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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203940SF *I Space Situation Awareness Operations*

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	-	62.795	90.678	264.966	0.000	264.966	145.957	133.893	106.442	108.508	Continuing	Continuing
673940: *Space Data Fusion*	-	62.795	58.027	73.665	0.000	73.665	70.718	78.660	80.719	74.604	Continuing	Continuing
673941: *Unified Data Library (UDL)*	-	0.000	29.507	187.370	0.000	187.370	72.123	52.016	22.441	30.503	Continuing	Continuing
67A018: *SF Weather Services Research*	-	0.000	3.144	3.931	0.000	3.931	3.116	3.217	3.282	3.401	0.000	20.091

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information/data integration capabilities within the SDA network while companion program element 1206425SF, Space Situational Awareness Systems, develops new network sensors and associated information integration capabilities across the network. Activities funded in this program (1203940SF) focus on surveillance of objects in earth orbit and beyond to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering. As a whole, this program upgrades, modifies, modernizes, operationalizes, fields, operates, and maintains sensors and information integration capabilities for an integrated, end-to-end SDA architecture that provides critical national security space solutions on tactical operational timelines.

The Space Data Fusion project (673940) develops and/or upgrades SDA data/data exploitation capabilities, to include Global Sensor Watch (GSW), TAPOUT, and Space Surveillance Telescopes, and provides Service Life Extension Programs (SLEPs) and pre-planned product improvement efforts to operational SDA capability. GSW, in partnership with Australia's Department of Defense, provides an integrated, end-to-end, SDA tip & cue capability that implements a resilient architecture providing overlapping, assured, and viable surveillance options for executing event response, SDA data processing at multiple classification levels, and automated, worldwide, cross-sensor tipping & cueing. TAPOUT is a tactical SDA system which consists of a Hardware Layer, a Data Layer, and an Application layer. The Space Surveillance Telescope (SST) provides rapid un-cued search, detection and tracking of dim objects in deep space, collecting data on all viewable objects in the Indio-Pacific region.

The SDF project (673940) is supported by, and supports, the Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) cell. The JCO's mission is to provide persistent and rapid SDA coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. SDF commercial data

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*

buys beyond protect and defend missions support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices.

The Unified Data Library project (673941) supports integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by on-boarding new data sets, directly connecting to SDA sensors, expanding data services, federating between enterprise data lakes, expanding defensive cyber operations capabilities, adding non-metric data to the SDA marketplace, continuing to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, purchase commercial data and services to support USSPACECOM operations, allow optimized data flow for use of existing SDA capability, and provide access to new commercial SDA innovations that will enable the broader SDA mission.

The SF Weather Services Research project (67A018) funds the operational development necessary to acquire, sustain, and modernize Air Force Weather Service (AFWS) capabilities in support of the 2018 National Defense Strategy. AFWS provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. AFWS provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental intelligence in support of decision makers to gain the asymmetric advantage during the full spectrum of air and space combat operations.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or re-purpose existing capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awareness Operations*		
B. Program Change Summary ($ in Millions)	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**
Previous President's Budget	64.763	80.903	79.710	0.000	79.710
Current President's Budget	62.795	90.678	264.966	0.000	264.966
Total Adjustments	-1.968	9.775	185.256	0.000	185.256
• Congressional General Reductions	0.000	-0.225			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	10.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.968	0.000			
• Other Adjustments	0.000	0.000	185.256	0.000	185.256

Change Summary Explanation

FY 2023: +10.000 Congressional add for Unified Data Library.

FY 2024: -0.523 to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity.

FY 2024: +35.960 increase to Unified Data Library to accelerate integration of space data and enable real-time access to interoperable data in support of warfighting operations.

FY 2024: +17.90 increase to Space Data Fusion for commercial data buys beyond Protect and Defend missions.

FY 2024: +131.40 increase to Unified Data Library for expansion of sensor communication upgrades. Upon FY 2024 funds appropriation, funding will be executed within Project 673940 (Space Data Fusion).

FY 2024: +0.519M inflation increase for non-pay and non-fuel purchases.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awarenes s Operations*	Project (Number/Name) 673940 / *Space Data Fusion*	

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
673940: *Space Data Fusion*	-	62.795	58.027	73.665	0.000	73.665	70.718	78.660	80.719	74.604	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Data Fusion project (673940) develops and/or upgrades SDA data/data exploitation capabilities, to include Space Surveillance Telescopes, Global Sensor Watch (GSW), TAPOUT, and provides Service Life Extension Programs (SLEPs) and pre-planned product improvement efforts to operational SDA capability.

GSW provides an integrated, end-to-end, SDA tip & cue capability that implements a resilient architecture providing overlapping, assured, and viable surveillance options for executing event response, SDA data processing at multiple classification levels, and automated, worldwide, cross-sensor tipping & cueing. Efforts directly enable support for Space Command & Control (C2) by developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of both space objects of interest and new foreign launches; developing & deploying advanced data analytics, machine learning, & artificial intelligence capabilities for rapid indication & warning; enhancing space environmental monitoring solutions; integrating and optimizing access to United States Government (USG), coalition, commercial, academic, intelligence community (IC) & Missile Defense Agency sensors to better support the broader space enterprise; supporting USSPACECOM operations and training exercises; leading trials, testing and training campaigns to test & optimize capabilities in support of the broader space kill chain; enhancing sensor performance to close the solar exclusion gap by leveraging modern technology and commercial & IC sensors for greater space domain coverage; and improving legacy communication paths through efforts such as upgrading legacy sensor communications and developing a redundant, terrestrial and space-based mesh communication network to enable a more complex space enterprise capability.

The mission of the current Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) as of Aug 2022 is to provide persistent and rapid SDA coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. The JCO augments JTF-SD tracking data, real-time visual magnitude, and real-time passive radio frequency (RF) using commercial capabilities. This funding will be used to support to a variety of other commercial mission sets beyond the protect and defend capabilities.

The Commercial Data Buys Beyond Protect and Defend Major Thrust Area will support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. As data ingress and egress grow, incorporate additional associated cloud-hosting, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization beyond protect and defend.

Provide support to JCO missions beyond the initial Protect & Defend capabilities. Review, adjudicate, and integrate initial capabilities with multiple commercial providers. These capabilities are planned to include: Geosynchronous Equatorial Orbit (GEO) spaceflight safety; Electromagnetic interference (EMI) detection and geolocation support for Positioning, Navigation and Timing (PNT); as well as space-based SDA augmentation from commercial providers. The expanding capabilities will build system resiliency and situational awareness. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and

prototyping, integration and test of C2, resiliency measures and mission partner interfaces, and office support etc. Towards the close of FY24, the desired end state is the expectation of three new capabilities in deployment.

The Space Surveillance Telescope (SST) provides rapid un-cued search, detection and tracking of dim objects in deep space, collecting data on all viewable objects in the Indio-Pacific region. As a combined program with Australia's Department of Defense, per the 2013 US Secretary of Defense (USSECDEF) and the Australian Defence Minister (AUSMINDEF) SST Partnership Memorandum of Understanding (MOU), SST improves detection and characterization of friendly and enemy military space activities; improves orbital safety of flight during maneuver, separation, conjunction assessment, and proximity operations; and improves support to defensive and offensive counterspace operations.

TAPOUT is a tactical SDA system which consists of a Hardware Layer, a Data Layer, and an Application layer. The planned Hardware Layer is the result of 2 years of prototyping, analysis, and collaboration with industry. 16 sites have been identified to field daytime/nighttime capable ground based sensors which will be remotely commanded and controlled through the Data and Application layers. The Data Layer consists of multi-source data feeds which are aggregated at a classified level where predictive threat warning occurs. The Application Layer consists of a series of Threat Warning and C2 applications at multiple classification levels which enable monitoring, and tactical command and control of the network.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

This program may include necessary civilian pay expenses required to manage, execute, and deliver the weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Global Sensor Watch (GSW)	43.207	58.027	55.765
Description: GSW provides an integrated SDA architecture to deliver a resilient, high capacity, sensitive, timely, and comprehensive global ground and space-based network of sensors that cover the geocentric and cislunar orbital regimes. GSW is a resilient, automated cross-sensor tip and cue capability that provides overlapping, assured, and viable surveillance options for executing event response, and SDA data processing at multiple classification levels. In order to ensure the successful implementation of a resilient, overlapping, assured, and viable architecture, GSW includes the necessary sensor communication upgrades to ensure data transport/throughput, compatibility, and effects-based tactical tasking/response functionality. To do this, GSW enables highly available, non-stovepiped sensor planning, tasking, response, and data collection, as well as processed information/products/results to be stored, shared, and integrated for warfighting and analysis.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
GSW will continue coordination international work with Japanese Ministry of Defense (JMOD) on the development of classified C2 and SDA data sharing between a Japanese Space Operations Center (SpOC) and the U.S. Combined Space Operations Center (CSpOC). This will align Japanese sensors and United States Government (USG) and non-USG assets to provide critical national security space solutions on tactical operational timelines and continue to pursue security cooperations with other international partners such as Canada and the United Kingdom. ***FY 2023 Plans:*** Complete and operationalize GSW sensor comm upgrades for the first and second sites. Begin third phase of GSW software development for incorporating non-traditional data sources. GSW will continue to upgrade sensor communications to existing systems, including radar sites at Eglin Air Force Base, Florida, Upgraded Early Warning Radars (UEWR), Millstone Radar Site Massachusetts, Space Fence (Reagan Test site) assets, to facilitate GSW tip and cue operations. Modernize legacy sensor message formats and protocols for greater accuracy; support USSPACECOM operations and test activities to vet new SDA capability deliveries and concepts of operations for optimizing legacy SDA sensors operations; establish a SDA tip and cue sensor test asset; continue integration of GSW tip and cue software at existing radar sites; continue automation of manual SDA processes; develop classified C2 and SDA sharing with Japanese Space Operations Center (JSpOC) and expand Security Cooperation activities with mission partners in Canada and the United Kingdom; align USG and non-USG assets to provide critical national security space solutions on tactical operational timelines; and accomplish satellite tracking, space object identification (SOI), tracking, and cataloging of data collected from global assets. TAPOUT will 1) begin operations immediately with existing sensors, 2) begin procuring and fielding TAPOUT sensors, especially long lead items that require early purchase orders to meet the 24 month Fully Operational Capability (FOC) timeline, 3) improve external network interfaces, 4) enhance existing TAPOUT Threat Warning capabilities and tactical messaging, and 5) provide training. Additionally, FY 2023 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control (C2), resiliency measures and mission partner interfaces via network and network modernization, space test/combat range events, and office support etc. ***FY 2024 Plans:*** Continue GSW sensor communication upgrades (SCU) for the remaining sites of existing systems, including radar sites at Eglin Air Force Base, Florida, Upgraded Early Warning Radars (UEWR), Millstone Radar Site Massachusetts, and Reagan Test Site assets, to facilitate GSW tip and cue operations. Complete mesh network prototype demonstration for essential communications and resilient data transport capability. Continuation of RTS work on radome and sensor array development on Ground Based Radar-Kwajalein work. Continuation of planning and upgrades to other SDA sensors, such as DARC Site 1, COBRA DANE, GEODSS, and Ascension Site C (depending on Ascension status). Integrate MDA to augment SSN connectivity.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Continue GSW software development for incorporating non-traditional data sources and efforts to modernize legacy sensor message formats and protocols for greater accuracy. Continue integration of GSW tip and cue software at existing radar sites. Continue automation of manual SDA processes. Support USSPACECOM operations and test activities to vet new SDA capability deliveries and concepts of operations for optimizing legacy SDA sensors operations. Establish a SDA tip and cue sensor test asset. Complete Mission-driven Autonomous Collaborative Heterogeneous Intelligent Network Architecture (MACHINA) integration with the Air Force Research Lab (AFRL) Tako telescope network. Complete MACHINA integration with the secret-level Dynamic Optical Telescope System (DOTS) in Maui, and other sensors. Complete initial ops fielding for dynamic tasking input compatibility with mission partner Concept C mission system. Complete fielding of launch custody and high-rate-revisit capabilities at Millstone, Haystack, and ALTAIR radars. Continue developing classified C2 and SDA sharing with the Japanese Space Operations Center (JSpOC) and expand Security Cooperation activities with other International mission partners, such as Canada and the United Kingdom. TAPOUT will continue 1) operations with existing sensors, 2) procuring and fielding TAPOUT sensors, especially long lead items that require early purchase orders to meet the FOC timeline, 3) improve external network interfaces, 4) enhance existing TAPOUT Threat Warning capabilities and tactical messaging, and 5) provide training. Additionally, FY 2024 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control (C2), resiliency measures and mission partner Interfaces via network and network modernization, space test/combat range events, and office support etc. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 increased due to additional modernization efforts.			
Title: Commercial Data Buys Beyond Protect and Defend	-	0.000	17.900
Description: The mission of the current Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) as of Aug 2022 is to provide persistent and rapid Space Domain Awareness (SDA) coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. The JCO augments JTF-SD tracking data, real-time visual magnitude,			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
and real-time passive radio frequency (RF) using commercial capabilities. This funding will be used to support a variety of other commercial mission sets beyond the protect and defend capabilities. ***FY 2023 Plans:*** N/A. ***FY 2024 Plans:*** Provide support to JCO missions beyond the initial Protect & Defend capabilities. Review, adjudicate, and integrate initial capabilities with multiple commercial providers. These capabilities are planned to include: Geosynchronous Equatorial Orbit (GEO) spaceflight safety; Electromagnetic interference (EMI) detection and geolocation support for Positioning, Navigation and Timing (PNT); as well as space-based SDA augmentation from commercial providers. The expanding capabilities will build system resiliency and situational awareness. Support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. As data ingress and egress grow, incorporate additional associated cloud-hosting, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization beyond protect and defend, with the goal of deploying three new capabilities by the end of FY 2024. Activities may include, but are not limited to studies, technical analysis, risk reduction experiments and prototyping, integration and test of C2, resiliency measures and mission partner interfaces, and office support etc. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 increased due to addition of Commercial Data Buys Beyond Protect and Defend effort.			
Title: Space Data Fusion/Unified Data Library (UDL) ***Description:*** Space Data Fusion develops Unified Data Library (UDL) capabilities to support integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by onboarding new data sets, expand data services, expand defensive cyber operations capabilities, add non-metric data to the SDA marketplace, continue to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, and purchase commercial data and services to support USSPACECOM operations, allow optimized data flow for use of existing SDA capability, and provide access to new commercial SDA innovations that will enable the broader SDA mission. ***FY 2023 Plans:***	17.788	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
N/A ***FY 2024 Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Title: Space Surveillance Telescope (SST) ***Description:*** Space Surveillance Telescope (SST) provides rapid un-cued search, detection, and tracking of dim objects in deep space, collecting data on all viewable objects in the Indo-Pacific region. As a combined program with Australia's Department of Defence, per the 2013 USSECDEF and AUSMINDEF SST Partnership MOU, SST improves detection and characterization of friendly and enemy military space activities; improves orbital safety of flight during maneuver, separation, conjunction assessment, and proximity operations; and improves support to defensive and offensive counterspace operations addressing critical space domain awareness gaps. ***FY 2023 Plans:*** N/A ***FY 2024 Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A	1.800	0.000	0.000
Accomplishments/Planned Programs Subtotals	62.795	58.027	73.665

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
• SPAF 01 SPCMOD: *Space Mods*	0.000	8.589	2.000	-	2.000	-	-	-	-	0.000	10.589

Remarks

D. Acquisition Strategy

The acquisition strategies for GSW include a mix of modifications to existing Air Force or Space Force contracts and directing funds to other Air Force, Space Force, or DoD organizations for contract support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*	

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
GSW Integration (Dev, Sensor, C2)	Various	MIT/LL : Lexington, MA	-	-		-		18.678	Nov 2023	-		18.678	Continuing	Continuing	-
GSW Sensor Comm Upgrades	Various	Various : Various	-	16.423	Mar 2022	22.865	Mar 2023	26.464	Nov 2023	-		26.464	Continuing	Continuing	-
GSW Exploitation	Various	MIT/LL : Lexington, MA	-	11.488	Nov 2021	16.150	Mar 2023	-		-		-	0.000	27.638	-
GSW Dynamic Tasking	Various	Various : Various	-	9.213	Dec 2021	9.850	Dec 2022	-		-		-	0.000	19.063	-
GSW SW Development 3	Various	Sandia National Labs : Albuquerque, NM	-	1.000	Nov 2021	1.337	Nov 2022	-		-		-	0.000	2.337	-
UDL Data Science WG	C/CPAF	L3 Harris : Colorado Springs, CO	-	-		-		-		-		-	0.000	0.000	-
GSW Commercial Data Buys Beyond Protect and Defend	Various	Various : Colorado Springs, CO	-	-		-		15.740	Oct 2023	-		15.740	Continuing	Continuing	-
UDL Commercial Data	C/CPAF	Various : Various	-	1.534	Jan 2022	-		-		-		-	0.000	1.534	-
UDL Development/Data Onboarding	Various	Various : Various	-	6.734	Dec 2021	-		-		-		-	0.000	6.734	-
UDL Cloud Hosting	Various	Not specified. : TBD	-	6.193	Mar 2022	-		-		-		-	0.000	6.193	-
Space Surveillance Telescope	Various	Various : Exmouth, Australia	-	1.800	Oct 2021	-		-		-		-	0.000	1.800	-
TAPOUT	MIPR	AFRL : Various	-	-		2.425	Oct 2022	2.425	Nov 2023	-		2.425	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		-		2.578	Oct 2023	-		2.578	Continuing	Continuing	-
		Subtotal	-	54.385		52.627		65.885		-		65.885	Continuing	Continuing	N/A

Management Services ($ 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
A&AS	Various	Various : Colorado Springs, CO	-	6.610	Dec 2021	2.650	Dec 2022	4.700	Nov 2023	-		4.700	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awarenes s Operations*	Project (Number/Name) 673940 / *Space Data Fusion*	

Management Services ($ 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
FFRDC	RO	Various : Colorado Springs, CO	-	1.500	Nov 2021	2.000	Nov 2022	2.700	Nov 2023	-		2.700	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	0.300	Dec 2021	0.750	Dec 2022	0.380	Nov 2023	-		0.380	Continuing	Continuing	-
		Subtotal	-	8.410		5.400		7.780		-		7.780	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	62.795		58.027		73.665		-		73.665	Continuing	Continuing	N/A

Remarks

The Space Data Fusion project has minimal organic resources. The FY 2024 Management Services includes project management support for efforts to connect the SDA enterprise via a mesh network and establish secure connectivity between the US and Allied Space Operations Centers.

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

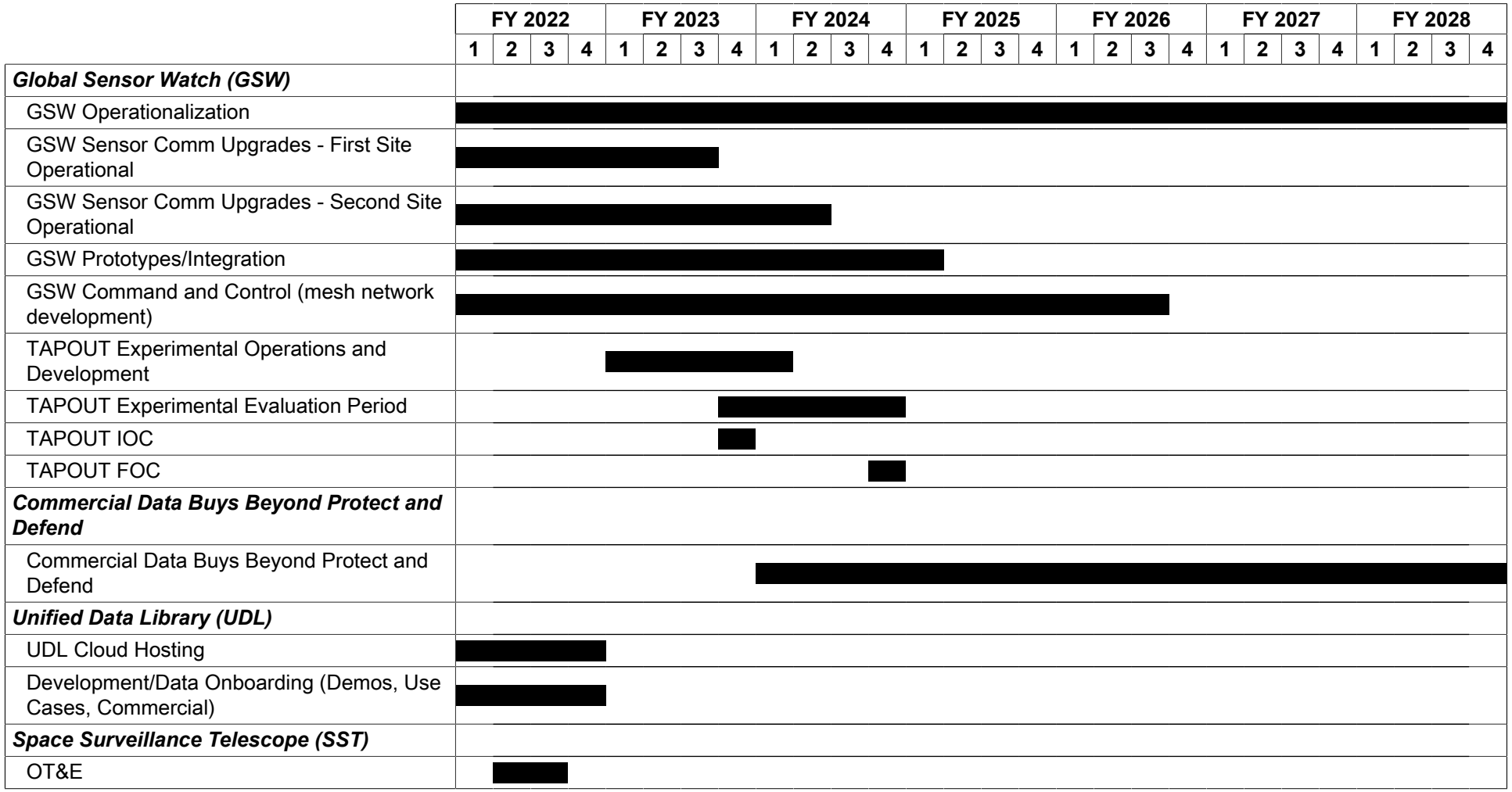

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673940 / *Space Data Fusion*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Global Sensor Watch (GSW)				
GSW Operationalization	1	2022	4	2028
GSW Sensor Comm Upgrades - First Site Operational	1	2022	3	2023
GSW Sensor Comm Upgrades - Second Site Operational	1	2022	2	2024
GSW Prototypes/Integration	1	2022	1	2025
GSW Command and Control (mesh network development)	1	2022	3	2026
TAPOUT Experimental Operations and Development	1	2023	1	2024
TAPOUT Experimental Evaluation Period	4	2023	4	2024
TAPOUT IOC	4	2023	4	2023
TAPOUT FOC	4	2024	4	2024
Commercial Data Buys Beyond Protect and Defend				
Commercial Data Buys Beyond Protect and Defend	1	2024	4	2028
Unified Data Library (UDL)				
UDL Cloud Hosting	1	2022	4	2022
Development/Data Onboarding (Demos, Use Cases, Commercial)	1	2022	4	2022
Space Surveillance Telescope (SST)				
OT&E	2	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awarenes s Operations*	Project (Number/Name) 673941 / *Unified Data Library (UDL)*	

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
673941: *Unified Data Library (UDL)*	-	0.000	29.507	187.370	0.000	187.370	72.123	52.016	22.441	30.503	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Unified Data Library (UDL) supports the integration, exploitation and delivery of Space Domain Awareness (SDA) data sources for Command and Control (C2) and battle management of space forces. It focuses on enabling data sharing, establishing the data architecture required to aggregate multi-sensor data for broader use at different clearance levels, transforming any-source data into normalized, usable information via data exploitation tools, followed by data hand off to Battle Management Command and Control mission systems to support actual space operations. UDL efforts include purchasing commercial SDA data and services in support of US Space Command (USSPACECOM) operations. The UDL will directly connect to USSF owned and collateral sensors with modernized interfaces and transport options to broadly expose data. The UDL will be the single source for accessing and managing all data in support of the USSF, providing a central location to find and access data, enabling superior analytics.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Center (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Unified Data Library (UDL)	-	29.507	55.970
Description: UDL capabilities support integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by on-boarding new data sets, directly connecting to SDA sensors, expanding data services, federating between enterprise data lakes, expanding defensive cyber operations capabilities, adding non-metric data to the SDA marketplace, continuing to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, purchasing commercial data and services to support USSPACECOM operations, allowing optimized data flow for use of existing SDA capability, and providing access to new commercial SDA innovations that will enable the broader SDA mission. The UDL enables analysis across the global space enterprise, as well as for Space Force related exercise support, cross-domain solution services and integration of the legacy communications architecture with the UDL.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673941 / *Unified Data Library (UDL)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Continue to expand UDL infrastructure to support increased number of customers and operations across multiple security environments by initiating an Enterprise Support structure that allows for the UDL to be "franchised" and proliferated at different classification levels, yet still supported by a common source of system administration for all UDL instances located at any classification level. All commercial SDA related funding will result in the timely provision of accurate data and information to government customers. Fund the expansion of defensive cyber operations capability, to include persistent red team analysis of broader UDL architecture. Overall, funds cover cloud hosting cost, data service development, security, system administration, data on boarding, Data as a Service platform for data ingestion, retention, processing, normalization, and analysis across the global space enterprise, Space Force related exercise support, cross domain solution services and integration of the legacy communications architecture with the UDL. Additionally, FY 2023 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of C2, resiliency measures and mission partner interfaces, space test/combat range events, and office support etc. ***FY 2024 Plans:*** Continue to expand UDL infrastructure to maintain digital superiority, support an increased number of customers and operations across multiple security environments. Expand the enterprise support structure to allow the UDL to be "franchised" and proliferated at different classification levels, yet supported by a common source of system administration for all UDL instances located at any classification level through Special Access Programs (SAP). Implement federation with five other existing Department of the Air Force (DAF) enterprise data lakes to expose data for the purposes of advanced data analytics. Incorporate commercial SDA related data and information to increase data samples and improve overall SDA picture for government customers. Expand cybersecurity efforts to include persistent red team analysis of broader UDL architecture and ensure zero trust. Directly connect the UDL to 20+ additional Space Surveillance Network (SSN) and non-traditional SDA sensors with modernized interfaces and transport options. Streamline SDA related data flows as transport options are implemented to meet SDA objectives. Expand bi-directional data sharing capabilities between C2 Centers and SDA systems, implement bi-directional data sharing with coalition and allied partners, and implement edge computing platform strategies to enhance the situational awareness necessary to operate in a congested space domain. As data ingress and egress grow, a portion of the funds will cover associated cloud-hosting costs, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization. Analyze space warfighting data across the global space enterprise, as well as for Space Force related exercise support, cross-domain solution services and integration of the legacy communications architecture with the UDL.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673941 / *Unified Data Library (UDL)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Additionally, FY 2024 funding will enable the program to implement system redundancy and resiliency to meet availability objectives in support of analysis and planning requirements. Activities may include, but are not limited to studies, technical analysis, risk reduction experiments , prototyping, integration and test of C2, evaluation of resiliency measures and mission partner interfaces, space test/combat range events, and expanded program support. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 increased due to directly connecting additional USSF sensors to the UDL, establishing bi-directional data sharing with coalition and allied partners, and increasing cloud hosting services.			
Title: Expansion of sensor communications upgrades and data integration ***Description:*** Expand planned sensor communications upgrades and the integration of non-traditional and commercial data. Deliver data on tactically relevant timelines from sensor to UDL and C2. ***FY 2023 Plans:*** N/A ***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:*** FY 2024 increased due to a classified add which will expand planned upgrades and integration efforts.	-	0.000	131.400
Accomplishments/Planned Programs Subtotals	-	29.507	187.370

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

During the first half of FY 2024, the Unified Data Library will continue to leverage the existing prime General Services Administration (GSA) contract. In parallel, the UDL will define the acquisition strategy for the next generation of the platform in support of emerging mission requirements, leading to a follow-on contract planned for late FY 2024, just prior to the expiration of the current GSA contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673941 / *Unified Data Library (UDL)*

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
UDL Data Science Working Group	C/CPFF	L3Harris : Colorado Springs, CO	-	-		-		0.600	Jan 2024	-		0.600	Continuing	Continuing	-
UDL Commercial Data	C/Various	Various : Various	-	-		3.141	Jan 2023	3.000	Jan 2024	-		3.000	Continuing	Continuing	-
UDL Development/Data Onboarding	C/Various	Various : Various	-	-		7.431	Dec 2022	27.027	Dec 2023	-		27.027	Continuing	Continuing	-
UDL Cloud Hosting	C/Various	Various : Various	-	-		10.723	Mar 2023	15.690	Mar 2024	-		15.690	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		0.000	Oct 2022	1.950	Oct 2023	-		1.950	Continuing	Continuing	-
Technical Mission Analysis	RO	Various : Various	-	-		1.331	Nov 2022	1.122	Nov 2023	-		1.122	Continuing	Continuing	-
Expansion of sensor comm upgrades and data integration	TBD	TBD : TBD	-	-		-		131.400	Jan 2024	-		131.400	Continuing	Continuing	-
		Subtotal	-	-		22.626		180.789		-		180.789	Continuing	Continuing	N/A

Management Services ($ 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
A&AS	Various	Various : Colorado Springs, CO	-	-		4.273	Dec 2022	3.931	Dec 2023	-		3.931	Continuing	Continuing	-
FFRDC	RO	Various : Colorado Springs, CO	-	-		2.518	Nov 2022	2.550	Nov 2023	-		2.550	Continuing	Continuing	-
Other Support	C/Various	Various : Colorado Springs, CO	-	-		0.090	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	-
		Subtotal	-	-		6.881		6.581		-		6.581	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		29.507		187.370		-		187.370	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673941 / *Unified Data Library (UDL)*

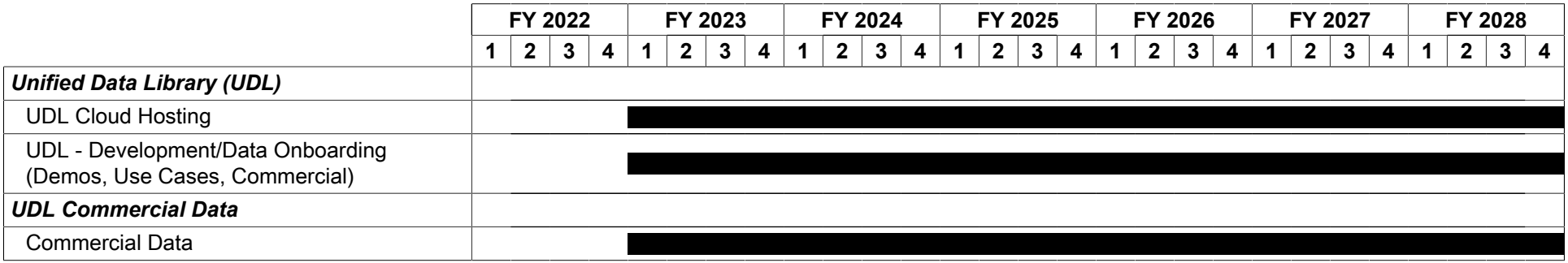

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 673941 / *Unified Data Library (UDL)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Unified Data Library (UDL)				
UDL Cloud Hosting	1	2023	4	2028
UDL - Development/Data Onboarding (Demos, Use Cases, Commercial)	1	2023	4	2028
UDL Commercial Data				
Commercial Data	1	2023	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awarenes s Operations*	Project (Number/Name) 67A018 / *SF Weather Services Research*	

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
67A018: *SF Weather Services Research*	-	0.000	3.144	3.931	0.000	3.931	3.116	3.217	3.282	3.401	0.000	20.091
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This budget activity funds the operational development necessary to acquire, sustain, and modernize SF Weather Services Research capabilities in support of the 2022 National Defense Strategy's (NDS) three lines of effort: build a more lethal force, strengthen alliances and attract new partners, and change the way we do business.

To improve readiness for a more lethal force, SF Weather Services Research provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. SF Weather Services Research provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental intelligence in support of warfighters to gain the asymmetric advantage during the full spectrum of air and space combat operations. SF Weather Services Research decreases the risk to mission and risk to force by increasing the lethality, effectiveness, and survivability of Department of Defense (DoD) weapon systems.

To strengthen alliances and partnerships, SF Weather Services Research development efforts integrate DoD, government agency, commercial, and international partner environmental data with AFWS information system equipment for processing, storing, exploiting, and disseminating multi-domain weather information for analysis, forecasting, mission integration, and greater interoperability.

To ensure greater performance and affordability for the Department of the AF, SF Weather Services Research sensors and information systems are being modernized through improvements to architecture and system efficiency, cybersecurity, joint all-domain command and control (JADC2) and sensing grid integration, migration to cloud computing, artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. The AF Weather Enterprise digital transformation and cloud migration effort modernizes key capabilities providing the military advantage to accurately predict environmental impacts optimizing mission planning, targeting, weaponeering, mission execution, battle damage assessment, and space systems operations.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Center (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

Activities include research and analysis to support current program planning. Management Service costs include Federally Funded Research and Development Centers (FFRDC) and Advisory and Assistance Service (A&AS).

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 67A018 / *SF Weather Services Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Space Weather Analysis and Forecast System (SWAFS)	0.000	3.144	3.931

Description: The SWAFS legacy baseline is currently being redesigned and upgraded under the Space Domain Awareness Environmental Toolkit for Defense (SET4D) effort to satisfy Space Domain Awareness goals for a modern cloud hosted infrastructure that is cyber resilient and integrated with the Unified Data Library. The Energetic Charged Particle Hazard Assessment System (ECP HAS) is one of several models and applications within the SET4D environment designed to inform satellite operators of hazards and the impacts of those hazards to their spacecraft that will provide warfighters with the environmental awareness to safely sustain their respective orbits and missions.

FY 2023 Plans:
Complete integration of the last component of the ECP HAS into the SET4D cloud infrastructure. This final phase will incorporate the Versatile Electron Radiation Belt (VERB) outer zone application which provides a Complete picture of the space environment charging impacts on satellites.
- Leverage and integrate data from the Military Application of the Space Environment (MASE) effort and Unified Data Library (UDL) effort to improve data for SWAFS analysis.
- Integrate the newest version of the Radio Frequency Ionospheric Scintillation Analysis Tool (RISA.v1.0) application for improved solar forecasting capabilities. This application will enhance the prediction and forecasting capabilities associated with major solar events that impact critical VHF/UHF/HF communication lines in support of global combat operations.
- Integrate new Data sources such as Global Positioning System Radio Occultation and Ultraviolet Photometer Co-located/Limb-imaging Ionospheric and Thermospheric Extreme Ultraviolet Spectrograph (GROUP CLites) and Responsive Environmental Assessment Commercially hosted (REACH) to enhance the performance and accuracy of numerous models within the SET4D baseline. Integrate electro-magnetic and Ionospheric impact Assessment capabilities such as Ovation Prime and Wide Band Model (WBMOD).

FY 2024 Plans:
Development activities include integration of software into the Space Environment Toolkit for Defense (SET4D) baseline that includes decomposing, developing, testing, and validating software applications that support the prediction/forecasting processors for global geomagnetic, auroral and solar activities that impact satellite, communication, radar, high flyer, and intelligence operations. The contractor will perform integration and cloud migration efforts of prototype tools developed to a Technology Readiness level (TRL) 6 or higher delivered to them from the Air Force Research Lab (AFRL), Atmospheric Environmental Research Corporation (AER), Boston College (BC), and John Hopkins University/Applied Physics Lab (JHU/APL) for integration into the SET4D baseline that give DOD customer's customized tools for performing space environment characterization for the different layers of the atmosphere. AFRL's Radio Frequency Ionospheric Scintillation Analysis tool (RISA v1 and v2) requires integration into the SET4D baseline and will produce a Global 4 dimensional Specification Product, a communications link Outage Map Product, and a ground-to-sky outage SkyMap Product. Boston College developed Constellation Observing System for

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 67A018 / *SF Weather Services Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Meteorology,Inosphere and Climate2 (COSMIC2) All Clear algorithms which contain additional filters that remove radio frequency interruptions (RFI) will require integration into the SET4D baseline. Additional AFRL tools such as Solar Indices Forecasting Tool (SIFT), Air Force Data Assimilative Photospheric Flux Transport (ADAPT), Solar Radio Burst (SRB) forecast, Radiation Exposure (RADEX), and the International Reference Ionosphere (IRI) 2016 model that provides an empirical electron density specification or forecast (by forecasting drivers) will require integration into SET4D baseline. JHU/APL software modernization of the OVATION-Prime (aurora radar model) and the global Ionospheric assimilation model (IDA4D) that replaces the Global Assimilation of Ionospheric Measurements (GAIM) will require integration into the SET4D baseline. The contractor will develop SET4D metrics that track performance of all the SET4D applications and perform raw data qualitative analysis to ensure the applications can discern good data from bad data in the final products. The contractor will perform integration of the Wideband Model (WBMOD) software in support of scintillation climatology characterization for Electromagnetic Induction (EMI) attribution of the DOD's ground and space assets for improved space situational awareness. Lastly, the contractor will address any carry-over of Continues Improvement/Continuous Development (CI/CD) activities for space environment characterization algorithm improvements. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 increased due to ramping up development and integration effort required to integrate multiple new software algorithm tools into SET4D.			
Accomplishments/Planned Programs Subtotals	0.000	3.144	3.931

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
• SPAF 01 SPCMOD: *Space Mods*	-	5.299	3.200	-	3.200	3.062	3.152	3.234	3.299	0.000	21.246
• RDTE 04 0604002F: *Air Force Weather Services Research*	-	0.796	-	-	-	-	-	-	-	0.000	0.796

Remarks

D. Acquisition Strategy

SF Weather Services Research uses a Continuous Integration/Continuous Deployment (CI/CD) approach to rapidly deliver capabilities using multiple contracts to support a family of systems through development, fielding and sustainment.

Cost Plus contracts are utilized for software development and sustainment and Fixed Firm Price contracts for Commercial-off-the-shelf (COTS) systems and Contract Logistics Support (CLS) efforts. Pre-competed General Services Administration (GSA) and Defense MicroElectronics Activity (DMEA) contract vehicles are leveraged when appropriate, and competitive and small-business awards are favored.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awarenes s Operations*	Project (Number/Name) 67A018 / *SF Weather Services Research*	

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
SET4D Modernization	C/CPFF	Peraton : Herndon, VA	-	-		3.144	Feb 2023	3.931	Feb 2024	-		3.931	Continuing	Continuing	-
		Subtotal	-	-		3.144		3.931		-		3.931	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		3.144		3.931		-		3.931	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 67A018 / *SF Weather Services Research*

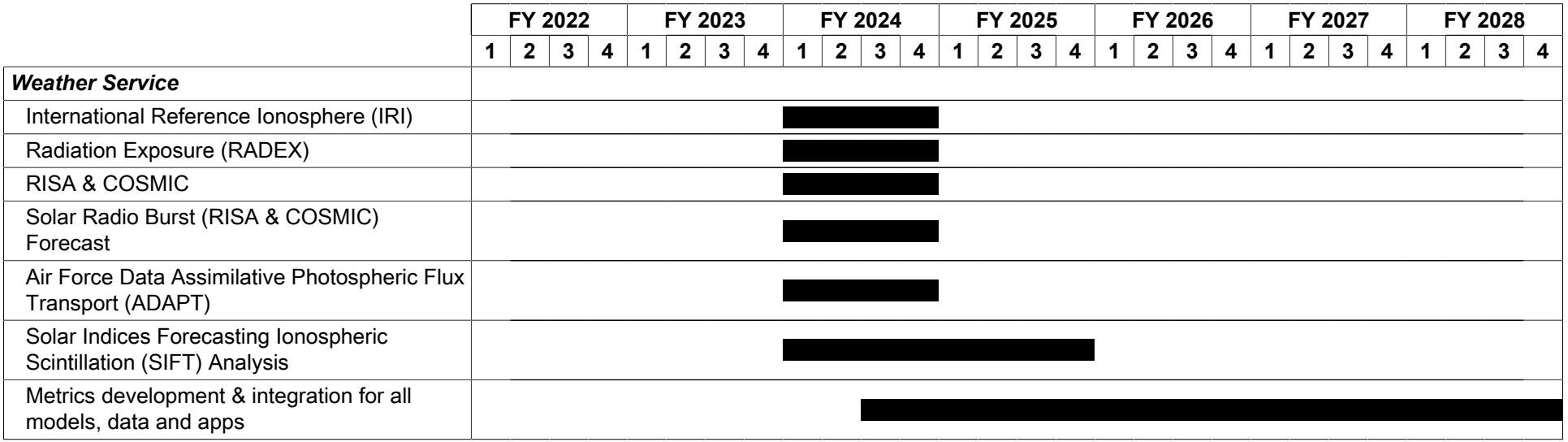

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 67A018 / *SF Weather Services Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Weather Service				
International Reference Ionosphere (IRI)	1	2024	4	2024
Radiation Exposure (RADEX)	1	2024	4	2024
RISA & COSMIC	1	2024	4	2024
Solar Radio Burst (RISA & COSMIC) Forecast	1	2024	4	2024
Air Force Data Assimilative Photospheric Flux Transport (ADAPT)	1	2024	4	2024
Solar Indices Forecasting Ionospheric Scintillation (SIFT) Analysis	1	2024	4	2025
Metrics development & integration for all models, data and apps	3	2024	4	2028