Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1206770SF / *Enterprise Ground Services*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	121.199	191.713	123.601	0.000	123.601	155.835	87.484	138.451	139.596	Continuing	Continuing
673140: *Enterprise Ground Services EGS*	-	121.199	191.713	123.601	0.000	123.601	155.835	87.484	138.451	139.596	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Today's rapidly changing threat environment requires the Department of Defense to deliver agile, integrated, and resilient effects in, from, and through space to meet the nation's warfighting needs. The Enterprise Ground Services (EGS) program will provide a robust enterprise ground architecture for United States Space Force (USSF) satellite systems. EGS capability will become the primary ground command and control (C2) suite of services for the Space Force enterprise that integrates with mission partner capabilities to meet evolving current and future space domain demands that will fully enable warfighting effects to maintain United States space dominance. EGS is based on Multi-Mission Satellite Operations Center (MMSOC) C2 capabilities developed under the Research and Development Space and Missile Operations (RDSMO) program.

The EGS program will perform technology maturation, development, prototyping and operational mission transition for increased commonality and resiliency in space program systems. EGS will focus efforts on the rapid development and deployment of tactical C2 services, developing and integrating on-premise and cloud infrastructure to laboratories and multiple sites, exploring advanced concepts, developing prototypes and demonstrations, maturing user experience, refining Concept of Operations (CONOPs), and supporting cybersecurity operations and operational mission training. These efforts will require support such as systems engineering, integration and test, standards and interface development, architecture development, enhanced cybersecurity development and implementation. Programs and projects in the space warfighting enterprise are evaluating ways to maximize innovation, resiliency, and the ability to respond to known and emerging threats, as well as to identify shared/common platform, infrastructure, and data layer solutions to support open frameworks and architectures across the enterprise ground portfolio. Space enterprise efforts aim to execute technology risk-reduction efforts and integrate new or re-purposed capabilities, enterprise decision-making tools, experimentation, and rapid prototyping and fielding via all appropriate acquisition authorities and contract mechanisms.

Over the Future Years Defense Program (FYDP), EGS will be developing and deploying C2 services and software applications into its service catalog in order to support integrating legacy and new missions such as Missile Warning; Missile Defense; MILSATCOM; Positioning, Navigation, and Timing; Environmental Monitoring; Space Domain Awareness; and various classified and experimental satellites and missions to the EGS open architecture. The modifications to catalog software applications provided by EGS are being made in an agile development, security, and operations (DevSecOps) environment.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770SF / *Enterprise Ground Services*

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 element may include necessary civilian pay expenses required to manage, execute, and deliver 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.

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.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	116.791	191.713	0.000	0.000	0.000
Current President's Budget	121.199	191.713	123.601	0.000	123.601
Total Adjustments	4.408	0.000	123.601	0.000	123.601
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	8.160	0.000			
• SBIR/STTR Transfer	-3.752	0.000			
• Other Adjustments	0.000	0.000	123.601	0.000	123.601

Change Summary Explanation

FY 2021: +$8.160M reprogramming increase to refine enterprise monitoring, data analytics, transmit and receive, and flight dynamics services needed to support space enterprise scheduling and Next Generation OPIR; -$3.752M for SBIR

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Enterprise Ground Services (EGS) Development	57.890	103.028	49.577
Description: Integrate common applications and services, refine standards and interfaces, develop and implement cybersecurity and cryptography requirements, refine training and CONOPs, and mature advanced concepts. Support prototype mission partner demonstrations and integration and test of mission-unique software. Expand the development environment in order to develop software applications and services in support of integrating additional satellite missions.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770SF *I Enterprise Ground Services*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Complete maturation of EGS laboratories, including providing an on-premise and cloud-based DevSecOps capability, at the Catalyst Campus in Colorado Springs, Colorado. Continue the development and deployment of C2 services, prototype mission partner demonstrations, implement cybersecurity and cryptography development, update platform development and interfaces, refine training and CONOPs, mature advanced concepts, support integration and test of mission-unique software, and integrate common applications and services at the distributed System Integration Lab (SIL). Continue expanding User Experience guidelines and user interface specifications to complete delivery of seven Enterprise services for mission partner integration and Initial Enterprise Capability Minimum Viable Product (MVP): TT&C; Ground Resource Manager; Ground Resource Scheduler; Transmit/Receive; Archiving; Platform; and Infrastructure. Expand EGS catalog services based on mission needs, including Mission Planning, Data Analytics, and Flight Dynamics. Mature EGS deployment automation and testing. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Procure infrastructure for scaling to support mission partner integration onto EGS. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, and prototyping. ***FY 2023 Plans:*** Continue the development and deployment of existing EGS services, prototype mission partner demonstrations, implement cybersecurity and cryptography development, update platform development and interfaces, refine training and CONOPs, mature advanced concepts, support integration and test of mission-unique software, and integrate common applications and services at the distributed System Integration Lab (SIL). Continue development and update of the Enterprise Capability Minimum Viable Product (MVP): Antenna as a Service (AaaS) comprised of Ground Resource Manager, Ground Resource Scheduler, and Transmit/Receive; Archiving; Platform; and Infrastructure. Mature EGS deployment automation and testing. Provide infrastructure to support mission partners integrated with EGS. Further develop on-premise and cloud-based DevSecOps capabilities at the EGS Canopy lab at the Catalyst Campus in Colorado Springs, Colorado. Robust enterprise ground architecture can include studies to identify shared platform, infrastructure, and data layer solutions that will inform future concepts and activities in support of enterprise open frameworks and architectures as well as risk reduction activities, technical analysis for common platform, infrastructure and data layers for ground and communication systems to build upon. Additionally, FY 2023 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, and prototyping. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased due to completion of Initial Minimum Viable Product (MVP) Enterprise Capability in FY 2022.			
Title: EGS Pre-Operations (Pre-Ops) Support	3.957	18.131	20.484

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Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770SF *I Enterprise Ground Services*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Maintain EGS hardware and software baselines, update software licenses, cybersecurity, help-desk operations, and associated training. ***FY 2022 Plans:*** Continue conducting pre-ops support activities for satellites using enterprise services to include maintaining EGS hardware and software baselines for 14 services, updating software licenses, prototyping, furthering continuous integration/continuous delivery (CI/CD) efforts, facilitating user engagement, and extending helpdesk operations at multiple locations, and associated training and cybersecurity support for EGS. Implement state-of-the-art hardware components at key EGS operational locations. Continue GEO Non-Integrated Tactical Warning/Attack Assessment (ITW/AA) Operations Migration to EGS (GNOME) effort. Scale service center capabilities to support growth of mission partners from two to eight using EGS, accomplish infrastructure technical refresh, patching, and cyber updates. ***FY 2023 Plans:*** Continue conducting pre-ops support activities for satellites using enterprise services to include maintaining EGS hardware and software baselines for EGS services, updating software licenses, prototyping, furthering CI/CD efforts, facilitating user engagement, help desk operations, and associated training and cybersecurity support for EGS. Implement state-of-the-art hardware components at key EGS operational locations. Improve service center capabilities to support mission partners integrating with EGS, accomplish necessary infrastructure technical refresh, patching, and cyber updates. Complete GNOME effort and continue support to missile warning (GNOME, Future Operationally Resilient Ground Evolution (FORGE)) and other mission partners integrating with EGS. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased as pre-ops support activities increased but was partially offset by the replanned deployment to Kirtland Air Force Base (KAFB).			
Title: EGS Deployment	59.352	70.554	53.540
Description: Rapidly deploy tactical C2 services and space domain capabilities to support customer-funded mission integration with EGS activities including future mission acquisition planning and risk-reduction efforts. ***FY 2022 Plans:*** Continue the operational deployment of C2 services and maturation of networks and links across the EGS enterprise to support growth from two to eight mission partners. Continue integration efforts with current and future space domain capabilities. Expand service offerings and functionality for both existing and new satellites that will use EGS. Continue developing the programmatic, technical and architectural roadmaps to enable the phased integration of mission partners to EGS. Provide technical information and guidance to programs which are developing EGS interfaces, mission applications, factory connectivity, and integration and			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770SF *I Enterprise Ground Services*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
test plans and procedures. Support customer-funded mission integration plans including future mission acquisition planning and risk-reduction efforts. Support deployment of enterprise ground services to different infrastructures, to scale capabilities for additional missions to use EGS, and to support services integration. Establish initial capability at Schriever Space Force Base (SSFB). ***FY 2023 Plans:*** Continue the operational deployment of C2 services and maturation of networks and links across the EGS enterprise to support mission partners. Continue integration efforts with space domain capabilities. Update service offerings and functionality for both existing and new satellites that will use EGS. Continue refining the programmatic, technical and architectural roadmaps to enable the phased integration of mission partners to EGS. Provide technical information and guidance to programs which are developing EGS interfaces, mission applications, factory connectivity, and integration and test plans and procedures. Support customer-funded mission integration plans including future mission acquisition planning and risk-reduction efforts. Build upon previous integration efforts with missile warning (GNOME, FORGE) and other mission partners. Improve capability at SSFB and Buckley Space Force Base (BSFB). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased due to completion of SSFB Initial Capability in FY 2022 and re-planned resource-loaded effort and schedule for deployment to KAFB.			
Accomplishments/Planned Programs Subtotals	121.199	191.713	123.601

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

E. Acquisition Strategy

The EGS acquisition strategy focuses on rapidly delivering C2 prototypes and operational capabilities to warfighters, while leveraging industry best practices for agile development and continuous integration/delivery (CI/CD). One of the key tenets of the EGS acquisition strategy is to maintain government ownership of the technical baseline. As a result, EGS uses a combination of existing and new contracts and agreements with industry and academia to procure prototypes, platform services, system engineering services, and pre-ops support for mission users. EGS is leveraging two Small Business Innovation Research (SBIR) Phase III five-year contracts that were awarded sole source in late FY 2019 to scale EGS capabilities and enable more rapid development and deployment of tactical C2 services to operational users. Additionally, EGS provides development, integration, and pre-ops support for mission users through a five-year contract competitively awarded in FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1206770SF / *Enterprise Ground Services*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EGS Development	Various	Various : Various	-	43.858	Nov 2020	85.015	Nov 2021	34.855	Nov 2022	-		34.855	Continuing	Continuing	-
EGS Pre-Ops Support	Various	Various : Various	-	3.957	Dec 2020	18.131	Dec 2021	20.484	Dec 2022	-		20.484	Continuing	Continuing	-
EGS Deployment	Various	Various : Various	-	47.273	Nov 2020	57.977	Oct 2021	47.370	Nov 2022	-		47.370	Continuing	Continuing	-
EGS Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	4.595	Oct 2020	5.034	Jan 2022	5.000	Oct 2022	-		5.000	Continuing	Continuing	-
Enterprise Systems Engineering and Integration (SE&I)	Various	MITRE : Bedford, MA	-	12.079	Oct 2020	12.577	Dec 2021	6.170	Oct 2022	-		6.170	Continuing	Continuing	-
		Subtotal	-	111.762		178.734		113.879		-		113.879	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	4.945	Oct 2020	4.905	Jan 2022	3.900	Oct 2022	-		3.900	Continuing	Continuing	-
A&AS Support	Various	Various : Various	-	4.154	Dec 2020	7.712	Jan 2022	4.722	Dec 2022	-		4.722	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.338	Dec 2020	0.362	Dec 2021	1.100	Dec 2022	-		1.100	Continuing	Continuing	-
		Subtotal	-	9.437		12.979		9.722		-		9.722	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	121.199		191.713		123.601		-		123.601	Continuing	Continuing	N/A

Remarks

FY 2022 Product Development and Management Services requirements may vary during year of execution due to integration and cybersecurity necessary to complete delivery of seven Enterprise services for mission partner integration and initial enterprise capability Minimum Viable Product (MVP).

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1206770SF / *Enterprise Ground Services*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

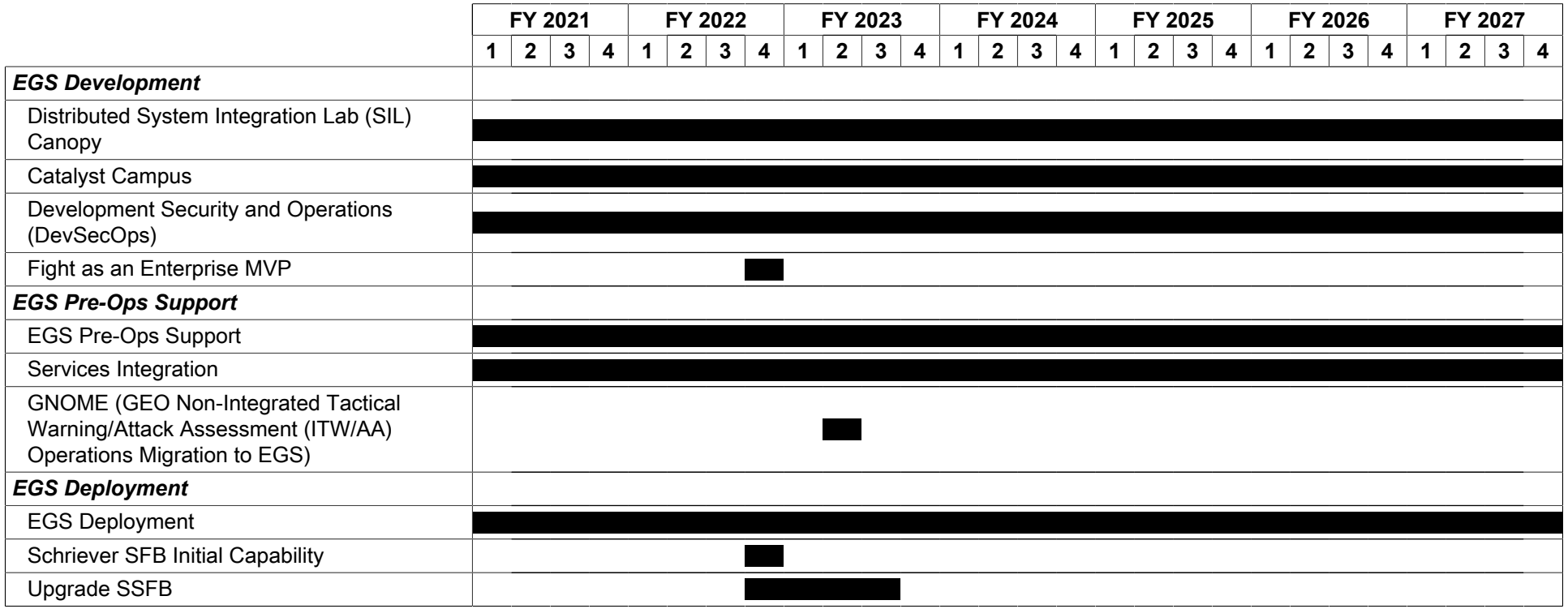

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1206770SF / *Enterprise Ground Services*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EGS Development				
Distributed System Integration Lab (SIL) Canopy	1	2021	4	2027
Catalyst Campus	1	2021	4	2027
Development Security and Operations (DevSecOps)	1	2021	4	2027
Fight as an Enterprise MVP	4	2022	4	2022
EGS Pre-Ops Support				
EGS Pre-Ops Support	1	2021	4	2027
Services Integration	1	2021	4	2027
GNOME (GEO Non-Integrated Tactical Warning/Attack Assessment (ITW/AA) Operations Migration to EGS)	2	2023	2	2023
EGS Deployment				
EGS Deployment	1	2021	4	2027
Schriever SFB Initial Capability	4	2022	4	2022
Upgrade SSFB	4	2022	3	2023

Note

Singular events depicted above represent milestones. All milestones include effort prior-to and after the event. EGS Initial Enterprise Capability milestone includes initial delivery and maturation of tactical C2 enterprise services and space domain capabilities. EGS Deployment milestones include initial build-outs of EGS enclaves at operational sites. Continuous Integration/Continuous Deployment is on-going. EGS Pre-Ops support milestones include phased initial integration of mission partners and EGS. Pre-ops support is on-going.