



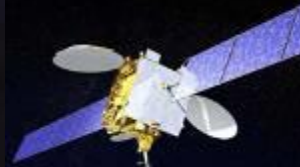
SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL COORDINATION OFFICE

GPS Perspectives

Space Situational Awareness 2015

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Director, National Coordination Office
United States of America

GPS enables a diverse array of applications



Space Applications



Surveying & Mapping



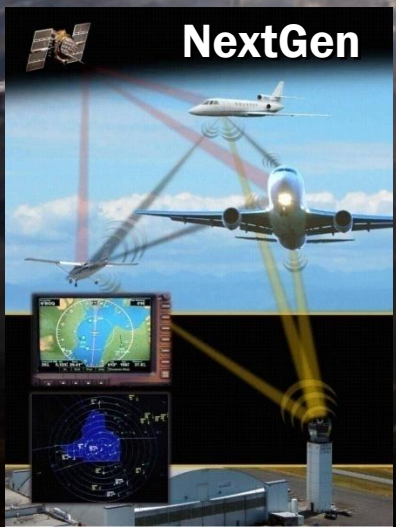
Power Grids



Precision Agriculture



Transit Operations



NextGen



Disease Control



Intelligent Vehicles



TeleComm



Trucking Shipping



Personal Navigation



Oil Exploration



Fishing & Boating



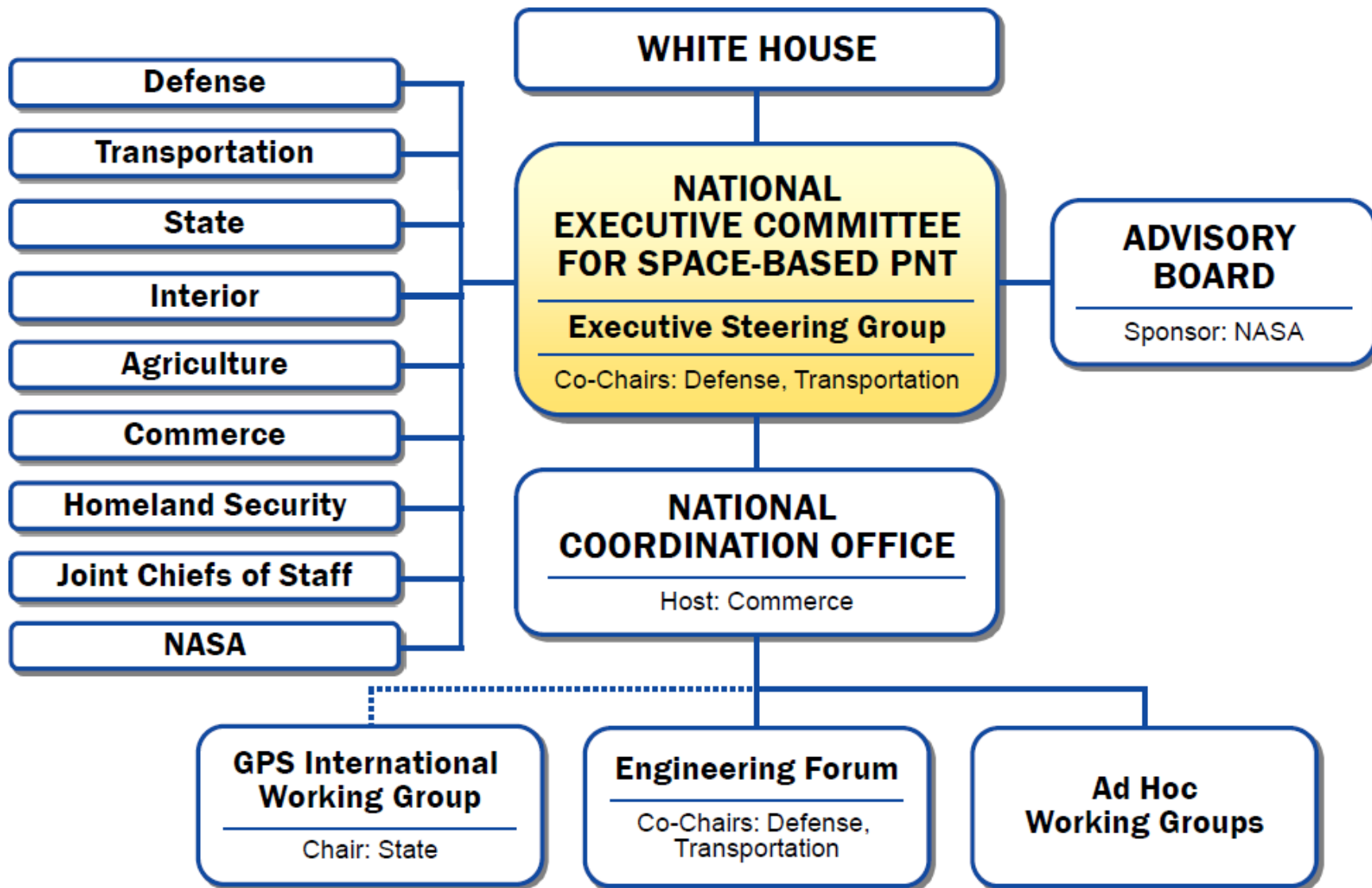
U.S. Policy & GPS Status

The U.S. must maintain its leadership in the service, provision and use of Global Navigation Satellite Systems (GNSS)

- Robust, reliable operational GPS constellation
- 2014 averaged 70 cm user range error, best ever
- 4 successful launches last year, most since 1993
- 2015 season underway with good launch 25 Mar
- Modernized civil messages on the air via L2C & L5, pre-operational, employ at user's own risk
- Continuous, worldwide, free of direct user fees
- Work with other GNSS service providers to ensure compatibility, interoperability, and transparency



National Space-Based PNT Organization





GPS Modernization Program



Legacy GPS IIA/IIR

- Single Frequency (L1)
- Coarse acquisition (C/A) code
- Y-Code (L1Y & L2Y)

GPS IIR-M

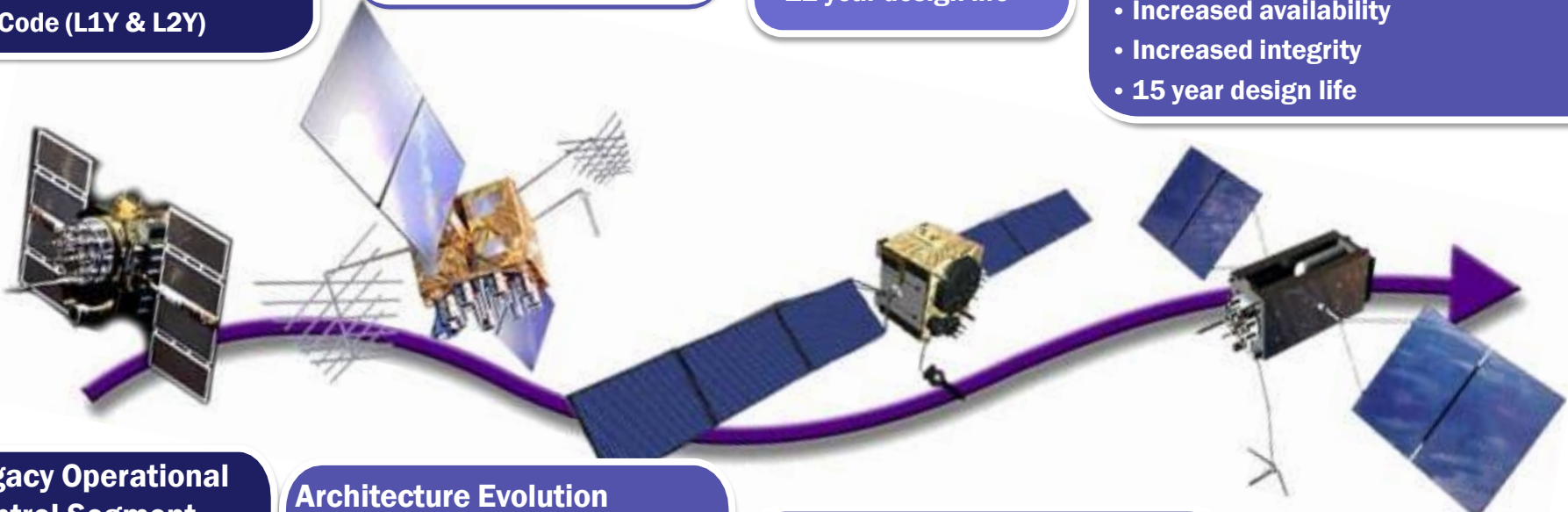
- 2nd Civil Signal (L2C)
- M-Code (L1M & L2M)

GPS IIF

- 3rd civil signal (L5)
- 2 Rb + 1 Cs Clocks
- 12 year design life

GPS III

- 4th civil signal (L1C)
- 4x better User Range Error than GPS IIF
- Increased availability
- Increased integrity
- 15 year design life



Legacy Operational Control Segment (OCS)

- Mainframe system
- Command & Control
- Signal monitoring

Architecture Evolution Plan (AEP)

- Distributed architecture
- Increased signal monitoring
- Security
- Accuracy
- Launch and disposal ops

Next Generation Operational Control System (OCX) Block 0

- Launch & On-Orbit Checkout of GPS III

OCX Block 1

- Transition to OCX for all GPS command and control operations



Complementary PNT



- **EXCOM looked at need for complement to GPS**
 - Assessment driven by many factors: from policy to technology
 - U.S. coverage for GPS outage from natural or man-made events
- **Current Activity: Identify and assess alternatives**
 - Assessed a broad mix of terrestrial RF and autonomous PNT technologies
- **Decision timeline: No earlier than summer 2015**
 - Supports FY17 investment decisions
- ***Federal Register* Notice published 23 March 2015 for public stakeholder engagement**



Public Comment/Stakeholder Outreach



- DOT drafted a *Federal Register* Notice in conjunction with CPNT Team seeking:
 - Brief description of PNT application(s)
 - PNT performance required for a complementary PNT capability
 - Availability and coverage area required for a CPNT capability
 - Willingness to equip with an eLoran receiver
 - Current/planned availability of e-Loran user equipment
 - Other non-eLoran PNT technologies or operational procedures currently available or planned
- Widely circulated to stakeholder communities
- Comments posted on www.regulations.gov when received
- Comments due by **May 22, 2015** (60-Day Comment Period)

Synopsis of Comments Provided At End of Comment Period



Thank You !

GPS.gov Official U.S. Government information about the Global Positioning System (GPS) and related topics

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Home » Applications

APPLICATIONS:

- Applications**
- Agriculture
- Aviation
- Environment
- Marine
- Public Safety & Disaster Relief
- Rail
- Recreation
- Roads & Highways
- Space
- Surveying & Mapping
- Timing

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GPS Applications

Like the Internet, GPS is an essential element of the global information infrastructure. The free, open, and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life. GPS technology is now in everything from cell phones and wristwatches to bulldozers, shipping containers, and ATMs.

GPS boosts productivity across a wide swath of the economy, to include farming, construction, mining, surveying, package delivery, and logistical supply chain management. Major communications networks, banking systems, financial markets, and power grids depend heavily on GPS for precise time synchronization. Some wireless services cannot operate without it.

GPS saves lives by preventing transportation accidents, aiding search and rescue efforts, and speeding the delivery of emergency services and disaster relief. GPS is vital to the Next Generation Air Transportation System (NextGen) that will enhance flight safety while increasing airspace capacity. GPS also advances scientific aims such as weather forecasting, earthquake monitoring, and environmental protection.

Examples

- Agriculture
- Aviation
- Environment
- Marine
- Public Safety & Disaster Relief
- Rail
- Recreation
- Roads & Highways
- Space
- Surveying & Mapping
- Timing

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***GPS: Continuous improvement,
predictable, dependable performance***