RCS: DD-A&T(Q&A)823-292

# Global Positioning System III (GPS III)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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## Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

## Program Information

| Program Name |
| --- |
| Global Positioning System III (GPS III) |

| DoD Component |
| --- |
| Air Force |

This is a United States Space Force program.

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## References

**SAR Baseline (Production Estimate)**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated January 31, 2011

**Approved APB**

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated December 12, 2017

## Mission and Description

Global Positioning System (GPS) is a satellite-based radio navigation system that provides worldwide military and civil users satellite signals they can process to determine accurate position, velocity, and time. On May 8, 2000, the USD(AT&L) approved entry into the initial modernization efforts for Navstar GPS. GPS III, an Acquisition Category IC program, is the next generation space vehicle (SV) that will provide significant enhancements to complete the modernization of the constellation. GPS III complies with section 2281 of title 10, United States Code, ensuring the continued sustainment and operation of GPS for military and civilian purposes, and section 50112 of title 51, USC, continuing as an international standard available on a continuous worldwide basis free of direct user fees.

As captured in a November 6, 2006 Memorandum, the JROC validated and endorsed the GPS III CDD for the first increment, validating the requirements for the GPS III program and authorized the Air Force to deliver SV01-SV08. In his February 27, 2015 ADM, the USD(AT&L) directed the procurement of SV09/10 as technical equivalents for SV01-08. Follow -on vehicles SV11+ will be procured in a separate ACAT IB program called GPS III Follow-On (GPS IIIF).

The primary GPS III missions are worldwide positioning, navigation, and precise time transfer. GPS provides strategic and tactical support to the following DoD missions: Joint Operations by providing capabilities for Position, Navigation and Timing (PNT); Command, Control, Communications, and Intelligence; Special Operations; Military Operations in Urban Terrain; Defense-Wide Mission Support; Air Mobility; and Space Launch Orbital Support.

For military users, the GPS III program provides Precise Positioning Service (PPS) to military operations and force enhancement. It also provides increased anti-jam power to the earth coverage Military code signals and anti-exploitation techniques in order to prevent unauthorized use of the GPS PPS signal. In addition, the program will support the U.S. Nuclear Detonation Detection System mission for worldwide monitoring and detection of nuclear events via a hosted payload.

The GPS III program provides a Standard Positioning Service to a broad spectrum of civil users which will include the three civil signals (L1 C/A, L2C, and L5) flown on previous satellites. It will also transmit a new fourth civil signal (L1C), which is compatible with the European Galileo satellite navigation system signal, E1. L1C is also compatible with those signals planned for broadcast on Japan's Quazi-Zenith Satellite System, a system meant to augment GPS services. Once implemented, the common civil signal will be jointly broadcast by up to 60 satellites from both GPS and Galileo constellations, further increasing the accuracy and availability of user PNT solutions.

On December 20, 2019, the President of the United States established the United States Space Force which assumed the responsibility for all major space acquisition programs. This program is now a United States Space Force program.

# Executive Summary

## Program Highlights Since Last Report

On August 22, 2019, Space Vehicle (SV)02 was successfully launched aboard a United Launch Alliance Delta IV rocket. On May 16, 2019, the Air Force declared SV03 Available for Launch (AFL) on May 16, 2019 while SV04 was declared AFL on September 10, 2019.

The Air Force and Lockheed Martin completed a pre-launch exercise and the Mission Dress Rehearsal for SV02, which vigorously prepared the Launch and Checkout Capability (LCC) for launch and early orbit operations. The SV02 on-orbit checkout successfully passed all test objectives. In addition to the rehearsals, the Air Force ran a hardware loading demonstration and multiple Launch and Checkout System readiness tests for the SV02 and SV03 launches. The Space Force is preparing the LCC for launch operations, while working towards transition of SV01 to the 14th Air Force for operations. SV02 was successfully launched on August 22, 2019 and the Next Generation Operational Control System (OCX) Block 0 system maintains its state of health.

The Air Force completed Assembly, Integration and Test major milestones for SV03 and declared an Initial Launch Capability date of April 2020. The Space Force is projecting to ship SV04 to the launch site in March 2020. SV05 completed Passive Intermodulation/Electromagnetic Interference/Electromagnetic Compatibility testing in September 2019. SV06 completed Thermal Vacuum testing in November 2019, within a record-setting 58 days, the shortest yet for GPS III. SV07 completed Core Mate in December 2019. All subsequent production SVs are proceeding nominally.

There are no significant software-related issues with this program at this time.

## History of Significant Developments Since Program Initiation

| History of Significant Developments Since Program Initiation | |
|---|---|
| **Date** | **Significant Development Description** |
| November 2000 | Global Positioning System (GPS) III-specific concepts were pursued through two 1-year GPS III System Architecture and Requirements Definition (SARD) contracts awarded to Boeing and Lockheed Martin on November 9, 2000. |
| January 2004 | Following the SARD efforts, two competitive GPS III Phase A contracts were authorized. These contracts continued to mature the GPS III joint space and control segment concept. |
| January 2005 | The Under Secretary of the Air Force, (SAF/US) directed that the GPS III control and space segments be contracted for separately to the "best of breed" industry partners for each segment, concurrently designating the program office as the integrator of the two segments. |
| February 2005 | Pursuant to SAF/US direction, the program office released a Request for Information to assess the technical, programmatic, and contractual alternatives available for the control and space segment acquisitions. The program office determined that Boeing and Lockheed Martin were the only two viable space segment prime contractors and extended the Phase A contracts with Boeing and Lockheed Martin to conduct Payload Risk Reduction and System Definition, a Delta-System Requirements Review that concluded in November 2006, a System Design Review that concluded in April 2007, and Space Vehicle (SV) Risk Reduction and Systems Definition. |
| May 2008 | The USD(AT&L) signed the GPS III APB and ADM, designating GPS III as an ACAT ID MDAP with approval to proceed into Phase B, preliminary design, and the authority to procure development SVs 01-02. On May 15, 2008, the GPS III contract was awarded to Lockheed Martin, giving them authority to proceed. |
| October 2008 | GPS III successfully completed its Integrated Baseline Review (IBR). The program implemented a comprehensive IBR process that validated the content, integrity and executability of the GPS III baseline, and ensured a low risk and high confidence execution. |
| May 2009 | GPS III successfully completed its SV Preliminary Design Review (PDR). This significant milestone demonstrated that the technical baseline had been established, requirements were stable and allocated to the appropriate level, the requirements were under configuration control, and the preliminary design met all KPPs. |
| August 2010 | As a result of the successful PDR completion, GPS III proceeded into its Critical Design Review (CDR) process which concluded with a successful SV CDR. This significant milestone demonstrated that the detailed design met all KPP requirements and was producible. |
| December 2010 | In preparation for the Annual GPS Enterprise Review, GPS III successfully completed an Independent Program Assessment review, an Air Force Review Board, and an Overarching Integrated Product Team review. |
| January 2011 | GPS III secured Milestone C approval and was authorized to begin long lead procurement. An ADM, an updated Acquisition Strategy Document and an updated APB were signed by the MDA authorizing the program to begin long lead procurement of production SV03-SV08. |
| January 2011 | Initial indications of technical problems with the Navigation Payload led to the formation of the Mission Data Unit (MDU) Tiger Team. |
| February 2013 | The SV01 BUS achieved Initial Power Turn-On and the team successfully completed a third simulation of GPS III Launch and Checkout System readiness exercise between GPS III and GPS Next Generation Operational Control System in August 2013. |
| December 2013 | The GPS III program received permission from the MDA to exercise the current Cost Plus Incentive Fee/Award Fee contract options for SV05-08. The option for SV05-SV06 was awarded in December 2013, and the SV07-SV08 option was awarded in March 2014. |

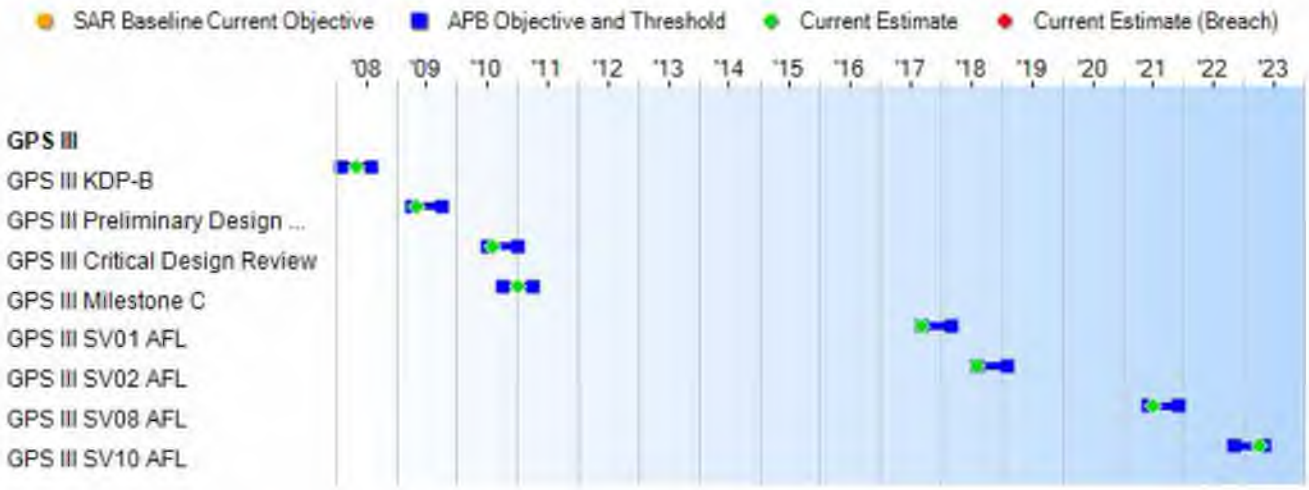
| | |
|---|---|
| March 2014 | The program addressed Navigation Payload MDU technical challenges associated with SV01, which impacted the GPS III contract cost and schedule baseline. |
| June 2014 | The program approved Lockheed Martin to conduct an Over Target Baseline (OTB) for SVs 01-08. The OTB concluded in May 2015. |
| February 2015 | USD(AT&L) signed an ADM approving the purchase of SV09-10 as technical equivalents to SV01-08. |
| March 2015 | The GPS III prime contractor requested an OTB due to an invalid contract baseline. The Government completed OTB activities and the MDA approved a new contract baseline. |
| December 2015 | SV01 successfully completed baseline Thermal Vacuum (TVAC) testing on December 23, 2015. This is a major system-level event. Significant confidence was gained in contractor design and workmanship based on TVAC testing, demonstrating the satellite can perform successfully in a space environment. |
| January 2016 | USD(AT&L) signed the updated APB. This update to the original APB was due to both cost and schedule breaches. In addition, the revised APB added SV09-10 to the MDAP program of record. |
| November 2017 | USD(AT&L) delegated the MDA for the program to the Secretary of the Air Force as an ACAT IC. |
| December 2017 | The MDA signed the updated APB Change 2, approving new Available for Launch (AFL) dates for SVs 01, 02 and 08 due to a schedule breach and projected schedule deviations. |
| August 2018 | SV02 declared AFL on August 10, 2018 with Initial Launch Capability projected for June 2019. |
| November 2018 | SV01 declared Consent to Fuel on November 9, 2018 with scheduled launch date set for December 2018. |
| December 2018 | SV01 successfully launched on the Space Exploration Technologies Falcon 9 from Cape Canaveral on December 23, 2018. |
| May 2019 | SV03 declared AFL on May 16, 2019 with Initial Launch Capability (ILC) projected for April 2020. |
| July 2019 | SV01 successfully completed On-Orbit Checkout and Test. |
| August 2019 | SV02 successfully launched on United Launch Alliance Delta IV from Cape Canaveral on August 22, 2019. |
| September 2019 | SV04 declared AFL on September 10, 2019 with ILC projected for July 2020. |
| November 2019 | SV01 successfully completed Integrated System Test 2-5. |

## Threshold Breaches

| APB Breaches | | |
|---|---|---|
| **Schedule** | | ☐ |
| **Performance** | | ☐ |
| **Cost** | RDT&E | ☐ |
| | Procurement | ☐ |
| | MILCON | ☐ |
| | Acq O&M | ☐ |
| **O&S Cost** | | ☐ |
| **Unit Cost** | PAUC | ☐ |
| | APUC | ☐ |

| Nunn-McCurdy Breaches | | |
|---|---|---|
| **Current UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |
| **Original UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |

## Schedule




| Schedule Events | | | | | |
|---|---|---|---|---|---|
| Events | SAR Baseline Production Estimate | Current APB Production Objective/Threshold | | Current Estimate | |
| GPS III KDP-B | Feb 2008 | Feb 2008 | Aug 2008 | May 2008 | |
| GPS III Preliminary Design Review | Apr 2009 | Apr 2009 | Oct 2009 | May 2009 | |
| GPS III Critical Design Review | Jul 2010 | Jul 2010 | Jan 2011 | Aug 2010 | |
| GPS III Milestone C | Oct 2010 | Oct 2010 | Apr 2011 | Jan 2011 | |
| GPS III SV01 AFL | Apr 2014 | Sep 2017 | Mar 2018 | Sep 2017 | |
| GPS III SV02 AFL | Apr 2015 | Aug 2018 | Feb 2019 | Aug 2018 | |
| GPS III SV08 AFL | May 2018 | Jun 2021 | Dec 2021 | Jul 2021 | (Ch-1) |
| GPS III SV10 AFL | N/A | Nov 2022 | May 2023 | Apr 2023 | (Ch-2) |

### Change Explanations

(Ch-1) The GPS III SV08 AFL changed from June 2021 to July 2021 due to a delay in the remote interface unit delivery which caused TVAC start to be delayed a month.
(Ch-2) The GPS III SV10 AFL changed from November 2022 to April 2023 due to a subcontractor that has manufactured defective components that are required for box-level SV installation.

### Acronyms and Abbreviations

AFL - Available for Launch
KDP - Key Decision Point
SV - Space Vehicle
TVAC - Thermal Vacuum

## Performance

| Performance Characteristics | | | | |
|---|---|---|---|---|
| **SAR Baseline Production Estimate** | **Current APB Production Objective/Threshold** | | **Demonstrated Performance** | **Current Estimate** |
| **Backward Compatibility** | | | | |
| All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers). | All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers). | (T=O) All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers). | TBD | All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers). |
| **User Range Error (meters)** | | | | |
| .2 | .2 | 1.1 | TBD | 1.0 |
| **Net-Ready** | | | | |
| The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations. | The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations. | The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for transition to Net-Centric military operations. | TBD | The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations. |
| **Satellite Availability** | | | | |
| 0.984 | 0.984 | (T=O) 0.984 | TBD | 0.984 |
| **Boosted Earth-Coverage M-Code Power (dBW)** | | | | |
| -148 | -148 | -153 | TBD | -151.7 |
| **Minimum L1C Signal Power** | | | | |
| -157 | -157 | (T=O) -157 | TBD | -157 |
| **Position and Time Transfer Integrity (Probability of Misleading SIS Information)** | | | | |

| | | | | |
|---|---|---|---|---|
| 0.0000001 | 0.0000001 | 0.0001 | TBD | 0.00000001 |

## Requirements Reference

CDD for Increment A dated November 6, 2006

## Change Explanations

None

## Notes

For the Net Ready KPP, Demonstrated Performance is TBD until it is verified with the completion of integrated system test-1 which verifies that OCX Block 1 can command and control legacy GPS II and new GPS III SVs.

Estimated completion dates for the capabilities are as follows:

- Backward Compatibility and Satellite availability: Third Quarter FY 2020
- Position Time Transfer and User Range Error: Third Quarter FY 2020
- Boosted Earth Coverage M-Code Power (dBW): Third Quarter FY 2022
- Minimum L1C Signal Power: Third Quarter FY 2022

## Acronyms and Abbreviations

dBW - Decibel-watt
GPS - Global Positioning System
ICD - Interface Control Document
IS - Interface Specifications
M-Code - Military Code
O - Objective
OCX - Next Generation Operational Control System
SIS - Signal in Space
SS - System Specifications
SV - Space Vehicle
T - Threshold
UE - User Equipment

# Track to Budget

## General Notes

In December 2014, the Office of Management and Budget directed the DoD to establish a new space procurement appropriation. Beginning in FY 2016, Air Force major procurement funding formerly under 3020F (Missile Procurement, Air Force) BA 05 will now be under 3021F (Space Procurement, Air Force) BA 01, a three-year procurement account.

In December 2019, the Office of Management and Budget directed the DoD to establish new Space Force RDT&E and procurement appropriations. Beginning in FY 2021, space-related RDT&E funding, formerly under 3600F (RDT&E, Air Force) is contained in 3620SF (RDT&E, Space Force) and space procurement funding formerly under 3021F (Space Procurement, Air Force) is contained in 3022SF (Procurement, Space Force).

## RDT&E

| Appn | | BA | PE | | |
|---|---|---|---|---|---|
| Air Force | 3600 | 07 | 0305265F | | |
| | **Project** | | **Name** | | |
| | 67A019 | | GPS IIIA | (Shared) | (Sunk) |
| Air Force | 3600 | 04 | 0603421F | | |
| | **Project** | | **Name** | | |
| | 644993 | | GPS III Development | | (Sunk) |
| Air Force | 3600 | 07 | 1203265F | | |
| | **Project** | | **Name** | | |
| | 67A019 | | GPS III | (Shared) | (Sunk) |
| Air Force | 3620 | 07 | 1203265SF | | |
| | **Project** | | **Name** | | |
| | 67A019 | | GPS III Space Segment | | |

## Notes

The shared funding lines include funding for SV11+ however these funds are not included in this SAR.

## Procurement

| Appn | | BA | PE | | |
|---|---|---|---|---|---|
| Air Force | 3020 | 05 | 0305265F | | |
| | **Line Item** | | **Name** | | |
| | GPSIII | | GPS III Space Segment | (Shared) | (Sunk) |
| Air Force | 3021 | 01 | 0305265F | | |
| | **Line Item** | | **Name** | | |
| | GPSIII | | GPS III Space Segment | (Shared) | (Sunk) |
| Air Force | 3021 | 01 | 1203265F | | |
| | **Line Item** | | **Name** | | |
| | GPSIII | | GPS III Space Segment | (Shared) | (Sunk) |

Air Force 3022 01 1203265SF

| Line Item | Name |
|---|---|
| GPSIII | GPS III Space Segment |

# Cost and Funding

## Cost Summary

| Total Acquisition Cost | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriation | BY 2010 $M | | | BY 2010 $M | TY $M | | |
| | SAR Baseline Production Estimate | Current APB Production Objective/Threshold | | Current Estimate | SAR Baseline Production Estimate | Current APB Production Objective | Current Estimate |
| RDT&E | 2623.9 | 2985.1 | 3283.6 | 2979.2 | 2653.8 | 3080.1 | 3075.8 |
| Procurement | 1519.0 | 2311.3 | 2542.4 | 1936.5 | 1616.0 | 2570.0 | 2131.8 |
| Flyaway | -- | -- | -- | 1704.2 | -- | -- | 1862.2 |
| Recurring | -- | -- | -- | 1703.6 | -- | -- | 1861.5 |
| Non Recurring | -- | -- | -- | 0.6 | -- | -- | 0.7 |
| Support | -- | -- | -- | 232.3 | -- | -- | 269.6 |
| Other Support | -- | -- | -- | 232.3 | -- | -- | 269.6 |
| Initial Spares | -- | -- | -- | 0.0 | -- | -- | 0.0 |
| MILCON | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 4142.9 | 5296.4 | N/A | 4915.7 | 4269.8 | 5650.1 | 5207.6 |

**Current APB Cost Estimate Reference**

SCP dated July 02, 2015

**Cost Notes**

No cost estimate for the program has been completed in the previous year.

| Total Quantity | | | |
|---|---|---|---|
| Quantity | SAR Baseline Production Estimate | Current APB Production | Current Estimate |
| RDT&E | 2 | 2 | 2 |
| Procurement | 6 | 8 | 8 |
| Total | 8 | 10 | 10 |

## Cost and Funding

## Funding Summary

| Appropriation Summary | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FY 2021 President's Budget / December 2019 SAR (TY$ M) | | | | | | | | | |
| Appropriation | Prior | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | To Complete | Total |
| RDT&E | 3024.7 | 24.0 | 7.1 | 7.3 | 1.6 | 3.4 | 7.7 | 0.0 | 3075.8 |
| Procurement | 2020.7 | 31.5 | 20.1 | 21.3 | 19.3 | 7.9 | 1.9 | 9.1 | 2131.8 |
| MILCON | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PB 2021 Total | 5045.4 | 55.5 | 27.2 | 28.6 | 20.9 | 11.3 | 9.6 | 9.1 | 5207.6 |
| PB 2020 Total | 5034.5 | 55.5 | 27.2 | 28.6 | 26.9 | 27.3 | 5.4 | 9.1 | 5214.5 |
| Delta | 10.9 | 0.0 | 0.0 | 0.0 | -6.0 | -16.0 | 4.2 | 0.0 | -6.9 |

| Quantity Summary | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FY 2021 President's Budget / December 2019 SAR (TY$ M) | | | | | | | | | | |
| Quantity | Undistributed | Prior | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | To Complete | Total |
| Development | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Production | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| PB 2021 Total | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| PB 2020 Total | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Cost and Funding

## Annual Funding By Appropriation

| Annual Funding<br>3600 \| RDT&E \| Research, Development, Test, and Evaluation, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | TY $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2002 | -- | -- | -- | -- | -- | -- | 51.5 |
| 2003 | -- | -- | -- | -- | -- | -- | 39.7 |
| 2004 | -- | -- | -- | -- | -- | -- | -- |
| 2005 | -- | -- | -- | -- | -- | -- | 21.2 |
| 2006 | -- | -- | -- | -- | -- | -- | 51.4 |
| 2007 | -- | -- | -- | -- | -- | -- | 195.2 |
| 2008 | -- | -- | -- | -- | -- | -- | 189.8 |
| 2009 | -- | -- | -- | -- | -- | -- | 356.7 |
| 2010 | -- | -- | -- | -- | -- | -- | 390.6 |
| 2011 | -- | -- | -- | -- | -- | -- | 405.3 |
| 2012 | -- | -- | -- | -- | -- | -- | 399.6 |
| 2013 | -- | -- | -- | -- | -- | -- | 237.1 |
| 2014 | -- | -- | -- | -- | -- | -- | 193.3 |
| 2015 | -- | -- | -- | -- | -- | -- | 172.6 |
| 2016 | -- | -- | -- | -- | -- | -- | 100.6 |
| 2017 | -- | -- | -- | -- | -- | -- | 73.1 |
| 2018 | -- | -- | -- | -- | -- | -- | 107.3 |
| 2019 | -- | -- | -- | -- | -- | -- | 39.7 |
| 2020 | -- | -- | -- | -- | -- | -- | 24.0 |
| Subtotal | 2 | -- | -- | -- | -- | -- | 3048.7 |

| Annual Funding<br>3600 \| RDT&E \| Research, Development, Test, and Evaluation, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | BY 2010 $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2002 | -- | -- | -- | -- | -- | -- | 60.1 |
| 2003 | -- | -- | -- | -- | -- | -- | 45.7 |
| 2004 | -- | -- | -- | -- | -- | -- | -- |
| 2005 | -- | -- | -- | -- | -- | -- | 23.2 |
| 2006 | -- | -- | -- | -- | -- | -- | 54.6 |
| 2007 | -- | -- | -- | -- | -- | -- | 202.0 |
| 2008 | -- | -- | -- | -- | -- | -- | 192.6 |
| 2009 | -- | -- | -- | -- | -- | -- | 357.2 |
| 2010 | -- | -- | -- | -- | -- | -- | 386.3 |
| 2011 | -- | -- | -- | -- | -- | -- | 393.4 |
| 2012 | -- | -- | -- | -- | -- | -- | 381.2 |
| 2013 | -- | -- | -- | -- | -- | -- | 222.4 |
| 2014 | -- | -- | -- | -- | -- | -- | 178.8 |
| 2015 | -- | -- | -- | -- | -- | -- | 158.1 |
| 2016 | -- | -- | -- | -- | -- | -- | 90.8 |
| 2017 | -- | -- | -- | -- | -- | -- | 64.7 |
| 2018 | -- | -- | -- | -- | -- | -- | 93.0 |
| 2019 | -- | -- | -- | -- | -- | -- | 33.8 |
| 2020 | -- | -- | -- | -- | -- | -- | 20.0 |
| Subtotal | 2 | -- | -- | -- | -- | -- | 2957.9 |

| Annual Funding<br>3620 \| RDT&E \| Research, Development, Test, and Evaluation, Space Force, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | TY $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2021 | -- | -- | -- | -- | -- | -- | 7.1 |
| 2022 | -- | -- | -- | -- | -- | -- | 7.3 |
| 2023 | -- | -- | -- | -- | -- | -- | 1.6 |
| 2024 | -- | -- | -- | -- | -- | -- | 3.4 |
| 2025 | -- | -- | -- | -- | -- | -- | 7.7 |
| Subtotal | -- | -- | -- | -- | -- | -- | 27.1 |

| Annual Funding<br>3620 \| RDT&E \| Research, Development, Test, and Evaluation, Space Force, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | BY 2010 $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2021 | -- | -- | -- | -- | -- | -- | 5.8 |
| 2022 | -- | -- | -- | -- | -- | -- | 5.8 |
| 2023 | -- | -- | -- | -- | -- | -- | 1.3 |
| 2024 | -- | -- | -- | -- | -- | -- | 2.6 |
| 2025 | -- | -- | -- | -- | -- | -- | 5.8 |
| Subtotal | -- | -- | -- | -- | -- | -- | 21.3 |

| Annual Funding<br>3020 \| Procurement \| Missile Procurement, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | TY $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2010 | -- | 96.0 | -- | -- | 96.0 | -- | 96.0 |
| 2011 | -- | -- | -- | -- | -- | -- | -- |
| 2012 | 2 | 413.1 | -- | -- | 413.1 | 39.0 | 452.1 |
| 2013 | 2 | 458.3 | -- | -- | 458.3 | 33.0 | 491.3 |
| 2014 | 2 | 417.5 | -- | -- | 417.5 | 31.8 | 449.3 |
| 2015 | 1 | 196.0 | -- | 0.7 | 196.7 | 19.5 | 216.2 |
| Subtotal | 7 | 1580.9 | -- | 0.7 | 1581.6 | 123.3 | 1704.9 |

| Annual Funding<br>3020 \| Procurement \| Missile Procurement, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | BY 2010 $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2010 | -- | 94.0 | -- | -- | 94.0 | -- | 94.0 |
| 2011 | -- | -- | -- | -- | -- | -- | -- |
| 2012 | 2 | 390.0 | -- | -- | 390.0 | 36.8 | 426.8 |
| 2013 | 2 | 422.9 | -- | -- | 422.9 | 30.4 | 453.3 |
| 2014 | 2 | 379.7 | -- | -- | 379.7 | 28.9 | 408.6 |
| 2015 | 1 | 176.2 | -- | 0.6 | 176.8 | 17.5 | 194.3 |
| Subtotal | 7 | 1462.8 | -- | 0.6 | 1463.4 | 113.6 | 1577.0 |

| Cost Quantity Information<br>3020 \| Procurement \| Missile Procurement, Air Force | | |
|---|---|---|
| **Fiscal Year** | **Quantity** | **End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M** |
| 2010 | -- | -- |
| 2011 | -- | -- |
| 2012 | 2 | 417.9 |
| 2013 | 2 | 417.9 |
| 2014 | 2 | 417.9 |
| 2015 | 1 | 209.1 |
| Subtotal | 7 | 1462.8 |

| Annual Funding<br>3021 \| Procurement \| Space Procurement, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | TY $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2016 | 1 | 161.9 | -- | -- | 161.9 | 10.9 | 172.8 |
| 2017 | -- | 20.6 | -- | -- | 20.6 | 9.6 | 30.2 |
| 2018 | -- | 23.6 | -- | -- | 23.6 | 23.2 | 46.8 |
| 2019 | -- | 19.1 | 8.9 | -- | 28.0 | 38.0 | 66.0 |
| 2020 | -- | 6.2 | 8.8 | -- | 15.0 | 16.5 | 31.5 |
| Subtotal | 1 | 231.4 | 17.7 | -- | 249.1 | 98.2 | 347.3 |

| Annual Funding<br>3021 \| Procurement \| Space Procurement, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | BY 2010 $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2016 | 1 | 143.0 | -- | -- | 143.0 | 9.7 | 152.7 |
| 2017 | -- | 17.8 | -- | -- | 17.8 | 8.3 | 26.1 |
| 2018 | -- | 20.0 | -- | -- | 20.0 | 19.6 | 39.6 |
| 2019 | -- | 15.8 | 7.4 | -- | 23.2 | 31.5 | 54.7 |
| 2020 | -- | 5.0 | 7.1 | -- | 12.1 | 13.5 | 25.6 |
| Subtotal | 1 | 201.6 | 14.5 | -- | 216.1 | 82.6 | 298.7 |

APPN 3022 is a continuation of our 3021 funding that ended in FY 2020. There is no quantity to align with this funding. The quantity is captured under APPN 3021 in FY 2016. All funding is aligned to support quantities in FY 2016 for amounts in APPN 3021 and APPN 3022.

| Cost Quantity Information<br>3021 \| Procurement \| Space Procurement, Air Force | | |
|---|---|---|
| **Fiscal Year** | **Quantity** | **End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M** |
| 2016 | 1 | 215.7 |
| 2017 | -- | -- |
| 2018 | -- | -- |
| 2019 | -- | -- |
| 2020 | -- | -- |
| Subtotal | 1 | 215.7 |

| Annual Funding<br>3022 \| Procurement \| Procurement, Space Force, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | TY $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2021 | -- | 7.3 | 8.9 | -- | 16.2 | 3.9 | 20.1 |
| 2022 | -- | 4.5 | 4.5 | -- | 9.0 | 12.3 | 21.3 |
| 2023 | -- | 4.3 | -- | -- | 4.3 | 15.0 | 19.3 |
| 2024 | -- | 2.0 | -- | -- | 2.0 | 5.9 | 7.9 |
| 2025 | -- | -- | -- | -- | -- | 1.9 | 1.9 |
| 2026 | -- | -- | -- | -- | -- | 1.3 | 1.3 |
| 2027 | -- | -- | -- | -- | -- | 1.3 | 1.3 |
| 2028 | -- | -- | -- | -- | -- | 1.3 | 1.3 |
| 2029 | -- | -- | -- | -- | -- | 1.3 | 1.3 |
| 2030 | -- | -- | -- | -- | -- | 1.3 | 1.3 |
| 2031 | -- | -- | -- | -- | -- | 1.1 | 1.1 |
| 2032 | -- | -- | -- | -- | -- | 0.8 | 0.8 |
| 2033 | -- | -- | -- | -- | -- | 0.5 | 0.5 |
| 2034 | -- | -- | -- | -- | -- | 0.2 | 0.2 |
| Subtotal | -- | 18.1 | 13.4 | -- | 31.5 | 48.1 | 79.6 |

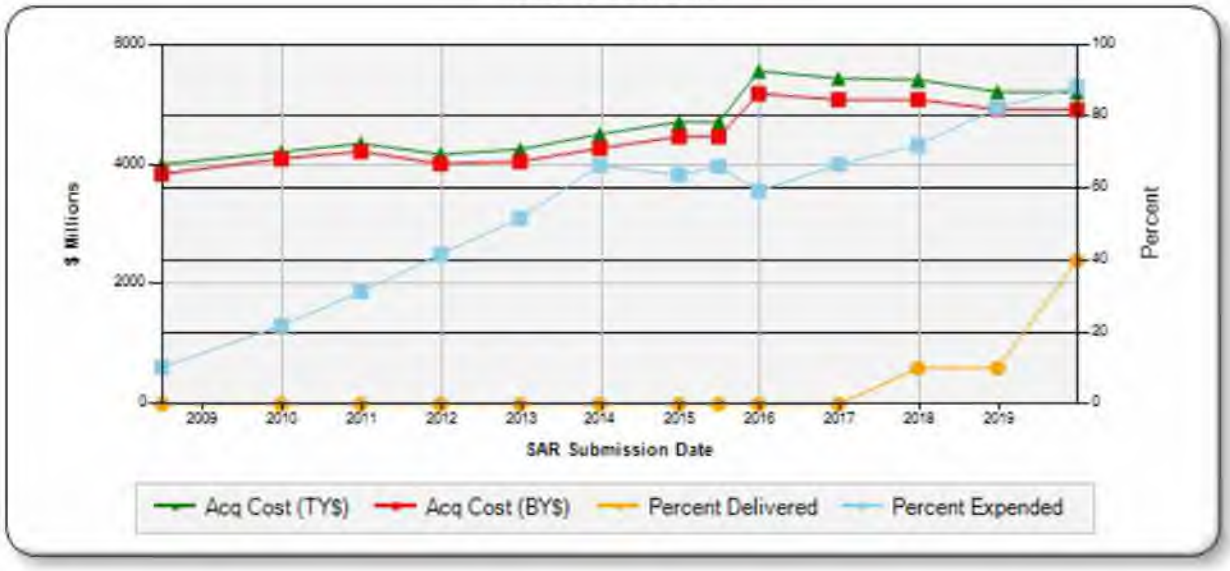
| Annual Funding<br>3022 \| Procurement \| Procurement, Space Force, Air Force | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year | Quantity | BY 2010 $M | | | | | |
| | | End Item Recurring Flyaway | Non End Item Recurring Flyaway | Non Recurring Flyaway | Total Flyaway | Total Support | Total Program |
| 2021 | -- | 5.8 | 7.1 | -- | 12.9 | 3.1 | 16.0 |
| 2022 | -- | 3.5 | 3.5 | -- | 7.0 | 9.6 | 16.6 |
| 2023 | -- | 3.3 | -- | -- | 3.3 | 11.5 | 14.8 |
| 2024 | -- | 1.5 | -- | -- | 1.5 | 4.4 | 5.9 |
| 2025 | -- | -- | -- | -- | -- | 1.4 | 1.4 |
| 2026 | -- | -- | -- | -- | -- | 0.9 | 0.9 |
| 2027 | -- | -- | -- | -- | -- | 0.9 | 0.9 |
| 2028 | -- | -- | -- | -- | -- | 0.9 | 0.9 |
| 2029 | -- | -- | -- | -- | -- | 0.9 | 0.9 |
| 2030 | -- | -- | -- | -- | -- | 0.9 | 0.9 |
| 2031 | -- | -- | -- | -- | -- | 0.7 | 0.7 |
| 2032 | -- | -- | -- | -- | -- | 0.5 | 0.5 |
| 2033 | -- | -- | -- | -- | -- | 0.3 | 0.3 |
| 2034 | -- | -- | -- | -- | -- | 0.1 | 0.1 |
| Subtotal | -- | 14.1 | 10.6 | -- | 24.7 | 36.1 | 60.8 |

APPN 3022 is a continuation of our 3021 funding that ended in FY 2020. There is no quantity to align with this funding. The quantity is captured under APPN 3021 in FY 2016. All funding is aligned to support quantities in FY 2016 for amounts in APPN 3021 and APPN 3022.

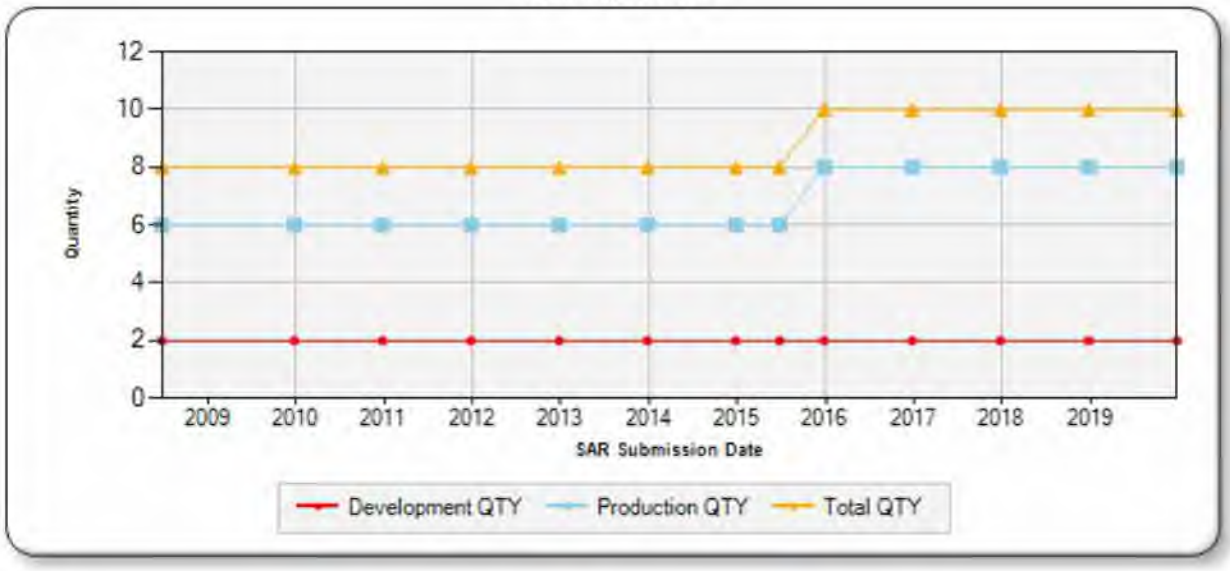
## Charts

**GPS III first began SAR reporting in June 2008**

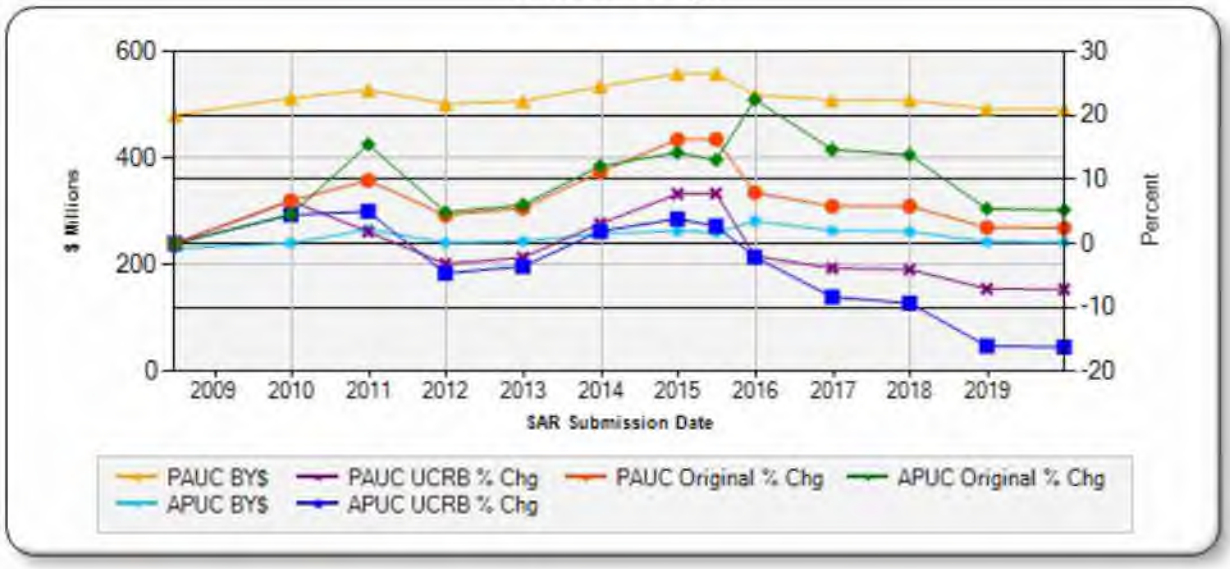
**Program Acquisition Cost - GPS III**
**Base Year 2010 $M**




**Quantity - GPS III**



**Unit Cost - GPS III**
**Base Year 2010 $M**



# Risks

## Significant Schedule and Technical Risks

| Significant Schedule and Technical Risks | |
|---|---|
| **Milestone B (May 2008)** | |
| 1. | Next Generation Operational Control System (OCX) development schedule (adequate margin). |
| 2. | Industrial base and the availability of high reliability parts and processes. |
| 3. | Rubidium Atomic Clock availability/gap |
| 4. | Navigation signal combining techniques impacting User Equipment. |
| 5. | Interface of Space and Ground |
| **Milestone C (January 2011)** | |
| 1. | Information Assurance Certification of Space Vehicle design |
| 2. | Subcontractor Cost Performance |
| 3. | GPS III Launch and Checkout System Availability |
| **Current Estimate (December 2019)** | |
| 1. | Backward Compatibility - GPS III Signal Combining Impact on Federal Aviation Administration & Legacy User Equipment as the 1C signal may not be backward compatible. |

## Risks

## Risk and Sensitivity Analysis

| Risks and Sensitivity Analysis | |
|---|---|
| **Current Baseline Estimate (December 2017)** | |
| 1. | Total Acquisition Cost (BY10$M) - $5,285.2M (Qty 10); PAUC - $528.520 (Qty 10); APUC- $287.912 (Qty 8) Risks - Cost growth is attributed to continued GPS III design, build, and test with the Navigation Payload. - Contractor concurrent development of Space Vehicle (SV)01-SV02. - Completed Over Target Baseline and new SCP in Summer 2015, which added 70% cost and schedule confidence back into the program. |
| **Original Baseline Estimate (May 2008)** | |
| 1. | Development APB (BY00$M): Total Acquisition Cost - $3,179.9M (Qty 8); PAUC - $397.488M (Qty 8); APUC -$190.567 (Qty 6) Risks - GPS III cost/schedule baseline established to support aggressive 72 month program.- Cost estimate developed prior to contract award, and employed parametric analysis using historical information from earlier GPS satellite programs (i.e., GPS-IIA, GPS-IIR, GPS-IIR-M, and GPS-IIF). |
| **Revised Original Estimate (N/A)** | |
| None | |
| **Current Procurement Cost (December 2019)** | |
| 1. | Total Acquisition Cost (BY10$M) - $4,915.3M (Qty 10); PAUC - $491.53 (Qty 10); APUC- $242.038 (Qty 8) No issues at this time. |

## Low Rate Initial Production

There is no LRIP for this program.

## Foreign Military Sales

None

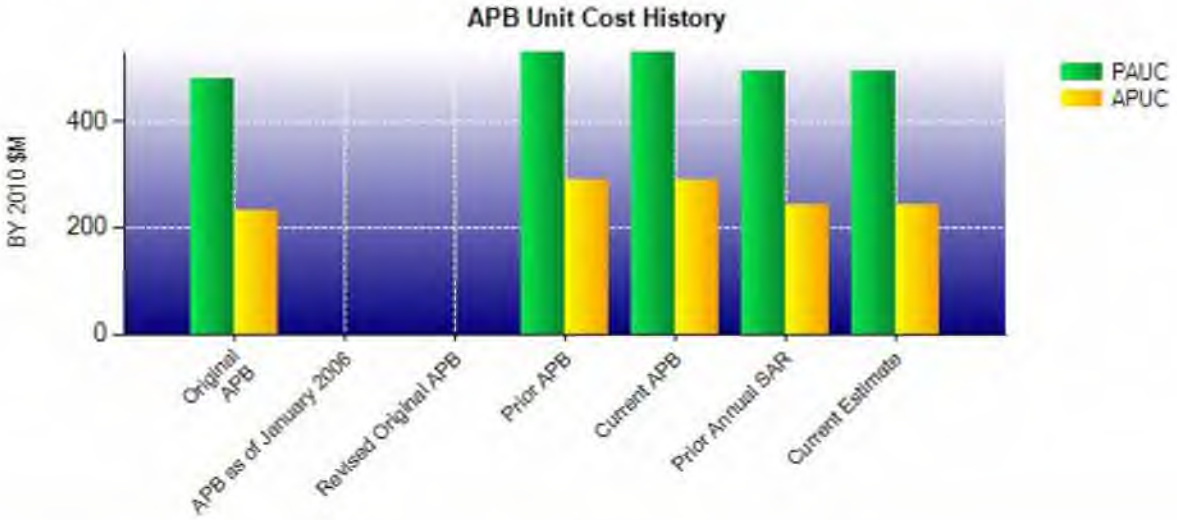
## Nuclear Costs

None

## Unit Cost

| Current UCR Baseline and Current Estimate (Base-Year Dollars) | | | |
|---|---|---|---|
| Item | BY 2010 $M<br>Current UCR Baseline (Dec 2017 APB) | BY 2010 $M<br>Current Estimate (Dec 2019 SAR) | % Change |
| Program Acquisition Unit Cost | | | |
| Cost | 5296.4 | 4915.7 | |
| Quantity | 10 | 10 | |
| Unit Cost | 529.640 | 491.570 | -7.19 |
| Average Procurement Unit Cost | | | |
| Cost | 2311.3 | 1936.5 | |
| Quantity | 8 | 8 | |
| Unit Cost | 288.912 | 242.062 | -16.22 |

| Original UCR Baseline and Current Estimate (Base-Year Dollars) | | | |
|---|---|---|---|
| Item | BY 2010 $M<br>Original UCR Baseline (May 2008 APB) | BY 2010 $M<br>Current Estimate (Dec 2019 SAR) | % Change |
| Program Acquisition Unit Cost | | | |
| Cost | 3840.8 | 4915.7 | |
| Quantity | 8 | 10 | |
| Unit Cost | 480.100 | 491.570 | +2.39 |
| Average Procurement Unit Cost | | | |
| Cost | 1381.0 | 1936.5 | |
| Quantity | 6 | 8 | |
| Unit Cost | 230.167 | 242.062 | +5.17 |




| APB Unit Cost History | | | | | |
|---|---|---|---|---|---|
| Item | Date | BY 2010 $M | | TY $M | |
| | | PAUC | APUC | PAUC | APUC |
| Original APB | May 2008 | 480.100 | 230.167 | 500.288 | 248.383 |
| APB as of January 2006 | N/A | N/A | N/A | N/A | N/A |
| Revised Original APB | N/A | N/A | N/A | N/A | N/A |
| Prior APB | Jan 2016 | 528.520 | 287.912 | 565.010 | 321.250 |
| Current APB | Dec 2017 | 529.640 | 288.912 | 565.010 | 321.250 |
| Prior Annual SAR | Dec 2018 | 491.950 | 242.538 | 521.450 | 267.250 |
| Current Estimate | Dec 2019 | 491.570 | 242.062 | 520.760 | 266.475 |

## SAR Unit Cost History

| Initial SAR Baseline to Current SAR Baseline (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Initial PAUC Development Estimate | Changes | | | | | | | | PAUC Production Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 500.288 | -9.013 | 0.000 | 0.775 | 0.000 | 63.063 | -9.513 | -11.875 | 33.437 | 533.725 |

| Current SAR Baseline to Current Estimate (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PAUC Production Estimate | Changes | | | | | | | | PAUC Current Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 533.725 | 3.510 | -31.275 | 0.000 | 0.000 | -12.550 | 0.000 | 27.350 | -12.965 | 520.760 |

| Initial SAR Baseline to Current SAR Baseline (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Initial APUC Development Estimate | Changes | | | | | | | | APUC Production Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 248.383 | -6.450 | 0.000 | 1.033 | 0.000 | 54.933 | -12.733 | -15.833 | 20.950 | 269.333 |

| Current SAR Baseline to Current Estimate (TY $M) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| APUC Production Estimate | Changes | | | | | | | | APUC Current Estimate |
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 269.333 | 2.975 | 27.004 | 0.000 | 0.000 | -67.025 | 0.000 | 34.188 | -2.858 | 266.475 |

| SAR Baseline History | | | | |
|---|---|---|---|---|
| Item | SAR Planning Estimate | SAR Development Estimate | SAR Production Estimate | Current Estimate |
| Milestone A | N/A | N/A | N/A | N/A |
| Milestone B | N/A | Feb 2008 | Feb 2008 | May 2008 |
| Milestone C | N/A | Sep 2009 | Oct 2010 | Jan 2011 |
| IOC | N/A | N/A | N/A | N/A |
| Total Cost (TY $M) | N/A | 4002.3 | 4269.8 | 5207.6 |
| Total Quantity | N/A | 8 | 8 | 10 |
| PAUC | N/A | 500.288 | 533.725 | 520.760 |

## Cost Variance

| Summary TY $M | | | | |
|---|---|---|---|---|
| Item | RDT&E | Procurement | MILCON | Total |
| SAR Baseline (Production Estimate) | 2653.8 | 1616.0 | -- | 4269.8 |
| Previous Changes | | | | |
| Economic | +11.5 | +24.1 | -- | +35.6 |
| Quantity | -- | +754.7 | -- | +754.7 |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | -- | -- | -- |
| Estimating | +411.2 | -538.0 | -- | -126.8 |
| Other | -- | -- | -- | -- |
| Support | -- | +281.2 | -- | +281.2 |
| Subtotal | +422.7 | +522.0 | -- | +944.7 |
| Current Changes | | | | |
| Economic | -0.2 | -0.3 | -- | -0.5 |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | -- | -- | -- |
| Estimating | -0.5 | +1.8 | -- | +1.3 |
| Other | -- | -- | -- | -- |
| Support | -- | -7.7 | -- | -7.7 |
| Subtotal | -0.7 | -6.2 | -- | -6.9 |
| Total Changes | +422.0 | +515.8 | -- | +937.8 |
| Current Estimate | 3075.8 | 2131.8 | -- | 5207.6 |

| Summary BY 2010 $M | | | | |
|---|---|---|---|---|
| Item | RDT&E | Procurement | MILCON | Total |
| SAR Baseline (Production Estimate) | 2623.9 | 1519.0 | -- | 4142.9 |
| Previous Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | +661.1 | -- | +661.1 |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | -- | -- | -- |
| Estimating | +355.3 | -477.9 | -- | -122.6 |
| Other | -- | -- | -- | -- |
| Support | -- | +238.1 | -- | +238.1 |
| Subtotal | +355.3 | +421.3 | -- | +776.6 |
| Current Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | -- | -- | -- |
| Estimating | -- | +2.0 | -- | +2.0 |
| Other | -- | -- | -- | -- |
| Support | -- | -5.8 | -- | -5.8 |
| Subtotal | -- | -3.8 | -- | -3.8 |
| Total Changes | +355.3 | +417.5 | -- | +772.8 |
| Current Estimate | 2979.2 | 1936.5 | -- | 4915.7 |

Previous Estimate: December 2018

| RDT&E | $M | |
|---|---|---|
| Current Change Explanations | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A | -0.2 |
| Revised estimate due to Air Force-wide funding adjustments. (Estimating) | -0.6 | -0.7 |
| Revised estimate in FY 2019 due to reallocation of funds in PE to support SV-01 Incentive Fee and SV-02 launch and on-orbit support. (Estimating) | +5.4 | +6.3 |
| Revised estimate in FY 2023, 2024, and 2025 to align with 2019 PEO approved Single Best Estimate. (Estimating) | -5.0 | -6.3 |
| Adjustment for current and prior escalation. (Estimating) | +0.1 | +0.1 |
| Funds transferred within program from Research, Development, Test, and Evaluation, Air Force to newly added Research, Development, Test, and Evaluation, Space Force. (Estimating) | -21.2 | -27.0 |
| Funds transferred within program from Research, Development, Test, and Evaluation, Air Force to newly added Research, Development, Test, and Evaluation, Space Force. (Estimating) | +21.3 | +27.1 |
| RDT&E Subtotal | 0.0 | -0.7 |

| Procurement | $M | |
|---|---|---|
| Current Change Explanations | Base Year | Then Year |
| Revised escalation indices. (Economic) | N/A | -0.3 |
| Revised estimate due to Below Threshold Reprogramming for Provisional overrun for Space Vehicle 03/04 Production in FY 2017. (Estimating) | +4.6 | +5.3 |
| Revised estimate in FY 2024 to align with 2019 PEO approved Single Best Estimate. (Estimating) | -2.7 | -3.6 |
| Adjustment for current and prior escalation. (Estimating) | +0.2 | +0.1 |
| Funds transferred within program from Space Procurement, Air Force Procurement appropriation to newly added Space Force, Air Force Procurement Appropriation. (Estimating) | -24.8 | -31.5 |
| Funds transferred within program from Space Procurement, Air Force Procurement appropriation to newly added Space Force, Air Force Procurement Appropriation. (Estimating) | +24.7 | +31.5 |
| Adjustment for current and prior escalation. (Support) | 0.0 | +0.1 |
| Revised estimate in FY 2024 and 2025 to align with 2019 PEO approved Single Best Estimate (-$7.8M). Funds transferred within program from Space Procurement, Air Force Procurement appropriation to newly added Space Force, Air Force Procurement Appropriation. (-$48.1M). (Support) | -41.9 | -55.9 |
| Funds transferred within program from Space Procurement, Air Force Procurement appropriation to newly added Space Force, Air Force Procurement Appropriation. (+$48.1M) (Support) | +36.1 | +48.1 |
| Procurement Subtotal | -3.8 | -6.2 |

# Contracts

## Contract Identification

**Appropriation:** Procurement
**Contract Name:** Global Positioning System (GPS) III (Production)
**Contractor:** Lockheed Martin Space Systems Denver
**Contractor Location:** Littleton, CO 80125
**Contract Number:** FA8807-08-C-0010/2
**Contract Type:** Cost Plus Incentive Fee (CPIF), Cost Plus Award Fee (CPAF)
**Award Date:** December 23, 2010
**Definitization Date:** December 23, 2010

| Contract Price | | | | | | | |
|---|---|---|---|---|---|---|---|
| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 74.7 | N/A | 2 | 1223.7 | N/A | 8 | 1724.3 | 1728.4 |

## Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to to the addition of the Quick Reaction Support (QRS) for transducer rework & replace, On Board Computer (OBC) QRS, Space Vehicles (SV) 03 -05 storage and SV03-05 Launch On-Orbit Checkout (LOOC), Valued Engineering Change Proposal (VECP) preparation, Backwards Compatibility Request for Equitable Adjustment (REA), and Advanced Clock Insertion effort.

| Contract Variance | | |
|---|---|---|
| Item | Cost Variance | Schedule Variance |
| Cumulative Variances To Date (12/22/2019) | -12.2 | -53.7 |
| Previous Cumulative Variances | +18.2 | -72.8 |
| Net Change | -30.4 | +19.1 |

## Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Scalable Power Regulation Unit (SPRU) overruns, Earth Deck Antenna Assembly troubleshooting (EDAA), Remote Interface Unit rework, troubleshooting and testing in battery production, and OBC rework.

The favorable net change in the schedule variance is due to completion of SV05 Thermal Vacuum testing, schedule recovery on SV05-10 SPRU efforts, SV03-08 system module assembly, and completion of Subcontractor's milestones. Favorable variance partially offset by SV03 launch delays and SV10 NPE missed milestones.

## Notes

The Contractor's Estimated Price at Completion increased due to the award of SV03-04 storage and LOOC, VECP preparation, Backward Compatibility REA, Advanced Clock Insertion, and additional growth in SV05-10 SPRU efforts and EDAA troubleshooting.

## Deliveries and Expenditures

| Deliveries | | | | |
|---|---|---|---|---|
| Delivered to Date | Planned to Date | Actual to Date | Total Quantity | Percent Delivered |
| Development | 2 | 2 | 2 | 100.00% |
| Production | 2 | 2 | 8 | 25.00% |
| Total Program Quantity Delivered | 4 | 4 | 10 | 40.00% |

| Expended and Appropriated (TY $M) | | | |
|---|---|---|---|
| Total Acquisition Cost | 5207.6 | Years Appropriated | 19 |
| Expended to Date | 4599.6 | Percent Years Appropriated | 57.58% |
| Percent Expended | 88.32% | Appropriated to Date | 5100.9 |
| Total Funding Years | 33 | Percent Appropriated | 97.95% |

The above data is current as of February 10, 2020.

### Notes

Expenditures consist of Air Force 3600, 3020, and 3021 funds.

A Space Vehicle (SV) is considered delivered upon completion and acceptance of a DD Form 250.

SV Delivery Dates:

Development:

SV01: December 23, 2018

SV02: August 22, 2019

Production:

SV03: May 16, 2019

SV04: September 10, 2019

# Operating and Support Cost

## Cost Estimate Details

**Date of Estimate:**

**Source of Estimate:**

**Quantity to Sustain:**

**Unit of Measure:**

**Service Life per Unit:**

**Fiscal Years in Service:**

The GPS III program will provide O&S for on-orbit support through the Launch and On-Orbit Support contract. For Space Vehicle (SV)01 and SV02, this is funded with RDT&E, Air Force (AF) and for SV03-10, it is funded with Space Procurement, AF and Space Force. These costs are captured in the cost and funding section of the SAR and will not appear here. The O&S responsibility for the control system will be accomplished through the Next Generation Operational Control System.

## Sustainment Strategy

-

## Antecedent Information

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| Annual O&S Costs BY2010 $M | | |
|---|---|---|
| **Cost Element** | **GPS III** | **No Antecedant (Antecedent)** |
| Unit-Level Manpower | -- | -- |
| Unit Operations | -- | -- |
| Maintenance | -- | -- |
| Sustaining Support | -- | -- |
| Continuing System Improvements | -- | -- |
| Indirect Support | -- | -- |
| Other | -- | -- |
| Total | -- | -- |

| Item | Total O&S Cost $M | | | |
|---|---|---|---|---|
| | GPS III | | | No Antecedant (Antecedent) |
| | Current Production APB Objective/Threshold | | Current Estimate | |
| **Base Year** | 0.0 | 0.0 | N/A | N/A |
| **Then Year** | 0.0 | N/A | N/A | 0.0 |

| O&S Cost Variance |
|---|

| Category | BY 2010 $M | Change Explanations |
|---|---|---|
| Prior SAR Total O&S Estimates - Dec 2018 SAR | 0.0 | |
| Programmatic/Planning Factors | 0.0 | |
| Cost Estimating Methodology | 0.0 | |
| Cost Data Update | 0.0 | |
| Labor Rate | 0.0 | |
| Energy Rate | 0.0 | |
| Technical Input | 0.0 | |
| Other | 0.0 | |
| Total Changes | 0.0 | |
| Current Estimate | 0.0 | |

## Disposal Estimate Details

**Date of Estimate:**

**Source of Estimate:**

**Disposal/Demilitarization Total Cost (BY 2010 $M):**