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

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 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	-	3.383	4.405	2.623	-	2.623	1.158	1.025	0.562	0.567	0.000	13.723
586: <i>Air Traffic Control</i>	-	3.383	4.405	2.623	-	2.623	1.158	1.025	0.562	0.567	0.000	13.723

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 (AC) and enroute Air Traffic Services (ATS). TAIS provides Airspace Management, planning, and dynamic execution capabilities at all echelons above Brigade, and enroute flight following air traffic services. TAIS is the only Army system with direct interface to the U.S. Air Force Air Operations Center (AOC) Weapon System for submission of the Army's requests for airspace from the Battlefield Coordination Detachment (BCD). Airspace Coordinating Measure Requests (ACMREQs) received from other mission command systems are passed to TAIS for approval or higher coordination. TAIS software supports U.S. Army commanders, airspace users, airspace managers, Army air traffic controllers, Joint organizations, and Unified Action Partners (UAP) by providing digitized, multi-echelon planning and execution of airspace management and Air Traffic Services. TAIS provides AC planning and enhanced AC execution; improved theater, intra-, and inter-Corps/Division Air Traffic Services (ATS) support; effective battlespace synchronization; and direct links to the Theater Air Ground System (TAGS) through interface with the automated airspace planning and communications systems of the Joint Force Air Component Commander (JFACC).

TAIS Common Operating Environment (COE) convergence to Integrated Mission Planning and Airspace Control Tools (IMPACT) will provide interoperability with Army Mission Command, Joint, and UAP systems. This will facilitate AC capabilities, enhance situational understanding, reduce risks, and provide more effective Air-Ground Integration to enable Multi-Domain Operations (MDO), Joint All Domain Operations (JADO), and Joint All Domain Command and Control (JADC2). IMPACT will be instantiated across Command Post Computing Environment (CE), Mounted CE, and Mobile/Handheld CE and will extend AC services to the tactical edge.

TAIS/IMPACT will leverage Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) technology. ASTARTE provides artificial intelligence and machine learning algorithms which will allow IMPACT to achieve more rapid synchronization of airspace planning and dynamic execution. This will enable commanders to maximize airspace usage, increase freedom of maneuver in the 3rd dimension, enhance safety and fratricide prevention, and enable seamless integration / deconfliction of fires and aviation operations in highly congested and complex environments during Large Scale Combat Operations (LSCO).

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.

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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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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.383	4.405	0.000	-	0.000
Current President's Budget	3.383	4.405	2.623	-	2.623
Total Adjustments	0.000	0.000	2.623	-	2.623
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	2.623	-	2.623

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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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>			
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
586: <i>Air Traffic Control</i>	-	3.383	4.405	2.623	-	2.623	1.158	1.025	0.562	0.567	0.000	13.723
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control (AC) and enroute Air Traffic Services (ATS). TAIS provides Airspace Management, planning, and dynamic execution capabilities at all echelons above Brigade, and enroute flight following air traffic services. TAIS is the only Army system with direct interface to the U.S. Air Force Air Operations Center (AOC) Weapon System for submission of the Army's requests for airspace from the Battlefield Coordination Detachment (BCD). Airspace Coordinating Measure Requests (ACMREQs) received from other mission command systems are passed to TAIS for approval or higher coordination. TAIS software supports U.S. Army commanders, airspace users, airspace managers, Army air traffic controllers, Joint organizations, and Unified Action Partners (UAP) by providing digitized, multi-echelon planning and execution of airspace management and Air Traffic Services. TAIS provides AC planning and enhanced AC execution; improved theater, intra-, and inter-Corps/Division Air Traffic Services (ATS) support; effective battlespace synchronization; and direct links to the Theater Air Ground System (TAGS) through interface with the automated airspace planning and communications systems of the Joint Force Air Component Commander (JFACC).

TAIS Common Operating Environment (COE) convergence to Integrated Mission Planning and Airspace Control Tools (IMPACT) will provide interoperability with Army Mission Command, Joint, and UAP systems. This will facilitate AC capabilities, enhance situational understanding, reduce risks, and provide more effective Air-Ground Integration to enable Multi-Domain Operations (MDO), Joint All Domain Operations (JADO), and Joint All Domain Command and Control (JADC2). IMPACT will be instantiated across Command Post Computing Environment (CE), Mounted CE, and Mobile/Handheld CE and will extend AC services to the tactical edge.

TAIS/IMPACT will leverage Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) technology. ASTARTE provides artificial intelligence and machine learning algorithms which will allow IMPACT to achieve more rapid synchronization of airspace planning and dynamic execution. This will enable commanders to maximize airspace usage, increase freedom of maneuver in the 3rd dimension, enhance safety and fratricide prevention, and enable seamless integration / deconfliction of fires and aviation operations in highly congested and complex environments during Large Scale Combat Operations (LSCO).

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

	FY 2021	FY 2022	FY 2023
Title: Tactical Airspace Integration System (TAIS)	2.418	4.244	2.623
Description: The Tactical Airspace Integration System (TAIS) is the Army's program of record for Airspace Control (AC) and enroute Air Traffic Services (ATS). TAIS provides Airspace Management, planning, and dynamic execution capabilities at all echelons above Brigade, and enroute flight following air traffic services. TAIS is the only Army system with direct interface to the U.S. Air Force Air Operations Center (AOC) Weapon System for submission of the Army's requests for airspace from the Battlefield Coordination Detachment (BCD). Airspace Coordinating Measure Requests (ACMREQs) received from other mission command systems are passed to TAIS for approval or higher coordination. TAIS software supports U.S. Army commanders, airspace users, airspace managers, Army air traffic controllers, Joint organizations, and Unified Action Partners (UAP) by			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
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>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>providing digitized, multi-echelon planning and execution of airspace management and Air Traffic Services. TAIS provides AC planning and enhanced AC execution; improved theater, intra-, and inter-Corps/Division Air Traffic Services (ATS) support; effective battlespace synchronization; and direct links to the Theater Air Ground System (TAGS) through interface with the automated airspace planning and communications systems of the Joint Force Air Component Commander (JFACC).</p> <p>TAIS Common Operating Environment (COE) convergence to Integrated Mission Planning and Airspace Control Tools (IMPACT) will provide interoperability with Army Mission Command, Joint, and UAP systems. This will facilitate AC capabilities, enhance situational understanding, reduce risks, and provide more effective Air-Ground Integration to enable Multi-Domain Operations (MDO), Joint All Domain Operations (JADO), and Joint All Domain Command and Control (JADC2). IMPACT will be instantiated across Command Post Computing Environment (CE), Mounted CE, and Mobile/Handheld CE and will extend AC services to the tactical edge.</p> <p>TAIS/IMPACT will transition Air Space Total Awareness for Rapid Tactical Execution (ASTARTE) technology. ASTARTE provides artificial intelligence and machine learning algorithms which will allow IMPACT to achieve more rapid synchronization of airspace planning and dynamic execution. This will enable commanders to maximize airspace usage, increase freedom of maneuver in the 3rd dimension, enhance safety and fratricide prevention, and enable seamless integration / deconfliction of fires and aviation operations in highly congested and complex environments during Large Scale Combat Operations (LSCO).</p> <p>FY 2022 Plans: Develop Airspace Control embedded operator training capability. Continue development of Joint All Domain Command and Control AC capabilities and AC service extension using Mission Command Information System and Tactical Assault Kit frameworks and plugins services. Continue development of a solution to utilize common and enterprise services in all Computing Environments. Continue development for integration and direct machine interfaces to emerging Artificial Intelligence assisted decision making aids.</p> <p>FY 2023 Plans: Continue with system development testing to validate capabilities enabling Air-Ground Integration. Develop Integrated Mission Planning and Airspace Control Tools (IMPACT) to meet CD5 Operational Needs, Joint All Domain Command and Control (JADC2) Airspace Control (AC) capabilities and AC service extension using MCIS and Tactical Assault Kit frameworks, plugins and services. Develop a solution to utilize common and enterprise services in all Computing Environments. Begin development for integration and direct machine interfaces to emerging Artificial Intelligence assisted decision making aids.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to a reduction in system development testing to validate capability enabling Air-Ground Integration.</p>				
Title: Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization		0.965	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Description: 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>Title: FY22 SBIR/STTR Transfer</p> <p>Description: FY22 \$161K SBIR/STTR transfer in accordance with Title 15 USC 638.</p> <p>FY 2022 Plans: FY22 \$161K SBIR/STTR transfer in accordance with Title 15 USC 638.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: SBIR/STTR amount in accordance with Title 15 USC 638.</p>	-	0.161	-
Accomplishments/Planned Programs Subtotals	3.383	4.405	2.623

C. Other Program Funding Summary (\$ in Millions)											
<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</u> <u>Complete</u>	<u>Total Cost</u>
• AA0050: <i>Air Traffic Control</i>	26.408	21.759	27.492	-	27.492	21.633	11.619	11.696	11.649	0.000	132.256

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 2023 Army **Date:** April 2022

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 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
FY22 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.161	Apr 2022	-		-		-	0.000	0.161	-
Subtotal			-	-		0.161		-		-		-	0.000	0.161	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Software Development (TTS/ASTARTE/JADC2)	SS/T&M	General Dynamics C4S : Huntsville, AL	40.642	2.418	May 2021	2.749	Jan 2022	1.797	Jan 2022	-		1.797	Continuing	Continuing	Continuing
TAIS EASI Software Development	MIPR	S3I : Redstone Arsenal, AL	-	-		1.334	Feb 2022	0.749	Feb 2022	-		0.749	Continuing	Continuing	Continuing
TAIS Cyber/JITC Testing	MIPR	Redstone Test Center/CCDC : Redstone Arsenal, AL	-	-		0.161	Jan 2022	0.077	Jan 2022	-		0.077	Continuing	Continuing	Continuing
ATNAVICS Modernization, TPX-59	Various	Various : Various	27.333	0.965	Jan 2021	-		-		-		-	0.000	28.298	-
Subtotal			67.975	3.383		4.244		2.623		-		2.623	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		67.975	3.383	4.405	2.623	-	-	2.623	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 2023 Army **Date:** April 2022

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 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
TAIS Software Development																												
TAIS																												
ATNAVICS Modernization TPX-59																												
TPX-59																												

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 2023 Army **Date:** April 2022

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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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TAIS Software Development	1	2015	4	2036
ATNAVICS Modernization TPX-59	3	2017	4	2021

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