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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Army **Date:** April 2022

<b>Appropriation/Budget Activity</b>					<b>R-1 Program Element (Number/Name)</b>							
2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>					PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing
EX8: <i>Future Unmanned Aircraft System (FUAS)</i>	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Future Unmanned Aircraft System (FUAS) is a critical system in the Multi-Domain Operations (MDO) concept that will employ MDO capabilities at all echelons and allow ground based forces to project power from land into other domains to defeat highly capable enemies, secure terrain, and consolidate gains. FUAS encompasses an array of capabilities from platoon soldiers to Division Commanders. The Army Requirements Oversight Council (AROC) approved the FUAS Initial Capabilities Document (ICD) on 6 Mar 2019. The FUAS ICD includes requirements for Future Tactical UAS (FTUAS), Air Launched Effects (ALE), and Scalable Control Interface (SCI). Manned, optionally-manned, and unmanned systems will penetrate defense-in-depth environments by employing ALE with teaming and swarming effects to detect, decoy, jam radar and communications, conduct cyber-attack, spoof and jam Global Positioning System (GPS), and kinetic engagement.

The Future Vertical Lift Cross Functional Team (FVL CFT) FUAS line of effort is comprised of multiple components including the FTUAS for the Brigade Combat Team (BCT), and ALE. The FTUAS seeks to replace the RQ-7Bv2 Shadow assets within the BCTs. Key attributes of the FTUAS BCT focus on Rapid Deployability, Expeditionary Maneuver, and Mobility for adaptive and agile operations. FTUAS will consist of an aircraft subsystem that will include the airframe, propulsion, avionics, communications, navigation, and software systems; aircraft-specific ground support equipment including power generation, transportation, or command and control equipment; aircraft software; and required engineering, logistics, programmatic support.

ALE extends tactical and operational reach, lethality, and protection to the advanced team as an attritable or optionally recoverable aerial capability that detects, identifies, locates, and reports threats; represents a credible decoy; disrupts threat communication, targeting and acquisition systems; and delivers lethal and non-lethal effects against those threats across Multi-Domain Operations.

Justification: Fiscal Year (FY) 2023 FTUAS Research Development Technology & Evaluation (RDT&E) Base funding of \$95.719 million will be utilized for the following:

- 1) \$40.372 million to support FTUAS component development,
- 2) \$20.587 million to initiate FTUAS competitive prototyping and integration efforts,
- 3) \$30.477 million to support ALE Systems Integration,
- 4) \$4.283 million provides Systems Engineering and Program Management (SEPM) to support FTUAS

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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	57.083	69.697	0.000	-	0.000
Current President's Budget	59.183	76.349	95.719	-	95.719
Total Adjustments	2.100	6.652	95.719	-	95.719
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.348			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.100	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	95.719	-	95.719

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** EX8: *Future Unmanned Aircraft System (FUAS)*

Congressional Add: *Program Increase- Future Unmanned Aircraft Systems*

Congressional Add: *Program Increase- Micro-IFF for FTUAS*

Congressional Add Subtotals for Project: EX8

Congressional Add Totals for all Projects

	<b>FY 2021</b>	<b>FY 2022</b>
	-	15.000
	-	5.000
Congressional Add Subtotals for Project: EX8	-	20.000
Congressional Add Totals for all Projects	-	20.000

**Change Summary Explanation**

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>				<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EX8: <i>Future Unmanned Aircraft System (FUAS)</i>	-	59.183	76.349	95.719	-	95.719	40.344	42.796	61.568	31.094	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Future Unmanned Aircraft System (FUAS) is a critical system in the Multi-Domain Operations (MDO) concept that will employ MDO capabilities at all echelons and allow ground based forces to project power from land into other domains to defeat highly capable enemies, secure terrain, and consolidate gains. FUAS encompasses an array of capabilities from platoon soldiers to Division Commanders. The Army Requirements Oversight Council (AROC) approved the FUAS Initial Capabilities Document (ICD) on 6 Mar 2019. The FUAS ICD includes requirements for Future Tactical UAS (FTUAS), Air Launched Effects (ALE), and Scalable Control Interface (SCI). Manned, optionally-manned, and unmanned systems will penetrate defense-in-depth environments by employing ALE with teaming and swarming effects to detect, decoy, jam radar and communications, conduct cyber-attack, spoof and jam Global Positioning System (GPS), and kinetic engagement.

The Future Vertical Lift Cross Functional Team (FVL CFT) FUAS line of effort is comprised of multiple components including the FTUAS for the Brigade Combat Team (BCT), and ALE. The FTUAS seeks to replace the RQ-7Bv2 Shadow assets within the BCTs. Key attributes of the FTUAS BCT focus on Rapid Deployability, Expeditionary Maneuver, and Mobility for adaptive and agile operations. FTUAS will consist of an aircraft subsystem that will include the airframe, propulsion, avionics, communications, navigation, and software systems; aircraft-specific ground support equipment including power generation, transportation, or command and control equipment; aircraft software; and required engineering, logistics, programmatic support.

ALE extends tactical and operational reach, lethality, and protection to the advanced team as an attritable or optionally recoverable aerial capability that detects, identifies, locates, and reports threats; represents a credible decoy; disrupts threat communication, targeting and acquisition systems; and delivers lethal and non-lethal effects against those threats across Multi-Domain Operations.

Justification: Fiscal Year (FY) 2023 FTUAS Research Development Technology & Evaluation (RDT&E) Base funding of \$95.719 million will be utilized for the following:

- 1) \$60.959 million to support FTUAS component development and competitive prototyping and integration efforts,
- 2) \$30.477 million to support ALE Systems Integration,
- 3) \$4.283 million provides Systems Engineering and Program Management (SEPM) to support FTUAS

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> Air Launched Effects (ALE) Systems Analysis	22.100	20.000	30.477
<b>Description:</b> ALE Systems Analysis, Tech Maturation, and Integration in preparation for a Materiel Development Decision (MDD), and to inform requirements. The PM will conduct market research, systems engineering analyses and an assessment of how the			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army		<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<p>proposed candidate materiel solution approaches are technically feasible and have the potential to effectively address capability gaps, desired operational attributes, and associated external dependencies. This will be followed by System Integration of the Prototype ALE and integration of the system onto a host launch platform.</p> <p><b>FY 2022 Plans:</b> Continue to fund the ALE Prototype (Increment 1A) demonstrations, engineering analysis, prototyping and begin integration of proposed material solution approaches in support of host platform. Continue to support the development of the Modular Open Systems Architecture and SCI required for ALE.</p> <p><b>FY 2023 Plans:</b> Continue to fund the ALE Prototype (Increment 1A) demonstrations, engineering analysis, prototyping and continue integration of proposed material solution approaches in support of host platform integration. Fund integration of prototype ALE onto launch platform and fund required testing in support of platform integration. Continue to support the development of the Modular Open Systems Architecture and SCI required for ALE.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Transition to host launch platform integration will increase costs due to an associated increase in launch platform coordination and integration and associated required testing in support of the integration.</p>				
<p><b>Title:</b> System Engineering/Program Management</p> <p><b>Description:</b> SEPM</p> <p><b>FY 2022 Plans:</b> Funding to continue SEPM to support FUAS milestone decision requirements and program execution.</p> <p><b>FY 2023 Plans:</b> Funding to continue SEPM to support FTUAS milestone decision requirements and program execution.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Development and testing efforts increase in FY23 resulting in increased manpower.</p>		3.325	1.500	4.283
<p><b>Title:</b> Future Tactical Unmanned Aircraft System (FTUAS)</p> <p><b>Description:</b> The FTUAS will be a runway independent Group 3 unmanned aircraft that provides the Brigade Combat Teams with expeditionary, intelligence, surveillance, and reconnaissance (ISR) with improved target location and designation.</p> <p><b>FY 2022 Plans:</b></p>		33.758	34.849	60.959

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023
Funds the award of competitive prototypes and continues to fund the development / integration of required FTUAS components (Artificial Intelligence, Miniaturized Mode 5/S IFF, Scalable Control Interface (SCI), Communications Relay Payloads).			
<b>FY 2023 Plans:</b> Continues to fund competitive prototypes, development / integration, and test of required FTUAS components (Artificial Intelligence, Miniaturized Mode 5/S IFF, Scalable Control Interface (SCI), Communications Relay Payloads) and systems.			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Competitive prototype effort with multiple vendors will award late FY22 and ramp up significantly in FY23.			
<b>Accomplishments/Planned Programs Subtotals</b>	59.183	56.349	95.719

	FY 2021	FY 2022
<b>Congressional Add:</b> Program Increase- Future Unmanned Aircraft Systems	-	15.000
<b>FY 2022 Plans:</b> Continues to funds the award of competitive prototypes and development / integration of required FTUAS components.		
<b>Congressional Add:</b> Program Increase- Micro-IFF for FTUAS	-	5.000
<b>FY 2022 Plans:</b> Micro Identify Friend/Foe (Micro-IFF) adds new capabilities to the existing model ZPX-C capability.		
<b>Congressional Adds Subtotals</b>	-	20.000

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• A01311: <i>Future Tactical Unmanned Aircraft System (TUAS)</i>	1.100	-	0.000	-	0.000	56.750	92.670	126.854	126.391	0.000	403.765
• A00511: <i>Air Launched Effects</i>	-	-	0.000	-	0.000	24.178	40.440	102.821	102.446	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
The Aviation Platform - Requirements Development Division (AP-RDD) prepared an Initial Capabilities Document (ICD) that was approved by the AROC on 6 Mar 2019.

The FVL CFT oversaw a demonstration effort in FY 2019 - 2021 that informed the FTUAS requirement to develop capability that will ultimately replace the RQ-7Bv2 Shadow TUAS within the BCT formation. The 12-month demonstration included 20 Soldier touchpoints (new equipment training, field training exercises, and Combat

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army		<b>Date:</b> April 2022
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<p>Training Center rotations) across five BCTs and included the training of 61 operators and 56 maintainers. The demonstration resulted in over 1,500 flight hours across more than 500 separate flights to inform the FTUAS Abbreviated Capability Development Document (A-CDD) which was approved by the AROC in 4QFY2021. As part of the program development, the program will request Middle Tier Acquisition authority in 3QFY2022 to conduct Rapid Prototyping.</p> <p>AP-RDD - Prepared ALE Initial Capability Refinement Document (ICRD) that was approved by GEN John M. Murray, CG, AFC on 21 Oct 2019.</p> <p>The plan to acquire ALE is through an incremental approach that allows rapid prototyping and fielding of technology to field available capabilities while continuing S&amp;T efforts to mature and transition emerging technologies to fully realize required capabilities. This is accomplished through multiple prototype development activities for the air vehicle, payloads, and mission system architecture through, experiments, simulations, and demonstrations conducted in parallel and/or sequential timelines. The objective of this incremental effort is to develop and exhibit multiple ALE prototypes to enable a rapid transition from prototype to operational implementation in the force.</p> <p>The ALE Prototyping effort will be a COTS/GOTS system to enable technology maturation, systems integration, and potential initial capabilities. The ALE program of record will be purpose built utilizing parallel efforts informed by S&amp;T investments and information learned from the demonstration and testing of the ALE Prototyping effort. Additional increments will leverage the mission system architecture, payload technologies and interfaces from the initial increment and seek to extend the range of ALE for missions in support of LRPF.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604113A / Future Tactical Unmanned Aircraft System (FTUAS)				EX8 / Future Unmanned Aircraft System (FUAS)							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management (SEPM)	Various	PM TUAS : Redstone Arsenal	4.259	3.325		1.500		4.283	Dec 2022	-		4.283	Continuing	Continuing	-
<b>Subtotal</b>			4.259	3.325		1.500		4.283		-		4.283	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Launched Effects (ALE) Systems Analysis	Various	PM TUAS : Redstone Arsenal	20.000	22.100		20.000		30.477	Nov 2022	-		30.477	Continuing	Continuing	-
Future Tactical Unmanned Aircraft System (FTUAS)	Various	PM TUAS : Redstone Arsenal	-	33.758		54.849		60.959	Oct 2022	-		60.959	Continuing	Continuing	-
<b>Subtotal</b>			20.000	55.858		74.849		91.436		-		91.436	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi Domain Task Force (MDTF) UAS Demonstration	Various	Various : Various	28.879	-		-		-		-		-	0.000	28.879	-
<b>Subtotal</b>			28.879	-		-		-		-		-	0.000	28.879	N/A
<b>Project Cost Totals</b>			53.138	59.183		76.349		95.719		-		95.719	Continuing	Continuing	N/A
<b>Remarks</b>															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Army</b>		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
FTUAS System Engineering/Program Management (SEPM)	[Blue bar]																															
FTUAS Demo	[Blue bar]				[Grey bar]																											
FTUAS CDD AROC					2 FTUAS CDD AROC																											
FTUAS MTA					4 FTUAS MTA																											
FTUAS CP													[Blue bar]																			
FTUAS PV																	[Blue bar]															
FTUAS Op Eval																	8 FTUAS Op Eval															
FTUAS RFD																	7 FTUAS RFD															
FTUAS FRP																					[Blue bar]											
ALE TA	[Blue bar]																															
ALE MV Demo	[Blue bar]				[Grey bar]																											
ALE RFI 2	1 ALE RFI 2																															
ALE OTA 2					3 ALE OTA 2																											

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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
ALE System Integration																												
ALE Small Rapid Fielding MTA Decision Point																												
ALE RFP																												
ALE Milestone B																												
ALE Engineering and Manufacturing Development																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Army		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604113A / <i>Future Tactical Unmanned Aircraft System (FTUAS)</i>	<b>Project (Number/Name)</b> EX8 / <i>Future Unmanned Aircraft System (FUAS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTUAS Multi Domain Task Force Demonstration (MDTF)	1	2019	4	2020
FTUAS System Engineering/Program Management (SEPM)	1	2019	4	2025
FTUAS Demonstration (APA Funded)	3	2020	2	2021
FTUAS A- CDD AROC	4	2021	4	2021
FTUAS Middle Tier Acquisition (MTA) Decision FTUAS	3	2022	3	2022
FTUAS Competitive Prototyping	1	2023	1	2025
FTUAS Production Validation	1	2025	4	2025
FTUAS Operational Evaluation	3	2025	3	2025
FTUAS MTA Rapid Fielding Decision	2	2025	2	2025
FTUAS Full Rate Production	2	2026	4	2032
ALE RFI	2	2019	2	2019
ALE A-CDD AROC	3	2020	3	2020
ALE OTA 1	4	2020	4	2020
ALE Technical Assessment	4	2020	4	2022
ALE Multi-Vendor Demonstrations	4	2020	4	2021
ALE RFI 2	2	2021	2	2021
ALE OTA 2 Award	2	2022	2	2022
ALE System Integration	2	2022	2	2024
ALE Small Rapid Fielding MTA Decision Point	3	2024	3	2024
ALE RFP	4	2024	4	2024
ALE Milestone B	3	2025	3	2025
ALE Engineering and Manufacturing Development	3	2025	3	2028