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

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>
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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	-	36.187	25.000	23.106	-	23.106	43.388	71.922	134.685	135.996	Continuing	Continuing
516: <i>Paladin/FAASV</i>	-	-	-	23.106	-	23.106	43.388	71.922	134.685	135.996	Continuing	Continuing
HB6: <i>Mobile 155MM Howitzer</i>	-	36.187	25.000	-	-	-	-	-	-	-	0.000	61.187

**Note**

Elimination: Project HB6 has no funding request for FY 2023.  
 New Start: Project Paladin/FAASV is a new start effort in FY 2023.

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

This program element encompasses engineering and manufacturing development for artillery weapons systems.

Project HB6 supports the mobile howitzer program. The Mobile 155mm Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing towed howitzer systems. Program activities in FY 2021 will be focused on evaluation of multiple vendor mobile howitzer systems at United States proving grounds against system requirements. Evaluation will include safety testing, US ammunition compatibility testing, and assessment of mobility, survivability and transportability.

Project Paladin/FAASV is a new start effort in FY 2023 in support of the Armament Upgrade Project to optimize capabilities and improve reliability for the M109A7 Self Propelled Howitzer (SPH) with expected changes in the system's operational profile. The M109A7 is an indirect fire weapon system with the ability of delivering accurate, long range, lethal and non-lethal cannon fires in support of both Combined Arms Maneuver (CAM) and Wide Area Security (WAS) operations. The M109A7 can be employed within any Brigade Combat Team formation to neutralize, suppress, or destroy enemy forces, while providing protected transport of a field artillery howitzer section on the modern battlefield.

This effort will include system usage and optimization studies, simulations, development engineering, prototype development and validation to provide an upgraded cannon configuration for incremental upgrades on the M109A7 SPH. The Armament Upgrade Project will focus on an integrated cannon, breech, and fire control system to improve reliability associated with higher charge levels and increased ranges.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>
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<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	36.187	0.000	0.000	-	0.000
Current President's Budget	36.187	25.000	23.106	-	23.106
Total Adjustments	0.000	25.000	23.106	-	23.106
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	25.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	23.106	-	23.106

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** HB6: *Mobile 155MM Howitzer*

Congressional Add: *Soft Recoil Development*

	<b>FY 2021</b>	<b>FY 2022</b>
	25.000	25.000
Congressional Add Subtotals for Project: HB6	25.000	25.000
Congressional Add Totals for all Projects	25.000	25.000

**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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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>				<b>Project (Number/Name)</b> 516 / <i>Paladin/FAASV</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
516: <i>Paladin/FAASV</i>	-	-	-	23.106	-	23.106	43.388	71.922	134.685	135.996	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

This is a new start in FY 2023.

This is a New Start in Fiscal Year 23 (FY23).

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

Project Paladin/FAASV is a new start effort in FY 2023 in support of the Armament Upgrade Project to optimize capabilities and improve reliability for the M109A7 Self Propelled Howitzer (SPH) with expected changes in the system's operational profile. The M109A7 is an indirect fire weapon system with the ability of delivering accurate, long range, lethal and non-lethal cannon fires in support of both Combined Arms Maneuver (CAM) and Wide Area Security (WAS) operations. The M109A7 can be employed within any Brigade Combat Team formation to neutralize, suppress, or destroy enemy forces, while providing protected transport of a field artillery howitzer section on the modern battlefield.

This effort will include system usage and optimization studies, simulations, development engineering, prototype development and validation to provide an upgraded cannon configuration for incremental upgrades on the M109A7 SPH. The Armament Upgrade Project will focus on an integrated cannon, breech, and fire control system to improve reliability associated with higher charge levels and increased ranges.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> Program Management	-	-	3.690
<b>Description:</b> Funding is provided for all Program Management efforts for the M109A7 howitzer upgraded armament system.			
<b>FY 2023 Plans:</b> Develop detailed schedules, prepare prototype order procurements, coordinate test & validation events, and prepare materiel release documents.			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> This is a New Start in Fiscal Year 23 (FY23).			
<b>Title:</b> Developmental Engineering	-	-	19.416
<b>Description:</b> Conduct development engineering efforts, perform system usage and optimization studies, perform simulations, and developed a proposed system configuration to be matured in support of future prototype manufacturing efforts.			
<b>FY 2023 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> 516 / <i>Paladin/FAASV</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023
Develop system configurations and conduct simulations to optimize system reliability/performance.			
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> This is a New Start in Fiscal Year 23 (FY23).			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	23.106

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

N/A

**Remarks**

**D. Acquisition Strategy**

The Armament Upgrade Project will leverage Government, Government support contractors, and a competition selected contractor for the development and validation of this effort. The purpose of this funding is to develop a validated prototype design for future production integration.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / Artillery Systems - EMD	<b>Project (Number/Name)</b> 516 / Paladin/FAASV
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
SEPM Government	MIPR	Various : Various	-	-		-		1.826	Dec 2022	-		1.826	0.000	1.826	-
SEPM Contractor	TBD	Various : Various	-	-		-		1.864	Mar 2023	-		1.864	0.000	1.864	-
<b>Subtotal</b>			-	-		-		3.690		-		3.690	0.000	3.690	N/A

<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Development Engineering	TBD	TBD : TBD	-	-		-		17.016	Mar 2023	-		17.016	0.000	17.016	-
Production, Engineering, Planning	TBD	TBD : TBD	-	-		-		0.499	Mar 2023	-		0.499	0.000	0.499	-
Development Tooling	TBD	TBD : TBD	-	-		-		0.006	Mar 2023	-		0.006	0.000	0.006	-
<b>Subtotal</b>			-	-		-		17.521		-		17.521	0.000	17.521	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Data	TBD	TBD : TBD	-	-		-		1.055	Mar 2023	-		1.055	0.000	1.055	-
Support Equipment	TBD	TBD : TBD	-	-		-		0.134	Mar 2023	-		0.134	0.000	0.134	-
Other	TBD	TBD : TBD	-	-		-		0.706	Mar 2023	-		0.706	0.000	0.706	-
<b>Subtotal</b>			-	-		-		1.895		-		1.895	0.000	1.895	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	-	-	23.106	-	23.106	0.000	23.106	N/A

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> 516 / <i>Paladin/FAASV</i>
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Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Developmental Engineering																												
Prototype Manufacturing																												
Component Level Testing																												
Prototype System Production																												
System Level Test and Validation																												

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Army **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> 516 / <i>Paladin/FAASV</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Developmental Engineering	2	2023	3	2028
Prototype Manufacturing	1	2024	3	2025
Component Level Testing	3	2025	4	2026
Prototype System Production	4	2024	3	2026
System Level Test and Validation	2	2026	3	2027

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

Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604854A / Artillery Systems - EMD				Project (Number/Name) HB6 / Mobile 155MM Howitzer			
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
HB6: <i>Mobile 155MM Howitzer</i>	-	36.187	25.000	-	-	-	-	-	-	-	0.000	61.187
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Project HB6 has no funding request for Fiscal Year (FY) 2023.

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

Project HB6 supports the mobile howitzer program. The Mobile 155 millimeter (mm) Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing and future towed howitzer systems.

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

	FY 2021	FY 2022	FY 2023
<b>Title:</b> Testing and Engineering Support	8.802	-	-
<b>Description:</b> Live fire testing of Mobile Howitzer and associated engineering support.			
<b>Title:</b> Bid Sample Test	2.385	-	-
<b>Description:</b> Funding will support engineering and operational evaluation of Mobile Howitzer vendor systems against the Operational Needs Statement (ONS).			
<b>Accomplishments/Planned Programs Subtotals</b>	11.187	-	-

	FY 2021	FY 2022
<b>Congressional Add:</b> Soft Recoil Development	25.000	25.000
<b>FY 2021 Accomplishments:</b> Funds support the engineering and development of the soft recoil system.		
<b>FY 2022 Plans:</b> Funds support the development and testing of soft recoil systems for possible utilization in current and future artillery systems.		
<b>Congressional Adds Subtotals</b>	25.000	25.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> HB6 / <i>Mobile 155MM Howitzer</i>
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**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The acquisition strategy for the Mobile Howitzer Program is to evaluate existing industry prototypes and fielded systems and assess capability of mobility and survivability attributes. Evaluation will be conducted by US Army engineers and the Army Test and Evaluation Command.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / Artillery Systems - EMD	<b>Project (Number/Name)</b> HB6 / Mobile 155MM Howitzer
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Mobile Howitzer Analysis	MIPR	Combat Capability Development Command, Armaments Center : Picatinny Arsenal, NJ	2.972	-		-		-		-		-	0.000	2.972	-
Soft Recoil Development	TBD	PM Towed Artillery Systems : Picatinny Arsenal, NJ	-	25.000	Mar 2021	25.000	Mar 2022	-		-		-	0.000	50.000	-
<b>Subtotal</b>			2.972	25.000		25.000		-		-		-	0.000	52.972	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Testing and Engineering Support	MIPR	Yuma Test Center / Combat Capability Development Command, Armaments Center : Yuma, AZ / Picatinny, NJ	-	8.802	Oct 2020	-		-		-		-	Continuing	Continuing	-
Bid Sample Test	MIPR	Yuma Test Center : Yuma, AZ	-	2.385	Jul 2021	-		-		-		-	0.000	2.385	-
105MM Mobile Howitzer Evaluation	SS/FFP	Army Contracting Command New Jersey : Various	10.000	-		-		-		-		-	0.000	10.000	-
<b>Subtotal</b>			10.000	11.187		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
	<b>Project Cost Totals</b>		12.972	36.187	25.000	-	-	-	Continuing	Continuing

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> HB6 / <i>Mobile 155MM Howitzer</i>
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Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Testing and Engineering Support	████████				████████																							
Bid Sample Test					████████																							
105MM Mobile Howitzer System Evaluation					████████																							
Soft Recoil Development					████████				████████████████████																			

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Army **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604854A / <i>Artillery Systems - EMD</i>	<b>Project (Number/Name)</b> HB6 / <i>Mobile 155MM Howitzer</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mobile Howitzer Analysis	1	2020	3	2020
Testing and Engineering Support	3	2020	4	2021
Bid Sample Test	3	2021	4	2021
105MM Mobile Howitzer System Evaluation	2	2021	4	2021
Soft Recoil Development	2	2021	4	2023