Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force											Date: March 2023	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206410SF / *Space Technology Development and Prototyping*							
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	-	0.000	1,015.822	2,081.307	0.000	2,081.307	1,626.682	1,736.618	1,925.304	1,894.456	Continuing	Continuing
643729: *Integration and Battle Management*	-	0.000	89.072	126.661	0.000	126.661	153.462	44.169	37.259	38.600	Continuing	Continuing
643731: *Transport*	-	0.000	845.442	1,847.944	0.000	1,847.944	1,436.717	1,692.449	1,888.045	1,855.856	Continuing	Continuing
643732: *Sensing*	-	0.000	81.308	106.702	0.000	106.702	36.503	0.000	0.000	0.000	Continuing	Continuing

Note

This program element includes funds for the Tranche 1 Transport Layer program, which is a Middle Tier of Acquisition effort. The total cost of the Tranche 1 Transport Layer Middle Tier of Acquisition effort is $3,199.0 million. The Tranche 1 Transport Layer program is fully funded across the Future Years Defense Program.

A. Mission Description and Budget Item Justification

SDA is responsible for developing and demonstrating the next generation proliferated warfighter space architecture to enable U.S. military operations to be responsive to emerging multi-domain threats against our national security. To achieve that goal, SDA will help inform the Department of Defense (DoD)'s decision to develop and implement a proliferated architecture enabled by lower-cost, mass-produced space vehicles and routine space access; and shift the DoD to a development organization focused on experimentation, prototyping, and accelerated fielding. SDA will manage, direct, and execute the development of the space capabilities for the joint warfighter in accordance with DoD's Space Vision and field space capabilities at speed and scale, with the following goals:

- Bold breakthroughs designed to out-pace our competitors,
- Mission-focused technology maturation and systems engineering,
- Value-based lean engineering, manufacturing, and support,
- Warfighter-centric capability development enabling joint all-domain operations,
- Industrial base expansion; streamlined development and acquisition processes, and
- Increased acquisition cooperation across the space enterprise.

SDA will rapidly deploy critical elements of next-generation space capabilities, initially focusing on these essential capabilities:

- Indications, warnings, targeting, and tracking for defense against advanced missile threats,
- Alternate position, navigation, and timing (PNT) for a navigation warfare (NAVWAR) resilient environment,
- Responsive, resilient, common ground-based space support infrastructure (e.g., optical and RF ground stations and commercially-oriented satellite operations centers),
- Cross-domain, networked, node-independent battle management command, control, and communications (BMC3), and
- Highly-scaled, low-latency, persistent, resilient proliferated Low Earth Orbit (LEO) space data transport.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206410SF *I Space Technology Development and Prototyping*

The establishment of a proliferated data transport layer in LEO is essential to developing a new, responsive space architecture, and will be SDA's primary initial focus within the Proliferated Warfighter Space Architecture (PWSA). SDA will develop an initial set of sub-constellations in conjunction with this Transport Layer to provide additional capabilities, such as advanced missile warning and tactical satellite communications.

This program element funds efforts to develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its sub-constellations in support of the DoD Space Vision.

This program element may include necessary civilian pay expenses and contractor support required to facilitate delivery of the Transport capability.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	986.822	1,680.407	0.000	1,680.407
Current President's Budget	0.000	1,015.822	2,081.307	0.000	2,081.307
Total Adjustments	0.000	29.000	400.900	0.000	400.900
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	29.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	400.900	0.000	400.900

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 643731: *Transport*		
Congressional Add: *Laser Communication Downlink Systems*	0.000	25.000
Congressional Add: *Space Architecture Experimental Testbed*	0.000	4.000
Congressional Add Subtotals for Project: 643731	0.000	29.000
Congressional Add Totals for all Projects	0.000	29.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206410SF *I Space Technology Development and Prototyping*

Change Summary Explanation

The worked performed in this program element is a continuation of efforts that in FY 2022 are funded in Appropriation 0400, RDT&E, Defense-Wide, BA 4, PE 1206410SDA.

FY 2023 Congressional marks resulted in a net gain of $29.0M. Project 643731 (Transport) was increased by $4.0M to support the space architecture experimental testbed and increased by $25.0M to support laser communication downlink systems demonstrating space-to-air and space-to-ground data transport capabilities. FY 2023 Congressional marks also included $22.5M for Tranche 1 Space Resiliency Payloads, but the funds were realigned to RDT&E, BA 5, PE 1206446SF.

FY 2024 increases for Tranche 1 and Tranche 2 advanced component development and prototyping, and includes a budget realignment from RDT&E, PE 1206310SF, to support those activities.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / *Space Technology Development and Prototyping*	Project (Number/Name) 643729 / *Integration and Battle Management*	

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
643729: *Integration and Battle Management*	-	0.000	89.072	126.661	0.000	126.661	153.462	44.169	37.259	38.600	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including space-based battle management and a ground support infrastructure. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver space-based command and control, tasking, mission processing and dissemination capabilities, as well as an integrated, resilient network of ground support capabilities, to U.S. joint warfighting forces in bi-annual tranches, beginning in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Integration and Battle Management	0.000	89.072	126.661
Description: Deliver capabilities to U.S. joint warfighting forces in two-year enhanced capability tranches, beginning in FY 2022. Products include but are not limited to performing trade studies, technical analyses, or modeling and simulation; identifying and maturing enabling technologies; defining and conducting ground-based and on-orbit risk reduction demonstrations, prototyping hardware or software systems; and exploring novel concepts for future warfighting capabilities augmented by a resilient proliferated Low Earth Orbit (pLEO) satellite architecture.			
FY 2023 Plans: Tranche 0: - Complete launch vehicle integration and services. - Complete design, integration, and installation of ground operations center. - Conduct on-orbit command and control operations from ground operations center. - Begin conducting Capstone demonstrations. Tranche 1 - Complete the Critical Design Review (CDR) for the development of the Network Operations Centers. - Begin formulating requirements for Operations, Maintenance, and Sustainment of the Network Operations Centers.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643729 / *Integration and Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Establish analytical baseline for systems, mission and value engineering analyses. - Begin development of battle management command, control, and communications (BMC3) Layer Application Factory software to enable common data processing and fusion across all Transport Layer satellites. Tranche 2 - Conduct early risk reduction studies designed to explore opportunities for ground capability expansion, the design and construct of a Government Owned, Contractor Operated (GOCO) Test and Checkout Center (TCC) for future tranche integration, and alternate acquisition models based on emerging ground requirements. - Identify extensions and/or additional capabilities required in SDA Network Operations Centers for ground command and control of Tranche 2 assets. ***FY 2024 Plans:*** Tranche 0 - Continue on-orbit command and control operations from ground operations center. - Continue to coordinate post-Capstone demonstrations and experimentation with warfighters and partner organizations. - Demonstrate on-orbit data fusion to inform command and control operations. Tranche 1 - Define CONOPS and complete validation and verification for Tranche 1 for Ground based mission segment and define the GOCO architecture. - Finalize Network Operations Center modifications at Redstone Arsenal and Grand Forks for Tranche 1 satellite operations. - Develop Ground Segment Ground Entry Strategy, Operations Center Vision, and Basing Actions and prepare for readiness tests. - Leverage Tranche 0 radio frequency (RF) antenna options and identify potential to increase antenna capability. - Fund mission unique hardware and integration of the Tranche 1 space vehicles on the National Security Space Launch (NSSL) Launch vehicles. - Coordinate software-in-the-loop (SIL) and hardware-in-the-loop (HIL) activities to ensure compatibility and interoperability of Factory with Operations and Integration (O&I). - Continue development of the O&I Operations, Maintenance, and Sustainment ground operations center. - Continue development of the Application Factory that will serve as the foundation of the BMC3 Layer. - Complete the CDR of the BMC3 Layer Application Factory software that enables common data processing and fusion across all Transport Layer satellites. - Establish design standards to ensure forward compatibility and begin designing Applications for the BMC3 Layer Application Factory to processing data on-board the space vehicle. - Begin designing additional BMC3 Layer Applications for supporting additional services and users.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643729 / *Integration and Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Tranche 2 - Initiate Tranche 2 acquisition and source selection processes leading to ground integrator procurement instruments. - Award contract for the Tranche 2 ground integrator. - Begin formulating ground operations integration requirements for follow-on Tranches. - Continue development of the TCC as a standalone Space Networking Center with terrestrial connectivity, Ground Entry Points (GEP), and all other necessary infrastructure to support the full range of Tranche 2 system operations. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase between the FY 2023 amount and the FY 2024 amount supports an increase in Tranche 1 Operations and Integration activities in preparation for the Tranche 1 Launches, as well as Tranche 2 and BMC3 activities.			
Accomplishments/Planned Programs Subtotals	0.000	89.072	126.661

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTE 04 1206410SDA: *Space Technology Development and Prototyping/Project 003 Integration and Battle Management*	130.719	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

The worked performed in this PE continues efforts that were previously funded in RDT&E BA 4, PE 1206410SDA, in FY 2022.

D. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643729 / *Integration and Battle Management*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tranche 0	C/FFP	Various : Various	-	0.000		3.700	Mar 2023	0.000		0.000		0.000	Continuing	Continuing	-
Tranche 1 Integration and Ground Activities	Various	Various : Various	-	0.000		76.109	Feb 2023	116.605	Nov 2023	0.000		116.605	Continuing	Continuing	-
Tranche 2 Integration and Ground Activities	Various	TBD : TBD	-	0.000		9.263	Jun 2023	10.056	Mar 2024	0.000		10.056	Continuing	Continuing	-
		Subtotal	-	0.000		89.072		126.661		0.000		126.661	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		89.072		126.661		0.000		126.661	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643729 / *Integration and Battle Management*

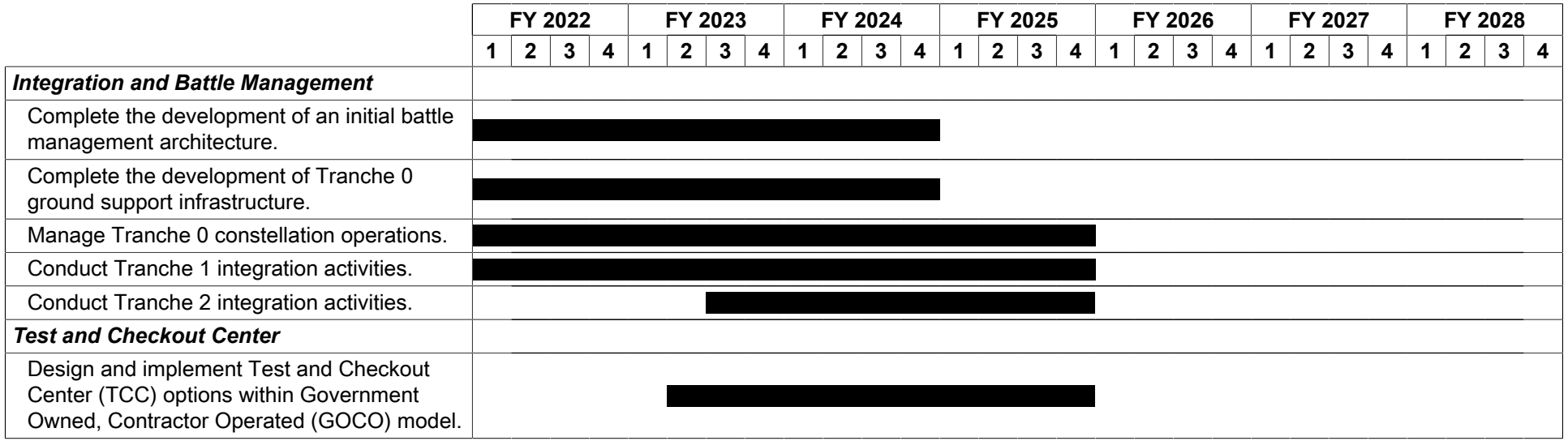

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643729 / *Integration and Battle Management*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Integration and Battle Management				
Complete the development of an initial battle management architecture.	1	2022	4	2024
Complete the development of Tranche 0 ground support infrastructure.	1	2022	4	2024
Manage Tranche 0 constellation operations.	1	2022	4	2025
Conduct Tranche 1 integration activities.	1	2022	4	2025
Conduct Tranche 2 integration activities.	3	2023	4	2025
Test and Checkout Center				
Design and implement Test and Checkout Center (TCC) options within Government Owned, Contractor Operated (GOCO) model.	2	2023	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / *Space Technology Development and Prototyping*	Project (Number/Name) 643731 / *Transport*	

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
643731: *Transport*	-	0.000	845.442	1,847.944	0.000	1,847.944	1,436.717	1,692.449	1,888.045	1,855.856	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	21	-	21	105	-	-	-		

Note

FY 2024 RDT&E funding for PE 1206410SF, Program 643731 is in compliance with budgeted end items per the approved test strategy and FY 2023 Omnibus, Sec. 8059.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including low-latency tactical communication enabling beyond line of sight targeting and advanced missile tracking. SDA is orchestrating the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver low-latency data transport and alternate position, navigation, and timing capabilities to U.S. joint warfighting forces in bi-annual tranches, beginning in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Transport	0.000	796.242	1,809.964

Description: Rapidly develop, deploy and demonstrate prototypes that enable a resilient and unified military data transport layer, sensor capabilities, and alternate position, navigation, and timing (APNT) capabilities enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will define, demonstrate, and deliver the architectures and standards necessary to rapidly prototype and field new satellite capabilities in LEO.

FY 2023 Plans:

Tranche 0:
- Complete launch of Transport and Tracking satellites.
- Complete on-orbit flight operations and verify satellite-to-satellite and satellite-to-ground communications on Tranche 0 satellites.
- Conduct Tranche 0 Capstone operational demonstration.
- Leverage Tranche 0 satellites as a testbed for investigating additional capabilities after Capstone demonstration.
- Integrate additional interoperable massless payload capabilities within Tranche 0 satellites.

Tranche 1:
- Finalize design through Critical Design Review (CDR) for the Transport Layer Tranche 1 space vehicles.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643731 / *Transport*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Investigate interoperable payloads for optical inter-satellite links for communications, radio-frequency (RF) communications, and Link-16 tactical data link operations. - Begin space vehicle assembly, integration, and test (AI&T). - Continue ground systems site development, integration, and installation in advance of operations and integration efforts at Tranche 1 Network Operations Centers under development at Grand Forks AFB, ND and Redstone Arsenal, AL. - Complete design through CDR for the Operations and Integration Layer Tranche 1 ground operations centers. - Continue hardware development and risk reduction for battle management command, control, and communications (BMC3) modules for Transport Layer satellites. Tranche 2: - Leverage lessons learned and accomplishments from Tranches 0 and 1 to inform space vehicle, ground, and interoperability design requirements for Tranche 2 and start development of the next set of capabilities. - Determine minimum viable capability for Tranche 2 Transport, tactical satellite communications and future tactical data link constellation components. - Receive concurrence from the warfighting community on performance requirements for Tranche 2. - Initiate Tranche 2 acquisition and source selection processes leading to space vehicle vendor procurement instruments. - Award initial Tranche 2 space vehicle contracts. ***FY 2024 Plans:*** Tranche 0 - Continue to leverage Tranche 0 satellites as a testbed for investigating additional capabilities after Capstone demonstrations. - Integrate additional interoperable massless payload capabilities within Tranche 0 satellites. Tranche 1 - Finish AI&T of Transport space vehicles in preparation for Transport space vehicle launches. - Determine readiness of hardware and software procedures to support the start of testing. - Determine readiness to ship flight hardware, software, and support equipment to launch site and launch site readiness to receive. - Evaluate the space flight worthiness of the space vehicle and launch vehicle flight hardware prior to integration, encapsulation, and upper stage mate. - Determine readiness for launch. - Ensure readiness to conduct launch and early orbit phase operations, transition to nominal operations, and provide continuing space vehicle and enterprise management and sustainment. - Begin launching the T1 Transport Layer space vehicles.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643731 / *Transport*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Continue hardware development and risk reduction for BMC3 modules for Transport Layer satellites. Tranche 2 - Continue designing the Tranche 2 Transport Layer space vehicles based on requirements and lesson learned from Tranche 0 and 1 space vehicles, ground system, and interoperability requirements. - Award Tranche 2 space vehicle contracts. - Continue establishing constellation design requirements for incorporating additional tactical data links into the Transport Layer, likely via the incorporation of Transport Layer vehicles hosting alternate data links. - Complete Preliminary Design Review (PDR) and order long-lead items. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase between the FY 2023 amount and the FY 2024 amount reflects the concurrent execution of Tranche 0 to include capstone demonstrations, the significant increase in Tranche 1 activities to support launches, and Tranche 2 activities.			
Title: Classified Program ***Description:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2023 Plans:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2024 Plans:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Due to the classified nature of this project, specific details are available at a higher classification level.	0.000	20.200	37.980
Accomplishments/Planned Programs Subtotals	0.000	816.442	1,847.944

	FY 2022	FY 2023
Congressional Add: Laser Communication Downlink Systems	0.000	25.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Develop ground, maritime and air optical communications terminals, leveraging the technical and manufacturing maturity of the current optical communications vendor market to quickly provide this capability at a lower cost and with a shorter deployment timeline. Demonstration spacecraft will be updated		

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643731 / *Transport*

	FY 2022	FY 2023
to downlink to mobile (ground, sea, and airborne) receivers that are ruggedized, and with the size, weight and power usable for mobile forces and in compliance with standards set forth by SDA.		
Congressional Add: Space Architecture Experimental Testbed ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Establish a Test & Checkout Center (TCC) as a standalone Space Networking Center with terrestrial connectivity, Ground Entry Points (GEP), and all other necessary infrastructure to support the full range of T2 system operations. The TCC would be used for Space Vehicle initialization, functional checkout, orbit raising and phasing, interoperability validation, and all other on-orbit system readiness preparations, allowing for a deliberate and orderly crossover to the SDA Space Networking Centers at Grand Forks Air Force Base, ND and Redstone Arsenal, AL.	0.000	4.000
Congressional Adds Subtotals	0.000	29.000

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTE 04 1206410SDA: *Space Technology Development and Prototyping/ Project 001 Transport*	270.602	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

The worked performed in this PE continues efforts that were previously funded in RDT&E BA 4, PE 1206410SDA, in FY 2022.

D. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / *Space Technology Development and Prototyping*	Project (Number/Name) 643731 / *Transport*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Transport Tranche 0	Various	Various : Various	-	0.000		2.676	Mar 2023	7.700	Mar 2024	0.000		7.700	0.000	10.376	-
Transport Tranche 1	Various	Various : Various	-	0.000		595.515	Oct 2022	1,031.460	Nov 2023	0.000		1,031.460	0.000	1,626.975	-
Transport Tranche 2	Various	TBD : TBD	-	0.000		198.051	Sep 2023	770.804	Nov 2023	0.000		770.804	0.000	968.855	-
Laser Communication Downlink System	Various	TBD : TBD	-	0.000		25.000	Mar 2023	0.000		0.000		0.000	0.000	25.000	-
Classified Project	Various	Various : TBD	-	0.000		20.200	Mar 2023	37.980	Nov 2023	0.000		37.980	0.000	58.180	-
Space Architecture Experimental Testbed	TBD	Not specified. : TBD	-	-		4.000	Jun 2023	-		-		-	0.000	4.000	-
		Subtotal	-	0.000		845.442		1,847.944		0.000		1,847.944	0.000	2,693.386	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		845.442		1,847.944		0.000		1,847.944	0.000	2,693.386	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643731 / *Transport*

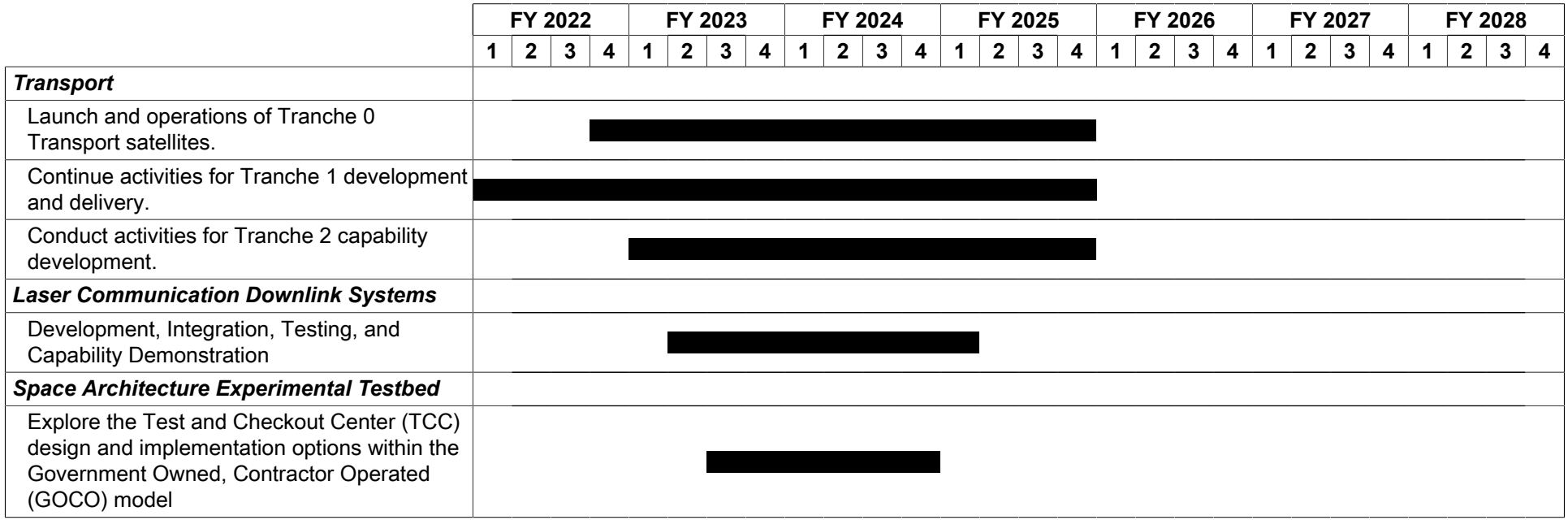

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643731 / *Transport*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Transport				
Launch and operations of Tranche 0 Transport satellites.	4	2022	4	2025
Continue activities for Tranche 1 development and delivery.	1	2022	4	2025
Conduct activities for Tranche 2 capability development.	1	2023	4	2025
Laser Communication Downlink Systems				
Development, Integration, Testing, and Capability Demonstration	2	2023	1	2025
Space Architecture Experimental Testbed				
Explore the Test and Checkout Center (TCC) design and implementation options within the Government Owned, Contractor Operated (GOCO) model	3	2023	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / *Space Technology Development and Prototyping*	Project (Number/Name) 643732 / *Sensing*	

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
643732: *Sensing*	-	0.000	81.308	106.702	0.000	106.702	36.503	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funds for the Tranche 1 Tracking Layer continue in RDT&E, Space Force, PE 1206446SF.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including advanced missile tracking and global surveillance enabling beyond-line-of-sight targeting. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver advanced missile tracking, global surveillance and surface moving target custody, and enhanced space domain awareness and deterrence capabilities to U.S. joint warfighting forces in bi-annual tranches, beginning in FY 2022.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Sensing	0.000	23.456	4.002
Description: Develop and demonstrate payload prototypes compatible with a proliferated Low Earth Orbit (pLEO) architecture. This effort will focus on developing and demonstrating sensors for beyond-line-of-sight targeting, space-to-space data links, space-to-tactical data links, and advanced missile warning capabilities to enable enhanced space domain awareness. On-orbit demonstrations will be tied to existing mission-specific ground infrastructure, when it exists. Ground infrastructure will be linked or developed to support payload integration and data processing.			
FY 2023 Plans: Tranche 0: - Conduct launch of Tranche 0 Tracking satellites. - Leverage operating Tranche 0 satellites to investigate potential developmental capabilities. - Characterize high-resolution background clutter in wide range of spectral bands. - Collect data to inform medium field of view (MFOV) and wide field of view (WFOV) trades. - Demonstrate WFOV performance and cost that enables proliferation. - Conduct Tranche 0 capstone operational demonstration to validate key PWSA mission capabilities including two-dimensional (2D) tracks generated on-board, passed to Ground and to Tranche 0 space vehicles for three-dimensional (3D) fusion, and 3D tracks disseminated to user interface.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643732 / *Sensing*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Tranche 1: - Integrate commercial and mission partners' satellite constellations and/or data into the PWSA to enable mission partner data to move directly into the hands of the warfighter via PWSA-enabled tactical data links. This investment creates synergy between mission partners' (commercial and government) investments in Intelligence, Surveillance, and Reconnaissance (ISR) satellite constellations, and the PWSA Transport Layer. ***FY 2024 Plans:*** Tranche 0: - Continue to leverage operating Tranche 0 satellites to investigate potential developmental capabilities. - Continue to characterize high-resolution background clutter in wide range of spectral bands. - Continue to collect data to inform medium field of view (MFOV) and wide field of view (WFOV) trades. - Continue to demonstrate WFOV performance and cost that enables proliferation. Tranche 1: - Continue to integrate commercial and mission partners' satellite constellations into the PWSA. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease between the FY 2023 and the FY 2024 amount reflects the shift from Tranche 0 to Tranche 1 activities. Funds for the Tranche 1 Tracking Layer continue in RDT&E, Space Force, PEs 1206446SF and 1206448SF.			
Title: Sabre	0.000	21.252	64.000
Description: Sabre is a joint partnership executed/managed by Space Development Agency (SDA) and supported by the Office of the Secretary of Defense (OSD) Test Resource Management Center (TRMC) and United States Army Futures Command. This project will provide a three-space vehicle demonstration for space-based monitoring of telemetry data transmitted by vehicles under test (VUTs, missiles or interceptors) during flight testing. The Sabre Telemetry Relay payload module onboard the SDA NExT Low Earth Orbit (LEO) satellites will receive telemetry from VUTs during flight and relay it to range controllers on the ground. Optical inter-satellite links facilitate timely relay. Sabre will demonstrate the ability to augment or replace DoD's decades-long approach of staging ships and airplanes along ground tracks of VUTs for the purpose of telemetry collection, tracking, and flight safety. In addition to reducing infrastructure cost, Sabre will also greatly enhance range test flexibility and improve test execution operational Security. The Sabre Telemetry Relay flight demonstration will leverage previously funded OSD TRMC and U.S. Army investments for payload design. This project will also consider other missions of opportunity to enhance Joint Warfighter capabilities in LEO.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643732 / *Sensing*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
FY 2023 Plans: - Conduct mission analysis and integration. - Initiate procurement of payloads. - Engineer the mission ground segment. - Develop payload software. - Architect flight demonstrations. - Define space to ground interfaces. ***FY 2024 Plans:*** - Deliver and integrate Sabre payloads with NExT SVs. - Complete environmental testing. - Complete system Space to Ground Verification Test. - Complete system Network Verification Test. - Complete system Encryption Verification Test. - Complete Ground Readiness Review. - Conduct flight readiness review. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase between the FY 2023 and the FY 2024 amount reflects payload development complexities with antennas to support TRMC's performance requirements as well as continuing efforts to prepare spacecraft for launch and test.			
Title: Classified Program ***Description:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2023 Plans:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2024 Plans:*** Due to the classified nature of this project, specific details are available at a higher classification level. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Due to the classified nature of this project, specific details are available at a higher classification level.	0.000	36.600	38.700
Accomplishments/Planned Programs Subtotals	0.000	81.308	106.702

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
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C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTE 04 1206410SDA: *Space Technology Development and Prototyping / Project 002 Sensing*	758.906	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643732 / *Sensing*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tracking Tranche 0	C/FFP	Various : Various	-	0.000		1.626	Apr 2023	0.213	Nov 2023	0.000		0.213	Continuing	Continuing	-
Transport Sensing Activities	Various	Various : Various	-	0.000		21.830	Apr 2023	3.789	Mar 2024	0.000		3.789	Continuing	Continuing	-
Sabre	C/TBD	TBD : TBD	-	0.000		21.252	Jan 2023	64.000	Nov 2023	0.000		64.000	Continuing	Continuing	-
Classified Program	C/TBD	Various : TBD	-	0.000		36.600	Jan 2023	38.700	Nov 2023	0.000		38.700	Continuing	Continuing	-
		Subtotal	-	0.000		81.308		106.702		0.000		106.702	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		81.308		106.702		0.000		106.702	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643732 / *Sensing*

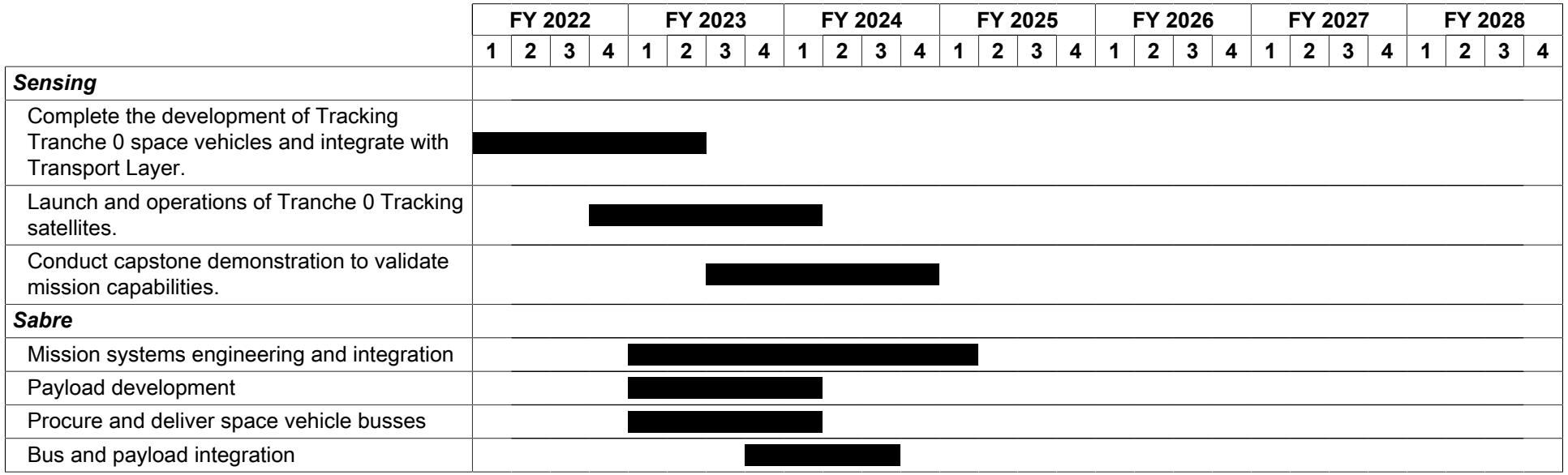

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206410SF / *Space Technology Development and Prototyping*	**Project (Number/Name)** 643732 / *Sensing*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Sensing				
Complete the development of Tracking Tranche 0 space vehicles and integrate with Transport Layer.	1	2022	2	2023
Launch and operations of Tranche 0 Tracking satellites.	4	2022	1	2024
Conduct capstone demonstration to validate mission capabilities.	3	2023	4	2024
Sabre				
Mission systems engineering and integration	1	2023	1	2025
Payload development	1	2023	1	2024
Procure and deliver space vehicle busses	1	2023	1	2024
Bus and payload integration	4	2023	3	2024