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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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1203269SF I GPS III Follow-On (GPS III F)
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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	275.819	237.947	292.847	308.999	0.000	308.999	254.025	193.634	167.288	70.120	277.486	2,078.165
653170: GPS III F	275.819	237.947	232.783	247.278	0.000	247.278	190.442	128.163	100.481	0.900	277.486	1,691.299
653171: GPS Enterprise Integration	0.000	0.000	60.064	61.721	0.000	61.721	63.583	65.471	66.807	69.220	0.000	386.866

Program MDAP/MAIS Code: 590

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

The system is composed of three segments: User Equipment (funded under Program Element (PE) 1203164F, 1203164SF), Space (funded under PE 1203165F, 1203265F, 1203265SF, 1203269F, and 1203269SF), and a Control Network (funded under PE 1206423F, 1206423SF and 1203165F). The satellites broadcast high accuracy data using precisely synchronized signals that are received and processed by user equipment installed in military and civil platforms. The user equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters (spherical error probable) worldwide. Additionally, GPS supports the United States (US) Nuclear Detonation (NUDET) Detection System (USNDS) mission and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence (C3I); Special Operations; Military Operations in Urban Terrain (MOUT); Defense-Wide Mission Support (DWMS); Air Mobility; and Space Launch Orbital Support.

GPS III Follow On (GPS III F) delivers improved satellites beyond the first ten GPS III Space Vehicles (SVs) being delivered (funded in PE 1203265SF GPS III Space Segment). While GPS III F satellites maintain the same capabilities as the GPS III satellites, they deliver significant enhancements to include: potential on-ramping of advanced PNT technology from efforts such as the Navigation Technology Satellite 3 (NTS-3), backward compatibility, Unified S-Band (USB) interface compliance, integration of hosted payloads including a redesigned USNDS payload, Laser Retro-reflector Arrays (LRAs), Search and Rescue/GPS (SAR/GPS), and Regional Military Protection (RMP) capabilities that provide the ability to deliver high-power regional Military Code (M-Code) signals in specific areas of intended effect.

Implementation of RMP into the GPS Enterprise requires integration with the ground and user segments, executed by the GPS Next Generation Operational Control System (OCX), along with the Military GPS User Equipment (MGUE) programs, respectively. The SAR/GPS payload provided by Canada supports Air Combat Command (ACC) and fills a validated National Search and Rescue Committee requirement to provide enduring, space-based distress alerting capability to detect,

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<p>locate, and relay distress alerts to fulfill its responsibilities under international agreements for Search and Rescue. LRA, built by the Naval Research Lab (NRL), is a passive reflector that improves accuracy and provides better satellite ephemeris data. National Geospatial-Intelligence Agency (NGA) funds the integration costs of the LRA.</p> <p>This PE funds the Research, Development, Test, and Evaluation (RDT&E) of GPS IIIIF SVs 11-12 (to include Non-Recurring Engineering (NRE) support efforts). This program includes risk-reducing simulators and systems engineering associated with delivering the new capabilities required of GPS IIIIF satellites.</p> <p>Starting in FY 2023, this program also funds the GPS Enterprise Integration (EI) project which includes critical efforts associated with the Government's responsibility to accomplish integration of multiple prime contracts across the three GPS enterprise segments, along with the transition to sustainment and operational communities. GPS EI maintains the current GPS architecture and system definition, controls and validates interfaces, ensures compatibility across current Generation II and III systems, and ongoing developments such as GPS IIIIF space systems, OCX control systems, and MGUE Inc 1 and MGUE Inc 2 systems. GPS EI also develops/manages plans for execution and fielding of new capability like the new M-Code for use at the earliest opportunity. Further, GPS EI provides modeling, simulation, and technical analyses of impacts for Government-directed enterprise level trades among the GPS segments, leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.</p> <p>In addition, GPS EI funds the technical evolution, risk reduction, enterprise-level testing and delivery of all PNT Enterprise, capabilities. GPS EI also assists in the analysis and assessment of futures technology to continue the advancement of the PNT enterprise ensuring PNT capabilities continue to be at the forefront. Examples for Generation II include electronic protection; for Generation III, additional anti-jamming protection and additional civil signals. To accomplish this, GPS EI delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, GPS EI is responsible for managing this cross-program work to provide these and other capabilities.</p> <p>GPS EI's analyses guide Government decisions to ensure efficient and effective synchronization and execution across all GPS II and III programs. For Enterprise-wide integration to be successful, GPS EI: works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS EI performs all these efforts across all PNT programs in all acquisition phases. The Government owns the GPS Enterprise system requirements and integration, interfaced specifications, and highly leverages the GPS EI team to eliminate the need to fund a development prime contractor to perform these functions. This enhances Government control, oversight and program accountability.</p> <p>Space acquisition must respond with speed and agility to pacing and emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, maximizing 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 repurposed capabilities.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203269SF / <i>GPS III Follow-On (GPS IIIIF)</i>
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This program may include necessary civilian pay expenses required to manage, execute, and deliver GPS IIIIF Space Segment weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	246.332	325.927	309.651	0.000	309.651
Current President's Budget	237.947	292.847	308.999	0.000	308.999
Total Adjustments	-8.385	-33.080	-0.652	0.000	-0.652
• Congressional General Reductions	0.000	-0.880			
• Congressional Directed Reductions	0.000	-32.200			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-8.385	0.000			
• Other Adjustments	0.000	0.000	-0.652	0.000	-0.652

Change Summary Explanation

FY 2023: -\$32.200M Congressional Directed Mark.

FY 2024: -\$2.035M 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: +\$1.383M Inflation adjustment

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

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F
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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
653170: GPS III F	275.819	237.947	232.783	247.278	0.000	247.278	190.442	128.163	100.481	0.900	277.486	1,691.299
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

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Implementation of RMP into the GPS Enterprise requires integration with the ground and user segments, executed by the GPS Next Generation Operational Control System (OCX), along with the Military GPS User Equipment (MGUE) programs, respectively. The SAR/GPS payload provided by Canada fills a validated National Search and Rescue Committee requirement to provide enduring, space-based distress alerting capability to detect, locate, and relay distress alerts to fulfill its responsibilities under international agreements for Search and Rescue. LRA, built by the Naval Research Lab (NRL), is a passive reflector that improves accuracy and provides better ephemeris data. National Geospatial-Intelligence Agency (NGA) funds the integration costs of the LRA.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / <i>GPS III Follow-On (GPS III F)</i>	Project (Number/Name) 653170 / <i>GPS III F</i>
<p>This PE funds the Research, Development, Test, and Evaluation (RDT&E) of GPS III F SVs 11-12 (to include Non-Recurring Engineering (NRE) support efforts). This program includes risk-reducing simulators (GPS Software and Simulator (GSS+ 1 & 2), (GPS Non-flight Satellite Test Bed (GNST+)) and systems engineering associated with delivering the new capabilities required of GPS III F satellites.</p> <p>Starting in FY 2023, this program also funds the GPS Enterprise Integration (EI) project which includes critical efforts associated with the Government's responsibility to accomplish integration of multiple prime contracts across the three GPS enterprise segments, along with the transition to sustainment and operational communities. GPS EI maintains the current GPS architecture and system definition, controls and validates interfaces, ensures compatibility across current Generation II and III systems, and ongoing developments such as GPS III F space systems, OCX control systems, and MGUE Inc 1 and MGUE Inc 2 systems. GPS EI also develops/ manages plans for execution and fielding of new capability like the new M-Code for use at the earliest opportunity. Further, GPS EI provides modeling, simulation, and technical analyses of impacts for Government-directed enterprise level trades among the GPS segments, leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.</p> <p>In addition, GPS EI funds the technical evolution, risk reduction, enterprise-level testing and delivery of all PNT Enterprise capabilities. GPS EI also assists in the analysis and assessment of futures technology to continue the advancement of the PNT enterprise ensuring PNT capabilities continue to be at the forefront. Examples for Generation II included electronic protection; for Generation III, additional anti-jamming protection and additional civil signals. To accomplish this, GPS EI delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, GPS EI is responsible for managing this cross-program work to provide these and other capabilities.</p> <p>GPS EI's analyses guide Government decisions to ensure efficient and effective synchronization and execution across all GPS II and III programs. For Enterprise-wide integration to be successful, GPS EI works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS EI performs all these efforts across all PNT programs in all acquisition phases. The Government owns the GPS Enterprise system requirements and integration, and interfaced specifications, and interfaced specifications, and highly leverages the GPS EI team to eliminate the need to fund a development prime contractor to perform these functions. This enhances Government control, oversight and program accountability.</p> <p>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, maximizing 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 repurposed capabilities.</p> <p>This program may include necessary civilian pay expenses required to manage, execute, and deliver GPS III F Space Segment weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392SF and 1206398SF.</p>		

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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: GPS III Follow-On (GPS III F) Development</p> <p>Description: The program utilizes RDT&E funds to develop and deliver space vehicles (SVs) 11-12, conduct the Non-recurring Engineering (NRE) of developing risk-reducing simulators (Global Positioning System (GPS) Software and Simulator (GSS+ 1 & 2), (GPS Non-flight Satellite Test Bed (GNST+)), developing support test equipment, and conducting the systems engineering associated with delivering the new capabilities required of GPS III F including backward compatibility, dual band Telemetry, Tracking, and Control, integration of Government Furnished Equipment hosted payloads, and Regional Military Protection (RMP), which delivers high power regional Military-Code (M-Code) signals in specific areas of intended effect.</p> <p>FY 2023 Plans: Complete build, test, and delivery of GNST+.</p> <p>Continue development, build, and test of GSS+ 1 & 2, SV 11, & SV 12 in support of system integration. Conduct Integration and Testing of satellites and GNST+ pathfinder. Receive and process critical components for SVs 11-12 and initiate system module assembly. Conduct and support capability insertion research, and perform risk reduction activities on the Common Bus approach for SVs 13+.</p> <p>FY 2024 Plans: Complete integration of GNST+. Complete test and transfer of GSS+ 1. Complete build, test and qualification of GSS+ 2. NTS-3 is scheduled to launch at the end of FY 2023. FY 2024 funds will be dedicated to early on orbit checkout and feed into 1 year of preplanned experiments (scheduled to end FY24). Continue development of SV-11, to include receipt of Mission Data Units, Testing and Core mate, and acoustic testing. Begin development of SV-12, to include initial delivery of System Module Hardware, receipt of Mission Data Units, and Testing and Core mate. Continue support capability insertion research, and perform risk reduction activities on the Common Bus approach for SVs 13+. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase is due to early on orbit checkout and continued development of SV-11, to include receipt of Mission Date Units, Testing and Core mate, and acoustic testing. In addition, increase is due to beginning development of SV-12.</p>	237.947	232.783	247.278
Accomplishments/Planned Programs Subtotals	237.947	232.783	247.278

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• SPSF 01 BA01 GPS03C: GPS III Follow On	835.176	616.962	118.916	-	118.916	678.531	708.802	743.060	758.646	2,051.461	6,511.554

Remarks

D. Acquisition Strategy

In December 2017, Principal Deputy Office of the Assistant Secretary of the Air Force Acquisition & Logistics began the GPS III F program. Beginning in FY 2019 and, consistent with the Fiscal Year 2016 National Defense Authorization Act, the program was categorized as an Acquisition Category 1B Major Defense Acquisition Program (MDAP) with the Service Acquisition Executive serving as the Milestone Decision Authority (MDA). During this time, the MDA approved the second phase of the two-phased GPS III Follow-On acquisition strategy. Executed using funds in PE 1203265F, GPS III Space Segment, the Phase 1 Production Readiness Feasibility Assessments conducted during FY 2016-2017 provided data and insight into contractors' GPS satellite production designs with emphasis on a mature navigation payload and production-ready designs. Phase 1 results affirmed the viability of a competitive approach for Phase 2. The Phase 2 strategy directed the Air Force to conduct a full-and-open competition for GPS III F space vehicles and specified the use of RDT&E funds to deliver SVs 11-12 and conduct associated NRE.

In addition to SVs 11-12, the RDT&E effort is comprised of developing risk-reducing simulators (GPS Software and Simulator (GSS+), (GPS Non-flight Satellite Test Bed (GNST+)), support test equipment, and conducting the systems engineering associated with delivering the new capabilities required of GPS III F. The Air Force awarded the contract to Lockheed Martin in September 2018 and began the 1-year Critical Design Review (CDR) campaign in March 2019. Completion of CDR was done in March 2020 and Milestone C production certification completed in July 2020. Procurement of SVs 13 and 14 awarded on October 7, 2020. Procurement of SVs 15-17 awarded on October 22, 2021. GPS III F SVs 18, 19, and 20 were awarded on October 27, 2022. The Space Force will continue to procure future GPS III F satellites via annual contract options exercised using Space Procurement, Air Force and Procurement, Space Force funds consistent with full-funding policy under an annual buy approach.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1203269SF / GPS III Follow-On (GPS III F)				653170 / GPS III F							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F Development	C/FPIF	Lockheed Martin : Littleton, CO	245.955	223.474	Dec 2022	206.765	Nov 2022	206.414	Nov 2024	-		206.414	514.381	1,396.989	1,374.851
NTS-3 Payload and Launch	Various	Various : Various : TBD	19.233	-		3.660	Mar 2023	5.203	Mar 2024	-		5.203	0.884	28.980	-
GPS III F SBIR/STTR	Various	Various : Various, CA	0.000	-		0.000		8.616	Mar 2024	-		8.616	2.863	11.479	-
GPS III F Technical Mission Analysis	Various	Aerospace : El Segundo, CA	5.325	2.216	Dec 2022	2.531	Dec 2022	6.077	Dec 2024	-		6.077	45.185	61.334	-
GPS III F Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	1.545	2.321	Dec 2022	6.082	Dec 2022	6.443	Dec 2024	-		6.443	26.693	43.084	-
Subtotal			272.058	228.011		219.038		232.753		-		232.753	590.006	1,541.866	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F Test and Evaluation	Various	Various : Various	1.000	0.000	Dec 2022	-		-		-		-	0.000	1.000	-
Subtotal			1.000	0.000		-		-		-		-	0.000	1.000	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F FFRDC	Various	Aerospace : El Segundo, CA	1.923	2.104	Dec 2022	1.106	Dec 2022	2.840	Dec 2024	-		2.840	35.485	43.458	-
GPS III F A&AS	Various	Various : El Segundo, CA	0.355	7.632	Dec 2022	12.339	Dec 2022	11.385	Dec 2024	-		11.385	40.643	72.354	-
GPS III F Other Support	Various	Various : El Segundo, CA	0.483	0.200	Oct 2022	0.300	Oct 2022	0.300	Oct 2024	-		0.300	1.200	2.483	-
Subtotal			2.761	9.936		13.745		14.525		-		14.525	77.328	118.295	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS IIIIF

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GPS IIIIF				
SV11 Subsystem Development, Procurement & Build	1	2022	3	2022
SV11 System Integration & Test	3	2022	1	2026
SV11 Available for Launch	2	2026	2	2026
SV 11 Launch	1	2027	1	2027
SV 11 Early Orbit Operations and On Orbit Checkout	1	2027	4	2027
SV12 Subsystem Development, Procurement & Build	1	2022	3	2023
SV12 System Integration & Test	3	2023	2	2026
SV12 Available for Launch	3	2026	3	2026
SV 12 Launch	4	2027	4	2027
SV 12 Early Orbit Operations and On Orbit Checkout	4	2027	4	2028
GPS IIIIF Advanced Capabilities Development	1	2022	4	2027
GNST+				
GNST+ Subsystem Development, Procurement & Build	1	2022	2	2022
GNST+ Integration	2	2022	1	2024
GSS+				
GSS+ 1 & 2 Subsystem Development, Procurement & Build	1	2022	3	2022
GSS+ 1 & 2 Hardware Available	3	2022	4	2022
GSS+ 1 & 2 Integration	1	2022	2	2024
GSS+ 1 Delivered	3	2024	3	2024
GSS+ 2 Delivered	4	2025	4	2025
Navigation Technology Satellite-3 (NTS-3)				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
NTS-3 Payload and Launch	1	2022	4	2024

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653171: GPS Enterprise Integration	0.000	0.000	60.064	61.721	0.000	61.721	63.583	65.471	66.807	69.220	0.000	386.866
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is not a New Start. In FY 2023, PE 1206423SF, Global Positioning System III - Operational Control Segment, Project 67A025, GPS Enterprise Integrator (EI), R-1 Line #52 efforts were transferred to PE 1203269SF, Global Positioning System IIIF, Project 653171, GPS Enterprise Integration, R-1 Line #17 in order to continue enterprise integration activities to support GPS IIIF Space, Ground and User Segment.

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) Program Office established and maintains the technical baseline and is responsible for the successful fielding of all the GPS Segments (space, control, and user). In order to successfully execute these responsibilities, GPS Enterprise Integrator (EI) creates an enterprise architecture, integrates segment products, verifies the enterprise requirements are adequately met, develops and implements various Systems Engineering documents, defines methods of verification, conducts integrated system test and test analysis, develops and manages the Enterprise technical baseline which reflect multiple stakeholder requirements; stakeholders include the Department of Defense (DoD), foreign governments, industry, and the general public (through four public interface specifications). Furthermore, GPS EI ensures PNT capabilities meet the warfighter's, civil agencies, commercial entities, international treaties, and over four billion global GPS users needs. Moreover, GPS EI is responsible for delivering a reliable Positioning, Navigation, and Timing (PNT) signal capability to military operators, the civil user community, and international partners. In addition, GPS EI validates the system performance in various mission threat scenarios during its development as well as provides in-depth technical expertise to enhance government control, oversight and program accountability. GPS EI is also responsible for all aspects of schedule and technical alignment across the GPS segments (space, control, and user equipment).

More specifically, GPS EI is responsible for technical baseline management, integration, synchronizing, testing, and verifying GPS III, GPS III Follow-on (IIIF), Operational Control System (OCS), Next Generation Operational Control System (OCX), Military GPS User Equipment (MGUE) Increment (Inc) 1 and Inc 2, and other PNT investment projects. Additionally, GPS EI is responsible for creating and managing plans that provide early exercise of the products under development, compatibility analysis, and inter-segment testing. The inter-segment tests are required to prove OCX interoperability with GPS III satellites and Modernized User Equipment. More importantly, it ensures backwards compatibility with legacy systems such as GPS Block II satellites, OCS, and legacy user equipment. The GPS EI also manages the process through which the Joint Requirements Oversight Council validated requirements are matured and flowed down to the system segments, while remaining consistent with various interfaces. This enables the GPS system to meet Title 10 of the USC, Sec 2281, mandated PNT capabilities, and various other obligations to the international community that provide inter-operable PNT signals.

GPS EI also supports GPS spectrum protection at international forums such as the International Telecommunications Union. Such support consists of providing technical support to the Departments of State and Defense to advocate on behalf of the US Government when negotiating with foreign partners. In addition, GPS EI provides technical expertise to maintain relationships with other US government agencies that include the Federal Aviation Administration, National Geospatial-

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Intelligence Agency (NGA), National Aeronautics and Space Administration, and Departments of State, Transportation, Homeland Security, and Commerce. GPS EI Spectrum also ensures GPS priority for eight essential spectrum signals, including those required for civil air navigation and safety of life. Spectrum Protection prevents encroachment from commercial or foreign entities, which results in the preservation of warfighter's reliable signal. As a result, military operations and the integrity of the global economic infrastructure are protected.

GPS EI also manages GPS and other navigation system performance monitoring and publishes performance specifications and reports to ensure anomalies with GPS can be resolved. In addition, GPS EI provides technical expertise for the development for GPS program technical baselines and public specifications to make certain that the DoD fulfills its commitment to the world for civilian GPS Service.

GPS EI also provides the PNT enterprise expertise in System Safety, Enterprise level System Security Engineering covering Acquisition Systems Program Security (i.e., personnel, industrial, operations, information, sensitive compartmented information, communication, and physical), Program Protection, Foreign Disclosure, Public Release reviews, Mission System Certification and Accreditation, and Enterprise Cybersecurity. GPS EI is accountable for the development, execution, and analysis of the PNT Enterprise Segments, cybersecurity, and associated test cases necessary to deliver a secure operational system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: Enterprise Integration</p> <p>Description: This is not a New Start. Funding supports the integration and technical baseline control of all elements of the Global Positioning System (GPS) system (space/control/user) in support of both military and civil users. Test and verification of integrated system performance in preparation for operational test and evaluation.</p> <p>FY 2023 Plans: Continue Space Systems Command (SSC)-led integrated test, operational evaluation, and transition to operations of the Next Generation Operational Control System (OCX) Block 1/2 and Military GPS User Equipment (MGUE) Increment (Inc) 1 receivers. Continue integrated, Government-led development and operational testing using operational assets, facilities and resources; efforts will include OCX Site Acceptance Testing, OCX Transition Risk Reduction to Operations, Integrated System Test (IST) 3-1 for OCX, Initial Operational Test and Evaluation (OT&E) for OCX-dependent capabilities, IST 3-3 Phase 4, and integration in the US Air Force B-2 Bomber and Navy Arleigh Burke Class Guided-Missile Destroyer (DDG). Support MGUE Inc 2 Miniature Serial Interface (MSI) with Next Generation Application Specific Integrated Circuit (ASIC) prototyping. Support MGUE Handheld program initiation and requirements review. Continue GPS Enterprise-wide systems engineering, systems integration, and technical baseline management to ensure GPS Programs of Record work effectively together.</p> <p>Support GPS III SV 09-10 delivery, launch planning and integration. Support integration planning for OCX Block 3 Follow-on (OCX 3F) and GPS III F Space Vehicles (SVs). Evaluate systems for effectiveness in delivering capabilities of GPS Constellation Management, prepare for GPS Enterprise Military-Code (M-Code) Positioning, Navigation, and Timing (PNT) Determination, GPS L2C signal PNT Determination, and GPS L5 signal PNT Determination. Support operational demonstration of Vanguard</p>	-	60.064	61.721

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Navigation Technology Satellite-3 (NTS-3) program acquisition planning for selected technology transition to operational systems. Work with US Civil Partners to develop and assess future GPS opportunities.</p> <p>Provide increased support for PNT cybersecurity including cyber survivability test and evaluation planning and analysis.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 Plans: Continue integrated, Government-led development and operational testing using operational assets, facilities and resources. Support MGUE Inc 2 MSI with Next Generation ASIC prototyping. Support MGUE Handheld program and requirements review. Continue GPS Enterprise-wide systems engineering, systems integration, and technical baseline management to ensure GPS Programs of Record work effectively together.</p> <p>Support GPS III SV09-10 delivery, launch planning and integration. Support integration planning for OCX 3F and GPS IIIIF SVs. Evaluate systems for effectiveness in delivering capabilities of GPS Constellation Management, GPS Enterprise M-Code PNT Determination, GPS L2C signal PNT Determination, and GPS L5 signal PNT Determination. Support operational demonstration of Vanguard NTS-3 program and acquisition planning for selected technology for transition to operational systems. Work with US Civil Partners to develop and assess future GPS opportunities.</p> <p>Provide increased support for PNT cybersecurity including cyber survivability test and evaluation planning and analysis.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program funding increases due to slight ramp up in support to MGUE Inc 2 Handheld and OCX 3F development, and GPS IIIIF production.</p>				
Accomplishments/Planned Programs Subtotals		-	60.064	61.721

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

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTE 07 1206423F: <i>Global Positioning System III - Operational Control Segment</i>	388.977	277.052	317.309	-	317.309	82.385	22.836	6.616	6.855	0.000	1,102.030
• RDTE 04 1203164F: <i>NAVSTAR Global Positioning System (User Equipment) (SPACE)</i>	419.889	381.394	353.807	-	353.807	299.499	133.838	0.000	0.000	0.000	1,588.427
• RDTE 07 1203265F: <i>GPS III Space Segment</i>	7.207	1.526	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.733
• RDTE 05 1203269SF: <i>GPS III Follow-On (GPS III F)</i>	199.947	232.783	247.278	-	247.278	190.442	128.163	100.481	0.900	214.192	1,314.186
• SPSF 01 1203265SF: <i>GPS III Space Segment</i>	84.452	103.340	121.770	-	121.770	75.491	50.078	2.809	0.000	0.000	437.940
• SPSF 01 1203269SF: <i>GPS III Follow-On (GPS III F)</i>	835.176	616.962	118.916	-	118.916	678.531	708.802	743.060	758.646	2,100.419	6,560.512

Remarks

D. Acquisition Strategy

In accordance with a "back to basics" acquisition approach the Space Force is required to exercise complete ownership of the architecture, system definition, technical baseline, and integration of the GPS space, ground, and user segments. This complex inter-segment integration requires the government to be the integrator. To execute this responsibility, the government leverages systems engineering and integration expertise from both Federally Funded Research and Development Center (FFRDC) contractors and a Systems Engineering & Integration (SE&I) contractor. The GPS EI function of the SE&I contractor is currently funded within this PE. SE&I effort was awarded in April 2022 through a full and open competition, following a sole source SE&I Bridge Contract that began in 1QFY22.

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

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration
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Product Development (\$ in Millions)				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			
GPS EI Enterprise SE&I	RO	SAIC : El Segundo, CA	0.000	-		29.587	Nov 2022	27.294	Nov 2023	-		27.294	Continuing	Continuing	-
GPS EI Technical Mission Analysis 1	RO	Aerospace : El Segundo, CA	0.000	-		5.559	Oct 2022	5.605	Oct 2023	-		5.605	Continuing	Continuing	-
GPS EI Technical Mission Analysis 2	Various	Mitre : Various	0.000	-		11.635	Oct 2022	13.684	Oct 2023	-		13.684	Continuing	Continuing	-
GPS EI SBIR/STTR	Various	Various : Washington, DC	0.000	-		0.000		2.151	Mar 2024	-		2.151	Continuing	Continuing	-
GPS EI Additional Product Development	Various	Various : Various	0.000	-		6.990	Oct 2022	1.486	Oct 2023	-		1.486	Continuing	Continuing	-
Subtotal			0.000	-		53.771		50.220		-		50.220	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				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			
GPS EI Integrated System Test	Various	Various : TBD	0.000	-		4.400	Dec 2023	4.400	Dec 2023	-		4.400	0.000	8.800	-
GPS EI GPS Test Asset Program (GTAP)	C/CPAF	Draper Labs : Cambridge, MA	0.000	-		-		5.637	Dec 2023	-		5.637	Continuing	Continuing	-
Subtotal			0.000	-		4.400		10.037		-		10.037	Continuing	Continuing	N/A

Management Services (\$ in Millions)				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			
GPS EI A&AS	Various	Various : El Segundo, CA	0.000	-		1.493	Oct 2022	1.064	Oct 2023	-		1.064	Continuing	Continuing	-
GPS EI Other Support	Various	Various : Various	0.000	-		0.400	Oct 2022	0.400	Oct 2023	-		0.400	Continuing	Continuing	-
Subtotal			0.000	-		1.893		1.464		-		1.464	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration

	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				
Support GPS III and GPS IIIIF AFL																																
GPS III SV09 Available for Launch					■																											
GPS III SV10 Available for Launch								■																								
GPS IIIIF SV11 Available for Launch																				■												
GPS IIIIF SV12 Available for Launch																				■												
GPS IIIIF SV13 Available for Launch																				■												
GPS IIIIF SV14 Available for Launch																																■
Enterprise Integration Support																																
Mission Integration and Technical Baseline Management					■																											
OCX Block 1 Ready to Transition to Operations (RTO)																■																
M-Code, L5 and L2C Initial Operational Capability (IOC)												■																				
M-Code PNT IOC																■																
OCX 3F Operational Acceptance																																■
Constellation Management Full Operational Capability																																■
L5 PNT Full Operational Capability																																■

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Support GPS III and GPS III F AFL</i>				
GPS III SV09 Available for Launch	1	2023	1	2023
GPS III SV10 Available for Launch	3	2023	3	2023
GPS III F SV11 Available for Launch	2	2026	2	2026
GPS III F SV12 Available for Launch	3	2026	3	2026
GPS III F SV13 Available for Launch	4	2026	4	2026
GPS III F SV14 Available for Launch	2	2027	2	2027
<i>Enterprise Integration Support</i>				
Mission Integration and Technical Baseline Management	1	2023	4	2028
OCX Block 1 Ready to Transition to Operations (RTO)	3	2024	3	2024
M-Code, L5 and L2C Initial Operational Capability (IOC)	2	2024	2	2024
M-Code PNT IOC	2	2025	2	2025
OCX 3F Operational Acceptance	1	2028	1	2028
Constellation Management Full Operational Capability	1	2028	1	2028
L5 PNT Full Operational Capability	2	2028	2	2028