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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 0203801A / Missile/Air Defense 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	-	3.588	1.287	1.288	-	1.288	0.128	0.000	0.000	0.000	0.000	6.291
038: Avenger PIP	-	3.588	1.287	1.288	-	1.288	0.128	0.000	0.000	0.000	0.000	6.291

A. Mission Description and Budget Item Justification

Avenger is a lightweight, ground-to-air missile and gun weapon system mounted on a High Mobility Multi-purpose Wheeled Vehicle. The system protects against unmanned aircraft systems, cruise missiles, and fixed and rotary wing threats. Avenger provides day/night adverse weather operations, shoot on the move capability, rapid target engagement, and remote firing capability. It can be air dropped, lifted by helicopter and is air transportable. The system employs up to eight Stinger missiles to counter aerial threats and a M3P gun for close-in ground and air threats. An Identification Friend or Foe (IFF) system aids in the identification of friendly aircraft in order to minimize the potential for fratricide. The Avenger fleet of 453 systems includes 169 systems that are equipped with a digital Slew-to-Cue (STC) capability to speed target detection and engagement.

The Avenger Modification - Service Life Extension Program (MOD-SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. The ongoing MOD-SLEP addresses obsolescence of Avenger components to ensure Avenger maintains operational capability through Fiscal Year (FY) 2031. Five key MOD-SLEP components are: the Targeting Console (TC), the .50 Caliber Machine Gun (M3P), the Avenger Fire Control Computer (AFCC), the Mode 5 IFF and the Vehicle Internal Communications (VIC-5). Additional Obsolescence Mitigation Items include Avenger Organizational Maintenance Tool Kits, AN/PSM-95 Electronic Systems Test Set and the Avenger Remote Handheld Terminal Unit mounting kits.

The Avenger MOD-SLEP is fielded in two phases. Phase I fields the TC to 169 STC Avengers. Phase II fields the AFCC (169 STC Avengers), VIC-5 and the Mode 5 IFF. The M3P will be fielded through attrition. The TC and AFCC are fielded to the 169 STC Avenger variants only.

FY 2021 funding of \$1.288 million ensures that several Avenger components are viable and sustainable through the end of program life. This includes the initial investigation of technologies that will provide Assured Positioning Navigation and Timing capability, including the Anti-Jam Antenna and DAGR Distributed Device (D3), which will provide M-Code capability. Avenger MOD-SLEP maintains operational capability of Avenger until FY 2031.

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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	3.641	1.287	1.289	-	1.289
Current President's Budget	3.588	1.287	1.288	-	1.288
Total Adjustments	-0.053	0.000	-0.001	-	-0.001
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.053	-			
• Adjustments to Budget Years	-	-	-0.001	-	-0.001

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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 0203801A / <i>Missile/Air Defense Product Improvement Program</i>				Project (Number/Name) 038 / <i>Avenger PIP</i>			
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
038: <i>Avenger PIP</i>	-	3.588	1.287	1.288	-	1.288	0.128	0.000	0.000	0.000	0.000	6.291
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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The Avenger Modification - Service Life Extension Program (MOD-SLEP) consists of Project 038: Avenger Production Improvement Program (PIP) and Program Element CE8710: Avenger MODS. The ongoing MOD-SLEP addresses obsolescence of Avenger components to ensure Avenger maintains operational capability through Fiscal Year (FY) 2031. Five key MOD-SLEP components are: the Targeting Console (TC), the .50 Caliber Machine Gun (M3P), the Avenger Fire Control Computer (AFCC), the Mode 5 IFF and the Vehicle Internal Communications (VIC-5). Additional Obsolescence Mitigation Items include Avenger Organizational Maintenance Tool Kits, AN/PSM-95 Electronic Systems Test Set and the Avenger Remote Handheld Terminal Unit mounting kits.

The Avenger MOD-SLEP is fielded in two phases. Phase I fields the TC to 169 STC Avengers. Phase II fields the AFCC (169 STC Avengers), VIC-5 and the Mode 5 IFF. The M3P will be fielded through attrition. The TC and AFCC are fielded to the 169 STC Avenger variants only.

FY 2021 funding of \$1.288 million ensures that several Avenger components are viable and sustainable through the end of program life. This includes the initial investigation of technologies that will provide Assured Positioning Navigation and Timing capability, including the Anti-Jam Antenna and DAGR Distributed Device (D3), which will provide M-Code capability. Avenger MOD-SLEP maintains operational capability of Avenger until FY 2031.

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

	FY 2019	FY 2020	FY 2021
Title: Avenger MOD-SLEP	3.535	1.287	1.288
Description: The Avenger MOD-SLEP consists of development activities for platform integration, software upgrades, and capability enhancements. Develops and executes test requirements and conducts limited contractor and government testing. Performs technical assessments, concept studies, cost reduction, risk reduction and development documentation.			
FY 2020 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Funding will complete the Materiel Release package for MOD-SLEP. This effort's funding will be executed by Program Executive Office Missiles & Space.			
<i>FY 2021 Plans:</i> Funding provides for the completion of the MOD-SLEP Phase II Materiel Release (MR). Funding provides for continuing mitigation of emerging obsolescence issues and maintains the viability of the Avenger system. This includes the initial investigation of technologies that will provide Assured Positioning Navigation and Timing capability, including the Anti-Jam Antenna and DAGR D3, which will provide M-Code capability.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> The increase of \$0.001 million from 2020 to 2021 partially compensates for inflation.			
<i>Title:</i> FY 2019 SBIR / STTR Transfer	0.053	-	-
Accomplishments/Planned Programs Subtotals	3.588	1.287	1.288

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 Complete</u>	<u>Total Cost</u>
• CE8710: AVENGER MODS	31.093	14.107	13.942	-	13.942	11.381	-	-	-	0.000	70.523

Remarks
CE8710 Avenger MODS procures the MOD-SLEP components for the Avenger system. This ensures that Avenger is viable and sustainable through FY 2031. This program is an integral part of the Army Air and Missile Defense Modernization strategy.

D. Acquisition Strategy
The Avenger MOD-SLEP addresses obsolescence of key components and ensures that Avenger is viable and sustainable through FY 2031.

The MOD-SLEP Phase I component is the TC.

The MOD-SLEP Phase II components are the AFCC, the Mode 5 IFF, the VIC-5 and the M3P machine gun. The M3P machine gun will be fielded through attrition. The other MOD-SLEP Phase II components will be installed in the field as a single installation package.

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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 0203801A / Missile/Air Defense Product Improvement Program						Project (Number/Name) 038 / Avenger PIP					
Management Services (\$ 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
Avenger Modification Management Services	Various	Various : Redstone Arsenal, AL	2.221	0.372	Nov 2018	0.169	Oct 2019	0.136	Oct 2020	-		0.136	0.000	2.898	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	0.053		-		-		-		-	0.000	0.053	-
Subtotal			2.221	0.425		0.169		0.136		-		0.136	0.000	2.951	N/A
Product Development (\$ 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
Avenger Modification Product Development	SS/ Various	Raytheon, The Boeing Company and others : Aberdeen Proving Grounds, MD and Huntsville, AL	8.410	1.215	Nov 2018	0.617	Oct 2019	0.443	Oct 2020	-		0.443	0.000	10.685	-
Subtotal			8.410	1.215		0.617		0.443		-		0.443	0.000	10.685	N/A
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
Avenger Modification Test Support	Various	The Boeing Company, Aviation and Missile Research Development and Engineering Center (AMRDEC) and others : Huntsville, AL and Redstone Arsenal, AL	4.855	1.948	Oct 2018	0.501	Oct 2019	0.709	Oct 2020	-		0.709	0.000	8.013	-
Subtotal			4.855	1.948		0.501		0.709		-		0.709	0.000	8.013	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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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
Integration and Testing (MOD-SLEP Phase II)	System Integration and Testing																											
Logistics Demo (MOD-SLEP Phase II)	Log Demo																											
Materiel Release (MOD-SLEP Phase II)									1 Materiel Release																			
Future Modifications to Address Evolving Threats					Evolving Threat Mods																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integration and Testing (MOD-SLEP Phase II)	2	2018	2	2020
Live Fire Testing (MOD-SLEP Phase II)	4	2018	4	2018
Logistics Demo (MOD-SLEP Phase II)	2	2019	4	2019
Materiel Release (MOD-SLEP Phase II)	1	2021	1	2021
Future Modifications to Address Evolving Threats	1	2020	4	2021

Note

MOD-SLEP Phase II components are the AFCC, IFF, VIC-5 and M3P machine gun.
 AFCC: Avenger Fire Control Computer
 IFF: Identification Friend or Foe
 MOD-SLEP: Modification - Service Life Extension Program
 VIC: Vehicle Internal Communications