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 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604113A *I Future Tactical Unmanned Aircraft System (FTUAS)*							
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	-	40.745	57.083	69.697	-	69.697	-	-	-	-	-	-
EX8: *Future Unmanned Aircraft System (FUAS)*	-	40.745	57.083	69.697	-	69.697	-	-	-	-	-	-

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) 2022 FTUAS Research Development Technology & Evaluation (RDT&E) Base funding of $69.944 million will be utilized for the following:
1) $36.444 million to support FTUAS component development,
2) $12.000 million to initiate FTUAS competitive prototyping and integration efforts,
3) $20.000 million to support ALE Systems Analysis,
4) $1.500 million provides Systems Engineering and Program Management (SEPM) to support FTUAS

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604113A *I Future Tactical Unmanned Aircraft System (FTUAS)*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	40.745	40.083	45.239	-	45.239
Current President's Budget	40.745	57.083	69.697	-	69.697
Total Adjustments	0.000	17.000	24.458	-	24.458
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	17.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	24.458	-	24.458

Change Summary Explanation

1) Increase of $24.458 Million is due to increase in Future Tactical Unmanned Aircraft System (FTUAS).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	Project (Number/Name) EX8 / *Future Unmanned Aircraft System (FUAS)*	

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
EX8: *Future Unmanned Aircraft System (FUAS)*	-	40.745	57.083	69.697	-	69.697	-	-	-	-	-	-
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.

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3) $20.000 million to support ALE Systems Analysis,
4) $1.500 million provides Systems Engineering and Program Management (SEPM) to support FTUAS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Multi-Domain Task Force (MDTF) Demonstration	18.079	-	-
Description: Funding for United States Army Pacific (USARPAC) Multi-Domain Task Force (MDTF) Demonstration supports UAS aircraft, payload and Multi-Function Electronic Warfare (MFEW) demonstration, which informed FTUAS requirements.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Air Launched Effects (ALE) Systems Analysis	20.000	20.000	20.000
Description: ALE systems analysis and Tech Maturation 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 proposed candidate materiel solution approaches are technically feasible and have the potential to effectively address capability gaps, desired operational attributes, and associated external dependencies. ***FY 2021 Plans:*** Continue to fund ALE Increment 1a demonstrations, engineering analysis, integration, prototyping, assessment of proposed material solution approaches in support of host platform integration. Continue to support the development of the Modular Open Systems Architecture and SCI required for ALE. ***FY 2022 Plans:*** 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.			
Title: System Engineering/Program Management	2.666	3.325	1.500
Description: SEPM ***FY 2021 Plans:*** Funding to continue SEPM to support FUAS milestone decision requirements. ***FY 2022 Plans:*** Funding to continue SEPM to support FUAS milestone decision requirements and program execution. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Conclusion of demonstration, reducing SEPM needs in following year.			
Title: Future Tactical Unmanned Aircraft System (FTUAS)	-	33.758	48.197
Description: 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. ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funds will development / integration of required FTUAS components (Miniaturized Type 1 Encryption, Miniaturized Mode 5/S IFF, Scalable Control Interface (SCI), and Tactical Data Link). ***FY 2022 Plans:*** 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). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY21 Congressional Add: Program increase - $2.0M for unmanned aerial vehicle fuel systems enhancements Program increase - $15.0M for next generation secure waveform Program Increase total - $17.0M FY22 will see an increase in competitive prototype development efforts as well as continuation of component development / Integration efforts.			
Accomplishments/Planned Programs Subtotals	40.745	57.083	69.697

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• A00510: *Future UAS Family*	12.100	1.100	-	-	-	-	-	-	-	-	-

Remarks

There is no Base Procurement funding in FY22.

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 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) that goes to an AROC in 3QFY2021. As part of the program development, the program will request Middle Tier Acquisition authority in 3QFY2022 to conduct Rapid Prototyping

AP-RDD - Prepared ALE Initial Capability Refinement Document (ICRD) that was approved by GEN John M. Murray, CG, AFC on 21 Oct 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

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&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. Increment 1A will be a COTS/GOTS system to enable technology maturation, systems integration, and potential initial capabilities. ALE program of record will be purpose built utilizing parallel efforts informed by S&T investments and information learned from the demonstration and testing of Increment 1A. 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	Project (Number/Name) EX8 / *Future Unmanned Aircraft System (FUAS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management (SEPM)	Various	PM TUAS : Redstone Arsenal	1.593	2.666		3.325		1.500		-		1.500	Continuing	Continuing	-
		Subtotal	1.593	2.666		3.325		1.500		-		1.500	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Launched Effects (ALE) Systems Analysis	Various	PM TUAS : Redstone Arsenal	-	20.000		20.000		20.000		-		20.000	Continuing	Continuing	-
Future Tactical Unmanned Aircraft System (FTUAS)	Various	PM TUAS : Redstone Arsenal	-	-		33.758		48.197		-		48.197	Continuing	Continuing	-
		Subtotal	-	20.000		53.758		68.197		-		68.197	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi Domain Task Force (MDTF) UAS Demonstration	Various	Various : Various	10.800	18.079		-		-		-		-	10.000	38.879	-
		Subtotal	10.800	18.079		-		-		-		-	10.000	38.879	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.393	40.745		57.083		69.697		-		69.697	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

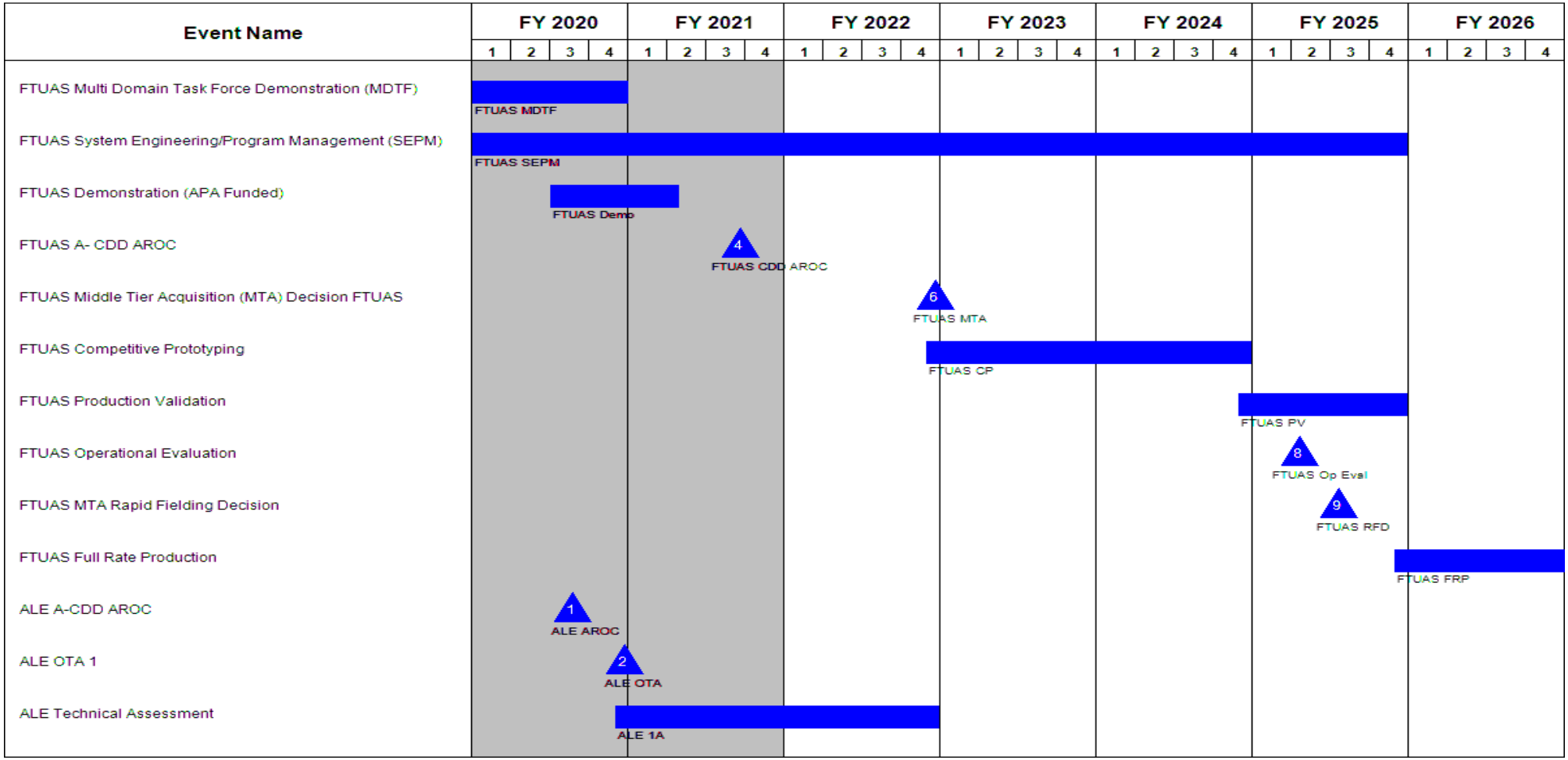

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

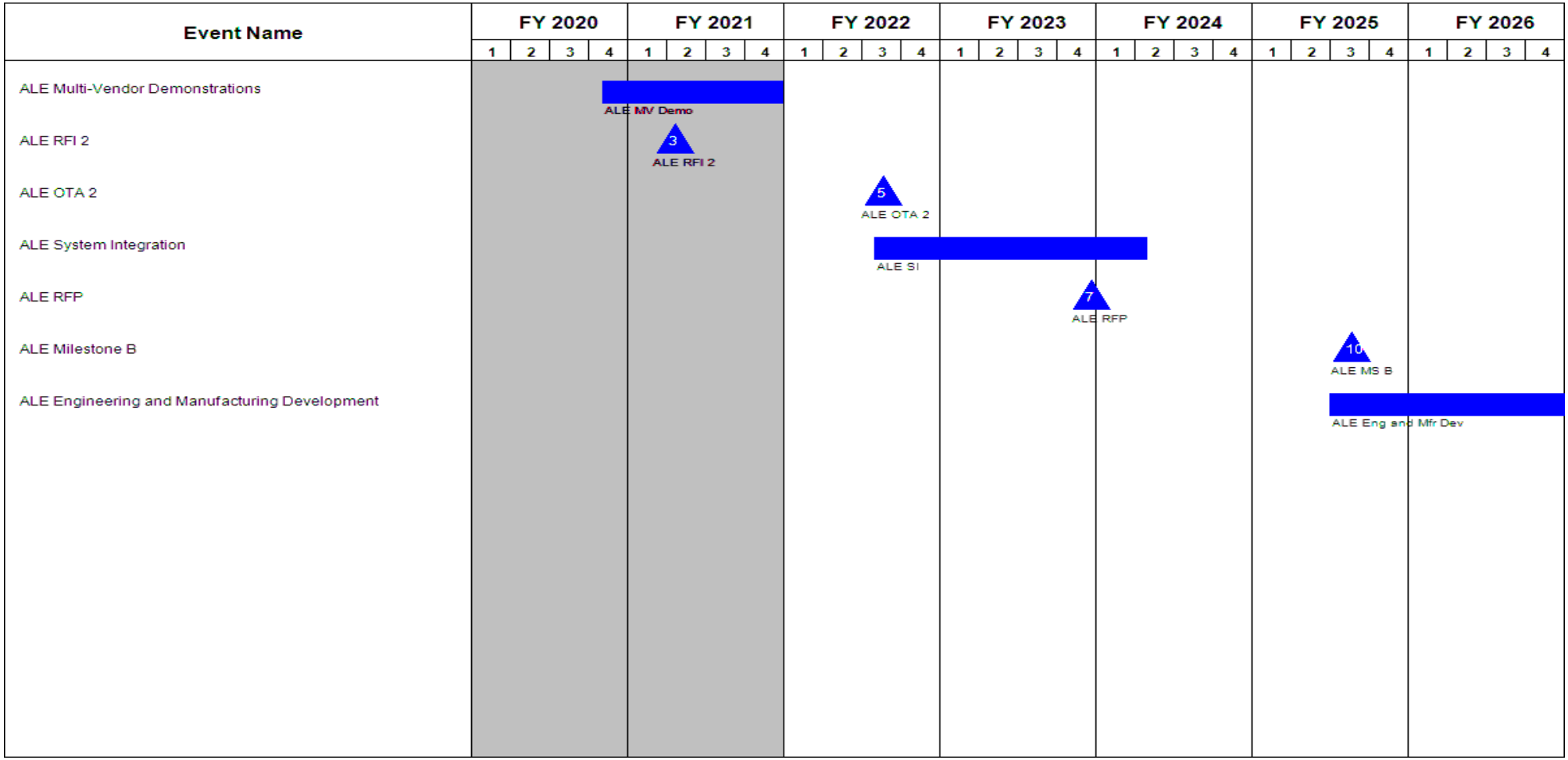

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0604113A / *Future Tactical Unmanned Aircraft System (FTUAS)*	**Project (Number/Name)** EX8 / *Future Unmanned Aircraft System (FUAS)*

Schedule Details

	Start		End	
Events	**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	3	2021	3	2021
FTUAS Middle Tier Acquisition (MTA) Decision FTUAS	4	2022	4	2022
FTUAS Competitive Prototyping	4	2022	4	2024
FTUAS Production Validation	4	2024	4	2025
FTUAS Operational Evaluation	2	2025	2	2025
FTUAS MTA Rapid Fielding Decision	3	2025	3	2025
FTUAS Full Rate Production	4	2025	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	3	2022	3	2022
ALE System Integration	3	2022	2	2024
ALE RFP	4	2023	4	2023
ALE Milestone B	3	2025	3	2025
ALE Engineering and Manufacturing Development	3	2025	3	2028