Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0203752A *I Aircraft Engine Component Improvement Program*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957
106: *A/C Compon Improv Prog*	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.080	0.132	0.000	-	0.000
Current President's Budget	0.080	0.132	0.148	-	0.148
Total Adjustments	0.000	0.000	0.148	-	0.148
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.148	-	0.148

Change Summary Explanation

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
106: *A/C Compon Improv Prog*	-	0.080	0.132	0.148	-	0.148	0.149	0.149	0.149	0.150	0.000	0.957
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service-revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Critical Safety Item (CSI) program. Non-program specific Auxiliary Power Unit (APU) as well as Unmanned Aerial Vehicle (UAV) safety and readiness issues are also addressed under this Program Element (PE).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Gray Eagle UAS Turbocharger Compressor Blow-off Valve ***Description:*** UAV Gray Eagle turbocharger investigation at the United States (US) Army Vehicle Technology Directorate (VTD) at Army Research Laboratory (ARL) Aberdeen Proving Grounds. Provide research to support airworthiness, reliability and performance improvements of the UAV Gray Eagle Turbocharger. Investigate and research the technology challenges of incorporating a turbocharger compressor blow-off valve. The current wastegate configuration was found to be highly sensitive at altitude, resulting in combustion instability. Analysis has been reviewed showing that turbochargers configured with compressor blow-off valves are more reliable and robust than the currently used wastegate configuration.	0.037	-	-
Title: In-House Support ***Description:*** In-house support for the CIP engineers. Contracting support for CIP contracts. ***FY 2022 Plans:*** Will continue to provide in-house engineering support for UAV engine CIP programs. ***FY 2023 Plans:*** Will continue to provide in-house engineering support for UAV engine CIP programs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Inflation adjustment	0.005	0.054	0.055
Title: Hunter UAS Turbocharger Life Management ***Description:*** UAV Hunter fuel injector investigation at the US Army VTD at ARL Aberdeen Proving Grounds. Instrument the Hunter turbochargers and exhaust manifolds, and provide support for in-flight testing to acquire data for turbocharger lifing analysis to support of airworthiness, readiness, reliability, and safety of the Hunter aircraft. UAV Hunter turbocharger	0.038	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
investigation at the U.S. ARL VTD at Aberdeen Proving Ground, MD. Also provides research to support airworthiness, reliability and performance improvements of Hunter UAV turbocharger. An alternate turbocharger is required to support airworthiness, reliability and performance of Hunter UAS engine. The Hunter UAS has experienced "Soft Rotation" due to the aircraft's inability to achieve an engine speed sufficient for take-off (i.e. insufficient thrust). The increased frequency in soft rotations during take-off increases the risk of potential damage to equipment or injury to personnel due to the potential for the aircraft to depart the runway after rotation rather than taking flight. Testing has demonstrated that the current turbocharger is operating very close to the surge limit. The engine calibration limits turbocharger speed. However, there is no potential for an increase in performance with the currently installed turbocharger.			
Title: UAS Fuel System Component Evaluation ***Description:*** This program is to improve aircraft readiness and reliability by mitigating the root cause of common component failures. ***FY 2022 Plans:*** UAS Component investigations will support airworthiness, reliability and performance improvements of the critical Unmanned Aerial Vehicle (UAV) components (e.g.. FADECs, fuel injectors, and high pressure fuel pumps) to determine root cause of occurrences which result in performance anomalies during aircraft operation ***FY 2023 Plans:*** UAS Component investigations will continue to support airworthiness, reliability and performance improvements of the critical Unmanned Aerial Vehicle (UAV) components (e.g.. FADECs, fuel injectors, and high pressure fuel pumps) to determine root cause of occurrences which result in performance anomalies during aircraft operation ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funds increased to address identify/evaluate failure root causes for new Gray Eagle UAS engine hardware being fielded and to continue to identify/evaluate failure root causes to improve readiness and reliability across multiple UAS platforms.	-	0.073	0.093
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638 ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	0.005	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	0.080	0.132	0.148

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Improved designs will be implemented via Engineering Change Proposal (ECP) and follow-on procurement or modification to a production contract to introduce the improved hardware.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Engineering	Allot	US Army AMRDEC : Redstone Arsenal, AL	3.080	0.005	Oct 2020	0.054	Oct 2021	0.055	Oct 2022	-		0.055	Continuing	Continuing	Continuing
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.005	Mar 2022	-		-		-	0.000	0.005	-
		Subtotal	3.080	0.005		0.059		0.055		-		0.055	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T700 Engine	SS/IDIQ	GE-Air : Lynn, MA	61.729	-		-		-		-		-	Continuing	Continuing	Continuing
T55 Engine	SS/IDIQ	Honeywell : Phoenix, AZ	30.161	-		-		-		-		-	Continuing	Continuing	Continuing
T62 Auxiliary Power Unit (APU)	C/IDIQ	Redstone Technical Center Redstone Arsenal, AL : ATEC	0.050	-		-		-		-		-	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Kelly AFB, TX	13.647	-		-		-		-		-	Continuing	Continuing	Continuing
Gray Eagle UAS Turbocharger Compressor Blow-Off Valve	Various	ARL-Vehicle Technology Directorate : TBD	1.090	0.037	Sep 2021	0.034	Oct 2021	-		-		-	Continuing	Continuing	Continuing
APU's	SS/IDIQ	Air Force : Hill AFB, UT	2.319	-		-		-		-		-	Continuing	Continuing	Continuing
T-62T-2B Vibration Test	Various	Redstone Technical Text Center : Redstone Arsenal, AL	0.050	-		-		-		-		-	Continuing	Continuing	-
Hunter UAS Fuel Injector Evaluation	TBD	To Be Determined : To Be Determined	0.033	-		-		-		-		-	0.000	0.033	-
Hunter UAS Turbocharger Life Management	TBD	To Be Determined : To Be Determined	0.023	0.038	Sep 2021	-		-		-		-	0.000	0.061	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0203752A / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 106 / *A/C Compon Improv Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hunter UAS Lower Propeller Shafts	TBD	To Be Determined : To Be Determined	0.020	-		-		-		-		-	0.000	0.020	-
UAS Fuel System Component Evaluation	TBD	Army Research Lab : Aberdeen Proving Ground	-	-		0.039	Oct 2021	0.093	Oct 2022	-		0.093	Continuing	Continuing	Continuing
		Subtotal	109.122	0.075		0.073		0.093		-		0.093	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.202	0.080		0.132		0.148		-		0.148	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

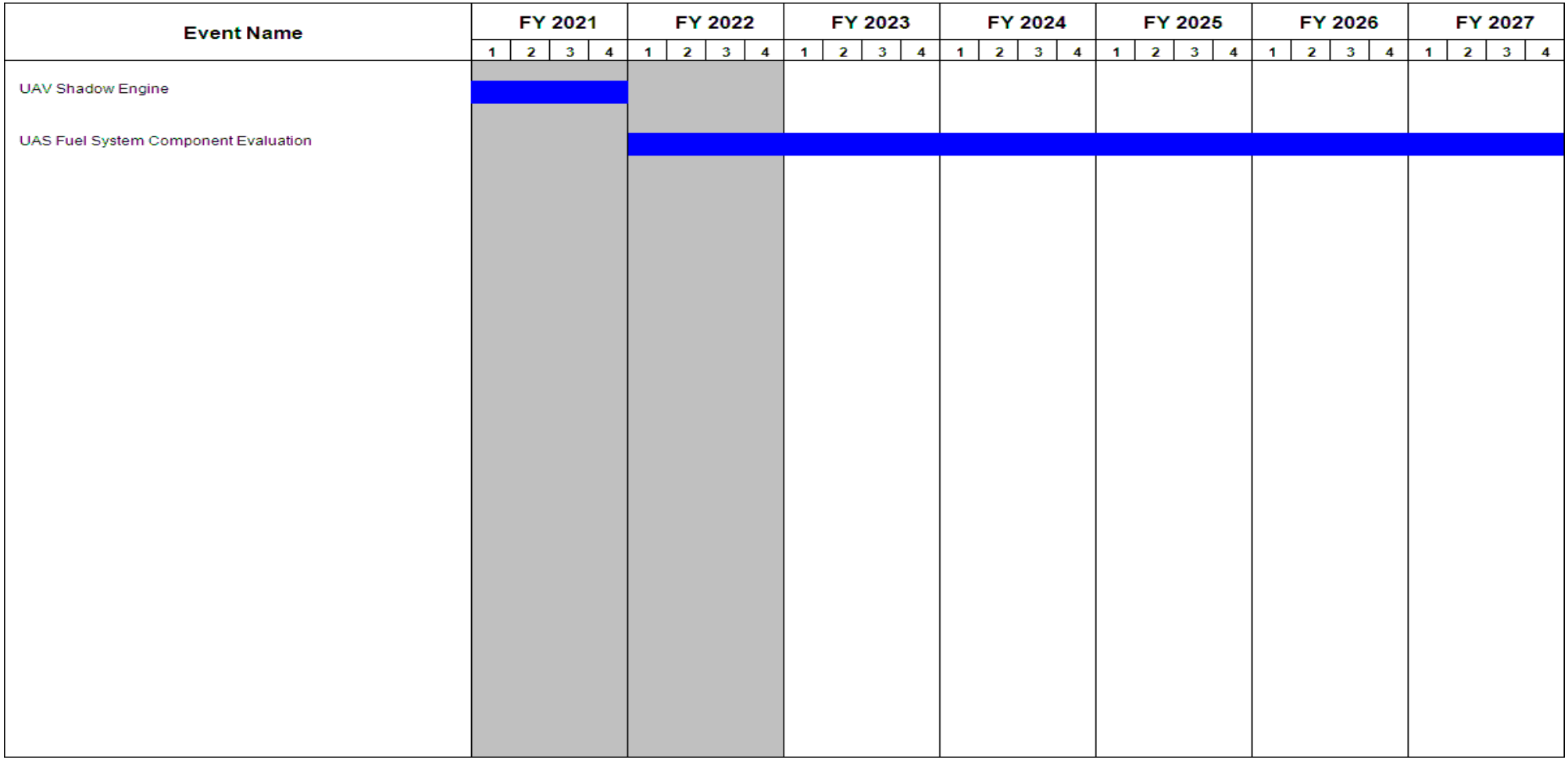

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0203752A / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 106 / *A/C Compon Improv Prog*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
T700 Engine Spit Pit Testing	1	2011	4	2012
T700 Engine Temperature Survey	2	2014	4	2015
T55 Engine 1553 Engine Control Unit (ECU)	2	2012	1	2013
T55 Engine N1 Drive Line Redesign	1	2010	4	2012
T55 Engine ECU Block Upgrade	2	2013	4	2015
Auxiliary Power Units (APUs)	1	2014	4	2015
UAV Shadow Engine	2	2014	4	2021
T700 CSI Update	1	2017	4	2017
UAS Fuel System Component Evaluation	1	2022	4	2027