Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607865A *I Patriot Product Improvement*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	-	146.753	177.197	168.458	-	168.458	168.617	165.083	226.762	223.166	Continuing	Continuing
DJ6: *Effector Product Improvement*	-	-	-	86.238	-	86.238	-	-	-	-	Continuing	Continuing
DV8: *Patriot Product Improvement*	-	146.753	177.197	82.220	-	82.220	168.617	165.083	226.762	223.166	Continuing	Continuing

Note

In Fiscal Year (FY) 2025, Project DJ6 / Effector Product Improvement efforts realigned within PE 0607865A / Patriot Product Improvement from Project DV8/Patriot Product Improvement.

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the PATRIOT surface to air missile system. PATRIOT is an integral part of the Integrated Air and Missile Defense (IAMD) Architecture and enables the incremental fielding of the IAMD Battle Command System (IBCS) capability for Army Air and Missile Defense Battalions.

Beginning in FY25, Program Element 0607865A has two project numbers assigned. DJ6, Effector Product Improvement, supports PATRIOT Family of Missiles, M903 Launching Stations, and associated enduring efforts. DV8, Patriot Product Improvement, supports Patriot Ground Equipment, legacy radar, and associated efforts.

The PATRIOT Product Improvement Program (PIP) provides the upgrade of the PATRIOT System and as a component of the IAMD system through software improvements and individual materiel changes and upgrades to current force and IAMD-connected PATRIOT system components (interceptors, ground system equipment, launcher, and current radar) to address operational lessons-learned and necessary system performance improvements to include enhancements that support joint force interoperability and enable convergence with IBCS to ensure overmatch capability. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against emerging threats in a manner that is not practical to demonstrate with live fire flight tests alone due to cost, target availability, and range constraints. Flight testing is periodically required for validation of the modeling and simulation as well as satisfying Army Test and Evaluation Command/ Director, Operational Test and Evaluation (ATEC/ DOTE) requirements of segment improvements.

This effort supports work with national agencies to evaluate, assess, and develop means to mitigate threat trends and specific threat developments potentially impacting system performance including effective detection, tracking, discrimination, and engagement. Specific improvements may be developed and fielded under this task if warranted. The effort maintains the Mission Tailoring Database and its responses to immediate tactical concerns. Database updates are fielded between major software upgrades as necessary.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army	Date: March 2024
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607865A *I Patriot Product Improvement*

The PIP line also supports the identification, analysis, design, and test of materiel solutions to counter cyber security and electronic warfare shortcomings to all elements of the Lower Tier Battle Space.

FY 2025 base dollars in the amount of $168.458 million support the continuance of critical software improvements for current force PATRIOT and Army IAMD integration, including Software Improvement for Threat Evolution, PAC-3 Seeker Software Improvement, Upper Tier Debris Mitigation, THAAD/PATRIOT Interoperability, Advanced Electronic Counter Measures (AECM), Combat ID enhancements, Tasks 2, 6, and 7 activities, program integration, modeling and simulation, acquisition of test assets and targets, Mobile Flight Mission Simulator (MFMS), PDB-8.1 and Patriot Component Software Build (PCSB) software, development and integration activities for Pacific Defense Initiative, Integrated Fires Architecture Fire Control Development, convergence with the IBCS and government and contractor support.

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	152.312	177.197	138.120	-	138.120
Current President's Budget	146.753	177.197	168.458	-	168.458
Total Adjustments	-5.559	0.000	30.338	-	30.338
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.559	-			
• Adjustments to Budget Years	-	-	30.338	-	30.338

Change Summary Explanation

For 677865DV8, Patriot Product Improvement, the FY25 funding in the amount of $15.030 million is in support of the Pacific Defense Initiative for Project D Software Development.

For 677865DJ6, the FY25 increase of $15.308 million supports the Effector Product Improvement.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*				Project (Number/Name) DJ6 / *Effector Product Improvement*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
DJ6: *Effector Product Improvement*	-	-	-	86.238	-	86.238	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year (FY) 2025, Project DJ6 / Effector Product Improvement efforts realigned within PE 0607865A / Patriot Product Improvement from Project DV8/Patriot Product Improvement.

A. Mission Description and Budget Item Justification

The DJ6 PIP Program upgrades lower tier effectors (interceptors and M903 launching stations) to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements to provide overmatch capability against the emerging threat.

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) and Ground Support Equipment. PATRIOT system components (interceptors, launcher, and radar) are integrated with current force PATRIOT and Army Integrated Air and Missile Defense (IAMD) components. DJ6 PIP activities support enduring components of the system as legacy PATRIOT Ground Equipment is sunset with fielding of Integrated Battle Command System (IBCS). As components, software, and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against specific threats in a manner that is not practical to demonstrate with live fire flight tests alone due to cost, target availability, and range constraints. Flight testing is periodically required for M&S validation as well as satisfying ATEC/DOTE requirements of segment improvements.

In FY2025, DJ6 funding will support test and development of improvements to currently fielded PATRIOT Family of Missiles (PFoM) and launching stations to keep pace with current and emerging threats, support Guam Defense Systems efforts, and support integrated Fires Control for the Army's Integrated Air and Missile Defense.
-Army Combat Capabilities Development Command Aviation and Missile Center (DEVCOM) and Other Government Agency (OGA) supports government labor for product development to keep pace with current threats.
-Government Program Management/SETA - U.S. Government and contractor support for DJ6 PIP efforts supporting system interceptors, launching stations, and associated materiel and provides studies and support to ensure these components continue to evolve to defeat emerging threats.
-DEVCOM and Other Agencies provide system engineering support for test and evaluation activities (includes planning, test event support, and data evaluation).
-PAC-3 Seeker Software Improvement supports improved missile capability to counter electronic attack threats.
-Program Integration MSE provides required support for systems integration into the PATRIOT and IBCS systems from Prime Contractors, Lockheed Martin and Raytheon, for the PAC-3 Missile Segment (PAC-3 CRI, PAC-3 MSE).
-Targets/Threat Simulation supports planning, design, and acquisition of Targets for Lower Tier Interceptors (LTI) test events.
-Modeling and Simulation supports performance assessment activities against all threats that would not be possible in flight tests due to cost, target and range constraints.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DJ6 / *Effector Product Improvement*

-Contractor Test and Evaluation (T&E) provides funding for contractor T&E activities in support of test planning, test conduct, and test analyses.
-Guam Defense Systems (GDS) funding supports GDS mission and ensures capability will meet mission requirements.
-Integrated PAC-3 Fire Control provides funding for requirement beginning in FY24 to support PAC-3 Fire Control and Link on ELES (LoE) development for integration with IBCS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Effector Product Improvement	-	-	86.238
FY 2025 Plans: Activities continued below were funded through project DV8 prior to FY25 -Continue program development through system level modeling, simulation, integration and test support to address emerging threats -Continue test program to include utilization of targets/threat simulators, flight simulator and modeling efforts to maintain effectiveness -Continue supporting Integrated PAC-3 Fire Testing -Continue PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements -U.S. Government and contractor support to ensure force effectiveness is maintained to keep pace with evolving and emerging threats -Continue system integration activities, test and analysis, and threat analysis and modeling -Continue development of PAC-3 Fire Control and LoE			
FY 2024 to FY 2025 Increase/Decrease Statement: Funding increase represents realignment in the amount of $86.238 million from DV8/Patriot Product Improvement.			
Accomplishments/Planned Programs Subtotals	-	-	86.238

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The design objective of Lower Tier Interceptors is to provide effectors capable of modification to cope with continuing threat evolution. The DJ6 PATRIOT Product Improvement Program (PIP) funds are utilized to minimize technological risks and provide means of enhancing effector capability to address new and emerging threats through planned upgrades of deployed systems. The DJ6 PIP Program upgrades lower tier effectors (interceptors and M903 launching stations) to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements to provide overmatch capability against the emerging threat. Upgrades are implemented through individual hardware and software materiel changes and fielded incrementally. This program encompasses

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DJ6 / *Effector Product Improvement*

several changes which will require the use of a variety of acquisition methods to develop, test, procure and field. Future hardware and software capabilities will be incorporated into PATRIOT Component Software Build (PCSB) releases and continue convergence efforts with IBCS. Developing, fabricating, and testing hit to kill surface to air missile and associated ground support equipment provides essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. These state-of-the-art capabilities and enhancements require ongoing demonstration through a series of flight tests and modeling and simulation activities to add survivability and resiliency in a denied environment. The lower tier effectors components are part of enduring system in integrated fires development efforts that include survivability, resiliency, and effectiveness improvements against advanced threats from near-peer adversaries. DJ6 effort includes integration with an evolving fire control mission command, common development tools and processes, MSE enhancements, threat modeling, and annual test and evaluation to provide data to support program assessments and progress toward closure of performance gaps.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DJ6 / *Effector Product Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	RSA, AL : RSA, AL	-	-		-		0.927	Oct 2024	-		0.927	Continuing	Continuing	-
		Subtotal	-	-		-		0.927		-		0.927	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SETA	Various	Multiple : Multiple	-	-		-		3.296	Oct 2024	-		3.296	Continuing	Continuing	-
DEVCOM and OGA	MIPR	RSA, AL : RSA, AL	-	-		-		6.644	Oct 2024	-		6.644	Continuing	Continuing	-
PAC-3 Seeker Software Improvement	Various	Multiple : Multiple	-	-		-		11.787	Feb 2025	-		11.787	Continuing	Continuing	-
Guam Defense Systems	Various	Multiple : Multiple	-	-		-		15.030	Jan 2025	-		15.030	Continuing	Continuing	-
Integrated PAC-3 Fire Control	Various	Multiple : Multiple	-	-		-		14.071	Apr 2025	-		14.071	Continuing	Continuing	-
		Subtotal	-	-		-		50.828		-		50.828	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVCOM and Other Govt Agencies	MIPR	RDEC and OGAs : RSA, AL	-	-		-		4.613	Jan 2025	-		4.613	Continuing	Continuing	-
Program Integration MSE	Various	LMMFC and Raytheon : Dallas, TX and Waltham, MA	-	-		-		10.988	Feb 2025	-		10.988	Continuing	Continuing	-
Targets/Threat Simulation	MIPR	Various : Huntsville, AL	-	-		-		10.420	Jan 2025	-		10.420	Continuing	Continuing	-
Modeling and Simulation	MIPR	Various : Huntsville, AL	-	-		-		5.629	Jan 2025	-		5.629	Continuing	Continuing	-
Contractor T&E	Various	Multiple : Various	-	-		-		2.833	Jan 2025	-		2.833	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DJ6 / *Effector Product Improvement*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		34.483		-		34.483	Continuing	Continuing	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		86.238		-		86.238	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DJ6 / *Effector Product Improvement*

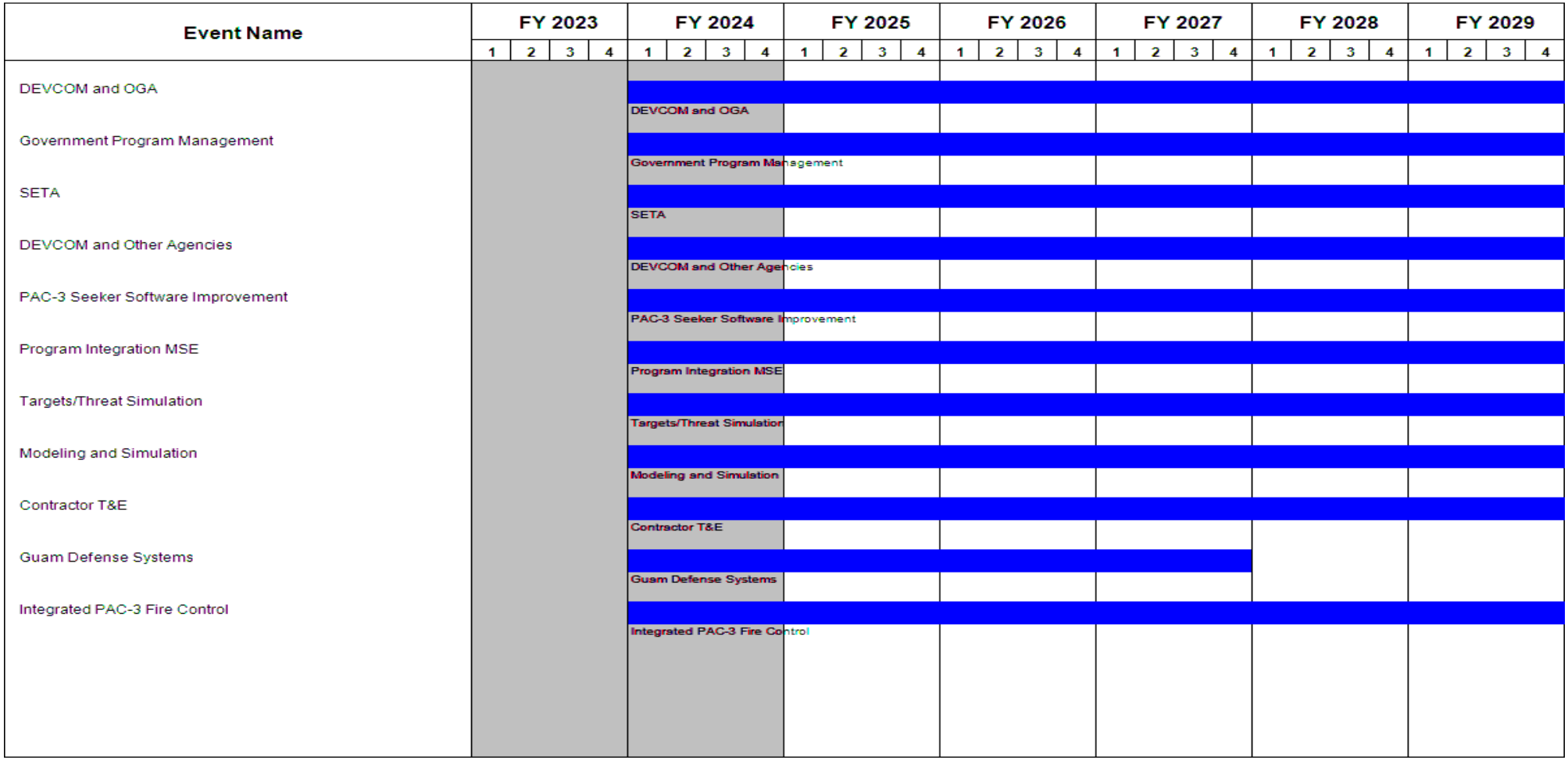

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DJ6 / *Effector Product Improvement*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DEVCOM and OGA	1	2024	4	2030
Government Program Management	1	2024	4	2030
SETA	1	2024	4	2030
DEVCOM and Other Agencies	1	2024	4	2030
PAC-3 Seeker Software Improvement	1	2024	4	2030
Program Integration MSE	1	2024	4	2030
Targets/Threat Simulation	1	2024	4	2030
Modeling and Simulation	1	2024	4	2030
Contractor T&E	1	2024	4	2030
Guam Defense Systems	1	2024	4	2027
Integrated PAC-3 Fire Control	1	2024	4	2030

Note

Activities displayed on schedule prior to FY25 were funded through project DV8.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army											Date: March 2024	
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*				Project (Number/Name) DV8 / *Patriot Product Improvement*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
DV8: *Patriot Product Improvement*	-	146.753	177.197	82.220	-	82.220	168.617	165.083	226.762	223.166	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY25 PDI funding in the amount of $15.030 million is in support of the Pacific Defense Initiative for Project D Software Development.

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (PAC-2, Guidance Enhanced Missiles, PAC-3 and PAC-3 Missile Segment Enhancement) and Ground Support Equipment. PATRIOT system components (interceptors, launcher, and radar) are integrated with current force PATRIOT and Army Integrated Air and Missile Defense (IAMD) components, including IBCS. As PATRIOT system components software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation (M&S) allow for performance assessment against specific threats in a manner that is not practical to demonstrate with live fire flight tests alone due to cost, target availability, and range constraints. Flight testing is periodically required for M&S validation as well as satisfying ATEC/DOTE requirements of segment improvements.

-PATRIOT system components software and hardware improvements for threat evolution: Performs necessary analysis and development efforts to maintain PATRIOT system (interceptors, ground support equipment, and current radar) effectiveness against evolving threat technologies and capabilities, support convergence with the IBCS, and complete PATRIOT Component Software Builds (PCSB). This effort identifies evolving threats and threat characteristics that present a challenge to PATRIOT's current capabilities and develops initial concepts to maintain system effectiveness including detection, tracking, discrimination, and engagement relative to these threats. Additionally, evolving threat information is used to develop, integrate, and assess evolving lethality models in high-fidelity interceptor simulations supporting system level assessment of hit-to-kill and warhead interceptor performance.

-Advanced Electronic Counter Measures (AECM): This task investigates the implications of advanced technology Digital Radio Frequency Memory available on airborne platforms that enables new ECM techniques which could adversely degrade Air and Missile Defense System effectiveness. AECM efforts support PATRIOT system interceptors, ground support equipment, and current radar.

-Task 2: Implements improved ground system and interceptor capabilities (PATRIOT Advanced Capability-2/Guidance Enhanced Missiles, PATRIOT Advanced Capability-3, and Missile Segment Enhancement) to counter emerging Tactical Ballistic Missile threats.

-Task 6: Software improvements enhance ground support equipment and current radar discrimination of higher altitude Tactical Ballistic Missile Re-entry Vehicles (RVs) from associated objects to support the full engagement capabilities of the interceptor. Longer-range detection, track, and improved high-altitude discrimination are required to achieve the required lethality performance against the RV and to mitigate and reduce missile wastage against separation debris. This task leverages the signal processing capabilities of the Radar Digital Processor, and supports the high altitude engagements required by the PATRIOT Advanced Capability-3 (PAC-3) and PAC-3 Missile Segment Enhancement (MSE) missiles.

-Task 7: Performs analysis on existing and evolving Tactical Ballistic Missile (TBM) countermeasures to determine the effects on PATRIOT system effectiveness. Develops hardware and software concepts to address countermeasure effects to ensure the PATRIOT system maintains its effectiveness. Develops detailed system requirements to implement concepts; design/code/test software implementation leveraging Radar Digital Processor, Modernized Adjunct Processor, Enhanced Weapons

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

Control Computer - Emulator and Flight Solution Computer-Redesign processing capabilities. Implements simulation-based concepts to define trade space and establish system requirements.
-Combat ID Enhancements: Develop and implement improvements to the Radar Digital Processor-Capability Combat ID capabilities and additional Non-Cooperative Target Recognition techniques to further mitigate misclassification and fratricide risk, and to provide the Warfighter with improved situational awareness. This effort mitigates detection, tracking, and engagement errors on friendly targets.
-Upper-Tier Debris Mitigation (UTDM): Implements algorithms to mitigate system impacts of debris from Upper Tier intercepts associated with operating in the Ballistic Missile Defense System (BMDS) environment. Debris from Upper Tier intercepts can cause significant radar loading effects and the potential for erroneous engagements and missile wastage on debris.
-THAAD/PATRIOT Interoperability: Implements improvements to THAAD/PATRIOT Interoperability and addresses Joint Defense Network deficiencies that impact Tactical Ballistic Missile battle management and force/engagement operations. Efforts will be concentrated on joint, collaborative force operations (defense design and planning) and enhanced Tactical Digital Information Link - Joint interoperability.
-PAC-3 Seeker Software Improvements: Perform PAC-3 MSE Software improvements to address evolving and newly fielded Electronic Attack threats providing analysis, engineering, prototyping, testing, and tactical software implementation of improvements.
-Program Integration MSE Lockheed Martin Missile and Fire Control (LMMFC): This task support interceptor flight mission analysis, test missile preparation, flight mission interceptor integration, and range safety tasks allowing execution of required PATRIOT flight test activities.
-Mobile Flight Mission Simulator (MFMS) is a real-time system exerciser integrated with tactical ground hardware to simulate signals into the radar. The MFMS is part of the simulation and testing infrastructure required to support fielded PATRIOT.
-Development and Integration Activities in support of the Pacific Defense Initiative.
-Integrated Fires Architecture Fire Control Development: Perform Integrated Fire Architecture Fire Control Development improvements to address evolving and newly fielded threats providing analysis, engineering, prototyping, testing, and tactical software implementation of improvements.
-U.S. Government and contractor support for PIP efforts supporting system interceptors, ground support equipment, and current radar provide studies and support to ensure the system and its components continue to evolve to defeat emerging threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: PATRIOT Product Improvement	146.753	177.197	82.220
Description: Patriot Product improvement line provides continuous improvement to current force PATRIOT and Army IAMD to keep pace with and counter evolving and emerging threats. ***FY 2024 Plans:*** -Continue Software Improvement for Threat Evolution and AECM to address emerging threats and convergence with IBCS -Continue Combat ID enhancements to reduce fratricide potential -Continue Tasks 2, 6, and 7 activities to develop hardware and software to maintain PATRIOT system effectiveness in the field -Continue program development through system level modeling, simulation, integration and test support to address emerging threats and convergence with IBCS			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
-Continue test program to include utilization of targets/threat simulators, flight simulator and modeling efforts to maintain system effectiveness -Continue supporting Integrated Fires Testing -Development and integration in support of the Pacific Defense Initiative -Continue Ballistic Missile Defense System (BMDS) Integration Testing -Continue PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements -U.S. Government and contractor support to ensure force effectiveness is maintained to keep pace with evolving and emerging threats -Continue IBCS convergence and PCSB effort -Continue PAC-3 Seeker Software Improvements to counter Electronic Attack Threats -Continue system integration activities, test and analysis, and threat analysis and modeling -Continue MSS-2 laboratory support for high fidelity seeker data collection, modeling and analysis			
FY 2025 Plans: -Continue Software Improvement for Threat Evolution and AECM to address emerging threats and convergence with IBCS -Continue Combat ID enhancements to reduce fratricide potential -Continue Tasks 2, 6, and 7 activities to develop hardware and software to maintain PATRIOT system effectiveness in the field -Continue program development through system level modeling, simulation, integration and test support to address emerging threats and convergence with IBCS -Continue test program to include utilization of targets/threat simulators, flight simulator and modeling efforts to maintain system effectiveness -Continue supporting Integrated Fires Testing -Development and integration in support of the Pacific Defense Initiative -Continue Ballistic Missile Defense System (BMDS) Integration Testing -Continue PATRIOT program M&S laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements -U.S. Government and contractor support to ensure force effectiveness is maintained to keep pace with evolving and emerging threats -Continue IBCS convergence and PCSB effort -Continue system integration activities, test and analysis, and threat analysis and modeling -Continue A-PNT prototype demonstration, test and evaluation activities, and data analysis			
FY 2024 to FY 2025 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Funding decrease from FY 2024 to FY 2025 is due to a reduction in PDI - Modernized and Strengthened Presence. In addition, FY 2025 funds have realigned in the amount of $86.238 million to APE 677865DJ6/Effector Product Improvement.			
Accomplishments/Planned Programs Subtotals	146.753	177.197	82.220

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• C50700: *Patriot Mods*	462.959	212.247	171.958	-	171.958	760.673	1,821.040	1,004.129	832.309	Continuing	Continuing

Remarks

The improvements/enhancements developed through the PATRIOT Product Improvement Program (PIP) are interrelated with the hardware kits that are procured and installed under the Missile Procurement, Army (MIPA) appropriation's PATRIOT Mods program and maximizes PAC-3 MSE capabilities.

FY25 PDI funding in the amount of $15.030 million is in support of the Pacific Defense Initiative for Project D Software Development.

D. Acquisition Strategy

The design objective of the PATRIOT system was to provide a baseline system capable of modification to cope with continuing threat evolution. This program minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The PATRIOT Product Improvement Program upgrades the PATRIOT system and the Army IAMD system to address operational lessons learned, enhancements to joint force interoperability and communications, and other system performance improvements including detection, tracking, discrimination, and engagement to provide overmatch capability against the emerging threat. Upgrades are implemented through individual hardware and software materiel changes and fielded incrementally. This program encompasses several changes which will require the use of a variety of acquisition methods to develop, test, procure and field. Future hardware and software capabilities will be incorporated into Patriot Component Software Build (PCSB) releases and continue convergence efforts with IBCS. Developing, fabricating, and testing hit to kill surface to air missile and associated ground support equipment provides essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. These state-of-the-art capabilities and enhancements require ongoing demonstration through a series of flight tests and modeling and simulation activities to add survivability and resiliency in a denied environment. The PATRIOT system 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	RSA, AL : RSA, AL	23.946	4.515	Jan 2023	4.515	Jan 2024	2.325	Jan 2025	-		2.325	Continuing	Continuing	-
U.S. Contracts	Various	Multiple : Multiple	13.270	1.770	Feb 2023	1.770	Feb 2024	0.911	Feb 2025	-		0.911	Continuing	Continuing	-
		Subtotal	37.216	6.285		6.285		3.236		-		3.236	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Improvement for Threat Evolution	Various	Multiple : Multiple	78.135	6.529	Jan 2023	8.374	Jan 2024	6.625	Jan 2025	-		6.625	Continuing	Continuing	-
Advanced Electronic Counter Measures (AECM)	Various	Multiple : Multiple	124.473	13.643	Jan 2023	14.808	Jan 2024	6.195	Jan 2025	-		6.195	Continuing	Continuing	-
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	Various	Multiple : Multiple	60.901	6.885	Feb 2023	6.515	Feb 2024	4.115	Feb 2025	-		4.115	Continuing	Continuing	-
Task 6 Discrimination Improvements	Various	Multiple : Multiple	58.418	3.807	Feb 2023	4.072	Feb 2024	4.194	Feb 2025	-		4.194	Continuing	Continuing	-
Task 7 TBM Countermeasures / Effectors	Various	Multiple : Multiple	64.476	16.923	Feb 2023	13.541	Feb 2024	8.741	Feb 2025	-		8.741	Continuing	Continuing	-
Assured PNT	Various	Multiple : Multiple	20.879	2.400	Jan 2023	4.524	Feb 2024	4.659	Feb 2025	-		4.659	Continuing	Continuing	-
Combat ID Enhancements	Various	Multiple : Multiple	66.226	10.807	Feb 2023	11.088	Feb 2024	6.250	Feb 2025	-		6.250	Continuing	Continuing	-
Tactical Telemetry Ground Station	Various	Multiple : Multiple	0.250	2.000	Feb 2023	1.600	Feb 2024	1.648	Feb 2025	-		1.648	Continuing	Continuing	-
PAC-3 Seeker SW Improvement	Various	Multiple : Multiple	37.538	2.000	Feb 2023	6.408	Feb 2024	-		-		-	Continuing	Continuing	-
CDCC and OGAs	MIPR	RSA : RSA	1.636	0.850	Oct 2022	0.850	Oct 2023	0.876	Oct 2024	-		0.876	Continuing	Continuing	-
Program Integration MSE LMMFC	Various	LMMFC : Dallas, TX	33.297	7.442	Feb 2023	8.130	Feb 2024	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DV8 / *Patriot Product Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSE/PAC-3 Raytheon	Various	Raytheon : Watham, Massachusetts	12.500	2.500	Feb 2023	2.710	Feb 2024	-		-		-	Continuing	Continuing	-
SETA Contracts	Various	Multiple : Multiple	5.700	0.918	Feb 2023	1.010	Feb 2024	0.983	Feb 2025	-		0.983	Continuing	Continuing	-
Development and Integration for the Pacific Defense Initiative	TBD	Various : Various	-	-		20.000	Feb 2024	6.450	Feb 2025	-		6.450	0.000	26.450	-
Development and Integration for the Pacific Defense Initiative PCSB 1.0	TBD	Various : Various	-	-		26.340	Feb 2024	8.580	Feb 2025	-		8.580	0.000	34.920	-
		Subtotal	564.429	76.704		129.970		59.316		-		59.316	Continuing	Continuing	N/A

Remarks

The contract method type Sole Source/Various is Fixed Price Level of Effort which includes Cost Plus Fixed Fee for material, ODC, and travel.

FY25 PDI funding in the amount of $15.030 million is in support of the Pacific Defense Initiative for Project D Software Development.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CCDC and Other Govt Agencies	MIPR	RDEC and OGA'S : RSA, AL	20.746	5.255	Jan 2023	3.370	Jan 2024	1.735	Jan 2025	-		1.735	Continuing	Continuing	-
Targets/Threat Simulation	MIPR	Various : Huntsville, AL	48.881	32.397	Jan 2023	19.664	Jan 2024	2.550	Jan 2025	-		2.550	Continuing	Continuing	-
Modeling and Simulation	MIPR	Various : Huntsville, AL	6.722	3.700	Jan 2023	3.283	Jan 2024	1.660	Jan 2025	-		1.660	Continuing	Continuing	-
Contractor T&E	Various	Multiple : Various	16.146	5.655	Jan 2023	3.355	Jan 2024	1.728	Jan 2025	-		1.728	Continuing	Continuing	-
Other T&E	MIPR	Various : WSMR, NM	10.578	10.843	Feb 2023	1.590	Feb 2024	2.025	Feb 2025	-		2.025	Continuing	Continuing	-
Mobile Flight Mission Simulator	SS/FPIF	Raytheon : Massachusetts	2.427	1.166	Feb 2023	4.400	Feb 2024	4.532	Feb 2025	-		4.532	Continuing	Continuing	-
PDB-8.1/PCSB	MIPR	Various : WSMR, NM	17.125	4.748	Nov 2022	5.280	Nov 2023	5.438	Nov 2024	-		5.438	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607865A / *Patriot Product Improvement*	Project (Number/Name) DV8 / *Patriot Product Improvement*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	122.625	63.764		40.942		19.668		-		19.668	Continuing	Continuing	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	724.270	146.753		177.197		82.220		-		82.220	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

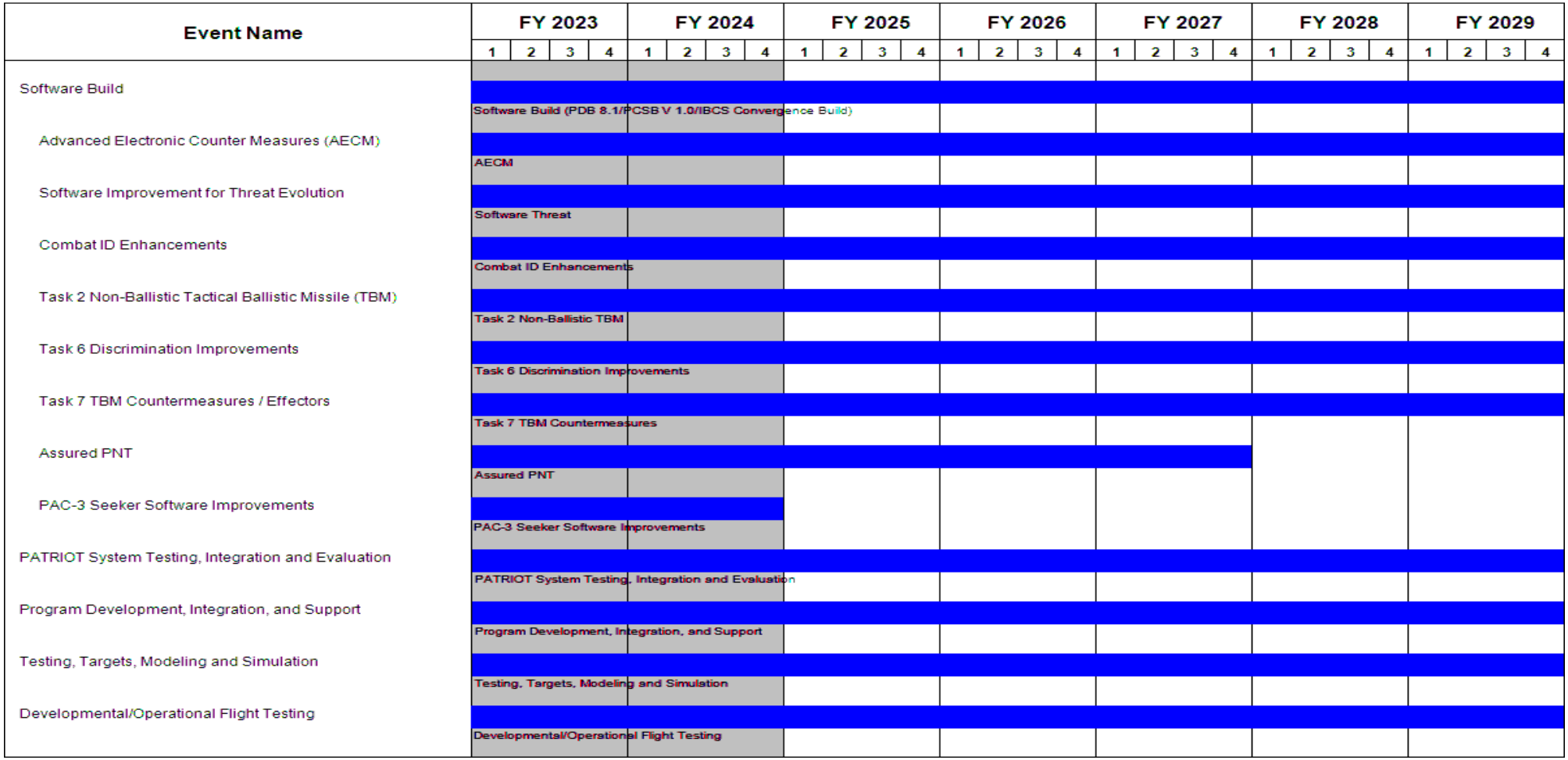

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

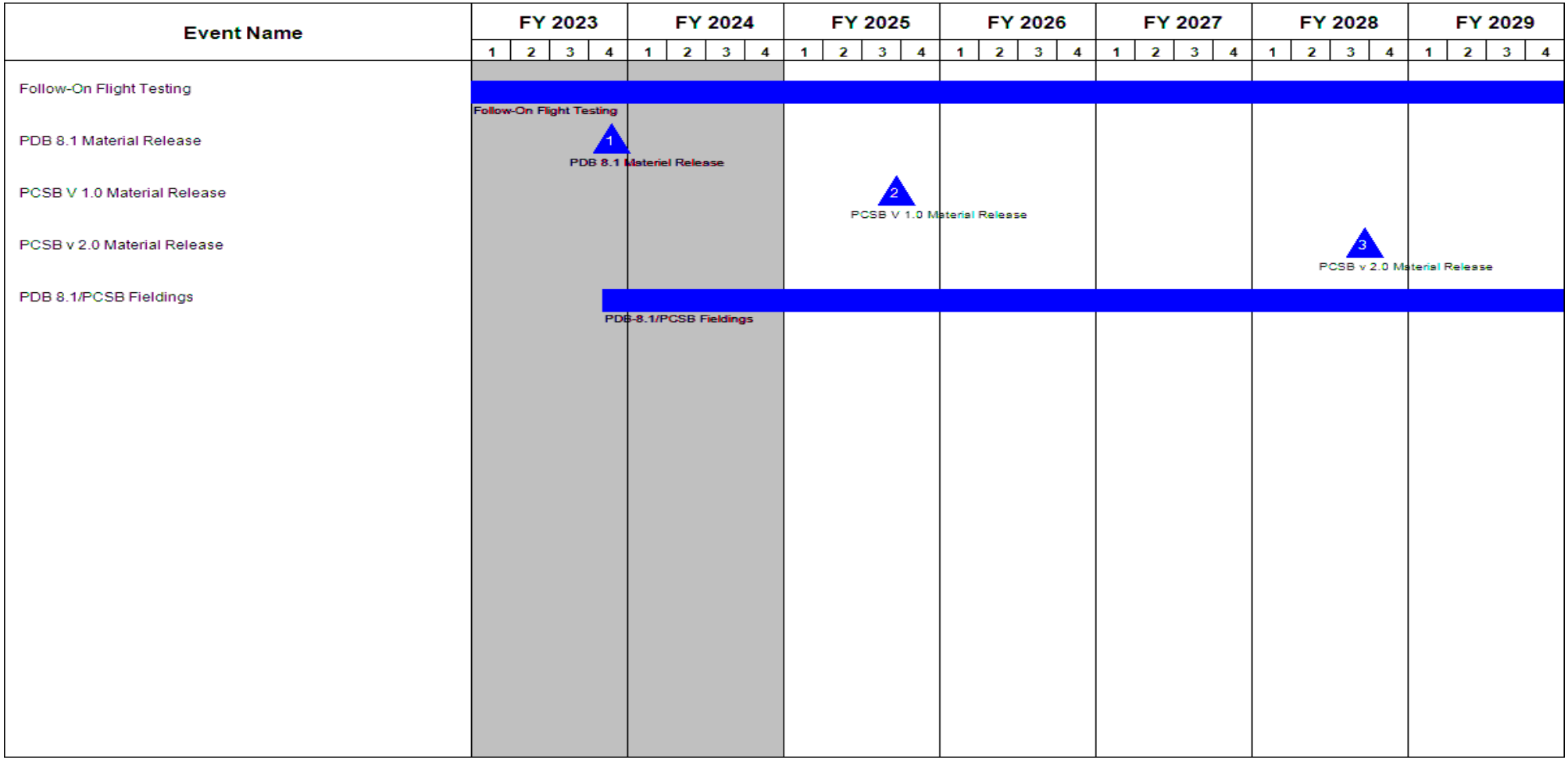

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607865A / *Patriot Product Improvement*	**Project (Number/Name)** DV8 / *Patriot Product Improvement*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Build	4	2005	4	2029
Advanced Electronic Counter Measures (AECM)	1	2014	4	2029
Software Improvement for Threat Evolution	1	2014	4	2029
Combat ID Enhancements	1	2014	4	2029
Task 2 Non-Ballistic Tactical Ballistic Missile (TBM)	1	2015	4	2029
Task 6 Discrimination Improvements	1	2014	4	2029
Task 7 TBM Countermeasures / Effectors	1	2015	4	2029
Assured PNT	1	2020	4	2027
PAC-3 Seeker Software Improvements	2	2020	4	2024
PATRIOT System Testing, Integration and Evaluation	1	2016	4	2029
Program Development, Integration, and Support	1	2016	4	2029
Testing, Targets, Modeling and Simulation	1	2016	4	2029
Developmental/Operational Flight Testing	3	2020	4	2029
Follow-On Flight Testing	4	2022	4	2029
PDB 8.1 Material Release	4	2023	4	2023
PCSB V 1.0 Material Release	3	2025	3	2025
PCSB v 2.0 Material Release	3	2028	3	2028
PDB 8.1/PCSB Fieldings	4	2023	4	2029