Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604036A *I Multi-Domain Sensing System (MDSS) Adv Dev*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	-	-	50.548	-	50.548	-	-	-	-	-	-
BY9: *Multi-Domain Sensing System Adv Dev*	-	-	-	50.548	-	50.548	-	-	-	-	-	-

Note

MDSS 0604036A is not a New Start. MDSS received an initial $39.625 million on PE 0603766A in FY 2021 and transitioned to 0604036A in FY 2022.

A. Mission Description and Budget Item Justification

The Multi Domain Sensing System (MDSS) will provide advanced aerial intelligence sensing capabilities for Multi-Domain Operations (MDO) against peer and near-peer adversaries. Initial MDSS development focuses on the High Accuracy Detection and Exploitation System (HADES), providing globally deployable, MDO-relevant sensing at extended ranges for indications and warnings, electronic order of battle, and patterns of life for the competition phase of MDO, and target development for the transition to conflict. In conflict, it will operate at standoff distances for survivability against enemy air defenses. HADES will comprise multi-faceted sensing on higher altitude, longer endurance fixed-wing aircraft that can provide effective stand-off from enemy anti-access/area denial systems. HADES sensors will include signals intelligence (SIGINT) (electronic intelligence (ELINT) and communications intelligence (COMINT)), and synthetic aperture radar (SAR)/moving target indicator (MTI) in its first increment. Future increments will add cyber/electronic warfare (EW) systems and use air-launched effects (ALE) to extend sensing ranges. These capabilities will enable ground commanders to detect, locate, identify, track, and target critical enemy assets on the ground, supporting tactical consumers like Long Range Precision Fires (LRPF).

FY 2022 base dollars in the amount of $50.548 million support the continued development and prototyping of SIGINT and SAR/MTI sensors and Open Architecture to meet MDSS HADES requirements.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	50.548	-	50.548
Total Adjustments	0.000	0.000	50.548	-	50.548
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	50.548	-	50.548

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604036A *I Multi-Domain Sensing System (MDSS) Adv Dev*

Change Summary Explanation

MDSS 0604036A is not a New Start. MDSS received an initial $39.625 million on PE 0603766A in FY 2021 and transitioned to 0604036A in FY 2022. The increase in funding from FY 2021 to FY 2022 supports continued SIGINT, SAR/MTI and architecture development and prototyping begun in FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	Project (Number/Name) BY9 / *Multi-Domain Sensing System Adv Dev*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
BY9: *Multi-Domain Sensing System Adv Dev*	-	-	-	50.548	-	50.548	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

MDSS 0604036A is not a New Start. MDSS received an initial $39.625 million on PE 0603766A in FY 2021 and transitioned to 0604036A in FY 2022.

A. Mission Description and Budget Item Justification

The Multi Domain Sensing System (MDSS) will provide advanced aerial intelligence sensing capabilities for Multi-Domain Operations (MDO) against peer and near-peer adversaries. Initial MDSS development focuses on the High Accuracy Detection and Exploitation System (HADES), providing globally deployable, MDO-relevant sensing at extended ranges for indications and warnings, electronic order of battle, and patterns of life for the competition phase of MDO, and target development for the transition to conflict. In conflict, it will operate at standoff distances for survivability against enemy air defenses. HADES will comprise multi-faceted sensing on higher altitude, longer endurance fixed-wing aircraft that can provide effective stand-off from enemy anti-access/area denial systems. HADES sensors will include signals intelligence (SIGINT) (electronic intelligence (ELINT) and communications intelligence (COMINT)), and synthetic aperture radar (SAR)/moving target indicator (MTI) in its first increment. Future increments will add cyber/electronic warfare (EW) systems and use air-launched effects (ALE) to extend sensing ranges. These capabilities will enable ground commanders to detect, locate, identify, track, and target critical enemy assets on the ground, supporting tactical consumers like Long Range Precision Fires (LRPF).

FY 2022 base dollars in the amount of $50.548 million support the continued development and prototyping of SIGINT and SAR/MTI sensors and Open Architecture to meet MDSS HADES requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: SAR/MTI Development and Prototyping	-	-	24.790
Description: SAR/MTI development and prototyping to expand sensor performance to address HADES requirements and ability to exploit near-peer threats. ***FY 2022 Plans:*** Development of software for Range Enhancement, Automatic Target Recognition (ATR), and Electronic Protection (EP) capability, continued development of prototypes, and conduct of experimentation, integration, and test. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 will continue SAR/MTI development and prototyping begun in FY 2021.			
Title: SIGINT Development and Prototyping	-	-	16.867

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	**Project (Number/Name)** BY9 / *Multi-Domain Sensing System Adv Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: SIGINT development, prototyping, and demonstration to expand sensor performance and sensitivity to address HADES requirements and ability to exploit near-peer threats. ***FY 2022 Plans:*** Development of SIGINT sensor enhancements to increase capability and sensor sensitivity to close identified HADES capability gaps while in parallel developing prototypes and conducting experimentation, integration, and test. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 will support SIGINT development and prototyping following sensor demonstrations begun in FY 2021.			
Title: Prototype Component Acquisition ***Description:*** Acquisition of Communications, Processing and Workstation prototype components. ***FY 2022 Plans:*** Acquire key communications, processing and workstation components for the prototype Mission Equipment Package. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 will support acquisition of required Communications Equipment and Workstation prototype components in support of system integration and testing.	-	-	2.017
Title: Architecture Development ***Description:*** Development of the HADES integrated systems architecture to ensure end-to-end compatibility and sensor fusion. ***FY 2022 Plans:*** Develop an Integrated systems architecture design to ensure all components functionally and physically integrate into the HADES system. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 will support continued Architecture Development begun in FY 2021.	-	-	2.284
Title: Engineering Support ***Description:*** Engineering Support for MDSS development and prototype demonstration efforts. ***FY 2022 Plans:***	-	-	2.040

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	**Project (Number/Name)** BY9 / *Multi-Domain Sensing System Adv Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Support SIGINT, SAR/MTI, and Open Architecture development, prototyping, and demonstration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 is less than 10% for engineering support.			
Title: Program Management ***Description:*** Program Management support for MDSS development and prototype demonstration efforts. ***FY 2022 Plans:*** Support SIGINT, SAR/MTI and Open Architecture development, prototyping, and demonstration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase in funding from FY 2021 to FY 2022 is less than 10% for engineering support.	-	-	2.550
Accomplishments/Planned Programs Subtotals	-	-	50.548

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	37.490	182.400	113.365	-	113.365	-	-	-	-	-	-

Remarks

MDSS received an initial $39.625 million on this line in FY2021 and transitioned to 0604036A in FY2022. MDSS 0604036A is not a New Start.

D. Acquisition Strategy

MDSS development continues SIGINT and SAR/MTI sensor and open architecture development and prototyping efforts that were begun in FY 2021 on 0603766A Tactical Support Development - Adv Dev and transitioned in FY 2022 to 0604036A MDSS - Adv Dev. MDSS-HADES requirements were approved by the Army Requirements Oversight Council (AROC) on 26 August 2020 and signed by the Commanding General, Army Futures Command on 18 September 2020. An Acquisition Decision Memorandum directing sensor prototyping activities for HADES was signed on 16 November 2020. With the funding and acquisition authority allocated for HADES in FYs 2021 and 2022, the MDSS program office will pursue an agile acquisition strategy, maximizing prototyping and experimentation to choose best-of-breed sensors, and leveraging a non-proprietary, open system architecture to enable easy upgrades of software and hardware. The MDSS program office will take advantage of lessons learned from past and current quick reaction HADES-like capabilities to develop operational context and validate the capabilities described in the HADES requirements. These "path of learning" efforts, and others, will collectively inform HADES subsystem development and integration. The MDSS program's demonstration and development cycle will be executed in parallel to the path of learning above and will be informed by those efforts and related Army strategic decisions. Prototyping will include Soldier touchpoints throughout the process in order to help refine requirements. These Soldier touchpoints may include quick integration onto surrogate high altitude platforms to support operational exercise to gather real world data on sensor effectiveness.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	Project (Number/Name) BY9 / *Multi-Domain Sensing System Adv Dev*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support Services	TBD	ACC APG : APG, MD	-	-		-		2.040	Nov 2021	-		2.040	0.000	2.040	-
		Subtotal	-	-		-		2.040		-		2.040	0.000	2.040	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SAR/MTI Development and Prototyping	Various	TBD : TBD	-	-		-		24.790	Dec 2021	-		24.790	Continuing	Continuing	-
SIGINT Development and Prototyping	Various	ACC APG : APG, MD	-	-		-		16.867	Mar 2022	-		16.867	Continuing	Continuing	-
Prototype Component Acquisition	Various	ACC APG : APG, MD	-	-		-		2.017	Apr 2022	-		2.017	Continuing	Continuing	-
Architecture Development	TBD	AVMC : Redstone, AL	-	-		-		2.284	Dec 2021	-		2.284	Continuing	Continuing	-
		Subtotal	-	-		-		45.958		-		45.958	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	RO	Various : APG, MD	-	-		-		2.550	Nov 2021	-		2.550	Continuing	Continuing	-
		Subtotal	-	-		-		2.550		-		2.550	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		50.548		-		50.548	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	**Project (Number/Name)** BY9 / *Multi-Domain Sensing System Adv Dev*

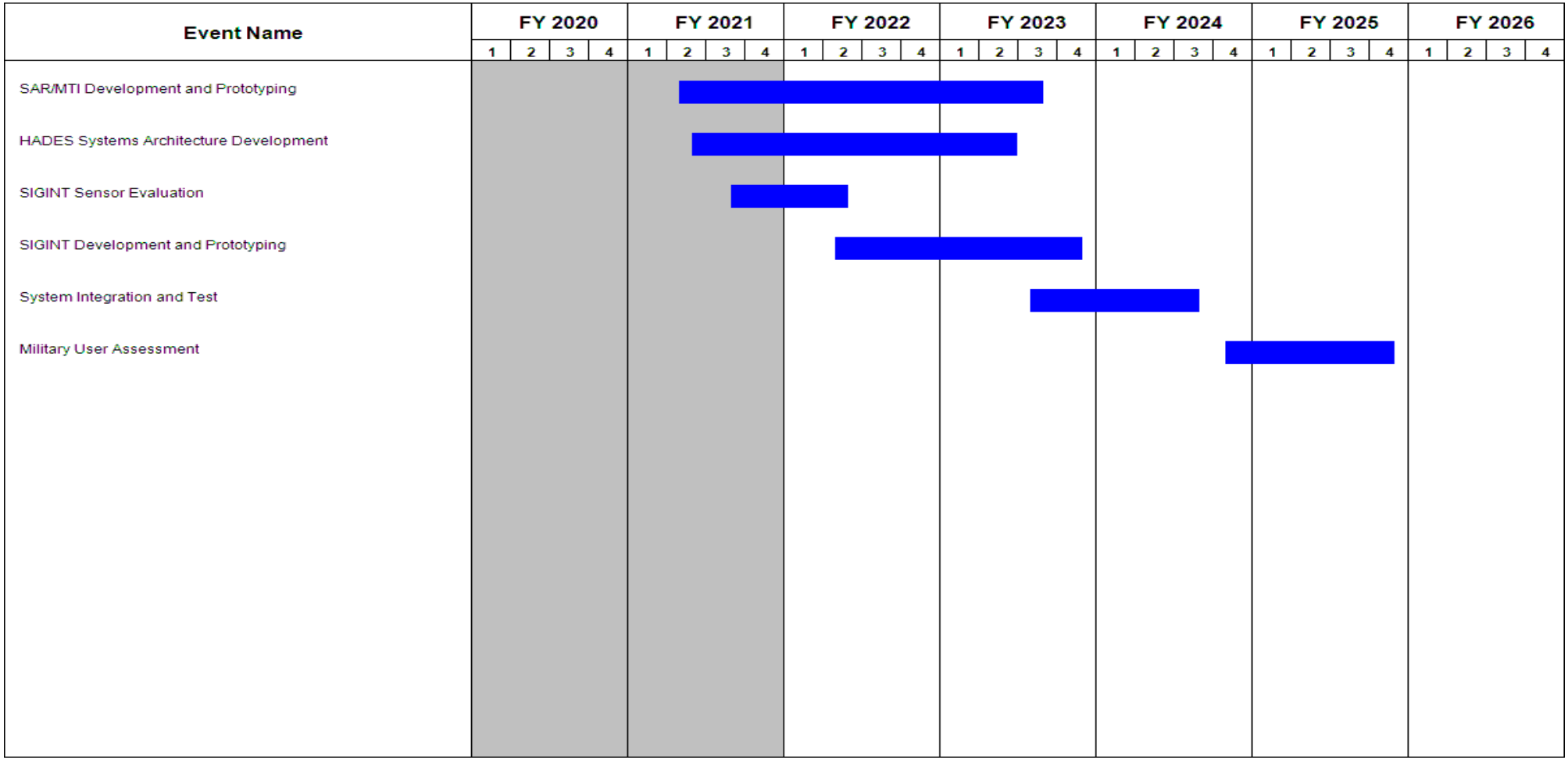

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604036A / *Multi-Domain Sensing System (MDSS) Adv Dev*	**Project (Number/Name)** BY9 / *Multi-Domain Sensing System Adv Dev*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SAR/MTI Development and Prototyping	2	2021	3	2023
HADES Systems Architecture Development	2	2021	2	2023
SIGINT Sensor Evaluation	3	2021	2	2022
SIGINT Development and Prototyping	2	2022	4	2023
System Integration and Test	3	2023	3	2024
Military User Assessment	4	2024	4	2025