Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	171.058	141.109	270.124	-	270.124	-	-	-	-	-	-
AX3: *Technology Maturation Initiatives*	-	-	13.475	149.672	-	149.672	-	-	-	-	-	-
AX4: *Computational Prototyping Environment (CPE)*	-	3.927	5.224	-	-	-	-	-	-	-	-	-
AX5: *Next Generation Close Combat Missile*	-	5.630	4.813	3.000	-	3.000	-	-	-	-	-	-
AX6: *Active Protection Systems Integration*	-	7.096	10.107	-	-	-	-	-	-	-	-	-
AX7: *Multi-Mission High Energy Laser (MMHEL) Sys Demo*	-	17.882	7.844	-	-	-	-	-	-	-	-	-
AX8: *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*	-	24.731	-	24.700	-	24.700	-	-	-	-	-	-
AX9: *Adv Mobility Experimental Prototype Adv Tech*	-	10.068	15.209	12.500	-	12.500	-	-	-	-	-	-
AY1: *MUM-T Platform Enabler*	-	6.904	4.332	-	-	-	-	-	-	-	-	-
AY2: *Army Operational Fires*	-	18.122	17.336	37.832	-	37.832	-	-	-	-	-	-
AY3: *Strategic Long Range Cannon*	-	76.698	62.769	-	-	-	-	-	-	-	-	-
CE4: *Emerging Technology Initiatives Development*	-	-	-	42.420	-	42.420	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Project funds the Technology Maturation Initiative (TMI), which matures and integrates component technologies into early system/sub-system experimental prototypes for demonstration in relevant environments and tactical/operational scenarios. The Technology Maturation Initiative conducts experimental prototyping and integration of technologies from a demonstrated Technology Readiness (TRL) 6 to (TRL) 7, reducing the risk of technology insertion for current or future acquisition programs. TMI efforts support insertion of mature technologies to address emerging and enduring Army capability gaps in support of Army Modernization. Technologies matured include items such as advanced sensors/seekers; communications, command and control systems; directed energy systems; hypersonics; propulsion systems; guidance and control systems; active protection systems; armor; and advanced engines. TMI provides prototyping for Supersystem/Subsystem Intersection, Technology

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604115A *I Technology Maturation Initiatives*

Product Prototyping, and Emerging Technology Opportunities. It provides the Army an improved mechanism for incorporating innovative technologies and advanced capabilities into acquisition program planning, and more closely aligns high-priority technology products with current and future Programs of Record.

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 PE 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	179.676	156.834	268.981	-	268.981
Current President's Budget	171.058	141.109	270.124	-	270.124
Total Adjustments	-8.618	-15.725	1.143	-	1.143
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.350	-			
• SBIR/STTR Transfer	-7.268	-5.725			
• Adjustments to Budget Years	-	-	1.143	-	1.143

Change Summary Explanation

Fiscal Year (FY) 2021 decrease of $10.000 million due to Congressional reduction to 0604115A / AY2 for operational fires requirement.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX3 / *Technology Maturation Initiatives*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX3: *Technology Maturation Initiatives*	-	-	13.475	149.672	-	149.672	-	-	-	-	-	-
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 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 inform 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 & reconnaissance systems and equipment; precision weapons; High Energy Laser (HEL) 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 future Programs of Record.

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. Approved Technology Maturation Initiative projects are typically 2-4 years in duration and are budgeted under Projects AX3, AX5, AX8, AX9, AY2, and CE4.

This project 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.

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. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Future Vertical Lift (FVL) Helmet Mounted Display	-	3.798	-
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.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: Mature and integrate novel HMDs with high bright full color high resolution organic light-emitting diodes (OLEDs), low cost free-form prism optics, and low cost micro complementary metal?oxide?semiconductor (CMOS) cameras optimized for utilization by Army aviators in all pilotage conditions; and mature inertial measurement unit (IMU) technologies for integration with head tracking hardware/software. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FVL Helmet Mounted Display (HMD) effort transitions to the Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms effort (PE 0604115A / AX3) in FY 2022.			
Title: Large Caliber Armament System Prototype ***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. ***FY 2021 Plans:*** Mature and integrate 120mm reduced-recoil armament system in a test bed configuration to inform Next Generation Combat Vehicle requirements; fabricate turret and ammunition and handling systems for integration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Effort ends in FY2021.	-	9.677	-
Title: Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms ***Description:*** This project leverages the technologies developed under the IVAS program (Integrated Vision Augmented System) 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. ***FY 2022 Plans:***	-	-	42.070

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Future Vertical Lift (FVL) Helmet Mounted Display effort (PE 0604115A / AX3) transitions to the Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms effort in FY 2022.			
Title: TMI Planning for Super-System and Technology Product Prototyping ***Description:*** TMI Super-System and Technology Product Prototyping addresses the Army advanced technologies that support multiple Programs of Record (PoRs) within a PEO or multiple PEOs and/or technologies that have matured to TRL 6 from S&T but are deemed too high risk for transition to PoRs without additional prototyping / Soldier evaluations. Efforts selected by the 3-Star Technology Maturation Board will address PoRs required capability gaps in the areas of deep strike munition/ munition systems, alternative munition effect capability, advanced navigation / networking, and advanced Soldier, vehicle, and platform capabilities. ***FY 2022 Plans:*** Will execute prototyping in support of Soldier evaluations in potential areas of deep strike munition/ munition systems, advanced navigation / networking capability, and/or advanced Soldier, vehicle, and platform capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** New start effort in FY 2022. Funding was realigned from PE 0604115A / AY3 Strategic Long Range Cannon.	-	-	72.602
Title: Universal MDO Fire Control and SA Systems ***Description:*** This is a new Task required to support the Technology Maturation Initiative experimental prototypes to demonstrate high priority capability to provide mid to large caliber weapon platforms a real time 360 degree situation awareness (SA) and sensor input to the targeting / firing control systems. This Task will prototype a common architecture and interface kit containing IR/RF sensors to ensure interoperability and sustainment across platforms. This Task is needed in FY 2022 to enable a timely start of common architecture and interface definitions / 'B-Kit' like interface hardware development that supports multiple platforms and prototype demonstration of common 360 degree modular sensing system for fire control and SA with self-calibration / boresight functions 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. ***FY 2022 Plans:***	-	-	35.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** New Start effort in FY 2022 approved by the Technology Maturation Board.			
Accomplishments/Planned Programs Subtotals	-	13.475	149.672

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX3 / *Technology Maturation Initiatives*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TMI Planning for Super-System and Technology Product Prototyping	Option/ Various	Various : Various	-	-		-		72.602		-		72.602	0.000	72.602	-
		Subtotal	-	-		-		72.602		-		72.602	0.000	72.602	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms	C/Various	Various : Various	-	-		-		42.070		-		42.070	0.000	42.070	-
Universal MDO Fire Control and SA Systems	C/Various	Various : Various	-	-		-		35.000		-		35.000	0.000	35.000	-
		Subtotal	-	-		-		77.070		-		77.070	0.000	77.070	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Future Vertical Lift Helmet Mounted Display (FVL HMD)	C/Various	AFC : Fort Belvoir, VA	-	-		3.798		-		-		-	13.000	16.798	-
Large Caliber Armament System Prototype	C/Various	AFC : Picatinny, NJ	-	-		9.677		-		-		-	18.400	28.077	-
		Subtotal	-	-		13.475		-		-		-	31.400	44.875	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		13.475		149.672		-		149.672	31.400	194.547	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX3 / *Technology Maturation Initiatives*	

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

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

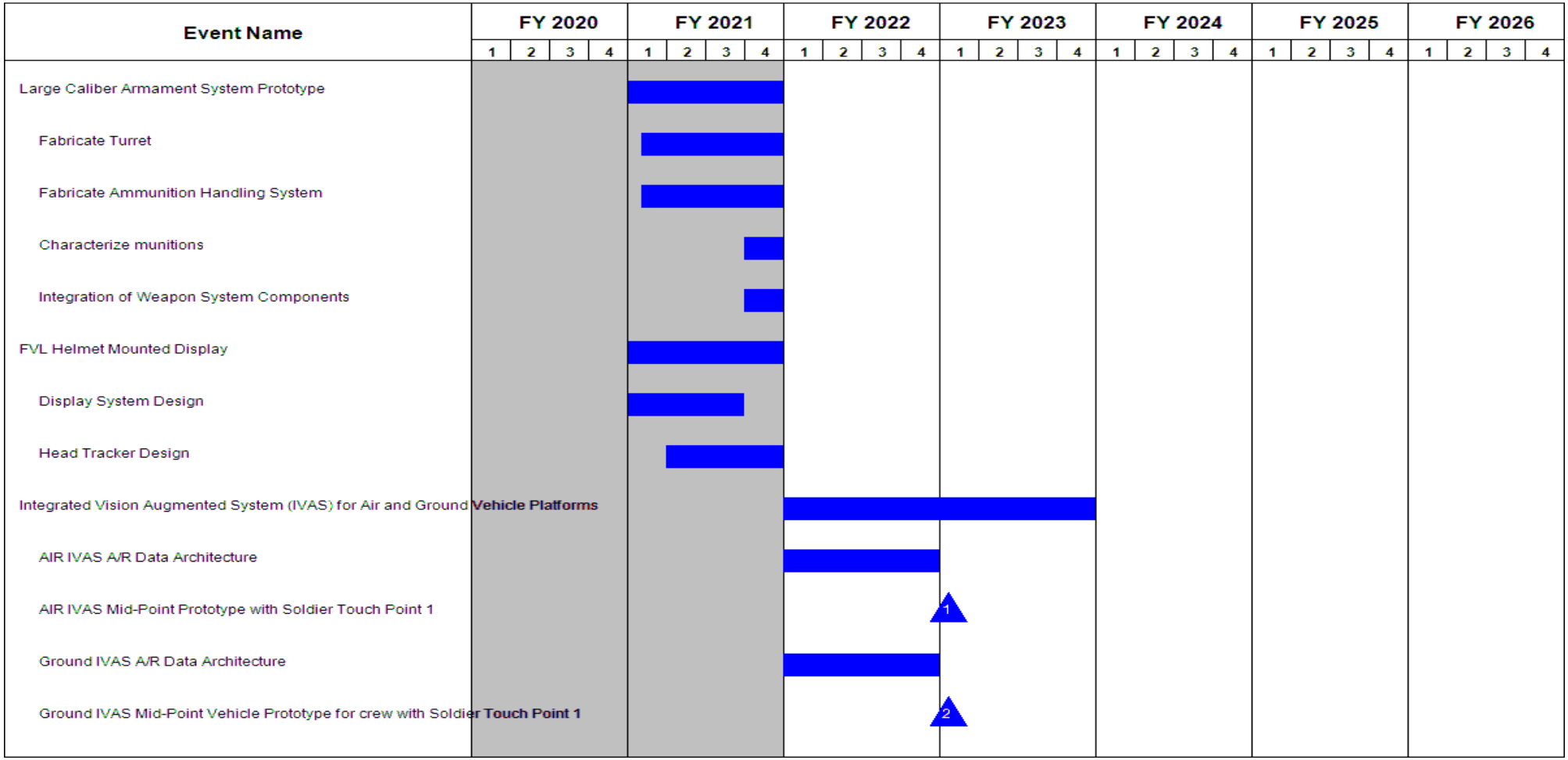

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

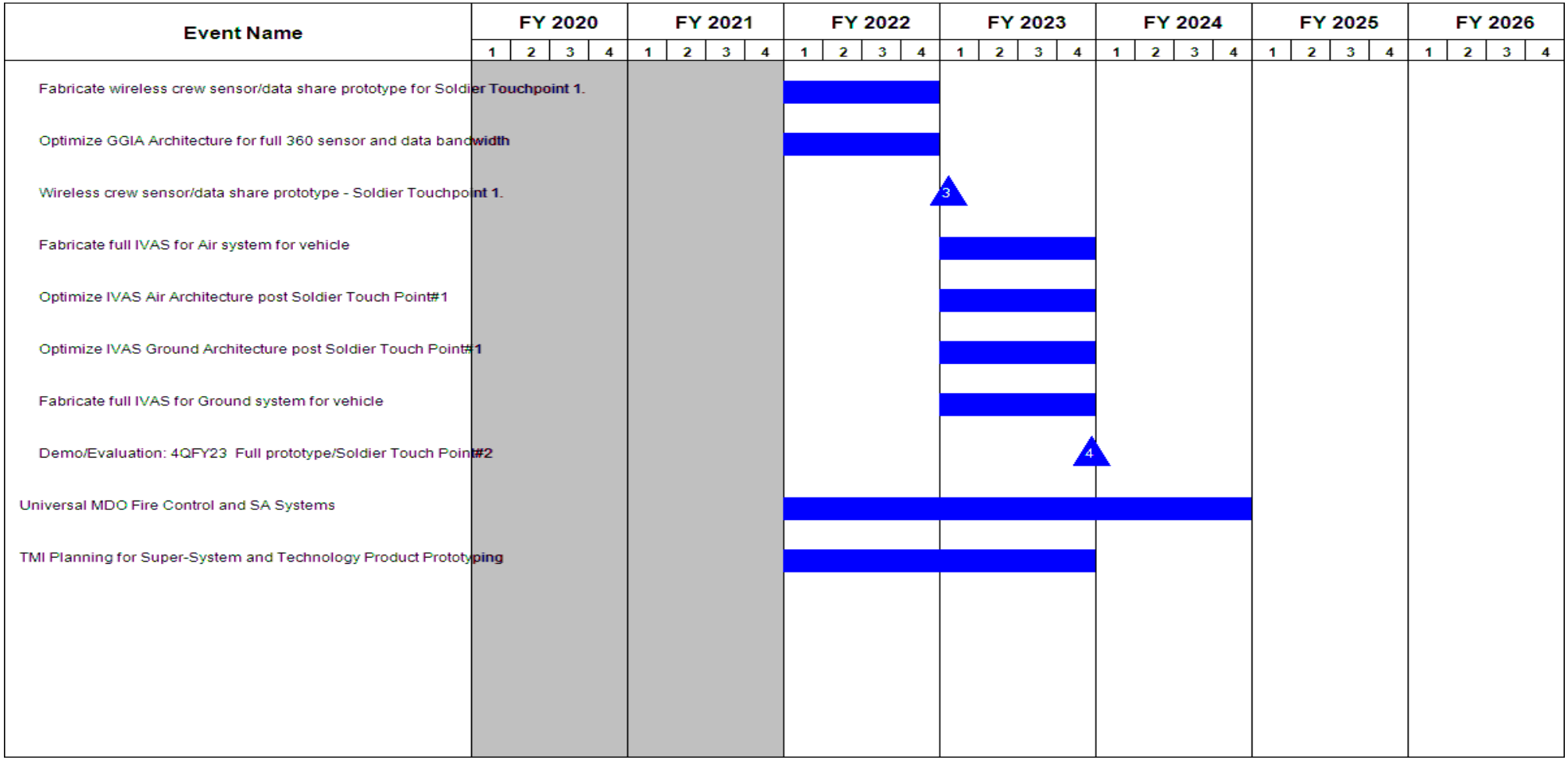

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

Schedule Details

	Start		End	
Events	**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
Integrated Vision Augmented System (IVAS) for Air and Ground Vehicle Platforms	1	2022	4	2023
AIR IVAS A/R Data Architecture	1	2022	4	2022
AIR IVAS Mid-Point Prototype with Soldier Touch Point 1	1	2023	1	2023
Ground IVAS A/R Data Architecture	1	2022	4	2022
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
Optimize GGIA Architecture for full 360 sensor and data bandwidth	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 MDO Fire Control and SA Systems	1	2022	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX3 / *Technology Maturation Initiatives*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TMI Planning for Super-System and Technology Product Prototyping	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX4 / *Computational Prototyping Environment (CPE)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX4: *Computational Prototyping Environment (CPE)*	-	3.927	5.224	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the development and demonstration of a robust Virtual Proving Ground (VPG) for rapid, accurate, and computational prototyping of major Army platforms. Computation Prototyping Environment (CPE) provides the ability to validate platform design variations in a VPG, in a way that identifies potential performance and design failures, and assesses mitigating solutions and trades before cost bearing production and manufacturing. Activities under this Project include the maturation and integration of physics-based, computational modeling with new advances in tradespace analytics and visualization. This Project leverages recent Department of Defense (DOD) advancements in large data tradespace analytics, high fidelity physics-based modeling, high-performance computing capabilities, and inverse modeling approaches to enable rapid computational prototyping to inform emerging acquisition programs.

Work in this Project is fully coordinated with Program Element (PE) 0633465A (Future Vertical Lift Advanced Technology)

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology 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 2020	FY 2021	FY 2022
Title: Computational Prototyping Environment (CPE)	3.927	5.224	-
Description: Computational Analysis Toolkit (CAT) matures and integrates physics-based, computational modeling with new advances in tradespace analytics and visualization to demonstrate a robust Virtual Proving Ground (VPG) that provides the ability to virtually explore design tradespaces and understand possible defeat strategies for prototype Army platforms. Demonstrates rapid computational prototyping to inform emerging acquisition programs through large data tradespace analytics, high fidelity physics-based modeling, high-performance computing capabilities, and inverse modeling approaches. CPE capabilities will be piloted to support and inform Army Future Vertical Lift (FVL) platform design.			
FY 2021 Plans: Develop a data repository for physical test data, computational models, and operational environments linked to High Performance Computing environment. Improve the FVL VPG to model candidate Future Attack Reconnaissance Aircraft (FARA) designs during			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX4 / *Computational Prototyping Environment (CPE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
maneuver and the VPG to include different operationally relevant environmental conditions; improve machine learning techniques to drive engineering analysis of FVL systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Effort ends in FY 2021.			
Accomplishments/Planned Programs Subtotals	3.927	5.224	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX4 / *Computational Prototyping Environment (CPE)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Computational Prototyping Environment	C/TBD	ERDC : Vicksburg, MS	-	3.927		5.224		-		-		-	6.918	16.069	-
		Subtotal	-	3.927		5.224		-		-		-	6.918	16.069	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.927		5.224		-		-		-	6.918	16.069	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX4 / *Computational Prototyping Environment (CPE)*

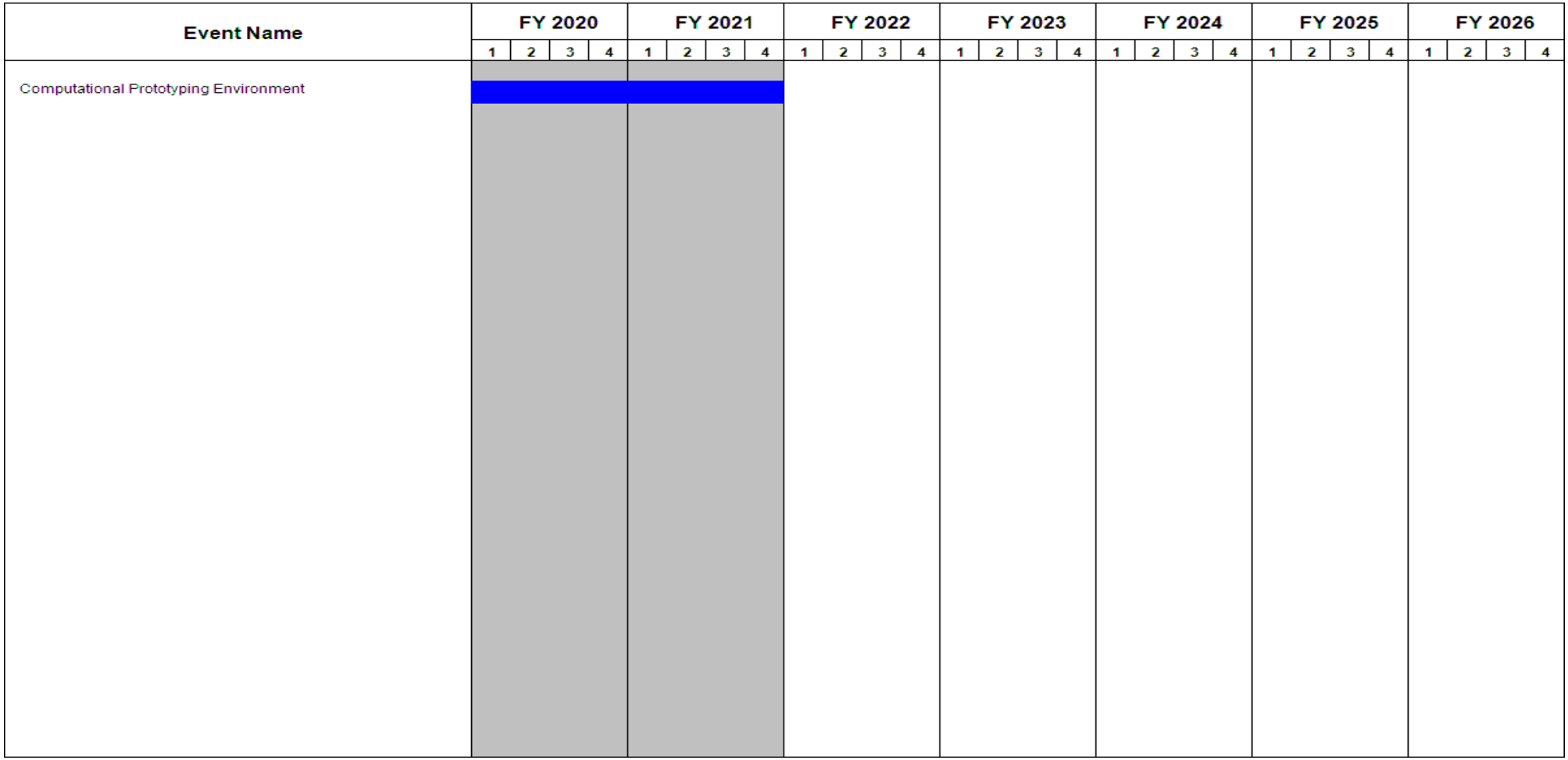

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX4 / *Computational Prototyping Environment (CPE)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Computational Prototyping Environment	3	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX5 / *Next Generation Close Combat Missile*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX5: *Next Generation Close Combat Missile*	-	5.630	4.813	3.000	-	3.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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. Early prototyping work concludes in Fiscal Year (FY) 2021 to mature technology and demonstrate needed Warfighter capability in advance of acquisition program of record.

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 2020	FY 2021	FY 2022
Title: Next Generation Close Combat Missile	5.630	4.813	3.000
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 2021 Plans:*** Evaluate performance of propulsion system components, integrated in a tactically-representative missile, through flight demonstration; transition designs, documentation and data to Program Executive Office Missiles and Space. ***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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Normal program progression to support test / evaluation.			
Accomplishments/Planned Programs Subtotals	5.630	4.813	3.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX5 / *Next Generation Close Combat Missile*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX5 / *Next Generation Close Combat Missile*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Close Combat Missile	Various	AvMC : Huntsville, AL	-	5.630		4.813		3.000		-		3.000	0.000	13.443	-
		Subtotal	-	5.630		4.813		3.000		-		3.000	0.000	13.443	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.630		4.813		3.000		-		3.000	0.000	13.443	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX5 / *Next Generation Close Combat Missile*

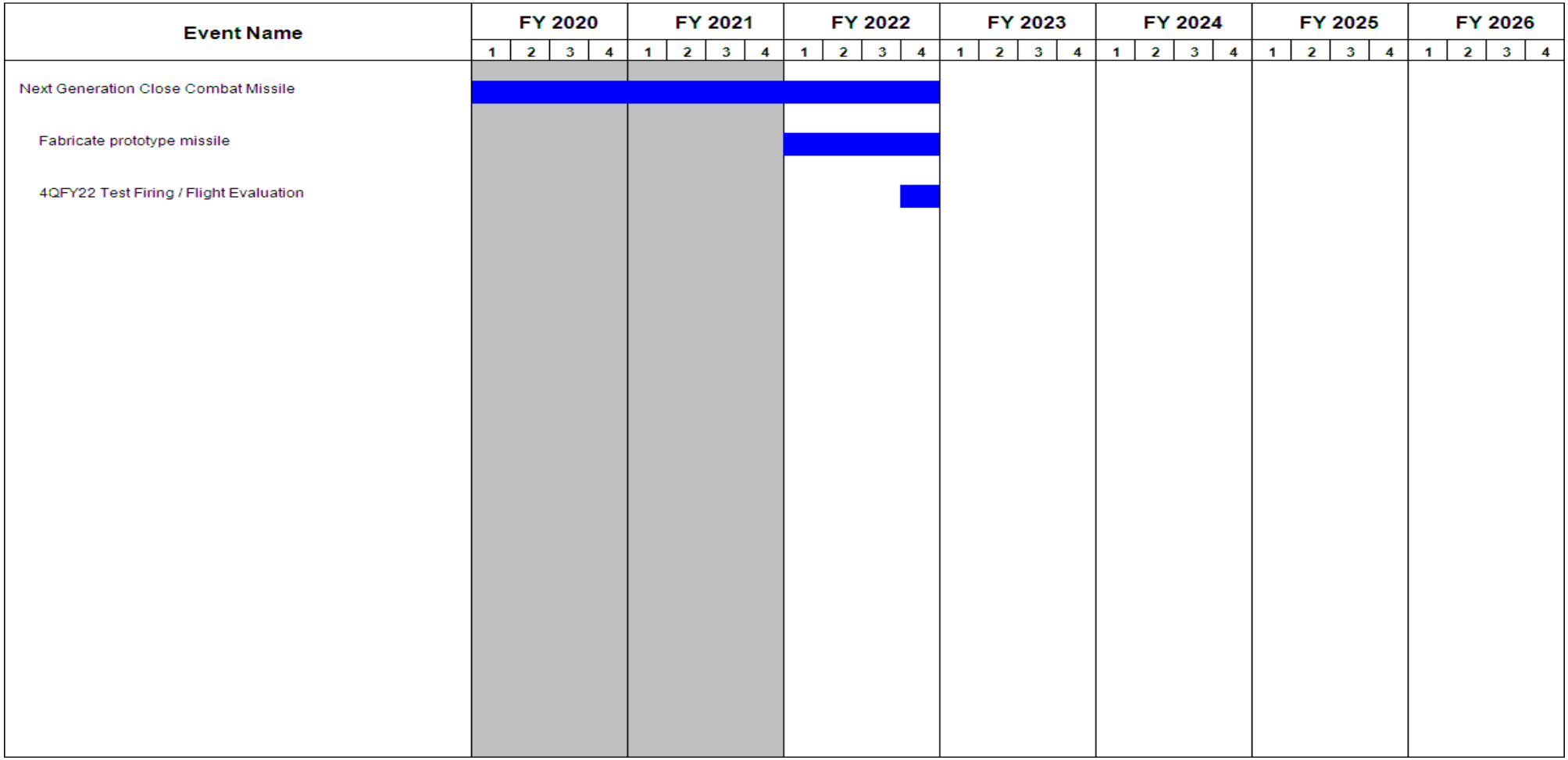

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX5 / *Next Generation Close Combat Missile*

Schedule Details

	Start		End	
Events	**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

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX6 / *Active Protection Systems Integration*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX6: *Active Protection Systems Integration*	-	7.096	10.107	-	-	-	-	-	-	-	-	-
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 2020	FY 2021	FY 2022
Title: Agile Layered Protection: APS Integration Advanced Technology Demonstrator	7.096	10.107	-
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.			
FY 2021 Plans: Continue to mature the combat vehicle protection layering approach, integrating additional protection and survivability capabilities based on selection of mature technologies from FY 2020; optimize, design, and demonstrate integration of selected protection			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX6 / *Active Protection Systems Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
technologies on the combat vehicle platform demonstrator to validate integration; and test the combat vehicle platform demonstrator to ensure the added technologies do not degrade the vehicle?s or previously tested technologies? performance. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Effort ends in FY 2021.			
Accomplishments/Planned Programs Subtotals	7.096	10.107	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX6 / *Active Protection Systems Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineer Integration of APS Layered Protection	C/Various	Various : Various	-	4.219		-		-		-		-	0.000	4.219	-
Validation of APS Layered Protection	Various	Various : Various	-	1.918		-		-		-		-	0.000	1.918	-
Integration of added APS Layered Protection	C/Various	Various : Various	-	0.959		4.808		-		-		-	0.000	5.767	-
Validation of added APS Layered Protection	C/Various	AFC : Warren, MI	-	-		5.299		-		-		-	0.000	5.299	-
		Subtotal	-	7.096		10.107		-		-		-	0.000	17.203	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.096		10.107		-		-		-	0.000	17.203	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX6 / *Active Protection Systems Integration*

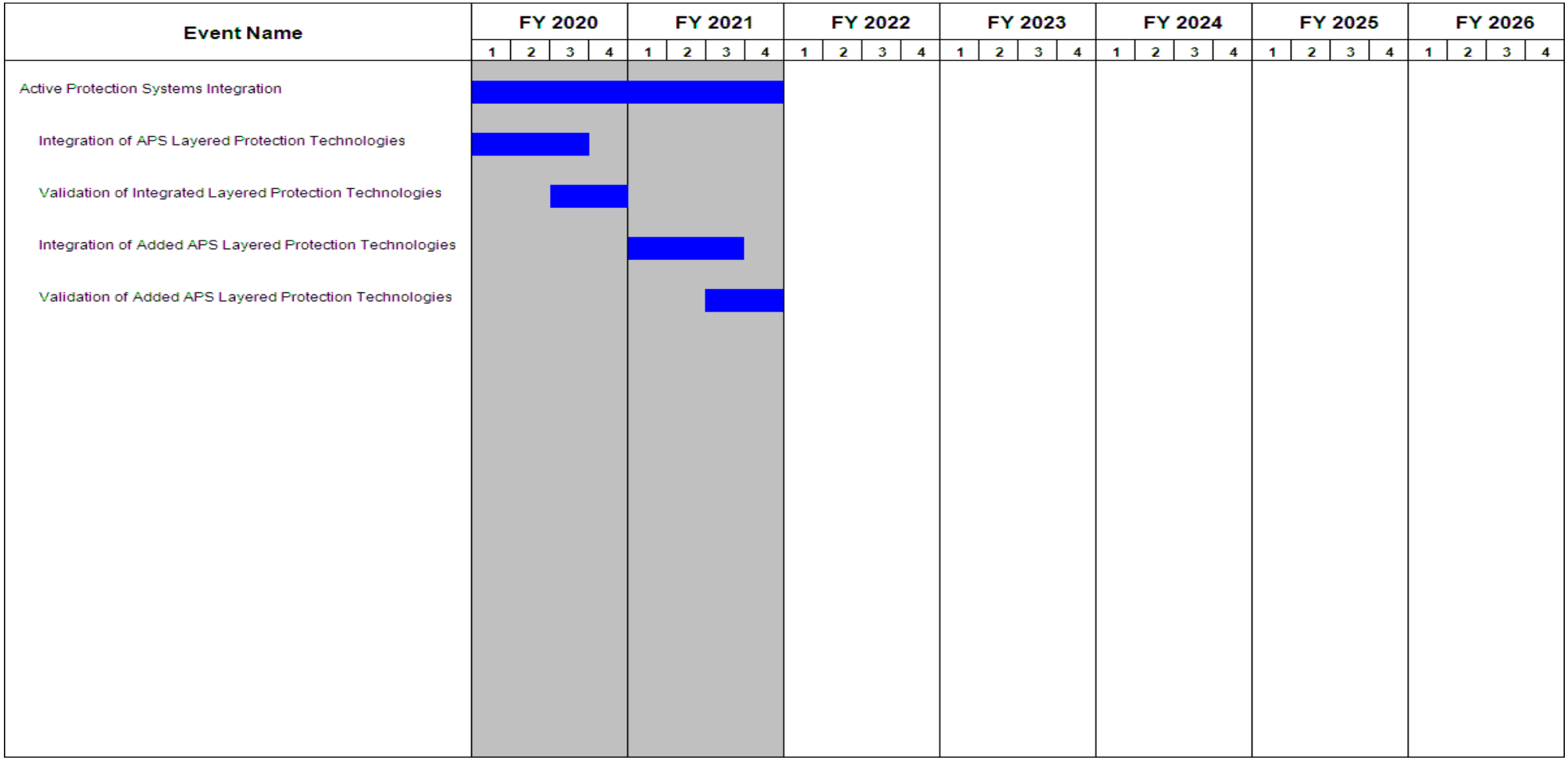

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX6 / *Active Protection Systems Integration*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Active Protection Systems Integration	1	2019	4	2021
Integration of APS Layered Protection Technologies	1	2019	3	2020
Validation of Integrated Layered Protection Technologies	3	2020	4	2020
Integration of Added APS Layered Protection Technologies	1	2021	3	2021
Validation of Added APS Layered Protection Technologies	3	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX7 / *Multi-Mission High Energy Laser (MMHEL) Sys Demo*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX7: *Multi-Mission High Energy Laser (MMHEL) Sys Demo*	-	17.882	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 Brigade Combat Teams (BCTs). 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 2020	FY 2021	FY 2022
Title: Multi-Mission High Energy Laser (MMHEL) Integration and Demonstration	17.882	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.			
FY 2021 Plans: Integrate system hardware, weapon fire control software, Forward Area Air Defense Command and Control (FAADC2), and Intelligence software; conduct full system level test/fix/test process; system verification and acceptance testing; and prepare for and execute a technology readiness level 7 demonstration. Execute system performance testing to inform Capability Developer?s requirement, Concept of Operations and training development.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX7 / *Multi-Mission High Energy Laser (MMHEL) Sys Demo*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Effort ends in FY 2021.			
Accomplishments/Planned Programs Subtotals	17.882	7.844	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX7 / *Multi-Mission High Energy Laser (MMHEL) Sys Demo*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Mission High Energy Laser (MMHEL) Integration and Demonstration	C/Various	SMDTC : Huntsville, AL	-	17.882		7.844		-		-		-	0.000	25.726	-
		Subtotal	-	17.882		7.844		-		-		-	0.000	25.726	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	17.882		7.844		-		-		-	0.000	25.726	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX7 / *Multi-Mission High Energy Laser (MMHEL) Sys Demo*

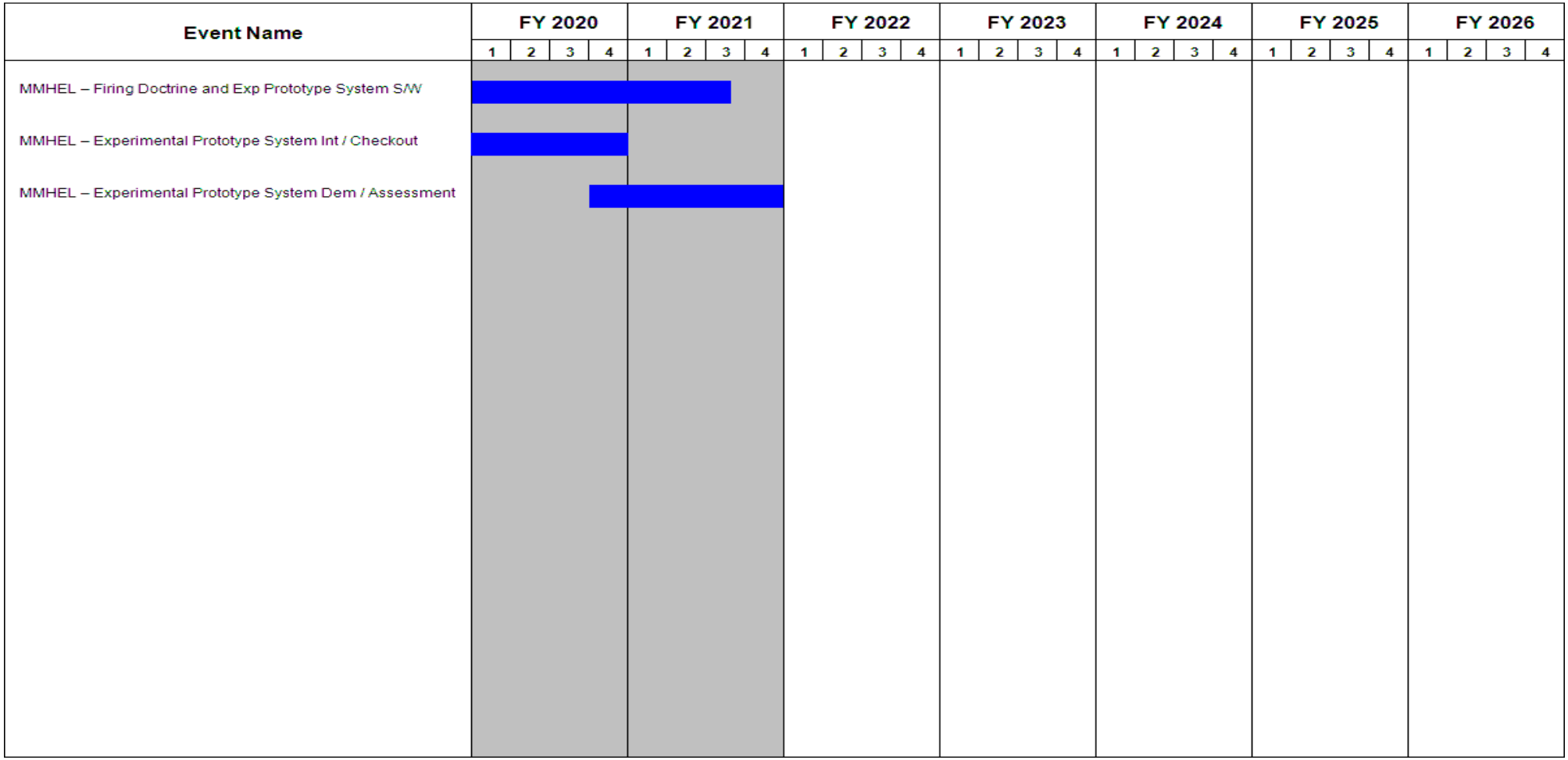

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX7 / *Multi-Mission High Energy Laser (MMHEL) Sys Demo*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Multi-Mission High Energy Laser (MMHEL) ? System-Level Design	3	2018	4	2018
MMHEL ? Subsystem Design Refinement, Assembly, and Delivery	4	2018	4	2019
MMHEL ? Firing Doctrine and Exp Prototype System S/W	1	2019	3	2021
MMHEL ? Experimental Prototype System Int / Checkout	2	2019	4	2020
MMHEL ? Experimental Prototype System Dem / Assessment	4	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX8 / *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX8: *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*	-	24.731	-	24.700	-	24.700	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Project experiences a skip year in FY 2021.

A. Mission Description and Budget Item Justification

This Project matures and integrates next-generation 50mm weapon system technologies transitioned from under the Advanced Lethality and Accuracy System for Medium Caliber (ALAS-MC) advanced technology development effort into a vehicle-agnostic combat turret to inform requirements for the Next Generation Combat Vehicle (NGCV). This Project integrates and assesses critical ALAS-MC 50mm technology components for on-the-move engagement of moving personnel and materiel targets, bringing the subsystem to Technology Readiness Level (TRL) 7. Under Advanced Targeting and Lethality Automated System (ATLAS), 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 2020	FY 2021	FY 2022
Title: Advanced Lethality and Accuracy System for Med Cal (ALAS-MC) ***Description:*** This effort matures and integrates the next generation 50mm weapon system technologies transitioned from the ALAS-MC advanced technology development effort into vehicle- agnostic combat turret to inform requirements for the Next Generation Combat Vehicle.	3.444	-	-
Title: Advanced Targeting and Lethality Automated System (ATLAS) ***Description:*** The ATLAS effort matures, integrates, and demonstrates novel algorithms and sensor enhancements in a Next Generation Combat Vehicle (NGCV) vehicle agnostic, robotic turret. It integrates autonomous, wide-area search sensors and	21.287	-	24.700

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX8 / *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 system to demonstrate an end-to-end engagement system on NGCV platforms, and enable experimentation and soldier touch-points with robotic turret concepts. ***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 2021 to FY 2022 Increase/Decrease Statement:*** Skip year in FY 2021. Technology Maturation Board reviewed progress and impact of the ATLAS program (through FY2020 evaluation) and recommended the effort continue in FY 2022.			
Accomplishments/Planned Programs Subtotals	24.731	-	24.700

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX8 / *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALAS-MC: Procure Ammo Rounds H/W	C/Various	ARDEC : Picatinny, NJ	-	3.524		-		-		-		-	0.000	3.524	-
ALAS-MC: Control Unit	C/Various	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		-		-		-		-	0.000	4.762	-
ATLAS: Artificial Intelligence/Machine Learning Development	TBD	CERDEC : Fort Belvoir, VA	-	6.191		-		24.700		-		24.700	0.000	30.891	-
ATLAS: Data Collection and Synthetic Data	TBD	CERDEC : Fort Belvoir, VA	-	7.682		-		-		-		-	0.000	7.682	-
ATLAS: Integration and Test	TBD	CERDEC : Fort Belvoir, VA	-	1.333		-		-		-		-	0.000	1.333	-
		Subtotal	-	23.969		-		24.700		-		24.700	0.000	48.669	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALAS-MC	TBD	ARDEC : Picatinny, NJ	-	0.762		-		-		-		-	0.000	0.762	-
		Subtotal	-	0.762		-		-		-		-	0.000	0.762	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	24.731		0.000		24.700		-		24.700	0.000	49.431	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX8 / *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*

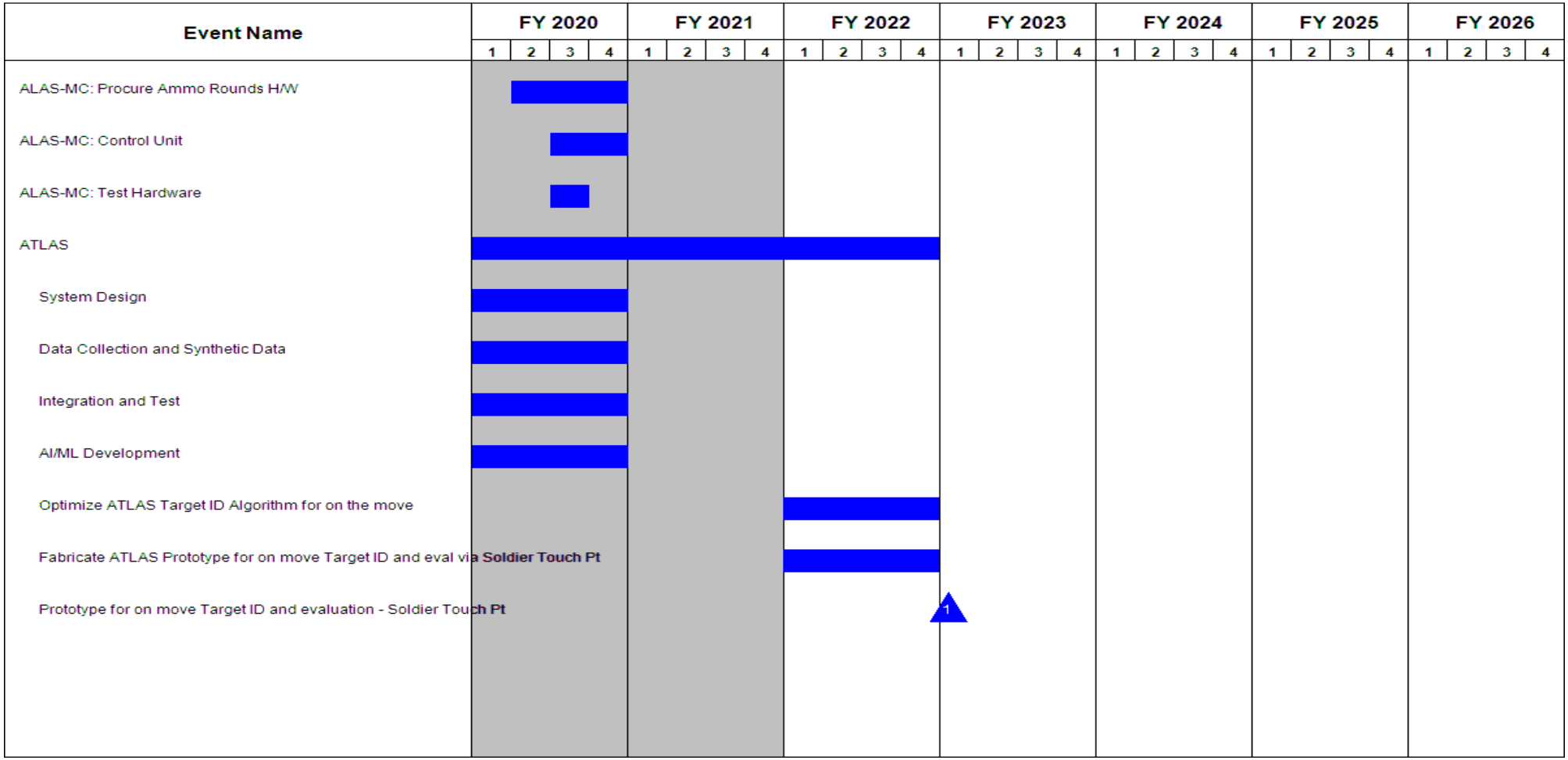

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX8 / *Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALAS-MC: Procure Ammo Rounds H/W	2	2020	4	2020
ALAS-MC: Control Unit	3	2020	4	2020
ALAS-MC: Test Hardware	3	2020	3	2020
ATLAS	1	2020	4	2022
System Design	1	2020	4	2020
Data Collection and Synthetic Data	1	2020	4	2020
Integration and Test	1	2020	4	2020
AI/ML Development	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

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX9 / *Adv Mobility Experimental Prototype Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AX9: *Adv Mobility Experimental Prototype Adv Tech*	-	10.068	15.209	12.500	-	12.500	-	-	-	-	-	-
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 2020	FY 2021	FY 2022
Title: Advanced Mobility Experimental Prototype	10.068	15.209	12.500
Description: Efforts integrate and demonstrate advanced powertrain, power generation, running gear technologies, and unmanned robotic technologies into a ground combat vehicle to demonstrate reduced percentage of no go terrain for ground vehicles, increased maneuver speeds across all traversable terrain, reduced fuel demands thus extending operation time between resupply, and onboard power generation to enable the integration of energy based capabilities such as directed energy weapons and electromagnetic armor. This effort mitigates risk for the Self Propelled Howitzer and also supports power generation advances and propulsion systems for multi-platform insertion.			
FY 2021 Plans: Continue to develop and mature air induction/filtration, exhaust system, fuel cooling, final drives, and controls to integrate into experimental prototype and integrate higher capacity engine and transmission as well as improved track and suspension into a medium weight-class combat vehicle. Continue to demonstrate operational benefits of leader follower autonomous capability for unmanned combat vehicle formations.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX9 / *Adv Mobility Experimental Prototype Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Normal progression of the effort. Funding supports testing and evaluation of the prototype system.			
Accomplishments/Planned Programs Subtotals	10.068	15.209	12.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AX9 / *Adv Mobility Experimental Prototype Adv Tech*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design and Integration of Components	C/Various	GVSC : Warren, MI	-	0.909		6.100		5.000		-		5.000	5.000	17.009	-
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		-		-		-		-	0.000	3.409	-
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		-		-		-	5.000	7.380	-
Turret Enhancements	TBD	GVSC : Warren, MI	-	-		-		7.500		-		7.500	0.000	7.500	-
		Subtotal	-	10.068		15.209		12.500		-		12.500	17.700	55.477	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.068		15.209		12.500		-		12.500	17.700	55.477	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX9 / *Adv Mobility Experimental Prototype Adv Tech*

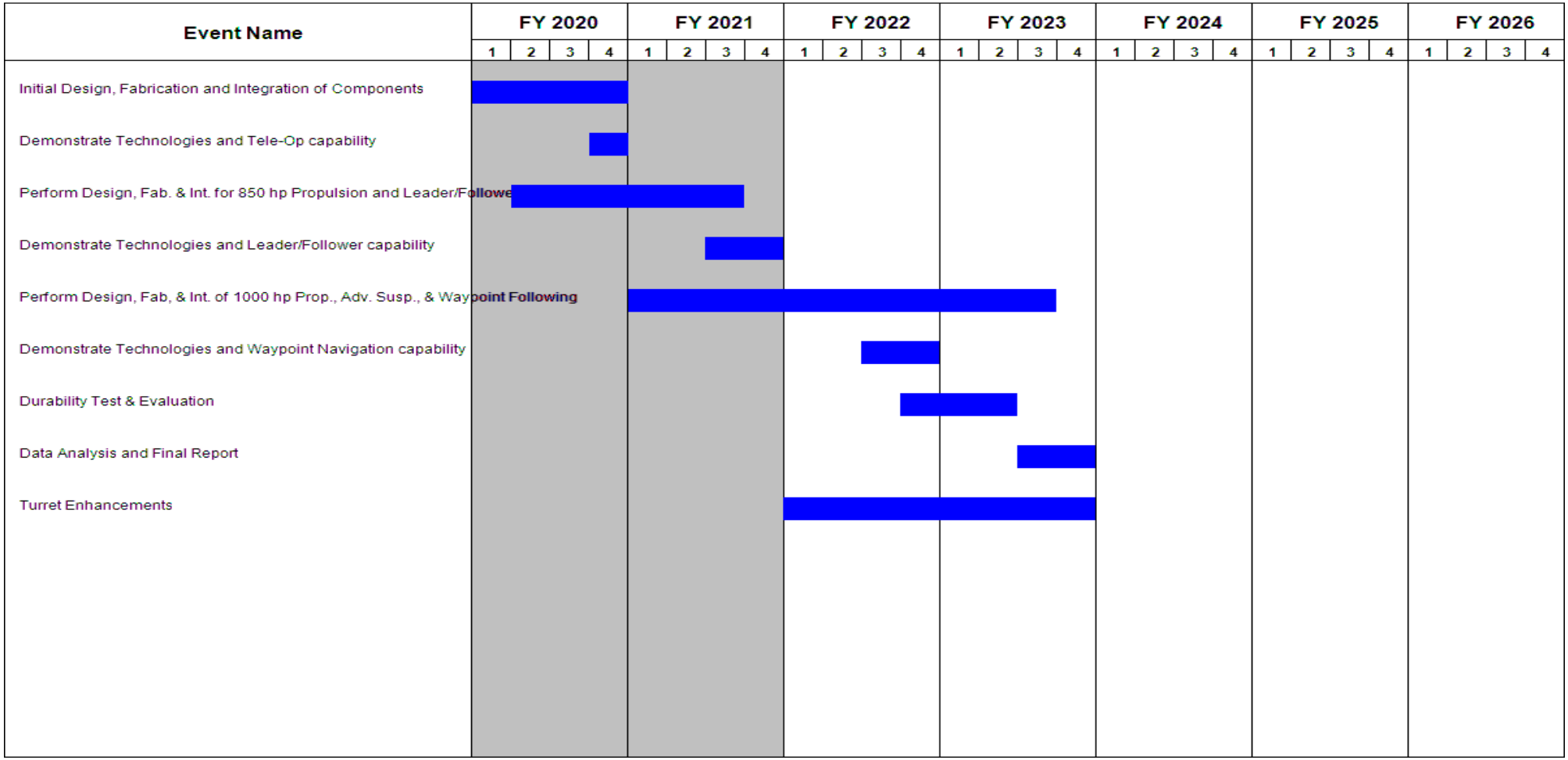

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AX9 / *Adv Mobility Experimental Prototype Adv Tech*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Initial Design, Fabrication and Integration of Components	1	2020	4	2020
Demonstrate Technologies and Tele-Op capability	4	2020	4	2020
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
Perform Design, Fab, & Int. of 1000 hp Prop., Adv. Susp., & Waypoint Following	1	2021	3	2023
Demonstrate Technologies and Waypoint Navigation capability	3	2022	4	2022
Durability Test & Evaluation	4	2022	2	2023
Data Analysis and Final Report	3	2023	4	2023
Turret Enhancements	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY1 / *MUM-T Platform Enabler*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AY1: *MUM-T Platform Enabler*	-	6.904	4.332	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project will mature and demonstrate Manned Unmanned Teaming (MUMT) technologies in a realistic operating environment to drive down risk in three critical areas for ground MUMT: remote lethality, unmanned maneuver and network. These major technical hurdles will be addressed by integrating mature technologies into the MUMT Campaign of Learning through three, synergistic integration efforts: Unmanned Aerial Vehicle (UAV)/ground platform integration, a transportable MUMT simulation environment, and an advanced interface for the Warfighter.

Work within this Project supports the Army Modernization Priority for Next Generation Combat Vehicle.

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 2020	FY 2021	FY 2022
Title: Unmanned Aerial Vehicle / Ground Platform Integration	3.917	4.332	-
Description: This effort matures and demonstrates, in an operational environment, technologies that address critical capability challenges related to the integration of UAVs and ground vehicle platforms. This effort also improves human-machine interactions through an intuitive Warfighter Machine Interface (WMI) between operators and unmanned platforms. The end state is to analyze the operational impact of multiple advanced enabling technologies to reduce risk in critical capabilities that support MUMT operations. ***FY 2021 Plans:*** Mature required subsystems based on lessons learned from engineering demonstrations and standardize interfaces for UAV to ground platform integration using simulators developed in FY 2020. Conduct operational demonstrations with users to evaluate the effectiveness of the integrated solution against their operational needs, shape future engineering work, and inform requirements development feedback into the Warfighter Machine Interface simulators developed in FY 2020. Produce final documentation of interfaces, architecture, requirements, and test data for delivery to Transition Partner. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Effort ends in FY 2021.			
Title: Transportable Manned Unmanned Teaming Simulation	2.987	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY1 / *MUM-T Platform Enabler*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: This effort provides an immersive, transportable MUMT simulation environment in order to gather insights from diverse user groups to shape and inform MUMT Tactics, Techniques and Procedures (TTPs). Specifically, it provides the capability to optimize Warfighter Machine Interface (WMI) implementations and advanced payloads for multiple MUMT scenarios. The end state is to provide Soldiers across the fighting echelon, from command to end user, the requisite knowledge to formulate the appropriate Concept of Operations (CONOPS) 7.200 for MUMT in order to operate and fight disbursed against near-peer adversaries with greater lethality and force projection.			
Accomplishments/Planned Programs Subtotals	6.904	4.332	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY1 / *MUM-T Platform Enabler*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UAV / Ground Platform Integration	C/Various	TARDEC : Warren, MI	-	3.917		4.332		-		-		-	4.200	12.449	-
Transportable Simulator	C/Various	TARDEC : Warren, MI	-	2.987		-		-		-		-	0.000	2.987	-
		Subtotal	-	6.904		4.332		-		-		-	4.200	15.436	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.904		4.332		-		-		-	4.200	15.436	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY1 / *MUM-T Platform Enabler*

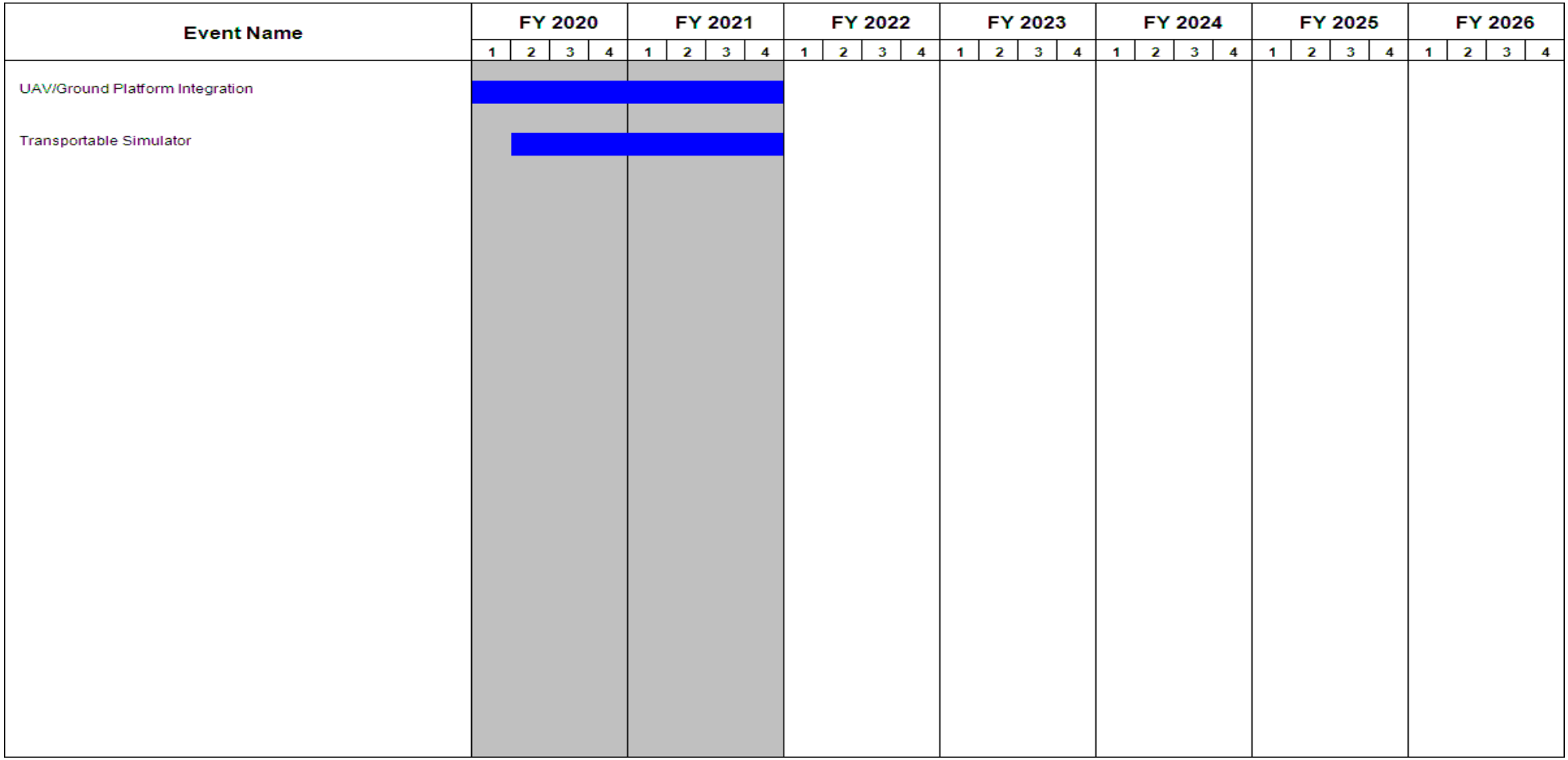

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY1 / *MUM-T Platform Enabler*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UAV/Ground Platform Integration	1	2020	4	2021
Transportable Simulator	2	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY2 / *Army Operational Fires*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AY2: *Army Operational Fires*	-	18.122	17.336	37.832	-	37.832	-	-	-	-	-	-
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 sensitive targets in contested Anti-Access/Area Denied (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).

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 2020	FY 2021	FY 2022
Title: Army Operational Fires	18.122	17.336	37.832
Description: This Project matures and demonstrates a ground-launched, treaty-compliant weapon system capable of destroying critical relocatable, time sensitive targets in contested Anti-Access/Area Denied (A2/AD) environments. Activities include system-level prototyping to extend the range of Army fires well beyond 499km to complement other fires developments.			
FY 2021 Plans: Mature fire control software development and launch platform hardware development; conduct end to end propulsion system integration and testing of developed propulsion booster system; and conduct system level critical design review (CDR) in preparation for final flight test hardware fabrication.			
FY 2022 Plans: Will continue maturation of Hypersonic Missile All-Up-Round (AUR) Hardware-in-the-Loop (HWIL) technology improvements. Will continue integrating AUR hardware and interfaces modifications with launch platform simulation, simulators, and actual equipment to enable system architecture and interface development between the AUR and the launch platform. Will continue to prototype the first fire control software of the rapid trajectory generator for the hypersonic weapon system and will mature the AUR missile booster stack for increased missile performance through weight reduction achieved by utilization of innovative advanced thermal			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY2 / *Army Operational Fires*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
protection materials. Will conduct Short Hot Launch (SHOTL) test execution and post test data analysis of improved solid rocket booster subsystem design performance. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding is due to: - The execution of SHOTL test in 2Q FY2022. - The RTG demonstration in 2Q FY2022. - The GSE technical demonstration task will begin in FY2022 with the first demonstration planned in 3Q FY2022. - The technical maturation effort for performance improvement is conducted in 1Q FY2022.			
Accomplishments/Planned Programs Subtotals	18.122	17.336	37.832

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY2 / *Army Operational Fires*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Operational Fires	C/CPIF	Lockheed-Martin - Denver : Denver	-	18.122		17.336		37.832		-		37.832	52.700	125.990	-
		Subtotal	-	18.122		17.336		37.832		-		37.832	52.700	125.990	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.122		17.336		37.832		-		37.832	52.700	125.990	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY2 / *Army Operational Fires*

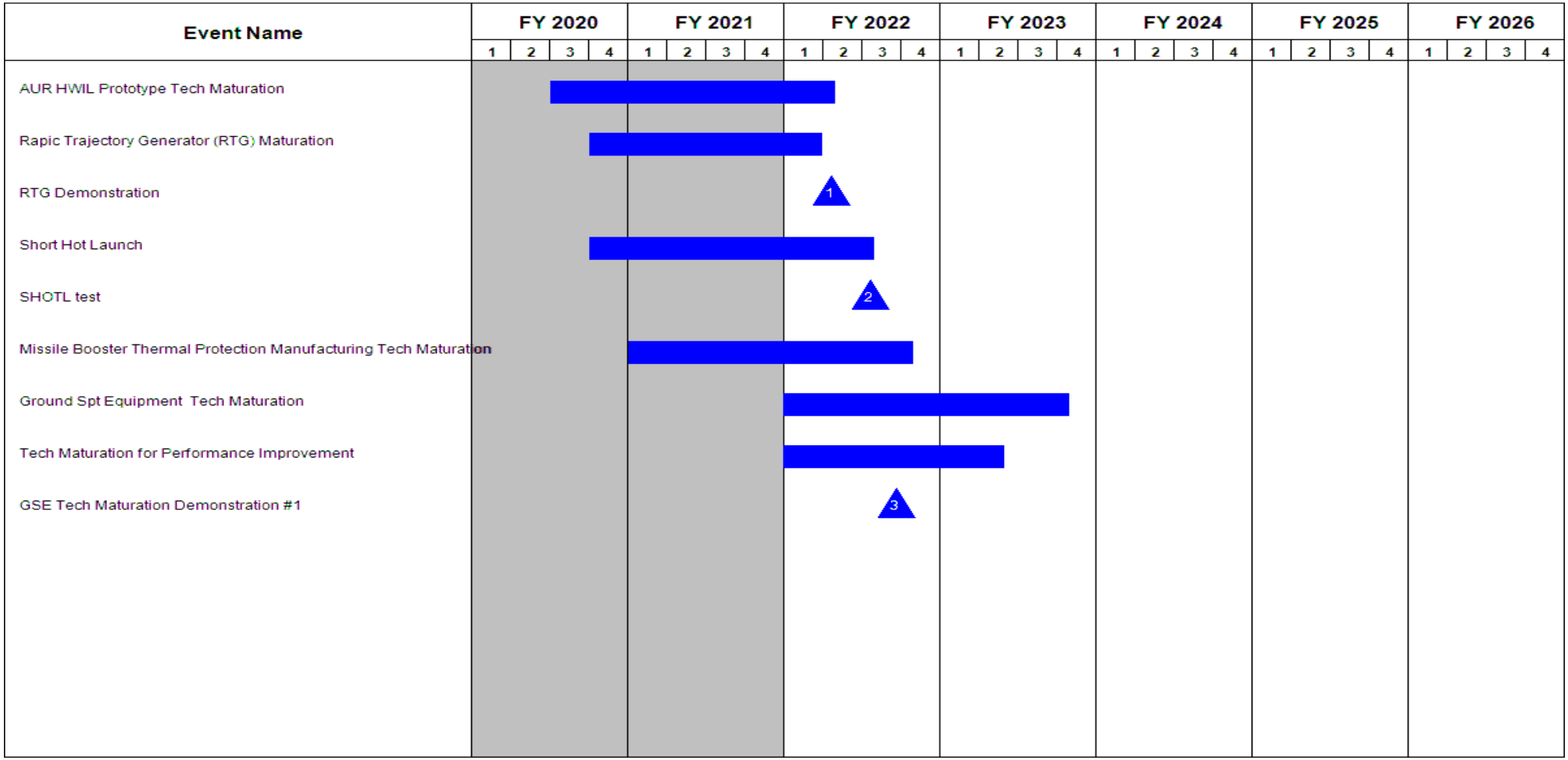

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY2 / *Army Operational Fires*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AUR HWIL Prototype Tech Maturation	3	2020	2	2022
Rapic Trajectory Generator (RTG) Maturation	4	2020	1	2022
RTG Demonstration	2	2022	2	2022
Short Hot Launch	4	2020	3	2022
SHOTL test	3	2022	3	2022
Missile Booster Thermal Protection Manufacturing Tech Maturation	1	2021	4	2022
Ground Spt Equipment Tech Maturation	1	2022	4	2023
Tech Maturation for Performance Improvement	1	2022	2	2023
GSE Tech Maturation Demonstration #1	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY3 / *Strategic Long Range Cannon*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AY3: *Strategic Long Range Cannon*	-	76.698	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 2020	FY 2021	FY 2022
Title: Strategic Long Range Cannon	61.806	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. ***FY 2021 Plans:*** Mature critical sub-system technologies with major engineering tests on high risk components such as the rocket motor. Conduct static warhead testing to demonstrate performance against targets of interest. Conduct system integration and technology maturation for SLRC to include designs for long lead prototypes to be used in upcoming major system level demonstrations. Scale and perform prototyping on components including objective cannon, gun carriage, and test platform. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** This effort is projected to end in FY 2021. Funding was realigned to PE 0604115A / Project AX3 (Technology Maturation Initiatives).			
Title: Extended Range Cannon Artillery Autoloader	10.946	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY3 / *Strategic Long Range Cannon*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: This effort matures, integrates, and demonstrates a novel technology sub-system prototype for ammunition handling to support the prototyping of a next-generation, extended range armaments system that will provide significantly increased range and accuracy without an increase in platform weight.			
Title: Extended Range Cannon Artillery Projectile ***Description:*** This effort integrates component technologies that provide optimized range, precision, counter-measure, and payload into a long-range artillery projectile sub-system for demonstration and experimentation. Activities support the maturation and prototyping of a next-generation, extended range armaments system that will provide significantly increased range and accuracy without an increase in platform weight.	3.946	-	-
Accomplishments/Planned Programs Subtotals	76.698	62.769	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) AY3 / *Strategic Long Range Cannon*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Strategic Long Range Cannon	C/Various	ARDEC : Picatinny, NJ	-	61.806		62.769		-		-		-	0.000	124.575	-
Extended Range Cannon Artillery (ERCA) Autoloader	C/Various	ARDEC : Picatinny, NJ	-	10.946		-		-		-		-	0.000	10.946	-
Extended Range Cannon Artillery (ERCA) Projectile	C/Various	ARDEC : Picatinny, NJ	-	3.946		-		-		-		-	0.000	3.946	-
		Subtotal	-	76.698		62.769		-		-		-	0.000	139.467	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	76.698		62.769		-		-		-	0.000	139.467	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY3 / *Strategic Long Range Cannon*

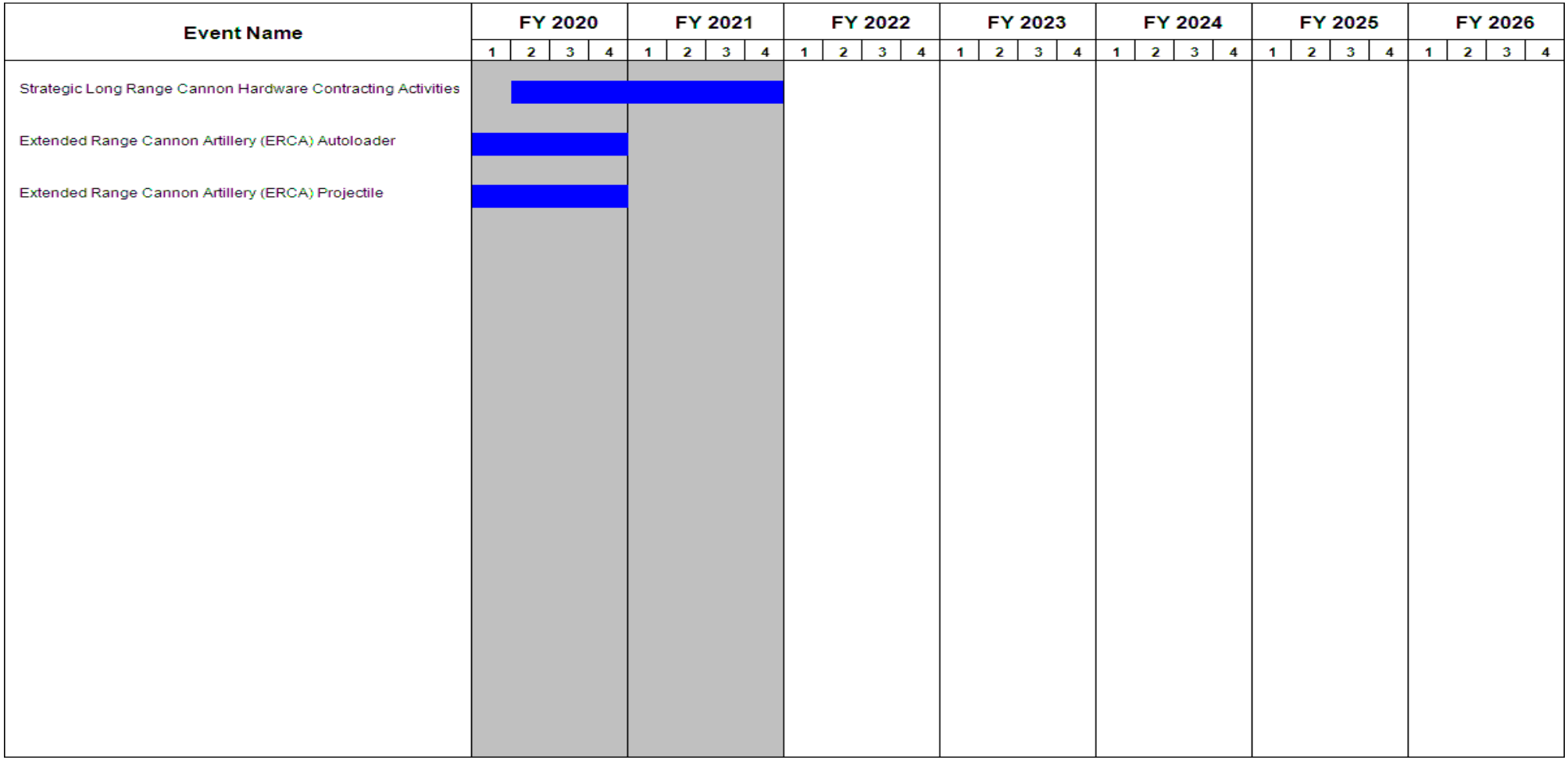

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** AY3 / *Strategic Long Range Cannon*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Strategic Long Range Cannon Hardware Contracting Activities	2	2020	4	2021
Extended Range Cannon Artillery (ERCA) Autoloader	1	2020	4	2020
Extended Range Cannon Artillery (ERCA) Projectile	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) CE4 / *Emerging Technology Initiatives Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
CE4: *Emerging Technology Initiatives Development*	-	-	-	42.420	-	42.420	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2022.

This project is considered a new start in FY2022.

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 (PEOs), and non-traditional vendors that potentially address existing Programs of Record (PoRs) 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 2020	FY 2021	FY 2022
Title: Emerging Technology Initiatives Development	-	-	34.920
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 ***FY 2022 Plans:*** Funds will support 3-Star Technology Maturation Board oversight as a mechanism to identify and select new and novel concepts and technologies for advanced development and transition to PoRs. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** New Start in FY 2022.			
Title: Rapid Capabilities and Critical Technology Office (RCCTO) Innovation Funding	-	-	7.500
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			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** CE4 / *Emerging Technology Initiatives Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
ecosystem and accelerating transition to rapid fielding of their technology. Innovative Funding will fund technical scouting, concept incubation, staged pilot evaluations, and prototype development in Army-wide disciplines through rigorous technical assessment, Soldier feedback, and mentorship. ***FY 2022 Plans:*** 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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** New Start in FY 2022. Funding was realigned from Abrams Recapitalization, Army Program Element (APE) GA0750000, (Abrams Upgrade Program).			
Accomplishments/Planned Programs Subtotals	-	-	42.420

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / *Technology Maturation Initiatives*	Project (Number/Name) CE4 / *Emerging Technology Initiatives Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technology Initiatives Development	TBD	Various activities : Various Locations	-	-		-		34.920		-		34.920	0.000	34.920	-
RCCTO Innovation Funding	TBD	Various Activities : Various Locations	-	-		-		7.500		-		7.500	0.000	7.500	-
		Subtotal	-	-		-		42.420		-		42.420	0.000	42.420	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		42.420		-		42.420	0.000	42.420	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** CE4 / *Emerging Technology Initiatives Development*

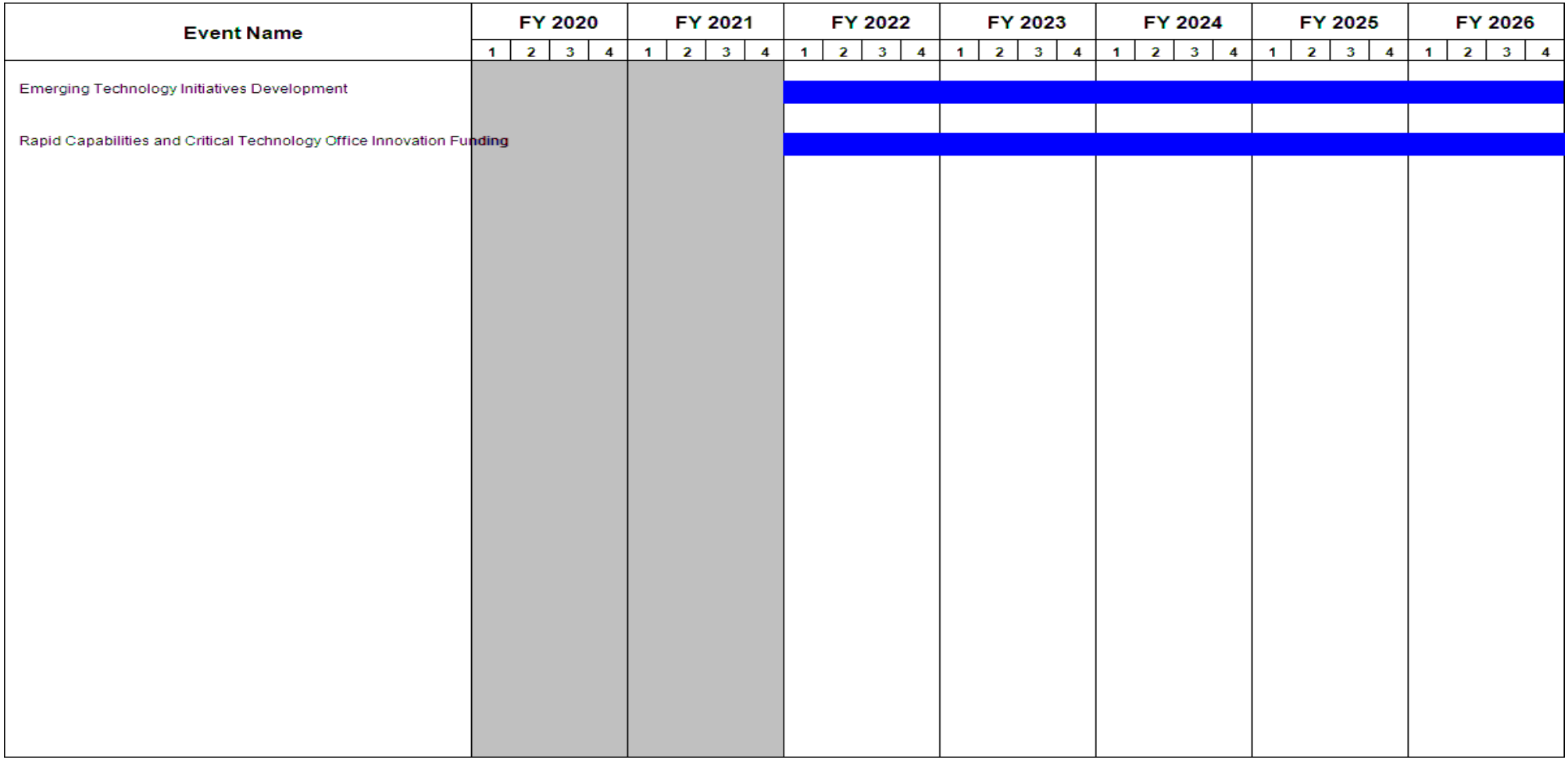

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604115A / *Technology Maturation Initiatives*	**Project (Number/Name)** CE4 / *Emerging Technology Initiatives Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Emerging Technology Initiatives Development	1	2022	4	2026
Rapid Capabilities and Critical Technology Office Innovation Funding	1	2022	1	2027