



U.S. GNSS International Activities Update

Civil GPS Service Interface Committee Meeting

Nashville, Tennessee

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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



Economic Benefits of GPS in U.S.

*Excerpted from NDP Consulting report commissioned by the
"Save Our GPS Coalition" in 2011*

- "We estimate that the value to the U.S. economy of the productivity gains and input cost reductions alone amounts to between \$68 billion and \$122 billion per year, or 0.5 to 0.9 percent of annual U.S. gross domestic product."
- The report estimates **\$67.6 billion in direct economic benefits** due to annual productivity increases and cost savings in precision agriculture (\$19.9 billion), engineering construction (\$19.9 billion), transportation (\$28.2 billion), and other commercial GPS uses (\$28.2 billion).
- "In addition, GPS technology creates direct and indirect positive spillover effects, such as emission reductions from fuel savings, health and safety gains in the work place, time savings, job creation, higher tax revenues, and improved public safety and national defense.
- Today, there are **more than 3.3 million jobs that rely on GPS technology**, including approximately 130,000 jobs in GPS manufacturing industries and 3.2 million in the downstream commercial GPS-intensive industries."



Planned GNSS

- Global Constellations
 - **GPS (24+)**
 - GLONASS (30)
 - GALILEO (27+3)
 - BEIDOU (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)



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



Bilateral Cooperation: China

- U.S. and China concluded ITU operator-to-operator coordination on GPS-BeiDou signal compatibility in September 2010
- Successful Workshop on GNSS conducted by the Chinese Academy of Engineering and U.S. National Academy of Engineering in 2011
- Bilateral meeting on aviation satellite navigation issues in 2011
- Bilateral discussions with China Satellite Navigation Office (CSNO) and China National Administration of GNSS and Applications (CNAGA), on the margins of multilateral international meetings held in 2012 and 2013



Bilateral Cooperation: Europe

- GPS-Galileo Agreement signed in 2004, ratified by EU in December 2011
 - Four working groups established under the Agreement
- Bilateral Plenary meeting held in June 2012 in Washington, DC
- ITU coordination meeting, May 2013
 - Focused on GPS III
- Working groups continue to meet regularly as needed



Bilateral Cooperation: India

- U.S. – India Joint statement signed in 2007
 - Cooperation on GPS and GPS augmentations
 - Expanded effort to ensure interoperability between GPS and GAGAN
- ITU Coordination – Meeting in early 2013
- U.S.-India Civil Space Joint Working Group (CSJWG) bilateral meeting held in Washington, DC in March 2013



Bilateral Cooperation: Japan

- Joint statement signed in 1998
- Cooperation focuses on compatibility and interoperability between GPS and Japan's Quasi-Zenith Satellite System (QZSS)
- Hosting of QZSS monitoring stations in Hawaii and Guam
- Annual plenary meeting held July 2013
 - Both sides reaffirmed close cooperation on GNSS issues, no major outstanding problems or issues
 - GPS-QZSS Technical Working Group met to discuss compatibility coordination under the ITU auspices



Bilateral Cooperation: Russia

- GPS-GLONASS discussions ongoing since 1996, and Joint Statement issued December 2004
- Working group on search and rescue capabilities meets regularly
 - Most recent meeting in Fall 2012 in Washington, DC
- Joint statements signed in September 2011 and June 2012 reaffirming intent to continue cooperation
- Bilateral discussions regarding monitoring of GLONASS/SDCM from U.S. territory



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





ICG-7 Outcomes

- Endorsement of two Workshops (Honolulu, HI, U.S. – April 2013)
 - Second Workshop on Interference Detection and Mitigation, following a successful first Workshop in June 2012
 - Interoperability Workshop focused on industry feedback regarding signal design and parameters
- Multi-GNSS monitoring: Tasks and a Work Plan for the ICG International GNSS Monitoring and Assessment (IGMA) Subgroup were approved
 - Identify what service parameters should be monitored
 - Define the level and methods for carrying out the monitoring
- ICG to adopt the International Terrestrial Reference System (ITRS) as the theoretical reference system for the alignment of GNSS terrestrial reference frames
- Consensus that achieving a fully interoperable GNSS space service volume would provide significant performance benefits that no single system could provide on its own

ICG-8 will be hosted by the UAE in Dubai, November 2013



2013 ICG Workshops Hosted by U.S.

- Workshop on Interference Detection and Mitigation (IDM)
 - 35 participants, 5 of 6 System Providers represented
 - Topics discussed include:
 - RNSS spectrum regulation
 - Information sharing/dissemination & collaboration
 - Concepts, techniques and research related to IDM
 - Concrete outcomes and recommendations identified
- Interoperability Workshop
 - 45 participants, 5 of 6 System Providers represented
 - Primary focus: industry feedback on interoperability
 - Responses to specific interoperability questions posed in advance
 - Results to be presented during ICG-8 WG-A meeting



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
- 18th GIT meeting held 2-4 July 2013 in Bali, Indonesia



Summary

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



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U.S. and UK Reach Understanding on GPS Patents

The United States and United Kingdom successfully reached an understanding on intellectual property rights that will ensure GPS civil signals remain free and openly available for users worldwide.

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THANK YOU!

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