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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</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	-	11.580	5.781	3.511	-	3.511	9.823	2.563	2.127	1.605	0.000	36.990
586: <i>Air Traffic Control</i>	-	11.580	5.781	3.511	-	3.511	9.823	2.563	2.127	1.605	0.000	36.990

A. Mission Description and Budget Item Justification

Program Element (PE) 0604633A Air Traffic Control funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements.

The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new web-based services for Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments.

The Air Traffic Navigation Integration and Coordination System (ATNAVICS) is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the Interrogation Identification Friend-or-Foe (IFF) system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture.

The Tactical Terminal Control System (TTCS) is a mobile ATC communications system that provides initial Air Traffic Services at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft, and ground stations. TTCS provides aircraft separation and ground control capabilities, a meteorological measuring system for basic weather information, and Blue Force Tracker which provides near real time situational awareness and precision location capability.

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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	12.332	6.989	7.523	-	7.523
Current President's Budget	11.580	5.781	3.511	-	3.511
Total Adjustments	-0.752	-1.208	-4.012	-	-4.012
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.208			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.752	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-4.012	-	-4.012

Change Summary Explanation

Fiscal Year (FY) 2021 reflects a decrease in funding to better align with Army Air Traffic Control requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604633A / Air Traffic Control				Project (Number/Name) 586 / Air Traffic Control			
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
586: Air Traffic Control	-	11.580	5.781	3.511	-	3.511	9.823	2.563	2.127	1.605	0.000	36.990
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 586 Air Traffic Control funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements.

The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new web-based services for Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments.

The Air Traffic Navigation Integration and Coordination System (ATNAVICS) is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the Interrogation Identification Friend-or-Foe (IFF) system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture.

The Tactical Terminal Control System (TTCS) is a mobile ATC communications system that provides initial Air Traffic Services at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft, and ground stations. TTCS provides aircraft separation and ground control capabilities, a meteorological measuring system for basic weather information, and Blue Force Tracker which provides near real time situational awareness and precision location capability.

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

	FY 2019	FY 2020	FY 2021
Title: Tactical Airspace Integration System (TAIS)	7.017	2.810	2.546
Description: The TAIS is the Army's program of record for Airspace Control and enroute Air Traffic Services. It requires development, testing and integration of new web-based services for Airspace Control in order to maintain compatibility and interoperability with the Army Mission Command Information System. TAIS includes development and testing of improvements to incorporate emerging Air Force interfaces, ability to simultaneously connect to multiple sensor systems to receive and process situational awareness information, the capability to connect to sensors to enhance available situational awareness thus reducing risk to aviation and ground forces, and to implement new software features for use in multiple computing environments.			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / Air Traffic Control	Project (Number/Name) 586 / Air Traffic Control		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p><i>FY 2020 Plans:</i> Continued Army's Common Operating Environment (COE) and Airspace Integration Improvements and certification in support of the interoperability within the Army's Mission Command Information Systems (MCIS). Incorporate emerging Federal Aviation Administration (FAA) requirements. Developed software solutions to provide FAA Notice to Airman, Pilot Reports and adjust critical performance and loading software.</p> <p><i>FY 2021 Plans:</i> Will continue with the initiation of System Modification testing which includes reliability and maintainability, communications range testing, transportability, and mobility tests. Plan to continue COE and Airspace Integration Improvements and certification in support of the interoperability within the Army's Mission Command Information Systems (MCIS). Plan to incorporate emerging FAA requirements & will develop software solutions to provide FAA Notice to Airman, Pilot Reports and adjust critical performance and loading software.</p> <p><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding decreases in FY 2021 due the completion of Non-Recurring Engineering efforts.</p>				
<p><i>Title:</i> Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization</p> <p><i>Description:</i> The ATNAVICS is a highly mobile Airport Surveillance Radar and Precision Approach Radar system that provides Air Traffic Services at Army airfields and landing sites at Division, Corps, and Echelons above Corps to include services for Joint and Allied aircraft. ATNAVICS integrates capabilities to control aircraft both Outside of the Continental United States and in the Continental United States. ATNAVICS is upgrading the IFF system to maintain international airspace compatibility, capture flight information through the reception of aircraft self-reporting data broadcasts, and process into an interconnected air picture.</p> <p><i>FY 2020 Plans:</i> Continued TPX-59 integration, Risk Management Framework (RMF) compliance, and product support analysis efforts for ATNAVICS.</p> <p><i>FY 2021 Plans:</i> Will continue to complete RMF compliance efforts and product support analysis efforts.</p> <p><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding decreases in FY 2021 due to completion of RMF compliance efforts and product support analysis efforts.</p>		3.656	2.709	0.965
<p><i>Title:</i> Tactical Terminal Control System (TTCS)</p> <p><i>Description:</i> The TTCS is a mobile ATC communications system that provides initial ATS at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft and ground stations. TTCS also provides aircraft separation and ground control capabilities, a meteorological measuring system for</p>		0.907	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
basic weather information, and Blue Force Tracker which provides near real time situational awareness and precision location capability.			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638 FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638	-	0.262	-
Accomplishments/Planned Programs Subtotals	11.580	5.781	3.511

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• AA0050: Air Traffic Control	63.872	32.738	26.408	-	26.408	20.471	23.627	17.665	11.554	0.000	196.335

Remarks

D. Acquisition Strategy

This project is comprised of multiple systems supporting ATC development and test efforts. While the detailed acquisition strategy varies by program, the general strategy for each program is to complete development and testing efforts through contract modifications, engineering service tasks, and new/follow-on contracts. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international air traffic control and upcoming Next Gen requirements and mandates as well as current aircraft self-reporting transponders.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army **Date:** February 2020

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / Air Traffic Control	Project (Number/Name) 586 / Air Traffic Control
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Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PM Support	Various	PM ATC : Redstone Arsenal, AL	2.227	-		-		-		-		-	0.000	2.227	-
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.262		-		-		-	0.000	0.262	-
Subtotal			2.227	-		0.262		-		-		-	0.000	2.489	N/A

Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TAIS (Web Based Services Dev)	SS/T&M	General Dynamics C4S : Huntsville, AL	30.815	7.017	Aug 2019	2.810	May 2020	2.546	May 2021	-		2.546	Continuing	Continuing	Continuing
ATNAVICS Modernization, TPX-59	Various	Various : Various	20.944	3.656	Aug 2019	2.709	Jan 2020	0.965	Jan 2021	-		0.965	0.000	28.274	-
Tactical Terminal Control System (TTCS)	Various	Various : Various	3.628	0.907	Mar 2019	-		-		-		-	0.000	4.535	-
Subtotal			55.387	11.580		5.519		3.511		-		3.511	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		57.614	11.580	5.781	3.511	-	3.511	Continuing	Continuing	N/A

Remarks
 PM: Program Management
 TAIS: Tactical Airspace Integration System
 ATNAVICS: Air Traffic Navigation Integration and Coordination System

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</i>	Project (Number/Name) 586 / <i>Air Traffic Control</i>
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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
TAIS (Web Based Services Dev)																												
TAIS																												
ATNAVICS Modernization TPX-59																												
TPX-59																												
Tactical Terminal Control System (TTCS) - 198C Upgrade																												
198C Upgrade																												

Note
 TAIS: Tactical Airspace Integration System
 ATNAVICS: Air Traffic Navigation Integration and Coordination System

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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
TAIS (Web Based Services Dev)	1	2015	4	2025
ATNAVICS Modernization TPX-59	3	2017	4	2021
Tactical Terminal Control System (TTCS) - 198C Upgrade	2	2018	4	2020

Note

TAIS: Tactical Airspace Integration System
 ATNAVICS: Air Traffic Navigation Integration and Coordination System