Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**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	-	12.010	16.360	26.809	-	26.809	28.724	24.594	24.600	24.826	0.000	157.923
BS9: *Robotic Payloads*	-	-	8.531	7.643	-	7.643	-	-	-	-	0.000	16.174
FB3: *Robotics Architecture*	-	2.604	2.346	2.769	-	2.769	2.789	2.785	2.786	2.814	0.000	18.893
FB4: *Common Robotic Systems*	-	1.766	-	-	-	-	-	-	-	-	0.000	1.766
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	4.125	3.063	11.270	-	11.270	20.258	16.235	16.239	16.397	0.000	87.587
FG8: *Common Robotic Controller*	-	3.515	2.420	5.127	-	5.127	5.677	5.574	5.575	5.615	0.000	33.503

A. Mission Description and Budget Item Justification

This Program Element supports modernization of the current Ground Robotic fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of the Universal Robotic Controller program.

BS9: The Robotic Payloads project is a suite of modular capabilities designed with open architecture to provide an increased level of standoff, situational awareness, disruption capability, and dexterity to respond to current and emergent Chemical, Biological, Radiological, and Nuclear (CBRN), Explosive Ordnance Disposal (EOD) and Engineer requirements. Current Man Transportable Robotic Systems Increment II (MTRS Inc II) and Common Robotic System - Heavy (CRS-H) system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. This project supports development and testing of the following capabilities: Extended Range Mesh Network (ERMN), Pan/Tilt Imager (PTI) and Obstacle Avoidance & Digital Modeling (OA&DM). The use of robotic payloads allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier. These multiple, modular robotic mission payloads will use open architecture to integrate with the MTRS Inc II and CRS-H platforms to form the Army's next generation platform adaptable robotics systems.

FY 2023 Base dollars in the amount of $7.643 million supports Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) payload prototypes to include development of the necessary software updates to allow for payload to platform communications and development of integration provisions for mounting the ERMN and PTI to both the MTRS Inc II and CRS-H platforms. Additionally, FY 2023 funding supports Development and Production Prove-out Testing, logistics product analysis and verification and execution of user jury event.

FB2: The Man Transportable Robotic System (MTRS) Inc. II is the Army's Soldier transportable, remotely operated, medium size (<= 164 lbs.) common robotic system. The system utilizes both radio and tethered communications allowing dismounted Soldiers to perform hazardous missions from a safe standoff distance. The MTRS

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

Inc. II system consists of an Operator Control Unit (OCU), a suite of various mission payloads, and a mobility platform. Open architecture and the Ground Robotic Autonomous Systems (RAS) Interoperability Profile (IOP) requirements are employed to reduce obsolescence risks and to maximize efficiency in acquiring future capabilities. MTRS Inc. II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units.

FB2 has no FY 2023 funding request.

FB3: Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, common control, performance specifications and test results. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Small Multipurpose Equipment Transport (S-MET) Inc II, Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Common Robotics System (Individual) (CRS(I)) Inc. II, Enhanced Robotic Payloads (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat Vehicle (RCV), Assault Breacher Vehicle Remote Control System (ABV RCS), Advanced Reconnaissance Vehicle (ARV), Universal Robotic Controller, etc.), and new standards addressing emerging requirements and Modular Mission Payloads (MMP) (i.e. Cyber Security, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc.). RA underpins the RAS Software Foundry by providing the interface standards to allow the compatibility between next generation autonomous & unmanned software products (i.e., Robotic Technology Kernel, Warfighter Machine Interface, and innovative industry software products).

FY 2023 Base dollars in the amount of $2.769 million supports the finalization of the Robotics and Autonomous Systems-Ground (RAS-G) Interoperability Profile (IOP) Version 6.0 and the maturation of IOP to a model based single source of truth to enable digital engineering. IOP V6.0 will provide the required modular open interfaces and compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, TWV-LF, OMFV, RCV, ERP, Assault Breacher Vehicle Remote Control System (ABV RCS), Advanced Reconnaissance Vehicle (ARV), Universal Robotic Controller, and robotic applique kits for manned ground systems. Additionally, FY 2023 RDTE funds will continue the development and hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. FY 2023 RDTE funds will also mature the Common Specification Reference (CSR) to a minimum viable product.

FB4: The Common Robotic System - Individual (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, common robotic system. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated Warfighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

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Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

FB4 has no FY 2023 funding request.

FB6: Small Multipurpose Equipment Transport (S-MET) Increment I will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The S-MET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The S-MET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. S-MET will have open architectures, a remote control, support casualty evacuation, power generation/offload and Modular Mission Payloads (MMP). S-MET Inc II is a follow on program that will add capability and system maturity in the areas of platform autonomy, increased cyber and electromagnetic interference hardening, ballistic protections against kinetic threats, and improved battery safety for additional transportability modes. In addition, S-MET Inc II will have added capability to integrate government furnished Modular Mission Payloads (MMPs), such as dismount radios, counter Unmanned Aerial Systems, and universal battery chargers

FY 2023 RDTE Base dollars in the amount of $11.270 million supports Increment I Technical Insertions, Engineering Change Proposals, and Modular Mission Payloads (MMP) to increase mission capabilities and address requirements in the Abbreviated Capability Development Document (A-CDD). FY 2023 RDTE funds testing and development of logistics material required to support MMP efforts. Program support to include labor, travel and miscellaneous expenses in support of these RDTE efforts will also be funded. FY 2023 also funds SMET Increment II development, prototyping, and test initiation.

The total cost of the SMET Increment I Middle Tier of Acquisition Rapid Fielding effort is $164.350 million from FY19 to FY24, including $29.345 million of RDT&E and $135.005 million of Procurement. The SMET program is fully funded across the Future Years Defense Program.

FB8: The Soldier Borne Sensor (SBS) is a small unmanned aerial vehicle. The SBS provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The system is simple to deploy and use to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions. Funding in this project aligns with Army's priorities in support of the National Defense Strategy. In FY 2020, this project and funding transitioned to PE: 06044827A / Soldier Systems - Warrior Dem/Val project 0604827A.FK4.

FB9: The Common Robotic System, Heavy (CRS(H)) is a modular large-sized system that provides enhanced protection to the EOD Soldier in order to support the Joint Force Commander with the ability to identify, render safe and dispose of explosive ordnance (EO) and improvised explosive devices (IEDs) in support of the Range of Military Operations (ROMO) and Home Land Defense (HLD) operations. CRS(H) will also enable EOD Soldiers to execute Defense Support of the Civil Authorities (DSCA) operations in response to requests from federal, state, local, and tribal authorities for domestic incidents, emergencies, disasters, designated law enforcement support and other activities. CRS(H) will support current and future missions for Explosive Ordnance Disposal (EOD) units.

The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the

following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multi-shot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier.

FB9 has no FY 2023 funding request.

FG8: Universal Robotics Control (URC) will provide the common information system for all squad and above Robotic and Autonomous Systems (RAS) command and control (C2). The U.S. Army is challenged to transform the Command and Control (C2) warfighting function to execute the RAS strategy in support of Multi-Domain Operations (MDO). The Universal Robotics Control (URC) program responds to this challenge by developing and fielding a system that rapidly synchronizes effects in all domains to defeat the enemy regardless of the mission command network. The URC operates as a distributed information system designed for resilience in a high threat environment utilizing existing and planned RAS elements. URC provides soldier and machine interfaces to establish and maintain positive C2 in all phases of combat and support operations, supported by a continuously developed software ecosystem. The capabilities of a unified information system for RAS C2 at the tactical edge enables improved situational awareness, multi-domain maneuvers, and deployment of lethal and nonlethal effects. URC is a critical enabling capability for NGCV OMFV and RCV programs.

FY 2023 RDTE Base dollars in the amount of $5.127 million will be utilized for Systems Engineering and Program Management (SEPM) to develop and execute risk reduction and program maturation activities. This includes Statement of Work and System Specification preparation. FY 2023 funding will be utilized to conduct execution of a Software Acquisition Pathway pending final OPR determination of the acquisition strategy, including identification of necessary support activities for MOSA/MBSE engineering and Safety, Cyber, and other certifications that support a continuous software development and fielding effort.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	12.010	18.241	0.000	-	0.000
Current President's Budget	12.010	16.360	26.809	-	26.809
Total Adjustments	0.000	-1.881	26.809	-	26.809
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.881			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	26.809	-	26.809

Change Summary Explanation

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) BS9 / *Robotic Payloads*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BS9: *Robotic Payloads*	-	-	8.531	7.643	-	7.643	-	-	-	-	0.000	16.174
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Ground Robotics - Robotic Payloads project is a suite of modular capabilities designed with open architecture to provide an increased level of standoff, situational awareness, disruption capability and dexterity to respond to current and emergent Engineer, CBRN and EOD requirements. Current Man Transportable Robotic Systems Increment II (MTRS Inc II) and Common Robotic System - Heavy (CRS-H) system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. This project will support development and testing of the following capabilities: Extended Range Mesh Network (ERMN), Pan/Tilt Imager (PTI) and Obstacle Avoidance & Digital Modeling (OA&DM). The use of robotic payloads allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier. These multiple, modular robotic mission payloads will use open architecture to integrate with the MTRS Inc II and CRS-H platforms to form the Army's next generation platform adaptable robotics systems.

FY 2023 Base dollars in the amount of $7.643 million supports Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) payload prototypes to include development of the necessary software updates to allow for payload to platform communications and development of integration provisions for mounting the ERMN and PTI to both the MTRS Inc II and CRS-H platforms. Additionally, FY 2023 funding supports Development and Production Prove-out Testing, logistics product analysis and verification and execution of user jury event.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Prototype and Payload Development	-	4.367	0.540
Description: Development of Extended Range Mesh Network (ERMN), Pan/Tilt Imager (PTI) and Obstacle Avoidance & Digital Modeling (OA&DM) payload prototypes and payload to platform integration requirements. ***FY 2022 Plans:*** Development of Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) payload prototypes and payload to platform integration requirements. ***FY 2023 Plans:*** FY 2023 funding will continue development of Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) payload prototypes and payload to platform integration requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decrease from FY 2022 to FY2023 due to the majority of ERMN & PTI development occurring in FY 2022.			
Title: Integration & Software Development (Platform)	-	2.941	1.300

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** BS9 / *Robotic Payloads*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Development of integration provisions for mounting the ERMN, PTI, and OA&DM to both the MTRS Inc II and CRS-H platforms. Development of the necessary software updates to allow for payload to platform communications. ***FY 2022 Plans:*** Development of integration provisions for mounting the ERMN and PTI to both the MTRS Inc II and CRS-H platforms. Development of the necessary software updates to allow for payload to platform communications. ERMN & PTI payloads will take priority over OA&DM due to technology readiness level of the OA&DM. ***FY 2023 Plans:*** FY 2023 funding will continue the development of integration provisions for mounting the Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) to both the MTRS Inc II and CRS-H platforms. It will also continue development of the necessary software updates to allow for payload to platform communications. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decrease from FY 2022 to FY2023 due to majority of software development and integration occurring in FY 2022.			
Title: ERMN and PTI Prototypes ***FY 2023 Plans:*** Funding will purchase Extended Range Mesh Network (ERMN) and Pan/Tilt Imager (PTI) prototypes to be utilized in testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased from FY 2022 to FY 2023 because prototypes were not a requirement in FY 2022.	-	-	0.916
Title: Testing and Evaluation ***FY 2023 Plans:*** FY 2023 funding supports testing and training of the vendor prototypes to the performance specifications requirements and safety requirements. FY 2023 funding will also fund logistics product verification and analysis and conduct a user jury where Soldiers will test prototypes prior to production decision. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased from FY 2022 to FY2023 due to program transitioning from development into testing.	-	-	3.423
Title: Program Support ***FY 2022 Plans:*** Funding will support the Enhanced Robotic Payloads program during the prototype and development of the payloads as well as integration & software development for the platforms. ***FY 2023 Plans:***	-	0.912	1.464

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** BS9 / *Robotic Payloads*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding will continue to support the Enhanced Robotic Payloads program during the development of the prototype payloads, integration & software development for the platforms, as well as the testing and evaluation of the payloads. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased from FY 2022 to FY2023 due to program ramping up development and testing as it prepares for MS C at the end of FY2023.			
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR Transfer	-	0.311	-
Accomplishments/Planned Programs Subtotals	-	8.531	7.643

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
• FD2: *Soldier Robotics Systems*	1.872	-	0.000	-	0.000	-	-	-	-	0.000	1.872

Remarks

D. Acquisition Strategy

PdM Robotic and Autonomous Systems (RAS) is currently developing a Performance Specification (PSPEC) from the Enhanced Robotic Payloads-Unmanned Ground Systems (ERP-UGS) Capability Development Document (CDD). PdM RAS will seek out proposal from industry on capabilities to meet the PSPEC and select the best capability to be further developed, integrated into the host platforms, and test as a system in an Abbreviated Engineering Manufacturing Development (EMD) phase. After a successful EMD, a production decision will be made to enter Production and Deployment (PD) phase.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** BS9 / *Robotic Payloads*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support ERMN & PTI	MIPR	PdM RAS : Warren, MI	-	-		0.912	Nov 2021	1.464	Nov 2022	-		1.464	0.000	2.376	-
Prototype and Payload Development ERMN & PTI	SS/TBD	FLIR : Boston, MA	-	-		4.367	Jan 2022	0.540	Jan 2023	-		0.540	0.000	4.907	-
Integration & Software Development ERMN & PTI	SS/TBD	FLIR : Boston, Ma	-	-		2.941	May 2022	1.300	Jan 2023	-		1.300	0.000	4.241	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.311		-		-		-	0.000	0.311	-
		Subtotal	-	-		8.531		3.304		-		3.304	0.000	11.835	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test ERMN & PTI	MIPR	TBD : TBD	-	-		-		0.850	Jan 2023	-		0.850	0.000	0.850	-
Production Prove-Out Test ERMN & PTI	MIPR	TBD : TBD	-	-		-		1.578	Jun 2023	-		1.578	0.000	1.578	-
User Jury	MIPR	TBD : TBD	-	-		-		0.200	Aug 2023	-		0.200	0.000	0.200	-
Logistics Product Verification & Analysis	TBD	TBD : TBD	-	-		-		0.795	Jan 2023	-		0.795	0.000	0.795	-
ERMN & PTI Prototypes	SS/CPFF	TBS : TBD	-	-		-		0.916	Dec 2022	-		0.916	0.000	0.916	-
		Subtotal	-	-		-		4.339		-		4.339	0.000	4.339	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	-	-		8.531		7.643		-		7.643	0.000	16.174	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** BS9 / *Robotic Payloads*

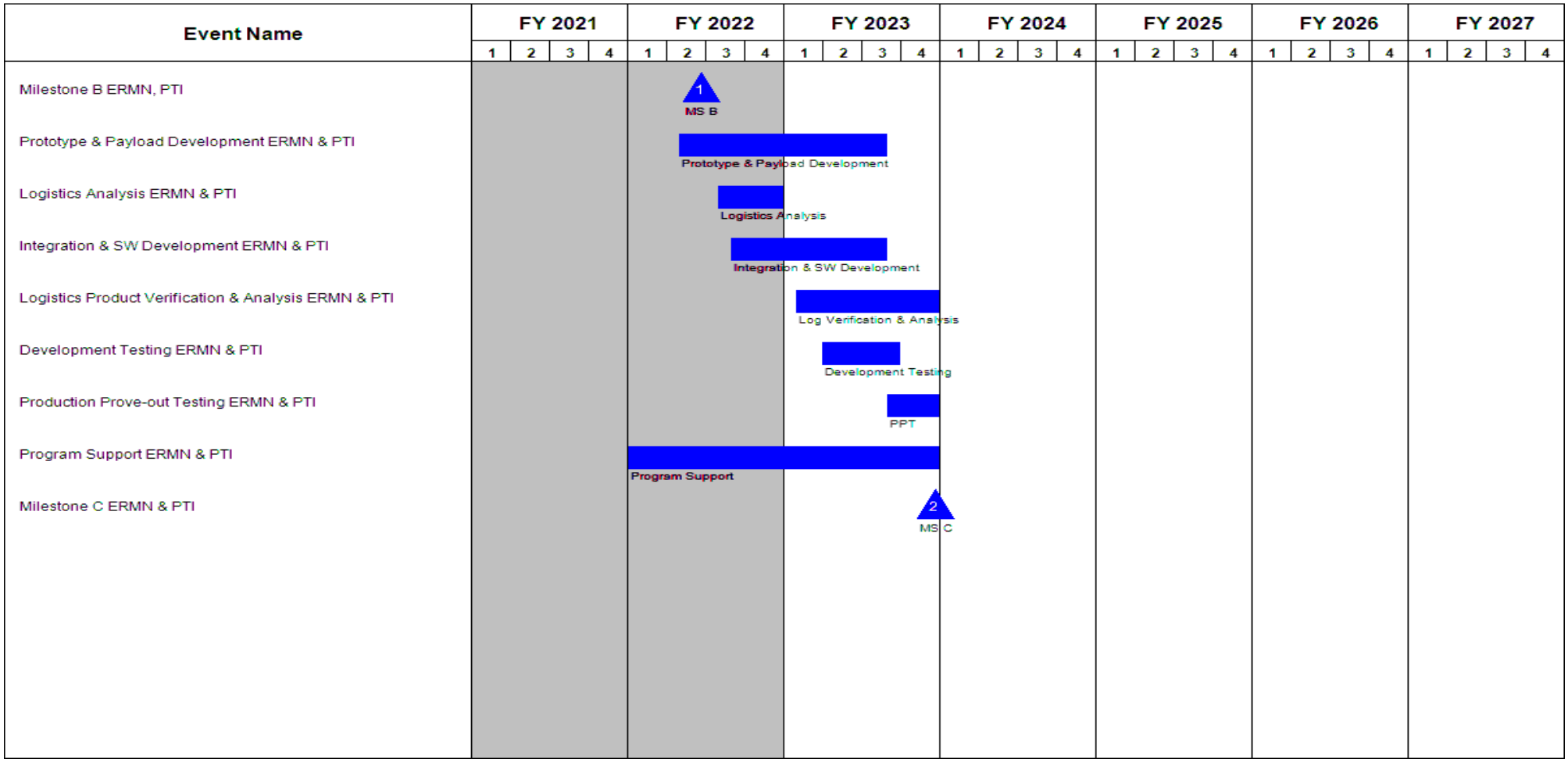

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** BS9 / *Robotic Payloads*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B ERMN, PTI	2	2022	2	2022
Prototype & Payload Development ERMN & PTI	2	2022	3	2023
Logistics Analysis ERMN & PTI	3	2022	4	2022
Integration & SW Development ERMN & PTI	3	2022	3	2023
Logistics Product Verification & Analysis ERMN & PTI	1	2023	4	2023
Development Testing ERMN & PTI	2	2023	3	2023
Production Prove-out Testing ERMN & PTI	3	2023	4	2023
Program Support ERMN & PTI	1	2022	4	2023
Milestone C ERMN & PTI	4	2023	4	2023

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*				Project (Number/Name) FB3 / *Robotics Architecture*			
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
FB3: *Robotics Architecture*	-	2.604	2.346	2.769	-	2.769	2.789	2.785	2.786	2.814	0.000	18.893
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Robotic Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, common control, performance specifications and test results. . RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Small Multipurpose Equipment Transport (S-MET) Inc II, Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Common Robotics System (Heavy) (CRS(H), Common Robotics System (Individual), (CRS(I)) Inc II, Enhanced Robotic Payloads (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat (RCV) variants, robotic bridging and construction vehicles, robotic applique kits for manned ground systems, etc.), and new standards addressing emerging requirements and Modular Mission Payloads (MMP) including Cyber Security, software safety requirements from MIL-STD-882E, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc. RA underpins the RAS software Foundry by providing the interface standards to allow the compatibility between next generation autonomous & unmanned software products (i.e., Robotic Technology Kernel, Warfighter Machine Interface, and innovative industry software products). The RA priority going forward will be integrating RA interfaces with the larger enterprise confluence of Software Foundry, Agile/DevSecOps & software development environments.

FY 2023 Base dollars in the amount of $2.769 million supports the finalization of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 6.0 and the maturation of IOP to a model based single source of truth to enable digital engineering. IOP V6.0 will provide the required modular open interfaces and compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, CRS(H), TWV-LF, OMFV, RCV, ERP, Assault Breacher Vehicle Remote Control System (ABV RCS), Advanced Reconnaissance Vehicle (ARV), Universal Robotic Controller, and robotic applique kits for manned ground systems. Additionally, FY 2023 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. FY 2023 RDTE funds will also mature the Common Specification Reference (CSR) to a minimum viable product.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023**
Title: Robotics Architecture	2.604	2.260	2.769
Description: Provide architecture tools and support for current Programs of Record (PoR) & new requirements to allow for interoperability within the Joint community for Robotics & Autonomous Systems.			
FY 2022 Plans: FY 2022 RDTE funds in the amount of $2.260 million supports the initial development of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 6. IOP V6.0 will provide the required modular open interfaces and			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
compliance test tools for new programs including S-MET Modular Mission Payloads (MMPs), LRR, CRS(M), TWVLF, OMFV, RCV, ERP, ABV RCS, ARV, URC, and robotic applique kits for manned ground systems. Additionally, FY 2022 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. FY 2022 RDTE funds will also continue the development and refinement of the Common Specification Reference (CSR). SBIR/STTR/FFRDC transfer $85,630. ***FY 2023 Plans:*** FY 2023 RDTE funds in the amount of $2.769 million supports the finalization of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 6. IOP V6.0 will provide the required modular open interfaces and compliance test tools for new programs including Small Mobile Equipment Transport (S-MET) Modular Mission Payloads (MMPs), Common Robotic System Heavy (CRS(H)), Tactical Wheeled Vehicle Leader Follower (TWVLF), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat Vehicle (RCV), Enhanced Robotics Payloads (ERP), Assault Breacher Vehicle Remote Control System (ABV RCS), Advanced Recon Vehicle (ARV), Universal Robotic Controller (URC), and robotic applique kits for manned ground systems. Additionally, FY 2023 RDTE funds will continue the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. FY 2023 RDTE funds will also result in the minimum viable product of the Common Specification Reference (CSR). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased due to additional planned ROS-M capability sets to support Robotic Technology Kernel (RTK) IAW the planned Software Foundry deployment.			
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** SBIR/STTR Transfer	-	0.086	-
Accomplishments/Planned Programs Subtotals	2.604	2.346	2.769

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

In FY 2023 the Robotics Architecture line funds supporting indirect matrix personnel & related contracts to develop IOP, ROS-M, and CSR tools and supporting infrastructure. It leverages intellectual capital and products which allow for Joint interoperability and helps meet Army Program of Record cost and schedule while

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

delivering high quality products for fielding. The architecture and tools developed under this line provide enterprise wide efficiencies and are central to the Army's acquisition philosophy of a modular open system approach between the major subsystems of robotics and autonomous systems, as described throughout the Army approved Robotics & Autonomous Systems (RAS) Initial Capabilities Document (ICD), as well as its current update to support artificial intelligence.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Multiple	1.818	0.002	Nov 2021	0.200	Nov 2021	-		-		-	0.000	2.020	-
SBIR/STTR transfer	TBD	TBD : TBD	-	-		0.086	Apr 2022	-		-		-	0.000	0.086	-
		Subtotal	1.818	0.002		0.286		-		-		-	0.000	2.106	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IOP V4	Various	Various : Multiple	1.471	-		-		-		-		-	0.000	1.471	-
Instantiation Tool Development	SS/CPFF	DCS : Warren, MI	0.084	-		-		0.150	May 2023	-		0.150	0.000	0.234	-
Conformance Verification Testing (CVT) Update	MIPR	GVSC : Warren, MI	0.283	-		-		0.250	Nov 2022	-		0.250	0.000	0.533	-
IOP V5 and V6 Development	SS/CPFF	Various,DCS : Warren, MI	1.053	1.010	May 2021	1.135	Jun 2022	0.350	May 2023	-		0.350	0.000	3.548	-
Robotic Operating System - Military (ROS-M)	Various	Various : Multiple	0.783	0.742	Jun 2021	0.525	May 2022	0.675	May 2023	-		0.675	0.000	2.725	-
IOP V4 Radio Interfaces Development	MIPR	NAVSEA : Washington D.C.	0.560	-		-		-		-		-	0.000	0.560	-
Instantiation Tool Development	MIPR	Various : Multiple	-	0.126	Jan 2021	-		0.150	Nov 2022	-		0.150	0.000	0.276	-
IOP Software Safety	RO	GVSC : Warren	-	0.150	Jan 2021	-		-		-		-	0.000	0.150	-
Common Specification Reference (CSR)	C/CPFF	TBD : TBD	-	-		0.400	Mar 2022	0.400	Jan 2023	-		0.400	0.000	0.800	-
Model based Systems Engineering IOP	MIPR	GVSC : Warren, MI	-	-		-		0.350	Nov 2022	-		0.350	0.000	0.350	-
		Subtotal	4.234	2.028		2.060		2.325		-		2.325	0.000	10.647	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Conformance Verification Testing (CVT) Maintenance	MIPR	TARDEC : Warren, MI	0.110	0.123	Jan 2021	-		-		-		-	0.000	0.233	-
Robotic Operating System - Military (ROS-M) Infrastructure Management	MIPR	TARDEC : Warren, MI	0.134	0.150	Jan 2021	-		0.194	Jan 2023	-		0.194	0.000	0.478	-
		Subtotal	0.244	0.273		-		0.194		-		0.194	0.000	0.711	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
New IOP & ROS-M Artifacts Stress Testing	MIPR	TARDEC : Warren, MI	0.184	0.301	Apr 2021	-		-		-		-	0.000	0.485	-
CVT testing	SS/CPFF	Various, DCS : Warren, MI	-	-		-		0.250	May 2023	-		0.250	0.000	0.250	-
		Subtotal	0.184	0.301		-		0.250		-		0.250	0.000	0.735	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.480	2.604		2.346		2.769		-		2.769	0.000	14.199	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

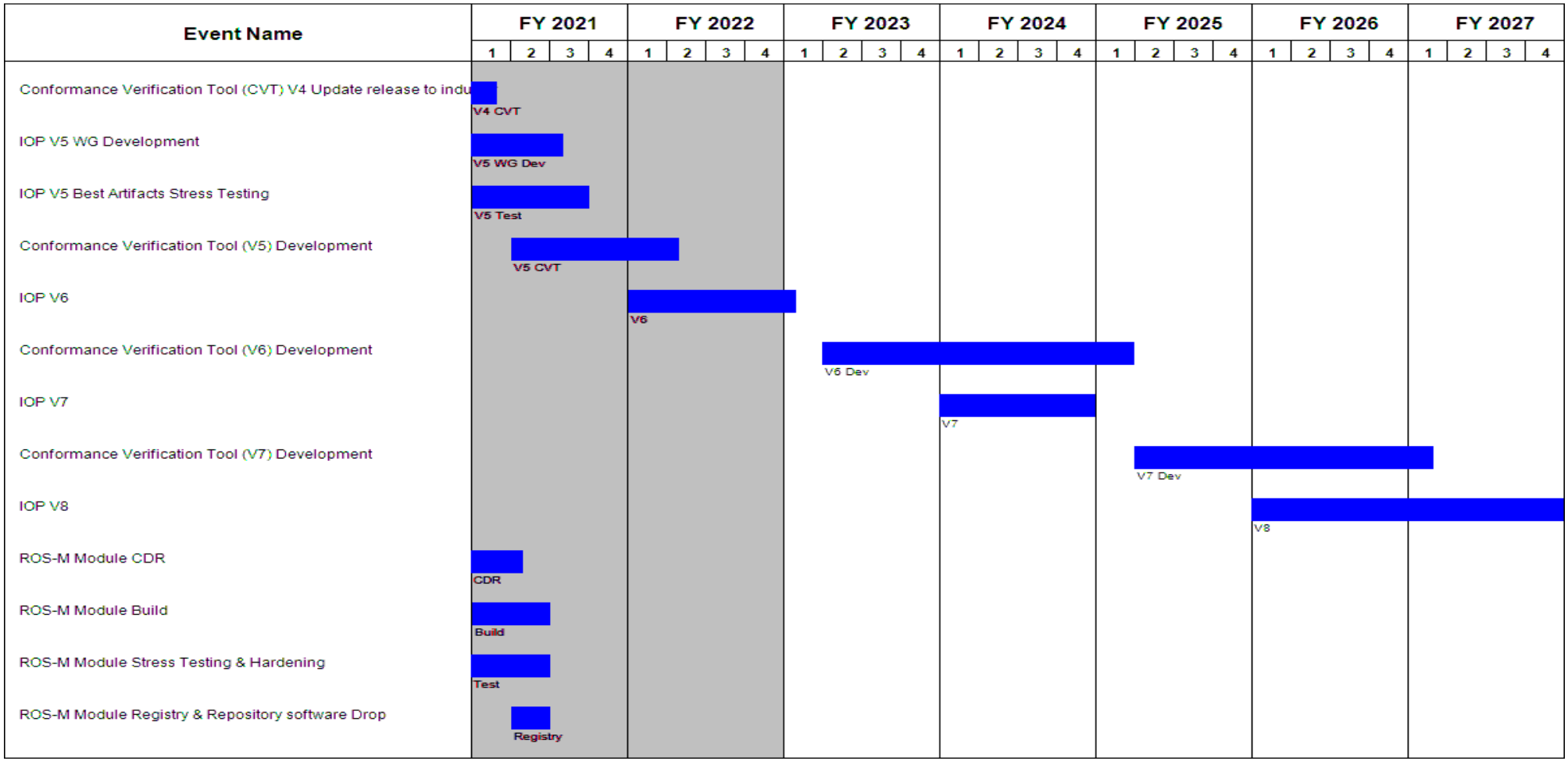

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

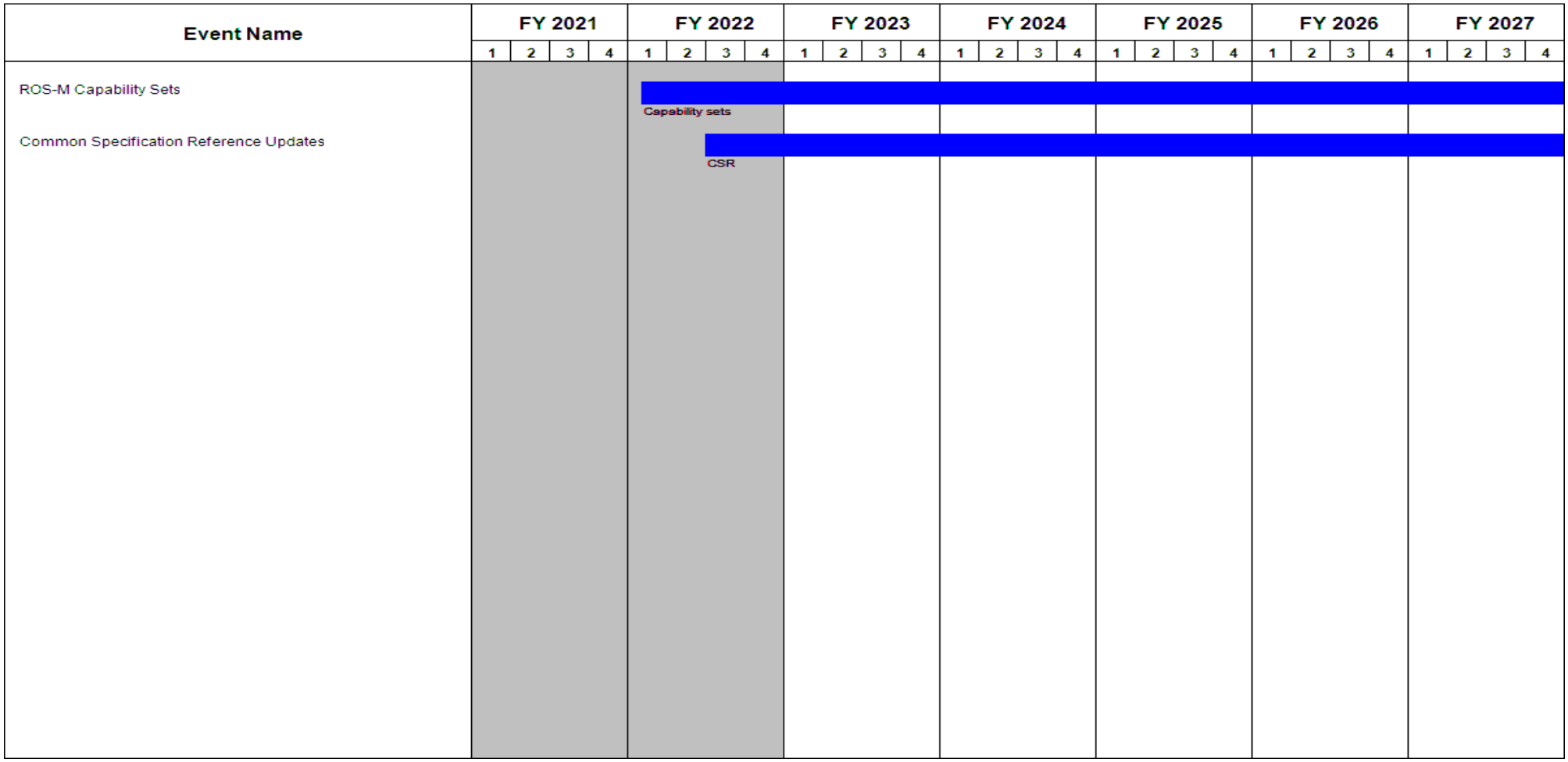

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IOP V4 Capability Plan (CP) Development	1	2018	2	2018
IOP V4 WIPT Kickoff	3	2018	3	2018
IOP V4 WG Development	3	2018	3	2019
Conformance Verification Testing (CVT) V3 Update release to industry	1	2018	4	2018
Instantiation tool development	2	2018	4	2018
Conformance Verification Testing (CVT) V4 Development	1	2019	4	2019
Conformance Verification Tool (CVT) V4 Update release to industry	1	2020	1	2021
IOP V5 Capability Plan (CP) Development	1	2020	2	2020
IOP V5 WIPT Kickoff	3	2020	3	2020
IOP V5 WG Development	3	2020	3	2021
IOP V5 Best Artifacts Stress Testing	1	2021	3	2021
Conformance Verification Tool (V5) Development	2	2021	2	2022
IOP V6	1	2022	1	2023
Conformance Verification Tool (V6) Development	2	2023	1	2025
IOP V7	1	2024	4	2024
Conformance Verification Tool (V7) Development	2	2025	1	2027
IOP V8	1	2026	4	2027
ROS-M Module SRR	3	2020	3	2020
ROS-M Module PDR	4	2020	4	2020
ROS-M Module CDR	1	2021	1	2021
ROS-M Module Build	1	2021	2	2021
ROS-M Module Stress Testing & Hardening	4	2020	2	2021
ROS-M Module Registry & Repository software Drop	2	2021	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ROS-M Capability Sets	1	2022	4	2027
Common Specification Reference Updates	3	2022	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FB4: *Common Robotic Systems*	-	1.766	-	-	-	-	-	-	-	-	0.000	1.766
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Robotic System - Individual (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, Common Robotic System. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated War-fighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: CRS(I) PQT and LUT execution ***Description:*** ATEC costs to execute Production Qualification Test (PQT) and Limited User Test (LUT).	0.265	-	-
Title: CRS(I) Log manuals ***Description:*** CRS(I) RDTE funding for contractor to complete development of Operator and Maintainer Technical Manuals.	0.400	-	-
Title: CRS(I) TARDEC Software Support ***Description:*** CRS(I) RDTE funding to support the following Engineering services to include software subject matter expert support, testing support, issue remediation, and transitioning platform software lead to the software sustainment agency.	0.416	-	-
Title: CRS(I) Engineering Change Proposals (ECPs) Development, Testing and Validation and Modification Work Orders ***Description:*** Changes to proposed configuration after baseline performance established at initial PQT.	0.685	-	-
Accomplishments/Planned Programs Subtotals	1.766	-	-

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
• G99595: *Common Robotic System-Individual (CRS-I)*	1.154	1.141	0.000	-	0.000	-	-	-	-	0.000	2.295

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

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
• G93696: *Common Robotic System - Individual (CRS-I)*	52.528	12.625	0.000	-	0.000	-	-	-	-	0.000	65.153

Remarks

D. Acquisition Strategy

The CRS(I) competitive Firm Fixed Price (FFP) contract was awarded to a single contractor in March 2019 for the CRS (I) Low Rate Initial Production (LRIP) phase. This phase includes Full Materiel Release (FMR) (FY 2021) and Full Rate Production (FRP) (FY 2021).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	Combat Support - Combat Service Support : Warren MI	0.505	0.006	Oct 2020	-		-		-		-	0.000	0.511	-
Mission suppport - SETA contract	TBD	AMENTUM SERVICES, INC : GERMANTOWN, MD	-	0.257		-		-		-		-	0.000	0.257	-
		Subtotal	0.505	0.263		-		-		-		-	0.000	0.768	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log manuals	C/CPFF	Multiple : Various	0.260	0.372	May 2021	-		-		-		-	0.000	0.632	-
		Subtotal	0.260	0.372		-		-		-		-	0.000	0.632	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Production Qualification Testing (PQT) & Limited User Testing (LUT)	Various	Aberdeen Test Center : Aberdeen MD	2.788	0.110	Feb 2021	-		-		-		-	0.000	2.898	-
TARDEC software support	Various	TARDEC : Warren, MI	0.370	0.510	Jan 2021	-		-		-		-	0.000	0.880	-
NIWC software support	Various	SPAWAR : San Diego, CA	0.230	-		-		-		-		-	0.000	0.230	-
ECP/MWO Development Testing and Validation	C/CPFF	Qinetiq North America : Waltham, MA	0.038	0.157	Jun 2021	-		-		-		-	0.000	0.195	-
Testing	TBD	Aberdeen Test Center : Aberdeen, MD	-	0.354		-		-		-		-	0.000	0.354	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB4 / *Common Robotic Systems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			3.426	1.131		-		-		-		-	0.000	4.557	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	4.191	1.766		-		-		-		-	0.000	5.957	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

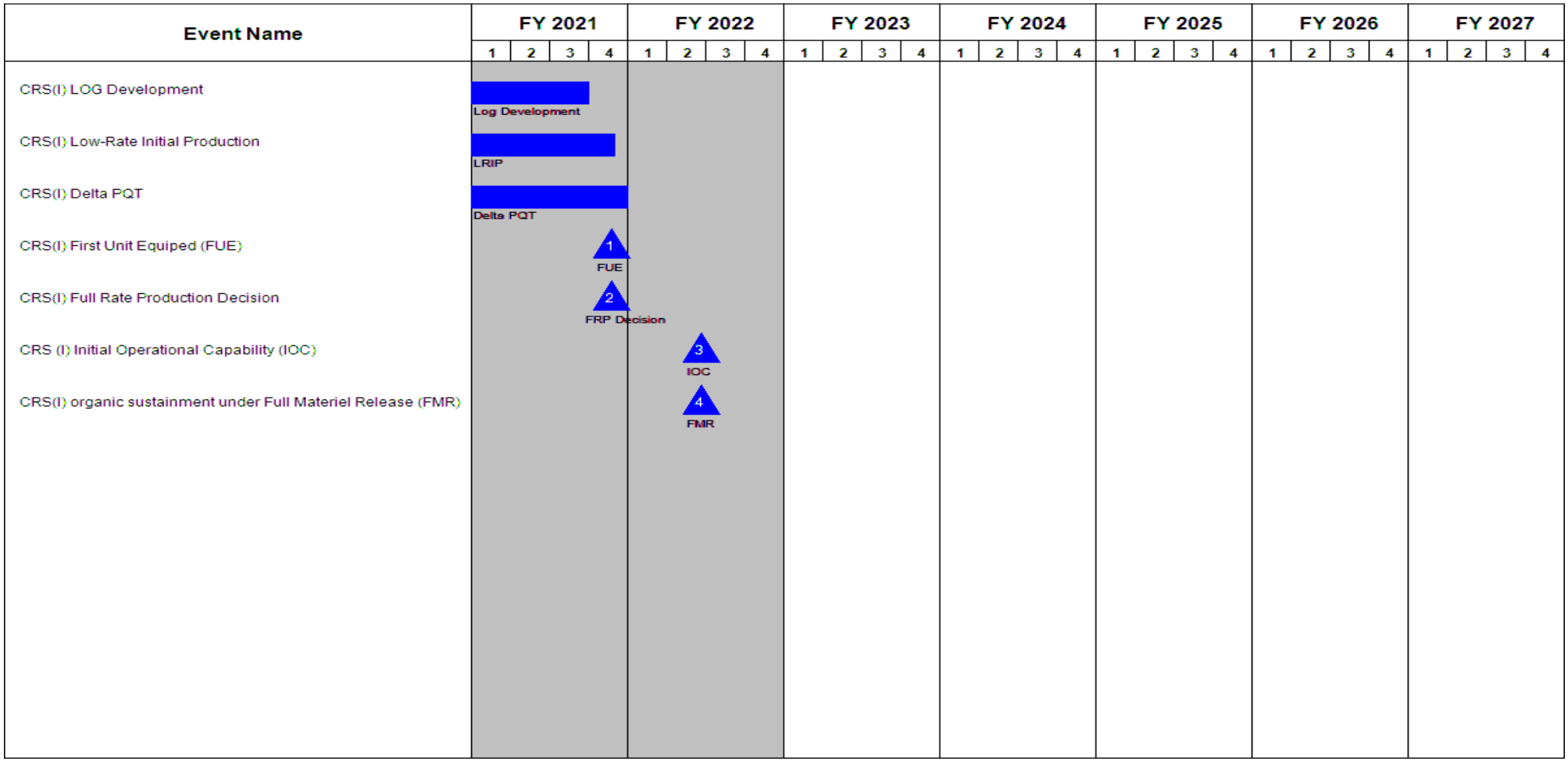

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CRS(I) Milestone B	2	2018	2	2018
CRS(I) Contract Award	2	2018	2	2018
CRS(I) LOG Development	3	2018	3	2021
CRS(I) Critical Design Review (CDR) (x2)	3	2018	3	2018
CRS(I) Run-off	1	2019	1	2019
CRS(I) Post-CDR Design/Competitive Downselection (to one vendor)	1	2019	2	2019
CRS(I) Milestone C	2	2019	2	2019
CRS(I) Low-Rate Initial Production	2	2019	4	2021
CRS(I) Production Qualification Testing (PQT)/Limited User Testing (LUT)	3	2019	1	2020
CRS(I) Authority to Operate (ATO)	3	2020	3	2020
CRS(I) Delta PQT	3	2020	4	2021
CRS(I) First Unit Equiped (FUE)	4	2021	4	2021
CRS(I) Full Rate Production Decision	4	2021	4	2021
CRS (I) Initial Operational Capability (IOC)	2	2022	2	2022
CRS(I) organic sustainment under Full Materiel Release (FMR)	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	4.125	3.063	11.270	-	11.270	20.258	16.235	16.239	16.397	0.000	87.587
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The total cost of the SMET Increment I Middle Tier of Acquisition Rapid Fielding effort is $164.350 million from FY19 to FY24, including $29.345 million of RDT&E and $135.005 million of Procurement. The SMET program is fully funded across the Future Years Defense Program.

Small Multipurpose Equipment Transport (S-MET) will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The S-MET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The S-MET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. S-MET will have open architectures, a remote control and support casualty evacuation, power generation/offload and reintegration of Modular Mission Payloads (MMP) and technical insertions.

FY 2023 RDTE Base dollars in the amount of $11.270 million supports Increment I Technical Insertions, Engineering Change Proposals, and Modular Mission Payloads (MMP) to increase mission capabilities and address requirements in the Abbreviated Capability Development Document (A-CDD). FY 2023 RDTE funds testing and development of logistics material required to support MMP efforts. Program support to include labor, travel and miscellaneous expenses in support of these RDTE efforts will also be funded. FY 2023 also funds the start of SMET Increment II development, prototyping, and test initiation. S-MET Inc II is a follow on program that will add capability and system maturity in the areas of platform autonomy, increased cyber and electromagnetic interference hardening, ballistic protections against kinetic threats, and improved battery safety for additional transportability modes. In addition, S-MET Inc II will have added capability to integrate government furnished Modular Mission Payloads (MMPs), such as dismount radios, counter Unmanned Aerial Systems, and universal battery chargers.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: S-MET	4.125	2.951	6.700
Description: Small Multipurpose Equipment Transport (S-MET) Increment I			
FY 2022 Plans: FY 2022 RDTE funding in the amount of $2.951 million supports the development, integration, and procurement of Technical Insertions, Engineering Change Proposals, and Modular Mission Payloads (MMP) to increase mission capabilities and address requirements in the Abbreviated Capability Development Document (A-CDD). FY2022 RDTE funds testing and development of			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
logistics material required to support MMP efforts. Program support to include labor, travel and miscellaneous expenses in support of these RDTE efforts will also be funded. ***FY 2023 Plans:*** FY 2023 RDTE Base dollars in the amount of $6.700 million continues to support Increment I Technical Insertions, Engineering Change Proposals, and Modular Mission Payloads (MMP) to increase mission capabilities and address requirements in the Abbreviated Capability Development Document (A-CDD). FY 2023 RDTE funds will also to continue to fund testing and development of logistics material required to support MMP efforts. Program support to include labor, travel and miscellaneous expenses in support of these RDTE efforts will also be funded. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase due to the increase in technical insertion efforts			
Title: S-MET Inc II ***Description:*** Small Multipurpose Equipment Transport (S-MET) Increment II ***FY 2023 Plans:*** FY 2023 funds SMET Increment II development, prototyping, and test initiation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase due to the start of the development and prototyping phase for Inc II version of the S-MET	-	-	4.570
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	-	0.112	-
Accomplishments/Planned Programs Subtotals	4.125	3.063	11.270

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
• R12154: *Squad Multipurpose Equipment Transport (SMET)*	28.555	24.448	29.709	-	29.709	46.787	91.912	84.357	66.456	0.000	372.224

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

C. Other Program Funding Summary ($ in Millions)

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

Remarks

D. Acquisition Strategy

It is the Army's intent to maximize the use of an Open Systems Architecture (OSA), as well as the approved Unmanned Ground Vehicle (UGV) interoperability profiles (IOP) for Small Multipurpose Equipment Transport (S-MET). Data collected up to and during the Phase III Production Effort will be utilized to reduce development efforts and provide cost savings for future technical insertions, Engineering Change Proposals (ECP), and Modular Mission Payloads (MMP) into the Program of Record. Throughout the life of the program, the Army will continue to survey the marketplace to identify opportunities for technology insertions and required Modular Mission Payloads (MMP), relying on competition to drive down costs.

Small Multipurpose Equipment Transport (S-MET) increment II will be a competitive acquisition to include competitive prototyping of up to two candidate systems. The prototyping phase will include the delivery of prototype systems, safety and performance testing, and further development and integration of Modular Mission Payloads (MMP). Upon completion of test, the government will then down select to one system representing the best value to the government and transition to a Program of Record (POR) and into production and deployment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	PM FP : Warren, MI	4.045	1.577	Oct 2020	1.463	Oct 2021	1.875	Oct 2022	-		1.875	0.000	8.960	-
SBIR / STTR Transfer	TBD	Varoius : Various112	-	-		0.112		-		-		-	0.000	0.112	-
		Subtotal	4.045	1.577		1.575		1.875		-		1.875	0.000	9.072	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Requirement Technology Demonstration	C/FFP	Year Long Excursion : TBD	12.528	-		-		-		-		-	0.000	12.528	-
Increment II Prototype Development Phase	C/FFP	Year Long Excursion : TBD	-	-		-		4.570	Oct 2022	-		4.570	0.000	4.570	-
Technical Insertions	C/FFP	TBD : TBD	3.162	1.137	Feb 2021	0.150	Feb 2022	3.325	Feb 2023	-		3.325	0.000	7.774	-
Modular Mission Payloads (MMP)	MIPR	Ft Benning : Ft Benning, GA	1.262	0.239	Nov 2020	1.038	Jan 2022	0.500	Jan 2023	-		0.500	0.000	3.039	-
Test / Logistic Assets	SS/FFP	General Dynamic Land Systems : London, ON	-	0.857	Jan 2021	-		-		-		-	0.000	0.857	-
		Subtotal	16.952	2.233		1.188		8.395		-		8.395	0.000	28.768	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber / Integration	MIPR	TBD : TBD	2.962	-		0.050	Oct 2021	-		-		-	0.000	3.012	-
DOTMLPF Support / Analysis	MIPR	TBD : TBD	-	-		0.050	May 2022	-		-		-	0.000	0.050	-
		Subtotal	2.962	-		0.100		-		-		-	0.000	3.062	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC Test Support	MIPR	Army Test Engineering Center : Various	6.264	0.315	Nov 2020	0.200	Nov 2021	1.000	Nov 2022	-		1.000	0.000	7.779	-
Air Drop Testing	MIPR	NATICK : Various	1.162	-		-		-		-		-	0.000	1.162	-
		Subtotal	7.426	0.315		0.200		1.000		-		1.000	0.000	8.941	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	31.385	4.125		3.063		11.270		-		11.270	0.000	49.843	N/A

Remarks

The FY 2023 request includes $6.700 million for the Small Multipurpose Equipment Transport Increment I Middle Tier Acquisition (MTA).

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

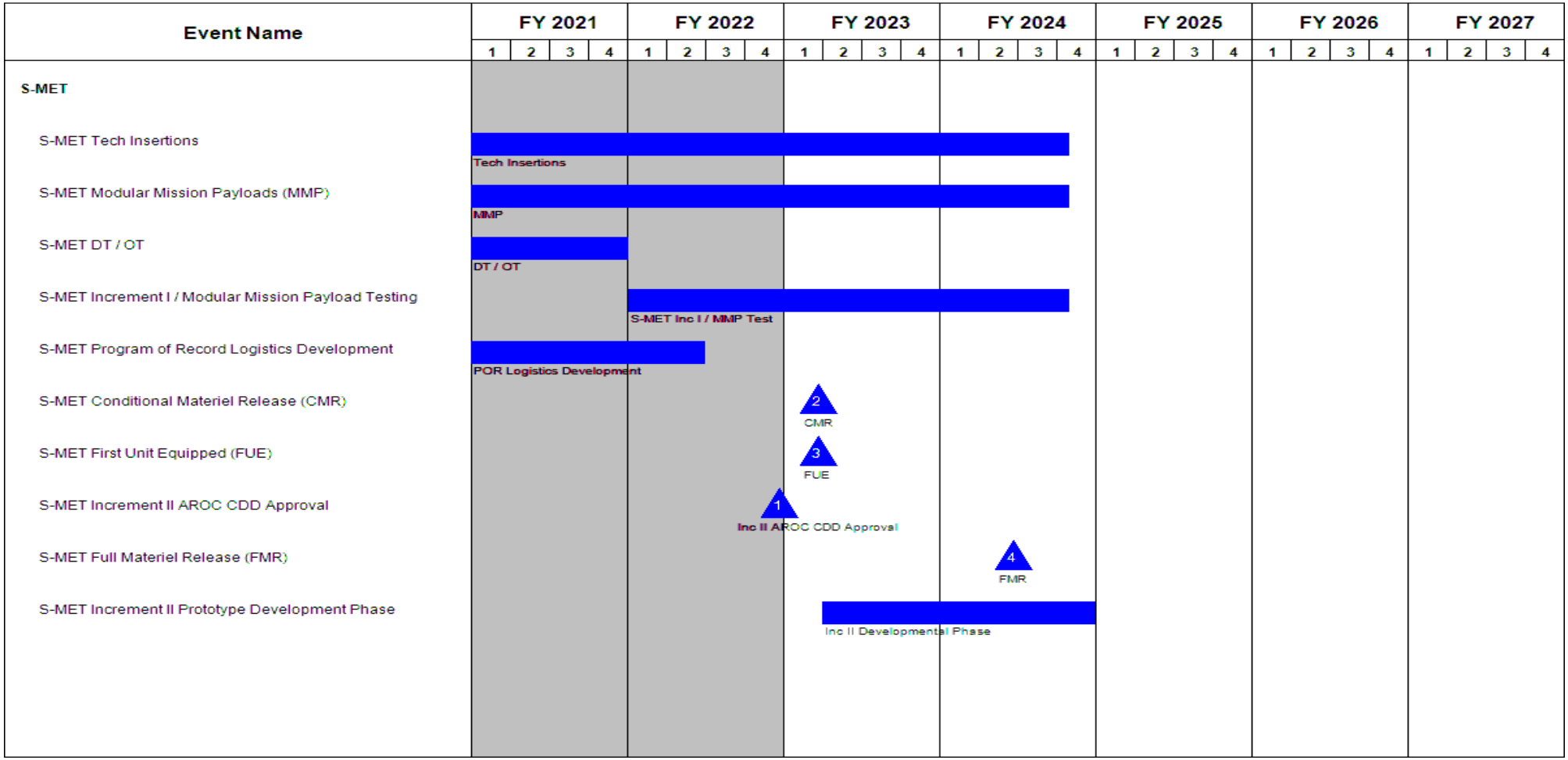

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
S-MET	1	2018	4	2022
S-MET Tech Insertions	3	2018	4	2024
S-MET Modular Mission Payloads (MMP)	2	2019	4	2024
S-MET DT / OT	4	2018	4	2021
S-MET Increment I / Modular Mission Payload Testing	1	2022	4	2024
S-MET Phase II Logistics Development	3	2018	3	2019
S-MET Technology Demo	1	2019	3	2019
S-MET MMP Assessment	3	2019	3	2019
S-MET 804 MTA Approval	4	2019	4	2019
S-MET Production Award	4	2020	4	2020
S-MET Program of Record Logistics Development	4	2020	2	2022
S-MET Conditional Materiel Release (CMR)	1	2023	1	2023
S-MET First Unit Equipped (FUE)	1	2023	1	2023
S-MET Increment II AROC CDD Approval	4	2022	4	2022
S-MET Full Materiel Release (FMR)	2	2024	2	2024
S-MET Increment II Prototype Development Phase	2	2023	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FG8: *Common Robotic Controller*	-	3.515	2.420	5.127	-	5.127	5.677	5.574	5.575	5.615	0.000	33.503
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Universal Robotics Control provides Robotics and Autonomous Systems (RAS) Command and Control (C2) for Multi-domain Operations (MDO) at Battalion and Below. URC rapidly synchronizes RAS maneuvers, sensors, and effects across all domains in a common information system. URC software provides soldier and machine interfaces for Artificial Intelligence-enabled C2 in all phases of combat and support operations. URC operates in denied environments regardless of mission command network, integrating all existing and planned RAS platforms and payloads, and aligns to adjacent C2 programs using a Modular Open Systems Approach (MOSA). URC is deployable in the Common Operating Environment (COE) and integrates RAS into the Common Operating Picture (COP). URC dynamically initializes, configures, and hands off control of RAS in both human-in-the-loop and human-on-the-loop scenarios, reducing the number of operators needed. URC supports a variety of human-machine interface (HMI) modalities to ensure that requirements for readiness, persistence, and resilience are met and maximize the soldier's ability to fight. The capabilities of a unified information system for RAS C2 at the tactical edge improves situational awareness, lowers the soldier's cognitive load, enables multi-domain maneuvers and deployment of lethal and nonlethal effects. URC is an enabling capability for Army modernization priorities and bridges Operational C2 capabilities to the tactical edge.

FY 2023 RDTE funding in the amount of $5.127 million will be utilized for Systems Engineering and Program Management (SEPM), risk reduction, and program maturation. This effort will develop and execute risk reduction and program maturation activities. This includes the personnel for preparation of the necessary acquisition strategy, plans, costing, specifications, and supporting documentation for the scheduled FY 2024 year of execution. FY23 funding will be utilized to conduct execution of a Software Acquisition Pathway pending final OPR determination of the acquisition strategy, including identification of necessary support activities for MOSA/MBSE engineering and safety, cyber, interoperability, and other certifications that support a continuous software development and fielding effort.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: URC improves Soldier situational awareness while reducing cognitive load on Soldiers and the robotics portfolio logistics footprint	3.515	2.332	5.127
Description: The Universal Robotics Control (URC) information system improves situational awareness, multi-domain maneuvers, and deployment of lethal and nonlethal effects utilizing the entire Robotics and Autonomous Systems (RAS) portfolio. FY22 Provided continuity to Prototype and Data Analysis Framework which further shaped the acquisition strategy. The Universal Robotics Control (URC) demonstrates the capability to coordinate multiple operators and concurrently control multiple Robotics and Autonomous Systems (RAS) that operate on a heterogenous network using a unified information system. The controlled RAS may be mobile or stationary and may include modular mission payloads on controlled and non-controlled platforms. URC will be capable of dynamic initialization, configuration, and handoff of the RAS elements and network, reducing			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
the burden to and number of operators required for control. The URC is executing in coordination with a multi-domain hardware controller acquisition strategy to ensure that the physical units meet all requirements for the RAS concept of operations, whether mounted or dismounted, and support a variety of human-machine interface (HMI) modalities to ensure that unit and soldier requirements for readiness, persistence, and resilience are met and maximize the soldier?s ability to fight. ***FY 2022 Plans:*** FY 2022 RDTE funding in the amount of $2.420 million will be utilized for Systems Engineering and Program Management (SEPM) support in preparing the Contracts Requirements Package (CRP) for URC. This includes Statement of Work and System Specification preparation, as well as follow up from the FY22 prototype/demonstration and analysis to further shape the acquisition strategy. FY22 funding will also be utilized for risk reduction activities to include using a government or contractor provider to further enhance the prototype product and inform the CRP process. ***FY 2023 Plans:*** FY 2023 RDTE funding in the amount of $5.127 million will be utilized for Systems Engineering and Program Management (SEPM), risk reduction, and program maturation. This effort will develop and execute risk reduction and program maturation activities. This includes the personnel for preparation of the necessary acquisition strategy, plans, costing, specifications, and supporting documentation for the scheduled FY 2024 year of execution. FY23 funding will be utilized to conduct execution of a Software Acquisition Pathway pending final OPR determination of the acquisition strategy, including identification of necessary support activities for MOSA/MBSE engineering and safety, cyber, interoperability, and other certifications that support a continuous software development and fielding effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased funding builds the team to support, develop, and execute risk reduction and program maturation activities.			
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	-	0.088	-
Accomplishments/Planned Programs Subtotals	3.515	2.420	5.127

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• G99595: *Common Robotic System-Individual (CRS-I)*	1.154	1.141	0.000	-	0.000	-	-	-	-	0.000	2.295

Remarks

D. Acquisition Strategy

Recommended Software Acquisition Pathway pending final determination of the OPR.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management support	C/TBD	Various : Multiple	0.724	1.658	Mar 2021	1.602	Jun 2022	0.520	Nov 2022	-		0.520	0.000	4.504	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.088		-		-		-	0.000	0.088	-
		Subtotal	0.724	1.658		1.690		0.520		-		0.520	0.000	4.592	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Manufacturing & Development	C/CPFF	TBD : TBD	0.517	-		-		-		-		-	0.000	0.517	-
Software support	Various	Various : Various	1.284	-		-		-		-		-	0.000	1.284	-
Prototyping	TBD	Various : Multiple	-	1.765	Mar 2021	-		-		-		-	0.000	1.765	-
Risk Reduction/ Engineering Studies	TBD	TBS : TBD	-	-		0.730	Jun 2022	4.607	Feb 2023	-		4.607	0.000	5.337	-
		Subtotal	1.801	1.765		0.730		4.607		-		4.607	0.000	8.903	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log Manuals	Various	Various : Multiple	0.738	-		-		-		-		-	0.000	0.738	-
		Subtotal	0.738	-		-		-		-		-	0.000	0.738	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor PQT	Various	Endeavor & QinetiQ : Massachusetts	0.660	-		-		-		-		-	0.000	0.660	-
Analysis of Alternatives	TBD	TBS : TBD	0.083	0.092	Mar 2021	-		-		-		-	0.000	0.175	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.743	0.092		-		-		-		-	0.000	0.835	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	4.006	3.515		2.420		5.127		-		5.127	0.000	15.068	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

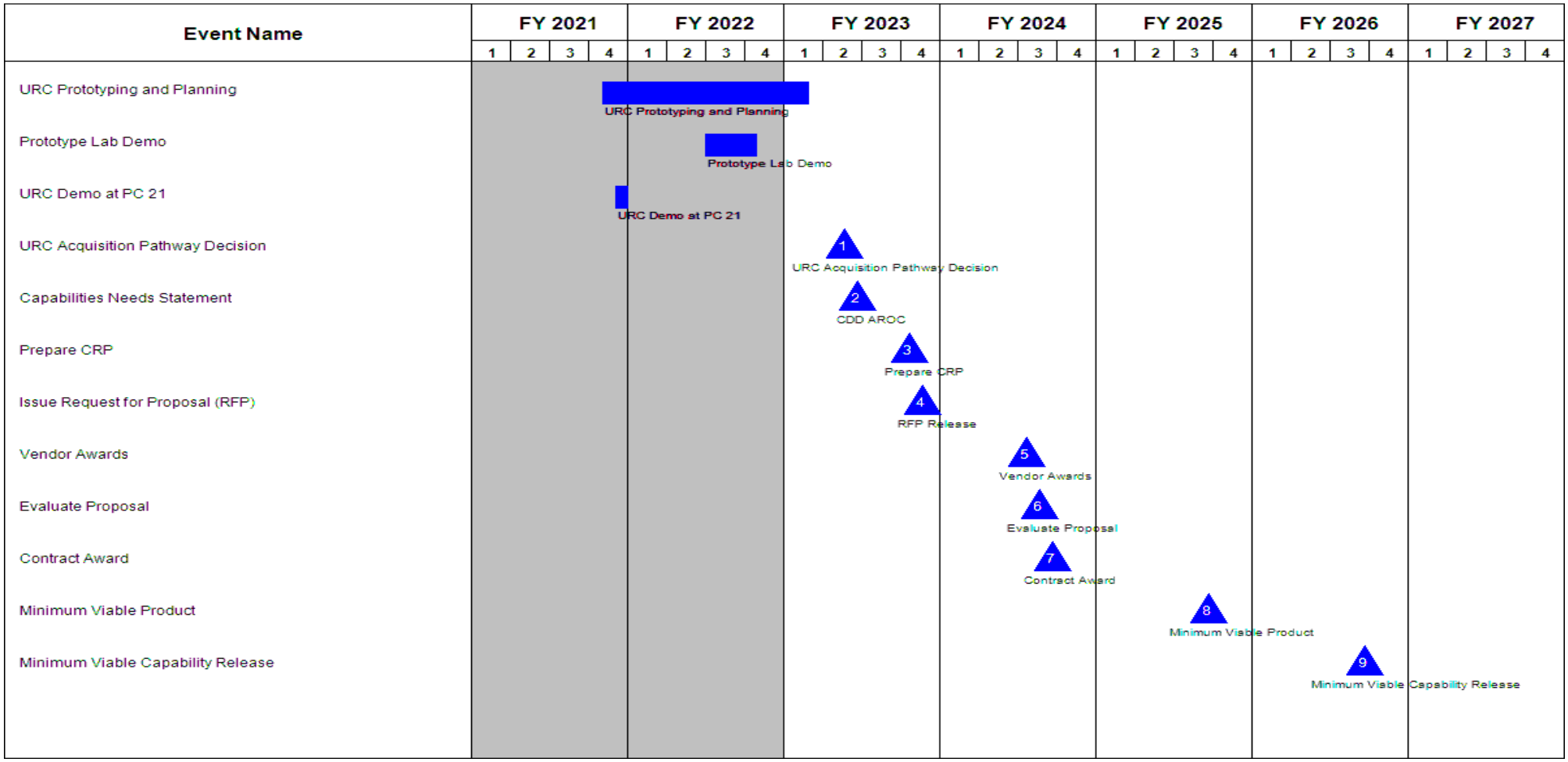

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
URC Prototyping and Planning	4	2021	1	2023
Prototype Lab Demo	3	2022	4	2022
URC Demo at PC 21	4	2021	4	2021
URC Acquisition Pathway Decision	2	2023	2	2023
Capabilities Needs Statement	2	2023	2	2023
Prepare CRP	4	2023	4	2023
Issue Request for Proposal (RFP)	4	2023	4	2023
Vendor Awards	3	2024	3	2024
Evaluate Proposal	3	2024	3	2024
Contract Award	3	2024	3	2024
Minimum Viable Product	3	2025	3	2025
Minimum Viable Capability Release	3	2026	3	2026