

# THE US DEPARTMENT OF TRANSPORTATION

## CIVIL INTERFACE ROLE

### Abstract

The Global Positioning System (GPS) is now a worldwide utility and an integral part of information technologies that are fundamental to modern life. The President of the United States and U.S. Congress have both directed the U.S. Department of Transportation (DOT) to be the civil lead in GPS management and to be the stewards of the system for the civil community.

This paper will briefly describe the history and the methods DOT uses to perform that role, as it bridges the gap between GPS management, system operations, and the user community. Users of global satellite-based positioning, navigation, and timing services need current, real-time information and support that promotes the efficient performance of daily and future applications. To this end, the authors will also examine some of the current issues faced by the civil community, identify the near-term methods of addressing those issues, and describe the plans to meet future user requirements. Those issues include but are not limited to, user input for continued system operation and modernization, the reporting and resolution of intentional and unintentional interference, and the dissemination of GPS operational information.

### Background

In 1986, the U.S. Department of Defense (DoD) identified a need to coordinate and distribute information to the civil community. DoD formed the GPS Civilian Users Steering Committee, which would evolve into the Civil GPS Service Interface Committee (CGSIC). The leadership of the committee transferred from DoD to DOT. The committee's main focus was to identify and meet the user requirements for system status and other operational information. The Bulletin Board Service was established, and is now known as the Navigation Center's (NAVCEN) Navigation Information Service (NIS).

Civil use of GPS grew rapidly in the United States, and around the world. GPS reached maturity as the technology to integrate GPS into applications, such as vehicle location and GIS, came of age. The needs of the non-traditional navigator grew in importance. DOT needed to expand its role to meet the challenge of this expanding requirement.

In 1994, responsibility and chair of the Committee transferred to the DOT Office of the Secretary. The Coast Guard is the Deputy Chair and responsible for the daily administrative activities.

At the same time, DOT recognized the importance of placing civilian personnel in strategic GPS operations and decision-making positions. DOT personnel were placed at Air Force Space Command and the GPS Joint Program Office.

### Civil GPS Service Interface Committee

The CGSIC mission is to achieve the full potential of GPS in the civil sector. Both service providers and users of GPS need an effective channel for the exchange of information. The Civil GPS Service Interface Committee serves as the primary link between worldwide civil GPS users and the U.S. government service providers. The CGSIC:

- \* Provides a forum for the two-way exchange of GPS technical information and needs between civil GPS users and U.S. service providers.
- \* Identifies information requirements and methods to distribute this information to the civil GPS user community.
- \* Identifies GPS issues that may need resolution by the U.S. service providers or by the Interagency GPS Executive Board.

Committee membership is open to anyone with an interest in GPS.

### CGSIC Structure

The Chair is the Deputy Assistant Secretary for Transportation Policy in the Office of the Secretary of Transportation. The Deputy Chair is the

Commanding Officer of the Coast Guard's NAVCEN, which houses the Executive Secretariat, which coordinates and executes the business of the CGSIC. A panel of advisors consists of representatives from maritime (USCG), aviation (FAA), land (FHWA), the State Department, and the GPS Interagency Advisory Council to provide guidance.

## Committee Structure

### Subcommittees

Currently, three subcommittees focus on specialized areas: International Information, Timing Information, and U.S. States and Local Governments.

The International Information SubCommittee (IISC) addresses the user concerns utilizing a regional approach of representation. A network of regional Vice-chairs and country points of contact were established. This network can be effective in gathering requirements from the community globally. The IISC holds meetings outside the main meetings. Meetings in Europe are generally convened in December, while the Asia-Pacific region meetings are generally held in the summer.

The Timing Subcommittee consists of the leaders in the timing community and the many users of timing information. This subcommittee examines the needs of the timing users, sources of GPS timing information, and the methods of timing information dissemination.

The U.S. States and Local Government Subcommittee provides a forum for its members to present issues and information requirements and has been especially effective in developing the requirements for the Nationwide DGPS system. This subcommittee is relatively new. The need for this subcommittee became evident as the DOT attempted to coordinate responses to the concept of a Nationwide DGPS based on the maritime system. The Subcommittee meetings now also include discussions of the innovative means that individual states are using GPS.

## GPS Information Management Structure

### CGSIC Responsibilities

The CGSIC support the IGEB and the Chair's mission to represent the civil user interest in decisions concerning GPS. The Chair sets the priorities of the committee and determines what the focus of the committee will be and which issues will be addressed.

### Coast Guard Navigation Center

The CGSIC identified a need for a central point for information distribution to the civil users. The Coast Guard accepted this responsibility and established a group that today is known as the Navigation Information Service (NIS), located at the Coast Guard's Navigation Center. Today, the NIS distributes Notice to NAVSTAR Users (NANUs), the GPS signal specification, and other information use essential to GPS users. NIS personnel are available 24 hours a day, seven days a week to distribute information from the Air Force and to assist the GPS user. They answer general questions, and relay questions to the GPS managers. The NIS is also responsible for collecting outage reports. These reports are forwarded to the Air Force for explanation and resolution.

### Additional DOT Support

As previously mentioned, DOT has civil representatives located at strategic locations in DoD offices: Air Force Space Command in Colorado Springs and the GPS Joint Program Office in Los Angeles.

### Air Force Space Command

In accordance with the Civil Use of GPS, DOT/DoD Memorandum of Agreement, a DOT position was established at Air Force Space Command, Peterson AFB, Colorado. This position, the Civil GPS Liaison, serves as the senior DOT representative to Air Force Space Command, United States Space Command, and the 50th Space Wing (home of the GPS Master

Control Station). The Civil GPS Liaison is the spokesperson for civil GPS users, and the on-site representative of the DOT Assistant Secretary for Transportation Policy (who is the Co-Chair of the Interagency GPS Executive Board and Chair of the DOT Positioning/Navigation Executive Committee). The Civil GPS Liaison duties include, but are not limited to: representing civil interests in the long term GPS planning, coordinating the solicitation and approval of civil GPS modernization requirements into the GPS Operational Requirements Document, and participation in the daily functions of GPS operations, maintenance, and sustainment related to civil GPS use.

The Coast Guard Navigation Center established a Chief Quartermaster position at Air Force Space Command to facilitate the daily transfer of information to the Navigation Information Service, and ultimately the civil GPS users. Attached to NAVCEN and deals with the daily operational concerns, and facilitates the information exchange between the 2nd Space Operations and the NAVCEN. The Navigation Center (NAVCEN) is the distribution point for GPS information to the non-aviation user using the combination of the CGSIC membership roles and the NAVCEN distribution and collection methods.

### GPS JPO

The Coast Guard has represented DOT at the GPS Joint Program Office (JPO) since the 1980s. The senior DOT representative at the JPO is the DOT Deputy Program Manager (DPM). The DPM is directly responsible to the GPS Program Director and the Deputy Assistant Secretary of Transportation for Navigation Systems Policy.

### GPS Requirements

The U.S. Government, under the combined direction of DOT and DoD, is presently examining the options for modernizing GPS. To maintain and improve the adequacy of GPS, this modernization program focuses equally on the present and future needs of the civilian user community, as well as those of the US DoD and allied military. The modernization program includes the identification of civilian GPS requirements, the analysis of alternatives for meeting approved requirements, and the procurement of funds for implementing improvements to GPS.

The Department of Transportation is responsible for coordinating the civilian contributions to this process. DOT completed a comprehensive program to request, correlate, analyze, and approve civil GPS modernization requirements. Formal processes were employed to solicit requirements within the U.S. Government, but the requirement's process did not stop there. Request for modernization requirements and general input was literally solicited from every civil GPS user worldwide. The most significant methods employed the use of the USCG NIS website and the CGSIC. In all, more than 500 inputs were received and used in the modernization requirements process.

### User Support Center

The degree and type of GPS general and detailed operational information, required by the wide range of civil GPS users, is as diverse as the number of GPS applications. To meet all of the civil requirements for GPS information, DOT has two methods for disseminating GPS information.

1. The US Coast Guard's NAVCEN is the civil focal point for coordination and dissemination of GPS operational information, and reporting cases of GPS Standard Positioning Service (SPS) operational disruption or degradation.
2. The FAA's National Operations Control Center (NOCC) provides a similar service. Because of its unique aviation, safety-of-life mission, the NOCC focuses on and provides these services to the aviation GPS user. Additionally, the FAA oversees the spectrum band in which the present SPS and the future third civil signal (L5) reside.

The Department of Defense performs similar services for use by the military. US Space Command is the focal point for handling DoD GPS operational information needs. To accomplish this mission, US Space Command has established the DoD GPS Support Center. Additionally, the DoD GPS Support Center will accept and respond to GPS SPS problem reports from the US Coast Guard's NAVCEN and the FAA's NOCC, and will inform the NAVCEN and NOCC of operational changes to the GPS satellite constellation which may impact civil use of the SPS.

Initial operations and coordination of these three organizations have been established. Plans are now being developed to provide capabilities that will serve all GPS users. Bringing these functions together will result in the establishment of a Joint GPS User Support Center.

### Summary

The Department of Transportation has established a network of personnel, links to Departments within the U.S. Government, and links to the international GPS user community in order to provide the best possible representation for the civil user. DOT is committed to supporting and representing the civil GPS user community.