

GPS OCX: Smart Thinking, From the Ground Up

Perhaps no other technological innovation has – and will continue to have – greater, more diverse applicability to a spectrum of military and civilian uses than the Global Positioning System (GPS). GPS is a global satellite-based, navigation and timing system enabling users to determine precise time and coordinates for their or another's location – from anywhere on the earth's surface to orbital space.

Originally developed for military purposes, GPS first proved its worth during Operation Desert Storm, fundamentally changing the very nature of warfare. GPS provided reliable navigation that empowered U.S. forces to effectively maneuver and fire with unprecedented accuracy on vast expanses of featureless desert, in sandstorms and at night, even when enemy troops familiar with the terrain could not.

GPS has fundamentally changed the ways in which we fight, work and play:

- > It determines the accuracy of nearly all military operations and weapons systems.
- > It provides a common, precise position and timing reference throughout our national security and economic infrastructure, including cellular communications, electrical power distribution, banking and finance, airspace management and emergency services.
- > It improves the quality of life and increases economic performance across a range of uses and applications. These include, but are hardly limited to, everything from in-vehicle navigation systems to search and rescue support.

Immediate Challenges Ahead

- > Transportation systems, such as air traffic control and interstate roadways, are antiquated and overburdened, costing Americans more than \$90 billion a year in lost time and more than \$3 billion in wasted fuel. The FAA's NextGen system deals with air traffic congestion and requires new GPS capabilities providing air traffic controllers and pilots with greater accuracy, safety and navigational integrity.
- > Today's military applications require a GPS control segment enabling effects-based operations, net-centricity, increased battle space awareness and reliable targeting support to evolving net-enabled weapons systems. These are features not currently available.
- > America's adversaries understand the asymmetric advantage of and our increased reliance on GPS. That they do is apparent in increased jamming, interference and cyber attacks we experience daily. (Last year, cyber raids on military networks alone were up 55 percent.) Simply put, any failure of GPS of any duration is unacceptable.



OCX: The Next-Generation GPS Control Segment Will Set New Standards for Reliability, Versatility and Utility

The need for a highly secure, extensible and maintainable GPS control system – one that truly assures GPS system viability and mission success for decades to come – is critical. The increasing complexity of GPS usage requirements and the more sophisticated GPS satellites, soon to launch, call for implementation of a new-generation of GPS Control Segment.

The new GPS OCX will have it all:

- > A robust, flexible, scalable infrastructure.
- > Support for net-centric capabilities, navigation warfare and effects-based operations with all the tools to increase operational efficiency.
- > New military signals -- M-code -- designed to further improve anti-jamming and secure access of the military GPS signal.
- > Additional civil signals (L2C, L5) providing navigational integrity, improved accuracy and increased availability.
- > Effective protections against cyber threats (Information Assurance).

All the Right Moves: Establishing a Separate Process and Program for Developing and Deploying GPS OCX

To achieve optimal results throughout the GPS program, the Air Force has separated the control segment contract from the satellite contract in order to more rapidly address challenging military and civil needs across the globe.

- > Establishing each segment as a separate contract allows better oversight, rapid integration of enhanced capabilities and ensures control segment improvements are available in time to support future GPS III launches.
- > OCX will dramatically expand and enhance GPS operations by integrating commercial best practices, enhanced automation and state-of-the art mission management, along with information assurance and integrity software.
- > Most importantly, OCX, hosted on a flexible service-oriented architecture (SOA) provides a broader menu of critical services to operational users today and tomorrow.



OCX: Your Solution to an Evolving Future

Development and deployment of GPS OCX, in tandem with the launch of new, modernized satellites, will safely and securely steward in a new age of improved and enhanced GPS capabilities and services, all designed to meet the changing demands of the navigation user community. In sum, the new GPS OCX system, in a very literal way, will break critical ground in the effort to launch the new age of military and civil position, navigation and timing for the 21st Century.

The immediate and near-term advantages of the new generation GPS OCX are calling. America's response must be to answer now.

(For more detailed information visit gps.losangeles.af.mil)