Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602000D8Z / *Joint Munitions Technology*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	20.309	22.961	19.157	-	19.157	19.530	19.955	20.373	20.816	Continuing	Continuing
076: *Enhanced Munitions*	-	20.309	22.961	19.157	-	19.157	19.530	19.955	20.373	20.816	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

This program conducts cross-cutting, foundational research improving the lethality, range, reliability, safety, survivability, and effectiveness of kinetic weapon systems to rapidly advance U.S. capabilities necessary for the Joint Fight. The program technology objectives include: high-speed weapon delivery, longer range precision effects, networked and collaborative systems of systems, agility at the engagement level, increased capacity / affordable munitions, survivability during delivery and target engagement, and open systems architecture. The program develops enabling technologies specific to kinetic weapon munitions (warheads, propulsion, advanced lethality mechanisms, state of the art fuzing technologies, and pioneering targeting technologies) from a Joint Service, multi-domain perspective, thus maximizing efficiencies and ensuring the development of technologies with the broadest applicability to ensure good stewardship of taxpayer dollars.

In order to maintain superior power protection capabilities against near peer adversaries, there is an urgent need to provide U.S. warfighters with augmented or new capabilities to ensure technical superiority. The program follows a threat/opportunity analysis to develop kinetic capabilities that enable scenario-based effects from a Joint Fight perspective by exploring technological advances that are beyond Service investment risk acceptance and target asymmetric advantage. The goal is to enable military dominance to ensure effective deterrence of adversary aggression.

The program will invest in technologies that will enable U.S. warfighters to maintain or regain operational and battlefield advantages that technologies can provide through increased performance, range, and lethality to improve the Joint Force military advantages and build a more lethal force across air, land and sea contested domains. This program's investment portfolio has been aligned to complement and utilize the Department's priority technology areas.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602000D8Z / *Joint Munitions Technology*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	20.529	18.961	19.493	-	19.493
Current President's Budget	20.309	22.961	19.157	-	19.157
Total Adjustments	-0.220	4.000	-0.336	-	-0.336
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.217	-			
• Program Adjustments	-0.003	-	-0.336	-	-0.336

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 076: *Enhanced Munitions*		
Congressional Add: *Next Generation Explosives and Propellants*	1.000	2.000
Congressional Add: *Energetics Manufacturing Technology*	-	2.000
Congressional Add Subtotals for Project: 076	1.000	4.000
Congressional Add Totals for all Projects	1.000	4.000

Change Summary Explanation

The FY 2024 reduction of $0.336 million is comprised of a realignment of $0.424 million to support the Historically Black Colleges Universities/Minority Serving Institutions program, which is a priority of the Under Secretary of Defense for Research and Engineering (USD(R&E)), $0.020 million to support departmental priorities and an increase of $0.108 million for economic assumptions.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602000D8Z / *Joint Munitions Technology*	Project (Number/Name) 076 / *Enhanced Munitions*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
076: *Enhanced Munitions*	-	20.309	22.961	19.157	-	19.157	19.530	19.955	20.373	20.816	Continuing	Continuing

A. Mission Description and Budget Item Justification

The enhanced munitions effort investigates and develops advanced energetics concepts and explosive and propellant materials to improve the performance, range, speed, and lethality of weapons. Technologies and concepts developed will have the potential to impact multiple munitions types with wide applicability to improve the performance, lethality, speed, range, and survivability of weapons to ensure the U.S. is not outgunned and outranged on the battlefield of the future.

The Joint Enhanced Munition Technology Program (JEMTP) exploits technology developments, such as hypersonics, machine learning, artificial intelligence, quantum computing, and to accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials, advanced propulsion, warhead effects, enabling fuze technologies, and pioneering targeting technologies with a specific focus on enhancing kinetic weapons lethality, range and resultant effects. The program informs technology investments with broad applicability across the Department. Investments will be informed by a threat-opportunity based analysis that focuses on developing weapons systems that exploit technology dominance to ensure military objectives in Joint Force campaign and operational scenarios. New technology roadmaps for the Joint munition technical areas will guide investments consistent with the National Defense Strategy and inform Service technology investments.

In FY 2022, the Joint Fuze Technology Program (JFTP) and JEMTP merged and the program scope expanded to exploit technology developments, such as hypersonics, machine learning, artificial intelligence, quantum computing, and to accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials , advanced propulsion, warhead effects, enabling fuze technologies, and pioneering targeting technologies with a specific focus on enhancing kinetic weapons lethality, range and resultant effects. The program will retain tri-Service leadership to inform technology investments accelerating development across the Department. Investments will be informed by a threat-opportunity based analysis that focuses on developing weapons systems that exploit technology dominance to ensure military objectives in Joint Force campaign scenarios. New technology roadmaps for munition technical areas will guide investments consistent with the National Defense Strategy and inform Service technology investments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Enhanced Munitions	19.309	18.961	19.157
Description: Enhanced Munitions enabling technologies focus on the following key areas: - Munitions Versatility: Combined and Collaborative Kinetic Effects - Munitions Readiness: Modularity, Advanced Manufacturing and Materials - Munitions Efficiency: Weapon Survivability - Munitions Effectiveness - Munitions Kinetic and Tailorable Lethality Effects • Propulsion Systems			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602000D8Z / *Joint Munitions Technology*	**Project (Number/Name)** 076 / *Enhanced Munitions*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
• Target Detection and Burst Point Control ***FY 2023 Plans:*** - Complete novel propellant testing and validate data to modelling and simulation results. - Finalize prototype novel missile low erosion nozzle design and conduct testing in realistic temperature regimes. - Complete characterization of novel new explosive material and formulate with novel metal fuels, to start down-selection process of formulations to enable fabrication of mid-scale samples for testing. - Complete End-to-End machine learning radar with significant improvement in Electronic Countermeasure Resistance by completing laboratory prototyping with a software defined radio and RF simulator. - Initiate machine learning based target detection design based on algorithm and database option exploration for high speed weapon fuzing. - Demonstrate target detection research with evaluation of implemented solution to determine effectiveness of enhanced technology for survivability and precise trigger timing to enhance lethality. ***FY 2024 Plans:*** - Complete rotating detonation engine enabling technology research though static firing test and transition this long range propulsion technology into advanced development. - Develop advanced propulsion solid fuels, thrust control technologies, variable nozzle technologies that will enhance U.S. missile range, speed and maneuverability. - Continue development of machine learning based target detection technologies to enhance lethality with focus on maritime targets. - Investigate advanced munitions energetics and non-energetics materials using novel and agile processing technologies for enhanced performance and survivability future weapons. - Improve energetic materials production and processing technologies to bolster supply chain and diversify energetic systems industrial base. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase between FY 2023 and FY 2024 of $0.196 reflects changes for economic assumptions.			
Accomplishments/Planned Programs Subtotals	19.309	18.961	19.157

	FY 2022	FY 2023
Congressional Add: Next Generation Explosives and Propellants	1.000	2.000
FY 2022 Accomplishments: Explosives and propellants are crucial to address U.S. Forces capability needs for enhancing weapon lethality, range and speed against advanced adversary threats. Program increase was used		

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602000D8Z / *Joint Munitions Technology*	**Project (Number/Name)** 076 / *Enhanced Munitions*

	FY 2022	FY 2023
to accelerate Joint Enhanced Munitions Technology Program efforts for advanced explosives and propellants to enhance Joint Force munitions effectiveness and readiness and support future warfighting needs across all domains. ***FY 2023 Plans:*** The Next Generation Explosives and Propellants project increase develops advanced energetic ingredients and consolidation methods at Virginia Polytechnic Institute & State University (Virginia Tech).		
Congressional Add: Energetics Manufacturing Technology ***FY 2023 Plans:*** The energetics manufacturing technology program increase will focus on maturing advanced manufacturing concepts that enable improvements in energetics manufacturing quality and capacity to bolster supply chain and diversify energetic systems industrial base and ultimately develop munitions with increase range and performance.	-	2.000
Congressional Adds Subtotals	1.000	4.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A