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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607145A / <i>Apache Future Development</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	0.000	5.448	77.177	-	77.177	9.024	11.595	10.485	0.000	0.000	113.729
FD5: <i>Apache Product Improvement</i>	-	0.000	5.448	77.177	-	77.177	9.024	11.595	10.485	0.000	0.000	113.729

A. Mission Description and Budget Item Justification

The Apache Capabilities Enhancements (ACE) prioritizes, informs, influences, matures, tracks, statuses, and packages technologies and/or material solutions to address known capability gaps, identified during real-world combat missions and associated with current/emerging threats; for transition to Apache development for integration and implementation to the AH-64E fleet to increase combat capability.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	0.000	5.448	7.252	-	7.252
Current President's Budget	0.000	5.448	77.177	-	77.177
Total Adjustments	0.000	0.000	69.925	-	69.925
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	69.925	-	69.925

Change Summary Explanation

Additional funding for Spike Non Line Of Sight (NLOS) missile system.

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Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607145A / Apache Future Development				Project (Number/Name) FD5 / Apache Product Improvement			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
FD5: Apache Product Improvement	-	0.000	5.448	77.177	-	77.177	9.024	11.595	10.485	0.000	0.000	113.729
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Apache Capabilities Enhancements (ACE) prioritizes, informs, influences, matures, tracks, statuses, and packages technologies and/or material solutions to address known capability gaps, identified during real-world combat missions and associated with current/emerging threats; for transition to Apache development for integration and implementation to the AH-64E fleet to increase combat capability.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Product Development	-	5.448	7.252	-	7.252
Description: Future development of production program.					
FY 2020 Plans: Performed trade studies evaluating options for pursuing a family, i.e. large, medium, small, of common processors that are software and unit-level re-configurable and exploring options for sensor processing and fusion at the platform level processor or other dedicated processor. The common processor trade study supported Apache's approach for addressing the increasing demand for processing power while reducing logistical impact from both a maintenance and supply perspective. The sensor processing and fusion at a platform level processor or other upstream dedicated processor trade study looked at identifying upstream processing options for providing an optimized situational awareness picture of the operational environment and supporting enhanced target/threat identification utilizing multiple sensor inputs.					
FY 2021 Base Plans: Apache Program management Office (PMO) needs to develop a phased approach to incorporate an Improved Tail Rotor Drive System (ITRDS) for the AH-64 platform. Several improvements to the existing drivetrain are necessary to increase safety margins on the tail rotor anti-torque capability. The platform overtime will continue to increase in gross weight through system upgrades and larger payloads being authorized. Missions being conducted at higher density altitudes and an increased gross weight will put the warfighters at risk of being in a loss of tail rotor authority scenario which can lead to a catastrophic situation. These product improvements would increase performance from the legacy design, decrease the maintenance burden on the warfighter, and reduce overall O&S costs. These improvements would also build the infrastructure for an improved Drive system					

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607145A / Apache Future Development	Project (Number/Name) FD5 / Apache Product Improvement

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
that will be able to handle increased performance upgrades, provide a positive impact to future sustainment, support Multi-Domain Operations, and ensuring the warfighter is not placed in a catastrophic situation when it is preventable. The funding would be utilized to conduct analysis, determine feasibility of life limits, and initiate redesign plans on new components of the drive system to include hanger bearings, elastomeric mounts, Intermediate Gearbox (IGB), Tail Rotor Gearbox (TRGB), drive shafts, and other components impacted on the Tail Rotor Drive System found during testing. FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funding request for Project FD5 Apache Product Improvement from FY 2020 to FY 2021.					
Title: Spike NLOS (Non Line Of Sight) FY 2021 Base Plans: Apache will Federate the Spike NLOS (Non Line Of Sight) missile system by providing Program Management, Systems Engineering, Development Test, Live Fire Test, Life Cycle Management and Integrated Logistics. This effort will support the AH-64D/E of an interim Long Range Precision Munition (LRPM) solution. The Army will optimize the Aviation munitions portfolio as part of this strategy creating reinvestment opportunities to close existing lethality gaps by making the portfolio sufficiently lethal for both manned and unmanned platforms against a broad range of increasingly more sophisticated threats. FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funding request for Project FD5 Apache Product Improvement from FY 2020 to FY 2021 to support Spike NLOS Directed Requirement.	-	-	69.925	-	69.925
Accomplishments/Planned Programs Subtotals	-	5.448	77.177	-	77.177

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• A05111: AH-64 Apache Block IIIA Reman	927.798	1,010.100	961.487	-	961.487	705.535	678.822	805.508	571.077	6,118.130	11,778.457
• A05133: AH-64 Apache Block IIIB New Build	510.414	-	0.000	69.154	69.154	-	-	-	-	Continuing	Continuing
• AA6605: AH-64 MODS	104.996	58.172	118.316	-	118.316	84.420	82.084	64.619	4.954	Continuing	Continuing

Remarks

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D. Acquisition Strategy

The NRE will encompass subsystem integration and will utilize existing test aircraft, incorporate the technical insertions, and initiate appropriate qualification and operational flight-testing. In FY 2014, a contract for Apache AH-64E Lot 3, initiating Full Rate Production, was awarded with options for Lot 4. Training device concurrency will be maintained with each technical insertion. The Engineering/Manufacturing Design (EMD) effort is managed as Cost Reimbursable. Production efforts will be awarded as Fixed Price Incentive (FPI) and include the Advance Procurement requirements. In FY 2013, FY 2014, and FY 2015 MRL NRE encompassed US Government (USG) design of the Hydra Launcher Electronics Assembly (LEA), modification of the M261 launcher, launcher fabrication, and launcher testing. In FY 2015 - FY 2019, Apache AH-64E Version 6 System Development and Demonstration (SDD) Contract. Multi-year production awarded March 15, 2017. FY 2020 - FY 2023, the Apache Capabilities Enhancements (ACE) delivers required capability enhancements supported by Apache's Modernization Strategy to ensure AH-64E maintains relevance and dominance throughout its expected service life.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607145A / Apache Future Development	Project (Number/Name) FD5 / Apache Product Improvement

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Contract Award																												
Contract Award for SPIKE NLOS																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contract Award	1	2020	3	2021
Contract Award for SPIKE NLOS	1	2021	4	2022