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**Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army** **Date:** May 2021

<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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	191.076	217.959	213.281	-	213.281	-	-	-	-	-	-
FF9: PIM Improvement Program	-	191.076	217.959	213.281	-	213.281	-	-	-	-	-	-

**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, rate of fire system improvements, and optionally-manned capability onto the M109A7 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 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.

**B. Program Change Summary (\$ in Millions)**

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	199.274	427.254	301.244	-	301.244
Current President's Budget	191.076	217.959	213.281	-	213.281
Total Adjustments	-8.198	-209.295	-87.963	-	-87.963
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-193.700			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-8.198	-15.595			
• Adjustments to Budget Years	-	-	-87.963	-	-87.963

**Change Summary Explanation**

Rate of Fire schedule shifted to the right due programmatic changes.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2022 Army **Date:** May 2021

<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
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
FF9: PIM Improvement Program	-	191.076	217.959	213.281	-	213.281	-	-	-	-	-	-
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, rate of fire system improvements, and optionally-manned capability onto the M109A7 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 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.

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

	FY 2020	FY 2021	FY 2022
<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 2021 Plans:</b> Conduct developmental engineering efforts, conduct vehicle integration design, build ERCA prototypes, support testing, and develop level 3 Technical Data Package (TDP).</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 2021 to FY 2022 Increase/Decrease Statement:</b> Slight decrease in Fiscal Year (FY) 2022 is due to reduction in planned Rate of Fire activities.</p>	159.639	149.459	145.817
<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> <p><b>FY 2021 Plans:</b></p>	5.128	12.689	12.700

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Army		<b>Date:</b> May 2021
<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

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>Continue the development and production for all required documents, office staff and engineering Integrated Product Team (IPT) development. Use non traditional contractors Other Transaction Authorities (OTAs) to reduce risk.</p> <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 2021 to FY 2022 Increase/Decrease Statement:</b> Slight increase due to expected cost inflation.</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 2021 Plans:</b> Conduct Developmental Testing and ammunition qualification. These events include all test execution, data collection, contractor and logistic support for mobility, reliability and firings tests.</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 2021 to FY 2022 Increase/Decrease Statement:</b> Slight decrease from FY 2021 to FY 2022 due to ramp down of Developmental testing and Operational Assessment.</p>	26.309	55.811	54.764
<b>Accomplishments/Planned Programs Subtotals</b>	191.076	217.959	213.281

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

N/A

**Remarks**

**D. Acquisition Strategy**

Extended Range Cannon (ERCA) uses the approved National Defense Authorization Act (NDAA) Section 804 middle tier acquisition program for development, rapid prototyping, rapid fielding, integration, test, and sustainment actions 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 2022 Army												Date: May 2021			
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							
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	36.222	64.442	Jan 2020	77.830	Jan 2021	62.862	Jan 2022	-		62.862	Continuing	Continuing	Continuing
ERCA Range - Prototype Build	Various	Various : Various Locations	9.342	87.742		36.180	Jan 2021	17.238	Jan 2022	-		17.238	Continuing	Continuing	Continuing
ERCA Rate of Fire - Developmental Eng	Various	Various : Various Locations	-	7.455	Feb 2020	12.740	Feb 2021	27.591	Feb 2022	-		27.591	Continuing	Continuing	Continuing
ERCA Rate of Fire - Prototype Build	Various	Various : Various Locations	-	-		22.709	Oct 2020	38.126	Oct 2021	-		38.126	Continuing	Continuing	Continuing
<b>Subtotal</b>			67.725	159.639		149.459		145.817		-		145.817	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	6.350	5.128	Dec 2019	12.689	Oct 2020	12.700	Oct 2021	-		12.700	Continuing	Continuing	Continuing
<b>Subtotal</b>			6.350	5.128		12.689		12.700		-		12.700	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Test and Evaluation	MIPR	Various - OGAs : Various	0.760	26.309	Apr 2020	55.811	Oct 2020	54.764	Oct 2021	-		54.764	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.760	26.309		55.811		54.764		-		54.764	Continuing	Continuing	N/A
<b>Project Cost Totals</b>			74.835	191.076		217.959		213.281		-		213.281	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2022 Army</b>							<b>Date: May 2021</b>			
<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				
	<b>Prior Years</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2022 Army		<b>Date:</b> May 2021
<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	2023	4	2023
Rate of Fire - Developmental Engineering	4	2020	2	2025
Rate of Fire - Prototype Manufacturing	1	2024	4	2026
Rate of Fire - Developmental Testing and Operational Assessment	4	2024	2	2028