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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	25.000	48.106	42.490	-	42.490	70.518	132.172	133.582	135.073	Continuing	Continuing
516: <i>Paladin/FAASV</i>	-	-	23.106	42.490	-	42.490	70.518	132.172	133.582	135.073	Continuing	Continuing
HB6: <i>Mobile 155MM Howitzer</i>	-	25.000	25.000	-	-	-	-	-	-	-	0.000	50.000

Note

Elimination: Project HB6 has no funding request for FY 2024.

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 to modernize the M109 Family of Vehicles (FoV) to improve performance and address expected changes in the operational profile. The M109 FoV 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 M109 FoV 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. Funding also supports work being completed at the Watervliet Arsenal (WVA) in Watervliet, NY.

This effort will include system usage and optimization studies, simulations, development engineering, prototype development and validation for incremental upgrades on the M109 FoVs.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	25.000	23.106	43.388	-	43.388
Current President's Budget	25.000	48.106	42.490	-	42.490
Total Adjustments	0.000	25.000	-0.898	-	-0.898
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	25.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.898	-	-0.898

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

Project: HB6: *Mobile 155MM Howitzer*
 Congressional Add: *Soft Recoil Development*

	<u>FY 2022</u>	<u>FY 2023</u>
	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

Decreased funding to support higher Army priorities.

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>				Project (Number/Name) 516 / <i>Paladin/FAASV</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
516: <i>Paladin/FAASV</i>	-	-	23.106	42.490	-	42.490	70.518	132.172	133.582	135.073	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Paladin/FAASV to modernize the M109 Family of Vehicles (FoV) to improve performance and address expected changes in the operational profile. The M109 FoV 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 M109 FoV 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. Funding also supports work being completed at the Watervliet Arsenal (WVA) in Watervliet, NY.

This effort will include system usage and optimization studies, simulations, development engineering, prototype development and validation for incremental upgrades on the M109 FoVs.

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

	FY 2022	FY 2023	FY 2024
<p>Title: Program Management</p> <p>Description: Funding is provided for all Program Management support efforts.</p> <p>FY 2023 Plans: Lead the planning and coordination for a system trade study which will be used to inform an Army Senior Leader decision on the strategy for increasing performance of the M109 Family of Vehicles (FoV).</p> <p>FY 2024 Plans: Develop and manage detailed schedules for modernization activities, execute prototype orders, and begin development, production, and coordination for all required programmatic documents.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase reflects planned lifecycle efforts.</p>	-	3.690	3.733
<p>Title: Developmental Engineering</p> <p>Description: Conduct development engineering efforts, perform system usage and optimization studies, perform simulations, develop a proposed system configuration to be matured, material and labor required in support of prototype manufacturing efforts.</p> <p>FY 2023 Plans: Develop system configurations and conduct simulations to optimize system reliability/performance.</p> <p>FY 2024 Plans:</p>	-	18.573	38.757

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Continue engineering development activities to include studies and design reviews. Place orders for prototype material. <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increased funding in FY 2024 is due to ramp up on development efforts and prototype materials as a result of the Army decision from trade study.			
<i>Title:</i> SBIR/STTR Transfer <i>FY 2023 Plans:</i> SBIR/STTR Transfer. Funding transferred in accordance with Title 15 USC 638. <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> SBIR/STTR Transfer. Funding transferred in accordance with Title 15 USC 638.	-	0.843	-
Accomplishments/Planned Programs Subtotals	-	23.106	42.490

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

N/A

Remarks

D. Acquisition Strategy

The M109 FoV modernization will leverage Government and Government support contractors, as well as contract mechanisms to prototype, test, and evaluate technologies for the development and validation of modernization efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 516 / <i>Paladin/FAASV</i>
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	1.848	Dec 2023	-		1.848	0.000	3.674	-
SEPM Contractor	TBD	Various : Various	-	-		1.864	Mar 2023	1.885	Mar 2024	-		1.885	0.000	3.749	-
SBIR/STTR	TBD	TBD : TBD	-	-		0.843	Dec 2022	-		-		-	0.000	0.843	-
Subtotal			-	-		4.533		3.733		-		3.733	0.000	8.266	N/A

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	18.295	Mar 2024	-		18.295	0.000	35.311	-
Production, Engineering, Planning	TBD	TBD : TBD	-	-		0.499	Mar 2023	0.501	Mar 2024	-		0.501	0.000	1.000	-
Development Tooling	TBD	TBD : TBD	-	-		0.006	Mar 2023	0.006	Mar 2024	-		0.006	0.000	0.012	-
Prototype Manufacturing	TBD	TBD : TBD	-	-		-		17.332	Mar 2024	-		17.332	0.000	17.332	-
Subtotal			-	-		17.521		36.134		-		36.134	0.000	53.655	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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	-	-		0.918	Mar 2023	1.058	Mar 2024	-		1.058	0.000	1.976	-
Support Equipment	TBD	TBD : TBD	-	-		0.134	Mar 2023	0.134	Mar 2024	-		0.134	0.000	0.268	-
Other	TBD	TBD : TBD	-	-		-		1.431	Mar 2024	-		1.431	0.000	1.431	-
Subtotal			-	-		1.052		2.623		-		2.623	0.000	3.675	N/A

			Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	23.106	42.490	-	42.490	0.000	65.596	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 516 / <i>Paladin/FAASV</i>
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Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	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																																
Prototype/System Level Test and Validation																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 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	2	2024	3	2026
Prototype/System Level Test and Validation	3	2025	2	2029

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>				Project (Number/Name) HB6 / <i>Mobile 155MM Howitzer</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
HB6: <i>Mobile 155MM Howitzer</i>	-	25.000	25.000	-	-	-	-	-	-	-	0.000	50.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project HB6 has no funding request for Fiscal Year (FY) 2024.

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 2022	FY 2023
Congressional Add: Soft Recoil Development	25.000	25.000
FY 2022 Accomplishments: Funds support the development and testing of soft recoil systems for possible utilization in current and future artillery systems.		
FY 2023 Plans: Funds support the continued development and testing of soft recoil systems for possible utilization in current and future artillery systems.		
Congressional Adds Subtotals	25.000	25.000

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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Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	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				
Soft Recoil Development																																

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 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	2024