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

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition
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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	-	61.641	51.488	91.323	-	91.323	99.578	103.058	68.532	53.842	Continuing	Continuing
CD8: Long Range Precision Munition (LRPM)	-	12.936	13.265	43.693	-	43.693	49.648	59.528	24.543	9.363	0.000	212.976
EB9: Aviation Airborne Expendable Countermeasures	-	5.327	-	-	-	-	-	-	-	-	0.000	5.327
EC3: Ammunition Logistics Prototyping	-	2.062	1.839	1.892	-	1.892	1.931	1.932	1.952	1.973	0.000	13.581
FA5: Assured Precision Weapons and Munitions	-	41.316	36.384	45.738	-	45.738	47.999	41.598	42.037	42.506	Continuing	Continuing

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

A portion of this funding line is directly aligned to each Future Vertical Lift (FVL) and Assured Positioning, Navigation, & Timing (APNT) Army Modernization Priorities. The Tank and Medium Caliber Ammunition Program Element encompasses a comprehensive program to develop, rapidly transition to production, and field advanced weapons and munitions for small, medium and large caliber munitions, tank ammunition, mortar ammunition, cannon artillery ammunition, and close combat system items. These Projects will ensure continued battlefield overmatch and lethality of United States maneuver forces against the full range of modern battlefield threats. To achieve this, Tank and Medium Caliber Ammunition projects will identify and develop promising technologies through competitive development and streamlined acquisition procedures.

Project CD8 - Long Range Precision Munition (LRPM) is an Army Aviation weapon that will provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 Aug 2022. Primary target set for LRPM is Integrated Air Defense Systems. LRPM will provide Army Aviation with a precise long range munition system to rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an Anti-Access Area Denial (A2AD) and positioning, navigation, and timing (PNT) denied environment.

Project EB9 - Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2024 Army		<b>Date:</b> 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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.</p> <p>Project EC3 Ammunition Logistics Prototyping: This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.</p> <p>Project FA5 - The Assured Precision Weapons and Munitions (APWM) Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) Navigation Warfare (NavWar), and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured PNT/Space (APNT/S) and Long Range Precision Fires (LRPF) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and APNT/S Cross-Functional Team (CFT) programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&amp;M) operating in a SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed APNT related PoR milestone and Army cross-functional modernization decisions.</p>		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2024 Army	<b>Date:</b> March 2023
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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>
Previous President's Budget	73.844	64.669	78.962	-	78.962
Current President's Budget	61.641	51.488	91.323	-	91.323
Total Adjustments	-12.203	-13.181	12.361	-	12.361
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.100			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-12.203	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	12.361	-	12.361
• FFRDC Transfer	-	-0.081	-	-	-

**Change Summary Explanation**

The FY24 change is due to an increase in project FA5 / Assured Precision Weapons and Munitions (APMW). The increase is needed in Fires APNT to maintain development pace with Joint APNT prototyping initiatives directly addressing Congressional mandates for resilient and survivable PNT and M- code. Maintaining pace avoids larger future integration APNT costs for M-Code Inc 2 (needed to address critical obsolescence and Joint Fires capability needs) and Software Defined Receivers to continue to outpace the threat maintaining Joint Fires overmatch.

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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 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> CD8 / Long Range Precision Mmunition (LRPM)			
<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>
CD8: Long Range Precision Mmunition (LRPM)	-	12.936	13.265	43.693	-	43.693	49.648	59.528	24.543	9.363	0.000	212.976
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Long Range Precision Mmunition (LRPM) is an Army Aviation Weapon that will provide leap ahead capability in the penetration and dis-integration phases of Joint All Domain Operations (JADO). The ability to interoperate and coordinate with other weapon systems and munitions at long ranges and adapt to changing threats is a core concept of the Army Aviation Weapons, Sub-Systems, and Munitions Initial Capability Document validated in July 2018, as well as the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 August 2022. Primary target set for LRPM is Integrated Air Defense Systems. LRPM will provide Army Aviation with a precise long range munition system to rapidly respond in a combat environment in order to improve the survivability of Warfighters and weapon systems, including aviation platforms in an Anti-Access Area Denial (A2AD) and positioning, navigation, and timing (PNT) denied environment.

FY 2024 dollars in the amount of \$43.693 million includes LRPM program acquisition, contract documentation preparation and coordination, and technical evaluations leading to a contract award to mature and qualify the LRPM System.

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

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Long Range Precision Mmunition	12.936	12.781	43.693
<b>Description:</b> This line funds the demonstration, development, and validation of a munition system that will engage and render desired lethal effects on targets at ranges beyond line of sight. The LRPM development effort includes demonstration and validation of precision guided munitions with the capability to complete the assigned mission in environments that could include cyber-attack, countermeasures, counter precision guided munition systems and anti-access area denial environments. These efforts will include technical assessments, concept studies, performance of risk reduction efforts, technology maturation, engineering design, engineering / manufacturing development, test, demonstration of prototype hardware, platform integration of LRPM, and document preparation for associated contract and acquisition efforts.			
<b>FY 2023 Plans:</b> Complete review and analysis of the FY 2022 Capabilities Demonstration. Technology maturation and risk reduction efforts continue. Continue LRPM program acquisition and contract documentation preparation and coordination.			
<b>FY 2024 Plans:</b> Technology maturation and risk reduction efforts continue. Design Maturity, Modeling and Simulation maturation, and Prototype development will continue. Vendor(s) to provide deliverable(s) to include design and Modeling and Simulation. Continue LRPM program acquisition and contract documentation preparation and coordination. Complete acquisition activities & technical			

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> CD8 / <i>Long Range Precision Munition (LRPM)</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
evaluations leading to an acquisition decision and contract award(s) to mature the LRPM design and modeling and simulation to determine system of systems technical feasibility.				
<b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Increase is due to contract award in FY 2024 to maintain continued vendor competition, material maturation, and development activities leading to a future design review.				
<b>Title:</b> FY 2023 SBIR/STTR Transfer		-	0.484	-
<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.				
<b>Accomplishments/Planned Programs Subtotals</b>		12.936	13.265	43.693
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
The LRPM program completed a Capability Demonstration in 4Q FY 2022-1Q FY 2023 to explore/leverage industry's ability to deliver a LRPM solution, wherein selected vendors delivered test assets in support of a United States Government Demonstration event. This demonstration event illustrated industry design concepts, technical approaches, and technology maturity to inform the LRPM CDD. Acquisition pathway decision is projected to occur 4Q FY 2023 after approval of the LRPM CDD. Contract award projected for 2Q FY 2024 to begin technology design and development activities.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) CD8 / Long Range Precision Munition (LRPM)							
Management Services (\$ in Millions)				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
Systems Engineering/ Program Management	Various	Various Performers : Various	-	4.350	Apr 2022	4.446	Nov 2022	3.750	Nov 2023	-		3.750	0.000	12.546	Continuing
Technical Evaluations	Various	Multiple Activities : Redstone Arsenal, Alabama	-	-		-		2.013	Nov 2023	-		2.013	0.000	2.013	Continuing
FY2023 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.484		-		-		-	0.000	0.484	-
<b>Subtotal</b>			-	4.350		4.930		5.763		-		5.763	0.000	15.043	N/A
Product Development (\$ in Millions)				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
LRPM Other Government Agency	MIPR	CCDC Redstone Arsenal, AL : Various	-	3.403	Jun 2022	5.534	Nov 2022	2.724	Nov 2023	-		2.724	0.000	11.661	Continuing
System Development Maturation, Prototypes, and Integration	C/TBD	Multiple : Multiple	-	-		-		31.865	Mar 2024	-		31.865	0.000	31.865	Continuing
Engineering and Technical Support	Various	Various : Redstone Arsenal, Alabama	-	3.051	Apr 2022	2.801	Jan 2023	3.341	Jan 2024	-		3.341	0.000	9.193	Continuing
<b>Subtotal</b>			-	6.454		8.335		37.930		-		37.930	0.000	52.719	N/A
Test and Evaluation (\$ in Millions)				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
Vendor Capability Demonstration	MIPR	Dugway Proving Ground : Dugway Utah	-	1.550	Jun 2022	-		-		-		-	0.000	1.550	Continuing
LRPM Other Government Agency	MIPR	Various Performers : Various	-	0.582	May 2022	-		-		-		-	0.000	0.582	Continuing
<b>Subtotal</b>			-	2.132		-		-		-		-	0.000	2.132	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</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 0603639A / <i>Tank and Medium Caliber Ammunition</i>				<b>Project (Number/Name)</b> CD8 / <i>Long Range Precision Munition (LRPM)</i>				

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	12.936	13.265	43.693	-	43.693	0.000	69.894	N/A

**Remarks**



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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> CD8 / <i>Long Range Precision Munition (LRPM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Capability Demonstration	1	2022	1	2023
Acquisition and Contract Preparation	1	2022	2	2024
System Development, Maturation, Prototypes, and Integration	2	2024	1	2031
Materiel Development Decision	2	2022	2	2022
Acquisition Pathway / Contract Determination	4	2023	4	2023
Contract Award(s)	2	2024	2	2024

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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 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB9 / Aviation Airborne Expendable Countermeasures
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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
EB9: Aviation Airborne Expendable Countermeasures	-	5.327	-	-	-	-	-	-	-	-	0.000	5.327
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev. Program transitions from prototyping phase into engineering and manufacturing development.

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

Project EB9 Aviation Airborne Expendable Countermeasure (AAECM) supports the advanced development activities and technology demonstrations of the AAECM to include the XM215 Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are essential parts for Army aircraft and will be employed with currently fielded countermeasures as a cocktail to provide protection against all threats. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical Aircraft Survivability Equipment (ASE) enabler for enduring aircraft and the Future Vertical Lift (FVL) Cross Functional Team (CFT) within the Army's top modernization priorities.

These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. This program will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments. Prototypes will demonstrate component and subsystem maturity prior to integration into major Army aircraft platforms.

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

	FY 2022	FY 2023	FY 2024
<b>Title:</b> Expendable Countermeasures to Guided Missile Threats	5.327	-	-
<b>Description:</b> This program will develop expendable countermeasure decoys which will protect Army aircraft from surface-to-air missiles.			
<b>Accomplishments/Planned Programs Subtotals</b>	5.327	-	-

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

Line Item	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
• EP7: Aviation Airborne Expendable Countermeasures	7.251	6.363	3.194	-	3.194	3.208	0.932	-	-	0.000	20.948

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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 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB9 / Aviation Airborne Expendable Countermeasures

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

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• E49101: Flare, Aircraft Countermeasure, RF (Passive)	-	1.036	8.083	-	8.083	14.978	-	-	-	0.000	24.097
• E49102: Flare, Aircraft Countermeasure, XM215	-	-	0.000	-	0.000	0.860	0.538	8.279	9.574	Continuing	Continuing

**Remarks**

Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev. Program transitions from prototyping phase into engineering and manufacturing development.

**D. Acquisition Strategy**

During the Materiel Solution Analysis (MSA), Milestone A phase, prototypes developed by the US Government (USG) and contractors were tested and evaluated against initial CDD requirements. The contractor developed XM20 design and the USG developed XM215 design were selected to enter into Engineering and Manufacturing Development (EMD), Milestone B phase, to finalize the design based on lessons learned from the MSA flight test and CDD requirements. Test assets are being procure from industry via Other Transaction Authority (OTA) contract mechanism in FY 2021 to support EMD. Final XM20 and XM215 and configurations to support production after MS C will be procured via Full and Open FAR based contracts.

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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 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB9 / Aviation Airborne Expendable Countermeasures
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<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			
XM20 Testing Hardware	C/FFP	Armtec : Lillington, NC	-	0.912	Apr 2022	-		-		-		-	0.000	0.912	-
<b>Subtotal</b>			-	0.912		-		-		-		-	0.000	0.912	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			
XM20 Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.734	2.352	Apr 2022	-		-		-		-	0.000	4.086	-
<b>Subtotal</b>			1.734	2.352		-		-		-		-	0.000	4.086	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			
XM20 Design Verification and Flight Testing	MIPR	Various : Various	4.079	2.063	Apr 2022	-		-		-		-	0.000	6.142	-
<b>Subtotal</b>			4.079	2.063		-		-		-		-	0.000	6.142	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
	<b>Project Cost Totals</b>			5.813	5.327	-	-	-	-	0.000	11.140

**Remarks**

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Aviation Airborne Expendable Countermeasures</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				
<b>Radio Frequency (RF) Development</b>																																
XM20 Development Contract																																
	XM20 EMD																															
XM20 Critical Design Review	<div style="display: flex; align-items: center; justify-content: center;"> <span style="color: blue; font-size: 24px; margin-right: 5px;">▲</span> <span style="color: red; font-weight: bold; font-size: 18px;">1</span> </div>																															
	XM20 CDR																															
XM20 Developmental Testing																																
	XM20 DT																															
XM20 Test Hardware																																
					XM20 Test Hardware																											
XM20 UH60 Developmental Testing																																
									XM20 UH60 DTE																							
XM20 UH60/AH64/CH47 Radar Cross Section Testing																																
													XM20 UH60/AH64/CH47 RCS																			
XM20 Milestone C																	<div style="display: flex; align-items: center; justify-content: center;"> <span style="color: blue; font-size: 24px; margin-right: 5px;">▲</span> <span style="color: red; font-weight: bold; font-size: 18px;">3</span> </div>															
																	XM20 MS-C															
XM20 Low Rate Initial Production																																
																	XM20 LRIP															
XM20 AH64/CH47 Developmental Testing																																
																	XM20 AH64//CH47 DTE															
XM20 UH60 Initial Operational Test and Evaluation																																
																	XM20 UH60 IOTE															
XM20 AH64/CH47 Initial Operational Test and Evaluation																																
																					XM20 AH64/CH47 IOTE											
XM20 Production																																
																									XM20 FRP							

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Aviation Airborne Expendable Countermeasures</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
<b>XM215 Development</b>																												
XM215 Engineering and Manufacturing Development																												
XM215 Prototype Build																												
XM215 Flight Test 2																												
XM215 Developmental and Operational Testing																												
XM215 Milestone C																												
XM215 Low Rate Initial Production																												
XM215 Pattern Development																												
XM215 UH60/AH64 Seeker Bowl																												
XM215 CH47/FW Seeker Bowl																												
XM215 Full Rate Production																												

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Aviation Airborne Expendable Countermeasures</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Radio Frequency (RF) Development	1	2019	4	2025
XM20 Milestone A	1	2019	1	2019
XM20 Prototype Development	1	2019	4	2019
XM20 Demonstrations	2	2019	3	2019
XM20 Technology Maturation and Risk Reduction	1	2020	2	2021
XM20 Flight Testing	2	2020	2	2020
XM20 Modeling and Simulation	3	2020	4	2020
XM20 Data Analysis	1	2021	2	2021
XM20 Milestone B	2	2021	2	2021
XM20 Development Contract	2	2021	4	2022
XM20 Critical Design Review	2	2022	2	2022
XM20 Developmental Testing	2	2022	4	2022
XM20 Test Hardware	1	2023	2	2026
XM20 UH60 Developmental Testing	4	2023	1	2024
XM20 UH60/AH64/CH47 Radar Cross Section Testing	3	2024	4	2024
XM20 Milestone C	1	2025	1	2025
XM20 Low Rate Initial Production	2	2025	4	2026
XM20 AH64/CH47 Developmental Testing	3	2025	4	2025
XM20 UH60 Initial Operational Test and Evaluation	3	2025	4	2025
XM20 AH64/CH47 Initial Operational Test and Evaluation	2	2026	4	2026
XM20 Production	1	2027	4	2031
XM215 Development	1	2019	4	2025

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Aviation Airborne Expendable Countermeasures</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
XM215 Milestone A	1	2019	1	2019
XM215 Prototyping	1	2019	2	2020
XM215 Down Select	3	2019	3	2019
XM215 Testing Efforts (Stability/Heat/Cold)	3	2019	2	2020
XM215 Flight Testing	1	2020	2	2020
XM215 Milestone B	2	2020	2	2020
XM215 Engineering and Manufacturing Development	2	2020	4	2023
XM215 Design Verification Test	2	2021	3	2021
XM215 Flight Test	2	2021	2	2021
XM215 Prototype Build	3	2021	4	2023
XM215 Flight Test 2	1	2023	1	2023
XM215 Developmental and Operational Testing	2	2023	4	2023
XM215 Milestone C	1	2024	1	2024
XM215 Low Rate Initial Production	1	2024	4	2026
XM215 Pattern Development	1	2024	1	2026
XM215 UH60/AH64 Seeker Bowl	3	2024	1	2025
XM215 CH47/FW Seeker Bowl	3	2025	1	2026
XM215 Full Rate Production	1	2027	4	2031

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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 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EC3 / Ammunition Logistics Prototyping			
<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>
EC3: Ammunition Logistics Prototyping	-	2.062	1.839	1.892	-	1.892	1.931	1.932	1.952	1.973	0.000	13.581
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This Project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2024 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.

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

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Munitions Health and Inventory Monitoring Systems	1.065	0.885	0.992
<b>Description:</b> Performance and reliability of certain munitions can be degraded by the environmental exposure history they experience during their lifetime. This Project will develop simple to complex environmental health and inventory monitoring systems to improve reliability and asset visibility and enable effective Condition Based Management for Ammunition. All research and development initiatives will be supporting the Long Range Precision Fires (LRPF) & Solider Lethality (SL) Cross Functional Teams (CFTs) and the multi domain operations modernization objectives that consume, store or transport/distribute munitions and munition components in the maneuver formations.			
<b>FY 2023 Plans:</b> Develop and mature prototype systems to monitor munition exposure throughout the tactical distribution system. Develop systems to monitor large caliber projectiles, associated propellant, fuzes, and any other ammunition components as packaging and transport/storage configurations evolve within the tactical distribution system. Integrate these monitoring systems with other ammunition management technologies.			
<b>FY 2024 Plans:</b> Develop and mature prototype systems to monitor munition environmental exposure beginning as ammunition is issued from the Ammunition Storage Areas and handed off to the sustainment formations. Develop a system architecture that can			

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p>efficiently collect environmental exposure to temperature, humidity, shock, and vibration while simultaneously correlating these parameters to ballistic performance. The first iteration of these prototypes will be supporting large caliber projectiles, associated propellant, fuzes, and any other ammunition components. As the packaging of long-range precision ammunition items for tactical transportation and distribution configurations evolve through modernization, surveillance reporting of environmental exposure will become critical to ensure lethality and readiness. Integrate these prototype systems with other ammunition management technologies and leverage existing Systems of Record such as the Command Post Computing Environment, Joint Battle Command - Platform, Paladin Digital Fire Control System, and Advanced Field Artillery Tactical Data System.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Slight increase due to projected increase in labor rates.</p>				
<p><b>Title:</b> Munitions Containerization Systems</p> <p><b>Description:</b> For each family of munitions containers, optimize prototype container systems for automation compatibility, combat unit load quantity, sustainability/recyclability, Insensitive Munitions/explosives safety, environmental protection, load reconfiguration, unitization, and standardized interfaces. This will improve ammunition distribution efficiency while minimizing environmental and operational impacts.</p> <p><b>FY 2023 Plans:</b> Conduct qualification testing on plastic cylindrical injection molded containers and / or inner packaging components that are low cost, lightweight and incorporate features that will enable interoperability with future automated weapon and sustainment systems, for integration with ammunition items under development by PM CAS. Complete developmental testing on inner packaging barrier prototypes designed to protect new large caliber propellant items against environmental effects.</p> <p><b>FY 2024 Plans:</b> Develop and test series of prototype ammunition consolidators suitable for providing protection to class V items as they are transported by tactical wheeled vehicle organic to the sustainment formations and handed off to the ammo section within the Fires formations. All consolidators must be compliant with the environmental sensor prototype under concurrent development elsewhere within the JPEO A&amp;A portfolio, and incorporate automation friendly features. Prototype consolidator concepts will supplement potential inner-packaging components and stress low cost, lightweight and interoperability with future manual and automated weapon and sustainment systems with ammunition items under development by PM CAS as the primary goal.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Slight increase due to projected increase in labor rates.</p>		0.997	0.887	0.900
<p><b>Title:</b> SBIR/STTR Transfer</p> <p><b>FY 2023 Plans:</b></p>		-	0.067	-

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</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>		2.062	1.839	1.892
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
Fiscal Year (FY) 2023 funding will be used to further mature munition health monitoring devices in accordance with the needs of the relevant PMs. However, the preponderance of the funding will be used to directly to support Long Range Precision Fire (LRPF) munition health monitoring requirements throughout its resupply process. Specifically, the funding will be used to address munition health monitoring and packaging/preservation of munitions within the tactical movement of large caliber ammunition.				

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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 0603639A / Tank and Medium Caliber Ammunition				EC3 / Ammunition Logistics Prototyping								
<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	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.067		-		-		-	0.000	0.067	-	
<b>Subtotal</b>			-	-		0.067		-		-		-	0.000	0.067	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	
Advanced Munitions Health Monitoring System (CAT)	C/FFP	Cybernet : Ann Arbor, MI	-	-		0.200	Jan 2023	0.470	Jan 2024	-		0.470	0.000	0.670	-	
Tactical Munitions Health Monitoring System	C/FFP	Cybernet : Ann Arbor, MI	0.765	1.063	Jan 2022	0.275	Jan 2022	-		-		-	0.000	2.103	-	
Large Caliber Automation Friendly Packaging	TBD	TBD : TBD	-	-		0.433	Mar 2023	-		-		-	0.000	0.433	-	
Advanced Munitions Health Monitoring System (PLS)	TBD	CR Tactical : Pittsburgh, PA	-	-		-		0.462	Jan 2024	-		0.462	0.000	0.462	-	
Lightweight Steel Container	TBD	SAVIT : Rockaway, NJ	-	-		-		0.300	Nov 2023	-		0.300	0.000	0.300	-	
<b>Subtotal</b>			0.765	1.063		0.908		1.232		-		1.232	0.000	3.968	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	
DEVCOM Armaments Center	MIPR	Picatinny Arsenal : NJ	5.404	0.799	Nov 2021	0.664	Nov 2021	0.660	Nov 2023	-		0.660	0.000	7.527	-	
<b>Subtotal</b>			5.404	0.799		0.664		0.660		-		0.660	0.000	7.527	N/A	



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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</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
Tactical Munitions Health Monitoring System	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Large Caliber Automation Friendly Packaging	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Advanced Munitions Health Monitoring System (CAT)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Advanced Munitions Health Monitoring System (PLS)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Lightweight Steel Container	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Concept Development-Munitions Containerization-1A	1	2020	4	2021
Advanced Concept Development-Munitions Health Monitoring-3	3	2017	4	2020
Tactical Munitions Health Monitoring System	1	2022	4	2024
Large Caliber Automation Friendly Packaging	1	2023	4	2025
Advanced Munitions Health Monitoring System (CAT)	2	2024	2	2026
Advanced Munitions Health Monitoring System (PLS)	2	2024	2	2026
Lightweight Steel Container	1	2024	1	2026

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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 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions			
<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>
FA5: Assured Precision Weapons and Munitions	-	41.316	36.384	45.738	-	45.738	47.999	41.598	42.037	42.506	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The Assured Precision Weapons and Munitions (APWM) - FA5 Project is focused on advanced risk mitigation, technology integration, prototyping, and product support to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapon and munitions components and subsystems within a complex system-of-systems (SoS) environment. The APWM Project reinforces the National Defense Strategy's major lines of effort through technology development and prototyping, which increases lethality and ensures future combat overmatch success of the Joint Force against peer/near-peer adversaries. This project also aims to improve program performance and affordability for multiple weapons and munitions Programs of Record (PoRs) via Joint Lethality Positioning, Navigation and Timing (PNT) Navigation Warfare (NavWar), and Army M-Code Global Positioning System (GPS) coordinated efforts. The APWM Project directly supports top Army Modernization Priorities via the Assured PNT/Space (APNT/S) and Long Range Precision Fires (LRPF) imperatives in support of the National Defense Strategy and multiple Public Law related Congressional imperatives. Funding will support engagement by weapons and munitions PNT experts in the development, evaluation, and technology delivery activities of the US Space Force's M-Code GPS, Army's PNT related programs, and APNT/S Cross-Functional Team (CFT) programs in support of LRPF and Counter Anti-Access/Area Denial (A2/AD) missions. Funding will also enable component and subsystem architecture input essential for Precision Weapons and Munitions (PW&M) operating in a SoS environment, Army M-Code GPS technology integration and evaluation, planning and evaluating next generation M-Code GPS to validate capability for future Joint precision munitions, and maturation of alternative PNT and NavWar related technologies and solutions to enable Resilient and Survivable PNT as well as making informed APNT related PoR milestone and Army cross-functional modernization decisions.

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

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> APWM Integrated Product Support - Joint Lethality PNT and Navigation Warfare (NavWar) SME Working Integrated Product Team (WIPT) & Program Management	3.600	3.744	3.848
<b>Description:</b> Provide APWM technical subject matter expertise and support to the Joint oversight board for APWM. Provide overall APWM Project Program Management support.			
<b>FY 2023 Plans:</b> Provides overall Project Program Management support for 643639A-FA5. The Joint Lethality SMEs will continue to provide technical expertise and support to the Joint oversight board for Assured Precision Weapons and Munitions by coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs, participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and			

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
munitions operating in a Joint SoS multi-domain environment. Specific support focus includes requirements for MGUE Increment 2, resilient and survivable PNT technology maturation, and NavWar dependencies.  <b>FY 2024 Plans:</b> Provides overall Project Program Management support for 643639A-FA5. The JL SMEs will continue to provide technical expertise and support to the Joint oversight board for Assured Precision Weapons and Munitions by coordinating with and supporting the development and technology delivery activities of the Joint Weapons and Munitions community, to include PNT modernization and NavWar related programs, participation in design reviews, evaluation and formal feedback on technology and systems requirements and performance, component and subsystem architecture input essential for precision weapons and munitions operating in a Joint SoS multi-domain environment. Specific support focus includes requirements and virtual prototyping for MGUE Increment 2, resilient and survivable PNT technology maturation, NavWar dependencies, and direct participation in new technology areas such as PGM Software Defined Receivers.  <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Level of effort slightly increased from FY23 to FY24 due to the ongoing APNT/S CFT and US Space Force's MGUE program efforts, maturing NavWar initiatives, and increasing complexity of multi-domain operations impacting collaborative efforts for the Joint Lethality community.				
<b>Title:</b> Fires System-of-Systems APNT related AS and NavWar  <b>Description:</b> Prototype PNT enabling technologies that are critical for executing Fires SoS NavWar missions to include munition-based offensive, defensive, and associated Command and Control (C2) functions. Prototyping efforts will focus on enabling combat lethality overmatch in PNT challenged environments for cannon and rocket/missile core missions. Prototype long range stand-off NavWar capability to penetrate contested A2/AD environments via use of long-range artillery, Fires SoS architectures enabling advanced NavWar attack, sense, and optimization, and advanced anti-jam/anti-spoof techniques for munitions.		5.000	-	-
<b>Title:</b> Next Generation PNT Technologies Phase 1  <b>Description:</b> Continue prototyping APNT technologies to provide the next generation of APNT capability to weapons and munitions in a highly complex and fast paced battlefield. Will leverage prior Army Science & Technology (S&T), previous integrated demonstration events, information on threat advancement, and lessons learned to rapidly develop, integrate, prototype, and transition critical APNT technologies to weapons and munitions directly supporting LRPF and Air & Missile Defense initiatives.  <b>FY 2023 Plans:</b> Demonstrate resilient and survivable PNT solutions for weapons and munitions using results of phase 1 spiral APNT technology solutions in complex PNT threat environments.  <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b>		1.216	2.268	-

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
Funding decreases due to Next Gen PNT Technologies Phase I transitioning to Next Gen NavWar Tech Phase I, and PGM SDRx Phase II for continued maturation and transition to Fires PORs.				
<b>Title:</b> Rocket/Missile Precision Guided Munition M-Code Prototyping <b>Description:</b> Directly supports M-Code public law by rapidly prototyping M-Code receivers for direct transfer to rocket/missile systems.		6.000	-	-
<b>Title:</b> Munition Deployed NavWar Countermeasures <b>Description:</b> Prototype, integrate, and experiment with initial increment of Munition Deployed NavWar Countermeasures (MDNC) and weapons and munitions SoS dependencies directly supporting APNT/S CFT NavWar initiatives and LRPF initiative of penetrating, disrupting, and disintegrating A2/AD environments to enable employment of precision weapons and munitions.		6.000	-	-
<b>Title:</b> Assured PNT related Weapons & Munitions Prototyping - PGM Software-Defined Receiver (SDRx) <b>Description:</b> Develop a prototype "All In One" GPS, Global Navigation Satellite System (GNSS), Alternative Navigation (AltNav), Signals of Opportunity (SoO)) software defined radio frequency APNT receiver for a large portion of the PGM portfolio. <b>FY 2023 Plans:</b> Continue to develop diverse RF Basic Navigation functions required for a prototype PGM SDRx and initiate GPS security certification process. <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Funding is decreased due to transition of PGM SDRx Phase I prototyping results to PGM SDRx Phase II for physical prototyping and eventual live fire demonstrations.		6.000	5.329	-
<b>Title:</b> Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation <b>Description:</b> Provide technical assessment, coordination, and engineering support related to the development, prototyping, integration, and evaluation of US Space Force's MGUE technology deliverables across all Army Weapons and Munitions, including participation in design reviews, testing, evaluation, and formal feedback on technology, component-level, card-level, sub-system-level, and systems-level requirements and performance. Reduce risk, support, and inform M-Code GPS related Army cross-functional modernization decisions for weapons and munitions operating in a peer/near threat SoS environment as well as identifying complementary PNT and NavWar related solutions when M-Code GPS is not solely sufficient to enable Combat Overmatch. <b>FY 2023 Plans:</b>		12.000	12.420	11.902

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p>Continues to support design reviews, experimentation, prototyping, testing, evaluation, and risk reduction of Army M-Code Inc2, AltNav, and NavWar by in-house government activities and OTA/IDIQ Contract efforts. Maintains an Army APNT and NavWar Weapons and Munitions IPT working directly with the APNT/S CFT and multiple PEOs. Facilitate weapon and munition APNT and NavWar experimentation in PNT Assessment (PNTAX) and Project Convergence type events to inform CONOPS and requirement generation processes.</p> <p><b>FY 2024 Plans:</b> Continues to support design reviews, experimentation, prototyping, testing, evaluation, and risk reduction of Army M-Code Inc2, AltNav, and NavWar by in-house government activities and OTA/IDIQ Contract efforts. Maintains an Army APNT and NavWar Weapons and Munitions IPT working directly with the APNT/S CFT and multiple PEOs. Facilitate weapon and munition APNT and NavWar experimentation in PNTAX and Project Convergence type events to inform CONOPS and requirement generation processes.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Level of effort required in FY24 is similar to FY23. Army APNT and NavWar Technology Integration Evaluation decreases slightly due to shift in focus on MGUE Inc2 for JROC-directed PGM Lead Platform.</p>				
<p><b>Title:</b> MGUE Inc2 for JROC-directed PGM Lead Platform</p> <p><b>Description:</b> Influence next generation MGUE development to ensure precision guided munition needs and requirements are met with the US Space Force (USSF) next generation MGUE. Evaluate the next generation MGUE to verify and validate PGM needs and requirements are met by next generation MGUE.</p> <p><b>FY 2023 Plans:</b> Work directly with USSF and M-Code Inc2 GPS prime vendors to start virtually prototyping and conducting PGM application specific design trade studies to reduce risk of integration into LR PGK, as the JROC-approved selected representative PGM for next generation ASIC verification and validation ensuring PGM PNT-related needs and requirements are met by MGUE Inc2.</p> <p><b>FY 2024 Plans:</b> Work directly with USSF and M-Code Inc2 GPS prime vendors to mature PGM specific design trade studies leading to a completed virtual prototype. Begin PGM M-Code Inc2 Circuit Card Assembly (CCA) designs with PGM specific software development reducing risk to accept USSF ASIC prototypes. Virtually prototype JROC-directed representative PGM Lead Platform design modifications to accept USSF M-Code Inc2 prototype technology for next generation ASIC verification and validation ensuring PGM PNT-related needs and requirements are met by MGUE Inc2.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p>		1.500	11.295	17.030

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
Funding increases in FY24 due to level of effort significantly increasing to perform prototyping across multiple levels of integration. Prototyping will be executed across the ASIC, CCA, guidance navigation and control unit, and supporting Fire Control C2 systems to reduce risk of accepting USSF M-Code Inc2 technology to verify and validate Joint Fires Requirements.				
<b>Title:</b> SBIR/STTR Transfer <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		-	1.328	-
<b>Title:</b> Next Generation NavWar Tech Phase 1 <b>Description:</b> Continue prototyping NavWar technologies across weapons and munitions needed to continue to dominate the PNT battlespace. Will leverage prior Army and Joint Services S&T, previous integrated demonstration events, information on threat and adversary PNT advancement, and lessons learned to rapidly develop, integrate, prototype, and transition critical NavWar technologies. Prototyping will transition to new Fuze Setter functions, MDN upgrades, and hardening of APNT systems to counter new threats, and control adversaries PNT access. <b>FY 2024 Plans:</b> Continue prototyping NavWar attack, sense, and countermeasure technologies to preserve weapon and munition access to PNT, while dominating adversary access to PNT. Phase 1 technologies will advance data collect and use of NavWar situational awareness for Fires to enhance lethality and ensure effects on target(s) in complex threat environments. <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Next Gen NavWar Tech Phase 1 continues to mature and prototype NavWar technology from Fires SoS APNT related AS and NavWar and Next Gen PNT technologies Phase 1, while transitioning new S&T technology capabilities from DEVCOM Centers (Combat Capabilities Development Command (CCDC) Armaments Center, CCDC Aviation and Missile Center and CCDC Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR)). Funding increase due to transition of multiple technologies into Next Gen NavWar Tech Phase 1.		-	-	3.358
<b>Title:</b> PGM Software Defined Receiver (SDRx) Phase II		-	-	9.600

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p><b>Description:</b> Use PGM SDRx Phase I results to complete a prototype "All In One " APNT (GPS, GNSS, AltNav, SoO), SDRx for a large SWAP PGMs that is ready to transition to Army Fires PoRs, directly addressing the FY21 NDAA Section 1611 Congressional mandate for resilient and survivable PNT.</p> <p><b>FY 2024 Plans:</b> Use results of PGM SDRx Phase I prototyping to develop physical prototypes for use in experimentations and evaluations of technology capabilities. Formalize USSF security certification target to reduce risk of obtaining a security certified PGM SDRx capable of M-Code GPS using Commercial-off-the-Shelf (COTS) components.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Funding is increased due to transition of PGM SDRx Phase 1 prototyping results to PGM SDRx Phase II. PGM SDRx Phase II leverages PGM SDRx Phase I prototype results to develop physical prototypes for use in evaluation across Army Fires and eventual live fire demonstration facilitating transition of SDRx technology across Fires directly addressing FY21 NDAA Section 1611. Increase also due to increased coordination with USSF to achieve military GPS security certification of the PGM SDRx Phase II prototype.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	41.316	36.384	45.738

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

**Remarks**

**D. Acquisition Strategy**  
Acquisition Strategy: The Assured Precision Weapons and Munitions Project will utilize a combination of Other Transaction Authority (OTA) contract mechanisms such as the Defense Ordinance Technology Consortium (DOTC) OTA and In-House government development and engineering capabilities to obtain prototypes and demonstrate/evaluate the maturity and integration risk of the M-Code GPS on Precision Munitions and Weapons, as well as other alternative PNT and NavWar related capabilities and corresponding related prototype system-of-systems solutions.

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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 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions
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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			
FY23 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.328		-		-		-	0.000	1.328	-
<b>Subtotal</b>			-	-		1.328		-		-		-	0.000	1.328	N/A

**Remarks**  
In FY 2022, funding in the amount of \$0.450 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			
Assured PNT related Munitions Integration Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	11.786	5.000	Dec 2021	2.258	Dec 2022	-		-		-	0.000	19.044	-
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation	MIPR	Various : Various	12.622	7.200	Dec 2021	9.900	Dec 2022	-		-		-	0.000	29.722	-
Weapon & Munitions Prototyping & Integration Risk Mitigation	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	15.666	Dec 2021	3.939	Dec 2022	-		-		-	0.000	19.605	-
MGUE Inc2 for JROC directed PGM Lead Platform Development	MIPR	DoD Ordnance Technology Consortium (DOTC) - Various : Various	-	-		8.689	Dec 2022	-		-		-	0.000	8.689	-
Fires APNT	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	-		-		24.288	Dec 2023	-		24.288	Continuing	Continuing	Continuing
Fires NavWar	MIPR	DoD Ordnance Technology	-	-		-		4.532	Dec 2023	-		4.532	Continuing	Continuing	Continuing

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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 0603639A / Tank and Medium Caliber Ammunition				FA5 / Assured Precision Weapons and Munitions							
Product Development (\$ in Millions)				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
		Consortium (DOTC) - TBD; Various : Various													
Fires Systems of Systems APNT and NavWar	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD; Various : Various	-	-		-		4.533	Dec 2023	-		4.533	Continuing	Continuing	Continuing
<b>Subtotal</b>			24.408	27.866		24.786		33.353		-		33.353	Continuing	Continuing	N/A
Support (\$ in Millions)				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
Program Management	Various	Joint Program Executive Office Armaments and Ammunition (JPEO A&A) : Picatinny Arsenal, NJ	4.597	1.250	Dec 2021	1.278	Dec 2022	-		-		-	0.000	7.125	2.858
Assured Precision Weapons and Munitions IPT Support	MIPR	Various : Various	8.464	2.400	Dec 2021	2.466	Dec 2022	-		-		-	0.000	13.330	9.726
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation Support. (Multiple PEO Sup	MIPR	Various : Various	1.500	5.200	Dec 2021	2.520	Dec 2022	-		-		-	0.000	9.220	-
Assured Technologies Engineering Support	MIPR	DEVCOM : Picatinny Arsenal, NJ	3.796	2.500	Dec 2021	1.000	Dec 2022	-		-		-	0.000	7.296	1.991
Assured Technologies Engineering Support	MIPR	Communication Electronics Research, Development and Engineering	1.671	0.400	Dec 2021	0.200	Dec 2022	-		-		-	0.000	2.271	-

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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 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions
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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			
		Center (C5ISR) : Aberdeen Proving Ground, MD													
Assured Technologies Engineering Support	MIPR	Aviation and Missiles Center (AvMC) : Redstone Arsenal, AL	-	0.200	Dec 2021	0.200	Dec 2022	-		-		-	0.000	0.400	-
MGUE Inc2 for JROC-directed PGM Lead Platform Support	MIPR	Combat Capability Development Command Armament Center (CCDC AC) : Picatinny Arsenal, NJ	2.571	1.500	Dec 2021	2.606	Dec 2022	-		-		-	0.000	6.677	-
Program Management and Integrated Product Support	Various	Various : Various	-	-		-		3.848	Dec 2023	-		3.848	Continuing	Continuing	Continuing
Fires APNT	Various	Various : Various	-	-		-		6.070	Dec 2023	-		6.070	Continuing	Continuing	Continuing
Fires NavWar	Various	Various : Various	-	-		-		1.334	Dec 2023	-		1.334	Continuing	Continuing	Continuing
Fires Systems of Systems APNT and NavWar	Various	Various : Various	-	-		-		1.133	Dec 2023	-		1.133	Continuing	Continuing	Continuing
<b>Subtotal</b>			22.599	13.450		10.270		12.385		-		12.385	Continuing	Continuing	N/A

**Remarks**  
Support consists of labor, travel and other non-labor costs in Fiscal Year (FY) 2022.

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	47.007	41.316	36.384	45.738	-	45.738	Continuing	Continuing	N/A

**Remarks**

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</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
Integrated Product Support	[Blue bar]																											
Joint Lethality PNT and NavWar SME WIPT (systems Enginee...	[Blue bar]																											
Program Management	[Blue bar]																											
Fires APNT	[Blue bar]																											
MGUE Inc2 for JROC-directed PGM Lead Platform	[Blue bar]																											
Accelerate NAVSTORM-M-Integration	[Blue bar]				[Grey bar]																							
Next Gen PNT Technologies Phase 1	[Blue bar]																											
PGM Software Defined Receiver (Phase 1)	[Blue bar]																											
PGM Software Defined Receiver (Phase 2)	[Grey bar]				[Grey bar]				[Blue bar]				[Grey bar]				[Grey bar]				[Grey bar]							
Rocket/Missile PGM M-Code Prototyping	[Blue bar]				[Grey bar]																							
Next Gen PNT Technologies Phase 2	[Grey bar]				[Grey bar]				[Grey bar]				[Grey bar]				[Grey bar]				[Blue bar]							
Advanced multi-source PNT solutions for Precision Weapon...	[Grey bar]																											
Army APNT (incl M-Code) and NavWar Technology Integratio...	[Blue bar]																											

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</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
Fires NavWar																												
Next Gen NavWar Technology																												
Munition Deployed NavWar Countermeasures																												
Munition Deployed NavWar Dual Mode Attack/Sense Phase 1																												
Munition Deployed NavWar Dual Mode Attack/Sense Phase 2																												
Multi-mode/Multi-mission Munition Deployed NavWar																												
Munition Deployed NavWar multi-spectral countermeasures ...																												
Army APNT (incl M-Code) and NavWar Technology Integratio...																												
Fires SoS APNT related AS and NavWar																												
Network Assisted Assured PNT and NavWar Phase 1																												
Network Assisted Assured PNT and NavWar for MDO Phase 1																												
Army APNT (incl M-Code) and NavWar Technology Integratio...																												

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integrated Product Support	1	2017	4	2033
Joint Lethality PNT and NavWar SME WIPT (systems Engineer Support & Integration)	1	2017	4	2033
Program Management	1	2017	4	2033
Fires APNT	1	2017	4	2033
MGUE Inc2 for JROC-directed PGM Lead Platform	1	2022	4	2027
Accelerate NAVSTORM-M-Integration	3	2021	3	2022
Next Gen PNT Technologies Phase 1	1	2021	4	2023
PGM Software Defined Receiver (Phase 1)	1	2022	4	2023
PGM Software Defined Receiver (Phase 2)	1	2024	4	2025
Rocket/Missile PGM M-Code Prototyping	1	2022	4	2022
Next Gen PNT Technologies Phase 2	1	2027	4	2028
Advanced multi-source PNT solutions for Precision Weapons and Munitions Phase 1	1	2029	4	2030
Advanced multi-source PNT solutions for Precision Weapons and Munitions Phase 2	1	2031	4	2032
Autonomous Integration of multi-Source PNT for Precision Weapons and Munitions	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires APNT	1	2024	4	2028
Fires NavWar	1	2017	4	2033
Next Gen NavWar Technology	1	2024	4	2025
Munition Deployed NavWar Countermeasures	1	2022	4	2022
Munition Deployed NavWar Dual Mode Attack/Sense Phase 1	1	2025	4	2026
Munition Deployed NavWar Dual Mode Attack/Sense Phase 2	1	2027	4	2028
Multi-mode/Multi-mission Munition Deployed NavWar	1	2029	4	2030

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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 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Multi-mode/Multi-mission Munition Deployed Advanced NavWar	1	2031	4	2032
Munition Deployed NavWar multi-spectral countermeasures Phase 1	1	2029	4	2030
Munition Deployed NavWar multi-spectral countermeasures Phase 2	1	2031	4	2032
Integrated Passive and Active Munition Deployed NavWar	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires NavWar	1	2018	4	2033
Fires SoS APNT related AS and NavWar	1	2021	4	2033
Network Assisted Assured PNT and NavWar Phase 1	1	2025	4	2026
Network Assisted Assured PNT and NavWar Phase 2	1	2031	4	2032
Network Assisted Assured PNT and NavWar for MDO Phase 1	1	2029	4	2030
Network Assisted Assured PNT and NavWar for MDO Phase 2	1	2031	4	2032
Automation of NavWar MDO across Fires Systems-of-Systems	1	2033	4	2033
Army APNT (incl M-Code) and NavWar Technology Integration and Evaluation - Fires SoS	1	2022	4	2033

**Note**

Notes:  
 Positioning, Navigation and Timing (PNT)  
 Subject Matter Expert (SME)  
 Working Integrated Product Team (WIPT)  
 Network Assisted (NA)  
 Assured Positioning, Navigation and Timing (APNT)