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

<b>Appropriation/Budget Activity</b> 3620F: <i>Research, Development, Test &amp; Evaluation, Space Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 1206770SF / <i>Enterprise Ground Services</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	170.083	123.251	155.825	0.000	155.825	137.645	137.475	139.512	144.551	Continuing	Continuing
673140: <i>Enterprise Ground Services EGS</i>	-	170.083	123.251	155.825	0.000	155.825	137.645	137.475	139.512	144.551	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.

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 and address Zero Trust. 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 to support integrating legacy and new missions such as Missile Warning; Missile Defense; MILSATCOM; Positioning, Navigation, and Timing; Environmental Monitoring; Space Domain Awareness; Space Rapid Capabilities Office (SpRCO) Ground Command, Control, and Communications (GC3) and various classified and experimental satellites and missions to support a message standard compliant open architecture to meet Space Domain Awareness and Battle Management Command, Control, and Communication dynamic emerging threats. 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

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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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>
Previous President's Budget	191.713	123.601	155.835	0.000	155.835
Current President's Budget	170.083	123.251	155.825	0.000	155.825
Total Adjustments	-21.630	-0.350	-0.010	0.000	-0.010
• Congressional General Reductions	0.000	-0.350			
• 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	-15.244	0.000			
• SBIR/STTR Transfer	-6.386	0.000			
• Other Adjustments	0.000	0.000	-0.010	0.000	-0.010

**Change Summary Explanation**

FY 2022: -15.244M reprogramming for higher Space Force priorities and -6.386M SBIR reduction.

FY 2023: -0.350M for congressionally-directed Federally Funded Research and Development Center (FFRDC) reduction.

FY 2024: +1.014M for inflation adjustment.

FY 2024: -1.024M 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.

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Enterprise Ground Services (EGS) Development	82.628	49.577	78.268

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p><b>Description:</b> Integrate common applications and services, refine standards and interfaces, develop and implement cybersecurity and cryptography requirements, refine training and CONOPs, address Zero Trust, 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.</p> <p><b>FY 2023 Plans:</b> 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.</p> <p><b>FY 2024 Plans:</b> Award contract to a systems integrator to manage development and execute integration and test of additional enterprise services such as flight dynamics and Space C2 and Unified Data Library interfaces for missile warning (Geosynchronous (GEO) Non-Integrated Tactical Warning and Attack Assessment (ITW/AA) Ops Migration to EGS (GNOME), Future Operationally Resilient Ground Evolution (FORGE)), MILSATCOM (Command and Control System-Consolidated (CCS-C)), Research and Development Space and Missile Operations (RDSMO) Multi-Mission Satellite Operations Center (MMSOC), and classified mission partners. Collaborate with the Space Rapid Capabilities Office (SpRCO) Global Command, Control, and Communications (GC3) program to integrate and test SpRCO's GC3 developed services for EGS enterprise catalog adoption. Scale development and expand integration, test, and deployment of cybersecurity, cryptography, security architectures, service catalog, and support beyond EGS Minimum Viable Product (MVP) capabilities. Support increasing integration with mission-partner developed unique software to meet tactical end-to-end C2 requirements. Grow infrastructure and network connectivity to support new mission partners integrating with EGS. Mature a hybrid multi-cloud architecture comprised of on-premise and cloud-based integration and test capabilities at the EGS Canopy lab and operational locations such as Buckley Space Force Base (BSFB), Schriever Space Force</p>				

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p>Base (SSFB), and multiple cloud environments. Robust and resilient enterprise ground architectures 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 analyses for common platform, infrastructure, and data layers for ground and communication systems to operate in a contested space domain.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> FY 2024 increased due to adding an EGS systems integrator, expanding EGS service development, growing a hybrid multi-cloud and on-premise architecture, and scaling enterprise capabilities up to meet increasing needs of existing and new mission partners.</p>				
<p><b>Title:</b> EGS Pre-Operations (Pre-Ops) Support</p> <p><b>Description:</b> Maintain EGS hardware and software baselines, update software licenses, cybersecurity, help-desk operations, and associated training.</p> <p><b>FY 2023 Plans:</b> 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, FORGE) and other mission partners integrating with EGS.</p> <p><b>FY 2024 Plans:</b> Scale pre-ops support activities and facilities for increasing number of mission partners using enterprise services to include maintaining EGS hardware and software baselines for EGS services, expanding into other multiple cloud environments, updating software licenses, prototyping, furthering CI/CD efforts, facilitating user engagement, and continuing 24x7 help desk operations, associated training, and cybersecurity support for EGS. Provide pre-ops support for SpRCO GC3 developed services adopted into the EGS enterprise catalog. Continue implementing state-of-the-art hardware and software components at key EGS operational locations, such as BSFB and SSFB. Improve service center capabilities to support mission partners developing, integrating, testing, and operating with EGS. Accomplish necessary infrastructure technical refresh, patching, and cybersecurity updates. Expand support to a growing number of mission partners integrating and operating with EGS, including missile warning (GNOME, FORGE), MILSATCOM (CCS-C), RDSMO (MMSOC), and classified mission partners.</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p>		21.376	20.484	31.477

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
FY 2024 increased due to additional technologies such as Zero Trust and pre-ops support activities at different classification levels for additional mission partners integrating with EGS.				
<b>Title:</b> EGS Deployment		66.079	53.190	46.080
<b>Description:</b> 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.				
<b>FY 2023 Plans:</b> 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 BSFB.				
<b>FY 2024 Plans:</b> Continue the operational deployment of C2 services and maturation of environments, networks, and links across the EGS enterprise to support a growing number of mission partners. Reduce operational deployment timelines through automation and other capabilities to optimize resilient operations such as mission failover across the multi-hybrid cloud architecture for workload mobility. Continue the integration efforts with space domain capabilities. Update service offerings and functionality for both existing and new mission partners that integrate with EGS. Refine the programmatic, technical and architectural roadmaps to enable the phased integration of mission partners to EGS. Provide technical information and guidance to programs that 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. Continue building upon previous efforts with mission partners integrating and operating with EGS, including missile warning (GNOME, FORGE), MILSATCOM (CCS-C), SpRCO GC3 and classified mission partners. Continue improving capability at SSFB and BSFB.				
<b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> FY 2024 decreased due to EGS deployment automation efficiencies and migrating from an on-premise to a hybrid-cloud infrastructure.				
<b>Accomplishments/Planned Programs Subtotals</b>		170.083	123.251	155.825
<b>D. Other Program Funding Summary (\$ in Millions)</b>				
N/A				

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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 / *Enterprise Ground Services*

**D. Other Program Funding Summary (\$ in Millions)**

**Remarks**

N/A

**E. Acquisition Strategy**

The EGS acquisition strategy focuses on rapidly delivering C2 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 used a combination of existing and new contracts and agreements with government partners, industry, and academia to develop and procure operational capabilities, platform services, system engineering services, and pre-ops support for mission users. EGS leveraged 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 provided development, integration, and pre-ops support for mission users through a five-year contract competitively awarded in FY 2020.

As EGS transitions from prototyping activities in FY 2023, the program will expand its collaboration with government partners to develop and deliver complete end-to-end tactical C2 solutions while also implementing a contractor-led systems integration approach.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force** **Date:** March 2023

<b>Appropriation/Budget Activity</b> 3620F / 7	<b>R-1 Program Element (Number/Name)</b> PE 1206770SF / Enterprise Ground Services	<b>Project (Number/Name)</b> 673140 / Enterprise Ground Services EGS
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<b>Product Development (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
EGS Development	Various	Various : Various	-	63.921	Nov 2021	34.855	Nov 2022	51.703	Nov 2023	-		51.703	Continuing	Continuing	-
EGS Pre-Ops Support	Various	Various : Various	-	21.376	Dec 2021	20.484	Dec 2022	31.477	Dec 2023	-		31.477	Continuing	Continuing	-
EGS Deployment	Various	Various : Various	-	51.502	Oct 2021	47.020	Nov 2022	29.983	Oct 2023	-		29.983	Continuing	Continuing	-
EGS Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	5.035	Jan 2022	5.000	Oct 2022	7.000	Jan 2024	-		7.000	Continuing	Continuing	-
Enterprise Systems Engineering and Integration (SE&I)	Various	MITRE : Bedford, MA	-	14.577	Dec 2021	6.170	Oct 2022	16.097	Oct 2023	-		16.097	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		-		5.454	Oct 2023	-		5.454	Continuing	Continuing	-
<b>Subtotal</b>			-	156.411		113.529		141.714		-		141.714	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	4.906	Jan 2022	3.900	Oct 2022	6.727	Oct 2023	-		6.727	Continuing	Continuing	-
A&AS Support	Various	Various : Various	-	7.985	Jan 2022	4.722	Dec 2022	6.884	Dec 2023	-		6.884	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.781	Dec 2021	1.100	Dec 2022	0.500	Dec 2023	-		0.500	Continuing	Continuing	-
<b>Subtotal</b>			-	13.672		9.722		14.111		-		14.111	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
<b>Project Cost Totals</b>		-	170.083	123.251	155.825	155.825	Continuing	Continuing	N/A

**Remarks**  
 FY 2024 Product Development and Management Services requirements may vary during year of execution due to integration and cybersecurity necessary to complete delivery of Enterprise services and Minimum Viable Product (MVP) capability for mission partner integration.

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2024 Air Force		<b>Date:</b> March 2023
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<b>EGS Development</b>	
Distributed System Integration Lab (SIL) Canopy	
Catalyst Campus	
Development Security and Operations (DevSecOps)	
Fight as an Enterprise MVP	█
<b>EGS Pre-Ops Support</b>	
EGS Pre-Ops Support	
EGS Classified Pre-Ops Support	
EGS CCS-C Pre-Ops Support	
Services Integration	
GNOME (GEO Non-Integrated Tactical Warning/Attack Assessment (ITW/AA) Operations Migration to EGS)	█
EGS SpRCO GC3 Pre-Ops Support	
<b>EGS Deployment</b>	
EGS Deployment	
Schriever SFB Initial Capability	█
Upgrade SSFB	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Air Force		<b>Date:</b> March 2023
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>EGS Development</b>				
Distributed System Integration Lab (SIL) Canopy	1	2022	4	2028
Catalyst Campus	1	2022	4	2028
Development Security and Operations (DevSecOps)	1	2022	4	2028
Fight as an Enterprise MVP	1	2024	1	2024
<b>EGS Pre-Ops Support</b>				
EGS Pre-Ops Support	1	2022	4	2028
EGS Classified Pre-Ops Support	1	2022	4	2028
EGS CCS-C Pre-Ops Support	4	2023	4	2028
Services Integration	1	2022	4	2028
GNOME (GEO Non-Integrated Tactical Warning/Attack Assessment (ITW/AA) Operations Migration to EGS)	2	2023	2	2023
EGS SpRCO GC3 Pre-Ops Support	1	2024	4	2028
<b>EGS Deployment</b>				
EGS Deployment	1	2022	4	2028
Schriever SFB Initial Capability	4	2022	4	2022
Upgrade SSFB	1	2023	1	2024

**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.