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 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603924D8Z / *High Energy Laser Advanced Development*

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	109.113	81.173	111.149	111.799	-	111.799	113.468	115.931	118.356	120.935	Continuing	Continuing
924: *High Energy Laser Initiative*	109.113	81.173	111.149	111.799	-	111.799	113.468	115.931	118.356	120.935	Continuing	Continuing

Note

New Start (Y/N): No

Funding was realigned from this program to 0602890D8Z High Energy Laser Development starting in FY 2024 for Directed Energy Applied Research that is focused on technology in support of a strategic mission capability for counter hypersonic missile defense. Lethality Applied Research focused on the counter hypersonic missile defense is increased in FY 2024 to gain a better understanding on the vulnerabilities of threats of interest.

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

This program element funds Directed Energy (DE) advanced technology development aimed at translating technology solutions for broadly defined military problems into demonstrated performance pay-offs, increased capabilities, increased supportability, and/or increased affordability. DE weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, low incremental cost per kill, and a magazine that is recharged through on-board, fuel-based power and thermal management systems that reduce logistics requirements in contrast to stocks of munitions or warheads. As a result, DE systems have the potential to perform a wide variety of military missions. Activities conducted under this program element will develop and demonstrate the technology necessary to enable DE system missions across the Department of Defense (DoD).

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	83.159	111.149	113.765	-	113.765
Current President's Budget	81.173	111.149	111.799	-	111.799
Total Adjustments	-1.986	0.000	-1.966	-	-1.966
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	-1.986	-	-1.966	-	-1.966

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Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603924D8Z *I High Energy Laser Advanced Development*

Change Summary Explanation

FY 2024 reduction of $1.966 million is comprised of a realignment of $2.476 million to support the Historically Black Colleges and Universities/Minority Serving Institutions program, which is a priority of the Under Secretary of Defense for Research and Engineering (USD(R&E)), $0.119 million to support departmental priorities and an economic assumption increase of $0.629 million.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603924D8Z / *High Energy Laser Advanced Development*	Project (Number/Name) 924 / *High Energy Laser Initiative*	

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
924: *High Energy Laser Initiative*	109.113	81.173	111.149	111.799	-	111.799	113.468	115.931	118.356	120.935	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This program element is part of an overall Department strategy in Directed Energy (DE) weapon system advanced technology development. This effort will focus on scaling the output power of DE systems to reach operationally effective power levels applicable to broad mission areas across the DoD. Additionally, efforts will also pursue improvements in common DE system components such as beam control & propagation, lethality & vulnerability, and efficient power and thermal management approaches. This program element complements, and will be closely coordinated with other DoD DE efforts directed at specific Service and Agency missions. This program leverages and/or builds upon other investments in DE by the Services and Agencies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Directed Energy Advanced Technology Development	81.173	111.149	111.799
Description: Develop, mature and demonstrate directed energy sources that will provide system level performance commensurate with fieldable directed energy devices. Develop, mature and demonstrate technologies that supports improving beam control and beam propagation for DE weapon systems. Conduct directed energy lethality & vulnerability experiments on materials, components, and targets. Develop a lethality database, and integrate into a systems-level architecture plan and lethality models.			
FY 2023 Plans: DE Sources: Scaling HEL sources from 300 to 500 kW and 1 MW will begin by utilizing two laser builders who best demonstrate performance at 300 kW. Each of the two follow-on scaling efforts will validate performance of components critical for further scaling of power and reduced size and weight through risk reduction tests. Each will also establish system requirements traceability and mature the developments through a preliminary design phase. The remaining two 300kW developments will perform final scaled power laboratory demonstrations at 100-200kW to demonstrate the performance and limitations of their respective key technologies. -Beam Control and Propagation: Collect data on thermal blooming effects at higher laser powers to validate HEL propagation models. Collect tracking and atmospheric compensation data leveraging beam control testbed efforts across the Department to assess maturity of components developed under applied research. Continue to mature cross-cutting technology development in beam control systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603924D8Z / *High Energy Laser Advanced Development*	**Project (Number/Name)** 924 / *High Energy Laser Initiative*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
-Lethality and Vulnerability: Collect lethality damage effects, vulnerability and system response data on current and future cruise missile (CM) threats of all classes for both high energy laser and high power microwave technologies. Continuous wave and pulsed laser technologies will be investigated. Laboratory and field testing and modeling and simulation (M&S) results will be used to develop vulnerability modules (VMs) for use in DE weapons' effectiveness tools, mission and campaign level utility studies. A chartered, lethality database will begin transition to the Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) for analyst's use. Development efforts will continue, to include HPM lethality inputs for a more complete DE lethality database product. ***FY 2024 Plans:*** DE Sources: The follow-on 500kW-1MW developments will further mature through critical design and each begin the system build phase. -Beam Control and Propagation: Validate Beam Control technology to include acquisition and course track, fine track and aimpoint maintenance, wavefront compensation, and High Energy Laser optical components in a relevant environment to understand effectiveness and identify shortfalls that require additional research focus. -Lethality: Static and dynamic lethality testing of representative and/or actual CM targets will be conducted using HEL systems/ HELSI sources to validate cruise missile aimpoint selections, vulnerability predictions and system response. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 funding increase of $0.650M is due to programmatic adjustments and budget fluctuations.			
Accomplishments/Planned Programs Subtotals	81.173	111.149	111.799

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

N/A