



SPACE-BASED POSITIONING  
NAVIGATION & TIMING  
NATIONAL COORDINATION OFFICE

# U.S. Space-Based Positioning, Navigation & Timing (PNT) GPS Policy Update

**Milo Robinson**  
Senior Advisor

Department of the Interior  
National Coordination Office



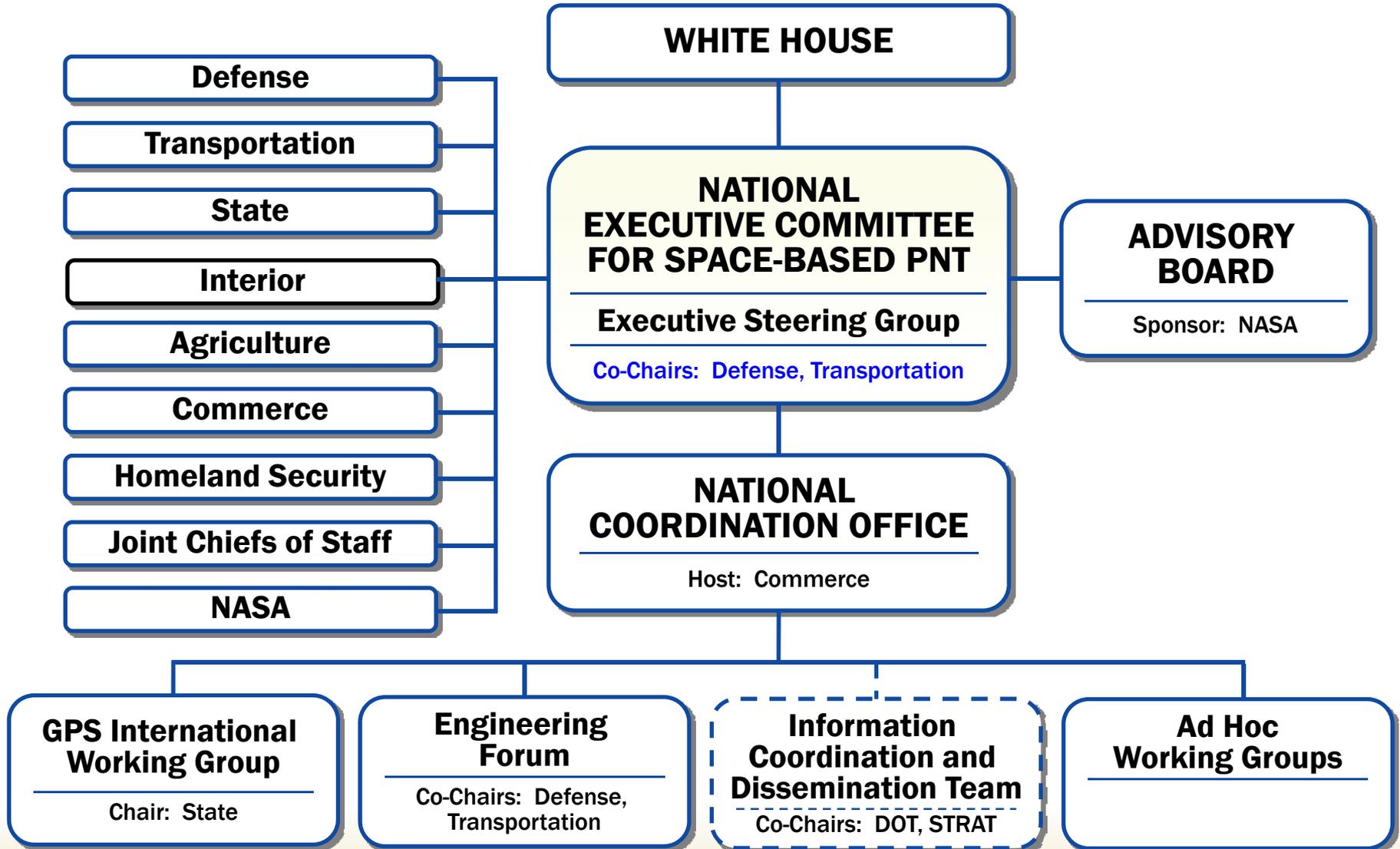
# Outline



- **U.S. Space-Based PNT Organization**
  - Executive Committee (EXCOM)
  - Executive Steering Group (ESG)
  - National Coordination Office (NCO)
  - National Space-Based PNT Advisory Board
- **U.S. Space-Based PNT Policy**
- **LightSquared Issue**
- **International Activities**



# U.S. Space-Based PNT Organizational Structure





# Executive Steering Group (ESG)



- **Established under Amended EXCOM Charter to:**
  - Perform tasks
  - Build consensus
  - Resolve issues } on behalf of the EXCOM
- **ESG Membership (Under/Assistant Secretary level)**
  - **Defense (co-chair)**
  - **Transportation (co-chair)**
  - State
  - Interior
  - Agriculture
  - Commerce
  - Homeland Security
  - Joint Chiefs of Staff
  - NASA
  - US Air Force
  - Federal Aviation Administration



# National Coordination Office (NCO)



- **Coordinate Space-Based PNT EXCOM**
  - Organize meetings (EXCOM, ESG)
  - Track projects and tasks (EXCOM, ESG Action Items)
  - Work interagency issues
  - Coordinate interagency documents
    - Develop “Five-Year National Plan”
    - Publish “Annual Report”
    - Submit “Biennial Report to Congress”
  - Conduct or Oversee studies, analyses, and projects
  - Comprised of representatives from member Departments or Agencies



# National Space-Based PNT Advisory Board



- Provides independent advice and recommendations on PNT
- Current Taskings
  - Non-ICD Compliant Civil/Commercial Receivers
  - PNT Architecture Implementation Plan Assessment
  - GPS Commercial Outage Impact Assessment
- 25 members (including 5 international members)
  - Co-chaired by Dr. James Schlesinger & Dr. Brad Parkinson





# Working Groups



- **GPS International Working Group (GIWG)**
  - Forum for US International PNT Policy
  - Reviews ongoing cooperation activities and discuss future international outreach opportunities
- **National PNT Engineering Forum (NPEF)**
  - Conducts assessments and makes recommendations on technical issues as tasked by the EXCOM
- **Information Coordination and Dissemination Team (ICDT)**
  - Forum for coordination of operational issues and user support activities relative to GPS and augmentations



# Recent PNT EXCOM Issues



- **Emerging Threats to GPS**
- **Bilateral Talks with China**
- **Implications of President Obama's Space Policy**
- **Comprehensive Civil Risk Assessment**
- **LightSquared Interference Impacts**



# U.S. Policy History



- **1983:** President announces civilian access to GPS following KAL 007
- **1991:** U.S. offers free civil GPS service to the International Community
- **1996:** First U.S. GPS Policy establishes joint civil/military management
- **1997:** U.S. law provides civil GPS access free of direct user fees
- **2000:** President ends use of *Selective Availability*
- **2004:** President issues U.S. Policy on Space-Based PNT
- **2004:** Agreement signed on GPS-Galileo Cooperation
- **2007:** President announces *Selective Availability* eliminated from future GPS III satellites
- **2010:** New National Space Policy provides high-level PNT guidance





# 2010 Space Policy



- **Maintain Leadership in the service, provision, and use of GNSS**
  - Provide civil GPS service, free of direct user charges
  - Foreign PNT services may be used to complement GPS
  - Encourage Global compatibility and interoperability GPS
  - Support International Activities to detect and mitigate harmful interference



# U.S. Space-Based PNT Policy

**GOAL: Ensure the U.S. maintains space-based PNT services, augmentation, back-up, and service denial capabilities that...**

---

## **ASSURE SERVICE**

Provide uninterrupted availability of PNT services

---

## **MEET DEMANDS**

Meet growing national, homeland, economic security, and civil requirements, and scientific and commercial demands

---

## **LEAD MILITARILY**

Remain the pre-eminent military space-based PNT service

---

## **STAY COMPETITIVE**

Continue to provide civil services that exceed or are competitive with foreign civil space-based PNT services and augmentation systems

---

## **INTEGRATE GLOBALLY**

Remain essential components of internationally accepted PNT services

---

## **LEAD TECHNICALLY**

Promote U.S. technological leadership in applications involving space-based PNT services



# What is LightSquared?



- **New Telecom company formed Mid 2010**
  - Formerly SkyTerra
  - FCC approved SkyTerra transfer order Mar 2010
- **Company formed to create a nationwide 4G LTE (Long Term Evolution) open wireless broadband network**
- **First wholesale-only broadband network**
- **Intends to provide coverage to 92% of USA by 2015**
- **Key Asset**
  - **Mobile Satellite Service /Ancillary Terrestrial Component license for 1525–1559 MHz; 1626.5-1660.5 MHz**



# LightSquared Interference to GPS

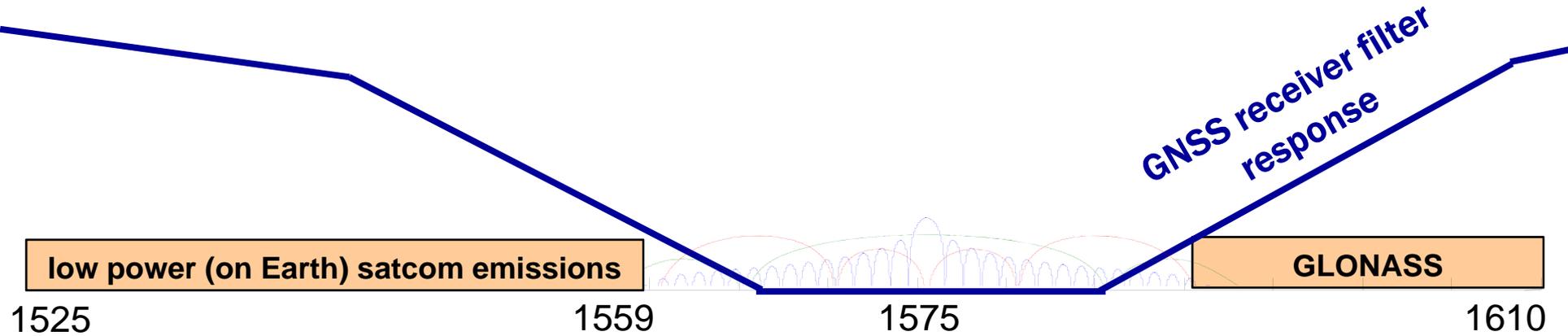


- **FCC Waiver to LightSquared (LSQ) for a Terrestrial Broadband in Mobile Satellite Service Spectrum adjacent to Spectrum used by GPS**
- **FCC has condition on Waiver that harmful interference concerns to GPS be resolved**
- **Testing Shows Widespread Harmful Interference to GPS devices**
- **FCC sought comments until 15 August**
- **Congressional Hearings planned for September**
- **No time line for FCC Decision**
- **Appears additional testing is likely on alternative approach suggested by LSQ (Low 10 Mhz)**

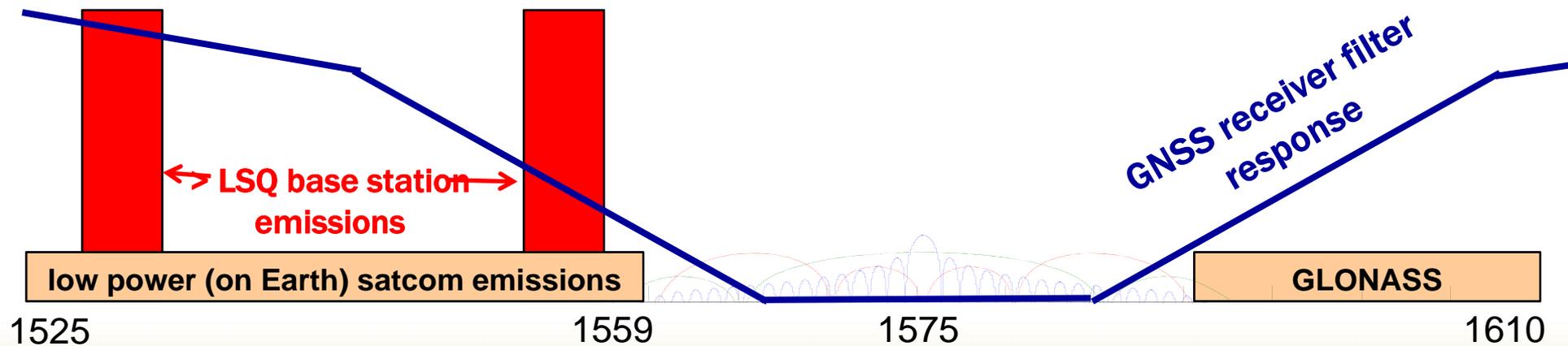


# Illustration of Concerns with LightSquared

## Situation before LightSquared

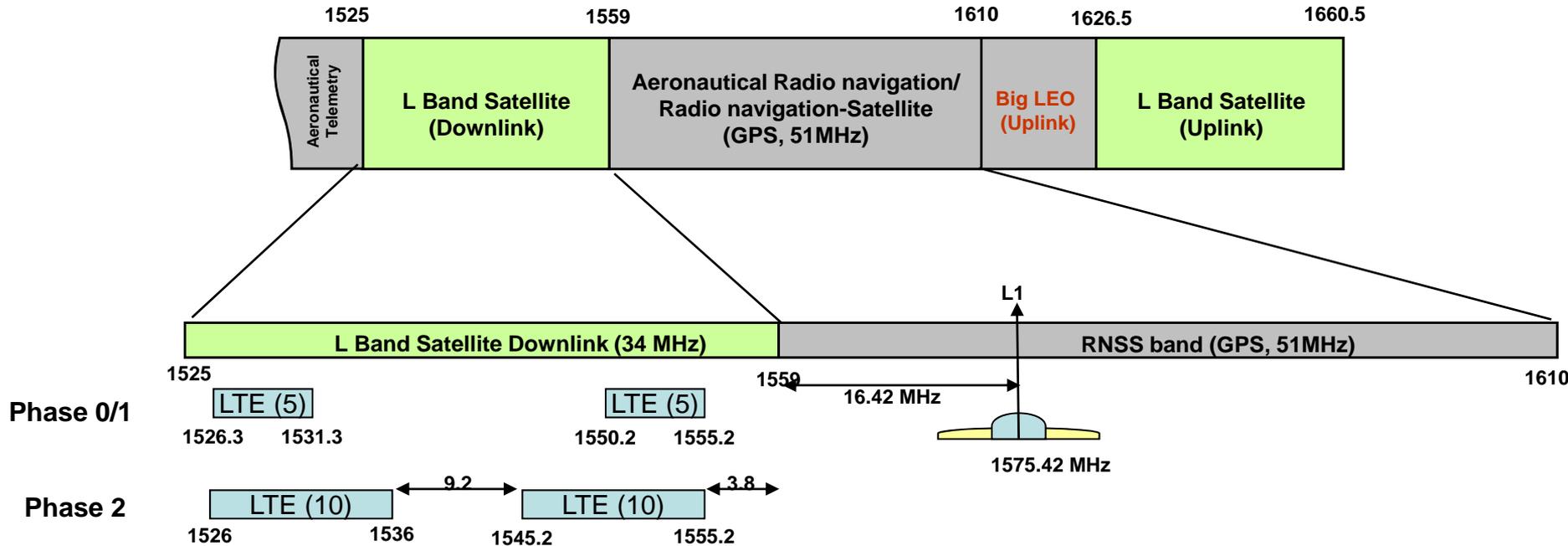


## Situation with LightSquared





# LightSquared Spectrum Plans





# 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
- **Sixth ICG meeting in Japan, September 2011**



# Planned GNSS



- **Global Constellations**

- **GPS (24+)**
- **GLONASS (30)**
- **Galileo (27+3)**
- **Compass (30 global and 5 regional satellites)**

- **Regional Constellations**

- **QZSS (3)**
- **IRNSS (7)**

- **Satellite-Based Augmentations**

- **WAAS (2+1)**
- **MSAS (2)**
- **EGNOS (3)**
- **GAGAN (2)**
- **SDCM (3)**



# 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 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



# Galileo concerns on LightSquared



- “Deep Concerns”
- “Considerable potential to cause harmful interference to Galileo”
- “Grave threat to providing Galileo service covering US”
- Galileo interoperable with GPS
- No Galileo receivers tested



EUROPEAN COMMISSION  
DIRECTORATE GENERAL FOR ENTERPRISE AND INDUSTRY

Director general

Brussels, 19. 07. 2011  
ENTR/GP1/PF/DH/ses ARES (2011) 800745

Mr Julius Genachowski  
Chairman  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, DC, 20554  
United States of America

Dear Mr Genachowski,

I am writing to express our deep concerns about the LightSquared system that is proposed for operation in frequencies immediately below the radionavigation-satellite service (RNSS) allocation at 1559-1610MHz. This band is the core band used by global satellite navigation systems including GPS and you are no doubt aware that Europe is at the advanced planning stage for its own system, Galileo, which will be operational by 2014/15, and that will also use this RNSS allocation.



# Contact Information



## Milo Robinson

National Coordination Office for Space-Based PNT  
1401 Constitution Ave, NW – Room 6822  
Washington, DC 20230

Phone: (202) 482-0019  
(703) 648-5162

[Milo.Robinson@pnt.gov](mailto:Milo.Robinson@pnt.gov)  
[www.pnt.gov](http://www.pnt.gov)