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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	6.574	14.615	10.157	-	10.157	12.467	35.514	33.997	35.685	0.000	149.009
093: Multi-Launch Rocket System (MLRS)	-	3.784	6.563	5.036	-	5.036	5.035	31.476	29.791	31.479	0.000	113.164
DX8: HIMARS Product Improvement Program	-	2.790	8.052	5.121	-	5.121	7.432	4.038	4.206	4.206	0.000	35.845

A. Mission Description and Budget Item Justification

Program element (PE) 0603778A MLRS Product Improvement Program supports development and testing of the Army's rocket launcher fleet, including the Multiple Launch Rocket System (MLRS) launcher and the High Mobility Artillery Rocket System (HIMARS) launcher. MLRS and HIMARS launchers support the Army's number one priority modernization effort, Long Range Precision Fires. Updated launchers are required to fire current and future munitions such as the Precision Strike Missile (PrSM) and Extended Range (ER) Guided Multiple Launch Rocket System (GMLRS). Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by Combat Capabilities Development Command Aviation and Missile Center (CCDC AvMC). The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Project 093 M270A1 MLRS launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the current MLRS Family of Munitions (MFOM) to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS-Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the ER GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the MLRS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding in FY 2023-2025 also funds non-recurring engineering for system hardware and software modernization to the MLRS chassis, Launcher Loader Module, and Fire Control System. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as APNT integration and rocket launcher software development effort by CCDC AvMC. The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Justification:
 Fiscal Year (FY) 2021 Base funding in the amount of \$5.036 million for Project 093 continues tactical launcher software development, qualification, and materiel release to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a MLRS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. The FY 2021 funds also allow additional integration of Assured Positioning, Navigation and Timing (APNT) capabilities, and integration of satellite communications, allowing the MLRS to continue to effectively operate in near peer and peer threat environments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0603778A / <i>MLRS Product Improvement Program</i>
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Project DX8 M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the current and emerging MLRS MFOM, to include the GMLRS-U, GMLRS-Alternative Warhead, the ATACMS and future MFOM to include the ER GMLRS, and the PrSM. Funds software development, training updates, APNT technology implementation, integration of satellite communications, and nonrecurring engineering for the HIMARS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as APN integration and rocket launcher software development effort by CCDC AvMC. The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

FY 2021 Base funding in the amount of \$5.121 million for Project DX8 supports tactical launcher software development and qualification to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. This effort funds research integration of Assured Positioning, Navigation and Timing (APNT) capabilities, and integration of satellite communications, allowing the HIMARS to continue to effectively operate in near peer threat environments.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	6.877	22.877	10.167	-	10.167
Current President's Budget	6.574	14.615	10.157	-	10.157
Total Adjustments	-0.303	-8.262	-0.010	-	-0.010
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-8.262			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.303	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.010	-	-0.010

Change Summary Explanation

FY 2021: The \$12.720 million decrease in base funding is a result of Army realignment of funds to higher priority programs.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
093: Multi-Launch Rocket System (MLRS)	-	3.784	6.563	5.036	-	5.036	5.035	31.476	29.791	31.479	0.000	113.164
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 093 M270A1 MLRS launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. MLRS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. MLRS is a tracked, indirect fire, rocket/missile launcher capable of firing two pods of precision rockets/missiles from the current MLRS Family of Munitions (MFOM) to include the Guided Multiple Launch Rocket System-Unitary (GMLRS-U), GMLRS-Alternative Warhead, the Army Tactical Missile System (ATACMS) and future MFOM to include the ER GMLRS, and the Precision Strike Missile (PrSM). Funds software development, training updates, Assured Positioning, Navigation and Timing (APNT) technology implementation, integration of satellite communications, and nonrecurring engineering for the MLRS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding in FY 2023-2025 also funds non-recurring engineering for system hardware and software modernization to the MLRS chassis, Launcher Loader Module, and Fire Control System. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as APNT integration and rocket launcher software development effort by CCDC AvMC. The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Justification:
 FY 2021 Base funding in the amount of \$5.036 million for Project 093 continues tactical launcher software development, qualification, and materiel release to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a MLRS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. The FY2021 funds also allow additional integration of Assured Positioning, Navigation and Timing (APNT) capabilities, and integration of satellite communications, allowing the MLRS to continue to effectively operate in near peer and peer threat environments.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: MLRS Product Improvement Program	3.625	6.265	5.036	-	5.036
Description: The M270A1 MLRS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion as capability enhancements are developed and to mitigate obsolescence. Support efforts include: electronic obsolescence mitigation and enhancements for the M993A1 carrier, Fire Control System, Launcher Loader Module and Enhanced Command and Control; development and updating the Fire Control System software to keep pace with changes to the munitions; and performing Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information Assurance compliance certification and network interoperability testing. Perform technical assessments and					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
concept studies for the following: obsolescence mitigation, APNT, crew protection, automotive and hardware/software enhancements, improving operational timelines and risk reduction. FY 2020 Plans: Continued tactical launcher software development and qualification to support the FCS electronic obsolescence mitigation hardware upgrade required to operate a MLRS launcher. Conducted research and development of APNT capabilities, and integration of satellite communications. FY 2021 Base Plans: Will continue updates to currently fielded tactical launcher software. Continue tactical launcher software development to incorporate updates post Functional Qualification and Post System Integration Qualification to support the FCS electronic obsolescence mitigation hardware upgrade required to operate a MLRS launcher. Conduct a demonstration for APNT capabilities. FY 2020 to FY 2021 Increase/Decrease Statement: Decreased funding of \$1.527 million delays the integration of GPS Anti-Jam and Anti-Spoofing capabilities, and integration of satellite communications by one year. This limits the MLRS Launcher's ability to continue effective operations in near-peer threat environment.					
Title: FY 2019 SIBR/STTR Transfer Description: Account for the FY 2019 SBIR / STTR Adjustment	0.159	-	-	-	-
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638 FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638	-	0.298	-	-	-
Accomplishments/Planned Programs Subtotals	3.784	6.563	5.036	-	5.036

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>			<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• C67500: MLRS Mods	478.998	372.550	310.419	20.000	330.419	277.623	207.159	165.712	165.062	Continuing	Continuing

Remarks

C67500 is Budget Line Item Number (BLIN) 22 funded in the Missiles Procurement Army appropriation.

D. Acquisition Strategy

The M270A1 MLRS Product Improvement Program performs development efforts required to address emerging requirements. Emerging requirements include, but are not limited to, updates to address emerging threats to the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility with other Army ground based systems reducing sustainability costs. Update software and hardware for fire control system, communications, and munitions to maintain compatibility and operational viability against near-peer adversaries.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)
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Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Government Program Management	Various	PFRMS Project Office : Redstone Arsenal, AL	8.955	-		-		-		-		-	0.000	8.955	-
FY 2019 SBIR / STTR	Various	Various : Various	-	0.159		0.084		-		-		-	0.000	0.243	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.298		-		-		-	0.000	0.298	-
Subtotal			8.955	0.159		0.382		-		-		-	0.000	9.496	N/A

Remarks
Government Program Management funding was transferred to the Operations and Maintenance, Army (OMA) appropriation.

Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Other Government Agencies OGA	MIPR	FT SILL OK, CECOM-NJ AMRDEC-RSA AL, : various	17.108	-		-		-		-		-	0.000	17.108	-
MLRS IAC	C/CPFF	Lockheed Martin : Grand Prairie, TX	30.498	-		-		-		-		-	0.000	30.498	-
MLRS FCS Development	SS/CR	Lockheed Martin : Grand Prairie, TX	70.200	-		-		-		-		-	0.000	70.200	-
Organic Software Development	MIPR	CCDC AvMC : Redstone Arsenal, AL	5.760	3.625	May 2019	4.831	Dec 2019	5.036	Dec 2020	-		5.036	Continuing	Continuing	Continuing
Risk Reduction Effort: Common Fire Control System	SS/CR	Lockheed Martin : Grand Prairie, TX	21.900	-		-		-		-		-	0.000	21.900	-
Risk Reduction Effort: Hulls	MIPR	Red River Army Depot : Red River Army Depot, TX	3.200	-		-		-		-		-	0.000	3.200	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Assured Position, Navigation and Timing (APNT) Demonstration	MIPR	CCDC AvMC : Redstone Arsenal, AL	-	-		0.176		-		-		-	0.000	0.176	-
Subtotal			148.666	3.625		5.007		5.036		-		5.036	Continuing	Continuing	N/A

Remarks
Organic (government developed, maintained, and owned) software development includes additional research and development related to Fire Control System electronic obsolescence, Assured Position, Navigation and Timing (APNT) activities such as Global Positioning System (GPS) Anti-Jam, Anti-Spoofing capabilities, and integration of satellite communications.

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Support Contract	Various	Multiple : Multiple	4.834	-		-		-		-		-	0.000	4.834	-
Subtotal			4.834	-		-		-		-		-	0.000	4.834	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Test Support, Joint Interoperability Test Certificate	MIPR	CTSF, Ft. Hood : Texas	10.712	-		-		-		-		-	0.000	10.712	-
Test Support	MIPR	Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, : RSA: Various	-	-		1.174	Nov 2019	-		-		-	Continuing	Continuing	Continuing
Subtotal			10.712	-		1.174		-		-		-	Continuing	Continuing	N/A

			Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			173.167	3.784	6.563	5.036	-	5.036	Continuing	Continuing	N/A











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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army							Date: February 2020			
Appropriation/Budget Activity 2040 / 7			R-1 Program Element (Number/Name) PE 0603778A / <i>MLRS Product Improvement Program</i>			Project (Number/Name) 093 / <i>Multi-Launch Rocket System (MLRS)</i>				
	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 Acronyms:
 AvMC: Aviation and Missile Center;
 CCDC: Combat Capabilities Development Command;
 AMRDEC - Aviation and Missile Research Development and Engineering Center;
 PFRMS - Precision Fires Rocket and Missile Systems (former name for PM STORM);
 STORM - Strategic and Operational Rocket and Missile Systems (new name for PM PFRMS);
 CTSF - Central Technical Support Facility;
 ATEC - US Army Test and Evaluation Command;
 APG MD - Aberdeen Proving Ground, Maryland;
 WSMR - White Sands Missile Range;
 RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) 093 / Multi-Launch Rocket System (MLRS)	

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Software Development																												
Software Qualification					 Software Qualification																							
Post System Integration Qualification									 Post System Integration Qualification																			
Functional Configuration Audit													 Functional Configuration Audit															
Delta Live Fire Testing for Improved Armored Cab (IAC)					 Delta Live Fire IAC																							
GPS Anti-Jam/Anti-Spoofing Integration					 GPS Anti-Jam/Anti-Spoofing Integration																							
GPS Anti-Jam/Anti-Spoof Demonstration									 GPS Anti-Jam/Anti-Spoof Demonstration																			
Launcher Modernization																												
System Requirements Review																	 System Requirements Review											
System Functional Review																					 System Functional Review							
Preliminary Design Review																									 Preliminary Design Review			
Critical Design Review																									 Critical Design Review			

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / <i>MLRS Product Improvement Program</i>	Project (Number/Name) 093 / <i>Multi-Launch Rocket System (MLRS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development	1	2018	4	2025
Software Qualification	3	2020	3	2020
Post System Integration Qualification	1	2021	3	2021
Functional Configuration Audit	2	2022	2	2022
Delta Live Fire Testing for Improved Armored Cab (IAC)	3	2020	3	2020
GPS Anti-Jam/Anti-Spoofing Integration	2	2020	2	2020
GPS Anti-Jam/Anti-Spoof Demonstration	2	2021	2	2021
Launcher Modernization	1	2023	4	2025
System Requirements Review	3	2023	3	2023
System Functional Review	1	2024	1	2024
Preliminary Design Review	3	2024	3	2024
Critical Design Review	3	2025	3	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DX8: HIMARS Product Improvement Program	-	2.790	8.052	5.121	-	5.121	7.432	4.038	4.206	4.206	0.000	35.845
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project DX8 M142 High Mobility Artillery Rocket System (HIMARS) launcher is a full-spectrum, combat-proven, all-weather, 24/7 lethal and responsive, precision strike weapon system. HIMARS provides critical missile precision strike, operational shaping fires, counterfire, and close support destructive and suppressive fires. HIMARS is a C-130 or C-17 transportable, wheeled, indirect fire, rocket/missile launcher capable of firing one pod of precision rockets/missiles from the current and emerging MLRS MFOM, to include the GMLRS-U, GMLRS-Alternative Warhead, the ATACMS and future MFOM to include the ER GMLRS, and the PrSM. Funds software development, training updates, APNT technology implementation, integration of satellite communications, and nonrecurring engineering for the HIMARS launcher. Funds development related to maintaining capability associated with the current and evolving threat. Funding from both Projects 093 and DX8 contributes to common efforts between both launcher platforms such as Assured Positioning, Navigation and Timing (APNT) integration and rocket launcher software development effort by CCDC AvMC. The goal is to develop common solutions applicable to both MLRS and HIMARS launchers.

Justification:

FY 2021 Base funding in the amount of \$5.121 million for Project DX8 supports tactical launcher software development and qualification to support the Fire Control System (FCS) electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. The tactical software is a critical developmental item required to field additional launchers, maintain backward compatibility for current fleet sustainment, and is the first release of government developed software common to both the MLRS and HIMARS launcher. This effort funds research integration of Assured Positioning, Navigation and Timing (APNT) capabilities, and integration of satellite communications, allowing the HIMARS to continue to effectively operate in near peer threat environments.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: MLRS Production Improvement Program (PIP)-HIMARS PIP	2.790	7.686	5.121	-	5.121
Description: The HIMARS Product Improvement Program provides the preservation of platform viability and readiness to accept technology insertion. As capability enhancements are developed, technology is inserted in order to mitigate obsolescence. Support efforts include: obsolescence mitigation and enhancements for the truck, Fire Control System, Launcher Loader Module and Enhanced Command and Control; development and updating the Fire Control System software to keep pace with changes to the munitions; and performing Command, Control, Communications, Computers and Intelligence (C4I)/interoperability and Information Assurance compliance certification and network interoperability testing. Perform technical assessments and concept studies for the following: electronic obsolescence mitigation and redesign to keep pace with the evolving					

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) DX8 / HIMARS Product Improvement Program

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>threat, APNT, crew protection, automotive and hardware/software enhancements, improving operational timelines, and risk reduction.</p> <p>FY 2020 Plans: Continued tactical launcher software development and qualification to support the FCS electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. Conducted research and development of APNT capabilities, and integration of satellite communications.</p> <p>FY 2021 Base Plans: Continue tactical launcher software development, risk reduction, and qualification to support the FCS electronic obsolescence mitigation hardware upgrade required to operate a HIMARS launcher. Integrate APNT capabilities, and integrate satellite communications.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decreased funding of \$1.931million delays integration of APNT capabilities, and integration of satellite communications. This integration allows the HIMARS Launcher to continue effective operations in near-peer threat environments.</p>					
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.366	-	-	-
Accomplishments/Planned Programs Subtotals	2.790	8.052	5.121	-	5.121

C. Other Program Funding Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• C67501: HIMARS Modifications	10.196	12.483	6.081	-	6.081	7.292	9.700	17.402	29.968	Continuing	Continuing
• C02901: High Mobility Artillery Rocket System (HIMARS)	171.138	-	41.226	-	41.226	88.979	41.228	-	-	0.000	342.571

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
C67501 (Budget Line Item Number 23) and C02091 (Budget Line Item Number 13) are funded in the Missiles Procurement Army appropriation.

D. Acquisition Strategy

The M142 HIMARS Product Improvement Program performs development efforts required to address emerging requirements. Emerging requirements include, but are not limited to, updates to address emerging threats to the launcher organic version 8.x software, reacting to system changes driven by policy and emerging requirements, and maintaining architectural compatibility with other Army ground based systems reducing sustainability costs. Update software and hardware for fire control system, communications, and munitions to maintain compatibility and operational viability against near-peer adversaries.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) DX8 / HIMARS Product Improvement Program
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Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Government Program Management	Various	PFRMS Project Office : Redstone Arsenal, AL	0.817	-		-		0.100		-		0.100	0.000	0.917	-
FY 2019 SBIR / STTR	Various	Various : Various	-	0.144		-		-		-		-	0.000	0.144	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.366		-		-		-	0.000	0.366	-
Subtotal			0.817	0.144		0.366		0.100		-		0.100	0.000	1.427	N/A

Remarks
Government Program Management funding was transferred to the Operations and Maintenance, Army (OMA) appropriation.

Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Other Government Agencies (OGA)	MIPR	AMCOM, GSA, RSA : Various	3.318	-		-		-		-		-	0.000	3.318	-
Organic Software Development	MIPR	CCDC AvMC : Redstone Arsenal, AL	11.389	2.546	Apr 2019	6.431	Apr 2020	5.021	Apr 2021	-		5.021	Continuing	Continuing	Continuing
APNT Demonstration	MIPR	CCDC AvMC : Redstone Arsenal, AL	-	-		0.128	Apr 2020	-		-		-	0.000	0.128	-
Subtotal			14.707	2.546		6.559		5.021		-		5.021	Continuing	Continuing	N/A





Remarks
Organic (government developed, maintained, and owned) software development includes additional research and development related to Fire Control System electronic obsolescence, Assured Position, Navigation and Timing (APNT) activities such as Global Positioning System (GPS) Anti-Jam, Anti-Spoofing capabilities, and integration of satellite communications.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
Appropriation/Budget Activity 2040 / 7				R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program				Project (Number/Name) DX8 / HIMARS Product Improvement Program							
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Support	MIPR	Ft Hood, TX, ATEC, APG, MD, WSMR, RTC, RSA : Various	3.459	0.100	Jun 2019	1.127	Jun 2020	-		-		-	Continuing	Continuing	Continuing
Subtotal			3.459	0.100		1.127		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2019	FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			18.983	2.790	8.052		5.121		-		5.121	Continuing	Continuing	N/A	
Remarks															
AvMC: Aviation and Missile Center; CCDC: Combat Capabilities Development Command; AMRDEC - Aviation and Missile Research Development and Engineering Center; PFRMS - Precision Fires Rocket and Missile Systems (former name for PM STORM); STORM - Strategic and Operational Rocket and Missile Systems (new name for PM PFRMS); CTSF - Central Technical Support Facility; ATEC - US Army Test and Evaluation Command; APG MD - Aberdeen Proving Ground, Maryland; WSMR - White Sands Missile Range; RTC RSA - Redstone Test Center, Redstone Arsenal, Alabama															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) DX8 / HIMARS Product Improvement Program

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Software Development																												
Software Qualification					 Software Qualification																							
Post System Integration Qualification									 Post System Integration Qualification																			
Improved Crew Protection (ICP) Cab Live Fire Testing (Coupon Testing)					 Coupon Testing																							
APNT Demonstration					 APNT Demonstration																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0603778A / MLRS Product Improvement Program	Project (Number/Name) DX8 / HIMARS Product Improvement Program

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development	1	2019	4	2025
Software Qualification	3	2020	3	2020
Post System Integration Qualification	1	2021	3	2021
Improved Crew Protection (ICP) Cab Live Fire Testing (Coupon Testing)	4	2019	4	2019
APNT Demonstration	2	2020	2	2020