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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Army	<b>Date:</b> February 2018
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<b>Appropriation/Budget Activity</b>					<b>R-1 Program Element (Number/Name)</b>							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0203743A / 155MM Self-Propelled Howitzer Improvements							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560
FF9: PIM Improvement Program	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560

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

The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS.

<b>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2017</u></b>	<b><u>FY 2018</u></b>	<b><u>FY 2019 Base</u></b>	<b><u>FY 2019 OCO</u></b>	<b><u>FY 2019 Total</u></b>
Previous President's Budget	0.000	40.784	42.137	-	42.137
Current President's Budget	0.000	40.784	40.676	-	40.676
Total Adjustments	0.000	0.000	-1.461	-	-1.461
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.024	-	-1.024
• Other Adjustments 1	-	-	-0.437	-	-0.437

**Change Summary Explanation**

Adjustments

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements				Project (Number/Name) FF9 / PIM Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FF9: PIM Improvement Program	-	0.000	40.784	40.676	-	40.676	33.953	22.147	0.000	0.000	0.000	137.560
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The current Paladin Integrated Management (PIM) is an ACAT1C Acquisition program. The PIM improvement program is intended to address the current Howitzer capability gap based on a capability needs assessment performed by the user community to restore indirect fires support overmatch to the US Army. This effort will evaluate developing technologies to determine which configuration will add optimal value to the Army. This effort may include but is not limited to the integration of a new cannon, gun mount, gun drive systems, fire control systems and autoloader into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation for this Engineering Change Proposal (ECP) and further inform the level of effort needed to integrate this capability into the current SPHS. .												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: PIM Improvement Program									-	40.784	-	
Description: Funding is provided to support Cost Benefit Analysis (CBA) and associated following on activities, and range requirements												
FY 2018 Plans:												
Will conduct a Cost Benefit Analysis (CBA) comparing several different packages of upgrades for the M109A7. Each upgrade package will be evaluated for cost, technology readiness and added performance. At the conclusion of the CBA the Army will be better informed to choose a path which can be sole source with the current vendor, open competition, or continue with government development through Engineering Manufacturing Development (EMD). This work effort is to pursue Objective Indirect Fire Range Requirement in the current M109 FOV Capability Production Document (CPD). The effort will address increased range requirements from a holisitic development process. Program will focus on gun mount, breech, tube, and fire control. It will be designed around M109A7 objective requirements for range. It is intended to address capability gaps as identified by the Army Chief of Staff.												
FY 2018 to FY 2019 Increase/Decrease Statement:												
Funding in FY19 has decreased to zero and transitioned to the Extended Range ECP Development (ERCA)												
Title: Extended Range ECP Development (ERCA)									-	-	35.585	
Description: Funds support Range ECP development.costs												
FY 2019 Plans:												

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<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 2017</b>	<b>FY 2018</b>
Will focus on executing the plan to begin Integration of improved armament configuration developed by ARDEC Science & Technology (S&T) effort onto the M109A7. Purchase of long lead hardware and prototype build. Develop testing strategy, systems engineering documentation and logistics input.			
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> FY 2019 transition to ERCA as result of Army CBA conclusion			
<b>Title:</b> Program Management		-	-
<b>Description:</b> Funding is provided for all Program Management efforts on the Extended Range ECP program.			4.231
<b>FY 2019 Plans:</b> Begin the development for all required documents, office staff and engineering Integrated Product Team (IPT) development.			
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Funding has increase in FY 2019 to fund program management support costs for ERCA			
<b>Title:</b> Training		-	-
<b>Description:</b> Funding is provided for all training efforts on the Extended Range ECP program.			0.860
<b>FY 2019 Plans:</b> Establish procedures for logistical development, production engineering and test.			
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Funding in FY 2019 has increased to fund training for ERCA			
<b>Accomplishments/Planned Programs Subtotals</b>		-	40.784
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>Remarks</b> N/A			
<b>D. Acquisition Strategy</b> PdM Self Propelled Howitzer will use available information from the completed Cost Benefits Analysis (CBA) and Market Survey to solidify the acquisition plan and execute contracting activities to award an EMD contract to accomplish development, integration, test and sustainment actions as the program moves forward.			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 7						R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements				Project (Number/Name) FF9 / PIM Improvement Program					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	C/TBD	To Be Determined : To Be Determined	-	-		38.784	Jun 2018	-		-		-	0.000	38.784	-
Extended Range ECP Development - Government	MIPR	ARDEC : Picatinny	-	-		-		21.682	Dec 2018	-		21.682	0.000	21.682	-
Extended Range ECP Development - Contractor	SS/CPFF	BAE Systems : York, PA	-	-		-		13.903	Dec 2018	-		13.903	0.000	13.903	-
Training	MIPR	Various - OGAs : Various	-	-		-		0.860	Dec 2018	-		0.860	0.000	0.860	-
Subtotal			-	-		38.784		36.445		-		36.445	0.000	75.229	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	-	-		2.000	Dec 2017	4.231	Dec 2018	-		4.231	0.000	6.231	-
Subtotal			-	-		2.000		4.231		-		4.231	0.000	6.231	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		40.784		40.676		-		40.676	0.000	81.460	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203743A / 155MM Self-Propelled Howitzer Improvements	Project (Number/Name) FF9 / PIM Improvement Program	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
TEMP Development																												
Engineering & Manufacturing Development (EMD)																												
Systems Engineering Plan (SEP)																												
Preliminary Design Review (PDR)																												
Critical Design Review (CDR)																												
CPD Complete																												
Acquisition Development Start																												
TDP Development																												
Prototype Build																												
Life Cycle Sustainment Plan (LCSP) Complete																												
Test																												
System Verification Review (SVR)																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Army			<b>Date:</b> February 2018
<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**

<b>Events</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
TEMP Development	1	2020	3	2020
Engineering & Manufacturing Development (EMD)	1	2019	1	2024
Systems Engineering Plan (SEP)	4	2017	4	2017
Preliminary Design Review (PDR)	2	2019	2	2019
Critical Design Review (CDR)	2	2020	2	2020
CPD Complete	1	2017	1	2017
Acquisition Development Start	2	2018	3	2018
TDP Development	4	2018	2	2020
Prototype Build	4	2019	3	2020
Life Cycle Sustainment Plan (LCSP) Complete	3	2020	3	2020
Test	4	2020	1	2025
System Verification Review (SVR)	4	2022	4	2022