



U.S. GNSS International Activities Update

***Civil GPS Service Interface Committee Meeting
Nashville, Tennessee***

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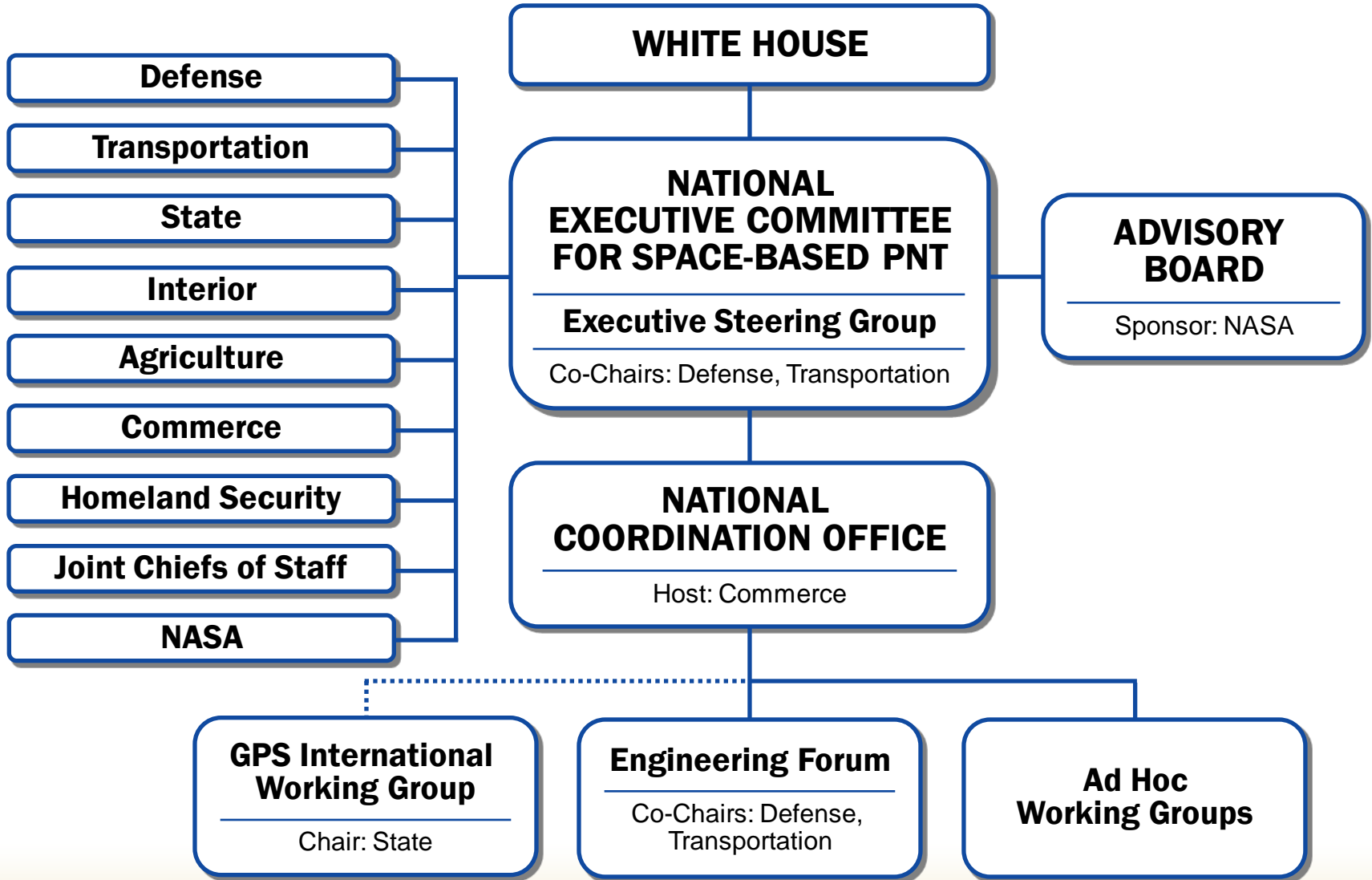
U.S. National Space Policy

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





Planned Space-Based Positioning, Navigation and Timing Systems

- Global Constellations

- **GPS (24+)**
- GLONASS (30)
- Galileo (27+3)
- Compass (27+3 IGSO + 5 GEO)



- Regional Constellations

- QZSS (4+3)
- IRNSS (7)

- Satellite-Based Augmentations

- **WAAS (3)**
- MSAS (2)
- EGNOS (3)
- GAGAN (2)
- SDCM (3)



China

- U.S. and China concluded ITU operator-to-operator coordination on GPS-COMPASS signal compatibility in September 2010
- Successful bilateral GNSS workshop organized by U.S. and Chinese engineering academies, May 2011 in Shanghai
- Bilateral meeting focused on aviation satellite navigation issues took place following the China Satellite Navigation Conference in May 2011
- On going discussions with China Satellite Navigation Office on the margins of multilateral international meetings



Europe

- GPS-Galileo Agreement signed in 2004, ratified by EU in December 2011
 - Four working groups established under the Agreement
- ITU coordination meetings held in September and December 2011
 - Focused on GPS III, WAAS, EGNOS
- Working Groups met in June 2012 to further cooperation activities
- Second Plenary meeting held in June 2012 in Washington, D.C.



India

- Joint statement on GNSS cooperation signed 2007
- Third U.S.-India Joint Working Group on Civil Space Cooperation held July 2011
- Parties agreed to resume work on interoperability between GPS and India's GPS Aided Geo Augmented Navigation (GAGAN) system and Indian Regional Navigational Satellite System (IRNSS)



Japan

- Joint statement signed in 1998
- Cooperation focuses on compatibility and interoperability between GPS and Japan's Quasi-Zenith Satellite System (QZSS)
- Bilateral agreements for QZSS monitoring stations in Hawaii and Guam
- Annual plenary meeting held January 2012
 - Both sides reaffirmed close cooperation on GNSS issues, no major outstanding problems or issues
 - GPS-QZSS Technical Working Group completed, released its report



Russia

- GPS-GLONASS discussions ongoing since 1996
- Joint Statement issued December 2004
- Working Group 1 met in June 2011 to discuss Russian augmentation system (SDCM), assignment of PRN codes, and GLONASS CDMA signal plans
- Working Group 2 met October 2011 to discuss joint search and rescue capabilities
- Joint statements signed in September 2011 and June 2012 reaffirming intent to continue cooperation
- Russia seeking GLONASS monitoring sites in U.S.: discussions ongoing



International Committee on GNSS (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
- Members include:
 - **GNSS Providers (U.S., EU, Russia, China, India, Japan)**
 - Other Member States of the United Nations
 - International organizations/associations



<http://www.icgsecretariat.org>



ICG Providers Forum

- Six space segment providers listed previously are members
- Purpose:
 - Focused discussions on **compatibility and interoperability**, encouraging development of complimentary systems
 - Exchange detailed information on systems & service provision plans
 - Exchange views on ICG work plan and activities
- Providers have agreed that all GNSS signals and services should be compatible and open signals and services should also be interoperable to the maximum extent possible
 - Working definition of **compatibility** includes respect for spectral separation between each system's authorized service signals and other systems' signals
 - **Interoperability** definition addresses signal, geodetic reference frame realization, and system time steerage considerations



ICG-6 Outcomes

- 6th ICG meeting held in Tokyo, Sept 2011
- The development of **Multi-GNSS monitoring** networks was a major topic of discussion
 - The Committee endorsed the IGS Multi-GNSS Experiment
 - A Subgroup of the Working Group A has been formed to collectively investigate international GNSS monitoring and assessment
- The Compatibility sub-group of Working A will initiate discussions and **collaboration on Open Service GNSS performance parameters**, including definitions and calculation methods
- Templates describing the **geodetic and timing references for all systems** have been completed
- **Interference Detection and Mitigation (IDM) Workshop** endorsed – Workshop held 7-8 June 2012

ICG-7 will be hosted by China in November 2012



Summary

- U.S. policy encourages **worldwide use of civil GPS and augmentations**
- **International cooperation** at all levels is a priority
- **Compatibility, interoperability, and transparency** in open service provision are critical

The screenshot shows the GPS.gov website with a navigation menu including HOME, WHAT'S NEW, SYSTEMS, APPLICATIONS, POLICY & FUNDING, MULTIMEDIA, and SUPPORT. A search bar is located in the top right corner. The main content area features a large banner with the text "Bienvenidos Welcome أهلا وسهلا 歡迎光臨 Bienvenue" and an image of people holding hands around a globe. Below the banner, there is a section for "Multilingual Content" with links for Español, Français, and 中文. The 中文 section includes links for "首页", "全球定位系统", "GPS的增强系统", and "GPS的应用". The Français section includes links for "Accueil", "Le Système de Positionnement Mondial", "Compléments GPS", and "Applications du GPS". To the right of the multilingual content, there is a section for "GPS Cooperation with Other Nations" listing countries like Australia, China, Europe, India, Japan, Russia, and International Organizations. Below this, there are images of "GPS Outreach Handouts" and a section titled "International GPS User Support" with a logo for the U.S. Coast Guard Navigation Center (NAVCEN) and text explaining its role in providing GPS user support to civilians outside the United States.

<http://www.gps.gov/>



THANK YOU!

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