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 0603619A / *Landmine Warfare and Barrier - Adv Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	79.504	56.067	50.314	-	50.314	-	-	-	-	-	-
606: *Cntrmn/Barrier Adv Dev*	-	-	2.000	-	-	-	-	-	-	-	-	-
BU5: *Standoff Volcano Obstacle (SAVO) Adv Tech*	-	14.049	6.702	3.951	-	3.951	-	-	-	-	-	-
CE5: *Breaching Capability Development - Mounted*	-	-	-	5.922	-	5.922	-	-	-	-	-	-
EK7: *Area Denial Capability Development*	-	65.455	47.365	40.441	-	40.441	-	-	-	-	-	-

Note

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

A. Mission Description and Budget Item Justification

This PE provides for the Concept Exploration and Refinement of Terrain Shaping Obstacles and develops modernized alternatives to the Family of Scatterable Mines systems.

Projects 606 and CE5 - The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles. This effort will focus on the development of the Next Generation Mounted Breaching system as a modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhance operational reliability, supportability, mobility and survivability beyond the current state. This new capability and payload will be compatible for use on existing and future platforms including Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M).

Project BU5 -Standoff Activated Volcano Obstacle (SAVO) supports the United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702 as well as revisions to the Multiple Delivery Mine System (Volcano) Joint Service Operational Requirement (JSOR) # 0683. SAVO is the top priority capability in the Army's Mobility portfolio. This capability will allow for a formation of pre-emplaced directed obstacles that can be initiated remotely via fielded wired or wireless initiation systems. SAVO can be initiated via one of three fielded systems; the M7 Spider Networked Munition System, the MK152/M156 Remote Activation Munition Systems (RAMS), or the CD450-4J Blasting Machine. SAVO has the ability to create a complex obstacle when combined with Top Attack systems such as the XM204 Interim Top Attack system. The primary item is the newly developed SAVO base plate which is placed on the ground and has four ports to connect fielded Volcano mine canisters. The base plate is packaged with ancillary components to aid in emplacement such as initiation wire, stabilizing ground stakes, sand bags, and canister carrying straps. If the emplaced obstacle is not initiated, SAVO can be recovered for future re-deployment. This item is compliant with the U.S. National landmine policy and supports the U.S. Army modernization priorities in support of the National Defense Strategy. SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical SAVO

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

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

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	82.915	64.092	44.621	-	44.621
Current President's Budget	79.504	56.067	50.314	-	50.314
Total Adjustments	-3.411	-8.025	5.693	-	5.693
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.686			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.411	-2.339			
• Adjustments to Budget Years	-	-	5.693	-	5.693

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 606: *Cntrmn/Barrier Adv Dev*		
Congressional Add: *Program increase - M58 mine clearing line charge*	-	2.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603619A *I Landmine Warfare and Barrier - Adv Dev*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add Subtotals for Project: 606	-	2.000
Congressional Add Totals for all Projects	-	2.000

Change Summary Explanation

Fiscal Year 2022 (FY22) funding increase in the amount of $5.693 million is due to a restructuring of a requirement of $5.922 million to support Project CE5 - Breaching Capability Development-Mounted, funding increase in the amount of $3.951 million for BU5-Standoff Activated Volcano Obstacle, funding decrease in the amount of $3.842 million for EK7-Area Denial Capability Development and decrease in the amount of $0.338 million for manpower that was realigned to Operations and Maintenance from Project EK7 - Area Denial Capability Development. Program support costs have been accurately updated to reflect the realignments.

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) 606 / *Cntrmn/Barrier Adv Dev*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
606: *Cntrmn/Barrier Adv Dev*	-	-	2.000	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles. This effort will focus on the development of the Next Generation Mounted Breaching system as a modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhance operational reliability, supportability, mobility and survivability beyond the current state. This new capability and payload will be compatible for use on existing and future platforms including Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M). FY 2021 supports the development of a scalable and adjustable breaching capability that can neutralize all current and future landmines regardless of triggering type and be employed by autonomous and/or semi-autonomous systems to replace the current MICLIC capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: Program increase - M58 mine clearing line charge	-	2.000
FY 2021 Plans: Begin Technology Maturation and Risk Reduction (TMRR) efforts to be implemented into future prototyping efforts		
Congressional Adds Subtotals	-	2.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• CE5: *Breaching Capability Development - Mounted*	-	-	5.922	-	5.922	-	-	-	-	-	-

Remarks

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

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** 606 / *Cntrmn/Barrier Adv Dev*

D. Acquisition Strategy

Breaching technologies initiated through the Next Generation Breaching Technology Science &Technology effort will be transitioned for maturation and fielding. Initial effort will focus on the target defeat mechanism and risk reduction ahead of a prototype build and technology demonstration. Upon successful demonstration, this target defeat capability will then be fully integrated with detection, marking and delivery systems to provide the full breaching capability in a modular mission payload. This payload will then be fielded on multiple platforms to include the planned Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M) and existing M1150 Assault Breacher Vehicle.

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) 606 / *Cntrmn/Barrier Adv Dev*	

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
Capability Development	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		1.652	Apr 2021	-		-		-	0.000	1.652	-
		Subtotal	-	-		1.652		-		-		-	0.000	1.652	N/A

Support ($ in Millions)

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
Platform Integration Support	MIPR	DEVCOM C5ISR : Aberdeen, MD	-	-		0.178	May 2021	-		-		-	0.000	0.178	-
Vehicle Integration Support	MIPR	DEVCOM Ground Vehicle Systems Center (GVSC) : Warren, MI	-	-		0.114	May 2021	-		-		-	0.000	0.114	-
Testing Planning Support	MIPR	Engineer Research and Development Center (ERDC) : Vicksburg, MS	-	-		0.056	May 2021	-		-		-	0.000	0.056	-
		Subtotal	-	-		0.348		-		-		-	0.000	0.348	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		2.000		-		-		-	0.000	2.000	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** 606 / *Cntrmn/Barrier Adv Dev*

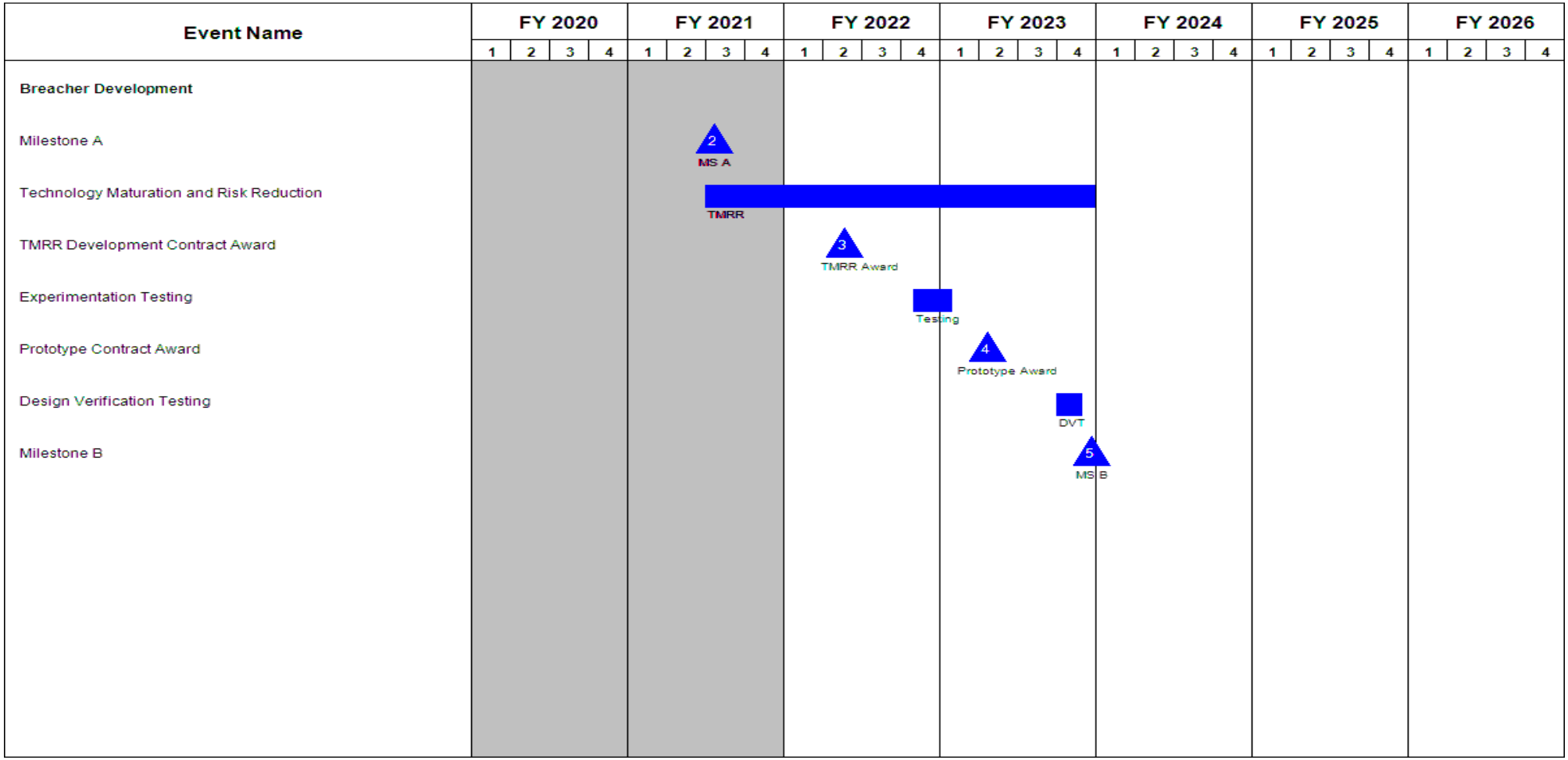

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** 606 / *Cntrmn/Barrier Adv Dev*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Breacher Development	4	2020	4	2020
Milestone A	3	2021	3	2021
Technology Maturation and Risk Reduction	3	2021	4	2023
TMRR Development Contract Award	2	2022	2	2022
Experimentation Testing	4	2022	1	2023
Prototype Contract Award	2	2023	2	2023
Design Verification Testing	4	2023	4	2023
Milestone B	4	2023	4	2023

Note

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

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) BU5 / *Standoff Volcano Obstacle (SAVO) 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
BU5: *Standoff Volcano Obstacle (SAVO) Adv Tech*	-	14.049	6.702	3.951	-	3.951	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

This item is compliant with the U.S. National landmine policy and supports the U.S. Army modernization priorities in support of the National Defense Strategy.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: SAVO Rapid Prototyping	11.798	2.236	0.386
Description: SAVO system Rapid Prototyping phase. ***FY 2021 Plans:*** Continue to perform the SAVO system Rapid Prototyping phase to include: continuation of Rapid Prototyping efforts, conduct design review, and begin qualification testing efforts. ***FY 2022 Plans:*** Complete Rapid Prototyping, complete qualification testing, and conduct operational demonstration. ***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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Fiscal Year (FY) 2022 funding decrease due to the completion of Rapid Prototyping activities.			
Title: Engineering Support ***Description:*** Provide Engineering Support. ***FY 2021 Plans:*** Continue to perform OGA and contract engineering support to the Integrated Product Team supporting the continued Rapid Prototyping effort. ***FY 2022 Plans:*** Continue to perform government and contract engineering support to the Integrated Product Team supporting the completion of the Rapid Prototyping effort and an urgent material release. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding decrease due to reduction of support team required for completion of Rapid Prototyping and transition of program to production.	1.941	2.172	1.801
Title: SAVO Management Services ***Description:*** Program Management and Support ***FY 2021 Plans:*** Continue to perform program management of the SAVO program. ***FY 2022 Plans:*** Continue to perform program management of the SAVO program and the transition to production. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding decrease due to reduction of travel and labor requirements needed to complete Rapid Prototyping and transition of program to production.	0.136	0.679	0.178
Title: SAVO Test & Evaluation ***Description:*** Provides support to Contractor/Government test activities. ***FY 2021 Plans:*** Continue to perform test and evaluation activities and begin qualification testing on prototype systems. ***FY 2022 Plans:***	0.174	1.615	1.586

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Complete government qualification testing and conduct operational demonstration.			
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 funding decrease due to requirements to support qualification testing, operational demonstration and urgent material release.			
Accomplishments/Planned Programs Subtotals	14.049	6.702	3.951

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• F76740: *Standoff Activated Volcano Obstacle*	-	-	4.685	-	4.685	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

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

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SAVO Program Management Travel and Support	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	-	0.061	Jan 2020	0.267	Feb 2021	0.100	Oct 2021	-		0.100	0.000	0.428	-
SAVO Contractor Support	C/FFP	BOWHEAD : Alexandria VA	-	-		0.187	Jun 2021	0.078	Mar 2022	-		0.078	0.000	0.265	-
SAVO Contractor Support	C/FFP	Booz Allen Hamilton : Dover, NJ	-	0.075	Nov 2021	0.225	May 2021	-		-		-	0.000	0.300	-
		Subtotal	-	0.136		0.679		0.178		-		0.178	0.000	0.993	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
Hardware Development	C/CPFF	Northrop Grumman Defense Systems : Plymouth, MN	-	11.789	May 2020	2.236	Jan 2021	0.386	Dec 2021	-		0.386	0.000	14.411	-
Prototype Components	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.009	Mar 2020	-		-		-		-	0.000	0.009	-
		Subtotal	-	11.798		2.236		0.386		-		0.386	0.000	14.420	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
SAVO - Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.917	Jan 2020	2.157	Jan 2021	1.781	Oct 2021	-		1.781	0.000	5.855	-
Human Research & Engineering (HRED) MANPRINT Support	MIPR	DEVCOM Army Research Laboratory - HRED : Aberdeen, MD	-	0.024	May 2020	0.015	Feb 2021	0.020	Dec 2021	-		0.020	0.000	0.059	-

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	1.941		2.172		1.801		-		1.801	0.000	5.914	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Qualification Testing	MIPR	Yuma Test Center : Yuma, AZ	-	0.037	Apr 2020	0.972	Aug 2021	0.736	Dec 2021	-		0.736	0.000	1.745	-
Electronic Environmental Effects E3 Testing	MIPR	White Sands Test Center : White Sands, NM	-	0.035	May 2020	0.335	Aug 2021	0.250	Dec 2021	-		0.250	0.000	0.620	-
Electronic Environmental Effects E3 Testing	MIPR	Redstone Test Center : Huntsville, AL	-	0.102	Feb 2021	0.135	Aug 2021	0.100	Dec 2021	-		0.100	0.000	0.337	-
Electronic Environmental Effects E3 Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal NJ	-	-		0.173	Aug 2021	0.100	Dec 2021	-		0.100	0.000	0.273	-
Operational Demonstration	MIPR	Various : Various	-	-		-		0.400	Dec 2021	-		0.400	0.000	0.400	-
		Subtotal	-	0.174		1.615		1.586		-		1.586	0.000	3.375	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.049		6.702		3.951		-		3.951	0.000	24.702	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*

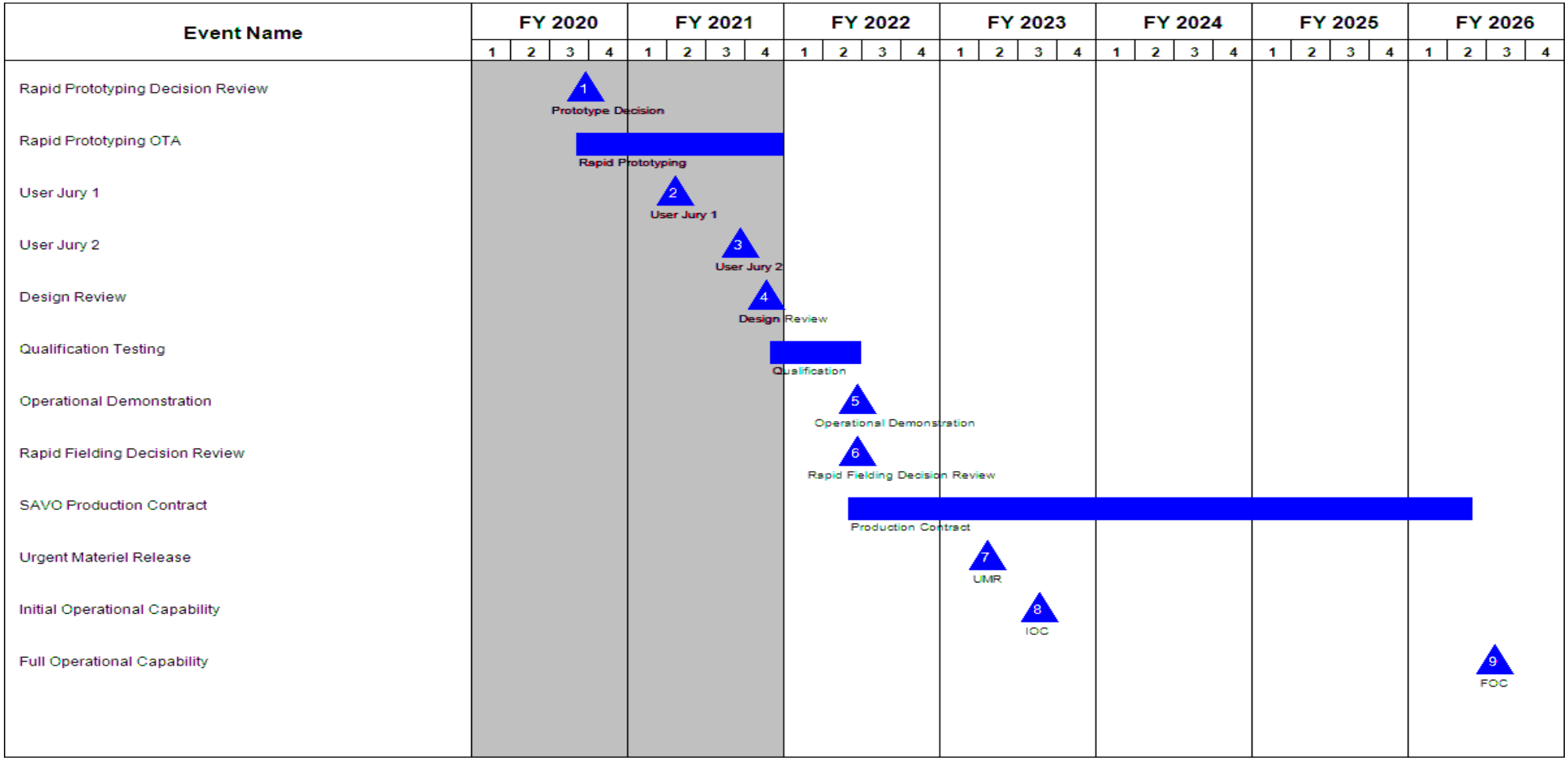

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** BU5 / *Standoff Volcano Obstacle (SAVO) Adv Tech*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Rapid Prototyping Decision Review	3	2020	3	2020
Rapid Prototyping OTA	3	2020	4	2021
User Jury 1	2	2021	2	2021
User Jury 2	3	2021	3	2021
Design Review	4	2021	4	2021
Qualification Testing	4	2021	2	2022
Operational Demonstration	2	2022	2	2022
Rapid Fielding Decision Review	2	2022	2	2022
SAVO Production Contract	2	2022	2	2026
Urgent Materiel Release	2	2023	2	2023
Initial Operational Capability	3	2023	3	2023
Full Operational Capability	3	2026	3	2026

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) CE5 / *Breaching Capability Development - Mounted*	

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
CE5: *Breaching Capability Development - Mounted*	-	-	-	5.922	-	5.922	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

The current mounted breaching system, the M58 Mine Clearing Line Charge (MICLIC), is a rocket-projected explosive line charge that was initially fielded over 50 years ago and is becoming increasingly less effective against modernized threat obstacles. This effort will focus on the development of the Next Generation Mounted Breaching system as a modular mission payload which will provide greater effectiveness against current and emerging threat obstacles and enhance operational reliability, supportability, mobility and survivability beyond the current state. This new capability and payload will be compatible for use on existing and future platforms including Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M). FY 2022 supports the development of a scalable and adjustable breaching capability that can neutralize all current and future landmines regardless of triggering type and be employed by autonomous and/or semi-autonomous systems to replace the current MICLIC capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Next Generation Mounted Breaching	-	-	5.922
Description: Develop the Next Generation Mounted Breaching capability to engage modernized threat obstacles. ***FY 2022 Plans:*** Continue Technology Maturation and Risk Reduction (TMRR) efforts to be implemented into future prototyping efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project 606 / Breaching Capability Development - Mounted within Program Element (PE) 0603619A / Landmine Warfare and Barrier - Adv Dev restructures to Project CE5 / Breaching Capability Development - Mounted within PE 0603619A / Landmine Warfare and Barrier - Adv Dev in FY 2022 to continue the development efforts for the Next Generation Mounted Breaching capability.			
Accomplishments/Planned Programs Subtotals	-	-	5.922

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** CE5 / *Breaching Capability Development - Mounted*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 606: *Cntrmn/Barrier Adv Dev*	-	2.000	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Breaching technologies initiated through the Next Generation Breaching Technology Science &Technology effort will be transitioned for maturation and fielding. Initial effort will focus on the target defeat mechanism and risk reduction ahead of a prototype build and technology demonstration. Upon successful demonstration, this target defeat capability will then be fully integrated with detection, marking and delivery systems to provide the full breaching capability in a modular mission payload. This payload will then be fielded on multiple platforms to include the planned Next Generation Combat Vehicle - Remote Combat Vehicle-Medium (NGCV RCV-M) and existing M1150 Assault Breacher Vehicle.

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) CE5 / *Breaching Capability Development - Mounted*	

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
TMRR Development Contractor	C/TBD	TBD : TBD	-	-		-		2.200	Feb 2022	-		2.200	0.000	2.200	-
TMRR Development Government	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.550	Oct 2021	-		0.550	0.000	0.550	-
		Subtotal	-	-		-		2.750		-		2.750	0.000	2.750	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		1.072	Oct 2021	-		1.072	0.000	1.072	-
Platform Integration Support	MIPR	DEVCOM C5ISR : Aberdeen, MD	-	-		-		0.325	Oct 2021	-		0.325	0.000	0.325	-
Vehicle Integration Support	MIPR	DEVCOM Ground Vehicle Systems Center (GVSC) : Warren, MI	-	-		-		0.275	Oct 2021	-		0.275	0.000	0.275	-
		Subtotal	-	-		-		1.672		-		1.672	0.000	1.672	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Testing	MIPR	Various : Various	-	-		-		1.500	Jul 2022	-		1.500	0.000	1.500	-
		Subtotal	-	-		-		1.500		-		1.500	0.000	1.500	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) CE5 / *Breaching Capability Development - Mounted*	

	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		5.922		-		5.922	0.000	5.922	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** CE5 / *Breaching Capability Development - Mounted*

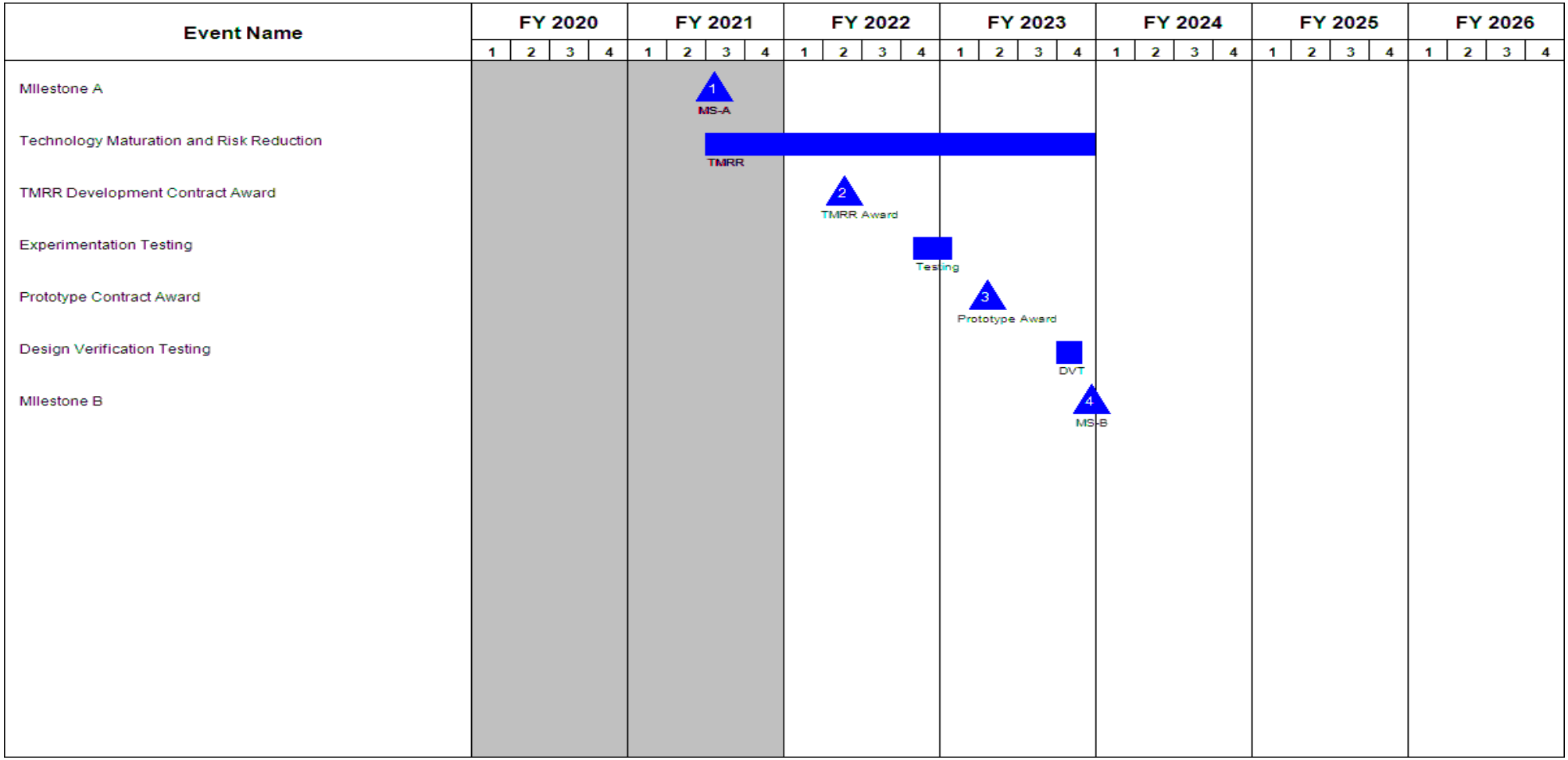

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** CE5 / *Breaching Capability Development - Mounted*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MIlestone A	3	2021	3	2021
Technology Maturation and Risk Reduction	3	2021	4	2023
TMRR Development Contract Award	2	2022	2	2022
Experimentation Testing	4	2022	1	2023
Prototype Contract Award	2	2023	2	2023
Design Verification Testing	4	2023	4	2023
MIlestone B	4	2023	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	Project (Number/Name) EK7 / *Area Denial Capability 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
EK7: *Area Denial Capability Development*	-	65.455	47.365	40.441	-	40.441	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

CTSO systems are a networked munition capability suite composed of top and bottom attack munitions which can be employed independently or together to create a controlled, scalable complex obstacle. The project will evaluate integrated technologies and develop prototype systems in a realistic operating environment for the next generation of CTSO systems to achieve doctrinally required obstacle effects during combat operations. CTSO systems will use an open system and modular architecture to facilitate future development, maintenance, repair, and product improvements.

The enduring CTSO capability development supports the approved Army Futures Command (AFC) Terrain Shaping Strategy for Land Domain and multi-domain operations (MDO). Full TSO capabilities will be developed through a series of capability insertions as approved by the Army Acquisition Executive on Feb 19, 2020. The XM204 Interim Top Attack system, the first CTSO capability insertion, supports a United States Army Europe (USAREUR) Operational Needs Statement (ONS) # 18-22702. XM204 can operate independently but can be used in conjunction with the Standoff Activated Volcano Obstacle (SAVO) system to create a complex obstacle. Follow on capability insertions will develop a Common Anti-Vehicular Munition (CAVM) which will be suitable for multiple delivery methods. Follow on capabilities will also include remote command and control, recoverability after arming, self-reporting, and full network capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Terrain Shaping Obstacles Capability Development	52.735	32.195	24.539
Description: Develop, build, and demonstrate Terrain Shaping Obstacle common munitions system. Demonstrate system in an operationally relevant environment.			
FY 2021 Plans: Continue XM204 Interim Top Attack system prototyping efforts in support of qualification testing, continue dispenser launch module design development, and complete critical design review.			
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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Complete XM204 Interim Top Attack system prototyping efforts in support of Operational Demonstration and Urgent Materiel Release. Award the Increment 1 Improved Top Attack Rapid Prototyping and CAVM development contract. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Fiscal Year (FY) 2022 funding decrease due to the finalization of XM204 prototyping efforts and the start of Increment 1 Improved Top Attack development efforts.			
Title: Engineering Support ***Description:*** Provide engineering support for Terrain Shaping Capability. ***FY 2021 Plans:*** Continue to provide engineering support for Terrain Shaping Obstacle XM204 design, dispenser launch module design, integration, design verification, and design qualification. ***FY 2022 Plans:*** Provide engineering support for final XM204 Interim Top Attack system prototyping efforts, Operational Demonstration, and Urgent Materiel Release. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding increase due to support of both XM204 and engineering development of Increment 1 Improved Top Attack Capabilities.	11.074	11.288	12.440
Title: Program Management and Oversight ***Description:*** Program management and oversight of Terrain Shaping Obstacle Capability development and system evaluation. ***FY 2021 Plans:*** Continue to provide program management and oversight for munition development, dispenser launcher module development, integration, design verification, and design qualification. ***FY 2022 Plans:*** Provide program management and oversight of Terrain Shaping Obstacle in support of development of the Improved Top Attack Munition capabilities.	0.374	0.362	0.362
Title: Test & Evaluation ***Description:*** Conduct testing and evaluation of Terrain Shaping Obstacle Capability performance. ***FY 2021 Plans:***	1.272	3.520	3.100

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Conduct qualification testing to evaluate technical performance, reliability, and safety of the XM204 Interim Top Attack System. Conduct Critical Design Review (CDR). ***FY 2022 Plans:*** Conduct final Safety and Suitability tests for XM204 culminating in Operational Demonstration Test (ODT). Procure new target vehicles to support Improved Top Attack development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding decrease is due to the completion of XM204 qualification and operational testing efforts in FY 2022.			
Accomplishments/Planned Programs Subtotals	65.455	47.365	40.441

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• E76740: *Close Terrain Shaping Obstacle*	-	4.995	34.761	-	34.761	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

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

The XM204 system, the first CTSO funded by this project, is the interim solution utilizing the Urgent Capability Acquisition Framework in support of United States Army Europe Operational Needs Statement 18-22702. It is currently completing development and qualification in order to obtain Urgent Materiel Release. Afterwards, the XM204 system will transition to production to support FY 2023 Initial Operating Capability.

The follow-on CTSO increments, Top Attack and Bottom Attack, will provide advanced command and control and advanced lethality. The programs will leverage the Middle Tier of Acquisition (MTA) pathway to allow for rapid prototyping and rapid fielding of a complex obstacle solution with Army decision points to transition to a Program of Record. This project will also integrate full network capability into Top and Bottom Attack increments.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	3.428	0.374	Nov 2019	0.362	Mar 2021	0.362	Nov 2021	-		0.362	Continuing	Continuing	-
Scorpion Contract Closeout	MIPR	General Dynamics : Reston, VA	0.305	-		-		-		-		-	0.000	0.305	-
		Subtotal	3.733	0.374		0.362		0.362		-		0.362	Continuing	Continuing	N/A

Remarks

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

Product Development ($ in Millions)

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
Improved Top Attack (TA) Rapid Prototype Development	C/CPFF	TBD : TBD	-	-		-		19.248	Mar 2022	-		19.248	Continuing	Continuing	-
XM204 Capability Development	C/CPFF	Textron Defense Systems : Wilmington, MA	1.004	41.627	Mar 2020	32.195	Nov 2020	5.291	Dec 2021	-		5.291	0.000	80.117	-
TRAC/WSMR capability study	MIPR	White Sands Missile Range : White Sands, NM	-	0.525	May 2020	-		-		-		-	0.000	0.525	-
Common Secure Network Architecture	SS/FFP	Northrop Grumman Systems Corporation : Plymouth, MN	-	4.709	Apr 2020	-		-		-		-	0.000	4.709	-
Common Secure Network Architecture	SS/CPFF	Textron Defense Systems : Wilmington, MA	17.965	4.561	Jun 2020	-		-		-		-	0.000	22.526	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Common Component Communications Study	SS/FFP	NAL Research Corporation : Manassas, Va	3.454	0.716	Aug 2020	-		-		-		-	0.000	4.170	-
High Powered Computer	C/FP	ACC New Jersey : Picatinny, NJ	-	0.247	Sep 2020	-		-		-		-	0.000	0.247	-
TSO Common Scene Generator	MIPR	DEVCOM Aviation And Missile Center : Redstone Arsenal, AL	-	0.350	Sep 2020	-		-		-		-	0.000	0.350	-
Top Attack Prototype Development A	SS/CPFF	Northrop Grumman Innovation Systems : Plymouth, MN	4.352	-		-		-		-		-	0.000	4.352	-
Top Attack Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	14.309	-		-		-		-		-	0.000	14.309	-
Technology Maturation Risk Reduction (TMRR) Development A	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Technology Maturation Risk Reduction (TMRR) Development B	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Secure Communications Network	SS/CPFF	Northrop Grumman Mission Systems : Redondo Beach, CA	16.976	-		-		-		-		-	0.000	16.976	-
User Evaluation Prototypes	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.214	-		-		-		-		-	0.000	0.214	-
		Subtotal	58.346	52.735		32.195		24.539		-		24.539	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVCOM Armaments Center Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	12.386	6.709	Dec 2020	6.684	Jan 2021	8.764	Oct 2021	-		8.764	Continuing	Continuing	-
DEVCOM C5ISR Center Engineering Support	MIPR	DEVCOM C5ISR NVESD Center : Fort Belvoir, VA	1.889	0.677	Jun 2020	0.401	Feb 2021	0.821	Jan 2022	-		0.821	Continuing	Continuing	-
Program Support	C/FFP	Bowhead : Picatinny Arsenal, NJ	0.556	0.577	May 2020	0.401	May 2021	0.636	May 2022	-		0.636	0.000	2.170	-
DEVCOM Army Research Laboratory Engineering Support	MIPR	DEVCOM Army Research Laboratory : Adelphi, MD	1.489	0.442	Jul 2020	0.301	Feb 2021	0.313	Jan 2022	-		0.313	Continuing	Continuing	-
Integrated Logistics Support	MIPR	TACOM ILSC : Warren, MI	0.156	-		0.056	May 2021	0.141	Jan 2022	-		0.141	0.000	0.353	-
Data Analysis Center	MIPR	DEVCOM-DAC : Aberdeen Proving Ground, MD	-	0.759	Aug 2020	1.476	Feb 2021	0.272	Jan 2022	-		0.272	0.000	2.507	-
Milestone Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	3.657	0.840	Jan 2020	1.079	Nov 2020	0.224	Feb 2022	-		0.224	0.514	6.314	-
Contractor Engineer Support	MIPR	American Systems INC : Chantilly, VA	-	0.074	Jun 2020	0.075	Nov 2020	0.076	Mar 2022	-		0.076	0.000	0.225	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	0.634	0.839	Apr 2020	0.815	Aug 2021	1.193	Aug 2022	-		1.193	Continuing	Continuing	-
Tactical and Trainer TDP development	MIPR	SAVIT Corporation : Rockaway, NJ	-	0.156	Nov 2020	-		-		-		-	0.000	0.156	-
Fibertek, INC. Operational Contractor Support	C/CPFF	FIBERTEK, INC. : Herndon, VA	0.130	-		-		-		-		-	0.000	0.130	-
Program Support	C/FFP	Millennium Corporation : Picatinny Arsenal, NJ	0.411	-		-		-		-		-	0.000	0.411	-
Air Worthiness Certification	MIPR	AMRDEC : Redstone Arsenal, AL	0.010	-		-		-		-		-	0.000	0.010	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Polaris Contractor Support	C/FFP	MSCOE : Ft Leonard Wood - MO	0.024	-		-		-		-		-	0.000	0.024	-
		Subtotal	21.342	11.073		11.288		12.440		-		12.440	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development Demonstration	MIPR	USAF 96th Test Squadron / OGEX : Eglin AFB, FL	-	-		-		1.000	Nov 2021	-		1.000	Continuing	Continuing	-
Procure Target Vehicles	MIPR	Target Management Office (TMO) : Huntsville, AL	-	-		0.453	Nov 2020	1.100	Nov 2021	-		1.100	0.000	1.553	-
Operational Demonstration Test	MIPR	Operational Test Command : Fort Hood, TX	-	-		-		1.000	Mar 2022	-		1.000	0.000	1.000	-
Test and Evaluation Support	MIPR	Yuma Test Center : Yuma, AZ	-	0.025	Apr 2020	2.619	Nov 2020	-		-		-	0.000	2.644	-
TSO Electromagnetic Environmental Effects E3 Test	MIPR	White Sands Missile Range : White Sands, NM	-	0.035	May 2020	0.255	May 2021	-		-		-	0.000	0.290	-
TSO E3 Test Support	MIPR	Redstone Test Center : Huntsville, AL	-	-		0.106	May 2021	-		-		-	0.000	0.106	-
Dynamic Flight Test and Ground Sensor Evaluation	MIPR	Aberdeen Test Center : Aberdeen, MD	-	0.400	Sep 2020	0.087	Dec 2020	-		-		-	0.000	0.487	-
XM204 Target Vehicle Refurbishment	MIPR	Yuma Proving Ground : Yuma Proving Ground, AZ	-	0.593	Jan 2020	-		-		-		-	0.000	0.593	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PAX2A type 1 for testing	MIPR	BAE SYSTEMS Ordnance Systems Inc : Kingsport, TN	-	0.220	Nov 2020	-		-		-		-	0.000	0.220	-
		Subtotal	-	1.273		3.520		3.100		-		3.100	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	83.421	65.455		47.365		40.441		-		40.441	Continuing	Continuing	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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

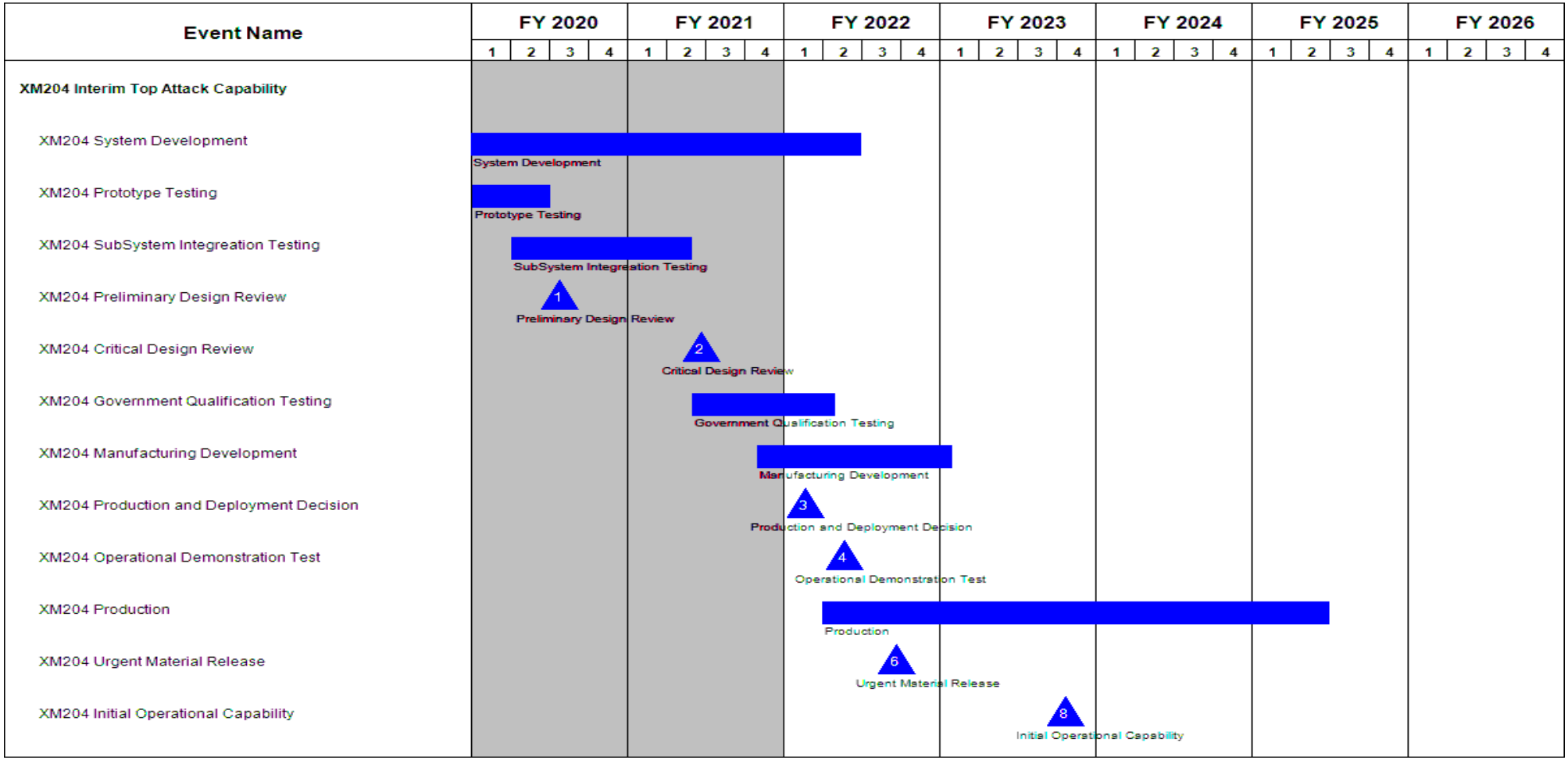

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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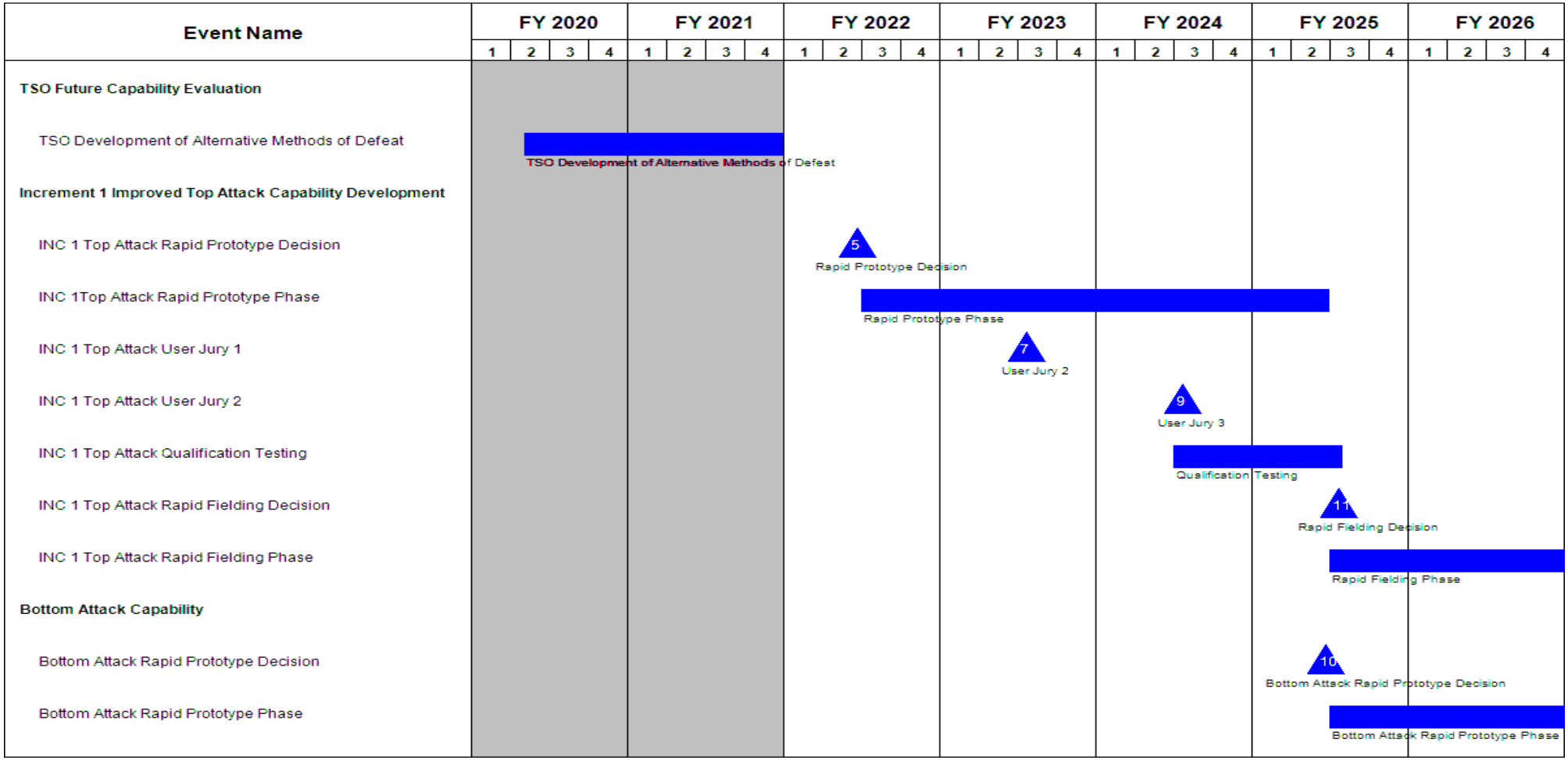

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Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

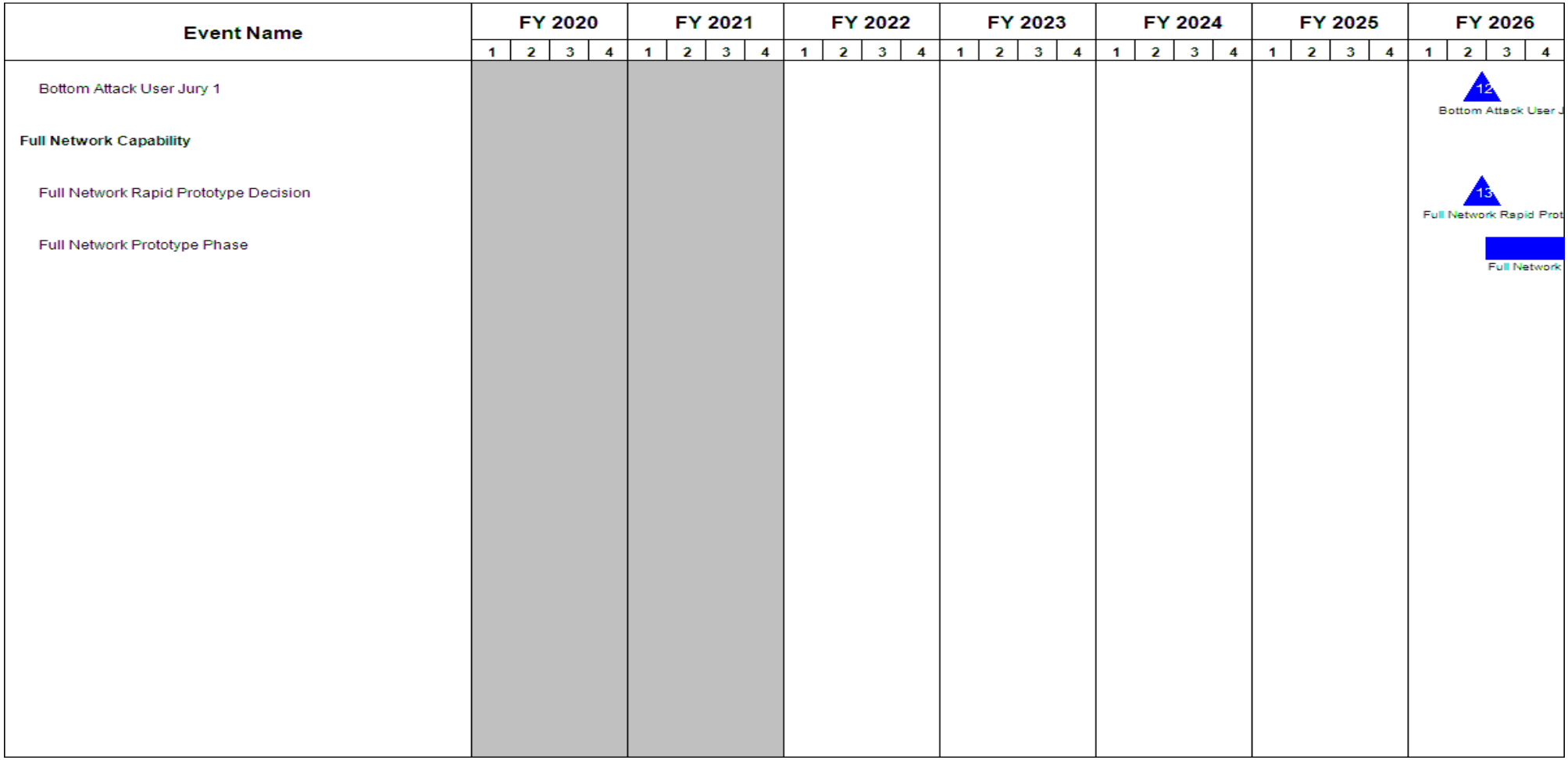

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

Schedule Details

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

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 0603619A / *Landmine Warfare and Barrier - Adv Dev*	**Project (Number/Name)** EK7 / *Area Denial Capability Development*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
XM204 Urgent Material Release	3	2022	3	2022
XM204 Initial Operational Capability	4	2023	4	2023
TSO Future Capability Evaluation	2	2020	4	2021
TSO Development of Alternative Methods of Defeat	2	2020	4	2021
Increment 1 Improved Top Attack Capability Development	2	2022	3	2032
INC 1 Top Attack Rapid Prototype Decision	2	2022	2	2022
INC 1Top Attack Rapid Prototype Phase	3	2022	2	2025
INC 1 Top Attack User Jury 1	3	2023	3	2023
INC 1 Top Attack User Jury 2	3	2024	3	2024
INC 1 Top Attack Qualification Testing	3	2024	3	2025
INC 1 Top Attack Rapid Fielding Decision	3	2025	3	2025
INC 1 Top Attack Rapid Fielding Phase	3	2025	3	2030
Bottom Attack Capability	2	2025	2	2033
Bottom Attack Rapid Prototype Decision	2	2025	2	2025
Bottom Attack Rapid Prototype Phase	3	2025	3	2028
Bottom Attack User Jury 1	2	2026	2	2026
Bottom Attack User Jury 2	2	2027	2	2027
Full Network Capability	3	2026	3	2028
Full Network Rapid Prototype Decision	2	2026	2	2026
Full Network Prototype Phase	3	2026	3	2028
Full Network User Jury 1	3	2027	3	2027
Full Network User Jury 2	3	2028	3	2028