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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing
<i>BX7: Low Earth Orbit (LEO) Satellite Capability</i>	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, DoD, commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

FY2024 base funding in the amount of \$38.851 million provides prototyping, experimentation, and risk reduction activities for the Army as it continues to develop and field the Tactical Intelligence Targeting Access Node (TITAN) pre-prototypes. TITAN and complimentary AI/ML technologies are assessed via the Army Theater-Level Access Node (ATHENA) ground station architectures. These Advanced Component Development and Prototypes efforts enable ground stations to dynamically task, receive, and disseminate data to directly support live-fire, S2S demonstrations and assessments, enabling wide-area, responsive, and deep-area sensing and force maneuver. Additionally, this funding supports navigation warfare (NAVWAR) technology integration and Positioning, Navigation and Timing (PNT) technology development and assessments.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	19.638	35.509	39.672	-	39.672
Current President's Budget	18.922	35.509	38.851	-	38.851
Total Adjustments	-0.716	0.000	-0.821	-	-0.821
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.716	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.821	-	-0.821

Change Summary Explanation

Decreased funding to support higher Army priorities.

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Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>				Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
<i>BX7: Low Earth Orbit (LEO) Satellite Capability</i>	-	18.922	35.509	38.851	-	38.851	22.457	22.893	23.069	23.327	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In an Army Budget memorandum dated, 21 September 2020, the Army changed the name of this Project from 'Low Earth Orbit (LEO) Satellite Capability' to 'Battle Management Command and Control (BMC2) and Ground Infrastructure for FY22 and beyond.'

A. Mission Description and Budget Item Justification

The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, Department of Defense (DoD), commercial Space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT), deep sensing capabilities and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat A2/AD forces and enable force projection and maneuver in contested Multi-Domain Operations.

The Low Earth Orbit (LEO) Battle Management Command and Control (BMC2) and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at the tactical edge to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.

FY2024 base funding in the amount of \$38.851 million provides prototyping, experimentation, and risk reduction activities for the Army as it continues to develop and field the Tactical Intelligence Targeting Access Node (TITAN) pre-prototypes. TITAN and complimentary AI/ML technologies are assessed via the Army Theater-Level Access Node (ATHENA) ground station architectures. These Advanced Component Development and Prototypes efforts enable ground stations to dynamically task, receive, and disseminate data to directly support live-fire, S2S demonstrations and assessments, enabling wide-area, responsive, and deep-area sensing and force maneuver. Additionally, this funding supports navigation warfare (NAVWAR) technology integration and Positioning, Navigation and Timing (PNT) technology development and assessments.

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

	FY 2022	FY 2023	FY 2024
Title: LEO Satellite Capability	18.922	34.213	38.851
Description: The United States Army Tactical Space Strategy provides tactical land component forces with space-based capabilities required to close the top three Large Scale Combat Operations (LSCO) gaps. National, Department of Defense			

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>(DoD), commercial space-based, and High Altitude (HA) sensor data will be integrated into ground architecture to provide resilient communications, Assured Positioning, Navigation, and Timing (APNT), deep sensing capabilities, and Processing Exploitation and Dissemination (PED) required in the targeting process. These capabilities will enable rapid and responsive Sensor-to-Shooter (S2S) applications required to engage and defeat Anti-Access / Area-Denial (A2/AD) forces and enable force projection and maneuver in contested Multi-Domain Operations.</p> <p>The LEO Satellite Capability is now called the LEO Battle Management Command, Control (BMC2) and Ground Infrastructure. The BMC2 and Ground Infrastructure will provide prototyping, experimentation, and risk reduction activities for ground architecture, supporting wide-area, responsive, and deep-area sensing required for Beyond-Line-of-Sight (BLOS) targeting and force maneuver, significantly reducing Sensor to Shooter (S2S) timelines. It will enable Warfighters at echelon to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Positioning, Navigation, and Timing/s (APNT/S) Cross Functional Team (CFT) Campaign of Learning and Army Futures Command (AFC) Project Convergence.</p> <p>FY 2023 Plans: Battle Management and Control (BMC2) and Ground Infrastructure (renamed from LEO Satellite Capability) continues the demonstration and validation of ground architecture, evaluating ability to provide wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor-to-Shooter (S2S) timelines. Ground architecture will be evaluated through multiple assessment events including the Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and the Army Futures Command (AFC) Project Convergence. These will provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance, and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), BMC2, and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical Warfighter. This will be executed through the S2S Demo/ Experimentation Plan which began with the first Positioning, Navigation and Timing (PNT) Assessment Exercise (PNTAX) in FY19, working through three Live-Fire Exercises and follow-on exercises in Europe and the Pacific, and culminating with a FY 2023 Project Convergence exercise. This Demo/Experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is being correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.</p> <p>FY 2024 Plans: Battle Management and Control (BMC2) and ground infrastructure continues the demonstration and validation of ground architecture, evaluating the ability to provide wide-area, responsive, and deep-area sensing required for Beyond Line of Sight (BLOS) targeting and force maneuver, significantly reducing Sensor-to-Shooter (S2S) timelines. Ground architecture is evaluated through multiple assessment events including the Assured Position, Navigation, Timing and Space (APNT/S) Cross Functional</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / Low Earth Orbit (LEO) Sate llite Capability	Project (Number/Name) BX7 / Low Earth Orbit (LEO) Satellite Capability

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Team (CFT) Campaign of Learning and Army Futures Command's Project Convergence. These provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), BMC2, and communications data to identify and locate targets of interest in denied and contested environments actionable by the tactical warfighter. This is executed through the S2S demonstration and experimentation plan which began with the first Positioning, Navigation and Timing (PNT) Assessment Exercise (PNTAX) in FY19. PNTAX provides the Army's sole large scale, open air, threat informed Radio Frequency/Global Positioning System denied environment for assessments and experiments necessary to ensure evolution of Multi-Domain Operations and Joint All Domain Command and Control (JADC2) capabilities. Further, APNT/S CFT conducts multiple CONUS-based live-fire exercises along with follow-on embedded experimentation in exercises across US Army Europe- African Command (USEUR-AF) and US Army Pacific Command (USARPAC), culminating with a FY 2024 Project Convergence exercise. Critical to this overall effort are Soldier touchpoints, prototyping and ground architecture development, Artificial Intelligence and machine learning integration, S2S demonstrations to inform space, high altitude, aerial and terrestrial based sensor development, space-based telemetry, Alternative Navigation and radio frequency sensing. This demonstration and experimentation cycle is extremely important as it is the Army's mechanism to ensure current and future funding is correctly applied against the most critical requirements. It provides an iterative framework for rapid concept of operations and tactics, techniques, and procedures development, evaluation and revision and for rapid technology insertion.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$3.342 million from FY23 (\$35.509 million) to FY24 (\$38.851 million) reflects an increased requirement for integration and experimentation of prototypes developed in FY23.</p>			
<p>Title: SBIR/STTR</p> <p>Description: Funding transferred in accordance with Title 15 USC §638</p> <p>FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638</p>	-	1.296	-
Accomplishments/Planned Programs Subtotals	18.922	35.509	38.851

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603766A: Tactical Electronic Surveillance System - Adv Dev	113.365	72.314	65.567	-	65.567	38.537	29.007	29.019	39.343	Continuing	Continuing

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
Development by Project BX7 'LEO Battle Command and Control (BMC2) and Ground Infrastructure' is in conjunction and complement Project CC5 'LEO ISR'. ref. PE 0603766A.CC5

D. Acquisition Strategy

The Army signed a Memorandum of Agreement (MOA) with the Mission Partner on November 19, 2019. This relationship has shown promise to build and deliver capacity for the Army. The MOA will allow the Army to leverage orbit experimental ISR satellites that will accelerate the Army's development of Concept of Operations (CONOPs), Tactics, Techniques and Procedures (TTPs), and refine requirements necessary to mitigate the deep-sensing gap, shorten the S2S timeline and improve situational awareness for Warfighters at both the operational and tactical levels.

This funding will enable the Army to utilize on-orbit demonstrations and numerous large-scale exercises within United States European Command (EUCOM) and U.S. Indo-Pacific Command (INDOPACOM) areas of responsibility (AORs). These demonstrations will help define the Army's tactical requirements, CONOPs, and TTPs for leveraging on-demand/direct link theater access, at echelon, to space-based ISR capabilities with trained/certified Soldiers. This will turn previously "opportunistic" collection into "assured" collection to support dynamic targeting and enhanced situational awareness. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments including Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. Existing Mission Partner contracts and Aviation & Missile Technology Consortium (AMTC) OTAs will be used for Prototype Development, Engineering Services and Test and Evaluation Support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604035A / Low Earth Orbit (LEO) Satellite Capability				BX7 / Low Earth Orbit (LEO) Satellite Capability							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Prototype Development and Engineering Services Support	C/FFP	Multiple : Multiple	-	3.214	Oct 2021	6.454	Oct 2022	6.600	Dec 2023	-		6.600	0.000	16.268	-
SBIR/STTR	TBD	HQDA : Pentagon, Arlington, VA	-	-		1.296	Mar 2023	-		-		-	0.000	1.296	-
Subtotal			-	3.214		7.750		6.600		-		6.600	0.000	17.564	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
LEO Satellite Infrastructure Capabilities Development	C/CPIF	Multiple : Multiple	14.100	11.708	Jan 2022	23.394	Jan 2023	27.280	Jan 2024	-		27.280	0.000	76.482	Continuing
Subtotal			14.100	11.708		23.394		27.280		-		27.280	0.000	76.482	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
LEO Infrastructure Test and Evaluation	C/CPIF	Multiple : Multiple	-	4.000	Jan 2022	4.365	Jan 2023	4.971	Jan 2024	-		4.971	0.000	13.336	-
Subtotal			-	4.000		4.365		4.971		-		4.971	0.000	13.336	N/A
Project Cost Totals			14.100	18.922		35.509		38.851		-		38.851	0.000	107.382	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>	

Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
BMC2 and Ground Infrastructure																												

Note
LEO activities transitioned to this PE 0604035A Project BX7 in FY2022 from previous PE 1206308A, Project FE5 Space And Missile Defense Integration.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604035A / <i>Low Earth Orbit (LEO) Satellite Capability</i>	Project (Number/Name) BX7 / <i>Low Earth Orbit (LEO) Satellite Capability</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BMC2 and Ground Infrastructure	1	2021	4	2028