



GPS AND THE FUTURE OF TRANSPORTATION

**Remarks of
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**Institute of Navigation – GNSS 2004 Conference
Long Beach, CA
September 21, 2004**

I am grateful for the opportunity to participate in this important conference. It furnishes a special opportunity to speak to so many distinguished professionals from around the world. You are the ones who have made the Global Positioning System the great success that it is today. We all rely on it each and every day, whether it's in our cars, as airline passengers, or even hiking up a mountain miles away from home. That is why it is so important that we continue to improve this essential, worldwide utility. I want to talk to you this evening about the role that GPS can play in shaping a robust, state-of-the-art, 21st Century transportation infrastructure.

GPS in a Time of Change

As you all know, we are witnessing some important changes in the world of radionavigation. GPS, a system initially created by and for military users, now has a far larger population of civilian users – large sectors of commercial and leisure activity that rely on the system for an enormous array of day-to-day needs. GPS has succeeded in a way that Brad Parkinson and other founding fathers of the system – as visionary as they were – never could have imagined. It should be no surprise that it has spawned emulators -- most importantly from Europe in the form of Galileo. That's not a bad thing.

After years of uncertainty about whether the world would have another constellation of radionavigation satellites, the question appears to have been resolved in the affirmative. We will. As you know, the U.S. Government and the EU reached an agreement on signal structure earlier this year that will protect the needs of our military while helping to ensure that the civil signals transmitted by both GPS and Galileo will be compatible. The full implications of the

agreement will take a while to digest, but those of us who care about transportation are intrigued with the possibilities it creates. Think about how robust our civil radionavigation services will be with twice the number of satellites to work with.

These developments will also help those of us in government plan more effectively for GPS's future. I know you are aware of the attention GPS policy is getting in Washington right now. I can assure you that – more than ever before – government understands the broader significance of GPS to our national security and to a host of other public policy objectives. We are working hard to ensure that its benefits are fully realized across the board, and that U.S. GPS policy, henceforth, is as much a function of civilian equities as of national security exigencies.

Importance of GPS to Transportation

At the U.S. Department of Transportation, our mission is to ensure the availability of the safest, most efficient transportation system possible for travelers and shippers across all modes – on our highways, railways and transit lines, in our airspace, and at sea. We even worry about the integrity of America's vast system of pipelines, through which so much of our nation's energy supply flows each day.

To put a real face on the challenge, consider a few statistics:

- Roughly forty-three thousand people died on our nation's highways last year, and another 3 million were injured in preventable accidents;
- six billion gallons in excess fuel are consumed each year as the result of congestion on our highways¹;
- more than fifty-eight thousand flights have been delayed at O'Hare International Airport so far this year, with enormous costs to airlines, passengers, and our economy as a whole;
- right here in Long Beach there is a port complex through which passes each year not less than 40 percent of America's international commerce, and yet right now there are 24 ships at anchor beyond the breakwater simply sitting idle because there aren't enough berths to accommodate them. They will wait days to be unloaded.

These facts and figures underscore a new imperative that now permeates everything we do at DOT: We must exploit technology in every way we can to better manage our transportation system and improve its safety, its security, and its capacity. GPS is a technology that is – and will remain – absolutely vital to the transportation sector. For example, GPS technology in cars can help reduce the number of accidental lane crossovers on our highways – a major cause of injuries and fatalities. GPS and its augmentations will improve landing capabilities at both new and existing airports, easing the burden on our most congested hubs. Using GPS technology to track and forecast the movement of freight has helped make possible a logistical revolution that has made businesses far more efficient and cost-effective. Many transit systems across our

¹ Estimate provided by the Texas Transportation Institute.

country use GPS to better track their bus services and improve on-time performance. GPS also facilitates the rapid response of emergency vehicles to the scene of accidents by having the precise location coordinates via GPS and E911 phone technologies.

Clearly, this is just the beginning. I want to talk some more about these applications this evening, but the point I want to make now is that the promise of GPS technology for increasing safety and security, reducing congestion, and improving efficiency are limitless. Quite simply, GPS has become the enabling technology for transportation.

Creating the Next Generation Air Transportation System

Before I return to some of the applications I just mentioned, let me tell you about what may well be the biggest new idea to emerge from the Department of Transportation in a long time. I am talking about our Next Generation Air Transportation System initiative. Its goal is to accommodate what we know will be a huge surge in air traffic over the next 15 to 20 years.

Secretary Mineta launched the initiative back in January of this year. Rather than relying exclusively on our established program of making incremental improvements to the current air transportation system – a program that has delivered, and will continue to deliver, essential enhancements over the years – the Secretary said that we will begin to move in a much more aggressive way. The intention is to design and deploy, by 2025, an airspace management system with three times the capacity of our current system.

The EU, of course, has a similar idea. That means we will have to work closely together with Europe to ensure that whatever systems are developed can talk to one another. We both want efficiency, not duplication and unnecessary costs. The bottom line is that we want to promote growth, not gridlock, in our skies.

My expectation is that the new system will be a blend of legacy terrestrial and newer satellite-based technologies, with the latter category heavily tied to the positioning, navigation, and timing capabilities provided by GPS. Bolstering the functionality and integrity of these resources will be critical, which is why we continue to develop augmentations such as the Wide Area Augmentation System, which the FAA commissioned last year.

WAAS will eventually provide precision approach assistance to aircraft at thousands of runways, including at airports that cannot afford to employ other, more costly navigation aids such as the Instrument Landing System. The added safety and efficiency benefits of satellite navigation will enable more communities to be served by commercial air service, and therefore will help relieve congestion at the largest airports as more business and microjet aircraft are newly able to operate safely at other locations.

To plan the Next Generation system, the FAA has established a Joint Program and Development Office with participation by a number of other federal agencies. The JPDO is now working on a draft of an integrated National Plan that we will submit to Congress by mid-December of this year. A key focus of the plan will be to describe an end state that will ultimately provide safety,

efficiency, and security enhancements by blending technology applications that many of you are intimately familiar with, while also pursuing newer concepts like Network Enabled Operations.

Network Enabled Operations (NEO)

The concept of Network Enabled Operations is woven throughout our draft Next Generation plan. The NEO model is simple but powerful: take the fragmented air traffic information that is now available only to select users and make it much more accessible. NEO facilitates a much more efficient exchange of information among all users of the system. With network-enabled air traffic operations, both system users and air traffic managers will have a common operating picture, as well as a common timing and geospatial reference provided through GPS. That will improve collaborative decision-making and expedite operations. More timely and effective responses to unforeseen events – aviation weather and security threats, for example -- will be the most important result. Everyone will benefit.

The NEO features of the Next Generation air transportation system will capitalize, of course, on GPS. The use of satellites and enhanced flight deck technology will provide for increasing levels of aircraft autonomy. The very nature of the way we manage air traffic today – and certainly the information flow behind it – will be transformed forever, and GPS will have made that transformation possible.

Surface Transportation

Let me now come back to some of the surface transport applications I was discussing earlier. If WAAS is an augmentation that bolsters the functionality and integrity of GPS for aviation applications, our Nationwide Differential GPS (NDGPS) System delivers similar enhancements for the benefit of our surface modes.

NDGPS is expanding across our nation, and will provide improved positioning performance for our rail, highway and maritime users. It will be a key enabler for some very important future applications.

What are they?

Intelligent Transportation Systems. First, we have another Joint Program Office at DOT – one that runs our Intelligent Transportation Systems programs. It brings together the resources of several of DOT's component modal administrations while also taking advantage of significant support from stakeholders.

One of the most interesting programs within the Intelligent Transportation Systems realm is the Intelligent Vehicle Initiative. The IVI is a program that blends technologies, using GPS positioning combined with a wireless technology called Dedicated Short Range Communications, or DSRC, to create a smarter, safer automobile.

Last year I experienced, close up and personal, the remarkable potential of these technologies. I went out to the Federal Highway Administration's Turner-Fairbanks research facility in McLean,

Virginia, to review some advanced safety system prototypes that had been installed there. One of the most interesting of these demos was what is termed an “intelligent intersection,” where automobiles are able to communicate not only with various roadside sensors but with other vehicles as well. It left me convinced that with a strong commitment to developing and deploying these important new technologies, we can make tremendous strides in improving safety on our nation’s highways. We will have more effective systems for crash prevention, distress alerts and position notification, electronic mapping, and of course in-vehicle navigation with audible warnings for precise position determination.

I probably don’t have to tell you that safety is our top priority at DOT, and both President Bush and Secretary Mineta are strongly committed to reducing that forty-three thousand fatality figure that I mentioned at the outset. To do so, we have to ensure that programs like the IVI are given the support they need.

Automatic Identification System (AIS) for Vessel Traffic Control (VTC). GPS also plays an increasingly important role in our nation’s maritime transportation system. One system that is endorsed by the International Maritime Organization, and firmly supported by DOT and the U.S. Coast Guard, is the Automatic Identification System – or AIS – which is used for Vessel Traffic Control around busy seaways. This service is not only vital for navigation, but is being increasingly used to bolster the security of our ports and waterways by providing the Coast Guard and other governmental organizations with greater situational awareness of commercial vessels and their cargo.

AIS is basically a transponder system that operates in the VHF maritime band and is capable of communicating ship to ship as well as ship to shore, transmitting information relating to ship identification, geographic location, vessel type, and cargo information – all on a real-time, wholly automated basis. Because the ship’s GPS position is embedded in these transmissions, all essential information about vessel movements and contents can be uploaded automatically to electronic charts. The degree to which the safety and security of vessels traveling throughout these waters are enhanced by this system simply can’t be overstated. That’s why the U.S., the EU, and others collaborated so closely on getting the IMO to make AIS a global standard.

Radio Spectrum and President’s Spectrum Policy Initiative.

Finally, before I conclude, I would like to say a few words about spectrum policy. The availability of clean, reliable radio spectrum is a key element in facilitating the development, deployment, and integrity of all the technologies I have discussed here tonight. Spectrum, as you all know, is a scarce resource. It has become a highly valuable commodity in the modern, high-tech world of today. Without sufficient spectrum, we simply will not be able to realize the benefits of these technologies. That’s why we spend so much time and effort working with the Commerce Department’s National Telecommunications and Information Administration and the Federal Communications Commission -- to ensure that transportation technologies have the spectrum they need to succeed.

Over the past twelve months, I have represented DOT on an interagency task force created to make recommendations for inclusion in the President's Spectrum Policy Initiative. The report issued by that task force, called a "Spectrum Policy for the 21st Century," was released in June.

Given the challenges involved in balancing the need to protect federal spectrum with the President's desire to promote new technology in the private sector, the discussions were always interesting – sometimes even tense. In the end, however, we developed a set of recommendations that I believe will help to unlock the economic value and entrepreneurial potential of U.S. spectrum assets while ensuring that sufficient spectrum remains available to support vital government missions – including safety-of-life missions. These recommendations reflect a good balance among national security, public safety and economic needs, while giving us new tools to resolve the national policy debates that can arise from time-to-time over spectrum management.

Conclusion

Let me be clear. Using GPS and other new technologies to transform major parts of the transportation system will not be easy, but the long-term benefits – especially in relation to future economic growth – make it critical that we succeed. We have a mantra at DOT, and I'm sure you have all heard it. It is that "Transportation is the engine of economic growth." A safe, secure, and efficient system is absolutely essential to keeping our communities, and our Nation, prosperous.

Your many contributions to GPS and other navigation systems have helped DOT and our partner agencies to pursue a wide range of important improvements to transportation infrastructure, and for that we are very grateful. It's not too much to say that, without GPS and related technologies, our transportation system would not be in a position to support our economic growth over the long term.

My sincere thanks for all of that. And thank you again for inviting me to speak here tonight. I look forward to answering any questions you may have.

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