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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor
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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	-	408.766	380.147	816.663	-	816.663	118.939	122.544	89.261	90.257	Continuing	Continuing
EX2: Lower Tier Air Missile Defense (LTAMD) Capability	-	408.766	380.147	816.663	-	816.663	118.939	122.544	89.261	90.257	Continuing	Continuing

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Lower Tier Air Missile Defense Sensor (LTAMDS) is a next generation sensor intended to sense and track Tactical Ballistic Missiles and Air Breathing Threats; expand the battlespace for Missile Segment Enhancement interceptor; and provide 360-degree sensing capability, surveillance, and fire control in the Lower Tier Army Integrated Air and Missile Defense (IAMD) ballistic missile defense battlespace.

The LTAMDS program competitively selected Raytheon as the prime vendor in 1st Quarter (Q) Fiscal Year (FY) 2020 to build six (6) Prototype sensors under the Section 804 Rapid Prototyping authority. The sensor/Radar Set (RS) replaces the baseline PATRIOT RS (AN/MPQ-65A) in an Integrated Air and Missile Defense Battle Command System (IBCS) enabled PATRIOT Battalion mitigating risk associated with threat advances, decreasing Operations and Support (O&S) costs, and growing obsolescence. Additionally, the LTAMDS capability increases sensor/ radar performance to maximize the inherent PATRIOT Advanced Capability (PAC-3) Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats in addition to addressing critical capability gaps, providing modernized technology, and increasing reliability and maintainability.

FY 2024 funds in the amount of \$816.663 million will fund three (3) sensors in FY 2024 to support the Pacific Deterrence initiative (PDI) to provide an Early Operational Capability. The program acquired two (2) prototype sensors in prior years to support Initial Operational Test and Evaluation (IOT&E) and transition from MTA to MCA. FY 2024 funding will fund an additional two (2) sensors to support LTAMDS testing culminating with Initial Operational Test and Evaluation (IOT&E) in FY 2026/2027. FY 2024 funds of \$383.688 million supports the Pacific Deterrence Initiative (PDI).

FY 2024 funding continues prototype Environmental Qualification testing; completes Primary Sector Operational Assessment with an Integrated Fires test campaign; completes Full Sector Contractor Verification Testing (CVT); and supports Development Test & Evaluation (DTE).

Additionally, funding in FY 2024 continues software development to counter evolving threats; supports digital modeling and simulation efforts; critical Program Protection / Anti-Tamper capabilities; Large Tactical Power System (LTPS) prototype development; integration activities with the IBCS; sensor enhancements as part of the Pre-Planned Product Improvement (P3I) effort; integration with the PATRIOT family of interceptors (PAC-2 GEM-T, PAC-3, PAC-3 MSE) in support of Integrated Fires and Multi-domain Operations; and supports AMD survivability efforts.

LTAMDS will transition from Middle Tier of Acquisition (MTA) to Major Capability Acquisition (MCA) in 1Q FY 2024. FY 2024 funding continues MCA walk-up activities to include required entry criteria, system verification, development of appropriate milestone documentation, and initiation of contract award activities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army	Date: March 2023
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604114A / <i>Lower Tier Air Missile Defense (LTAMD) Sensor</i>
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The total cost of the LTAMDS Middle Tier of Acquisition effort is \$1,463 million RDT&E from FY 2019 to FY 2024. The LTAMDS is fully funded across the Future Years Defense Program.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	297.629	382.147	89.187	-	89.187
Current President's Budget	408.766	380.147	816.663	-	816.663
Total Adjustments	111.137	-2.000	727.476	-	727.476
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-12.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	111.137	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	727.476	-	727.476

Change Summary Explanation

Realignment of funds from 2032 Missile Procurement, PE 7265C12000 / Lower Tier Air and Missile Defense (AMD) Sensor to 2040 RDTE, PE 0604114A / EX2: Lower Tier Air Missile Defense (LTAMD) Capability from the original PB23 submission due to a delay in LTAMDS development. PB23 included the cost of procuring LTAMDS radars in MSLS based on a planned 1Q FY 2024 Milestone C (MS C) decision. The revised plan is to acquire operational test sensors and capability for the Pacific Deterrence Initiative (PDI) prior to the MS C using RDT&E funds.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor				Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability			
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
EX2: Lower Tier Air Missile Defense (LTAMD) Capability	-	408.766	380.147	816.663	-	816.663	118.939	122.544	89.261	90.257	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Air and Missile Defense Modernization Priority.

The Lower Tier Air Missile Defense Sensor (LTAMDS) is a next generation sensor intended to sense and track Tactical Ballistic Missiles and Air Breathing Threats; expand the battlespace for Missile Segment Enhancement interceptor; and provide 360-degree sensing capability, surveillance, and fire control in the Lower Tier Army Integrated Air and Missile Defense (IAMD) ballistic missile defense battlespace.

The LTAMDS program competitively selected Raytheon as the prime vendor in 1st Quarter (Q) Fiscal Year (FY) 2020 to build six (6) Prototype sensors under the Section 804 Rapid Prototyping authority. The sensor/Radar Set (RS) replaces the baseline PATRIOT RS (AN/MPQ-65A) in an Integrated Air and Missile Defense Battle Command System (IBCS) enabled PATRIOT Battalion mitigating risk associated with threat advances, decreasing Operations and Support (O&S) costs, and growing obsolescence. Additionally, the LTAMDS capability increases sensor/ radar performance to maximize the inherent PATRIOT Advanced Capability (PAC-3) Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats in addition to addressing critical capability gaps, providing modernized technology, and increasing reliability and maintainability.

FY 2024 funds in the amount of \$816.663 million will fund three (3) sensors in FY 2024 to support the Pacific Deterrence initiative (PDI) to provide an Early Operational Capability. The program acquired two (2) prototype sensors in prior years to support Initial Operational Test and Evaluation (IOT&E) and transition from MTA to MCA. FY 2024 funding will fund an additional two (2) sensors to support LTAMDS testing culminating with Initial Operational Test and Evaluation (IOT&E) in FY 2026/2027. FY 2024 funds of \$383.688M support the Pacific Deterrence Initiative (PDI).

FY 2024 funding continues prototype Environmental Qualification testing; completes Primary Sector Operational Assessment with an Integrated Fires test campaign; completes Full Sector Contractor Verification Testing (CVT); and supports Development Test & Evaluation (DTE).

Additionally, funding in FY 2024 continues software development to counter evolving threats; supports digital modeling and simulation efforts; critical Program Protection / Anti-Tamper capabilities; Large Tactical Power System (LTPS) prototype development; integration activities with the IBCS; sensor enhancements as part of the Pre-Planned Product Improvement (P3I) effort; integration with the PATRIOT family of interceptors (PAC-2 GEM-T, PAC-3, PAC-3 MSE) in support of Integrated Fires and Multi-domain Operations; and supports AMD survivability efforts.

LTAMDS will transition from Middle Tier of Acquisition (MTA) to Major Capability Acquisition (MCA) in 1Q FY 2024. FY 2024 funding continues MCA walk-up activities to include required entry criteria, system verification, development of appropriate milestone documentation, and initiation of contract award activities.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability

The total cost of the LTAMDS Middle Tier of Acquisition effort is \$1,463 million RDT&E from FY 2019 to FY 2024. The LTAMDS MTA is fully funded across the Future Years Defense Program.

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

	FY 2022	FY 2023	FY 2024
<p>Title: Lower Tier Missile Defense Sensor</p> <p>Description: Provides the required sensing capabilities in the lower tier portion of the air and missile defense battlespace and expands the battlespace for the PAC-3 MSE interceptor.</p> <p>FY 2023 Plans: UMR - Provide four prototypes under UMR - Complete prototype Developmental Test and Evaluation - Complete Operational Demonstration - Continue Operational Assessment</p> <p>P3I - Buildup of P3I Test Assets to support DT/OT and IOTE - Software Development Activities to include Non-Cooperative Target Recognition, Electronic Protection, and continue software development tasks with IBCS. - Activities needed to support a MS C decision - Digital Modeling and Simulation activities - Support Large Tactical Power System (LTPS) development - Critical Design Review of P3I configuration</p> <p>Integration - Continue integration with IBCS - Continue integration with PATRIOT family of interceptors (PAC-2, GEM-T, PAC-3, PAC-3 MSE) - Continue Development and integration of Large Tactical Power System (LTPS)</p> <p>FY 2024 Plans: MTA Rapid Prototyping Program: - Continue Environmental Qualification, Government Development, and Operational Testing - Complete Primary Sector Operational Assessment - Complete Full Sector (360 degree) CVT</p>	408.766	366.637	816.663

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue Large Tactical Power System (LTPS) development, conduct prototype vendor down-select, and begin Government Testing - Continue development of critical Program Protection / Anti-Tamper capabilities - Continue P3I sensor enhancements for inclusion into Full Rate Production Configuration - Support AMD Survivability efforts - Continue MCA walk-up activities to include required entry criteria, system verification, development of appropriate milestone documentation, and initiation of contract award activities. <p>Early Operational Capability:</p> <ul style="list-style-type: none"> - Fund three (3) sensors in FY 2024 to support the Pacific Deterrence initiative (PDI) to provide an Early Operational Capability. - Fund two (2) sensors to support LTAMDS testing culminating with Initial Operational Test and Evaluation (IOT&E) in FY 2026/2027 <p>Integration:</p> <ul style="list-style-type: none"> - Conduct an Operational Assessment with as part of the Integrated Fires Test Campaign - Continue integration with IBCS - Continue integration with PATRIOT family of interceptors (PAC-2, GEM-T, PAC-3, PAC-3 MSE) - Continue digital modeling and simulation activities <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 increase is due to realignment of MSLS (2032) to RDTE (2040) from the original PB23 submission due to LTAMDS integration delays.</p>				
<p>Title: FY 2023 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC §638.</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638.</p>		-	13.510	-
Accomplishments/Planned Programs Subtotals		408.766	380.147	816.663

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• C12101: Lower Tier Air and Missile Defense Sensor	33.473	13.460	6.625	-	6.625	546.059	639.032	638.033	1,078.103	Continuing	Continuing

Remarks

D. Acquisition Strategy

On 25 September 2018, the Army Acquisition Executive (AAE) approved the execution of the LTAMDS Middle Tier Acquisition (MTA) (Sec. 804) for rapid prototyping. The Army conducted a Sense-Off in 3Q FY 2019 with multiple vendors to demonstrate advanced sensor capabilities with a follow-on competitive source selection informing the LTAMDS Product Office Other Transaction Authority (OTA) award to a single vendor. In 1Q FY 2020, Raytheon was selected to deliver six (6) prototypes for testing and Urgent Materiel Release (UMR) in support of the FY18 NDAA language to achieve an Early Operational Capability (EOC) no later than 1Q FY 2024. LTAMDS prototype builds are currently in progress and will support Contractor Verification Testing (CVT) and USG Development and Operational Testing.

LTAMDS will transition from Middle Tier of Acquisition to Major Capability Acquisition in 1Q FY2024. In 1Q FY 2024, LTAMDS Product Office plans to award a contract for three (3) RDT&E funded assets and associated sparing to meet Pacific Deterrence Initiative mission and two (2) RDT&E funded assets to support LTAMDS testing culminating with Initial Operational Test and Evaluation (IOT&E) in FY 2026/2027.

The LTAMDS program is a component of an integrated fires development effort that includes survivability, resiliency, and effectiveness improvements against advanced threats from near-peer adversaries. This effort includes integration with an evolving common fires mission command, common development tools and processes, and annual test and evaluation to provide data to support program assessments and progress toward closure of performance gaps.

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability
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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			
Government Program Management	MIPR	Various : Redstone Arsenal, AL	20.765	4.250	Oct 2021	4.780	Oct 2022	4.950	Nov 2023	-		4.950	Continuing	Continuing	-
Systems Engineering and Technical Assistance (SETA)	Various	Systems Engineering and Technical Assistance : Huntsville, AL	22.509	7.500	Oct 2021	7.655	Oct 2022	7.930	Feb 2024	-		7.930	Continuing	Continuing	-
SBIR/STTR	TBD	NA : NA	-	-		13.510		-		-		-	0.000	13.510	-
Subtotal			43.274	11.750		25.945		12.880		-		12.880	Continuing	Continuing	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			
Product Development Support	C/Various	University Affiliated Research Center (UARC); MIT; The Federally Funded Research and Development Center (FFRDC) : Various	16.849	12.500	Oct 2021	12.880	Oct 2022	13.920	Nov 2023	-		13.920	Continuing	Continuing	-
OGA Development and Integration Activities	C/Various	Various : Various	-	34.319	Dec 2021	54.430	Dec 2022	37.970	Dec 2023	-		37.970	Continuing	Continuing	-
Rapid Prototyping	C/FFP	Raytheon : Various	556.175	103.461	Feb 2022	-		-		-		-	Continuing	Continuing	-
Pre-Planned Product Improvements	Various	Raytheon : Various	-	59.556	Jan 2022	212.930	Jan 2023	67.063	Feb 2024	-		67.063	Continuing	Continuing	-
IOT&E (2) / PDI Assets (3)	TBD	Raytheon : Various	-	-		-		613.670	Nov 2023	-		613.670	Continuing	Continuing	-
Supplemental PATRIOT battery	TBD	Raytheon : Various	-	122.000	Jun 2022	-		-		-		-	Continuing	Continuing	-
Subtotal			573.024	331.836		280.240		732.623		-		732.623	Continuing	Continuing	N/A

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

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Product Development	C/Various	Army Laboratories, S3I System Integration Laboratory, CCDC : Various	2.454	8.920	Dec 2021	8.930	Dec 2022	10.550	Dec 2023	-		10.550	Continuing	Continuing	-
Subtotal			2.454	8.920		8.930		10.550		-		10.550	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 Planning/Targets/Interceptors/U.S. Other Government Agencies (OGAs)	MIPR	RDEC, SED, WSMR-T&E Support : Huntsville, AL; White Sands, NM	92.084	56.260	Feb 2022	65.032	Feb 2023	60.610	Feb 2024	-		60.610	Continuing	Continuing	-
Subtotal			92.084	56.260		65.032		60.610		-		60.610	Continuing	Continuing	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			710.836	408.766		380.147		816.663		-		816.663	Continuing	Continuing	N/A

Remarks

- Two (2) sensors delivered in FY26 will support IOT&E; three (3) will support PDI.
- Realign FY24 MSLS (2032) to RDTE (2040) due to a delay in LTAMDS development.
- Rapid Prototyping Test Activities schedule shift due to technical and integration challenges.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability

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
Production Representative Unit Manufacturing																												
Delta Qualification Testing																												
Developmental Test & Evaluation																												
Early Operational Capability																												
IOT&E																												
Operational Assessment / Integrated Fires FY23 Campaign																												
Operational Assessment / Integrated Fires FY24 Campaign																												
P3I Effort																												
Large Tactical Power System (LTPS) Prototyping																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Air Missile Defense (LTAMD) Sensor	Project (Number/Name) EX2 / Lower Tier Air Missile Defense (LTAMD) Capability

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Concept Definition	4	2017	4	2019
Select Single Vendor	1	2020	1	2020
Production Representative Unit Manufacturing	1	2020	4	2023
Delta Qualification Testing	2	2023	1	2025
Developmental Test & Evaluation	3	2023	4	2024
Early Operational Capability	1	2024	4	2026
IOT&E	2	2026	1	2027
Operational Assessment / Integrated Fires FY23 Campaign	1	2024	1	2024
Operational Assessment / Integrated Fires FY24 Campaign	1	2025	1	2025
P3I Effort	4	2022	1	2027
Large Tactical Power System (LTPS) Prototyping	4	2022	2	2025