Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604035A / *Low Earth Orbit (LEO) Satellite Capability*							
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	-	-	21.850	19.638	-	19.638	-	-	-	-	-	-
BX7: *Low Earth Orbit (LEO) Satellite Capability*	-	-	21.850	19.638	-	19.638	-	-	-	-	-	-

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; Multi-Domain Deep Sensing, Analysis, and Processing Exploitation and Dissemination (PED) to Target Threat Anti-Access/Area Denial (A2AD); Penetrate and Dis-Integrate A2AD; Long Range Fires to Enable Counter Fire and Shaping Operations. National, DoD, commercial Space-based, and High Altitude (HA) sensor data will be integrated in ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT) and deep sensing capabilities required in the targeting process to enable rapid and responsive sensor-to-shooter 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, Control and 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.

Follow-on persistent prototype tactical sensor capabilities will be operational by FY 2022 and will be integrated with the Army Tactical Intelligence Targeting Access Node (TITAN) ground station and Theater Gateways to tactically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	22.678	19.881	-	19.881
Current President's Budget	0.000	21.850	19.638	-	19.638
Total Adjustments	0.000	-0.828	-0.243	-	-0.243
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-0.828			
• Adjustments to Budget Years	-	-	-0.243	-	-0.243

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 0604035A *I Low Earth Orbit (LEO) Satellite Capability*

Change Summary Explanation

FY2021 for SBIR transfer. FY2022 adjustment for Army internal adjustments to other priorities.

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	Project (Number/Name) BX7 / *Low Earth Orbit (LEO) Satellite Capability*	

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
BX7: *Low Earth Orbit (LEO) Satellite Capability*	-	-	21.850	19.638	-	19.638	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year (FY) 2022, Project BX7 Low Earth Orbit (LEO) Satellite Capability transitions from Program Element (PE) 1206308A, Project FE5 Space And Missile Defense Integration.

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 in ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT) and deep sensing capabilities required in the targeting process to enable rapid and responsive sensor-to-shooter 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, Control and 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.

FY2022 Base funding in the amount of $19.638 million provides: prototyping, experimentation, and risk reduction activities to ground station architecture, supporting wide area, responsive, and deep area sensing and force maneuver. It will enable ground stations to dynamically task, receive and disseminate data to directly support live-fire S2S demonstrations and assessments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: LEO Satellite Capability	-	17.100	19.638
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, DoD, commercial Space-based, and High Altitude (HA) sensor data will be integrated in ground architecture to provide resilient communications, assured Positioning, Navigation, and Timing (PNT) and deep sensing capabilities required in the targeting process to enable rapid and			

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	**Project (Number/Name)** BX7 / *Low Earth Orbit (LEO) Satellite Capability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
responsive sensor-to-shooter 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, Control and 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. ***FY 2021 Plans:*** LEO Satellite Capability Begin validation of demonstration constellation in a realistic operational environment. Evaluate the integrated RSTA, PNT, BMC2, and communications technologies to identify and locate targets of interest in denied and contested environments actionable to the tactical warfighter. ***FY 2022 Plans:*** 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. Evaluation to be conducted through multiple assessment events including the Assured Position, Navigation, Timing (APNT) Cross Functional Team (CFT) Campaign of Learning and AFC Project Convergence. These will provide a realistic operational environment to evaluate the integrated Intelligence, Surveillance, and Recognizance (ISR), Positioning, Navigation and Timing (PNT), Battle Management Command and Control (BMC2), and communications data to identify and locate targets of interest in denied and contested environments actionable to 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 Project Convergence. 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. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In Fiscal Year (FY) 2021, Project BX7 Low Earth Orbit (LEO) Satellite Capability transitioned from Program Element (PE) 1206308A, Project FE5 Space And Missile Defense Integration.			
Title: APNT Integrated Space Communications	-	4.750	-

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	**Project (Number/Name)** BX7 / *Low Earth Orbit (LEO) Satellite Capability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Development of a unique advanced space communications capability to explore advanced ground based space communications technologies and concepts utilizing bi-static Radio Frequency (RF) scattering and propagation with precision frequency, phase, and power management. This space communications capability will develop and demonstrate multiple advanced Army LEO space communications concepts and will also assess interfacing with multiple Joint Service space communication missions ***FY 2021 Plans:*** Assess performance of space communications capabilities of multiple advanced Army LEO space communications concepts and interfacing with multiple Joint Services. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In Fiscal Year 2021, Project BX7 Low Earth Orbit (LEO) Satellite Capability transitioned from Program Element (PE) 1206308A, Project FE5 Space And Missile Defense Integration.			
Accomplishments/Planned Programs Subtotals	-	21.850	19.638

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
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	37.490	182.400	113.365	-	113.365	-	-	-	-	-	-

Remarks

Development by Project BX7 LEO Satellite Capability are 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 in November 19, 2019 at the direction of Under Secretary of Defense (Intelligence) (USD(I)) and Office of Management and Budget (OMB). This relationship has shown promise to building and delivering capacity for the Army. The MOA will allow the Army to leverage on orbit experimental Intelligence, Surveillance, and Recognizance (ISR) satellites that will accelerate the Army's development of Concept of Operations (CONOPs) and Tactics, techniques and procedures (TTPs), refine requirements necessary to mitigate deep sensing gap, shorten the Sensor to Shooter timeline and improve situational awareness for warfighters at both the operational and tactical level.

This funding will enable the Army to utilize on-orbit demonstrations systems in numerous large scale exercises within United States European Command (EUCOM) and U.S. Indo-Pacific Command (INDOPACOM) areas of responsibility (AORs) to define the Army's tactical requirements CONOPs, and TTPs for on demand/direct link theater access, at echelon, to space-based ISR capabilities with trained/certified Soldiers turns 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

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	**Project (Number/Name)** BX7 / *Low Earth Orbit (LEO) Satellite Capability*

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.

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	Project (Number/Name) BX7 / *Low Earth Orbit (LEO) Satellite Capability*	

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
Matrix Gov/SETA Support LEO	C/FFP	Multiple : Multiple Locations	-	-		3.000	Oct 2020	-		-		-	0.000	3.000	Continuing
Matrix Gov/SETA Support APNT Integrated Space Communications	TBD	Multiple : Multiple Locations	-	-		1.000	Oct 2020	-		-		-	0.000	1.000	Continuing
Prototype Development and Engineering Services Support	C/FFP	Multiple : Multiple	-	-		-		3.930	Oct 2021	-		3.930	0.000	3.930	-
		Subtotal	-	-		4.000		3.930		-		3.930	0.000	7.930	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
LEO Satellite Infrastructure Capabilities Development	TBD	Multiple : Multiple	-	-		14.100	Feb 2021	11.708	Jan 2022	-		11.708	0.000	25.808	Continuing
APNT Integrated Space Communications	C/FFP	Classified : Classified	-	-		3.750	Jan 2021	-		-		-	0.000	3.750	Continuing
		Subtotal	-	-		17.850		11.708		-		11.708	0.000	29.558	N/A

Test and Evaluation ($ 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
LEO Infrastructure Test and Evaluation	TBD	Multiple : TBD	-	-		-		4.000	Jan 2022	-		4.000	0.000	4.000	-
		Subtotal	-	-		-		4.000		-		4.000	0.000	4.000	N/A

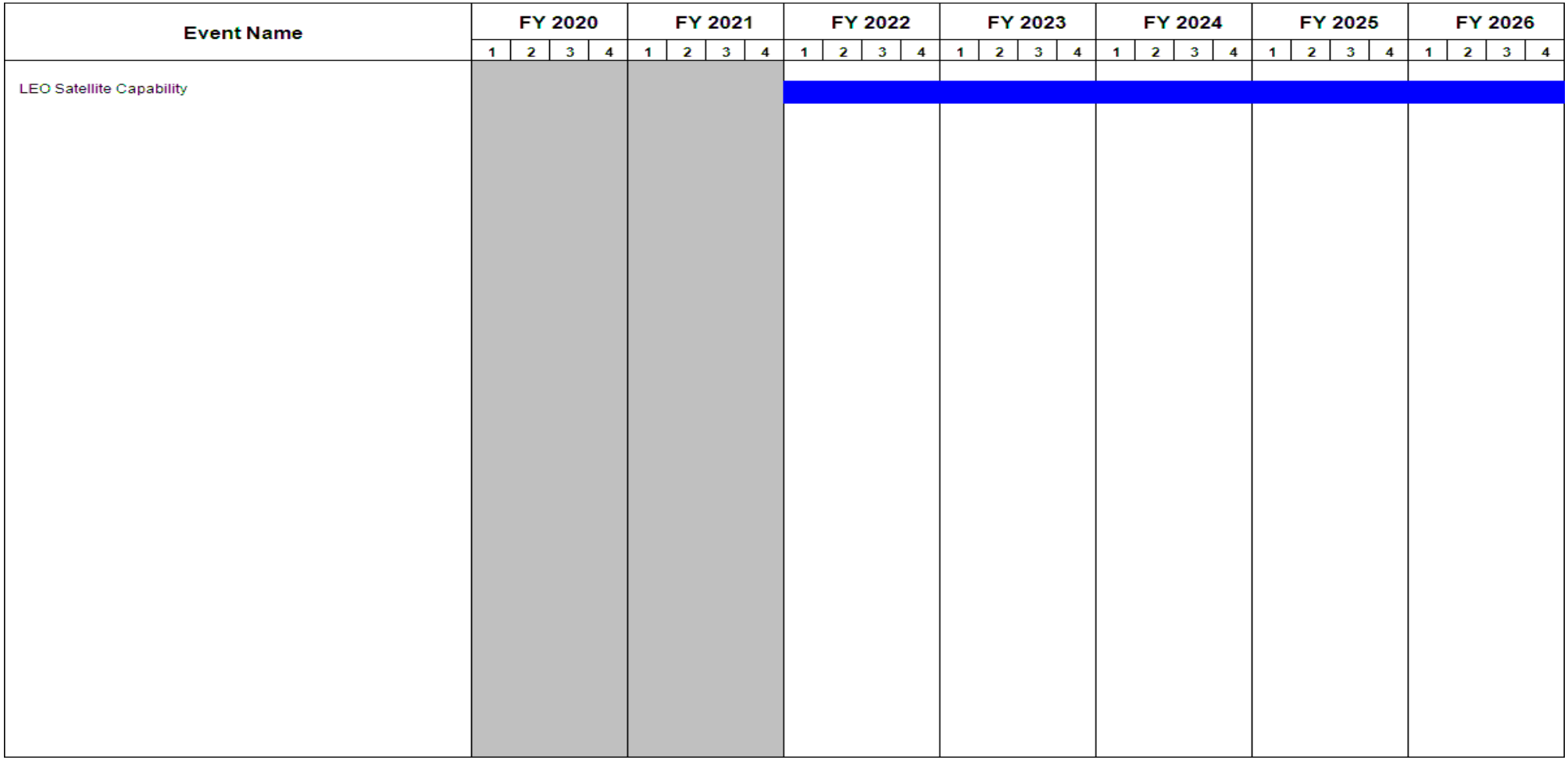
	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		21.850		19.638		-		19.638	0.000	41.488	N/A

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	Project (Number/Name) BX7 / *Low Earth Orbit (LEO) Satellite Capability*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	**Project (Number/Name)** BX7 / *Low Earth Orbit (LEO) Satellite Capability*



Note

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

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 0604035A / *Low Earth Orbit (LEO) Satellite Capability*	**Project (Number/Name)** BX7 / *Low Earth Orbit (LEO) Satellite Capability*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LEO Satellite Capability	1	2022	4	2027