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 0607131A *I Weapons and Munitions Product Improvement Programs*							
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	-	54.216	8.425	9.363	-	9.363	9.454	6.068	6.190	6.253	Continuing	Continuing
CP2: *Precision Fire Technology Improvements*	-	5.468	3.451	3.549	-	3.549	3.640	3.735	3.832	3.871	0.000	27.546
ER2: *Close Combat Technology*	-	5.205	0.687	1.754	-	1.754	1.753	-	-	-	Continuing	Continuing
ER5: *Indirect Fire and Fuze Technology*	-	2.364	2.225	2.306	-	2.306	2.308	2.333	2.358	2.382	Continuing	Continuing
ER6: *Direct Fire Technology*	-	41.179	2.062	1.754	-	1.754	1.753	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project CP2, Precision Fire Technology Improvements, supports required Precision Guided Munitions (PGMs), and Precision Fuze and Fuze Setter assessment and improvement initiatives to support increased rates of fire for items that have been fielded or in full rate production, such as the M1155 Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS), Excalibur and Precision Guidance Kit (PGK). Efforts will identify, characterize, study, analyze, test, and develop PGM and Fuze technologies to increase range, lethality, effectiveness, survivability, and accuracy in support of the Army's Cannon Modernization Strategy. Fiscal Year (FY) 2025 funding will support software development and integration activities as well as continued monitoring of upgrade strategies and requirements of interfacing PGMs and Fuzes in support of Artillery ammunition and platform modernization. FY 2025 funding will also support fuze setter integration activities required for compatibility with PGMs and all Self-Propelled Howitzer (SPH) systems equipped with cannon lengths greater than or equal to 52-caliber.

Project ER2 Close Combat Technology includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, and networked munitions and mines, that have been fielded or have received approval for full rate production. Funding will allow the project to identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

Project ER5 The Indirect Fire and Fuze Technology Project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Initiatives include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products. Fiscal Year (FY) 2025 funding will support Fuze Technology Integration (FTI) efforts to expand and refine the fuze critical components database to identify and mitigate obsolescence as well as single point components and processes; complete extended duration artillery fuze power sources; investigate M734A1 signal processor product improvement; continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; continue to integrate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes to complete the proximity sensor Hardware-in-the-loop (HWIL) countermeasures testing infrastructure; completes updating the M82 66mm smoke grenade with an integrated electronic delay.

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 0607131A *I Weapons and Munitions Product Improvement Programs*

Project ER6: The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, medium caliber ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. Fiscal Year (FY) 2025 funding supports a number of small caliber ammunition projects including improvements to training ammunition; improvements to make small caliber primers more environmentally friendly; optimization of handgun ammunition; exploring precision sniper improvements and continuing the effort to reduce Soldier load by developing lightweight ammunition. Improvements to medium caliber ammunition include lethality and safety enhancements. Improvements to 105mm and 120mm tank ammunition include examination and implementation of performance enhancement and improvements to tracer, combustible cartridge case and 105mm Advanced Multipurpose (AMP).

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	57.174	8.425	5.843	-	5.843
Current President's Budget	54.216	8.425	9.363	-	9.363
Total Adjustments	-2.958	0.000	3.520	-	3.520
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.531	-			
• SBIR/STTR Transfer	-0.427	-			
• Adjustments to Budget Years	-	-	3.520	-	3.520

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: ER6: *Direct Fire Technology*		
Congressional Add: *Smart Manufacturing for Armaments*	5.000	-
Congressional Add: *Additive Manufacuring for Weapons and Armaments Components*	10.000	-
Congressional Add: *Refractory Metal Alloys for Hypersonics*	10.000	-
Congressional Add: *Proof of Concept Military-Grade Antimony Trisulfide*	10.000	-
Congressional Add Subtotals for Project: ER6	35.000	-
Congressional Add Totals for all Projects	35.000	-

Change Summary Explanation

ER2 ($1.754M), CP2 ($0.007M), ER5 ($0.005M), and ER6 ($1.754M) increases due to continuous product improvement efforts on small, medium and large caliber ammunition.

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

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
CP2: *Precision Fire Technology Improvements*	-	5.468	3.451	3.549	-	3.549	3.640	3.735	3.832	3.871	0.000	27.546
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports required Precision Guided Munitions (PGMs), and Precision Fuze and Fuze Setter assessment and improvement initiatives to support increased rates of fire for items that have been fielded or in full rate production, such as the M1155 Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS), Excalibur and Precision Guidance Kit (PGK). Efforts will identify, characterize, study, analyze, test, and develop PGM and Fuze technologies to increase range, lethality, effectiveness, survivability, and accuracy in support of the Army's Cannon Modernization Strategy. Fiscal Year (FY) 2025 funding will support software development and integration activities as well as continued monitoring of upgrade strategies and requirements of interfacing PGMs and Fuzes in support of Artillery ammunition and platform modernization. FY 2025 funding will also support fuze setter integration activities required for compatibility with PGMs and all Self-Propelled Howitzer (SPH) systems equipped with cannon lengths greater than or equal to 52-caliber.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS) Modernization	-	3.451	3.549
Description: The effort supports fuze setting system requirements based on legacy and developmental platforms and munitions for 155mm Artillery systems. Efforts support development of comprehensive technology plan for all Self-Propelled Howitzer (SPH) systems equipped with cannon lengths greater than or equal to 52-caliber in support of the Army's Cannon Modernization Strategy.			
FY 2024 Plans: FY 2024 funding will support requirements management, software development and integration activities in support of 155mm Artillery ammunition and platform modernization. FY 2024 funding will also support fuze setting integration activities required for compatibility with the Extended Range Cannon Artillery (ERCA).			
FY 2025 Plans: Fiscal Year (FY) 2025 funding will support software development and integration activities as well as continued monitoring of upgrade strategies and requirements of interfacing PGMs and Fuzes in support of Artillery ammunition and platform modernization. FY 2025 funding will also support fuze setter integration activities required for compatibility with PGMs and all Self-Propelled Howitzer (SPH) systems equipped with cannon lengths greater than or equal to 52-caliber.			
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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Increase in funding in FY 2025 due to increase in contract and engineering costs associated with EPIAFS Modernization efforts.			
Title: Excalibur Ib Modernization ***Description:*** This effort completed a series of Excalibur Ib safety and reliability test activities survivability at higher pressures in modernized Self-Propelled Howitzer (SPH) weapon systems with cannon lengths greater than or equal to 52-caliber in support of the Army's Cannon Modernization Strategy.	5.468	-	-
Accomplishments/Planned Programs Subtotals	5.468	3.451	3.549

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The EPIAFS Modernization effort is utilizing US Government labor and development capabilities to accomplish trade studies and Other Transaction Agreement (OTA) contracts for development of modernized fuze setting concepts. Upon completion, efforts will transition to production as Engineering Change Proposals (ECPs) to be integrated into existing Federal Acquisition Regulation (FAR) production contracts.

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

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
EPIAFS Modernization Development and Hardware	Various	To Be Determined : TBD	0.932	-		1.259	Jun 2024	1.300	Jun 2025	-		1.300	0.000	3.491	-
Excalibur Ib Modernization Test Hardware	SS/CPFF	Raytheon Missles and Defense : Tuscon, AZ	4.115	1.900	Nov 2023	-		-		-		-	0.000	6.015	-
Excalibur Ib Modernization Component Hardware	C/Various	To Be Determined : TBD	0.234	0.756	Feb 2024	-		-		-		-	0.000	0.990	-
		Subtotal	5.281	2.656		1.259		1.300		-		1.300	0.000	10.496	N/A

Support ($ 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
EPIAFS Modernization Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	2.000	-		1.792	Nov 2023	1.849	Nov 2024	-		1.849	0.000	5.641	-
EPIAFS Modernization Platform/Fire Control Integration Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	0.100	-		0.100	Nov 2023	0.100	Nov 2024	-		0.100	0.000	0.300	-
EPIAFS Modernization Cybersecurity Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	0.100	-		0.100	Nov 2023	0.100	Nov 2024	-		0.100	0.000	0.300	-
Excalibur Ib Modernization Engineering Support	MIPR	Combat Capabilities Development	0.453	1.882	Dec 2023	-		-		-		-	0.000	2.335	-

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) CP2 / *Precision Fire Technology Improvements*	

Support ($ 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
		Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ													
		Subtotal	2.653	1.882		1.992		2.049		-		2.049	0.000	8.576	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
EPIAFS Modernization Environmental Testing	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	0.100	-		0.100	Aug 2024	0.100	Aug 2025	-		0.100	0.000	0.300	-
EPIAFS Modernization Firing Testing	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	0.100	-		0.100	Aug 2024	0.100	Aug 2025	-		0.100	0.000	0.300	-
Excalibur Ib Modernization Testing	MIPR	Yuma Proving Grounds (YPG) : Yuma, AZ	1.500	0.930	May 2024	-		-		-		-	0.000	2.430	-
		Subtotal	1.700	0.930		0.200		0.200		-		0.200	0.000	3.030	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	9.634	5.468		3.451		3.549		-		3.549	0.000	22.102	N/A

Remarks

EPIAFS = Enhanced Portable Inductive Artillery Fuze Setter

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

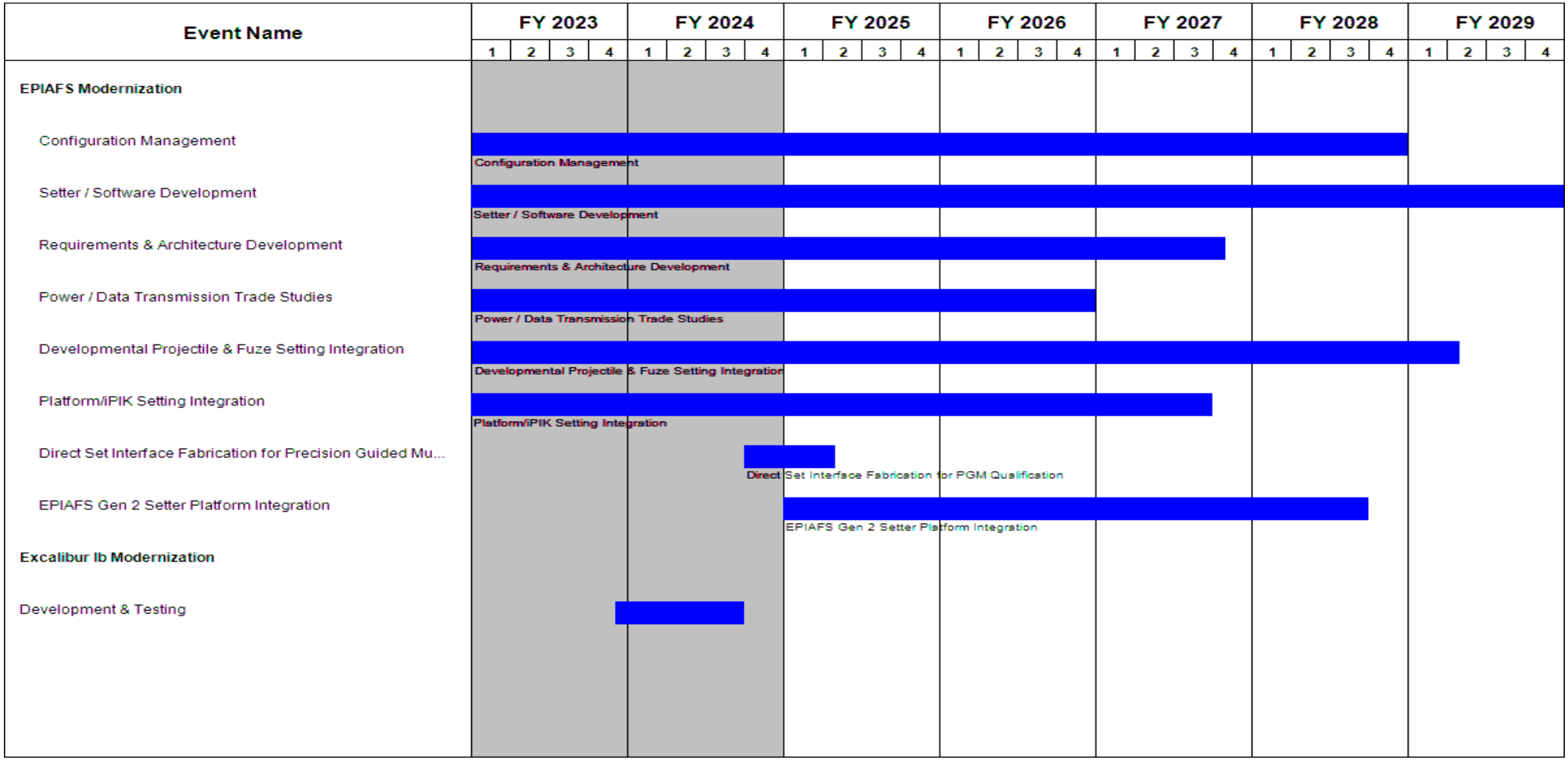

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** CP2 / *Precision Fire Technology Improvements*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EPIAFS Modernization	1	2022	4	2029
Configuration Management	1	2022	4	2028
Setter / Software Development	3	2022	4	2029
Requirements & Architecture Development	1	2022	4	2027
Power / Data Transmission Trade Studies	1	2023	4	2026
Developmental Projectile & Fuze Setting Integration	1	2023	2	2029
Platform/iPIK Setting Integration	3	2022	3	2027
Direct Set Interface Fabrication for Precision Guided Munition (PGM) Qualification	4	2024	2	2025
EPIAFS Gen 2 Setter Platform Integration	1	2025	3	2028
Excalibur Ib Modernization	4	2023	4	2024
Development & Testing	4	2023	3	2024

Note

EPIAFS = Enhanced Portable Inductive Artillery Fuze Setter

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER2 / *Close Combat Technology*	

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
ER2: *Close Combat Technology*	-	5.205	0.687	1.754	-	1.754	1.753	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project ER2 Close Combat Technology includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, countermeasure flares, non-lethal ammunition/systems, and networked munitions and mines, that have been fielded or have received approval for full rate production. Funding will allow the project to identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: M330 Obscuration Grenade	3.888	0.300	0.600
Description: The M330 Hand Grenade Smoke Screening (HGSS) produces a dense cloud of non-colored smoke for 90 to 150 seconds in the visual spectrum for screening and concealment of the tactical small unit. The environmentally friendly M330 is the approved replacement for the highly toxic AN-M8 HC Smoke hand grenade currently restricted for contingency operations. The interim solution, the M83 TA "Practice" smoke hand grenade, is not suitable and sustainable for combat operations as it requires a 3:1 ratio when compared to the AN-M8 HC or M330 for tactical obscuration. The M83 TA "Practice" smoke hand grenade will serve as the M330 HGSS trainer. The M330 enables the Soldier Lethality modernization priority by providing the Soldier with a tactical replacement for the AN-M8 that provides effective obscuration capability to support Soldier Maneuver under enemy fire while reducing toxicity to the Soldiers and Environment. The M330 also reduces Soldier load and the associated logistics burden as Soldiers can now use a single M330 in lieu of 3 M83s currently needed in tactical operations. ***FY 2024 Plans:*** FY 2024 funding supports the completion of the PQT and preparation for Type Classification. ***FY 2025 Plans:*** FY 2025 funding supports engineering efforts required to support Type Classification Standard and Full Materiel Release. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY25 funding required to finalize and certify the TDP.			
Title: M67 (G881) Fragmentation Hand Grenade	0.497	0.287	0.554
Description: The M67 Hand Grenade uses the M213 fuze which does not meet Insensitive Munitions (IM) requirements. The M67 E1 program is a modernization effort that will replace the legacy M67 with a more IM compliant system which greatly increases the safety of the warfighter as it will make the M67 less susceptible to inadvertent detonation. This effort will integrate the Israeli			

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
M840 IM compliant foreign fuze as a replacement to the current M213 fuze and incorporate an IM compliant explosive fill. The new IM compliant fuze and explosive fill will be qualified for incorporation into the M67 design and the TDP will be updated. The M67 is an enabler for Soldier Lethality as it provides Soldiers with a highly effective capability that is easy to throw and can produce casualties to enemy combatants via a 15 meter fragmentation radius. This capability enables the soldier lethality Army modernization priority by providing increased lethality while increasing soldier survivability due to safety benefits of the more IM compliant grenade. ***FY 2024 Plans:*** FY 2024 funding will finalize the load, assemble, pack (LAP) of qualification hardware in support of qualification testing of the IM compliant fuze for the M67 fragmentation grenade. ***FY 2025 Plans:*** FY 2025 funding supports the completion of the qualification build, a Limited User Assessment (LUA) at Fort Moore, and the start of qualification testing. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase in FY25 funding to prepare for qualification testing.			
Title: M112 Demolition Block - Alternate Fill ***Description:*** This effort will qualify an alternative explosive fill (PAX-52) for the M112 demolition block that is a more reliable demolition for use in cold and extreme cold conditions and more environmentally friendly in manufacture and use. It also eliminates the need for Polyisobutylene (PIB) a current OCONUS single point failure within the production of the M112 Demolition Block. ***FY 2024 Plans:*** FY 2024 funding will support the completion of EMQB required delta qualification testing of Ensign Bickford produced PAX-52 and LAP of blocks for testing. ***FY 2025 Plans:*** FY 2025 funding supports Insensitive Munition (IM), Final Hazard Classification (FHC), and EOD Render Safe Procedure (RSP) Testing in support of a TC/MR decision. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase in FY25 funding to conduct testing in support of a TC/MR decision.	0.686	0.100	0.400
Title: M87A1 ASIC Modernization	-	-	0.100

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Description: The technical data for the M87A1 Volcano Canister has not been produced in several decades, leading to several obsolescence issues that impact the ability to produce the item. This funding will support a study to evaluate M87A1 producibility to support potential production in future budget requests. ***FY 2025 Plans:*** The technical data for the M87A1 Volcano Canister has not been produced in several decades, leading to several obsolescence issues that impact the ability to produce the item. This funding will support a study to evaluate M87A1 producibility to support potential production in future budget requests. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 funding required for M87A1 producibility study.			
Title: Airborne Expendable Countermeasure Modernization ***Description:*** FY25 funding supports combining the legacy countermeasures into a single cartridge to optimize Size, Weight, and Power (SWAP) and increase the number of countermeasure solutions. ***FY 2025 Plans:*** FY 2025 funding will support modeling and simulation countermeasure improvements and produce initial prototypes for future testing. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 funding required to begin the modernization of legacy countermeasure capabilities.	-	-	0.100
Title: M82 Simulant Smoke Practice Grenade ***Description:*** This effort is to address performance issues with the current M82 design. The M82 Simulant Smoke Grenade is a 66mm grenade fielded to train in the handling, usage and deployment of the M76 infra-red, M81 graphite and brass flake and L8 Red Phosphorus grenades. This effort will modernize the M82 and will eliminate the end item reliability issues experienced by the legacy design. The improvement to the design will provide the soldier with a reliable training device thus increasing operational readiness.	0.134	-	-
Accomplishments/Planned Programs Subtotals	5.205	0.687	1.754

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

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
• E31911: *GRENADE, HAND:SMOKE, SCREENING, M330*	-	2.968	0.100	-	0.100	3.033	3.064	3.095	3.126	0.000	15.386
• E32000: *GRENADE, Hand, Frag, Delay, M67*	5.005	0.457	0.104	-	0.104	0.314	0.311	0.311	0.315	0.000	6.817

Remarks

D. Acquisition Strategy

M330 Obscuration Grenade: qualify an alternative fill as the legacy AN-M8 grenade is restricted for use in contingency operations due to its toxicity. Development of the M330 will ensure the Warfighter has tactical smoke obscuration that is more environmentally friendly. Once the smoke fill is qualified, the plan is to conduct Design Verification Testing, product qualification testing, implement the final design into the technical data package, and prepare for LRIP and production.

M67 E1 Fragmentation Hand Grenade: replace the legacy M67 with a more IM compliant system which greatly increases the safety of the warfighter as it will make the M67 less susceptible to inadvertent detonation. This involves integrating an IM compliant fuze along with an IM compliant explosive fill into the M67 offensive hand grenade. The new design will be tested and qualified in order to mitigate the insensitive munition hazards associated with the explosive fill and the fuze technology. Follow-on procurement efforts will be competitive pending market research.

M112 Demolition Block: Alternate Fill: upon qualification of PAX-52 as a bulk explosive and qualification for use in the M112 as an alternative to C4, it will be incorporated into the M112 TDP via an Engineering Change Proposal (ECP). Starting in FY 2027, a new contract for M112 will be established. M112 orders will be placed for the alternate (PAX-52) fill configuration, unless the current C4 configuration is specifically requested.

M87A1 Volcano: The technical data for the M87A1 Volcano Canister has not been produced in several decades, leading to several obsolescence issues that impact the ability to produce the item. This funding will support a study to evaluate M87A1 producibility to support potential production in future budget requests.

Airborne Expendable Countermeasure Modernization: use Other Transaction Authority (OTA) to produce test samples for flight testing and verification testing.

M82 Simulant Smoke Practice Grenade: modernize the design of specific parts to address reliability issues and to make it more producible. The new design will be validated through testing. The Technical Data Package (TDP) will be updated to implement the changes. The program will utilize an Other Transaction Authority (OTA) contract to demonstrate the design improvements.

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*	

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
M330 Hardware Build and LAP	MIPR	Pine Bluff Arsenal : White Hall, AR	-	0.804	Mar 2023	-		-		-		-	0.000	0.804	-
M67 (G881) Fragmentation Hand Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.401	-		-		-		-		-	0.000	0.401	-
M67 Load Assemble and Pack (LAP)	C/FFP	Battelle Memorial Institute : Columbus, OH	0.242	-		-		-		-		-	0.000	0.242	-
M112 Demolition Block - Alternate Fill Effort Materials	C/FFP	Leidos Inc : Reston, VA	0.118	0.204	Aug 2023	-		-		-		-	0.000	0.322	-
		Subtotal	0.761	1.008		-		-		-		-	0.000	1.769	N/A

Support ($ 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
M330 Enhanced Obscuration Grenade	MIPR	DEVCOM Chemical Biological Center : Edgewood, MD	1.915	0.280	Apr 2023	0.100	Oct 2023	0.150	Oct 2024	-		0.150	0.850	3.295	-
M330 Enhanced Obscuration Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.497	1.297	Apr 2023	0.200	Oct 2023	0.450	Oct 2024	-		0.450	0.000	3.444	-
M67 (G881) Fragmentation Hand Grenade	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.628	0.240	Feb 2023	0.287	Oct 2023	0.204	Oct 2024	-		0.204	Continuing	Continuing	-
M112 Demolition Block - Alternate Fill	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.400	0.256	Jan 2023	0.100	Oct 2023	0.100	Oct 2024	-		0.100	Continuing	Continuing	-
M87A1 Producibility Study	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.100	Jan 2025	-		0.100	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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*	

Support ($ 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
Countermeasure Modernization	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.050	Oct 2024	-		0.050	Continuing	Continuing	-
M330 Enhanced Obscuration Grenade Human System Integration	MIPR	DEVCOM DAC : Aberdeen Proving Grounds, MD	-	0.036	Aug 2023	-		-		-		-	0.000	0.036	-
M330 Enhanced Obscuration Grenade	MIPR	Pine Bluff Arsenal : White Hall, AR	-	0.070	Dec 2023	-		-		-		-	0.000	0.070	-
		Subtotal	5.440	2.179		0.687		1.054		-		1.054	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
M67 Qualification Testing	MIPR	Various : Various	-	-		-		0.350	Mar 2025	-		0.350	0.000	0.350	-
M112 Demolition Block - Alternate Fill IM, FHC, and TC/MR Testing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.300	Feb 2025	-		0.300	0.000	0.300	-
Countermeasure Modernization M&S	MIPR	TBD : TBD	-	-		-		0.050	Jan 2025	-		0.050	0.000	0.050	-
M330 Qualification Testing	MIPR	ATEC : Aberdeen Proving Ground, MD	-	1.099	Jun 2023	-		-		-		-	0.000	1.099	-
M330 Air Drop Testing	MIPR	DEVCOM Soldier Center : Natick, MA	-	0.302	Jan 2024	-		-		-		-	0.000	0.302	-
M112 Demolition Block - Alternate Fill Delta EMQB Tests	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.175	Aug 2023	-		-		-		-	0.000	0.175	-
M112 Demolition Block - Alternate Fill Engineering Tests	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.051	Aug 2023	-		-		-		-	0.000	0.051	-
M82 Simulant Smoke Practice Grenade	MIPR	Pine Bluff Arsenal : White Hall, AR	0.798	0.134	May 2023	-		-		-		-	0.000	0.932	-

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER2 / *Close Combat Technology*	

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
M67 ATEC Testing for LUA Prep	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	-	0.200	Apr 2024	-		-		-		-	0.000	0.200	-
M67 ATEC Engineering Testing Completion	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	-	0.057	Nov 2023	-		-		-		-	0.000	0.057	-
		Subtotal	0.798	2.018		-		0.700		-		0.700	0.000	3.516	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	6.999	5.205		0.687		1.754		-		1.754	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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

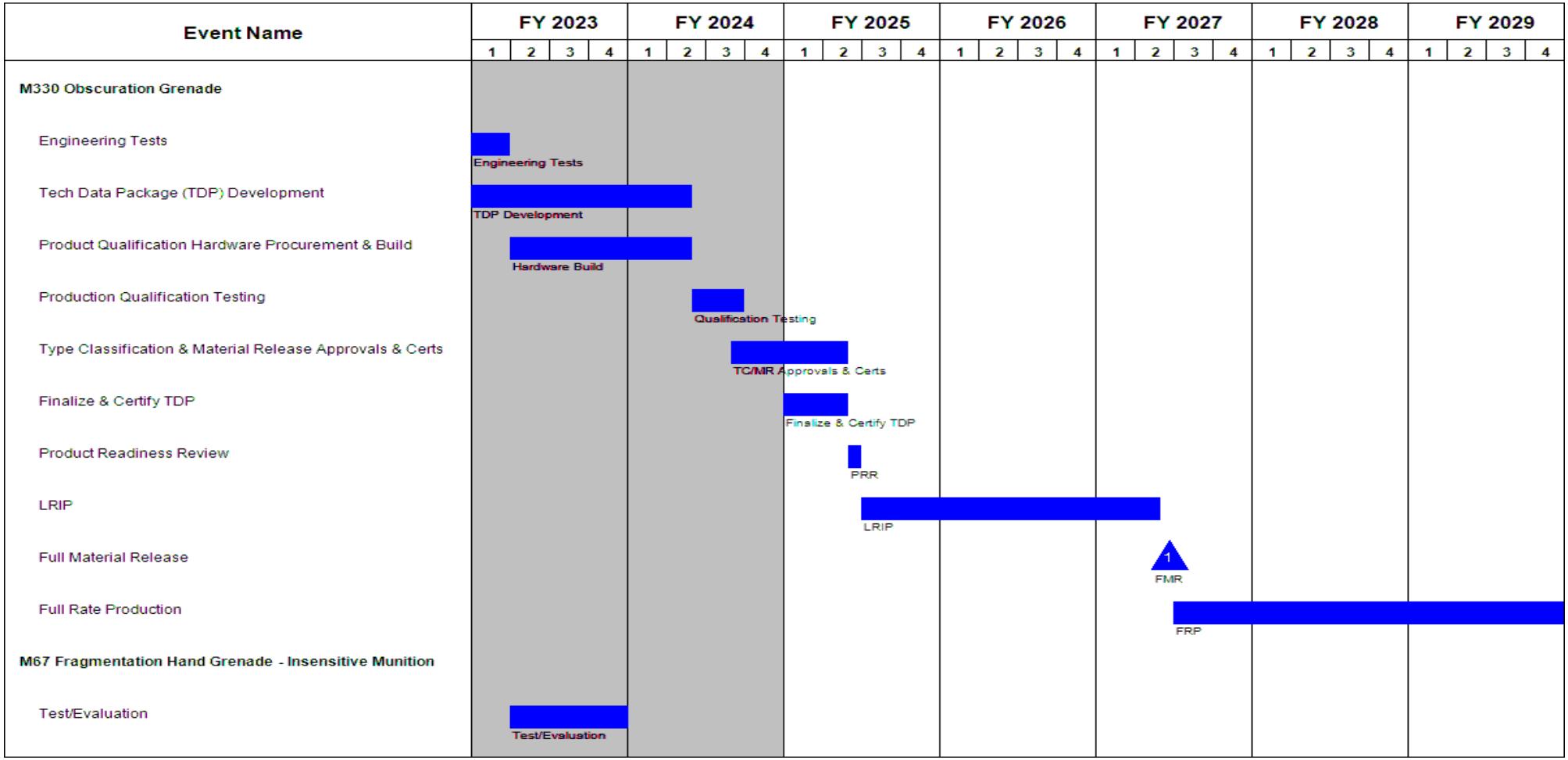

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

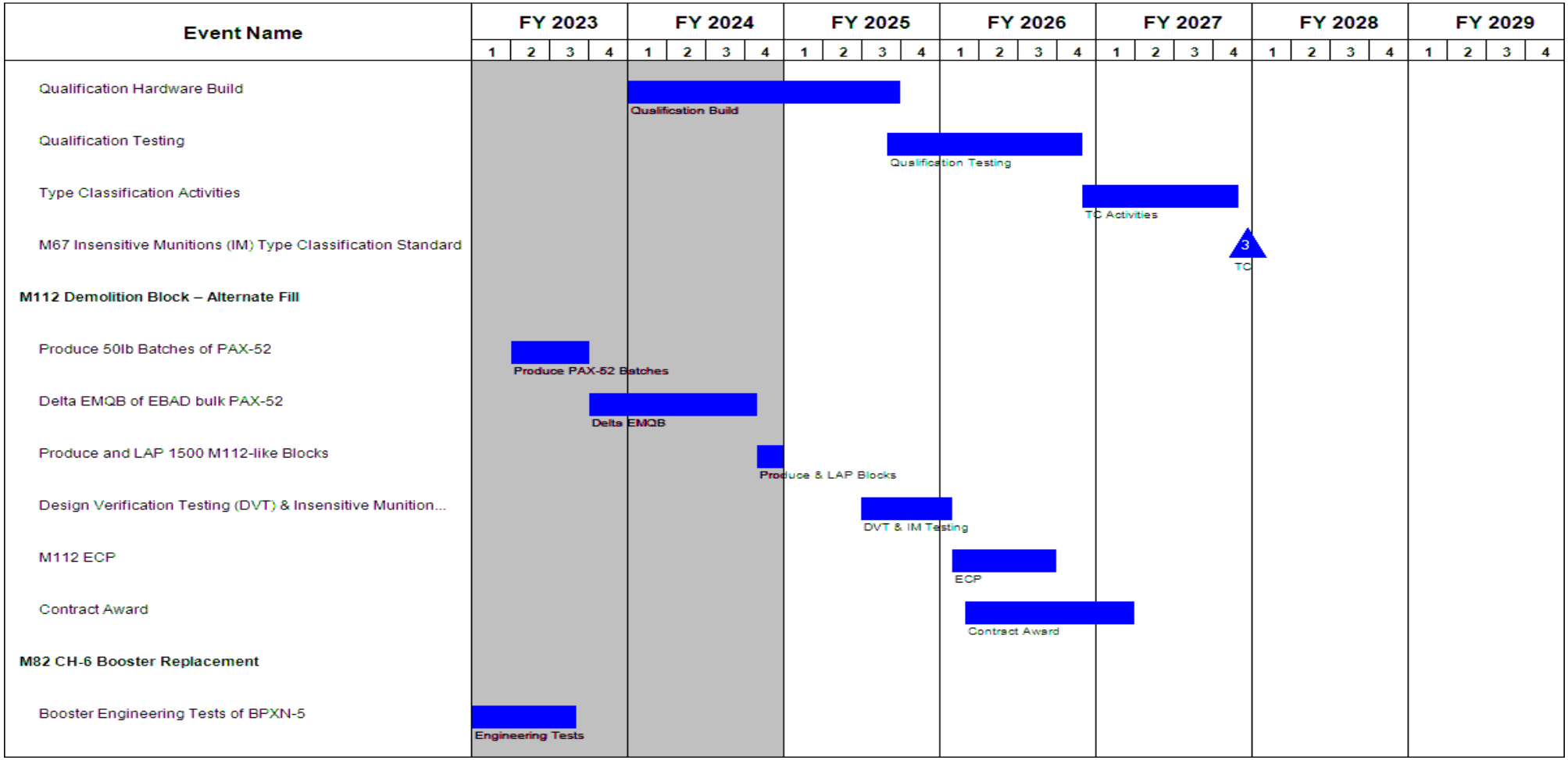

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

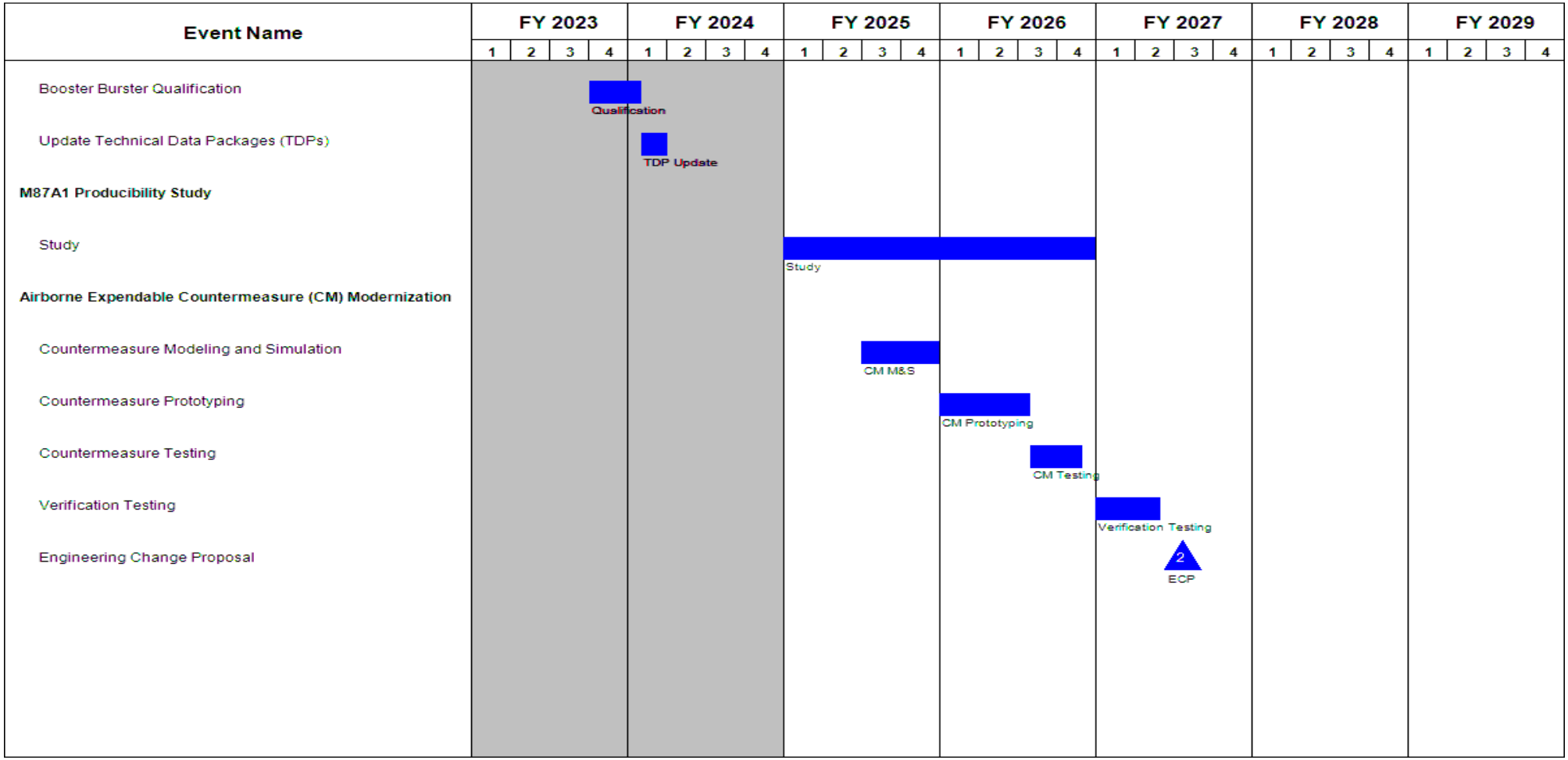

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
M330 Obscuration Grenade	1	2017	4	2025
Engineering Tests	1	2022	1	2023
Tech Data Package (TDP) Development	4	2021	2	2024
Product Qualification Hardware Procurement & Build	1	2023	2	2024
Production Qualification Testing	2	2024	3	2024
Type Classification & Material Release Approvals & Certs	3	2024	2	2025
Finalize & Certify TDP	1	2025	2	2025
Product Readiness Review	2	2025	2	2025
LRIP	3	2025	2	2027
Full Material Release	2	2027	2	2027
Full Rate Production	3	2027	4	2029
M67 Fragmentation Hand Grenade - Insensitive Munition	1	2021	4	2027
Test/Evaluation	1	2021	4	2023
Qualification Hardware Build	1	2024	3	2025
Qualification Testing	3	2025	4	2026
Type Classification Activities	4	2026	4	2027
M67 Insensitive Munitions (IM) Type Classification Standard	4	2027	4	2027
M112 Demolition Block - Alternate Fill	4	2021	1	2027
Produce 50lb Batches of PAX-52	2	2023	3	2023
Delta EMQB of EBAD bulk PAX-52	4	2023	4	2024
Produce and LAP 1500 M112-like Blocks	4	2024	4	2024
Design Verification Testing (DVT) & Insensitive Munitions (IM) Testing	3	2025	1	2026

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
M112 ECP	1	2026	3	2026
Contract Award	1	2026	1	2027
M82 CH-6 Booster Replacement	1	2017	1	2024
Baseline Testing and Dented Testing on the CH-6	1	2022	4	2022
Booster Engineering Tests of BPXN-5	1	2023	3	2023
Booster Burster Qualification	4	2023	1	2024
Update Technical Data Packages (TDPs)	1	2024	1	2024
M87A1 Producibility Study	1	2025	4	2026
Study	1	2025	4	2026
Airborne Expendable Countermeasure (CM) Modernization	1	2025	1	2030
Countermeasure Modeling and Simulation	3	2025	4	2025
Countermeasure Prototyping	1	2026	3	2026
Countermeasure Testing	3	2026	4	2026
Verification Testing	1	2027	2	2027
Engineering Change Proposal	3	2027	3	2027

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

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
ER5: *Indirect Fire and Fuze Technology*	-	2.364	2.225	2.306	-	2.306	2.308	2.333	2.358	2.382	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Indirect Fire and Fuze Technology Project includes product improvement development efforts to upgrade indirect fire weapon systems and munitions that have already been fielded and/or are in production. Initiatives include improved target engagement, increased reliability, availability, maintainability, and safety, standardization and interoperability with weapons and munitions of Allied Nations, defense exportability features, reduction of failure mechanisms, and supply chain risk through introduction of new and alternative technology and materiel solutions, improvement of manufacturing methods and their associated production and life cycle support processes, new capabilities in response to the evolving and emerging threats and countermeasures, and reduction/elimination of potential environmental and health risks associated with these products. Fiscal Year (FY) 2025 funding will support Fuze Technology Integration (FTI) efforts to expand and refine the fuze critical components database to identify and mitigate obsolescence as well as single point components and processes; complete extended duration artillery fuze power sources; investigate M734A1 signal processor product improvement; continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; continue to integrate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes to complete the proximity sensor Hardware-in-the-loop (HWIL) countermeasures testing infrastructure; completes updating the M82 66mm smoke grenade with an integrated electronic delay.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Fuze Technology Integration (FTI)	2.364	2.225	2.306
Description: This project implements new and mature technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The FTI project addresses two major areas: (1) analysis/risk mitigation and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce costs by providing competition and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect, identify, and correct latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes, increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues and add capabilities.			
FY 2024 Plans: Analysis/Risk Mitigation: Complete M783 mortar fuze evaluation, design improvement and testing to preclude early fuze functioning; continue to expand and refine the fuze critical components database to identify and mitigate obsolescence and single point components & processes; and continue integrating electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety. Block Upgrade: Continue maturing extended duration artillery fuze power sources; evaluate			

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes; and complete update of the proximity fuze sensor hardware in the loop testing infrastructure. ***FY 2025 Plans:*** Analysis/Risk Mitigation: Expand and refine the fuze critical components database to identify and mitigate obsolescence as well as single point components and processes; complete the proximity sensor Hardware-in-the-loop (HWIL) countermeasures testing infrastructure; and continue to integrate miniature reserve cell batteries for use in 30mm to 40mm medium caliber fuzes. Block Upgrade: Complete extended duration artillery fuze power sources; investigate M734A1 signal processor product improvement; continue to integrate electronic and energetic technologies into the M213 hand grenade fuze to increase fuze and explosive safety; completes updating the M82 66mm smoke grenade with an electronic delay. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase in FY 2025 funding supports additional FTI efforts; such as, the M82 66mm Smoke Grenade Electronic delay, which initiates and ends in FY 2025.			
Accomplishments/Planned Programs Subtotals	2.364	2.225	2.306

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Fuze Technology Integration (FTI) will improve current production munitions by exploiting available fuzing technologies and integrating them into current fielded and/or production fuzes, providing safer, more producible, and more lethal fuzing solutions. FTI develops second source suppliers and resolves component obsolescence issues to mitigate risk and prevent production interruptions in order to continue to provide safer, more reliable munitions for the Warfighter with significant risk reduction to production fuzes also benefiting the U.S. Taxpayer. The effort is a continuation of studies, analysis, evaluations, and insertion of fuzing technologies and safe and arm devices in production and fielded fuzes. This program will implement these technologies into fuzing systems to preclude component obsolescence, maximize standardization, enhance performance, and improve the safety, reliability, and exportability of existing munitions. FTI utilizes both the competitively awarded DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) to produce prototypes of the fuze technologies and devices, and Federal Acquisition Regulation (FAR) based contracts to implement proven efforts into production fuzes.

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

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
Fuze Technology Integration Development	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	7.182	0.743	Nov 2022	1.125	Nov 2023	1.321	Oct 2024	-		1.321	0.000	10.371	-
		Subtotal	7.182	0.743		1.125		1.321		-		1.321	0.000	10.371	N/A

Support ($ 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
Fuze Technology Integration Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	6.966	0.983	Nov 2022	1.050	Nov 2023	0.935	Oct 2024	-		0.935	0.000	9.934	-
		Subtotal	6.966	0.983		1.050		0.935		-		0.935	0.000	9.934	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
Fuze Technology Integration Ballistic Testing	MIPR	Army Test and Evaluation Command (ATEC) : Yuma Proving Ground, AZ	0.100	0.638	May 2023	0.050	May 2024	0.050	May 2025	-		0.050	0.000	0.838	-
		Subtotal	0.100	0.638		0.050		0.050		-		0.050	0.000	0.838	N/A

	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
Project Cost Totals	14.248	2.364		2.225		2.306		-		2.306	0.000	21.143	N/A

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

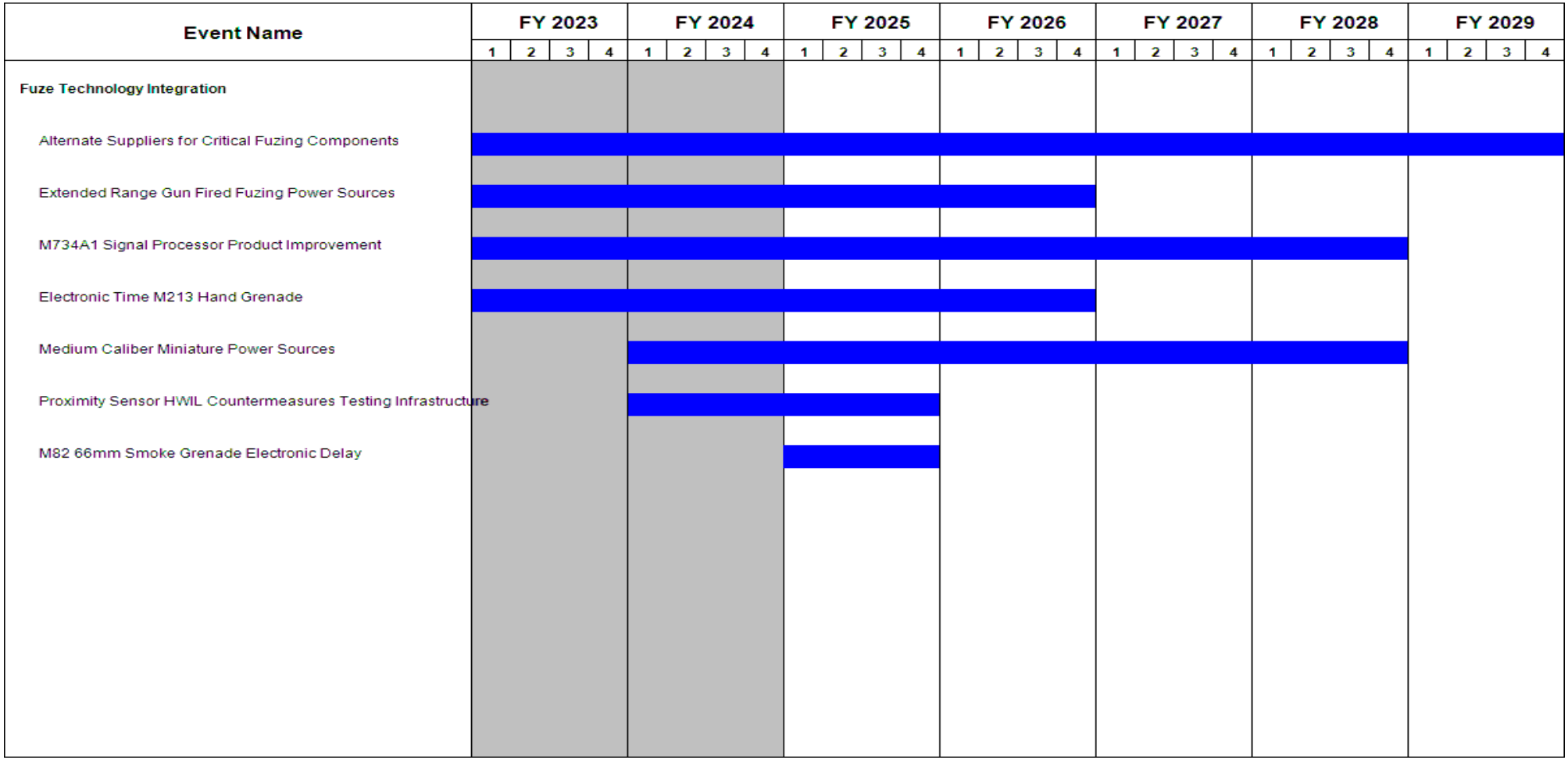

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Fuze Technology Integration	1	2017	4	2029
Alternate Suppliers for Critical Fuzing Components	1	2022	4	2029
Extended Range Gun Fired Fuzing Power Sources	1	2023	4	2026
M734A1 Signal Processor Product Improvement	1	2019	4	2028
Electronic Time M213 Hand Grenade	1	2023	4	2026
Medium Caliber Miniature Power Sources	1	2024	4	2028
Proximity Sensor HWIL Countermeasures Testing Infrastructure	1	2024	4	2025
M82 66mm Smoke Grenade Electronic Delay	1	2025	4	2025

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

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
ER6: *Direct Fire Technology*	-	41.179	2.062	1.754	-	1.754	1.753	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Direct Fire Technology funding will be used to support direct fire ammunition from small caliber ammunition, medium caliber ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. Fiscal Year (FY) 2025 funding supports a number of small caliber ammunition projects including improvements to training ammunition; improvements to make small caliber primers more environmentally friendly; optimization of handgun ammunition; exploring precision sniper improvements and continuing the effort to reduce Soldier load by developing lightweight ammunition. Improvements to medium caliber ammunition include lethality and safety enhancements. Improvements to 105mm and 120mm tank ammunition include examination and implementation of performance enhancement and improvements to tracer, combustible cartridge case and 105mm Advanced Multipurpose (AMP).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Small Caliber Ammunition Product Improvements	5.179	1.062	0.754
Description: Develop, demonstrate, and qualify improvements for 5.56mm, 7.62mm, .50 cal, Next Generation Squad Weapon ammunition, Precision Sniper ammunition and Handgun ammunition to achieve an increase in overall lethality and effectiveness.			
FY 2024 Plans: FY 2024 request will support development efforts for lightweight case .50 Caliber variant, continue material assessment, continue finalizing design, procure qualification sample, conduct qualification test. FY 2024 request will support an interim metallic solution development effort while developing the polymer case solution for lightweight case 7.62mm ammunition variant. FY 2024 will down-select to a single metallic solution, test polymer data, perform polymer aging study and material analysis, and conduct Lake City Army Ammunition Plant (LCAAP) impact study. FY 2024 request will support completing pre-production qualification testing (PPQT) for 7.62mm green primer, completing Energetic Qualification (EMQB) and initiate prototype machine design. FY 2024 request will support improved dispersion and lethality for precision sniper ammunition particularly M1158. FY 2024 request will support testing to field handgun improvements such as Enhanced Ball Round (EBR) and Breeching capability. FY 2024 request will continue to support 7.62mm M118LRA1 which improves sniper lethality.			
FY 2025 Plans: FY 2025 request will support development efforts for lightweight case .50 Caliber variant, continue material assessment, continue finalizing design, procure qualification sample, conduct qualification test.			

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 request will support an interim metallic solution development effort while developing the polymer case solution for lightweight case 7.62mm ammunition variant. FY 2025 will down-select to a single metallic solution, test polymer data, perform polymer aging study and material analysis, and conduct Lake City Army Ammunition Plant (LCAAP) impact study. FY 2025 request will support completing pre-production qualification testing (PPQT) for 7.62mm green primer, completing Energetic Qualification (EMQB), and initiating prototype machine design. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease due to planned activities as small caliber efforts implement engineering changes and transition into production.			
Title: Medium Caliber Ammunition Product Improvements ***Description:*** Develop, demonstrate, and qualify improvements for 20mm, 25mm, 30mm, and 40mm ammunition. 40mm M433E1 will improve lethality (fragmentation) of the M433 grenade. The 40mm M550 fuze replacement will replace the single stage fuze with a dual spinlock fuze to improve safety and performance reliability. Improve safety, performance and reliability issues on the 20mm M940 ammunition. ***FY 2024 Plans:*** FY 2024 funding supports continuing various 20mm, 30mm, 40mm ammunition improvement efforts, such as investigating safety, performance, reliability issues, and reducing barrel wear. Develop and demonstrate methods for increasing range, increasing system effectiveness through velocity correction, and improving point detonation sensitivity of the XM1166 cartridge. Develop, demonstrate and qualify an improved 40mm Smoke munition, including assessing current formulations compliance with environmental regulations and evaluating producibility of 40mm smoke munitions. Assess the potential to include a capability to obscure heat and Infra-Red (IR) signatures. ***FY 2025 Plans:*** FY 2025 funding supports continuing various 20mm, 30mm, 40mm ammunition improvement efforts, such as investigating safety, performance, reliability issues, and reducing barrel wear. Develop and demonstrate methods for increasing range, increasing system effectiveness through velocity correction, and improving point detonation sensitivity of the XM1166 cartridge. Develop, demonstrate and qualify an improved 40mm Smoke munition, including assessing current formulations compliance with environmental regulations and evaluating producibility of 40mm smoke munitions. Assess the potential to include a capability to obscure heat and Infra-Red (IR) signatures.	0.500	0.500	0.500
Title: Tank Ammunition Product Improvements ***Description:*** Develop and test potential improvements to 105mm and 120mm gun system ammunition. ***FY 2024 Plans:***	0.500	0.500	0.500

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 funding supports continuing various 105mm and 120mm tank ammunition improvement efforts, including tracer improvements, combustible cartridge case design and fabrication improvements, and continuing efforts to assess the 105mm Advanced Multipurpose (AMP) and 120mm AMP training cartridge/solution. Evaluate 105mm candidate cartridges, perform warhead lethality studies, modeling and simulation, conduct fuze assessment studies, perform propulsion system evaluation, assess fabrication improvements, and perform integration and testing of tank cartridges. ***FY 2025 Plans:*** FY 2025 funding supports continuing various 105mm and 120mm tank ammunition improvement efforts, including tracer improvements, combustible cartridge case design and fabrication improvements, and continuing efforts to assess the 105mm Advanced Multipurpose (AMP) and 120mm AMP training cartridge/solution. Evaluate 105mm candidate cartridges, perform warhead lethality studies, modeling and simulation, conduct fuze assessment studies, perform propulsion system evaluation, assess fabrication improvements, and perform integration and testing of tank cartridges.			
Accomplishments/Planned Programs Subtotals	6.179	2.062	1.754

	FY 2023	FY 2024
Congressional Add: Smart Manufacturing for Armaments	5.000	-
FY 2023 Accomplishments: Development of Automated Manufacturing and Inspection Processing Solutions Automated Inspection Processes for GOCO Data & Image Processing for Munition Inspection Robotic Integration into Manufacturing Process		
Congressional Add: Additive Manufacuring for Weapons and Armaments Components	10.000	-
FY 2023 Accomplishments: Exchange best practices with the organic industrial base and manufacturing industrial base (OIB/MIB) for a Robust US Manufacturing ecosystem. Multiple contracts to advance armaments systems lethality, range, and readiness. Assess components & systems produced for operational effectiveness in extreme environments. Expand the ability to produce munitions on agile production line(s) that can be assessed for "distributed manufacturing models". Assess Stratasys' "Data Security Platform" that is supporting U.S. Government Implementations of 3D Printing.		
Congressional Add: Refractory Metal Alloys for Hypersonics	10.000	-
FY 2023 Accomplishments: Development of refractory metal materials and manufacturing processing solutions. Advanced materials development & prototyping.		
Congressional Add: Proof of Concept Military-Grade Antimony Trisulfide	10.000	-

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

	FY 2023	FY 2024
FY 2023 Accomplishments: Using modern extraction and purification technologies design and demonstrate a line layout at a pilot scale to produce natural or synthetic stibnite that complies with MIL-A-159.		
Congressional Adds Subtotals	35.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for small, medium and large caliber product improvements is that all contracts are full and open competition.

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

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
Lightweight Case Ammunition	C/FFP	Vista Outdoor : Anoka, MN	1.580	1.900	Mar 2023	-		-		-		-	0.000	3.480	-
M118LRA1 - Contract 2	C/FFP	TBD : TBD	-	0.675	Mar 2023	-		-		-		-	Continuing	Continuing	Continuing
Smart Manufacturing for Armaments Contract	C/FFP	TBD : TBD	-	4.500	Jun 2023	-		-		-		-	0.000	4.500	-
Refractory Metal Alloys for Hypersonics Manufacturing contract	C/FFP	TBD : TBD	-	8.500	Jun 2023	-		-		-		-	0.000	8.500	-
Refractory Metal Alloys for Hypersonics Prototyping contract	C/FFP	TBD : TBD	-	0.500	Jun 2023	-		-		-		-	0.000	0.500	-
Antimony Sulfide proof of concept contract	C/CPFF	Perpetua Resources : Boise, ID	-	8.000	May 2023	-		-		-		-	0.000	8.000	-
Additive Manufacturing - Contract	C/FFP	TBD : TBD	-	3.998	Jun 2023	-		-		-		-	0.000	3.998	-
		Subtotal	1.580	28.073		-		-		-		-	Continuing	Continuing	N/A

Support ($ 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
Engineering Support - Small, Medium & Large Caliber	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, New Jersey	15.053	1.666	Nov 2022	0.803	Nov 2023	0.754	Nov 2023	-		0.754	Continuing	Continuing	Continuing
Engineering Support - Antimony Sulfide	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, New Jersey	-	2.000	May 2023	-		-		-		-	0.000	2.000	-
Engineering Support - Metal Alloys for Hypersonics	MIPR	DEVCOM Armaments Center :	-	1.000	Jun 2023	-		-		-		-	0.000	1.000	-

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

Support ($ 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
		Picatinny Arsenal, New Jersey													
Engineering Support - Smart Manufacturing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, New Jersey	-	0.500	Jun 2023	-		-		-		-	0.000	0.500	-
Engineering Support - Additive Manufacturing	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, New Jersey	-	6.002	Jun 2023	-		-		-		-	0.000	6.002	-
		Subtotal	15.053	11.168		0.803		0.754		-		0.754	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
ARL Test Support Small Medium & Large Caliber	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	4.623	1.700	Mar 2023	0.603	Mar 2024	0.500	Mar 2024	-		0.500	Continuing	Continuing	Continuing
ATC Test Support Small Medium & Large Caliber	MIPR	Aberdeen Test Center (ATC) : Aberdeen, Maryland	4.098	-		0.656	Mar 2024	0.500	Mar 2024	-		0.500	Continuing	Continuing	Continuing
Ballistic Support Office	MIPR	Lake City Army Ammunition Plant LCAAP : Independence, Missouri	-	0.238	Mar 2023	-		-		-		-	0.000	0.238	-
		Subtotal	8.721	1.938		1.259		1.000		-		1.000	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	25.354	41.179		2.062		1.754		-		1.754	Continuing	Continuing	N/A

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 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology*	

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract

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 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

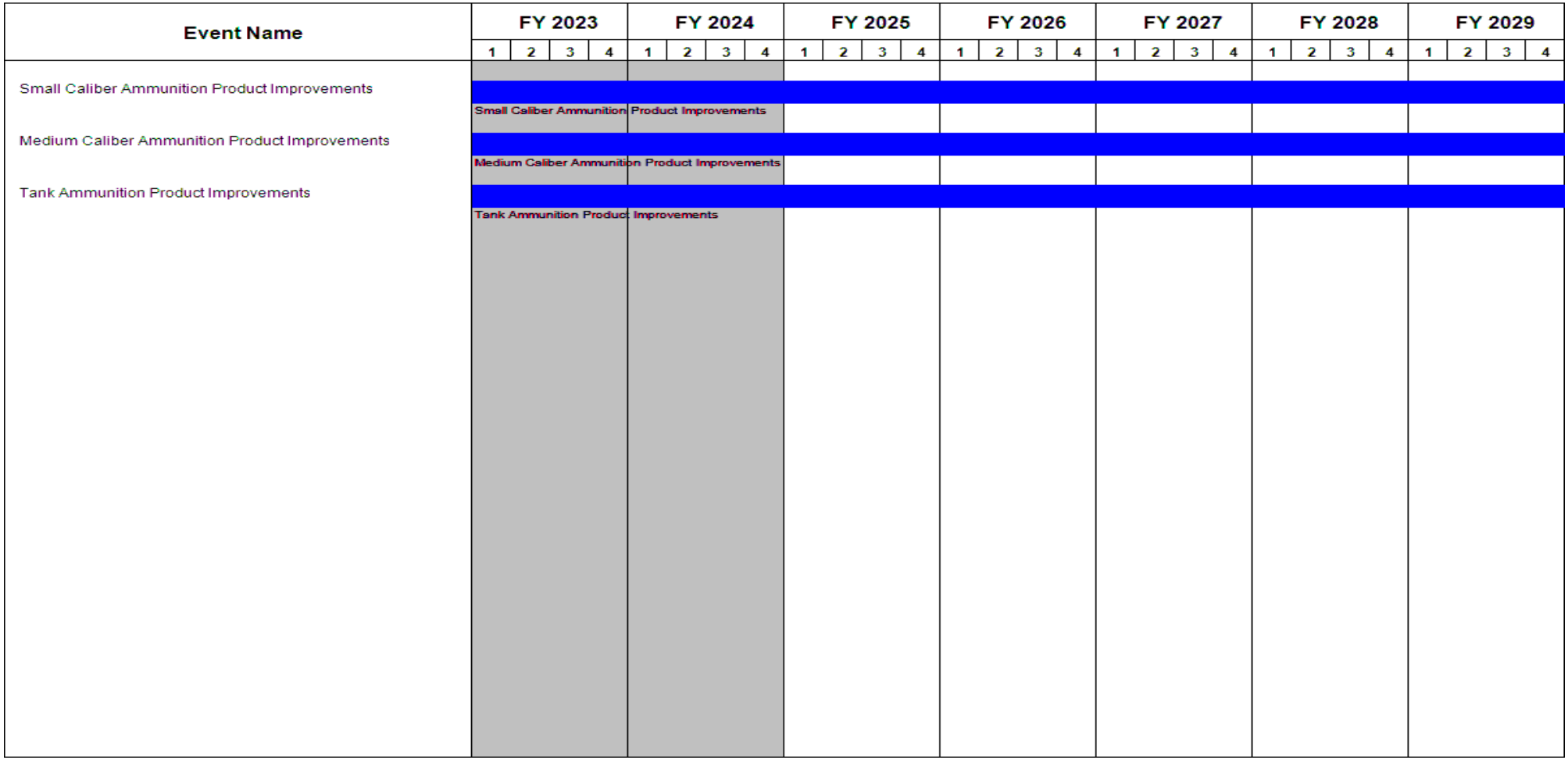

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Small Caliber Ammunition Product Improvements	1	2018	4	2033
Medium Caliber Ammunition Product Improvements	1	2018	4	2033
Tank Ammunition Product Improvements	1	2018	4	2033