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

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	<b>R-1 Program Element (Number/Name)</b> PE 0203743A / 155mm Self-Propelled Howitzer Improvements
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908
FF9: PIM Improvement Program	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908

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

The Extended Range Cannon Artillery (ERCA) modernization effort integrates emerging technologies to include: a new cannon, gun mount, gun drive systems, fire control systems, and rate of fire system improvements capability onto the M109A7 Self-Propelled Howitzer platform. ERCA improves lethality through increased range and increased rate of fire while also using mature technology to improve mobility, survivability, reliability, supportability, and lethality. This effort will analyze and evaluate the impact of the new cannon technology and make modifications to the cab, mobility and electronic architecture required to support ammunition automation, remote firing, and remote movement on the platform. This effort will also develop, evaluate, build, and test prototypes.

The total cost of the ERCA Middle Tier of Acquisition (MTA) effort is \$807.678 million RDT&E from FY 2018 to FY 2023. The ERCA MTA is fully funded across the Future Years Defense Program.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	217.959	213.281	0.000	-	0.000
Current President's Budget	217.959	175.076	136.680	-	136.680
Total Adjustments	0.000	-38.205	136.680	-	136.680
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-38.126			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	136.680	-	136.680
• FFRDC Transfer	-	-0.079	-	-	-

**Change Summary Explanation**

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

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

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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FF9: PIM Improvement Program	-	217.959	175.076	136.680	-	136.680	99.481	152.953	113.415	69.344	0.000	964.908
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The Extended Range Cannon Artillery (ERCA) modernization effort integrates emerging technologies to include: a new cannon, gun mount, gun drive systems, fire control systems, and rate of fire system improvements capability onto the M109A7 Self-Propelled Howitzer platform. ERCA improves lethality through increased range and increased rate of fire while also using mature technology to improve mobility, survivability, reliability, supportability, and lethality. This effort will analyze and evaluate the impact of the new cannon technology and make modifications to the cab, mobility and electronic architecture required to support ammunition automation, remote firing, and remote movement on the platform. This effort will also develop, evaluate, build, and test prototypes.

The total cost of the ERCA Middle Tier of Acquisition (MTA) effort is \$807.678 million RDT&E from FY 2018 to FY 2023. The ERCA MTA is fully funded across the Future Years Defense Program.

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

	FY 2021	FY 2022	FY 2023
<p><b>Title:</b> ERCA Prototype Development and Build</p> <p><b>Description:</b> Funds support the ERCA range and ERCA Rate of Fire development costs which include continuously improving drawings and the developing and building of the ERCA prototypes for testing.</p> <p><b>FY 2022 Plans:</b> Conduct developmental engineering efforts, conduct vehicle integration design, and build ERCA prototypes for First Unit Issued battalion. Design and integrate increased range and rate of fire capabilities. Conduct system level integration and engineering efforts to upgrade and design mobility, survivability, reliability and lethality upgrades. Procure material and build ERCA prototype vehicles to support test and evaluation.</p> <p><b>FY 2023 Plans:</b> Completion of developmental engineering efforts and ERCA prototype builds required for the First Unit Issued battalion at the end of FY 2023.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Decrease due to conclusion of Middle Tier Acquisition Rapid Prototyping program in FY 2023.</p>	149.459	101.219	35.426
<p><b>Title:</b> Program Management</p> <p><b>Description:</b> Funding is provided for all Program Management efforts on the Extended Range Cannon Artillery effort.</p>	12.689	12.700	14.300

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<p><b>FY 2022 Plans:</b> Continue the development and production for all required documents, office staff and engineering IPT development. Use non-traditional contractors OTAs to reduce risk.</p> <p><b>FY 2023 Plans:</b> Continue the development and production for all required documents, office staff and engineering IPT development.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase in funding for upcoming Milestone C in FY 2023.</p>				
<p><b>Title:</b> Test and Evaluation</p> <p><b>Description:</b> This funding supports all Testing and Evaluation the Extended Range Cannon Artillery effort.</p> <p><b>FY 2022 Plans:</b> Conduct Developmental Testing and ammunition qualification. These events include all test execution, data collection, contractor and logistics support for mobility, reliability and firings tests.</p> <p><b>FY 2023 Plans:</b> Conduct Developmental Testing and start of Operational Assessment. These events include all test execution, data collection, contractor and logistics support for mobility, reliability and firings tests.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase due to Continuation of Developmental testing and start of Operational Assessment.</p>		55.811	54.764	86.954
<p><b>Title:</b> SBIR/STTR Transfer</p> <p><b>FY 2022 Plans:</b> SBIR/STTR Transfer</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Initial capture of the SBIR/STTR Transfer</p>		-	6.393	-
<b>Accomplishments/Planned Programs Subtotals</b>		217.959	175.076	136.680
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				

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**D. Acquisition Strategy**

Extended Range Cannon (ERCA) uses the approved National Defense Authorization Act (NDAA) Section 804 Middle Tier Acquisition Authority for development efforts as the program moves forward and transitions to a program of record to field the ERCA system.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 7				PE 0203743A / 155mm Self-Propelled Howitzer Improvements				FF9 / PIM Improvement Program							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	Various : Various	-	-		6.393		-		-		-	0.000	6.393	-
<b>Subtotal</b>			-	-		6.393		-		-		-	0.000	6.393	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PIM Improvement Program	MIPR	Various - OGAs : PEO	22.161	-		-		-		-		-	Continuing	Continuing	Continuing
ERCA Range - Developmental Eng	Various	Various : Various Locations	100.664	77.830	Jan 2021	62.862	Jan 2022	20.510	Jan 2023	-		20.510	Continuing	Continuing	Continuing
ERCA Range - Prototype Build	Various	Various : Various Locations	97.084	36.180	Jan 2021	33.436	Jan 2022	10.091	Jan 2023	-		10.091	Continuing	Continuing	Continuing
ERCA Rate of Fire - Developmental Eng	Various	Various : Various Locations	7.455	12.740	Feb 2021	4.921	Feb 2022	4.825	Feb 2023	-		4.825	Continuing	Continuing	Continuing
ERCA Rate of Fire - Prototype Build	Various	Various : Various Locations	-	22.709	Oct 2020	-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			227.364	149.459		101.219		35.426		-		35.426	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	PM/PEO PIM : Various	11.478	12.689	Oct 2020	12.700	Oct 2021	14.300	Oct 2022	-		14.300	Continuing	Continuing	Continuing
<b>Subtotal</b>			11.478	12.689		12.700		14.300		-		14.300	Continuing	Continuing	N/A





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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Army		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0203743A / 155mm Self-Propelled Howitzer Improvements	<b>Project (Number/Name)</b> FF9 / PIM Improvement Program

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Range - Developmental Engineering	2	2018	3	2023
Range - Integration OTA Award	4	2019	4	2019
Range - Prototype Manufacturing	4	2018	3	2023
Range - Developmental Testing and Operational Assessment	1	2019	4	2024
Range - First Unit Issued	4	2023	4	2023
Milestone C	4	2024	4	2024
Rate of Fire - Developmental Engineering	4	2020	2	2026
Rate of Fire - Prototype Manufacturing	1	2025	4	2027
Rate of Fire - Developmental Testing and Operational Assessment	4	2025	2	2029