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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					PE 0203743A / 155mm Self-Propelled Howitzer Improvements							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	39.154	37.155	214.246	-	214.246	393.712	301.576	87.291	33.689	0.000	1,106.823
FF9: PIM Improvement Program	-	39.154	37.155	214.246	-	214.246	393.712	301.576	87.291	33.689	0.000	1,106.823

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 will consist of multiple increments to spiral technology as it matures and may include, but is not limited, to the integration of a new cannon, gun mount, gun drive systems, fire control systems, autoloader, and optionally-manned capability into the M109A7 Howitzer. Analysis will be required to evaluate the impact of the new cannon technology and modifications required to support ammunition automation, remote firing, and remote movement on current platform chassis, cab, suspension, mobility, and electronic architecture. This evaluation will be the foundation to inform the level of effort needed to integrate this capability into the current SPHS.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	40.784	40.676	33.953	-	33.953
Current President's Budget	39.154	37.155	214.246	-	214.246
Total Adjustments	-1.630	-3.521	180.293	-	180.293
• Congressional General Reductions	-0.033	-0.046			
• Congressional Directed Reductions	-	-3.475			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.597	-			
• Adjustments to Budget Years	-	-	180.293	-	180.293

Change Summary Explanation

Funding has changed to bring program more in line with the 804 Acquisition Strategy

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FF9: PIM Improvement Program	-	39.154	37.155	214.246	-	214.246	393.712	301.576	87.291	33.689	0.000	1,106.823
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program supports the Cross Function Team (CFT).												
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 to inform the level of effort needed to integrate this capability into the current SPHS.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: PIM Improvement Program									39.154	-	-	
Description: Funding is provided to support Cost Benefit Analysis (CBA) and associated following on activities, and range requirements												
Title: Extended Range Cannon Artillery (ERCA)									-	31.198	177.022	
Description: Funds support the Extended Range Cannon Artillery development costs to include risk reduction and the technical acceleration of building the ERCA prototypes.												
FY 2019 Plans: Focus on executing the plan to begin Integration of improved armament configuration developed by ARDEC Science & Technology (S&T) effort onto the M109A7. Purchase long lead hardware and prototype build. Develop testing strategy, systems engineering documentation and logistics input.												
FY 2020 Plans: Will purchase long lead materials for the ERCA prototypes to be integrated onto the M109A7 platform. Use ARDEC Other Transaction Agreement (OTAs) to bring non traditional contractors to burn down risk. System Level Critical Design Review (CDR) in 2Q FY 2020.												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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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	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
Increase from FY 2019 to FY 2020 is due to the purchase of long lead materials for prototype builds.			FY 2020
Title: Program Management Description: Funding is provided for all Program Management efforts on the Extended Range Cannon Artillery effort. FY 2019 Plans: Begin the development for all required documents, office staff and engineering Integrated Product Team (IPT) development. FY 2020 Plans: Continue the development for all required documents, office staff and engineering Integrated Product Team (IPT) development. Use ARDEC OTAs to bring non traditional contractors to burn down risk. FY 2019 to FY 2020 Increase/Decrease Statement: Decrease funding in FY 2020 is due to a reduction in support costs.		-	3.723
Title: Test and Evaluation Description: Funding is provided for all training efforts on the Extended Range Cannon Artillery effort FY 2019 Plans: Establish procedures for logistical development, production engineering and test. FY 2020 Plans: Government Test support to include all test execution, data collection and logistic support. To include tests of Mobility, Reliability and Test Firings. Use ARDEC OTAs to bring non traditional contractors to burn down risk. TDP Development through 3Q FY 2020. FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY 2019 to FY 2020 due to expected ramp up in testing during FY 2020. Those include Mobility testing, Reliability Testing and Test firings.		-	0.760
Title: FY 2019 SBIR / STTR Transfer Description: FY 2019 SBIR / STTR Transfer FY 2019 Plans: FY 2019 SBIR / STTR Transfer FY 2019 to FY 2020 Increase/Decrease Statement:		-	1.474
			-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals		39.154	214.246
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy PdM Self Propelled Howitzer will use, once approved, a series of NDAA Section 804 middle tier acquisition programs and rapid fielding that include development, integration, test and sustainment actions as the program moves forward and transitions to a program of record to field the ERCA system.			
E. Performance Metrics N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	Sep 2018	-		-		-		-	0.000	22.161	-
Extended Range Cannon Artillery Effort - Government	MIPR	ARDEC : Picatinny	-	8.396	Jun 2018	18.682	Dec 2018	86.040	Jan 2020	-		86.040	0.000	113.118	-
Extended Range Cannon Artillery Effort - Contractor	SS/CPFF	Various Contractors : Various Locations	-	5.948	Jun 2018	12.516	Dec 2018	90.982	Feb 2020	-		90.982	0.000	109.446	-
Test and Evaluation	MIPR	Various - OGAs : Various	-	-		0.760	Dec 2018	-		-		-	0.000	0.760	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.474	Nov 2018	-		-		-	0.000	1.474	-
Subtotal			-	36.505		33.432		177.022		-		177.022	0.000	246.959	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	-	2.649	Jul 2018	3.723	Dec 2018	3.896	Dec 2019	-		3.896	0.000	10.268	-
Subtotal			-	2.649		3.723		3.896		-		3.896	0.000	10.268	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	-	-		-		33.328	Apr 2020	-		33.328	0.000	33.328	-
Subtotal			-	-		-		33.328		-		33.328	0.000	33.328	N/A

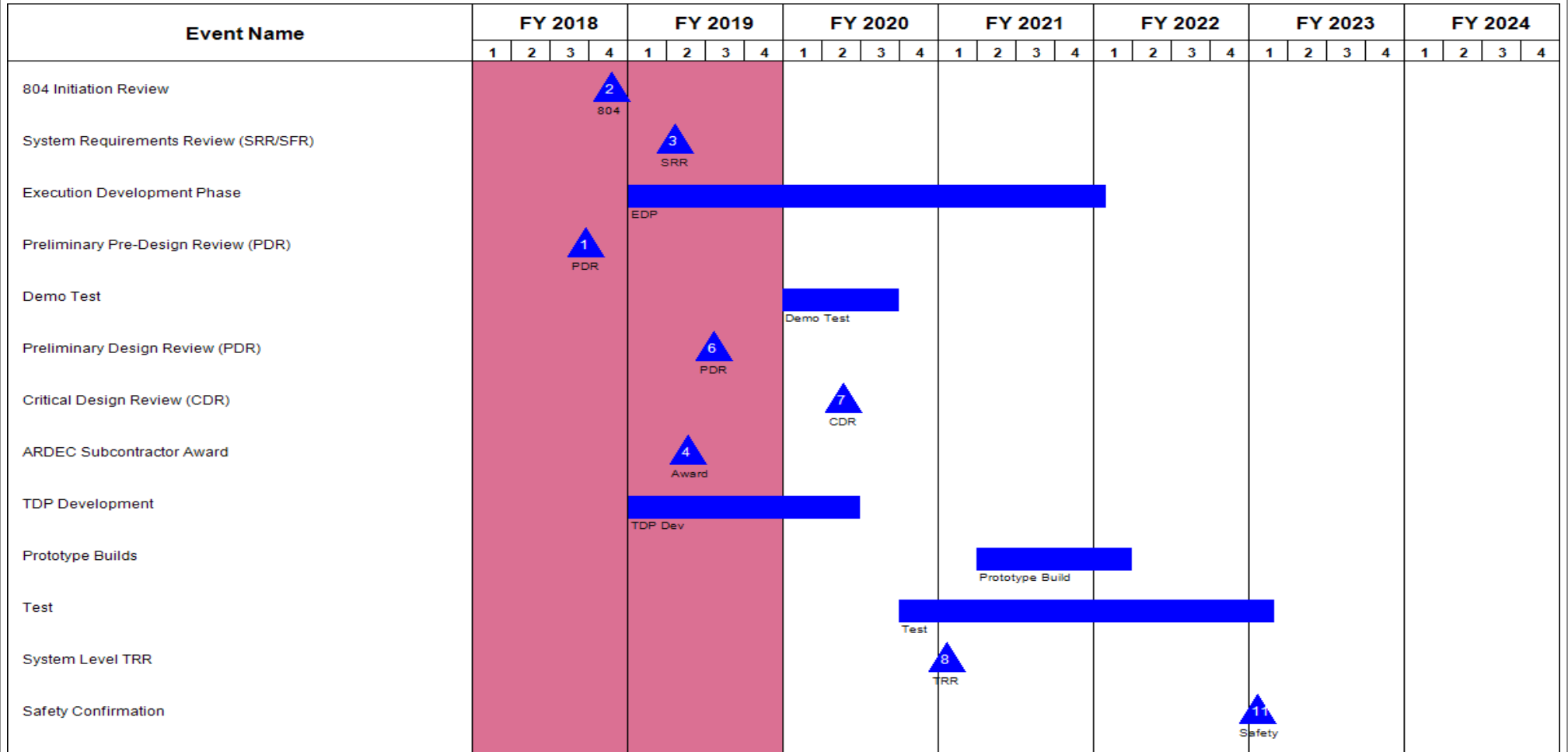
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army											Date: March 2019				
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0203743A / 155mm Self-Propelled Howitzer Improvements					Project (Number/Name) FF9 / PIM Improvement Program					
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	39.154		37.155		214.246		-		214.246	0.000	290.555	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019		
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UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019		
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 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
FUE																												
2UE																												
Increment 2 Initiation Decision																												
Tradoc Analysis Center (TRAC) Study																												
Inc 2 Execution Development Phase																												
Inc 2 SRR/SFR																												
Inc 2 Preliminary Design Review (PDR)																												
Inc 2 Demo Test																												
Inc 2 CDR																												
Inc 2 System Level TRR																												
Inc 2 Prototype Builds																												
Inc 2 Test																												
Inc 2 TDP Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
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	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Initial Analysis of Alternatives	1	2017	3	2017
804 Initiation Review	4	2018	4	2018
System Requirements Review (SRR/SFR)	2	2019	2	2019
Execution Development Phase	1	2019	1	2022
Preliminary Pre-Design Review (PDR)	3	2018	3	2018
Demo Test	1	2020	3	2020
Preliminary Design Review (PDR)	3	2019	3	2019
Critical Design Review (CDR)	2	2020	2	2020
ARDEC Subcontractor Award	2	2019	2	2019
TDP Development	1	2019	2	2020
Prototype Builds	2	2021	1	2022
Test	4	2020	1	2023
System Level TRR	1	2021	1	2021
Safety Confirmation	1	2023	1	2023
FUE	2	2023	3	2023
2UE	2	2024	3	2024
Increment 2 Initiation Decision	2	2019	2	2019
Tradoc Analysis Center (TRAC) Study	3	2018	4	2019
Inc 2 Execution Development Phase	4	2019	4	2021
Inc 2 SRR/SFR	2	2021	2	2021
Inc 2 Preliminary Design Review (PDR)	4	2021	4	2021
Inc 2 Demo Test	2	2021	4	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019	
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	Start		End	
Events	Quarter	Year	Quarter	Year
Inc 2 CDR	2	2023	2	2023
Inc 2 System Level TRR	2	2024	2	2024
Inc 2 Prototype Builds	2	2023	3	2024
Inc 2 Test	3	2024	4	2026
Inc 2 TDP Development	4	2020	4	2026