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**Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army** **Date:** March 2023

<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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	44.933	61.953	47.537	-	47.537	6.165	6.165	6.229	6.298	Continuing	Continuing
BU5: <i>Standoff Volcano Obstacle (SAVO) Adv Tech</i>	-	2.292	-	-	-	-	-	-	-	-	0.000	2.292
CE5: <i>Breaching Capability Development - Mounted</i>	-	3.726	7.157	7.131	-	7.131	-	-	-	-	0.000	18.014
EK7: <i>Area Denial Capability Development</i>	-	38.915	54.796	40.406	-	40.406	6.165	6.165	6.229	6.298	Continuing	Continuing

**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 US anti-personnel landmine policy compliant 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.

Projects 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 - Explosive 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 platforms for Explosive Breacher are the Assault Breacher Vehicle (ABV), as well as the Remote Combat Vehicle (RCV). Explosive Breacher has been endorsed by the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT) to fulfill the RCV breaching requirements. The modularity also allows for integration with other current and future platforms. The FY 2024 request supports continued Technology Maturation and Risk Reduction (TMRR), as well as a system-level concept demonstration / soldier touchpoint and pre-milestone B activities to support an FY25 MS-B.

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. Anti-personnel landmine policy compliant munition fields. During joint, multi-domain, high intensity conflict CTSO systems

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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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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, has entered into production and will achieve Initial Operational Capability (IOC) by FY 2025 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.

The total cost of the CTSO Inc. 1 Middle Tier of Acquisition effort is \$101 million RDT&E from FY23 to FY24. The CTSO Inc. 1 MTA is fully funded across the Future Years Defense Program.

<b>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2022</u></b>	<b><u>FY 2023</u></b>	<b><u>FY 2024 Base</u></b>	<b><u>FY 2024 OCO</u></b>	<b><u>FY 2024 Total</u></b>
Previous President's Budget	46.637	64.001	41.260	-	41.260
Current President's Budget	44.933	61.953	47.537	-	47.537
Total Adjustments	-1.704	-2.048	6.277	-	6.277
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.704	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	6.277	-	6.277
• FFRDC Transfer	-	-0.048	-	-	-
• Ukraine Supplemental	-	6.000	-	-	-

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2024 Army **Date:** March 2023

**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*

**Change Summary Explanation**

The programs changed in the amount of +\$6.277M is caused by a decrease to Area Denial Capability Development in the amount of -\$0.854M and an increase to Breaching Capability Development-Mounted in the amount of +\$7.131M. The addition of +\$7.131M on Breaching Capability Development - Mounted, is required for continued Technology Maturation and Risk Reduction efforts for the Explosive Breaching capability.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2024 Army **Date:** March 2023

<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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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
BU5: Standoff Volcano Obstacle (SAVO) Adv Tech	-	2.292	-	-	-	-	-	-	-	-	0.000	2.292
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 capability is compliant with the U.S. anti-personnel landmine policy and supports the U.S. Army modernization priorities in support of Multi Domain Operations (MDO).

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

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

	FY 2022	FY 2023	FY 2024
<b>Title:</b> SAVO Rapid Prototyping <b>Description:</b> SAVO system Rapid Prototyping phase.	1.427	-	-
<b>Title:</b> Engineering Support <b>Description:</b> Provide Engineering Support.	0.783	-	-
<b>Title:</b> SAVO Management Services <b>Description:</b> Program Management and Support	0.045	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army		<b>Date:</b> March 2023
<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 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> SAVO Test & Evaluation	0.037	-	-
<b>Description:</b> Provides support to Contractor/Government test activities.			
<b>Accomplishments/Planned Programs Subtotals</b>	2.292	-	-

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• F76740: STANDOFF ACTIVATED VOLCANO OBSTACLE (SAVO), XM343	4.685	4.503	17.410	-	17.410	16.728	16.446	0.964	-	0.000	60.736

**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 2025.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
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								
<b>Management Services (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	0.148	0.045	Jun 2022	-		-		-		-	0.000	0.193	-	
SAVO Contractor Support	C/FFP	BOWHEAD : Alexandria VA	0.108	-		-		-		-		-	0.000	0.108	-	
<b>Subtotal</b>			0.256	0.045		-		-		-		-	0.000	0.301	N/A	
<b>Product Development (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	14.025	1.427	Mar 2022	-		-		-		-	0.000	15.452	-	
<b>Subtotal</b>			14.025	1.427		-		-		-		-	0.000	15.452	N/A	
<b>Support (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	3.710	0.783	Apr 2022	-		-		-		-	0.000	4.493	-	
Human Research & Engineering (HRED) MANPRINT Support	MIPR	DEVCOM Army Research Laboratory - HRED : Aberdeen, MD	0.068	-		-		-		-		-	0.000	0.068	-	
<b>Subtotal</b>			3.778	0.783		-		-		-		-	0.000	4.561	N/A	



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2024 Army</b>		<b>Date:</b> March 2023
<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 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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	Rapid Prototyping																											
Design Review 2	▲ 1																											
Design Review 2		▲ 2																										
Doctrine Tactics and Training Event			▲ 2																									
Doctrine Tactics and Training Event				▲ 2																								
Qualification Testing				▲ 3																								
Qualification Testing					▲ 3																							
Design Review 3					▲ 3																							
Design Review 3						▲ 3																						
Operational Assessment					▲ 3																							
Operational Assessment						▲ 3																						
Production Decision Review							▲ 4																					
Production Decision Review								▲ 4																				
SAVO Production Contract									▲ 4																			
SAVO Production Contract										▲ 4																		
Urgent Materiel Release														▲ 5														
Urgent Materiel Release															▲ 5													
Initial Operational Capability																												
Initial Operational Capability																												
Full Operational Capability																												
Full Operational Capability																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Army		<b>Date:</b> March 2023
<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
Design Review 2	1	2022	1	2022
Doctrine Tactics and Training Event	2	2022	2	2022
Design Review 1	2	2021	2	2021
Qualification Testing	3	2022	3	2023
Design Review 3	1	2023	1	2023
Operational Assessment	1	2023	1	2023
Production Decision Review	3	2023	3	2023
SAVO Production Contract	4	2023	4	2028
Urgent Materiel Release	3	2025	3	2025
Initial Operational Capability	4	2025	4	2025
Full Operational Capability	3	2027	3	2027

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army										<b>Date:</b> March 2023		
<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 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CE5: Breaching Capability Development - Mounted	-	3.726	7.157	7.131	-	7.131	-	-	-	-	0.000	18.014
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**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 XM123 Ground Obstacle Breaching Lane Neutralizer (GOBLN) 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 platforms for GOBLN are the Assault Breacher Vehicle (ABV), as well as the Remote Combat Vehicle (RCV). GOBLN has been endorsed by the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT) to fulfill the RCV breaching requirements. The modularity also allows for integration with other current and future platforms. The FY 2024 request supports continued Technology Maturation and Risk Reduction (TMRR), as well as a system-level concept demonstration / soldier touchpoint and pre-milestone B activities to support an FY26 MS-B.

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

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p><b>Title:</b> XM123 Ground Obstacle Breaching Lane Neutralizer (GOBLN)</p> <p><b>Description:</b> Develop the Next Generation Mounted Breaching capability to engage near-peer current and emerging threat obstacles.</p> <p><b>FY 2023 Plans:</b> FY 2023 will support continued TMRR with subsystem development and testing and defining the final system architecture.</p> <p><b>FY 2024 Plans:</b> FY 2024 will support continued TMRR, a system-level concept demonstration/soldier touchpoint, and preparation activities for an FY26 MS-B.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Funding change reflects planned lifecycle of this effort.</p>	3.726	6.896	7.131
<p><b>Title:</b> Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)</p> <p><b>Description:</b> Funding transferred in accordance with Title 15 USC §638</p> <p><b>FY 2023 Plans:</b></p>	-	0.261	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army		<b>Date:</b> March 2023		
<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>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
Funding transferred in accordance with Title 15 USC §638				
<b>FY 2023 to FY 2024 Increase/Decrease Statement:</b>				
Funding transferred in accordance with Title 15 USC §638				
<b>Accomplishments/Planned Programs Subtotals</b>		3.726	7.157	7.131
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
<p>The Ground Obstacle Breaching Lane Neutralizer (GOBLN) Program of Record (POR) was established as an output of the Explosive Breacher Acquisition Shaping Panel Part 2 held on 13 June 2022 with Army Leadership. An Acquisition Decision Memorandum (ADM) is currently in staffing and is expected in 2QFY23. The goal of the TMRR phase is to integrate mature subsystems and hold a system-level concept demonstrations in FY24 and FY25 with MS-B occurring in FY 2026. The design will be refined in the Engineering and Manufacturing Development (EMD) phase through a single, competitively selected systems contractor utilizing a Government-developed Technical Data Package (TDP), with MS-C expected in FY 2028. It is expected that the EMD contract will include one or more LRIP option(s) to support deliveries in FY 2029, some of which will be utilized for operational testing expected to occur from 3QFY29 to 2QFY30. Initial Operational Capability (IOC) is expected in FY 2030 with FMR planned for FY 2031.</p>				

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army** **Date:** March 2023

<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>Management Services (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.261		-		-		-	0.000	0.261	-
<b>Subtotal</b>			-	-		0.261		-		-		-	0.000	0.261	N/A

<b>Product Development (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
TMRR Development Government	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.892	Jul 2022	2.762	Feb 2023	3.630	Oct 2023	-		3.630	0.000	8.284	-
Test Hardware	Various	Various : Various	-	-		1.000	May 2023	-		-		-	0.000	1.000	-
<b>Subtotal</b>			-	1.892		3.762		3.630		-		3.630	0.000	9.284	N/A

<b>Support (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Sensor Modification and Integration	MIPR	DEVCOM C6ISR : Fort Belvoir, VA	-	0.768	Sep 2022	1.395	Mar 2023	1.410	Nov 2023	-		1.410	Continuing	Continuing	-
Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	1.000	May 2022	1.000	Feb 2023	1.381	Oct 2023	-		1.381	Continuing	Continuing	-
Warhead Specialist	C/CPFF	American Systems Corporation : Chantilly, VA	-	0.066	Aug 2022	0.049	Jan 2023	-		-		-	0.000	0.115	-
Platform Virtual Integration	MIPR	DEVCOM GVSC : Warren, MI	-	-		0.240	Feb 2023	-		-		-	0.000	0.240	-
<b>Subtotal</b>			-	1.834		2.684		2.791		-		2.791	Continuing	Continuing	N/A





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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Army		<b>Date:</b> March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation and Risk Reduction	3	2021	4	2025
Material Development Decision	2	2023	2	2023
Touchpoint 1 (Launcher Subsystem Verification Test)	1	2023	1	2023
Touchpoint 2 (Sensor/Detection Subsystem Demonstration)	2	2023	2	2023
Touchpoint 3 (Neutralization Subsystem Verification)	4	2023	4	2023
Soldier Touchpoint 4 (System Concept Demonstration)	2	2024	3	2024
Soldier Touchpoint 5 (System Demonstration)	2	2025	3	2025
Milestone B	2	2026	2	2026
Engineering and Manufacturing Development	2	2026	1	2028
Integration Testing	2	2026	1	2028
Critical Design Review	3	2026	3	2026
Milestone C	2	2028	2	2028
LRIP Contract	3	2028	4	2029
Operational Testing	3	2029	2	2030

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army										<b>Date:</b> March 2023		
<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>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
<i>EK7: Area Denial Capability Development</i>	-	38.915	54.796	40.406	-	40.406	6.165	6.165	6.229	6.298	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 U.S. Anti-personnel 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, has entered into production and will achieve Initial Operational Capability (IOC) by FY 2025 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.

The total cost of the CTSO Inc. 1 Middle Tier of Acquisition effort is \$101 million RDT&E from FY23 to FY24. The CTSO Inc. 1 MTA is fully funded across the Future Years Defense Program.

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

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Terrain Shaping Obstacles Capability Development	24.695	33.904	25.447

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army		<b>Date:</b> March 2023
<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>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p><b>Description:</b> Develop, build, and demonstrate Terrain Shaping Obstacle common munitions system. Demonstrate system in an operationally relevant environment.</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. Complete Preliminary Design Review.</p> <p><b>FY 2024 Plans:</b> Complete CTSO Increment 1 munition design against peer targets and demonstrate performance and lethality. Conduct remaining updates of all fuzing and ammunition safety features to address certification pre-reviews. Demonstrate a fully integrated munition and communication prototype at User Jury 2 - shaping the AFC CDD that establishes final requirements for qualification and fielding. Coordinate and conduct Cyber Vulnerability Investigation to inform final cyber hardening design tasks. Complete Critical Design Review. Conduct Risk Reduction efforts for Bottom Attack Munitions to inform CTSO INC 2.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> FY 2024 decrease due to contractor finalizing maturation of prototypes and risk reduction at commercial facilities in preparation of USG testing in Government facilities the following year. U.S. Government will complete all required target procurement to support testing.</p>			
<p><b>Title:</b> Engineering Support</p> <p><b>Description:</b> Provide engineering support for Terrain Shaping Capability.</p> <p><b>FY 2023 Plans:</b> Provide engineering support for CTSO Increment 1 system design documentation, User Jury 1, contractor component level testing, and preliminary design review.</p> <p><b>FY 2024 Plans:</b> Provide engineering support for CTSO Increment 1 system design documentation, User Jury 2, contractor integration verification, and Critical Design Review. Leverage previous Test &amp; Evaluation Strategy (TES) to develop the Test &amp; Evaluation Master Plan (TEMP) to support progression towards system level qualification.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p>	10.843	13.764	11.222

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army		<b>Date:</b> March 2023		
<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 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
FY 2024 decrease due to majority of testing remaining supports the risk reduction efforts at the contractor facilities. Efforts in FY2024 supports planning for contractor and government qualification testing planned for FY2025.				
<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> <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 2024 Plans:</b> Provide program management and oversight of Terrain Shaping Obstacle Capability in support of development and qualification of the Increment 1 Top Attack Munition capabilities.</p>		0.113	0.362	0.362
<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 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 2024 Plans:</b> FY 2024 CTSO INC 1 Interim testing will be conducted on cyber vulnerabilities and Threat Countermeasures against fully integrated munition &amp; communications prototypes. Complete Contractor risk reduction testing, such as environmental, transportation, and lethality testing. Conduct fully integrated system sensor testing. Conduct tests at environmentally relevant locations to assess performance. Conduct E3 testing to ensure final design of electrical architecture can remain operational under full operational stresses. Refine model inputs to support future system evaluation. Repairs destroyed target vehicles from CTSO Increment 1 contractor risk reduction tests and provides vehicle support for sensor test events for INC 1's expanded target suite.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> FY 2024 decrease due to completion of rapid prototyping and maturation of technologies at contractor facilities to support system verification testing. The majority of testing remaining supports risk reductions at commercial facilities. USG facility testing will</p>		3.264	4.985	3.375

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Army		<b>Date:</b> March 2023
<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 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
ramp up in following year and have completed purchasing of target vehicle purchases required to complete testing efforts in FY2024.			
<b>Title:</b> Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) <b>Description:</b> Funding transferred in accordance with Title 15 USC §638 <b>FY 2023 Plans:</b> Funding transferred in accordance with Title 15 USC §638 <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Funding transferred in accordance with Title 15 USC §638	-	1.781	-
<b>Accomplishments/Planned Programs Subtotals</b>	38.915	54.796	40.406

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

<b>Line Item</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• E76740: <i>Close Terrain Shaping Obstacle</i>	34.761	25.403	55.374	-	55.374	27.713	27.424	11.941	10.977	0.000	193.593

**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 USAREUR ONS 18-22702. XM204 has entered into production and will achieve IOC in FY 2024 and complete production in FY 2026.

The follow-on CTSO increments, Top Attack INC 1 and Bottom Attack INC 2, will provide advanced command and control and advanced lethality. The CTSO INC1 program was approved as a 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 2024 Army** **Date:** March 2023

<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 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	3.880	0.113	Nov 2021	0.362	Feb 2023	0.362	Dec 2023	-		0.362	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.781	Jan 2023	-		-		-	0.000	1.781	-
<b>Subtotal</b>			3.880	0.113		2.143		0.362		-		0.362	Continuing	Continuing	N/A

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

<b>Product Development (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	Textron Defense Systems : Wilmington, MA	-	5.970	Nov 2022	32.685	Feb 2023	23.447	Nov 2023	-		23.447	Continuing	Continuing	-
CTSO Munition Risk Reduction	Various	Various : Various	-	-		3.000	May 2023	2.000	Jun 2024	-		2.000	0.000	5.000	-
XM204 Capability Development	C/CPFF	Textron Defense Systems : Wilmington, MA	71.434	18.725	Nov 2021	-		-		-		-	0.000	90.159	-
<b>Subtotal</b>			71.434	24.695		35.685		25.447		-		25.447	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	27.828	6.656	Jan 2022	7.536	Jan 2023	8.237	Dec 2023	-		8.237	Continuing	Continuing	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army** **Date:** March 2023

<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 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 Support	C/FFP	Bowhead : Picatinny Arsenal, NJ	1.347	-		0.661	May 2023	0.468	May 2024	-		0.468	Continuing	Continuing	-
DEVCOM Army Research Laboratory Engineering Support	MIPR	DEVCOM Army Research Laboratory : Adelphi, MD	2.232	0.312	Apr 2022	0.296	Mar 2023	0.301	Dec 2023	-		0.301	Continuing	Continuing	-
DEVCOM Data Analysis Center	MIPR	DEVCOM-DAC : Aberdeen Proving Ground, MD	1.667	0.811	May 2022	0.259	Mar 2023	0.264	Dec 2023	-		0.264	Continuing	Continuing	-
Milestone Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	6.000	0.951	May 2022	0.951	Mar 2023	0.951	May 2024	-		0.951	Continuing	Continuing	-
Logistics Support	MIPR	CECOM ILSC : Aberdeen, MD	-	0.141	Jan 2023	0.029	Feb 2023	0.090	Dec 2023	-		0.090	Continuing	Continuing	-
Contractor Engineer Support	MIPR	American Systems INC : Chantilly, VA	0.200	0.076	Jul 2022	0.110	Mar 2023	0.076	Mar 2024	-		0.076	Continuing	Continuing	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	2.277	0.800	Oct 2022	1.240	Aug 2023	0.835	Aug 2024	-		0.835	Continuing	Continuing	-
Prototyping Development of Network and RF	MIPR	C6ISR Aberdeen Proving Ground : Aberdeen, MD	-	-		0.606	Mar 2023	-		-		-	0.000	0.606	-
NETT Warrior Center	MIPR	NETT Warrior : Tobyhanna, PA	-	-		0.236	Mar 2023	-		-		-	0.000	0.236	-
ENFIRE Support	MIPR	Product Director Combat Terrain Information Systems (PD-CTIS) : Aberdeen Proving Ground, MD	-	-		0.059	Mar 2023	-		-		-	0.000	0.059	-
XM204EOD Publication Book	MIPR	Naval Surface Warhead Center : Indian Head, MD	-	0.060	Dec 2022	-		-		-		-	0.000	0.060	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army** **Date:** March 2023

<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 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 C5ISR Contractor Support	MIPR	C6ISR Aberdeen Proving Ground : Aberdeen, MD	-	0.621	Jun 2022	-		-		-		-	0.000	0.621	-
C5ISR Ft Belvoir Engineering Support	MIPR	C6ISR Ft. Belvoir : Fort Belvoir, VA	-	0.415	Jun 2022	-		-		-		-	0.000	0.415	-
<b>Subtotal</b>			41.551	10.843		11.983		11.222		-		11.222	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 E3 Personnel Electrostatic Discharge (PESD) & Helicopter (HESD) Risk Reduction Testing	MIPR	Picatiny Arsenal : Picatiny, NJ	-	-		-		0.100	Dec 2023	-		0.100	0.000	0.100	-
CTSO INC 1 E3 Hazards of Electronic Radiation to Ordnance (HERO) Risk Reduction Testing	MIPR	Whites Sands Missile Range : White Sands, NM	-	-		-		0.150	Dec 2023	-		0.150	0.000	0.150	-
CTSO INC 1 Environmental and Transportation Test	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		0.300	Jul 2023	0.400	Jan 2024	-		0.400	0.000	0.700	-
CTSO INC 1 Test and Evaluation Support	MIPR	Army Evaluation Center (AEC) : Aberdeen Proving Grounds, MD	-	-		0.015	Mar 2023	0.085	Jan 2024	-		0.085	0.000	0.100	-
CTSO INC 1 System Verification Testing Targets	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	-		2.750	Mar 2023	0.750	Apr 2024	-		0.750	0.000	3.500	-
CTSO INC 1 Warhead Evaluation Testing	MIPR	Iowa Army Ammunition Plant : Middletown, IA	-	-		-		0.200	Apr 2024	-		0.200	0.000	0.200	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army** **Date:** March 2023

<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 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 HERO E3 Testing	MIPR	White Sands Missile Range : White Sands, NM	-	-		-		0.260	Apr 2024	-		0.260	0.000	0.260	-
CTSO INC 1 User Jury 2	MIPR	Fort Leonardwood : Fort Leonardwood, MO	-	-		-		0.250	May 2024	-		0.250	0.000	0.250	-
CTSO INC 1 Warhead Assessment	MIPR	DEVCOM DAC : White Sands, NM	-	-		-		0.075	May 2024	-		0.075	0.000	0.075	-
CTSO INC 1 Ground Sensor Perf, C2 Sys Perf, CTR live Fire, End to End Testing	MIPR	Yuma Proving Ground : Yuma, AZ	-	-		-		0.500	Jun 2024	-		0.500	0.000	0.500	-
CTSO INC 1 Ground Sensor Perf, C2 Sys Performance Testing	MIPR	Aberdeen Proving Ground : Aberdeen, MD	-	-		-		0.500	Jun 2024	-		0.500	0.000	0.500	-
CTSO INC 1 E3 Direct Strike Lightning (DSL) Risk Reduction Testing	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	0.105	May 2022	-		0.105	Dec 2023	-		0.105	0.000	0.210	-
CTSO INC 1 User Jury 1	MIPR	Fort Leonardwood : Fort Leonardwood, MO	-	-		0.020	Jun 2023	-		-		-	0.000	0.020	-
CTSO INC 1 Cyber tabletop Exercise and Cooperative Vulnerability Identification	MIPR	DEVCOM DAC : White Sands, NM	-	-		0.010	May 2023	-		-		-	0.000	0.010	-
CTSO INC 1 Sensor Performance Testing	MIPR	Yuma Test Center (YTC) : Yuma, AZ	-	-		0.550	Aug 2023	-		-		-	0.000	0.550	-
CTSO INC 1 Cryptographic Module Validation Program	MIPR	DEVCOM DAC : White Sands, NM	-	-		0.100	Aug 2023	-		-		-	0.000	0.100	-
CTSO INC 1 Penetration Assessment	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen	0.087	-		0.075	Jun 2023	-		-		-	0.000	0.162	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army** **Date:** March 2023

<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 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
		Proving Grounds, MD													
CTSO INC 1 Software Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Grounds, MD	-	-		0.050	Mar 2023	-		-		-	0.000	0.050	-
CTSO INC 1 Operational Integration Test	MIPR	DEVCOM C6ISR NVESD Center : Fort Belvoir, VA	-	-		0.075	Apr 2023	-		-		-	0.000	0.075	-
Modeling & Simulation Advanced Joint Effectiveness Model(AJEM)	MIPR	DEVCOM Data Analysis Center (DAC) : Aberdeen Proving Grounds, MD	-	-		0.365	Mar 2023	-		-		-	0.000	0.365	-
Modeling & Simulation One Semi-Automated Forces (One SAF)	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.365	Jul 2022	0.050	Mar 2023	-		-		-	0.000	0.415	-
Modeling & Simulation Common Scene Generator	MIPR	Aviation & Missile Command : Redstone Arsenal, AL	-	-		0.625	Mar 2023	-		-		-	0.000	0.625	-
XM204 Operational Assessment	MIPR	Operational Test Command : Fort Hood, TX	0.289	0.916	Dec 2021	-		-		-		-	0.000	1.205	-
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	Mar 2022	-		-		-		-	0.000	0.257	-



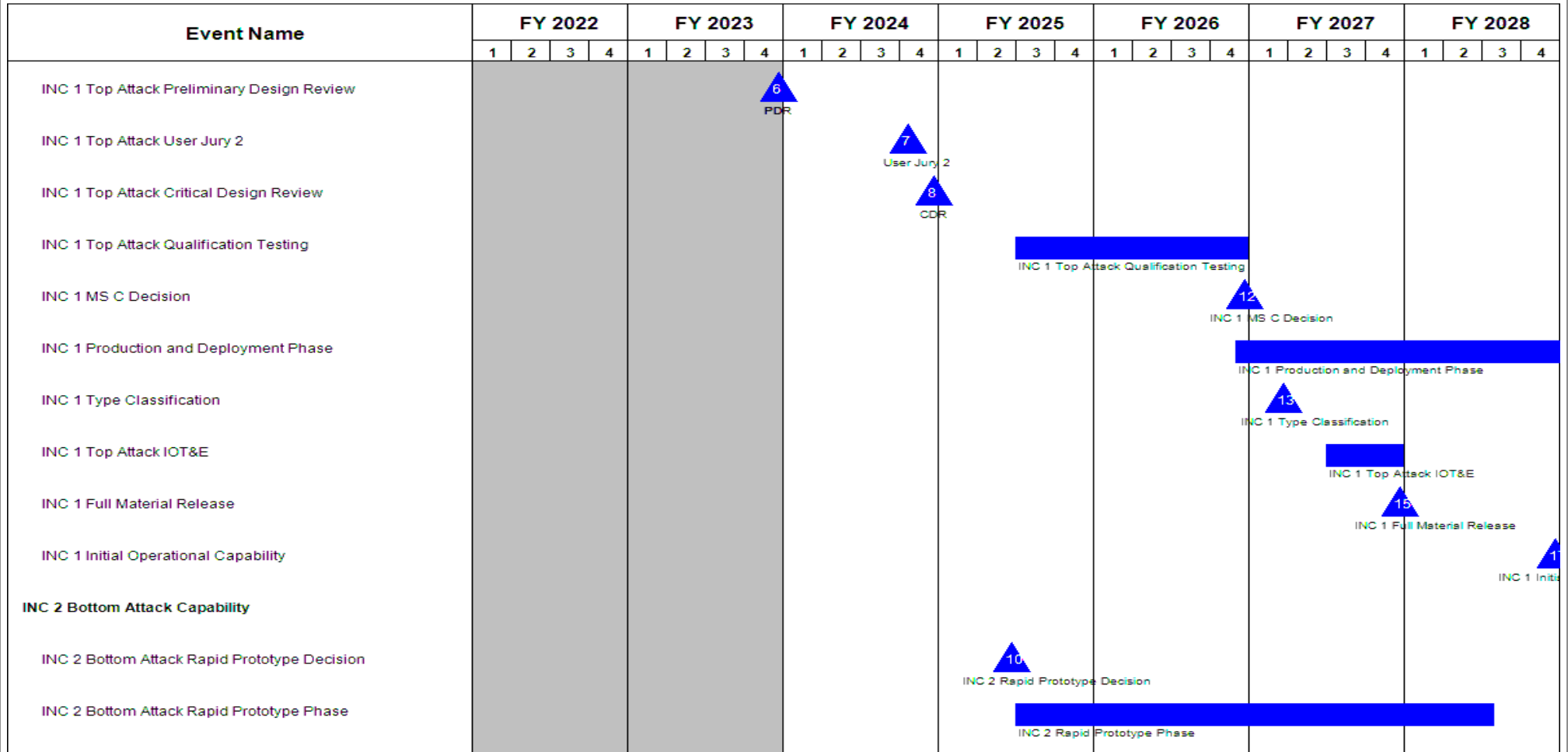
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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2024 Army</b>		<b>Date: March 2023</b>
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Landmine Warfare and Barrier - Adv Dev	<b>Project (Number/Name)</b> EK7 / Area Denial Capability Development

Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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]																											
XM204 Government Qualification Testing	[Blue Bar]																											
XM204 Manufacturing Development	[Blue Bar]																											
XM204 Production and Deployment Decision					▲ 1 Production and Deployment Decision																							
XM204 Operational Assessment Test					▲ 2 Operational Assessment Test																							
XM204 Production					[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]			
XM204 Urgent Material Release					▲ 4 Urgent Material Release																							
XM204 Initial Operational Capability													▲ 9 Initial Operational Capability															
<b>Increment 1 Improved Top Attack Capability Development</b>																												
INC 1 Top Attack Rapid Prototype Decision					▲ 3 Rapid Prototype Decision																							
INC 1 Top Attack Rapid Prototype Phase					[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]				[Blue Bar]			
INC 1 Top Attack User Jury 1					▲ 5 User Jury 1																							

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2024 Army</b>		<b>Date:</b> March 2023
<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>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2024 Army</b>		<b>Date:</b> March 2023
<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 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	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 Bottom Attack User Jury 1																	11 INC 2 User Jury 1															
INC 2 Bottom Attack User Jury 2																	14 INC 2 User Jury 2															
INC 3 Full Network Capability																																
INC 3 Full Network Rapid Prototype Decision																													16 Full Network Rapid Prot			
INC 3 Full Network Prototype Phase																													Full Network			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2024 Army</b>		<b>Date: March 2023</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	4	2019	1	2026
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	1	2023
XM204 Manufacturing Development	4	2021	1	2023
XM204 Production and Deployment Decision	4	2022	4	2022
XM204 Operational Assessment Test	4	2022	4	2022
XM204 Production	4	2022	1	2026

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Army **Date:** March 2023

<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	2	2025	2	2025
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	1	2023	1	2033
INC 1 Top Attack Rapid Prototype Decision	1	2023	1	2023
INC 1 Top Attack Rapid Prototype Phase	1	2023	4	2024
INC 1 Top Attack User Jury 1	4	2023	4	2023
INC 1 Top Attack Preliminary Design Review	4	2023	4	2023
INC 1 Top Attack User Jury 2	4	2024	4	2024
INC 1 Top Attack Critical Design Review	4	2024	4	2024
INC 1 Top Attack Qualification Testing	3	2025	4	2026
INC 1 MS C Decision	4	2026	4	2026
INC 1 Production and Deployment Phase	4	2026	1	2033
INC 1 Type Classification	1	2027	1	2027
INC 1 Top Attack IOT&E	3	2027	4	2027
INC 1 Full Material Release	4	2027	4	2027
INC 1 Initial Operational Capability	4	2028	4	2028
INC 2 Bottom Attack Capability	2	2025	2	2033
INC 2 Bottom Attack Rapid Prototype Decision	2	2025	2	2025
INC 2 Bottom Attack Rapid Prototype Phase	3	2025	3	2028
INC 2 Bottom Attack User Jury 1	2	2026	2	2026
INC 2 Bottom Attack User Jury 2	2	2027	2	2027
INC 3 Full Network Capability	3	2028	3	2031
INC 3 Full Network Rapid Prototype Decision	2	2028	2	2028

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Army **Date:** March 2023

<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
INC 3 Full Network Prototype Phase	3	2028	3	2031
INC 3 Full Network User Jury 1	3	2029	3	2029
INC 3 Full Network User Jury 2	3	2030	3	2030