# Perspectives on Positioning, Navigation, and Timing and Information Sharing

## Munich Satellite Navigation Summit

**Civil GPS Service Interface Committee**
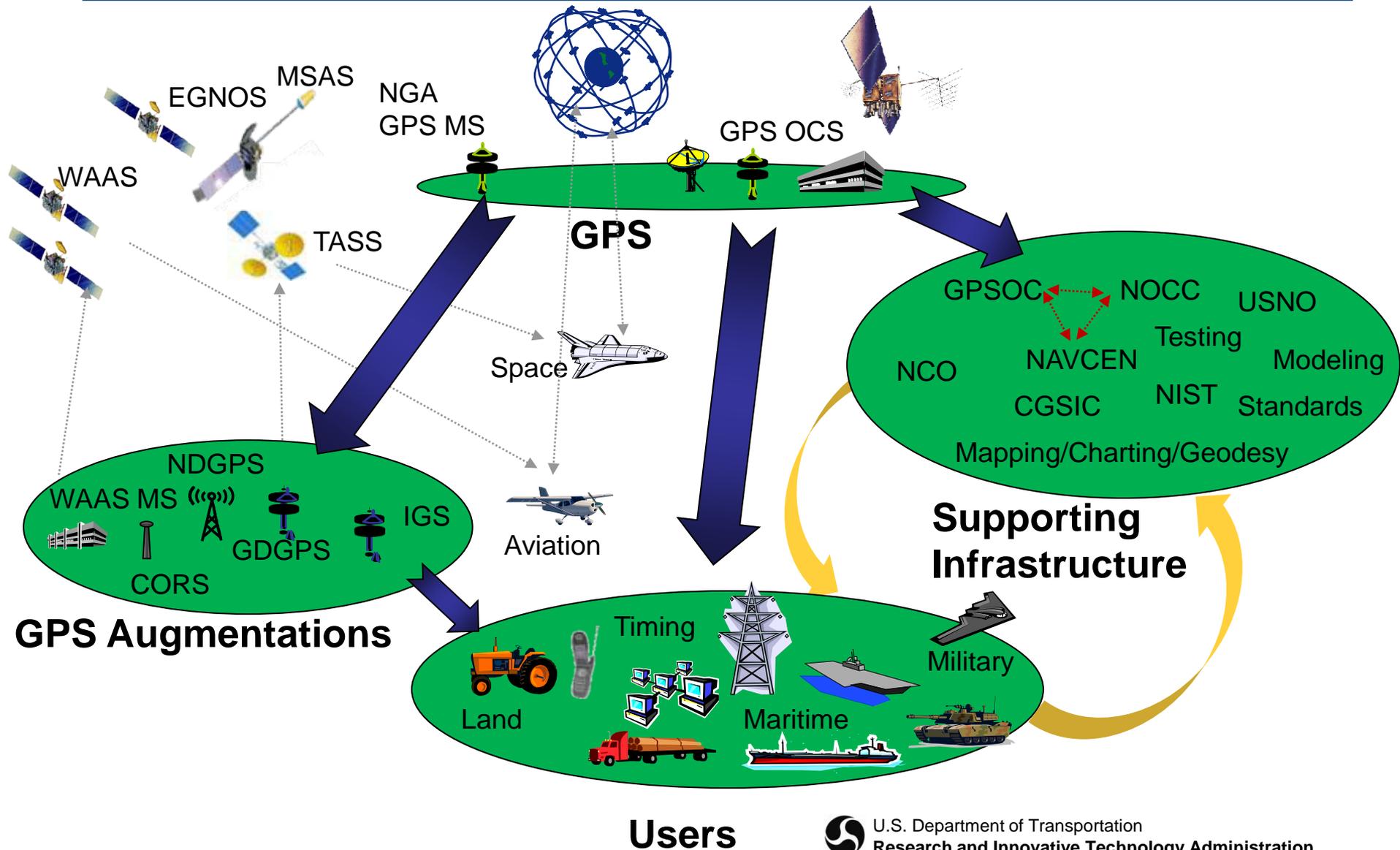**International Information Subcommittee**

Karen Van Dyke

March 3, 2011

# Overview

- Theme of CGSIC Session: GNSS Feedback Loop

- Challenges in Information Dissemination

- Focus for the Future

# GPS Feedback Loop



EGNOS

MSAS

NGA
GPS MS

GPS OCS

WAAS

**GPS**

TASS

GPSOC ⟷ NOCC    USNO

Testing

NCO    NAVCEN    Modeling

Space

CGSIC    NIST    Standards

Mapping/Charting/Geodesy

NDGPS

WAAS MS

IGS

GDGPS

Aviation

**Supporting Infrastructure**

CORS

**GPS Augmentations**

Timing

Military

Land    Maritime

**Users**

# Service Provider Information

## GPS

- ICDs /Interface Specifications

- Almanacs

- NANUs/NOTAMs

- SV outages

- Interference Reports

- Testing
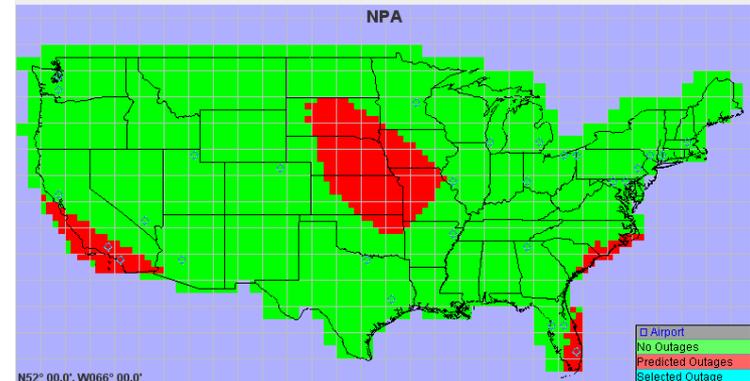


Emphasis on "service interface" – interpret what the GPS service provider information means to the end user

# Many GPS Users – How Many are "In the Loop"?

Surveying & Mapping

Power Grids

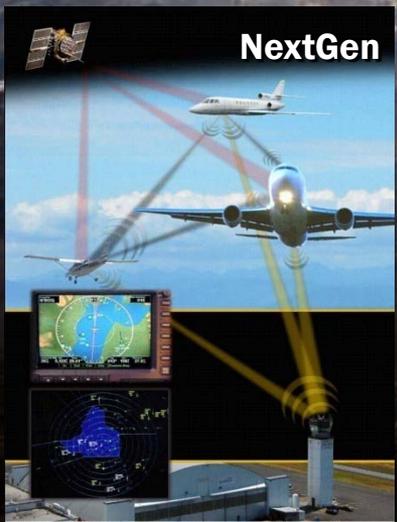Precision Agriculture

Satellite Operations

Transit Operations

NextGen

Trucking & Shipping

Intelligent Transportation Systems

TeleComm

Disease Control

Personal Navigation

Oil Exploration
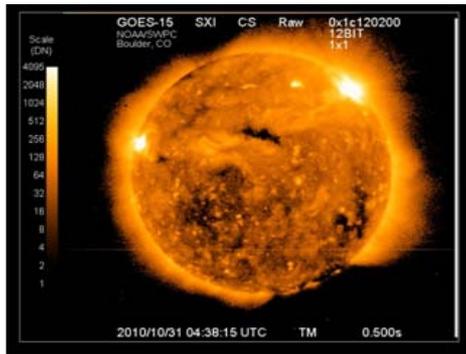
Fishing & Boating

# GPS Challenged Environments

**Ionospheric Disturbances**

**Underground/Indoors**

**Dense Canopy**

**Urban Environment**

**Electromagnetic Disturbances**

**Inaccurate/Out-of-Date Maps**

# Easy to Purchase GPS Jamming Devices

- Growing market for low-cost GPS jammers
    - Concern over being tracked using GPS, particularly among those driving a company or fleet vehicle

- Many devices are battery-operated or can be plugged into a cigarette lighter

- Sold as "privacy protectors"

**$99**

**$99**

**$320**

**$129**

**$145**

**$30**

**$430**

**$79**

# PNT Architecture Graphic (2025)

# DOT/RITA PNT Collaboration Website

www.transportationresearch.gov

Launched at January 2011 Transportation Research Board Meeting

PNT is one of 14 Research Clusters

Focus is on PNT Capability Gaps

User Audience:

- Open to the public - emphasis on Research Centers and Universities

- Users may request sign-on privileges to upload documents and to join in on discussions



U.S. Department of Transportation
**Research and Innovative Technology Administration**

# Summary

- Information Dissemination is a challenge when there isn't a means to interface with the user community already established

- Users will continue to expect the GPS/GNSS capability to work anywhere and everywhere
    - Including physically and electromagnetically impeded environments
    - Most will not know the difference between GPS, GNSS, Augmentation Systems, Terrestrial, and Autonomous PNT Sources

- Information Dissemination will become more challenging in a multi-constellation GNSS environment and integration with other PNT sources