



U.S. GNSS International Activities Update

*Civil GPS Service Interface Committee Meeting
Seattle, Washington*

*Anita Eisenstadt
U.S. State Department Representative to the Space-Based Positioning,
Navigation and Timing National Coordination Office
14 August 2012*



Overview



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



U.S. National Space Policy

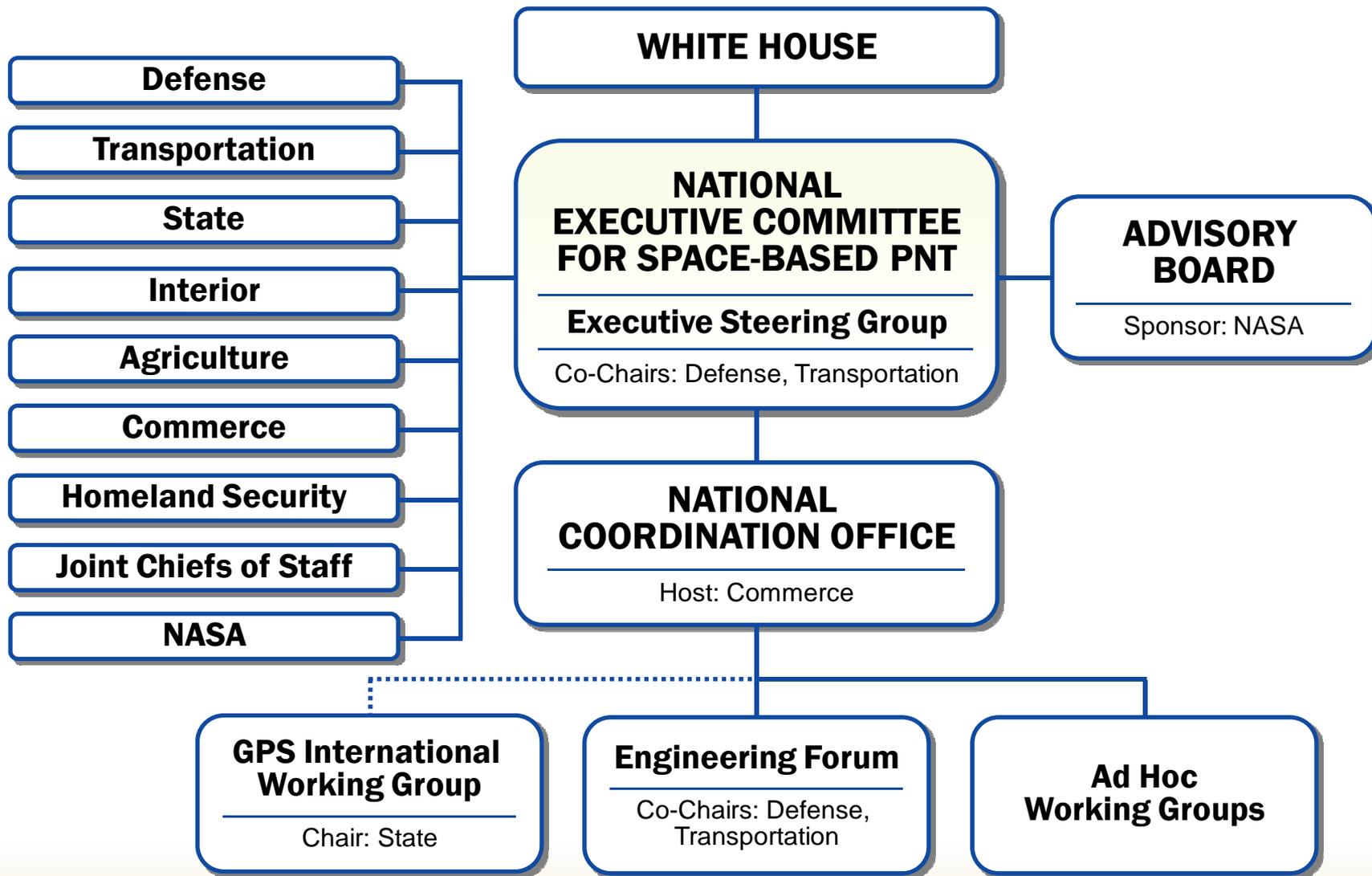


Space-Based PNT Guideline: Maintain leadership in the service, provision, and use of GNSS

- **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 GPS services
- 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





Overview



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



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
- Promote fair competition in the global marketplace

Pursue through Bilateral and Multilateral Cooperation



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**
- **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
- **Plenary and WG A, B, and C meetings held in June 2012 in Washington, D.C.**
 - Work towards shared U.S.-EU vision on IDM that would support future multilateral efforts on IDM
 - Working Group A is finalizing coordination between GPS and the EU's EGNOS augmentation system under ITU auspices
 - Working Group C is characterizing performance and benefits from joint GPS-Galileo receivers



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 in January 2012**
 - **Both sides reaffirmed close cooperation on GNSS issues, no major outstanding problems or issues**
 - **GPS-QZSS Technical Working Group complete and report released**



Russia



- **GPS-GLONASS discussions ongoing since 1996**
- **Joint Statement issued December 2004**
- **Working Group 1 met 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 September 2011 and June 2012 reaffirming intent to continue cooperation**



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 countries developing new infrastructure
 - 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**





ICG Providers Forum



- Six identified space segment providers are members
- Purpose:
 - Focused discussions on **compatibility and interoperability**, encouraging development of complimentary systems
 - Exchange detailed information on systems and service provision plans
 - Exchange views on ICG work plan and activities
- Providers have agreed that all GNSS signals and services must be compatible and open signals and services should also be interoperable to the maximum extent possible
- **Principle of Transparency**: every GNSS provider should publish documentation that describes the signal and system information, the policies of provision and the minimum levels of performance offered for its open services



ICG-6 Outcomes



- 6th ICG meeting held in Tokyo, Sept 2011
- The development of **multi-GNSS monitoring** networks was a major topic of discussion
 - Committee endorsed the IGS Multi-GNSS Experiment
 - Subgroup of Working Group A was formed to collectively investigate international GNSS monitoring and assessment
 - Ongoing discussions on **future framework for ICG**

China will host ICG-7 in November 2012



IDM Workshop Conclusions



- **Interference Detection and Mitigation (IDM) Workshop—June 2012**
- **Workshop Conclusions:**
 - ICG should develop educational materials
 - RNSS spectrum management
 - Exchange information and develop best practices for GNSS interface reporting
 - Identify a GNSS monitoring site or center to be recognized by ITU as part of international interference monitoring network.
 - ICG should consider process for developing guidelines for mobile GNSS device manufacturers interested in contributing interference detection information to National reporting authorities
 - Identify experts to participate in next IDM Workshop



APEC GNSS TERMS OF REFERENCE



- **Facilitate Global Navigation Satellite System (GNSS) applications to support seamless intermodal transportation to enhance safety, security, and sustainability in line with the APEC Transportation Ministerial Directives;**
- **Identify actions to facilitate and collaborate on implementations of GNSS applications for transportation in the APEC region**
- **Complement, not duplicate, work of the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), and the International Committee on GNSS (ICG)**
- **Provide a public/industry forum to address GNSS technologies related to transportation issues that will benefit the APEC region (including non-APEC economies and international organizations).**



APEC



- **United States/Thailand Co-chairs GIT.**
- **Reports to APEC Transportation Working Group.**
- **Adopted a strategy for 2010-2015 focused on seamless intermodal transportation.**
- **U.S. hosted GIT 14 in Seattle. GIT 16 held in Bangkok in February 2012 and GIT 17 held in St. Petersburg, August 2012.**
- **U.S. is lead on project assisting developing APEC economies to achieve ICAO requirements for Performance Based Navigation Implementation Plan. On-site visits to Malaysia and Philippines.**



Overview



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



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 displays the GPS.gov website interface. At the top, it features the site's logo and navigation menu in multiple languages (English, Español, Français, 中文, عربي). The main content area is titled "Bienvenidos Welcome أهلاً وسهلاً Bienvenue" and includes a graphic of people holding hands around a globe. Below this, there is a section for "Multilingual Content" with links for Spanish, French, and Arabic. To the right, a sidebar highlights "GPS Cooperation with Other Nations" listing countries like Australia, China, Europe, India, Japan, Russia, and the International Committee on GNSS. At the bottom, there is a section for "International GPS User Support" featuring the U.S. Coast Guard Navigation Center (NAVCEN) logo and text explaining its role in providing support to international users.

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



SPACE-BASED POSITIONING
NAVIGATION & TIMING

THANK YOU!

Anita Eisenstadt

**U.S. State Department Representative to the
National Coordination Office for Space-Based Positioning,
Navigation and Timing**

anita.eisenstadt@pnt.gov

202-482-5809