launcher PDS solution. Launcher integration ensures that the system is stable during launch and meets transportation requirements. Provides for the Government and Contractor coordination required to participate and plan for initial Test and Evaluation events. Integration efforts include wireless communication, rapid reloading, improved mobility, weight reduction, and M-Code implementation. Provides Systems Engineering and Government Program Management for MRC GSE project.

FY 2022 to FY 2023 Increase/Decrease Statement:

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

Title: Mid-Range Capability (MRC) Ground Support Equipment (GSE)

Description: The MRC Ground Support Equipment leverages Joint Service technologies and integration of common hardware, software, and mutually supporting test events for the GSE. This includes the Battery Operations Center (BOC), prime movers, trailers, generators, cabling, and support vehicles. The MRC BOC houses the federated Command and Control systems which enable the capability to fire a mix of missiles capable of flying at various speeds and altitudes for mid-range distances to engage targets.

FY 2022 Plans:

The FY 2022 Base funded the amount of \$100.226 million funded the fabrication, integration of design requirements, and test and evaluation for the MRC Ground Support Equipment (GSE) and MRC Battery Operations Center (BOC). The FY 2022 Base funding ensures safe and effective operational fielding of the MRC GSE and the prototype BOC. This funds the OEMs effort to obtain materials and sub-assemblies and to fabricate the MRC BOC and funds the system integration across military branches to include the OEM contractor and other government agencies in order to ensure a common MRC GSE. This effort completes the design, development, and integration of required characteristics to ensure safe and effective operational fielding. Provides for the Government and Contractor coordination required to participate and plan for initial Test and Evaluation events. Integration

FY 2021	FY 2022	FY 2023
-	93.083	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>	Project (Number/Name) MR1 / <i>Mobile Intermediate Range Missile</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
efforts include wireless communication, improved mobility, weight reduction, and M-Code implementation. Provides Systems Engineering and Government Program Management for MRC GSE project. FY 2022 to FY 2023 Increase/Decrease Statement: The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.			
Title: Mid-Range Capability (MRC) Missiles Description: MRC funds missiles and associated missile support equipment needed for the operational fielding of the MRC prototype Battery. The missiles are capable of flying at various speeds and altitudes for mid-range distances to engage targets. MRC provides Systems Engineering and Government Program Management for missile buys. FY 2022 Plans: FY 2022 funds the MRC missile buy to meet requirements. Details at a higher classification. FY 2022 to FY 2023 Increase/Decrease Statement: The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.	-	139.741	-
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	-	10.456	-
Accomplishments/Planned Programs Subtotals	88.100	286.445	-

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / Mobile Medium Range Missile	Project (Number/Name) MR1 / Mobile Intermediate Range Missile

D. Acquisition Strategy

The MRC project will develop, integrate, and produce MRC specific analysis, design, development, and integration through a RCCTO prototype Other Transaction Authority (pOTA), which was awarded to Lockheed Martin (LM) in November 2020. Additionally, the pOTA will leverage the Strategic Capabilities Office (SCO), Navy, and US Marine Corps (USMC) investments in weapon system development since 2016 by providing a body of data including Technical Data Packages (TDP), Critical Design Review (CDR) artifacts, and active production lines. The MRC project will leverage existing contract vehicles to procure supporting items currently in production through a combination of Army and Navy contracts. Using these contracts, the MRC project retains commonality in production, training, logistics, and sustainment with the SCO and the Navy.

US Army Rapid Capabilities and Critical Technologies Office (RCCTO) Mid-Range Capability (MRC) effort continues as the program transitions to the US Army Program Executive Office Missiles and Space (PEO M&S) PE 0605235A in FY 2023. Four MRC batteries will be developed and fielded; the initial MRC prototype battery will be developed by RCCTO, and the three remaining MRC batteries by PEO M&S.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / Mobile Medium Range Missile	Project (Number/Name) MR1 / Mobile Intermediate Range Missile
--	---	---

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Planning	Various	multiple : multiple	4.794	3.959	Mar 2021	-		-		-		-	0.000	8.753	-
System Engineering and Program Management	Various	TBD : Huntsville, AL; National Capitol Region	-	-		11.173		-		-		-	0.000	11.173	-
SIBR/STTR Tranfer	TBD	TBD : TBD	-	-		10.456		-		-		-	0.000	10.456	-
Subtotal			4.794	3.959		21.629		-		-		-	0.000	30.382	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Contracts for technology development, integration, prototyping	Various	multiple : multiple	-	84.141	Mar 2021	-		-		-		-	0.000	84.141	-
Original Equipment Manufacturer (OEM)	SS/CPFF	Lockheed Martin : Various	-	-		78.212		-		-		-	0.000	78.212	-
Government Furnished Equipment (GFE)	Various	Various : Various	-	-		8.352		-		-		-	0.000	8.352	-
Other Government Agencies (OGA)	Various	Various : Various	-	-		22.371		-		-		-	0.000	22.371	-
MRC Missiles	Various	Navy Various : Various	-	-		139.140		-		-		-	0.000	139.140	-
Subtotal			-	84.141		248.075		-		-		-	0.000	332.216	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cyber, Software, Transportation	Various	Various : Various	-	-		7.237		-		-		-	0.000	7.237	-
Subtotal			-	-		7.237		-		-		-	0.000	7.237	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / Mobile Medium Range Missile	Project (Number/Name) MR1 / Mobile Intermediate Range Missile
--	---	---

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test & Evaluation	Various	Various : Various	-	-		9.504		-		-		-	0.000	9.504	-
Subtotal			-	-		9.504		-		-		-	0.000	9.504	N/A
Project Cost Totals			4.794	88.100		286.445		-		-		-	0.000	379.339	N/A

Remarks
 The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / Mobile Medium Range Missile	Project (Number/Name) MR1 / Mobile Intermediate Range Missile

Event Name	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
MRC Ground Support Equipment (GSE) Assembly																												
MRC Launcher Payload Deployment System (PDS) Assembly																												
MRC Battery Operation Center (BOC) Assembly																												
Initial System Integration and Check Out																												
New Materiel in Brief (NMIB)																												
Initial Fielding Prototype																												
Obtain Release to Train																												
NET																												
TRR																												
Obtain Release to Field Prototype																												
SM-6 Missile Test																												
Tomahawk Missile Test																												
CLS																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>	Project (Number/Name) MR1 / <i>Mobile Intermediate Range Missile</i>	

Event Name	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
First Unit of Issue (FUI)									↑																			

Note
The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604644A / <i>Mobile Medium Range Missile</i>	Project (Number/Name) MR1 / <i>Mobile Intermediate Range Missile</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MRC Ground Support Equipment (GSE) Assembly	3	2022	4	2023
MRC Launcher Payload Deployment System (PDS) Assembly	1	2022	1	2023
MRC Battery Operation Center (BOC) Assembly	1	2022	1	2023
Initial System Integration and Check Out	3	2022	1	2023
New Materiel in Brief (NMIB)	3	2022	3	2022
Initial Fielding Prototype	1	2023	4	2023
Obtain Release to Train	1	2023	4	2023
NET	2	2023	3	2023
TRR	2	2023	2	2023
Obtain Release to Field Prototype	3	2023	3	2023
SM-6 Missile Test	3	2023	3	2023
Tomahawk Missile Test	3	2023	3	2023
CLS	4	2023	4	2024
First Unit of Issue (FUI)	4	2023	4	2023

Note

The Program Element (PE) 0604644A / Mobile Medium Range Missile (RCCTO) was moved from PE 0604644A to PE 0604135A / Strategic Mid-Range Fires (RCCTO) and PE 0605235A / Mid-Range Capability (PEO M&S) in FY 2023.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (Budget Activity 4)</i>
---	--

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	-	2.020	2.040	-	-	-	0.000	0.000	0.000	0.000	0.000	4.060
DS4: <i>Integrated Base Defense</i>	-	2.020	2.040	-	-	-	-	-	-	-	0.000	4.060

Note

PE 0604785A / Integrated Base Defense is an FY23 termination. No further RDTE requirements are anticipated in FY23 and beyond.

A. Mission Description and Budget Item Justification

0604785A/DS4/Integrated Base Defense (IBD) has no FY2023 funding request

Counter Vehicle Borne Improvised Explosive Device (CVBIED) is an integrated suite of systems developed in response to CENTCOM JUONS CC-0540. The CVBIED program provides an early VBIED detection capability prior to vehicles reaching entry into Forward Operating Bases. Additional sensor systems are being integrated into the current Force Protection infrastructure as part of CVBIED.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	2.020	2.040	0.000	-	0.000
Current President's Budget	2.020	2.040	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	-	-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (Budget Activity 4)</i>	Project (Number/Name) DS4 / <i>Integrated Base Defense</i>
--	--	--

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
DS4: <i>Integrated Base Defense</i>	-	2.020	2.040	-	-	-	-	-	-	-	0.000	4.060
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Integrated Base Defense (IBD) RDT&E funding provides for the integration and testing of software and hardware along with the development of analytical capabilities to support force protection systems and capabilities in the field as part of the Counter Vehicle Borne Improvised Explosive Device (CVBIED) program. IBD employs an enterprise approach to enable IBD capabilities across the operational spectrum by leveraging interoperability efforts in support of the Integrated Unit, Base, and Installation Force Protection framework focused on systems engineering, software development and testing.

Counter Vehicle Borne Improvised Explosive Device (CVBIED) is an integrated suite of systems developed in response to CENTCOM JUONS CC-0540. The CVBIED program provides an early VBIED detection capability prior to vehicles reaching entry into Forward Operating Bases. Additional sensor systems are being integrated into the current Force Protection infrastructure as part of CVBIED.

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

	FY 2021	FY 2022	FY 2023
Title: CVBIED Design and Build	2.020	2.040	-
Description: RDT&E efforts continue the development, integration and testing of CVBIED technologies into the current Force Protection infrastructure to address capabilities gaps within JUONS CC-0540.			
FY 2022 Plans: No Base RDT&E provided.			
FY 2022 to FY 2023 Increase/Decrease Statement: CVBIED will not require RDTE funding in FY23 and beyond; no further requirements are anticipated.			
Accomplishments/Planned Programs Subtotals	2.020	2.040	-

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
• M90115: <i>INTEG BASE DEF NONSTAND EQUIP (IBD NS-E) KITTING</i>	47.184	-	0.000	-	0.000	-	-	-	-	0.000	47.184

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604785A / Integrated Base Defense (Budget Activity 4)	Project (Number/Name) DS4 / Integrated Base Defense

D. Acquisition Strategy

The IBD acquisition strategy is to leverage the efforts of existing IBD-related government organizations and related technologies in order to award multiple contracts in support of IBD objectives for the development of holistic IBD architectures and products while also ensuring interoperability with fielded and emerging IBD-related systems. JUONS CC-0540 (CVBIED) equipment is comprised of a combination of Commercial and Government Off the Shelf items integrated to meet the requirements of JUONS CC-0540 (CVBIED).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (B</i> <i>udget Activity 4)</i>	Project (Number/Name) DS4 / <i>Integrated Base Defense</i>
--	---	--

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JUONS CC-0540 System Integration	MIPR	CCDC AvMC : Huntsville, AL	0.732	0.329	Jan 2021	0.329	Jan 2022	-		-		-	0.000	1.390	-
JUONS CC-0540 Hyper spectral Sensor Development Support	MIPR	CCDC C5ISR NVESD : Fort Belvoir, VA	-	0.471	Jan 2021	0.471	Feb 2022	-		-		-	0.000	0.942	-
JUONS CC-0540 Wide Area Motion Imagery Sensor Development	MIPR	NAVAIR : Patuxent River, MD	0.390	0.450	Jan 2021	0.450	Mar 2022	-		-		-	0.000	1.290	-
Integrated System Architecture (ISA) SW Development Support	MIPR	CCDC C5ISR NVESD : Fort Belvoir	0.225	0.270	Jan 2021	0.270	Mar 2022	-		-		-	0.000	0.765	-
Subtotal			1.347	1.520		1.520		-		-		-	0.000	4.387	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	C/CPFF	PM TS : Fort Belvoir	0.055	-		-		-		-		-	0.000	0.055	-
Subtotal			0.055	-		-		-		-		-	0.000	0.055	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	MIPR	A TEC - RTC : Redstone Arsenal, Huntsville, AL	0.598	0.500	Oct 2020	0.520	Oct 2021	-		-		-	0.000	1.618	-
Subtotal			0.598	0.500		0.520		-		-		-	0.000	1.618	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (Budget Activity 4)</i>			Project (Number/Name) DS4 / <i>Integrated Base Defense</i>					
	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	2.000	2.020	2.040		-	-	-	0.000	6.060	N/A	

Remarks
CVBIED will not require RDTE funding in FY23; no further requirements.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (B</i> <i>udget Activity 4)</i>	Project (Number/Name) DS4 / <i>Integrated Base Defense</i>

Event Name	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
Development, Test and Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
System Development and Component Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
AVIS Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
AVIS Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Video Analytics/Computer Learning Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Computer Learning Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Fixed Control Station Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
FCS Integration	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Facial Recognition/ RFID implementation	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Facial Rec/RFID Marking	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Intelligent Remote Imaging Spectrometer- Ground and Kestrel B	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
IRIS-G and KB2 Integration Phase II	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Intelligent Remote Imaging Spectrometer - Ground and Kestrel B	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
Block II Phase III	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
IRIS-G and KB2 Integration Phase III	[Blue bar spanning FY 2021 Q1-Q4, FY 2022 Q1-Q4]																											
ATEC Capabilities and Limitations - Increment 2	[Blue bar in FY 2021 Q3]																											
Assessment 2	[Blue bar in FY 2021 Q3]																											
System of Systems Integration	[Blue bar spanning FY 2021 Q3-Q4, FY 2022 Q1-Q4]																											
SoS Integration	[Blue bar spanning FY 2021 Q3-Q4, FY 2022 Q1-Q4]																											
SoS Integration Event 1	[Blue bar in FY 2022 Q1]																											
I.E. 1	[Blue bar in FY 2022 Q1]																											
SoS Integration Event 2	[Blue bar in FY 2022 Q2]																											
I.E. 2	[Blue bar in FY 2022 Q2]																											
SoS Integration Event 3	[Blue bar in FY 2022 Q3]																											
I.E. 3	[Blue bar in FY 2022 Q3]																											
ATEC Capabilities and Limitations - Increment 3	[Blue bar in FY 2022 Q4]																											
Assessment 3	[Blue bar in FY 2022 Q4]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604785A / <i>Integrated Base Defense (Budget Activity 4)</i>	Project (Number/Name) DS4 / <i>Integrated Base Defense</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development, Test and Integration	4	2019	4	2022
AVIS Integration	4	2019	4	2022
Video Analytics/Computer Learning Integration	4	2019	2	2022
Fixed Control Station Integration	1	2020	4	2022
Facial Recognition/ RFID implementation	4	2020	3	2021
Intelligent Remote Imaging Spectrometer- Ground and Kestrel Block II Phase I	1	2020	4	2020
Intelligent Remote Imaging Spectrometer- Ground and Kestrel Block II Phase II	1	2021	3	2021
Intelligent Remote Imaging Spectrometer - Ground and Kestrel Block II Phase III	4	2021	3	2022
ATEC Capabilities and Limitations- Increment 1	3	2020	4	2020
ATEC Capabilities and Limitations - Increment 2	2	2021	3	2021
System of Systems Integration	3	2021	4	2022
SoS Integration Event 1	1	2022	1	2022
SoS Integration Event 2	2	2022	2	2022
SoS Integration Event 3	4	2022	4	2022
ATEC Capabilities and Limitations - Increment 3	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>
---	---

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	-	50.525	55.895	55.677	-	55.677	0.000	0.000	0.000	0.000	0.000	162.097
DD3: <i>Joint Cyber Warfighting Architecture Cyber Train</i>	-	-	-	55.677	-	55.677	-	-	-	-	0.000	55.677
FA8: <i>Cyberspace Operations Forces and Force Support</i>	-	50.525	55.895	-	-	-	-	-	-	-	0.000	106.420

A. Mission Description and Budget Item Justification

Persistent Cyber Training Environment (PCTE) supports the United States Cyber Command (USCC) by enabling the critical need for the DoD Cyber Mission Force (CMF) to train at the individual, team, and force level. PCTE provides the DoD CMF with a standardized training capability that maximizes shared content across the Services to include emulated network environments and has the ability to connect to other range environments and cyber training assets. The PCTE platform is aligned to the outputs of the Office of the Under Secretary of Defense for Acquisition & Sustainment OUSD (A&S) and Chairman of the Joint Chiefs of Staff (CJCS) J6 led, "Cyber Range Evaluation of Alternatives (EOA) Findings and Issue Paper Deliberations," dated 17 November 2015. The Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) was designated as the DoD Acquisition Lead for the PCTE and the program is directed by the 2016 National Defense Authorization Act, Section 1645. With the Joint Requirements Oversight Council (JROC) validation of the Information System - Capability Development Document (IS-CDD) on 4 November 2019, the PCTE program quickly achieved Milestone B on 6 December 2019. Through ongoing rapid prototyping efforts, the PCTE platform has fulfilled the critical need for a CMF standardized training capability upon release of PCTE Version 2 in Fourth Quarter Fiscal Year 2020, and continues to do so with ongoing version releases.

FY 2023 PCTE funding will focus on United States Cyber Command (USCC) priorities within platform releases to include enhancing current capability fidelity while introducing additional features. Areas of planned feature updates and enhancements include CMF learning management system, assessment and readiness capabilities, cloud based cyber terrain replication, distributed platform consolidation, cloud migration, and infrastructure consumption model implementation. The PCTE platform will continue collaboration with all stakeholders within the Joint Cyber Warfighting Architecture (JCWA), and continue initial integration efforts across the JCWA portfolio as prioritized through USCC. The PCTE platform will maintain accreditations at all required classification levels to serve DoD CMF user training at the Unclassified, Secret, and Top Secret data classification levels. Platform infrastructure and licensing will be maintained to support the full DoD CMF user base.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>
---	---

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	50.525	52.988	0.000	-	0.000
Current President's Budget	50.525	55.895	55.677	-	55.677
Total Adjustments	0.000	2.907	55.677	-	55.677
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	55.677	-	55.677
• FFRDC Transfer	-	-0.093	-	-	-

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

Project: FA8: *Cyberspace Operations Forces and Force Support*

Congressional Add: *Program increase - Army Cyber Institute*

	<u>FY 2021</u>	<u>FY 2022</u>
	-	4.000
Congressional Add Subtotals for Project: FA8	-	4.000
Congressional Add Totals for all Projects	-	4.000

Change Summary Explanation

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>				Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>			
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
DD3: <i>Joint Cyber Warfighting Architecture Cyber Train</i>	-	-	-	55.677	-	55.677	-	-	-	-	0.000	55.677
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Under PE 0305251A / *Cyberspace Operations Forces and Force Support* Project FA8 / *Cyberspace Operations Forces and Force Support* moves to Project DD3 in FY 2023.

A. Mission Description and Budget Item Justification

Persistent Cyber Training Environment (PCTE) supports the United States Cyber Command (USCC) by enabling the critical need for the DoD Cyber Mission Force (CMF) to train at the individual, team, and force level. PCTE provides the DoD CMF with a standardized training capability that maximizes shared content across the Services to include emulated network environments and has the ability to connect to other range environments and cyber training assets. The PCTE platform is aligned to the outputs of the Office of the Under Secretary of Defense for Acquisition & Sustainment OUSD (A&S) and Chairman of the Joint Chiefs of Staff (CJCS) J6 led, "Cyber Range Evaluation of Alternatives (EOA) Findings and Issue Paper Deliberations," dated 17 November 2015. The Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) was designated as the DoD Acquisition Lead for the PCTE and the program is directed by the 2016 National Defense Authorization Act, Section 1645. With the Joint Requirements Oversight Council (JROC) validation of the Information System - Capability Development Document (ISCDD)

on 4 November 2019, the PCTE program quickly achieved Milestone B on 6 December 2019. Through ongoing rapid prototyping efforts, the PCTE platform has fulfilled the critical need for a CMF standardized training capability upon release of PCTE Version 2 in Fourth Quarter Fiscal Year 2020, and continues to do so with ongoing version releases.

FY 2023 PCTE funding will focus on United States Cyber Command (USCC) priorities within platform releases to include enhancing current capability fidelity while introducing additional features. Areas of planned feature updates and enhancements include CMF learning management system, assessment and readiness capabilities, cloud based cyber terrain replication, distributed platform consolidation, cloud migration, and infrastructure consumption model implementation. The PCTE platform will continue collaboration with all stakeholders within the Joint Cyber Warfighting Architecture (JCWA), and continue initial integration efforts across the JCWA portfolio as prioritized through USCC. The PCTE platform will maintain accreditations at all required classification levels to serve DoD CMF user training at the Unclassified, Secret, and Top Secret data classification levels. Platform infrastructure and licensing will be maintained to support the full DoD CMF user base.

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

	FY 2021	FY 2022	FY 2023
Title: Event Management for Persistent Cyber Training Environment (PCTE)	-	-	43.621
Description: Design, build and iterate PCTE capabilities; build upon individual training features supporting operational force training requirements; develop improved readiness functions, event scheduling, allocation and management for PCTE, to			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
include event design, planning and execution, supported by standardized training assessment tools and capabilities.				
<p>FY 2023 Plans: FY 2023 PCTE funding will focus on United States Cyber Command (USCC) priorities within platform releases to include enhancing current capability fidelity while introducing additional features. Areas of planned feature updates and enhancements include CMF learning management system, assessment and readiness capabilities, cloud based cyber terrain replication, distributed platform consolidation, cloud migration, and infrastructure consumption model implementation.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding was increased to continue capability enhancement fidelity while introducing additional features such as improved readiness and training reporting, CMF assessment and augmented traffic emulation while also addressing platform scalability.</p>				
<p>Title: Environment Operations and Management for Persistent Cyber Training Environment (PCTE)</p> <p>Description: Develop PCTE with mission-relevant terrain and realistic vignettes/scenarios as part of a system (syllabus) of individual and collective training that includes certification and real-world mission rehearsals.</p>		-	-	4.814
<p>FY 2023 Plans: FY 2023 PCTE funding will continue to focus on USCC priorities as they relate to integration with JCWA components within the JCWA data fabric in collaboration with all stakeholders. Areas of planned focus include JCWA pilots that increase mission relevant content sharing and discoverability across JCWA mission threads, in addition to enterprise compute integration for range resources within cloud cyber terrain.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding was increased to continue JCWA related integration pilots that focus on hosting mission-relevant environments on the PCTE platform within the JCWA architecture.</p>				
<p>Title: Physical and Virtual Connectivity for the Persistent Cyber Training Environment (PCTE)</p> <p>Description: PCTE has procured, installed and is maintaining Regional Compute and Storage (RCS) nodes which enable on demand, reliable, and secure virtual access from wherever participants are geographically located. Additionally, the PCTE RCS infrastructure create a core cyber exercise network and event management platform to support Cyber Mission Force (CMF) training at the Unclassified, Secret, and Top Secret data classification levels.</p>		-	-	5.510
<p>FY 2023 Plans:</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>The PCTE Regional Compute and Storage (RCS) nodes will execute a cloud migration and continue the consumption based model while continuing to leverage DoD enterprise transport services with access on all classification levels (Top Secret to Unclassified) to perform training.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding was increased in order to execute RCS cloud migration and continue the consumption based model while continuing to leverage DoD enterprise transport services.</p>				
<p>Title: Persistent Cyber Training Environment (PCTE) Test and Evaluation</p> <p>Description: Persistent Cyber Training Environment (PCTE) integration, development, and operational testing that will include validation and verifications (V&V), operational assessments (OA), and testing in association with cyber training exercises and incorporated throughout the Product Manager (PM) Development Operations (DevOps) process. An Operational Test Authority (OTA) has been incorporated, in coordination with the Director, Operational Test and Evaluation (DOT&E), to conduct operational testing leveraging DevOps testing processes.</p> <p>FY 2023 Plans: Testing will continue in FY 2023 with integration, verification and validation testing of the PCTE capability with an emphasis on NSA Red Team testing on PCTE throughout the development cycle. The focus for FY 2023 is on verifying existing and new capability through continuous testing and cyber resiliency assessments. Test efforts in FY 2023 include the integration and testing with other platforms within the Joint Capability Warfighter Architecture (JCWA).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding was increased to continue with integration, verification and validation testing of the PCTE capability.</p>		-	-	1.732
Accomplishments/Planned Programs Subtotals		-	-	55.677
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>The Persistent Cyber Training Environment (PCTE) program employs an incremental acquisition strategy leveraging the use of existing cyber contracts and Other Transaction Authority (OTA) vehicles to provide specified capabilities that will be integrated into a cohesive training platform. The next step in the acquisition strategy is developing a long term contract vehicle that will continue enabling the PCTE platform to achieve scalability, optimization, innovation, and quality standards to meet the dynamic needs of the Cyber Mission Force (CMF) user base. The Product Manager awarded an integration focused Single Award Indefinite Delivery/Indefinite Quantity (ID/IQ) contract to serve PCTE as well as other cyber community customers called the Cyber Training, Readiness, Integration, Delivery, and Enterprise Technology</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>

(TRIDENT) contract on Q1 FY2022. The Cyber TRIDENT contract enables PCTE to provide iterative capability provided to the Cyber Mission Forces (CMF) in Capability Drops (CDs) that either improve or add features. These CDs will be based on requirements contained and further developed as part of the PCTE Information System - Capability Development Document (IS-CDD). This is a major capability acquisition that will continue to deliver capability in line with Information Technology (IT) Box requirements strategy.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>
--	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PCTE Development and Integration Support	C/IDDQ	Various : Various	181.750	-		-		1.764	Feb 2023	-		1.764	0.000	183.514	-
PCTE Cyber Training, Readiness, Integration, Delivery, and Enterprise Technology (TRIDENT) Contract	C/IDDQ	Various : Various	24.581	-		-		13.363	Mar 2023	-		13.363	0.000	37.944	-
PCTE Development and Integration - Other Contracts	Option/ FFP	various : various	72.097	-		-		38.818	Mar 2023	-		38.818	0.000	110.915	-
Subtotal			278.428	-		-		53.945		-		53.945	0.000	332.373	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PCTE Government Test and Evaluation	Option/ Various	various : various	13.111	-		-		1.732	Mar 2023	-		1.732	0.000	14.843	-
Subtotal			13.111	-		-		1.732		-		1.732	0.000	14.843	N/A

Remarks
Validation and Verification tests at CMF existing training events will be conducted with every capability drop utilizing Cyber Mission Force operators and representatives from

	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	291.539	-	-	55.677	-	55.677	0.000	347.216	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>

Event Name	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
Platform Releases (v1.0 - v8.0) - (IS-CDD 1)					Platform Releases (v1.0 - v8.0) - (IS-CDD 1)																							
PCTE v4.0									1 PCTE v4.0																			
PCTE v5.0													2 PCTE v5.0															
PCTE v6.0																	3 PCTE v6.0											
PCTE v7.0																					4 PCTE v7.0							
PCTE v8.0																					5 PCTE v8.0							
Platform Releases (v9.0 - vX.0) - (IS-CDD 2)													Platform Releases (v9.0 - vX.0) - (IS-CDD 2)															
PCTE v9.0																	6 PCTE v9.0											
PCTE v10.0																					7 PCTE v10.0							
PCTE v11.0																					8 PCTE v11.0							
PCTE v12.0																					9 PCTE v12.0							
PCTE v13.0																					10 PCTE v13.0							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) DD3 / <i>Joint Cyber Warfighting Architecture Cyber Train</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Platform Releases (v1.0 - v8.0) - (IS-CDD 1)	2	2022	2	2024
PCTE v4.0	2	2022	2	2022
PCTE v5.0	4	2022	4	2022
PCTE v6.0	2	2023	2	2023
PCTE v7.0	4	2023	4	2023
PCTE v8.0	2	2024	2	2024
Platform Releases (v9.0 - vX.0) - (IS-CDD 2)	4	2024	4	2026
PCTE v9.0	4	2024	4	2024
PCTE v10.0	2	2025	2	2025
PCTE v11.0	4	2025	4	2025
PCTE v12.0	2	2026	2	2026
PCTE v13.0	4	2026	4	2026

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>				Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>			
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
FA8: <i>Cyberspace Operations Forces and Force Support</i>	-	50.525	55.895	-	-	-	-	-	-	-	0.000	106.420
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Under PE 0305251A / *Cyberspace Operations Forces and Force Support* Project FA8 / *Cyberspace Operations Forces and Force Support* moves to Project DD3 in FY2023.

A. Mission Description and Budget Item Justification

Persistent Cyber Training Environment (PCTE) supports the United States Cyber Command (USCC) by enabling the critical need for the DoD Cyber Mission Force (CMF) to train at the individual, team, and force level. PCTE provides the DoD CMF with a standardized training capability that maximizes shared content across the Services to include emulated network environments and has the ability to connect to other range environments and cyber training assets. The PCTE platform is aligned to the outputs of the Office of the Under Secretary of Defense for Acquisition & Sustainment OUSD (A&S) and Chairman of the Joint Chiefs of Staff (CJCS) J6 led, "Cyber Range Evaluation of Alternatives (EOA) Findings and Issue Paper Deliberations," dated 17 November 2015. The Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) was designated as the DoD Acquisition Lead for the PCTE and the program is directed by the 2016 National Defense Authorization Act, Section 1645. With the Joint Requirements Oversight Council (JROC) validation of the Information System - Capability Development Document (IS-CDD) on 4 November 2019, the PCTE program quickly achieved Milestone B on 6 December 2019. Through ongoing rapid prototyping efforts, the PCTE platform has fulfilled the critical need for a CMF standardized training capability upon release of PCTE Version 2 in Fourth Quarter Fiscal Year 2020, and continues to do so with ongoing version releases.

FY 2023 PCTE funding will focus on United States Cyber Command (USCC) priorities within platform releases to include enhancing current capability fidelity while introducing additional features. Areas of planned feature updates and enhancements include CMF learning management system, assessment and readiness capabilities, cloud based cyber terrain replication, distributed platform consolidation, cloud migration, and infrastructure consumption model implementation. The PCTE platform will continue collaboration with all stakeholders within the Joint Cyber Warfighting Architecture (JCWA), and continue initial integration efforts across the JCWA portfolio as prioritized through USCC. The PCTE platform will maintain accreditations at all required classification levels to serve DoD CMF user training at the Unclassified, Secret, and Top Secret data classification levels. Platform infrastructure and licensing will be maintained to support the full DoD CMF user base.

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

	FY 2021	FY 2022	FY 2023
Title: Event Management for Persistent Cyber Training Environment (PCTE)	37.897	40.031	-
Description: Develop event scheduling, allocation, and management function for PCTE, to include event design, planning and execution, supported by standardized training assessment tools and capabilities.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>PCTE capabilities will continue to support the full DoD Cyber Mission Force (CMF) user base. New capabilities and features, as prioritized by the United States Cyber Command (USCC) and CMF feedback, will include enhanced CMF assessment capabilities, traffic generation augmentation, platform scalability and resourcing, content authoring and sharing tools, and pilots for infrastructure utility models.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Under PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i> Project FA8 / <i>Cyberspace Operations Forces and Force Support</i> moves to Project DD3 in FY 2023.</p>				
<p>Title: Environment Operations and Management for Persistent Cyber Training Environment (PCTE)</p> <p>Description: Develop PCTE with realistic vignettes/scenarios as part of a system (syllabus) of individual and collective training that includes certification and real-world mission rehearsals.</p> <p>FY 2022 Plans: Will continue to maintain PCTE virtual environments with an emphasis on collaboration with all stakeholders within the Joint Cyber Warfighting Architecture (JCWA), and conduct initial pilot and exploratory requirements definition efforts across the JCWA portfolio as prioritized through United States Cyber Command (USCC).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Under PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i> Project FA8 / <i>Cyberspace Operations Forces and Force Support</i> moves to Project DD3 in FY 2023.</p>		4.244	4.657	-
<p>Title: Physical and Virtual Connectivity for the Persistent Cyber Training Environment (PCTE)</p> <p>Description: PCTE has procured, installed and is maintaining Regional Compute and Storage (RCS) nodes which enable on-demand, reliable, and secure virtual access from wherever participants are geographically located. Additionally, the PCTE RCS infrastructure create a core cyber exercise network and event management platform to support Cyber Mission Force (CMF) training at the Unclassified, Secret, and Top Secret data classification levels.</p> <p>FY 2022 Plans: The PCTE Regional Compute and Storage (RCS) nodes will continue infrastructure enhancements through a migration to a consumption based model while continuing to leverage DoD enterprise transport services with access on all classification levels (Top Secret to Unclassified) to perform training.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		6.592	5.500	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Under PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i> Project FA8 / <i>Cyberspace Operations Forces and Force Support</i> moves to Project DD3 in FY 2023.				
Title: Persistent Cyber Training Environment (PCTE) Test and Evaluation		1.792	1.707	-
Description: Persistent Cyber Training Environment (PCTE) integration, development, and operational testing that will include validation and verifications (V&V), operational assessments (OA), and testing in association with cyber training exercises and incorporated throughout the Product Manager (PM) Development Operations (DevOps) process. An Operational Test Authority (OTA) has been incorporated, in coordination with the Director, Operational Test and Evaluation (DOT&E), to conduct operational testing leveraging DevOps testing processes.				
FY 2022 Plans: Testing will continue in FY 2022 with integration, verification and validation testing of the PCTE capability. The focus for FY 2022 is on verifying existing and new capability through continuous testing and cyber resiliency assessments. Test efforts in FY22 include the initial integration and testing with other platforms within the Joint Capability Warfighter Architecture (JCWA). PCTE will integrate Persistent Cyber Operations, conducting continuous, blue team, red team, and purple team cyber assessments				
FY 2022 to FY 2023 Increase/Decrease Statement: Under PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i> Project FA8 / <i>Cyberspace Operations Forces and Force Support</i> moves to Project DD3 in FY 2023.				
Accomplishments/Planned Programs Subtotals		50.525	51.895	-
		FY 2021	FY 2022	
Congressional Add: Program increase - Army Cyber Institute		-	4.000	
FY 2022 Plans: Program increase - Army Cyber Institute: The funding will be used to create a multi-organization research initiative with academic, government, and industry partners focused on critical infrastructure resilience. The research will continue development of the Army Cyber Institute's Jack Voltaic project through efforts such as: development of automated training tools; assessment of installation force projection resiliency; threatcasting research to analyze future critical infrastructure threats; analysis of critical infrastructure software and firmware through code cloning detection techniques; legal and policy gap evaluations and proposals; analysis of data privacy threats to critical infrastructure and installations; development, testing and evaluation of artificial intelligence enabled models and tools to detect, characterize and respond to attacks against critical infrastructure other cyber-physical systems; and emerging technology (e.g., block-chain) uses with critical infrastructure protection systems. Efforts in FY22 will focus on development, planning, and				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>
--	---	---

	FY 2021	FY 2022
implementation of the research initiative. Efforts in FY23 will focus on research, development, analysis, and reporting.		
Congressional Adds Subtotals	-	4.000

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

N/A

Remarks

B65010-Other Procurement Army 2 (OPA2) - In FY 2021, OPA funds reprogrammed to Operations and Maintenance Army (OMA) (APE 151251000, MDEP VLWA) for software licensing for cyber training applications. PCTE has procured and installed the appropriate hardware infrastructure footprint to enable the platform to serve the Cyber Mission Force user base.

D. Acquisition Strategy

The Persistent Cyber Training Environment (PCTE) program employs an incremental acquisition strategy leveraging the use of existing cyber contracts and Other Transaction Authority (OTA) vehicles to provide specified capabilities that will be integrated into a cohesive training platform. The next step in the acquisition strategy is developing a long term contract vehicle that will continue enabling the PCTE platform to achieve scalability, optimization, innovation, and quality standards to meet the dynamic needs of the Cyber Mission Force (CMF) user base. The Product Manager awarded an integration focused Single Award Indefinite Delivery/Indefinite Quantity (ID/IQ) contract to serve PCTE as well as other cyber community customers called the Cyber Training, Readiness, Integration, Delivery, and Enterprise Technology (TRIDENT) contract on Q1 FY2022. The Cyber TRIDENT contract enables PCTE to provide iterative capability provided to the Cyber Mission Forces (CMF) in Capability Drops (CDs) that either improve or add features. These CDs will be based on requirements contained and further developed as part of the PCTE Information System - Capability Development Document (IS-CDD).

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0305251A / Cyberspace Operations Forces and Force Support				FA8 / Cyberspace Operations Forces and Force Support							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	TBD	Various : Various	2.300	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			2.300	-		-		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PCTE Development and Integration Support	C/IDIQ	Various : Various	178.414	1.636	Feb 2021	1.700	Feb 2022	-		-		-	Continuing	Continuing	Continuing
PCTE Cyber Training, Readiness, Integration, Delivery, and Enterprise Technology (TRIDENT) Contract	C/IDIQ	Various : Various	-	-		12.953	May 2022	-		-		-	Continuing	Continuing	Continuing
PCTE Development and Integration - Other Contracts	Option/ FFP	Various : Various	-	47.097	Mar 2021	35.535	Nov 2021	-		-		-	Continuing	Continuing	Continuing
Enhanced Vehicle Security System	C/TBD	Aberdeen Proving Ground : Aberdeen, Maryland	6.509	-		-		-		-		-	0.000	6.509	-
Subtotal			184.923	48.733		50.188		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add: ACI	TBD	TBD : TBD	-	-		4.000		-		-		-	0.000	4.000	-
Subtotal			-	-		4.000		-		-		-	0.000	4.000	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>
--	---	---

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PCTE Government Test and Evaluation	Various	Various : Various	9.612	1.792	Mar 2021	1.707	Mar 2022	-		-		-	Continuing	Continuing	Continuing
Subtotal			9.612	1.792		1.707		-		-		-	Continuing	Continuing	N/A

Remarks
Validation and Verification tests at CMF existing training events will be conducted with every capability drop utilizing Cyber Mission Force operators and representatives from the Operational Test Authority.

	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		196.835	50.525	55.895	-	-	-	Continuing	Continuing	N/A

Remarks
Under PE 0305251A / *Cyberspace Operations Forces and Force Support* Project FA8 / *Cyberspace Operations Forces and Force Support* moves to Project DD3 in FY 2023.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>

Event Name	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	
Platform Releases (v1.0 – v8.0) - (IS-CDD 1)	Platform Releases (v1.0 – v8.0) - (IS-CDD 1)																												
PCTE v3.0	1 PCTE v3.0																												
PCTE v4.0					2 PCTE v4.0																								
PCTE v5.0									3 PCTE v5.0																				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Prototype Releases (A-C) ? (Risk Reduction Efforts)	4	2018	4	2019
PCTE vA	4	2018	4	2018
PCTE vB	2	2019	2	2019
PCTE vC	4	2019	4	2019
Platform Releases (v1.0 ? v8.0) - (IS-CDD 1)	2	2020	4	2025
PCTE v1.0	2	2020	2	2020
PCTE v2.0	4	2020	4	2020
PCTE v3.0	2	2021	2	2021
PCTE v4.0	2	2022	2	2022
PCTE v5.0	4	2022	4	2022