Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603466A *I Air and Missile Defense Advanced Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	79.817	175.703	48.826	-	48.826	-	-	-	-	-	-
AC8: *Low Cost Extended Range Air Defense Adv Tech*	-	20.184	-	-	-	-	-	-	-	-	-	-
AD1: *High Energy Laser Tactical Vehicle Demo Adv Tech*	-	28.822	26.247	26.089	-	26.089	-	-	-	-	-	-
AD4: *Maneuver Air Defense Advanced Technology*	-	-	19.396	19.737	-	19.737	-	-	-	-	-	-
AD6: *Next Generation Fires Radar Advanced Technology*	-	7.411	6.899	-	-	-	-	-	-	-	-	-
AE1: *Close Combat High Energy Laser Advanced Technology*	-	-	2.407	-	-	-	-	-	-	-	-	-
AE3: *Unconventional Countermeasures-Survivability ATech*	-	1.900	1.254	3.000	-	3.000	-	-	-	-	-	-
BN7: *Weapons Components Adv Technology (CA)*	-	21.500	119.500	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Work in this PE matures demonstrates technology in support of Army Modernization Priority Air and Missile Defense by maturating, demonstrating and conducting system level experimentation for the development of advanced air defense technologies that reduce the cost curve of missile defense, restore overmatch, survive volley-fire attacks, and operate within sophisticated Anti-Access/Area Denial (A2/AD) and contested domains.

Work in this PE complements PE 0602150A (Air and Missile Defense Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy. All FY 2020 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

Work is performed by the U.S. Army Futures Command (AFC), the United States Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT), and the Engineer Research and Development Center (ERDC), and the United States Army Rapid Capabilities and Critical Technologies Office (RCCTO).

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603466A *I Air and Missile Defense Advanced Technology*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	82.113	58.130	53.396	-	53.396
Current President's Budget	79.817	175.703	48.826	-	48.826
Total Adjustments	-2.296	117.573	-4.570	-	-4.570
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	21.500	119.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-21.500	-			
• SBIR/STTR Transfer	-2.296	-1.927			
• Adjustments to Budget Years	-	-	-4.570	-	-4.570

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: BN7: *Weapons Components Adv Technology (CA)*		
Congressional Add: *Advanced Explosion Resistant Window Systems*	2.000	-
Congressional Add: *Silicon Carbide Power Electronics Packaging*	2.500	8.000
Congressional Add: *Enterprise Science and Technology Demonstration Prototyping*	7.000	7.000
Congressional Add: *High-Energy Laser Development for All-Terrain Vehicles*	10.000	-
Congressional Add: *Program increase*	-	20.000
Congressional Add: *Program increase - cUAS integration with robotic vehicles*	-	5.000
Congressional Add: *Program increase - thermal management system for high energy laser*	-	7.500
Congressional Add: *Program increase - HEL risk reduction*	-	50.000
Congressional Add: *Program increase - HEL system characterization lab*	-	22.000
Congressional Add Subtotals for Project: BN7	21.500	119.500
Congressional Add Totals for all Projects	21.500	119.500

Change Summary Explanation

FY21 increase due to congressional adds of $21.500 Million

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AC8 / *Low Cost Extended Range Air Defense Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AC8: *Low Cost Extended Range Air Defense Adv Tech*	-	20.184	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2021 this project is realigned to :
PE 0603466A (Air and Missile Defense Advanced Technology)
* Project AD4 (Maneuver Air Defense Advanced Technology)

A. Mission Description and Budget Item Justification

This Project directly supports Army Modernization Priority Air and Missile Defense capabilities. Matures and demonstrates key missile technologies for a lower-cost interceptor system to address advanced air defense threats such as medium to large unmanned aerial systems (UAS) and sub-sonic cruise missile systems.

Work in this Project complements missile Applied Research efforts within PE 0602150A (Air and Missile Defense Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy. All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

Work in this Project is performed by the United States (U.S.) Army Futures Command (AFC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Low Cost Extended Range Air Defense (LowER AD) Advanced Technology	20.184	-	-
Description: Mature and demonstrate key missile technologies for a lower-cost interceptor system to address advanced air defense threats such as medium to large unmanned aerial systems (UAS) and sub-sonic cruise missile systems			
Accomplishments/Planned Programs Subtotals	20.184	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AD1 / *High Energy Laser Tactical Vehicle Demo Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AD1: *High Energy Laser Tactical Vehicle Demo Adv Tech*	-	28.822	26.247	26.089	-	26.089	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project matures and demonstrates a greater than 100 kW-class mobile high energy laser (HEL) weapon system on a tactical platform to protect fixed and semi-fixed sites from rocket, artillery and mortar (RAM), unmanned aerial system (UAS), and advanced air defense threats. The major effort under this Project is the phased approach for mobile high power solid state laser (SSL) technology demonstrations that are traceable to the form, fit, and function requirements for a HEL weapon. This effort utilizes open systems architecture to ensure growth, interoperability, and opportunity for technology insertions for maturation of laser, beam control, sensor/radar, integration of power and thermal management subsystems, as well as Battle Management Command, Control, and Computers (BMC3).

Work in this Project complements PE 0602150A (Air and Missile Defense Technology)/ Project AC9 (High Energy Laser Tactical Vehicle Demonstrator Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, and the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

Work is performed by the United States (US) Army Rapid Capabilities and Critical Technologies Office (RCCTO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: High Energy Laser Tactical Vehicle Demonstrator (HEL TVD) Advanced Technology	28.822	26.247	26.089
Description: This effort integrates and demonstrates HEL technologies on an Army tactical platform for transition to the future Indirect Fire Protection Capability Increment 2-Intercept Program of Record. Effort includes integrating technologies developed under PE 0602307A/AC9 into HEL TVD and demonstrating the system against an array of RAM and UAS targets. Technology and knowledge gained from demonstration will be used to inform prototyping decisions by Army Rapid Capabilities and Critical Technologies Office and future material development decisions by Program Executive Office Missiles and Space.			
FY 2021 Plans: Begins integration and checkout of the HEL TVD subsystems. Integrates the electrical and thermal management subsystems into the HEL TVD platform. Begins integration of system software in preparation for FY22 HEL TVD demonstration.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** AD1 / *High Energy Laser Tactical Vehicle Demo Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will demonstrate a HEL-TVD system integration and a laboratory demonstration of a greater than 100kW laser weapon system for transition to the future Indirect Fire Protection Capability Program of Record. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding change reflects planned lifecycle of this effort.			
Accomplishments/Planned Programs Subtotals	28.822	26.247	26.089

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AD4 / *Maneuver Air Defense Advanced Technology*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AD4: *Maneuver Air Defense Advanced Technology*	-	-	19.396	19.737	-	19.737	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2021 (FY21) this Project was realigned from:
Program Element (PE) 0603466A Air and Missile Defense Advanced Technology
* Project AC8 Low Cost Extended Range Air Defense Adv Tech

A. Mission Description and Budget Item Justification

This Project directly supports Army Modernization Priority Air and Missile Defense capabilities. Matures and demonstrates key missile technologies for an affordable short range interceptor to defeat advanced Maneuver-Short Range Air Defense (M-SHORAD) threats (e.g. Rotary Wing, Fixed Wing, Tactical / Lethal Unmanned Aerial Systems, and Subsonic Cruise Missile.

Work in this Project complements PE 0602150A (Air and Missile Defense Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy. All FY20 adjustments align program financial structure to Army Modernization Priorities in support of the National Defense Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Maneuver Air Defense Advanced Technology	-	19.396	19.737
Description: Mature and demonstrate missile technologies and components necessary for an affordable short range air defense interceptor capability to defeat Rotary Wing, Fixed Wing, Tactical / Lethal Unmanned Aerial System, and cruise missile threats.			
FY 2021 Plans: Integrate a Guidance Electronics Unit (GEU) for missile hardware-in-the-loop (HWIL) maturation prior to integration with a testbed missile. Integrate GEU with a radome, airframe, motor, control actuation system for flight testing and demonstration.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** AD4 / *Maneuver Air Defense Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will continue integration of an interceptor Control Test Vehicle (CTV), then will conduct a CTV flight test to demonstrate expected control, navigation, and mid-course guidance performance; will complete Guidance Test Vehicle (GTV) Integration in a dynamic HWIL environment to verify performance of all major GEU and control subsystems prior to GTV flight test ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding change reflects planned lifecycle of this effort.			
Accomplishments/Planned Programs Subtotals	-	19.396	19.737

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AD6 / *Next Generation Fires Radar Advanced Technology*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AD6: *Next Generation Fires Radar Advanced Technology*	-	7.411	6.899	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Army Modernization Priority Air and Missile Defense capabilities by demonstrating scalable radar open systems architecture software allowing the insertion of modular software components.

Work in this Project complements PE 0602150A (Air and Missile Defense Technology)/ Project AD5 (Next Generation Fires Radar Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States Army Futures Command (AFC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Next Generation Fires Radar Advanced Technology	7.411	6.899	-
Description: This effort matures and demonstrates the architectures, processing and components necessary to deliver next generation capability, flexibility and supportability to the fires family of radar systems. Efforts focus on development of a modular and scalable open architecture that is extensible to multiple radar systems technologies in support of air defense and fixed- and semi-fixed site protection.			
FY 2021 Plans: Mature and demonstrate the complete Fires Radar Open System Technology architecture and back-end processing on the Full Digital Array Radar Testbed and other front end antenna configurations, as available, to verify scalability and modularity; complete the Mode Development Kit (MDK) to improve the performance and optimize the multi-mission capability of next generation Fires radar system; conduct final demonstrations of Fires radar technologies that will provide multi-mode and multi-mission capabilities relevant to current and future radar systems.			
FY 2021 to FY 2022 Increase/Decrease Statement: Funding is realigned to 0602141/CG4 Advanced Radar Concepts and Technologies.			
Accomplishments/Planned Programs Subtotals	7.411	6.899	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** AD6 / *Next Generation Fires Radar Advanced Technology*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AE1 / *Close Combat High Energy Laser Advanced Technology*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AE1: *Close Combat High Energy Laser Advanced Technology*	-	-	2.407	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort has concluded. There is no funding request for Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

This funding matures and demonstrates technologies for compact, highly efficient lasers, and compact beam control for close-combat platforms. This project investigates and develops advanced technologies for High Energy Laser (HEL) weapon systems to enable more efficient laser systems with greater power output, which in-turn enables laser weapons on smaller platforms for additional missions. This includes technologies to support development of alternate laser sources, precision optical pointing and tracking components, adaptive optics to overcome laser degradation due to atmospheric effects, more compact and lighter weight energy generation and storage devices, and more efficient thermal management systems to remove excess heat.

Work in this Project complements PE 0602150A (Air and Missile Defense Technology)/ Project AD9 (Close Combat High Energy Laser Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas, and the Army Modernization Strategy, and supports the Army's future capability opportunities for leap-ahead technology for directed energy.

Work is performed by the United States (US) Army Rapid Capabilities and Critical Technologies Office (RCCTO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Close Combat High Energy Laser Advanced Technology	-	2.407	-
Description: This effort develops laser and beam control technologies with extremely low size, weight, and power (SWaP) requirements enabling high energy lasers in smaller, close combat platforms. Extremely low SWaP laser systems will expand the laser weapons mission set. Reduction in SWaP also benefits higher power systems on the large tactical vehicles to counter the current threat set as well as laser-hardened threats more quickly or at longer ranges.			
FY 2021 Plans: Continued developing and validating laser and beam control technologies with extremely low SWaP to integrate on a risk reduction platform. Performed systems engineering analyses, including beam director, environmental, and laser power trade			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** AE1 / *Close Combat High Energy Laser Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
studies; conducted modeling and simulation to inform system performance objectives; performed HEL lethality effectiveness analysis and static and live-fire testing against designated threats and/or targets. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** This effort has concluded.			
Accomplishments/Planned Programs Subtotals	-	2.407	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*	Project (Number/Name) AE3 / *Unconventional Countermeasures-Survivability ATech*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
AE3: *Unconventional Countermeasures-Survivability ATech*	-	1.900	1.254	3.000	-	3.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2021, efforts in Applications of Environmentally-Inspired Unconventional Countermeasures are realigned from:
PE 0603119A (Ground Advanced Technology)
* Project BM1 (Protection from Advanced Weapon Affects Advanced Technology)

A. Mission Description and Budget Item Justification

This Project matures and demonstrates technologies to increase survivability of personnel and critical assets using integrated unconventional countermeasures. These countermeasures include tonedown concepts for signature management using novel materials, rapidly deployable, low-cost, multisprectral survivability enhancement technologies as well as intuitive decision support technologies to select and assess non-kinetic protective measures.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is conducted by the United States (U.S.) Army Engineer Research and Development Center and coordinated with U.S. Army Futures Command.

Work in this Project complements PE 0602150A (Air and Missile Defense Technology) / Project AE2 (Unconventional Countermeasures-Survivability Tech).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Development of Unconventional Countermeasures for Enhanced Survivability (DeUCES) Demonstrations	1.900	0.970	2.757
Description: This effort matures and demonstrates countermeasures to detect and defeat near-peer advanced weapons through computational simulations and physical countermeasures and enhanced tonedown measures.			
FY 2021 Plans: Mature and demonstrate integrated unconventional countermeasure protection for fixed and semi-fixed Air and Missile Defense assets.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** AE3 / *Unconventional Countermeasures-Survivability ATech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will demonstrate integrated unconventional countermeasure solutions and optimize their design and employment in fixed and semi-fixed Air and Missile Defense assets, and will document best practices for employment. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase in FY22 supports demonstration of and optimization efforts for unconventional countermeasure solutions.			
Title: Applications of Environmentally-Inspired Unconventional Countermeasures ***Description:*** This effort matures and demonstrates rapidly-deployable, eco-friendly materials with spectral signatures that alter or obscure underlying target spectral signatures. ***FY 2021 Plans:*** Mature and demonstrate a robust countermeasure spectral feature selection to detect and compare spectral vegetation ranges essential for the performance of unconventional countermeasures. ***FY 2022 Plans:*** Will use modeling and simulation tools to optimize countermeasure spectral feature selection matching for specific operating environments. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease in FY22 reflects planned lifecycle for this effort, ending in FY22.	-	0.284	0.243
Accomplishments/Planned Programs Subtotals	1.900	1.254	3.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603466A / *Air and Missile Defense Advanced Technology*				Project (Number/Name) BN7 / *Weapons Components Adv Technology (CA)*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
BN7: *Weapons Components Adv Technology (CA)*	-	21.500	119.500	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Congressional Interest Item funding provided for Weapons Components Advanced Technology.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for Weapons Components Advanced Technology.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: Advanced Explosion Resistant Window Systems ***FY 2020 Accomplishments:*** Program Increase supported advanced research on Advanced Explosion Resistant Window Systems. Work executed under the direction of the Army Futures Command.	2.000	-
Congressional Add: Silicon Carbide Power Electronics Packaging ***FY 2020 Accomplishments:*** Program Increase supported advanced research on Silicon Carbide Power Electronics Packaging. Work executed under the direction of the Army Futures Command. ***FY 2021 Plans:*** Program Increase supports advanced research on Silicon Carbide Power Electronics Packaging. Work executed under the direction of the Army Futures Command.	2.500	8.000
Congressional Add: Enterprise Science and Technology Demonstration Prototyping ***FY 2020 Accomplishments:*** Program Increase supported advanced research on Enterprise Science and Technology Demonstration Prototyping.	7.000	7.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** BN7 / *Weapons Components Adv Technology (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Work executed under the direction of the Army Futures Command. ***FY 2021 Plans:*** Program Increase supports advanced research on Enterprise Science and Technology Demonstration Prototyping. Work executed under the direction of the Army Futures Command.		
Congressional Add: High-Energy Laser Development for All-Terrain Vehicles ***FY 2020 Accomplishments:*** Program Increase supported advanced research on High-Energy Laser Development for All-Terrain Vehicles. Work executed under the direction of the Army Futures Command.	10.000	-
Congressional Add: Program increase ***FY 2021 Plans:*** Program increase supporting advanced technology development of High Energy Laser Systems. This effort performs research and development on advanced weapons technology leading to a high energy laser system for vehicles supporting Army Brigade and below operations. It further addresses Size, Weight, and Power/Cost (SWaP-C) and target requirements for enhanced capabilities of current directed energy prototyping efforts. The effort builds upon the advanced laser technologies being developed and integrated on larger vehicles. Work executed by the Rapid Capabilities and Critical Technologies Office under the direction of Army Futures Command.	-	20.000
Congressional Add: Program increase - cUAS integration with robotic vehicles ***FY 2021 Plans:*** Program increase supporting advanced technology development of Counter-Small Unmanned Aerial Systems Integration with Robotic Vehicles. This effort supports the integration of proven Commercial-Off-The-Shelf (COTS) technologies to provide a modular multi-mission capability to include surveillance (with small Unmanned Aerial Systems (sUAS) detection), Counter-sUAS (C-sUAS) electronic warfare & other hard kill capabilities including High Energy Laser (HEL).	-	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** BN7 / *Weapons Components Adv Technology (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
This effort will produce a single integrated prototype system delivered and demonstrated in support of an initial demonstration. Work executed by the Rapid Capabilities and Critical Technologies Office under the direction of Army Futures Command.		
Congressional Add: Program increase - thermal management system for high energy laser ***FY 2021 Plans:*** Program increase supporting advanced technology development of thermal management systems for high energy lasers. This effort will improve laser diode fiber amplifier cooling with smaller, lighter and more energy efficient thermal management technology. Recent developments in parallel Army programs has proven that novel phase change materials, coordinative complex compound sorption technology, and integrated combinations with vector-drive vapor compression technology, can dramatically reduce size, weight and power (SWaP) of directed energy weapons systems. Work executed by the Rapid Capabilities and Critical Technologies Office under the direction of Army Futures Command.	-	7.500
Congressional Add: Program increase - HEL risk reduction ***FY 2021 Plans:*** Program increase supporting advanced technology development of High Energy Laser Risk Reduction. The Indirect Fire Protection Capability-High Energy Laser (IFPC-HEL) pre-prototype demonstrator proves out a 300 kW HEL system in a laboratory by the end of FY22. This effort accelerates subsystem development and integration of HEL, Beam Control System (BCS), Beam Director Assembly (BDA), and power and thermal technologies. Integration of these subsystems into an enclosure and onto the platform for range / field demonstrations. Enable final verification of the system against its defined threat portfolio, and provide a potential path forward for follow-on prototype systems delivery to the Warfighter as residual combat capability. Work executed by the Rapid Capabilities and Critical Technologies Office under the direction of Army Futures Command.	-	50.000
Congressional Add: Program increase - HEL system characterization lab	-	22.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603466A / *Air and Missile Defense Advanced Technology*	**Project (Number/Name)** BN7 / *Weapons Components Adv Technology (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
FY 2021 Plans: Program increase supporting advanced technology development of high energy laser systems characterization lab. This effort will develop the equipment and instrumentation for a directed energy Systems Characterization Lab (SCL), integrate SCL equipment within High Energy Laser (HEL) lab, and create a capability for government validation of Science & Technology (S&T) performance and testing of HEL prototypes and weapons. Additionally, develop government owned surrogate HEL weapon subsystem performance evaluation frameworks necessary for the stimulation, test, and assessment of new HEL components and subsystems. Finally, this effort will develop laboratory instrumentation to measure HEL Weapon Systems, components, or subsystems. Work executed by the Rapid Capabilities and Critical Technologies Office under the direction of Army Futures Command.		
Congressional Adds Subtotals	21.500	119.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A