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

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	56.067	46.637	64.001	-	64.001	41.260	6.288	6.282	6.342	Continuing	Continuing
606: <i>Cntrmn/Barrier Adv Dev</i>	-	2.000	-	-	-	-	-	-	-	-	0.000	2.000
BU5: <i>Standoff Volcano Obstacle (SAVO) Adv Tech</i>	-	6.702	2.379	-	-	-	-	-	-	-	0.000	9.081
CE5: <i>Breaching Capability Development - Mounted</i>	-	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024
EK7: <i>Area Denial Capability Development</i>	-	47.365	40.391	56.844	-	56.844	41.260	6.288	6.282	6.342	Continuing	Continuing

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

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

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

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

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
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and canister carrying straps. If the emplaced obstacle is not initiated, XM343 SAVO can be recovered for future re-deployment. This item is compliant with the DoD Landmine Policy and supports the U.S. Army modernization priorities in support of the National Defense Strategy. SAVO Trainer base plates will reflect the form, fit, function, and weight of the tactical SAVO base plate. Trainer base plates interface with the fielded Volcano training canisters and are reusable. Upon receipt of a launch signal from a fielded initiation system, the training base plates produce sight and sound effects to effectively represent the SAVO obstacle's mine launch and armed status functionality.

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

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

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

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
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**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 606: *Cntrmn/Barrier Adv Dev*

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

Congressional Add Subtotals for Project: 606

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	2.000	-
	2.000	-
	2.000	-

**Change Summary Explanation**

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> 606 / Cntrmn/Barrier Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
606: Cntrmn/Barrier Adv Dev	-	2.000	-	-	-	-	-	-	-	-	0.000	2.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

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

**A. Mission Description and Budget Item Justification**

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

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

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

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• CE5: Breaching Capability Development - Mounted	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024

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

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

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

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

**D. Acquisition Strategy**

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> 606 / Cntrmn/Barrier Adv Dev
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Capability Development	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.652	Apr 2021	-		-		-		-	0.000	1.652	-
<b>Subtotal</b>			-	1.652		-		-		-		-	0.000	1.652	N/A

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

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>		-	2.000	-	-	-	0.000	2.000	N/A

**Remarks**

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

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Breacher Development</b>																												
Technology Maturation and Risk Reduction																												
Prototype Development																												
Materiel Development Decision																												
Subsystem Testing																												
Milestone B																												
Engineering and Manufacturing Development																												
Integration Testing																												
Critical Design Review																												
Milestone C																												
LRIP Contract																												
Operational Testing																												

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

Schedule Details

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

**Note**

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev			<b>Project (Number/Name)</b> BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	6.702	2.379	-	-	-	-	-	-	-	0.000	9.081
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

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

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

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

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

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

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

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

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
Funding transferred in accordance with Title 15 USC 638			
<b>Accomplishments/Planned Programs Subtotals</b>	6.702	2.379	-

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

<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• F76740: <i>Standoff Activated Volcano Obstacle</i>	-	4.685	4.503	-	4.503	10.700	6.186	0.753	-	0.000	26.827

**Remarks**

**D. Acquisition Strategy**

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

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603619A / Landmine Warfare and Barrier - Adv Dev				BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SAVO Program Management Travel and Support	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	0.061	0.087	Mar 2021	0.020	Apr 2022	-		-		-	0.000	0.168	-
SAVO Contractor Support	C/FFP	BOWHEAD : Alexandria VA	-	0.108	Jun 2021	0.100	Jul 2022	-		-		-	0.000	0.208	-
SAVO Contractor Support	C/FFP	Booz Allen Hamilton : Dover, NJ	0.075	0.230	Jun 2021	-		-		-		-	0.000	0.305	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.087		-		-		-	0.000	0.087	-
<b>Subtotal</b>			0.136	0.425		0.207		-		-		-	0.000	0.768	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPFF	Northrop Grumman Defense Systems : Plymouth, MN	11.789	2.236	Jan 2021	1.427	Mar 2022	-		-		-	0.000	15.452	-
Prototype Components	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.009	-		-		-		-		-	0.000	0.009	-
<b>Subtotal</b>			11.798	2.236		1.427		-		-		-	0.000	15.461	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SAVO - Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.917	1.793	Jan 2021	0.400	May 2022	-		-		-	0.000	4.110	-
Human Research & Engineering (HRED) MANPRINT Support	MIPR	DEVCOM Army Research Laboratory	0.024	0.044	Jun 2021	0.005	May 2022	-		-		-	0.000	0.073	-

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> BU5 / Standoff Volcano Obstacle (SAVO) Adv Tech
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<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		- HRED : Aberdeen, MD													
SAVO - Colocated Matrix	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.375	Nov 2020	-		-		-		-	0.000	0.375	-
<b>Subtotal</b>			1.941	2.212		0.405		-		-		-	0.000	4.558	N/A

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

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		14.049	6.702	2.379	-	-	-	0.000	23.130	N/A

**Remarks**

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

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Rapid Prototyping OTA	[Blue Bar]																											
User Jury 1	▲ 1 User Jury 1																											
Doctrine Tactics and Training Event					▲ 4 Doctrine Tactics and Training Event																							
Design Review 1	▲ 2 Design Review 1																											
Design Review 2					▲ 3 Design Review 2																							
Qualification Testing					[Blue Bar] Qualification Testing																							
Design Review 3					▲ 5 Design Review 3																							
Operational Assessment					▲ 6 Operational Assessment																							
Production Decision Review					▲ 7 Production Decision Review																							
SAVO Production Contract	[Blue Bar]																											
Urgent Materiel Release									▲ 8 UMR																			
Initial Operational Capability													▲ 9 IOC															
Full Operational Capability																					▲ 10 FOC							

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

Schedule Details

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev			<b>Project (Number/Name)</b> CE5 / Breaching Capability Development - Mounted				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CE5: Breaching Capability Development - Mounted	-	-	3.867	7.157	-	7.157	-	-	-	-	0.000	11.024
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

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

**A. Mission Description and Budget Item Justification**

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

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

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> CE5 / Breaching Capability Development - Mounted
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
Funding transferred in accordance with Title 15 USC 638			
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> Funding transferred in accordance with Title 15 USC 638			
<b>Accomplishments/Planned Programs Subtotals</b>	-	3.867	7.157

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

**Remarks**

**D. Acquisition Strategy**

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

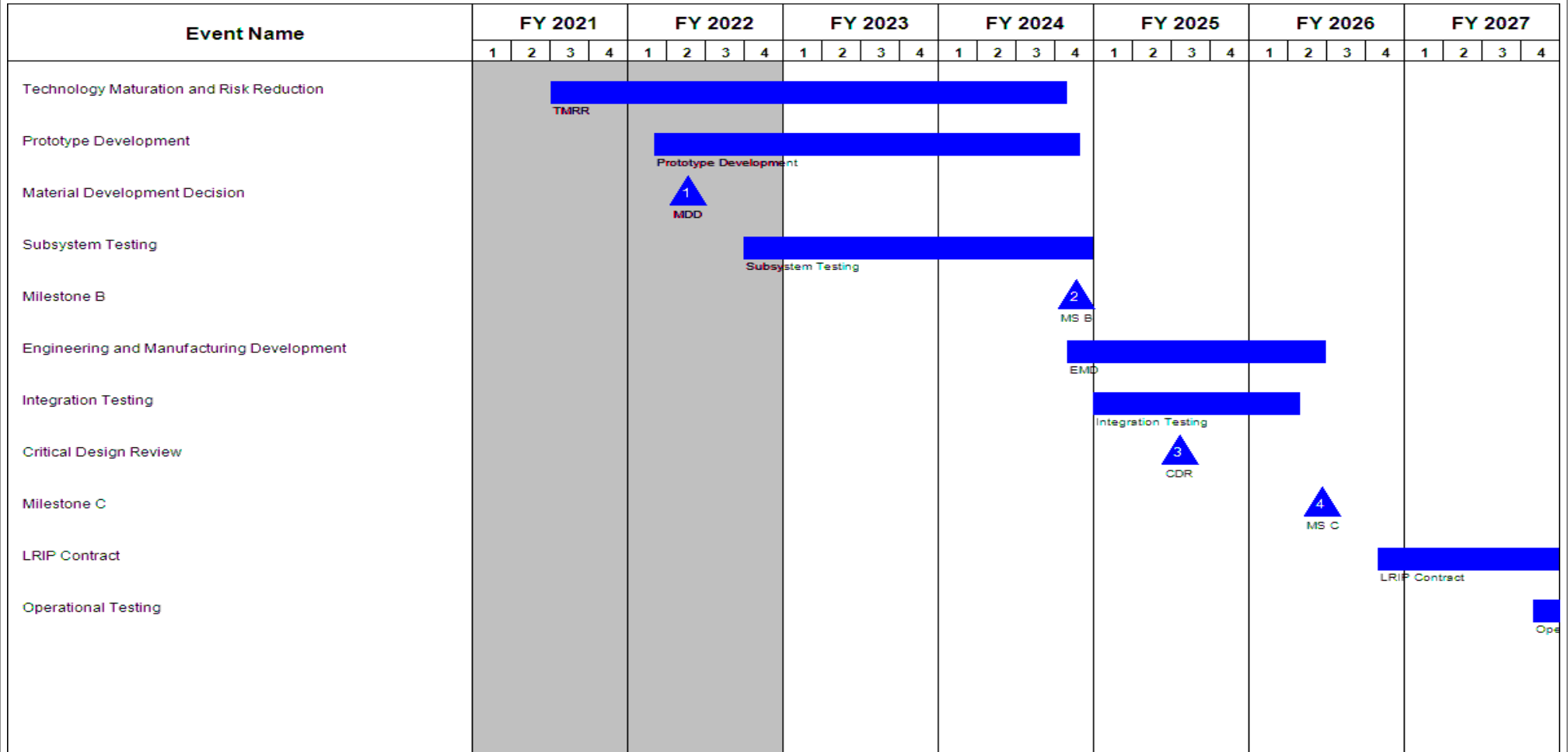
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603619A / Landmine Warfare and Barrier - Adv Dev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



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



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

Schedule Details

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev				<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EK7: Area Denial Capability Development	-	47.365	40.391	56.844	-	56.844	41.260	6.288	6.282	6.342	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

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

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

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

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

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

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

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

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

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

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

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

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

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

**Remarks**

**D. Acquisition Strategy**

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

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

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	PM Close Combat Systems : Picatinny Arsenal, NJ	3.802	0.078	Apr 2021	0.080	Nov 2021	0.362	Nov 2022	-		0.362	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.476		-		-		-	0.000	1.476	-
<b>Subtotal</b>			3.802	0.078		1.556		0.362		-		0.362	Continuing	Continuing	N/A

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

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
High Powered Computer	C/FP	ACC New Jersey : Picatinny, NJ	0.247	-		-		-		-		-	0.000	0.247	-
TSO Common Scene Generator	MIPR	DEVCOM Aviation And Missile Center : Redstone Arsenal, AL	0.350	-		-		-		-		-	0.000	0.350	-
Top Attack Prototype Development A	SS/CPFF	Northrop Grumman Innovation Systems : Plymouth, MN	4.352	-		-		-		-		-	0.000	4.352	-
Top Attack Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	14.309	-		-		-		-		-	0.000	14.309	-
Technology Maturation Risk Reduction (TMRR) Development A	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Technology Maturation Risk Reduction (TMRR) Development B	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.036	-		-		-		-		-	0.000	0.036	-
Secure Communications Network	SS/CPFF	Northrop Grumman Mission Systems : Redondo Beach, CA	16.976	-		-		-		-		-	0.000	16.976	-
User Evaluation Prototypes	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.214	-		-		-		-		-	0.000	0.214	-
PAX2A Explosive Binder	MIPR	NALAS Enginerering : Norwich, CT	-	0.078	Apr 2021	-		-		-		-	0.000	0.078	-
<b>Subtotal</b>			111.081	28.881		25.080		41.122		-		41.122	Continuing	Continuing	N/A

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DEVCOM Armaments Center Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	19.095	8.733	Jan 2021	6.186	Nov 2021	7.416	Oct 2022	-		7.416	Continuing	Continuing	-
DEVCOM C5ISR Center Engineering Support	MIPR	DEVCOM C5ISR NVESD Center : Fort Belvoir, VA	2.566	0.596	Nov 2021	0.725	Apr 2022	0.837	Jan 2023	-		0.837	Continuing	Continuing	-
Program Support	C/FFP	Bowhead : Picatinny Arsenal, NJ	1.133	0.214	Jun 2021	0.341	May 2022	0.661	May 2023	-		0.661	Continuing	Continuing	-
DEVCOM Army Research Laboratory Engineering Support	MIPR	DEVCOM Army Research Laboratory : Adelphi, MD	1.931	0.301	May 2021	0.312	Mar 2022	0.296	Jan 2023	-		0.296	Continuing	Continuing	-
Data Analysis Center	MIPR	DEVCOM-DAC : Aberdeen Proving Ground, MD	0.759	0.908	Mar 2021	0.811	Apr 2022	0.209	Jan 2023	-		0.209	Continuing	Continuing	-
Milestone Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	4.497	1.503	Nov 2020	0.922	May 2022	0.232	Feb 2023	-		0.232	Continuing	Continuing	-
Logistics Support	MIPR	CECOM ILSC : Aberdeen, MD	-	-		0.141	Apr 2022	0.079	Feb 2023	-		0.079	0.000	0.220	-
Contractor Engineer Support	MIPR	American Systems INC : Chantilly, VA	0.074	0.126	Nov 2020	0.076	Apr 2022	0.075	Mar 2023	-		0.075	Continuing	Continuing	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	1.473	0.804	Sep 2021	1.193	Aug 2022	1.240	Aug 2023	-		1.240	Continuing	Continuing	-
Tactical and Trainer TDP development	MIPR	SAVIT Corporation : Rockaway, NJ	0.156	-		-		-		-		-	0.000	0.156	-
Integrated Logistics Support	MIPR	TACOM ILSC : Warren, MI	0.156	0.057	Mar 2021	-		-		-		-	Continuing	Continuing	-
Fibertek, INC. Operational Contractor Support	C/CPFF	FIBERTEK, INC. : Herndon, VA	0.130	-		-		-		-		-	0.000	0.130	-
Program Support	C/FFP	Millennium Corporation : Picatinny Arsenal, NJ	0.411	-		-		-		-		-	0.000	0.411	-

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Air Worthiness Certification	MIPR	AMRDEC : Redstone Arsenal, AL	0.010	-		-		-		-		-	0.000	0.010	-
Polaris Contractor Support	C/FFP	MSCOE : Ft Leonard Wood - MO	0.024	-		-		-		-		-	0.000	0.024	-
Full Hazard Classification for PAX2A	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.051	Jun 2021	-		-		-		-	0.000	0.051	-
<b>Subtotal</b>			32.415	13.293		10.707		11.045		-		11.045	Continuing	Continuing	N/A

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CTSO INC 1 Penetration Assessment	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen Proving Grounds, MD	-	0.087	Sep 2021	-		0.075	Jun 2023	-		0.075	0.000	0.162	-
CTSO INC 1 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		-		0.050	Oct 2022	-		0.050	0.000	0.050	-
CTSO INC 1 Test and Evaluation Support	MIPR	Army Environmental Support : Aberdeen Proving Grounds, MD	-	-		-		0.035	Oct 2022	-		0.035	0.000	0.035	-
CTSO INC 1 Cryptographic Module Validation Program	MIPR	DEVCOM DAC : White Sands, NM	-	-		-		0.100	Aug 2023	-		0.100	0.000	0.100	-
CTSO INC 1 Environmental and Transportation Test	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		-		0.300	Jul 2023	-		0.300	0.000	0.300	-
CTSO INC 1 Operational Integration Test	MIPR	DEVCOM C5ISR NVESD Center : Fort Belvoir, VA	-	-		-		0.075	Apr 2023	-		0.075	0.000	0.075	-
XM204 Operational Assessment	MIPR	Operational Test Command : Fort Hood, TX	-	0.289	Feb 2022	1.152	Dec 2021	-		-		-	0.000	1.441	-
CTSO INC 1 Procure Target Vehicles	MIPR	Target Management Office (TMO) : Huntsville, AL	-	0.927	Nov 2020	1.100	May 2022	-		-		-	0.000	2.027	-
XM204 Test and Evaluation Support	MIPR	Yuma Test Center : Yuma, AZ	0.025	2.794	Nov 2020	-		-		-		-	0.000	2.819	-
XM204 Electromagnetic Environmental Effects E3 Test	MIPR	White Sands Missile Range : White Sands, NM	0.035	0.184	Jan 2022	-		-		-		-	0.000	0.219	-

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM204 E3 Test Support	MIPR	Redstone Test Center : Huntsville, AL	-	0.211	Mar 2022	-		-		-		-	0.000	0.211	-
XM204 Dynamic Flight Test and Ground Sensor Evaluation	MIPR	Aberdeen Test Center : Aberdeen, MD	0.400	0.068	Dec 2020	-		-		-		-	0.000	0.468	-
XM204 Target Vehicle Refurbishment	MIPR	Yuma Proving Ground : Yuma Proving Ground, AZ	0.593	-		-		-		-		-	0.000	0.593	-
XM204 PAX2A type 1 for testing	MIPR	BAE SYSTEMS Ordnance Systems Inc : Kingsport, TN	0.220	-		-		-		-		-	0.000	0.220	-
XM204 PAX2A for Testing and Packaging, Crating & Handling	MIPR	Letterkenny Army Depot : Chambersburg, PA	-	0.002	Dec 2021	-		-		-		-	0.000	0.002	-
XM204 Operational Assessment	MIPR	Aberdeen Test Center : Aberdeen, MD	-	0.551	Aug 2021	-		-		-		-	0.000	0.551	-
Govt System Verification Test	MIPR	Aberdeen Test Center : Aberdeen, MD	-	-		0.484	Dec 2021	-		-		-	0.000	0.484	-
CTSO XM204 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		0.049	Mar 2022	-		-		-	0.000	0.049	-
CTSO XM204 E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	-		0.257	May 2022	-		-		-	0.000	0.257	-
Adversarial Asessment	MIPR	Letterkenny Army Depot : Chambersberg, PA	-	-		0.006	Apr 2022	-		-		-	0.000	0.006	-
<b>Subtotal</b>			1.273	5.113		3.048		4.315		-		4.315	0.000	13.749	N/A



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

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027												
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4									
<b>XM204 Interim Top Attack Capability</b>																																					
XM204 System Development	[Blue Bar]																																				
System Development																																					
XM204 SubSystem Integration Testing	[Blue Bar]																																				
SubSystem Integration Testing																																					
XM204 Critical Design Review					▲ 1																																
Critical Design Review					1																																
XM204 Government Qualification Testing					[Blue Bar]																																
Government Qualification Testing																																					
XM204 Manufacturing Development					[Blue Bar]																																
Manufacturing Development																																					
XM204 Production and Deployment Decision					▲ 2																																
Production and Deployment Decision					2																																
XM204 Operational Assessment Test					▲ 3																																
Operational Assessment Test					3																																
XM204 Production					[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]																
Production																																					
XM204 Urgent Material Release									▲ 5																												
Urgent Material Release									5																												
XM204 Initial Operational Capability													▲ 8																								
Initial Operational Capability													8																								
<b>TSO Future Capability Evaluation</b>																																					
TSO Development of Alternative Methods of Defeat	[Blue Bar]																																				
TSO Development of Alternative Methods of Defeat																																					

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

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
<b>Increment 1 Improved Top Attack Capability Development</b>																														
INC 1 Top Attack Rapid Prototype Decision																													4	Rapid Prototype Decision
INC 1 Top Attack Rapid Prototype Phase																													5	Rapid Prototype Phase
INC 1 Top Attack User Jury 1																													6	User Jury 1
INC 1 Top Attack Preliminary Design Review																													7	PDR
INC 1 Top Attack User Jury 2																													9	User Jury 2
INC 1 Top Attack Qualification Testing																													10	CDR
INC 1 Top Attack Critical Design Review																													12	INC 1 MS C Decision
INC 1 MS C Decision																													15	INC 1 Type Classification
INC 1 Type Classification																													18	INC 1 Full Material Release
INC 1 Production and Deployment Phase																													19	INC 1 Production and Deployment Phase
INC 1 Full Material Release																													20	INC 1 Full Material Release
<b>INC 2 Capability</b>																														

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

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027																																																
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																																													
INC 2 Rapid Prototype Decision																	▲ 11																																																								
INC 2 Rapid Prototype Phase																	■																																																								
INC 2 User Jury 1																																	▲ 13																																								
INC 2 User Jury 2																																																	▲ 16																								
<b>Full Network Capability</b>																																																																									
Full Network Rapid Prototype Decision																																																	▲ 14																								
Full Network Prototype Phase																																																	■																								
Full Network User Jury 1																																																																	▲ 17								

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

Schedule Details

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

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development
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Events	Start		End	
	Quarter	Year	Quarter	Year
XM204 Urgent Material Release	2	2023	2	2023
XM204 Initial Operational Capability	4	2023	4	2023
TSO Future Capability Evaluation	2	2020	4	2021
TSO Development of Alternative Methods of Defeat	2	2020	4	2021
Increment 1 Improved Top Attack Capability Development	4	2022	4	2032
INC 1 Top Attack Rapid Prototype Decision	4	2022	4	2022
INC 1 Top Attack Rapid Prototype Phase	4	2022	1	2026
INC 1 Top Attack User Jury 1	3	2023	3	2023
INC 1 Top Attack Preliminary Design Review	4	2023	4	2023
INC 1 Top Attack User Jury 2	3	2024	3	2024
INC 1 Top Attack Qualification Testing	4	2024	3	2027
INC 1 Top Attack Critical Design Review	4	2024	4	2024
INC 1 MS C Decision	1	2026	1	2026
INC 1 Type Classification	4	2026	4	2026
INC 1 Production and Deployment Phase	1	2026	4	2033
INC 1 Full Material Release	4	2027	4	2027
INC 1 Initial Operational Capability	4	2028	4	2028
INC 2 Capability	2	2025	2	2033
INC 2 Rapid Prototype Decision	2	2025	2	2025
INC 2 Rapid Prototype Phase	3	2025	3	2028
INC 2 User Jury 1	2	2026	2	2026
INC 2 User Jury 2	2	2027	2	2027
Full Network Capability	3	2026	3	2028
Full Network Rapid Prototype Decision	2	2026	2	2026
Full Network Prototype Phase	3	2026	3	2028

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	<b>Project (Number/Name)</b> EK7 / <i>Area Denial Capability Development</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Full Network User Jury 1	3	2027	3	2027
Full Network User Jury 2	3	2028	3	2028