



SPACE-BASED POSITIONING  
NAVIGATION & TIMING  
NATIONAL COORDINATION OFFICE

# Bringing GPS to You, the Users

**Steve Sidorek**  
Legislative Affairs Advisor

**“GPS Adventures” Grand Opening**  
**The Wildlife Experience**

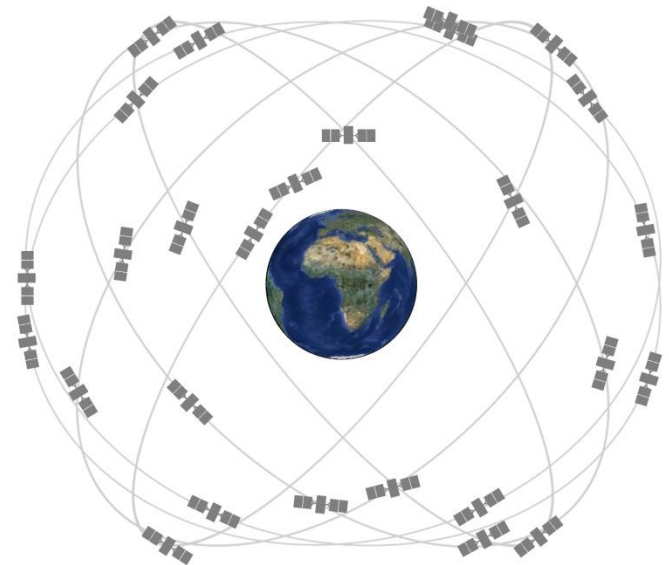
**Parker, Colorado**  
**February 9, 2013**



# The Global Positioning System



- **Baseline 27-slot satellite constellation in medium earth orbit**
- **Global coverage, 24 hours a day, all weather conditions**
- **Satellites broadcast precise time and orbit information on L-band radio frequencies**
- **Two types of signals:**
  - Standard (free of direct user fees)
  - Precise (U.S. and Allied military)
- **Owned and operated by the USG**
  - Paid for by U.S. taxpayers
  - Acquired and operated by Air Force
  - Guided at national level by civilian and military leadership





# U.S. Policy Promotes Global Use of GPS Technology



- **No direct user fees for civil GPS services**
  - **Provided on a continuous, worldwide basis**
- **Open, free access to information necessary to use civil GPS and augmentations**
  - **Anyone can develop applications, user equipment, and value-added services**
  - **Encourages 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**



# GPS IIF-3 Launch



**October 4, 2012**

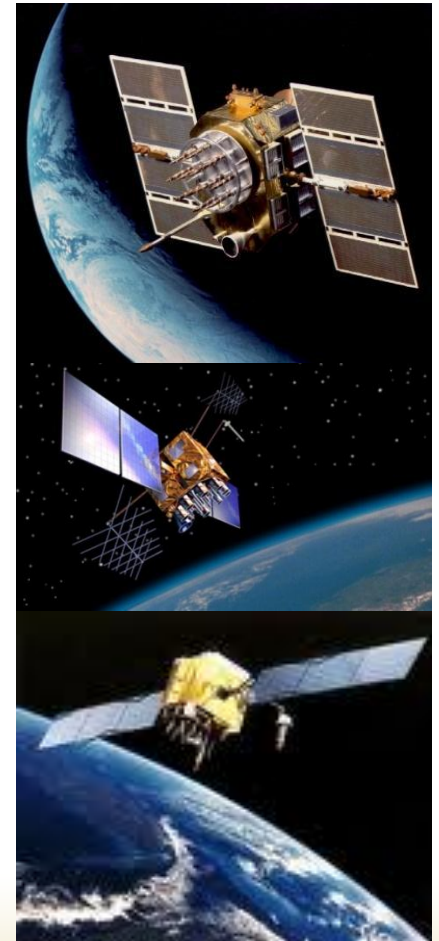


# GPS Constellation Status



**35 Satellites (31 Operational)**  
**Baseline Constellation: 27**

- **12 Block IIA**
  - 3 on-orbit in residual status
- **12 Block IIR**
- **8 Block IIR-M**
  - Transmitting new second civil signal
  - 1 GPS IIR-M in on-orbit testing
- **3 Block IIF**
  - Transmitting new safety of life signal
- **GPS III satellites start launching in 2015**
- **Global GPS civil service performance commitment met continuously since 1993**





# GPS Modernization – New Civil Signals



## Second civil signal “L2C”

- Designed to meet commercial needs
- Available since 2005 without data message
- Currently broadcasts from 10 satellites
- Full capability: 24 satellites and full CNAV approximately 2018



## Third civil signal “L5”

- Designed to meet transportation safety-of-life requirements
- Currently broadcasts from 3 satellites
- 24 satellites and full CNAV approximately 2021

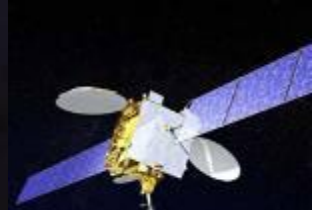
## Fourth civil signal “L1C”

- Designed for GNSS interoperability
- Specification developed in cooperation with industry
- Fully designed and in testing
- Will be broadcast by GPS III
- Available on 24 satellites approximately 2026



Improved performance in challenged environments

# GPS enables a diverse array of applications



**Satellite Operation**



**Surveying & Mapping**



**Power Grids**



**Precision Agriculture**



**Transit Operations**



**NextGen**



**Disease Control**



**Intelligent Vehicles**



**TeleComm**



**Trucking & Shipping**



**Personal Navigation**



**Oil Exploration**



**Fishing & Boating**



# Agriculture



- **Greater crop yields, profit margins**
- **Optimized placement of crop rows, seeds**
- **Enhanced monitoring of crop yields, soil quality, problems**
- **Automated, 24-hour operations using lighter equipment, less fuel, less labor**
- **Plant-specific applications of water, fertilizer, pesticides, herbicides**
- **Environmental benefits**



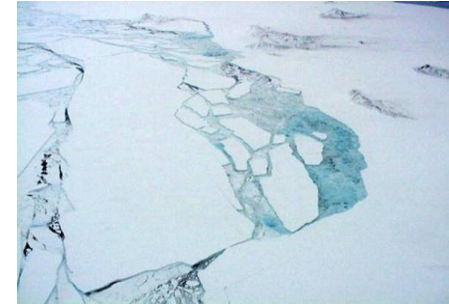




# Environmental Stewardship



- **Climate monitoring**
  - Sea level rise measurements
  - Ice sheet change observations
  - Atmospheric moisture profiles
- **Reduced greenhouse gas emissions**
  - Efficient routing of aircraft, trucks, and other vehicles
  - Reduction of vehicle fleet idle times
- **Oil and chemical spill cleanup**
  - Positioning, modeling of spills to guide remediation efforts
- **Commercial fishing**
  - Enforcement of fishery boundaries
- **Forestry**
  - Monitoring of illegal deforestation





# Disaster Management



- Assists in disaster planning efforts such as flood plain mapping
- Helps relief workers navigate disaster areas devoid of landmarks
- Facilitates containment and management of wildfires
- Enables disaster warning systems
  - GPS-equipped buoys for tsunami warnings
  - GPS ground networks monitor crustal motion, earthquakes





# Timing



- **GPS provides precise time needed to synchronize large networks**
- **Telecommunications**
  - Wired and wireless
- **Finance**
  - Stock exchanges
  - ATMs
- **Power grids**
  - Load balancing
  - Fault detection, location





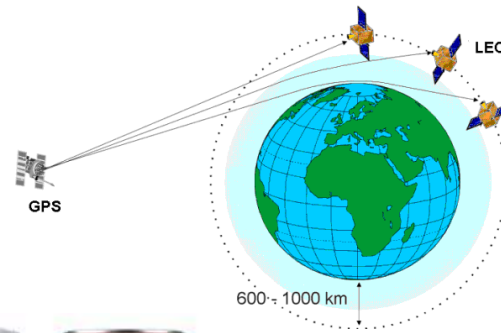
# New Applications Appear Every Day



- **Mobile applications**
  - Location based services
  - Social apps
- **Personal, pet safety**
- **Road use taxation**
- **Weather observation**



GPS Antennae





# Summary



- **USG is committed to providing GPS on a continuous worldwide basis, free of direct user charges**
  - To encourage its use worldwide and promote new applications
- **GPS is undergoing major upgrades**
  - Three new civilian signals coming online
- **GPS is critical to our economic infrastructure**
  - New uses invented every day



# For Additional Information



Welcome to GPS.gov x  
www.gps.gov

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## GPS.GOV

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

Search:

HOME WHAT'S NEW SYSTEMS APPLICATIONS GOVERNANCE MULTIMEDIA SUPPORT

For General Public  
For News Media  
For Congress  
For Internationals  
For Professionals

### All Systems Activated

The newest GPS satellite went online on Nov 13, following its successful launch and checkout. It is the third in the Block IIF series of modernized GPS spacecraft.

LEARN MORE... →

#### Get Help with Incorrect Addresses, Maps, and Directions

Do GPS devices show your house or business in the wrong place? Are they sending trucks through your back alley? Don't blame the GPS satellites... contact the map makers! We'll tell you how. [LEARN MORE... →](#)

#### New GPS Educational Poster

[CHECK IT OUT... →](#)

Wondering why there's a tractor on the

#### New Additions to GPS.gov

- Feb 1: Updates on LightSquared and GPS
- Jan 18: GPS educational poster
- Jan 17: UK-U.S. statement on GPS intellectual property
- Jan 16: Satellite manufacturer videos
- Jan 10: Bios for new NCO director, deputy director

[VIEW ALL WEBSITE UPDATES... →](#)  
[VIEW GPS NEWS ITEMS... →](#)

#### GPS Adventures Exhibit Coming to Colorado

The GPS Adventures exhibit is heading to The Wildlife Experience in Parker, Colorado. On February 9, there will be a special opening event featuring presentations and a geocaching expo. The National Coordination Office for Space-Based Positioning, Navigation, and Timing will participate and hand out copies of the new GPS poster.

#### GPS User Support

#### Common Questions

- How do I stop GPS devices from giving wrong directions?
- What can I do about GPS maps directing traffic to my neighborhood?
- How do I report GPS service problems?
- Can GPS help me find my lost phone?
- How does GPS work?
- How accurate is GPS?
- How vulnerable is GPS to malicious jamming?

[SEE MORE... →](#)

#### GPS Jammers

[www.gps.gov](http://www.gps.gov)