Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603464A / *Long Range Precision Fires 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	-	196.393	177.142	93.909	-	93.909	-	-	-	-	-	-
AE6: *Strategic Long Range Cannon Advanced Technology*	-	73.832	-	-	-	-	-	-	-	-	-	-
AE8: *Land-Based Anti-Ship Missile (LBASM) Advanced Tech*	-	20.664	9.690	15.698	-	15.698	-	-	-	-	-	-
AE9: *Low-Cost Tact Ext Range Missile (LC-TERM) Adv Tech*	-	13.567	9.710	-	-	-	-	-	-	-	-	-
AF4: *Missile Simulation Advanced Technology*	-	0.262	-	-	-	-	-	-	-	-	-	-
AG3: *Extended Range Cannon Artillery (ERCA) Adv Tech*	-	19.170	17.760	3.117	-	3.117	-	-	-	-	-	-
AG5: *Extended Range Artillery Munition Suite Adv Tech*	-	34.135	48.822	33.828	-	33.828	-	-	-	-	-	-
AG7: *Energetic Materials and Adv Processing Adv Tech*	-	1.956	2.061	2.096	-	2.096	-	-	-	-	-	-
AH3: *Single Multi-mission Attack Missile Adv Tech*	-	5.449	-	-	-	-	-	-	-	-	-	-
BO8: *Long Range Precision Fires Advanced Tech (CA)*	-	15.000	60.000	-	-	-	-	-	-	-	-	-
BS3: *Strategic Missile Advanced Technology*	-	12.358	-	-	-	-	-	-	-	-	-	-
BY2: *Advanced Hypersonic Technology*	-	-	29.099	39.170	-	39.170	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This PE matures and demonstrates Long Range Precision Fires (LRPF) technologies to destroy, neutralize, or suppress the enemy by cannon artillery and missile fire and enable integration of fire support assets into combined arms operations. Major Focus Areas for LRPF Science and Technology include: Missiles, Cannon Artillery, and Supporting LRPF Technologies covering Strategic, Operational and Tactical Lines of Effort. LRPF Missiles Advanced Development matures and demonstrates a broad range of Missile technologies to enhance Army integrated LRPF capabilities at extended range. Cannon Artillery Advanced Development matures and demonstrates critical technologies to increase range, precision, and both point and area effects for cannon artillery. Supporting LRPF Technologies Advanced

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 0603464A *I Long Range Precision Fires Advanced Technology*

Development matures and demonstrates a broad range of component technologies to address weapon cost drivers and enhance performance of future LRPF munitions and systems.

Work in this PE complements PE 0602147A Long Range Precision Fires 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 is performed by the United States Army Futures Command (AFC).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	189.386	121.060	86.534	-	86.534
Current President's Budget	196.393	177.142	93.909	-	93.909
Total Adjustments	7.007	56.082	7.375	-	7.375
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	15.000	60.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.819	-			
• SBIR/STTR Transfer	-7.174	-3.918			
• Adjustments to Budget Years	-	-	7.375	-	7.375

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: BO8: *Long Range Precision Fires Advanced Tech (CA)*		
Congressional Add: *High Energy Laser Development*	5.000	-
Congressional Add: *Missile Rapid Demonstration Capability*	10.000	25.000
Congressional Add: *Program increase - composite cannon tubes*	-	5.000
Congressional Add: *Program increase - hypervelocity projectile extended range*	-	20.000
Congressional Add: *Program increase: Tactical intercepting vehicle for access*	-	10.000
Congressional Add Subtotals for Project: BO8	15.000	60.000
Congressional Add Totals for all Projects	15.000	60.000

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AE6 / *Strategic Long Range Cannon 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
AE6: *Strategic Long Range Cannon Advanced Technology*	-	73.832	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by maturing and demonstrating technologies for a long range cannon capability to deliver lethal effects at strategic ranges while providing lethality overmatch.

Work in this Project complements PE 0604115A Technology Maturation Initiatives / Project AY6 Strategic Long Range Cannon.

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).

Project AE6 is being eliminated in FY 2021.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Strategic Long Range Cannon Advanced Technology ***Description:*** This effort will mature and demonstrate subsystem technologies to further enhance range, lethality, and precision enablers for extended range cannon and munition systems.	73.832	-	-
Accomplishments/Planned Programs Subtotals	73.832	-	-

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AE8 / *Land-Based Anti-Ship Missile (LBASM) Advanced 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
AE8: *Land-Based Anti-Ship Missile (LBASM) Advanced Tech*	-	20.664	9.690	15.698	-	15.698	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by maturing and demonstrating critical technologies to detect, engage, and defeat moving land or maritime surface targets under all conditions.

Work in this Project complements PE 0602147A Long Range Precision Fires 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: Land Based Anti-Ship Missile (LBASM) Advanced Technology	20.664	9.690	15.698
Description: Matures and demonstrates technologies that enable high-mobility artillery rocket system (HIMARS) and multiple-launch rocket system (MLRS) rocket/missile artillery systems to destroy enemy air defenses in the land and the maritime domains. ***FY 2021 Plans:*** Mature and demonstrate multi-mode seeker technologies in a surrogate missile system to obtain real world effect on seeker performance; analyze and exploit the data obtained through flight testing to optimize tracking, identification and aim-point algorithms; conduct system level performance testing through hardware-in-the-loop and system captive carry to improve the performance and precision of the sensor suite. ***FY 2022 Plans:*** Will complete demonstrations of multi-mode seeker technologies in a surrogate missile system to obtain real world effect on seeker performance; complete analysis flight testing data and optimization of tracking, identification and aim-point algorithms; and begin maturation and integration of seeker technologies into the Precision Strike Missile. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase in FY 2022 will support increased effort to perform additional demonstrations, flight testing and data analysis.			
Accomplishments/Planned Programs Subtotals	20.664	9.690	15.698

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AE8 / *Land-Based Anti-Ship Missile (LBASM) Advanced Tech*

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AE9 / *Low-Cost Tact Ext Range Missile (LC-TERM) 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
AE9: *Low-Cost Tact Ext Range Missile (LC-TERM) Adv Tech*	-	13.567	9.710	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Effort completed in Fiscal Year (FY) 2021. No funding request for FY 2022.

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires (LRPF) Modernization Priority capabilities by maturing and demonstrating propulsion technologies that enables extended range target engagements and navigation component technologies that reduce dependence on Global Positioning System (GPS) for precision effects. Additionally, technology development will support LRPF capabilities by investigating and developing critical technologies for the delivery of dedicated organic intelligence, surveillance and reconnaissance (ISR) payloads and attack capabilities via long range missiles. These long range missile delivered payloads will provide ISR that will be able to provide targetable data for area and point targets, and attack platforms for targets of opportunity.

Work in this Project complements PE 0602147A Long Range Precision Fires 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: Low-Cost Tactical Extended Range Missile (LC-TERM) Advanced Technology	13.567	9.710	-
Description: Mature and demonstrate propulsion technologies that enables extended range target engagement and navigation component technologies that reduce dependence on GPS for precision.			
FY 2021 Plans: Complete demonstrations of integrated enhanced long range fires navigation technologies to verify reduced dependence on GPS for precision effects, which include improved inertial, anti-jam, and complementary navigation technologies; demonstrate with static motor testing high temperature fiber, resin, optimized case insulation, nozzle, and structures propulsion component technologies to verify increased mass fraction, energy output, and range in the same form factor.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AE9 / *Low-Cost Tact Ext Range Missile (LC-TERM) Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Effort completes in FY 2021.			
Accomplishments/Planned Programs Subtotals	13.567	9.710	-

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AF4 / *Missile Simulation 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
AF4: *Missile Simulation Advanced Technology*	-	0.262	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2021 this Project was realigned to:
PE 0602147A (Long Range Precision Fires Technology)
* Project AF8 (Affordable Extended Range Precision Technology)

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by maturing and demonstrating enhanced analysis and high fidelity modeling and simulation technologies for advanced missiles and interceptor design and analysis.

Work in this Project complements PE 0602147A Long Range Precision Fires 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: Missile Simulation Advanced Technology	0.262	-	-
Description: Mature and demonstrate enhanced analysis and high fidelity modeling and simulation technologies for advanced missiles and interceptor design and analysis.			
Accomplishments/Planned Programs Subtotals	0.262	-	-

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AG3 / *Extended Range Cannon Artillery (ERCA) 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
AG3: *Extended Range Cannon Artillery (ERCA) Adv Tech*	-	19.170	17.760	3.117	-	3.117	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities. This effort matures and demonstrates artillery technologies including light weight cannon and mount structures, high efficiency recoil cylinders, common lower power fire control hardware, improved fire control software, and improved sensor to shooter communications which will increase range and accuracy without an increase in platform weight. This effort also develops a collaborative environment with analytic capabilities to support Fires and Intel Soldiers.

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: Extended Range Cannon Artillery Advanced Technology	19.170	14.754	-
Description: This effort matures and demonstrates extended range Armament technologies including Cannons and Gun Mounts, novel integration for automation, improved fire control, ammunition handling, and improved sensor to shooter communications which will maximize range increases and enable increase precision with next generation munition and target acquisition technology. ***FY 2021 Plans:*** Continue maturation of integrated automation technologies for the ammunition handling and weapon control components; optimize cannon, mount, and weapon system components to maximize weight reduction, optimize cannon/projectile interfaces, as well as ancillary components for automation; demonstrate automated ammunition handling at high rates of fire; demonstrate initial prototype of advanced precision technologies integrated in artillery fire control sensors and systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Completed of demonstration of initial prototype of automated ammo handling and fire control systems.			
Title: Synchronized High Op-Tempo (SHOT) Targeting for LRPF	-	3.006	3.117

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AG3 / *Extended Range Cannon Artillery (ERCA) Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: This effort develops a collaborative environment with analytic capabilities to support Fires and Intel Soldiers in organizing planning products, and analytics that automate data discovery and development of targets and streamlining workflows that support Course of Action development. ***FY 2021 Plans:*** Mature and demonstrate initial multiple intelligence (multi-INT) algorithms capable of facilitating timely creation of intelligence to support long range fires missions. Demonstrate system platforms capable of managing cross-domain, multi-INT, multi-platform data flows, and evaluate on the basis of speed, accuracy, and data integrity. ***FY 2022 Plans:*** Will continue maturation of multi-INT intelligence algorithms capable of facilitating timely creation of intelligence to support long range fires missions. Will integrate with Fires Systems and aggregation with Advanced Field Artillery Tactical Data System (AFATDS) minimum data for effects. Will align to Program of Record (POR) data fabric concepts to automate aggregation of all relevant data necessary to identify target and present actionable fires options. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding change reflects the planned lifecycle of this effort.			
Accomplishments/Planned Programs Subtotals	19.170	17.760	3.117

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AG5 / *Extended Range Artillery Munition Suite 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
AG5: *Extended Range Artillery Munition Suite Adv Tech*	-	34.135	48.822	33.828	-	33.828	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities. This effort matures and demonstrates extended range artillery technologies including advanced projectile propulsion and guidance technologies to increase range and accuracy.

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: Extended Range Artillery Munition Suite Advanced Technology	34.135	48.822	33.828
Description: Matures and optimizes long range unitary artillery projectile systems in the areas of range, precision, counter-measure, and payload technologies. ***FY 2021 Plans:*** Matured long range unitary artillery projectile systems to validate system modeling and simulation to optimize configurations of projectile technologies for increased performance; demonstrate integrated concepts of Extended Range Artillery Projectiles (e.g. XM1155) including improved algorithms, increased range, sensor optimization and integration; further optimize extended range cargo munitions for advanced area effects munition compatible with current and future artillery systems in the following areas: 1) dispensing techniques and sensor optimization for improved area effects; 2) formulations and characteristics for smoke and illumination payloads; and 3) survivability of cannon-launched terrain shaping munition. Perform demonstration to validate key enabling component technologies. ***FY 2022 Plans:*** Will mature and demonstrate long-range unitary artillery projectile systems to validate system M&S, architectures, and component capabilities. Will optimize configurations of projectile concepts to obtain increased performance; will continue to demonstrate integrated concepts for extended range artillery projectiles including: improved guidance algorithms, increased range, sensor optimization and integration. Will improve performance of extended range airframes designs for conventional and cargo munitions for advanced effects compatible with current and future artillery systems. Will continue to mature potential payload			

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AG5 / *Extended Range Artillery Munition Suite Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
configurations for extended range airframe delivered effects that include: dispensing techniques, potential payloads and sub-munition survivability. Will validate post gun launch propulsion range extension technologies. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease in accordance with project plan to demonstrate a unitary warhead Extended Range Artillery Projectile.			
Accomplishments/Planned Programs Subtotals	34.135	48.822	33.828

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AG7 / *Energetic Materials and Adv Processing 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
AG7: *Energetic Materials and Adv Processing Adv Tech*	-	1.956	2.061	2.096	-	2.096	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities. This effort matures and demonstrates the performance of energetic materials ranging from medium caliber through large caliber weapons.

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: Scale-up of Insensitive Energetic Materials	1.956	2.061	2.096
Description: This effort matures and demonstrates the performance and insensitivity of energetic materials ranging from 25mm medium caliber (direct fire) through 155mm large caliber (indirect fire) weapons. ***FY 2021 Plans:*** Continue to demonstrate and qualify energetic materials for complete material characterization; demonstrate developed high-energy explosive and propellant formulations in representative applications; mature and optimize advanced processing methods for increased scale and higher throughput of energetic ingredients and formulations. ***FY 2022 Plans:*** Will demonstrate advanced processing methods for increased scale and higher throughput of energetic ingredients and formulations; will demonstrate scale-up of energetic materials and advanced processing methods. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding change reflects planned lifecycle of this effort.			
Accomplishments/Planned Programs Subtotals	1.956	2.061	2.096

C. Other Program Funding Summary ($ in Millions)

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AG7 / *Energetic Materials and Adv Processing Adv Tech*

C. Other Program Funding Summary ($ in Millions)

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) AH3 / *Single Multi-mission Attack Missile 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
AH3: *Single Multi-mission Attack Missile Adv Tech*	-	5.449	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2020 (FY20) this Project was realigned from:
Program Element (PE) 0603313A Missile and Rocket Advanced Technology
* Project 263 Future Msl Tech Integr

In Fiscal Year 2021 (FY21) this Project is realigned to
PE 0603465A Future Vertical Lift Advanced Technology
* Project AK5 Multi-Role Small Guided Missile Advanced Tech

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities. Matures and demonstrate technologies for an expeditionary short-to-medium range loitering missile with man-in-the-loop capability for situational awareness, targeting, and lethal effects against hard and soft targets.

Work in this Project complements PE 0602147A Long Range Precision Fires Technology and PE 0603465A Future Vertical Lift 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.

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: Single Multi-mission Attack Missile (SMAM) Advanced Technology	5.449	-	-
Description: Matures and demonstrate technologies for an expeditionary short-to- medium range loitering missile with man-in-the-loop capability for situational awareness, targeting, and lethal effects against hard and soft targets.			
Accomplishments/Planned Programs Subtotals	5.449	-	-

C. Other Program Funding Summary ($ in Millions)

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** AH3 / *Single Multi-mission Attack Missile Adv Tech*

C. Other Program Funding Summary ($ in Millions)

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) BO8 / *Long Range Precision Fires Advanced Tech (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
BO8: *Long Range Precision Fires Advanced Tech (CA)*	-	15.000	60.000	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Congressional Interest Item funding provided for Long Range Precision Advanced Technology.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for Long Range Precision 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: High Energy Laser Development ***FY 2020 Accomplishments:*** Program Increase supported advanced research on High Energy Laser Development. Work executed under the direction of the Army Futures Command.	5.000	-
Congressional Add: Missile Rapid Demonstration Capability ***FY 2020 Accomplishments:*** Program Increase supported advanced research on Missile Rapid Demonstration Capability. Work executed under the direction of the Army Futures Command. ***FY 2021 Plans:*** Conduct advanced research in Missile Rapid Demonstration Capability. Work executed by Army Futures Command.	10.000	25.000
Congressional Add: Program increase - composite cannon tubes ***FY 2021 Plans:*** Conduct advanced research in Composite Cannon Tubes.	-	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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** BO8 / *Long Range Precision Fires Advanced Tech (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Work executed by Army Futures Command.		
Congressional Add: Program increase - hypervelocity projectile extended range ***FY 2021 Plans:*** Conduct advanced research in Hypervelocity Projectile Extended Range. Work executed by Army Futures Command.	-	20.000
Congressional Add: Program increase: Tactical intercepting vehicle for access ***FY 2021 Plans:*** Conduct advanced research in Tactical Intercepting Vehicle for Access. Work executed by Army Futures Command.	-	10.000
Congressional Adds Subtotals	15.000	60.000

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) BS3 / *Strategic Missile 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
BS3: *Strategic Missile Advanced Technology*	-	12.358	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2021 this Project is realigned to:
PE 0603464A (Long Range Precision Fires Advanced Technology)
* Project BY2 (Advanced Hypersonic Technology)

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by developing and maturing critical technologies for ground-based strategic missiles. Technology development includes critical technologies to improve strategic missile components such as advanced structures and materials, thermal protection systems, guidance/seekers, navigation systems, electronic controls, improve/miniaturize avionics and automated fight termination systems.

Work in this Project complements PE 0602147 Long Range Precision Fires Technology.

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

Work in this Project is performed by the U.S. Army Futures Command (AFC) in coordination with the United States Army Rapid Capability and Critical Technologies Office (RCCTO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Strategic Missile Advanced Technology ***Description:*** This effort develops and matures critical technologies for ground-based strategic missiles.	12.358	-	-
Accomplishments/Planned Programs Subtotals	12.358	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** BS3 / *Strategic Missile Advanced Technology*

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 0603464A / *Long Range Precision Fires Advanced Technology*	Project (Number/Name) BY2 / *Advanced Hypersonic 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
BY2: *Advanced Hypersonic Technology*	-	-	29.099	39.170	-	39.170	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2021 (FY21) this Project is realigned from:
PE 0603464A Long Range Precision Fires Advanced Technology:
* Project BS3 Strategic Missile Advanced Technology

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by developing and maturing critical technologies for ground-based strategic missiles. Technology development includes critical technologies to improve strategic missile components such as advanced structures and materials, thermal protection systems, navigation systems, modeling and simulation tools for hypersonic flight regimes, and kill chain architectures.
Work in this Project complements PE 0602147 Long Range Precision Fires Technology.
The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the U.S. Army Futures Command (AFC) in coordination with the United States Army Rapid Capability and Critical Technologies Office (RCCTO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Hypersonics Advanced Technology	-	29.099	39.170
Description: This Project matures and demonstrates new subsystems and components of a hypersonic weapon delivery system to defeat Anti Access/Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/ time critical targets. The effort includes modeling and simulating interfaces, data formats and networks to simulate integration into existing Army command and control systems for a separate, future prototype hypersonic weapon system effort.			
FY 2021 Plans: Will begin modeling, simulation and demonstrating of system components of Long Range Hypersonic Weapon. Will begin simulation of integration of subsystems and component technologies to optimize hypersonic weapon system performance.			
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 0603464A / *Long Range Precision Fires Advanced Technology*	**Project (Number/Name)** BY2 / *Advanced Hypersonic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will optimize candidate materials and material processing techniques to support critical material decisions for hypersonic weapons application; will mature simulation tools for optimization of vehicle flight performance; will mature guidance, navigation and control (GN&C) technology to dramatically reduce reliance on GPS for navigation accuracy; will mature data links and advanced communication technologies that will provide in-flight communication with the weapon system to hold multiple targets at risk; and will mature seeker / terminal sensor technologies that will allow engagement with moving or relocated targets. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The funding increase is to expand the capability to mature in-flight communications / data link capabilities and terminal sensor / seeker capabilities for incorporation into the Common Hypersonic Glide Body (CHGB) in Army LRHW Batteries 2 in FY25 and 3 in FY27, respectively. This is a critical technology that will allow LRHW to hold multiple targets at risk and support attack of moving maritime and/or ground targets.			
Accomplishments/Planned Programs Subtotals	-	29.099	39.170

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A