



SPACE-BASED POSITIONING NAVIGATION & TIMING

NATIONAL EXECUTIVE COMMITTEE

U.S. GPS Policy and U.S. International Cooperation Activities

Civil GPS Service Interface Committee
U.S. States and Local Government Subcommittee
Groton, Connecticut
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Overview



- **U.S. Space-Based PNT Policy**
- International Cooperation Activities



New U.S. National Space Policy

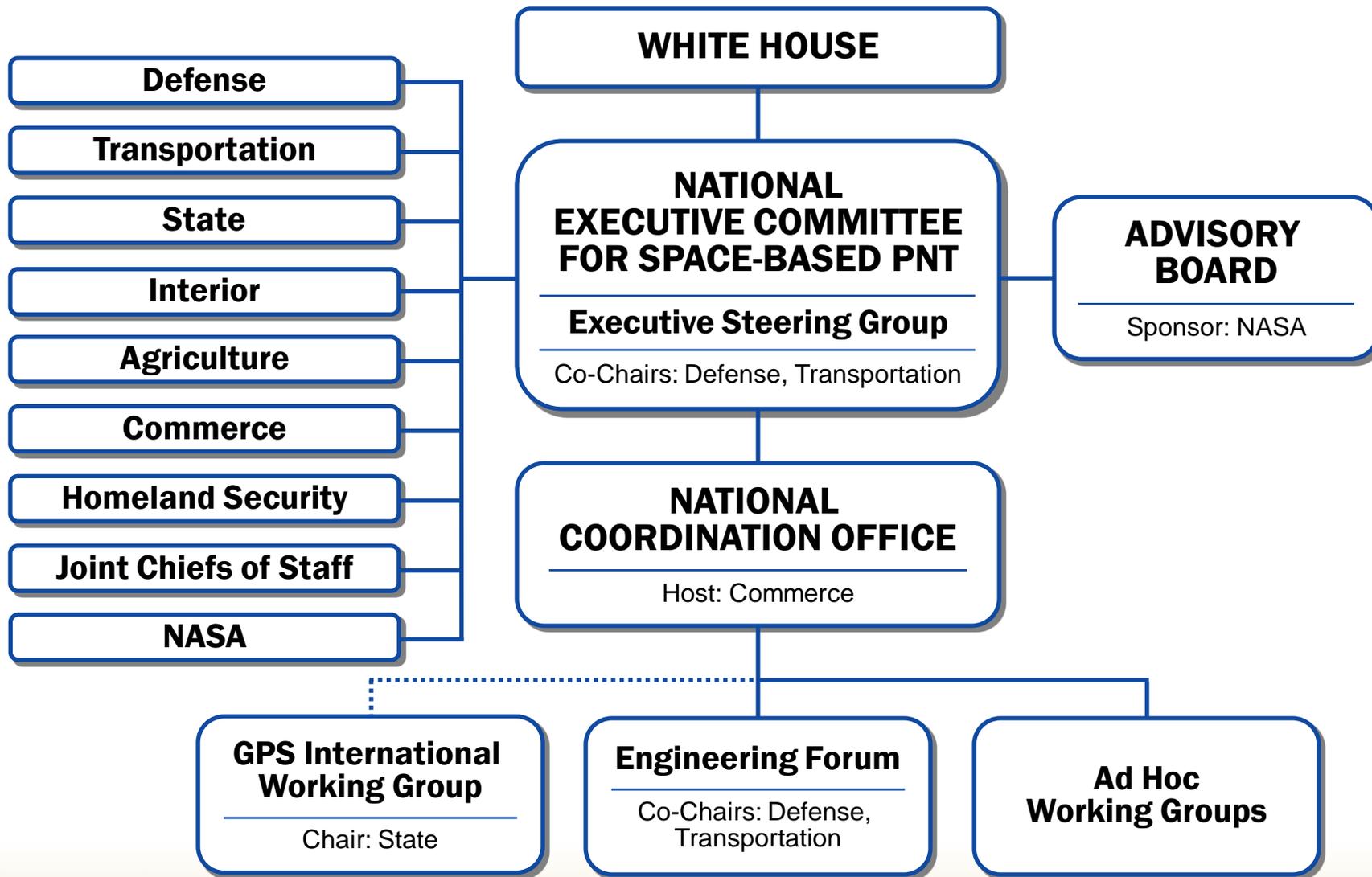


Space-Based PNT Guideline: Maintain leadership in the service, provision, and use of GNSS

- Provide civil GPS services, free of direct user charges
 - Available on a continuous, worldwide basis
 - Maintain constellation consistent with published performance standards and interface specifications
 - Foreign PNT services may be used to complement services from GPS
- Encourage global compatibility and interoperability with GPS
- Promote transparency in civil service provision
- Enable market access to industry
- Support international activities to detect and mitigate harmful interference



U.S. Space-Based PNT Organization Structure



U.S. Policy Promotes Global Use of GPS Technology



- No direct user fees for civil GPS services
 - Provided on a continuous, worldwide basis
- Open, public signal structures for all civil services
 - Promotes equal access for user equipment manufacturing, applications development, and value-added services
 - Encourages open, market-driven competition
- Global compatibility and interoperability with GPS
- Service improvements for civil, commercial, and scientific users worldwide
- Protection of radionavigation spectrum from disruption and interference



U.S. Objectives in Working with Other GNSS Service Providers

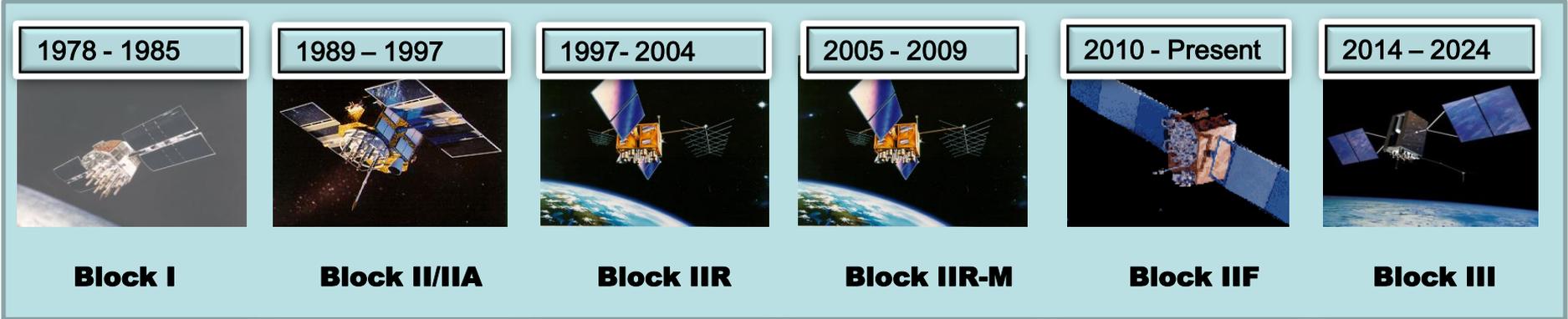


- Ensure **compatibility** — ability of U.S. and non-U.S. space-based PNT services to be used separately or together without interfering with each individual service or signal
 - Radio frequency compatibility
 - Spectral separation between M-code and other signals
- Achieve **interoperability** – ability of civil U.S. and non-U.S. space-based PNT services to be used together to provide the user better capabilities than would be achieved by relying solely on one service or signal
 - Primary focus on the common L1C and L5 signals

Pursue through Bilateral and Multi-lateral Cooperation



GPS Modernization Program



11 (10) Satellites	28 Satellites	13 (12) Satellites	8 Satellites	12 Satellites	32 Satellites
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Demonstration system	Basic GPS Provides Initial Navigation Capabilities	IIA/IIR Capabilities "Plus"	IIR -M Capabilities "Plus"	IIF Capabilities "Plus"
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- L1 (CA) Navigation signal
- L1 & L2 (P Code) Navigation signal
- 5 Year Design Life

- Standard Service**
- Single Frequency (L1)
 - C/A code navigation
- Precise Service**
- Two frequencies (L1 & L2)
 - P (Y) -Code navigation
 - 7.5 Year Design Life

- 2nd Civil Signal L2 (L2C)
- Earth Coverage M-Code on L1/L2
- L5 Demo
- Anti-Jam Flex Power
- 7.5 Year Design Life

- 3rd Civil Signal L5
- Reprogrammable Nav Processer
- Increased Accuracy requirement
- 12 Year Design Life

- IIIA**
- Increased accuracy
 - Increased Earth Coverage power
 - 15 Year Design Life
 - 4th Civil Signal (L1C)
- IIIB**
- Real-time Communications
- IIIC**
- Navigation Integrity
 - Spot Beam for AJ

Increasing Space System Capabilities – Increasing Military/Civil User Benefits



Overview



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Planned GNSS

- Global Constellations
 - **GPS (24+)**
 - GLONASS (30)
 - Galileo (27+3)
 - Compass (30 global and 5 regional satellites)
 - GINS - Global Indian Navigation System (24)
- Regional Constellations
 - QZSS (3)
 - IRNSS (7)
- Satellite-Based Augmentations
 - **WAAS (2+1)**
 - MSAS (2)
 - EGNOS (3)
 - GAGAN (2)
 - SDCM (2)



Bilateral Cooperation



- **U.S.-EU** GPS-Galileo Cooperation Agreement signed in June 2004
 - Four working groups set up under the Agreement
- **U.S.-Japan** Joint Statement on GPS Cooperation 1998
 - Quasi Zenith Satellite System (QZSS) designed to be fully compatible and highly interoperable with GPS
 - Bilateral agreements to set up QZSS monitoring stations in Hawaii and Guam
- **U.S.-Russia** Joint Statement issued December 2004
 - Working Groups: compatibility/interoperability, search/rescue



Bilateral Cooperation (continued)



- **U.S.-China** operator-to-operator coordination under ITU auspices is complete
 - Bilateral Meetings in 2007, 2008, 2009, 2010
- **U.S.-India** Joint Statement on GNSS Cooperation 2007
 - Technical Meetings focused on GPS-India Regional Navigation Satellite System (IRNSS) compatibility and interoperability held in 2008 and 2009
 - Continuation of ITU compatibility coordination is pending
- **U.S.-Australia** Joint Delegation Statement on Cooperation in the Civil Use of GPS in 2007
 - Bilateral meeting in Washington, D.C., Oct. 26-27, 2010
 - GNSS and applications to be included in expanded space cooperation, as discussed in an October 27 Joint Announcement



International Committee on Global Navigation Satellite Systems (ICG)



- Emerged from 3rd UN Conference on the Exploration and Peaceful Uses of Outer Space July 1999
 - Promote the **use of GNSS** and its **integration into infrastructures**, particularly in developing countries
 - Encourage **compatibility and interoperability** among global and regional systems
 - Met annually since 2006
- Members include:
 - **GNSS Providers** — China, EU, India, *Japan*, Russia, ***United States***
 - Other interested Member States of the United Nations
 - International organizations/associations



APEC GNSS Implementation Team (GIT)



- Established in 2002
- Promote implementation of regional GNSS augmentation systems to enhance inter-modal transportation and recommend actions to be considered in the Asia Pacific Region
- Reports to Transportation Working Group (TPT-WG) through the Inter-modal Experts Group (IEG)
- Adopted a GNSS Strategy designed to promote adoption of GNSS technologies throughout the Asia Pacific region, especially with regard to transportation



Summary



- **GPS performance is better than ever and will continue to improve**
 - Augmentations enable even higher performance
 - New civil GPS signal available now
 - Many additional upgrades scheduled
- **U.S. policy encourages worldwide use of civil GPS and augmentations**
- **International cooperation is a priority**
 - Compatibility and interoperability very important



Contact Information



SPACE-BASED POSITIONING
NAVIGATION & TIMING

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