**REMARKS FOR**
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I'm pleased to have the opportunity to be here in Tampa and say a few words about the unquantifiable value of the space-based PNT services offered by GPS and why protecting those capabilities—and planning for the future of PNT—is one of the most important challenges this nation will face in the decades ahead.

Flying into Tampa yesterday evening, I began think about the ubiquity of GPS data and how a service which is so important in so many ways, essentially looks the same regardless of whether it's used by an aircraft navigation system or the smartphone in my pocket.

GPS doesn't differentiate between guiding an aircraft and guiding Greg Winfree to the Tampa Convention Center.

And then I thought about how this egalitarian utility belies the technical complexity of GPS and the challenges presented by a satellite-based system—if something breaks, we can't just take a quick trip to space to fix it.

Now, Cape Canaveral is only 130 miles east, but it's hard to connect the dots between the GPS service used by my phone and what it took to get the system operational.

This is the irony of space-based PNT: we count on GPS services to find, to observe….to orient ourselves or something else when our own abilities are too limited. GPS is the technological cornerstone of situational awareness in the 21st Century, yet it only makes its presence known indirectly—through the applications and services enabled by it.

Situational awareness—the ability to process information about the world relative to the moment and make good decisions, quickly—is almost as old as life itself…if counting it's prehistoric, rudimentary form.

At its most fundamental level, situational awareness is about place and time; knowing where you are now, where you need to go and the best way to do it. For man and animal, the capacity for situational awareness is most critical when the timeframe for decision-making is measured in seconds.

Obviously, the role of situational awareness has evolved with us—today it's something we need to catch a bus during rush hour, or find our way back to the camp site, rather than avoid becoming the next meal of Paleolithic super-predator. But just because human situational awareness is far less dependent on adrenalin doesn't diminish its value in the modern world; in fact, the role of situational awareness has expanded so far beyond survival that the responsibility is often delegated.

Today, we rely on our own situational awareness and augment our biological capacity with technology—and PNT systems give us an unprecedented ability to obtain and process that all-important information about place and time. This is why the demand for PNT services has made this nation's constellation of GPS satellites the most important PNT system in the world…and omnipresent across industries, institutions and consumer products.

Countless devices and applications in the 21st Century are built around the foundational ability to continuously access and communicate precision data about position, direction and speed.

At the U.S. Department of Transportation, major initiatives that have the potential to make transportation safer and more efficient are built around GPS-enabled capabilities, for example:

- Intelligent Transportation Systems applications like connected vehicles are based on time-critical, precision data about motor vehicle position, direction and speed;
- Positive Train Control technology uses GPS data to activate signals that alert motorists and pedestrians that an oncoming train is approaching a rail-grade crossing;
- NextGen aviation and traffic control systems, which use GPS to vastly improve performance, enabling shorter routes and increased time and fuel savings, are being implemented around the world;
- Real-time travel information for transit services and multi-modal system management;
- Maritime surveillance programs use GPS to track ship movements in our waterways and at our ports.

As the lead federal agency for civil GPS users, the U.S. Department of Transportation has a huge responsibility to represent the myriad of GPS applications, ranging from navigation services, operations of first responders, search and rescue, weather forecasting, earthquake monitoring, surveying and mapping, precision agriculture, and financial transactions, to name a few.

The bottom line is:

- Businesses depend on GPS to manage their supply chain and logistics.
- Public agencies rely on GPS to improve essential services and keep track of their assets under tight budgets.
- Emergency responders need GPS to get help to someone who needs assistance as fast as possible.
- And people have made GPS-based convenience services like geolocation and navigation almost indispensable.

GPS is practically encoded in the DNA of the modern world. Which brings us back to situational awareness—how we use situational awareness continues to expand, because how we live and do business has rapidly evolved in the new millennium.

The world is becoming more and more data-driven; the ability to utilize technology to turn this growing wave of data into actionable information has shifted from novel to necessity. And the resulting democratization of data-driven devices and applications has made the data-wave swell into a tsunami.

This presents as many challenges as it does opportunities for the United States and especially for the future of the nation's transportation system.

Situational awareness is the central capability underpinning the Intelligent Transportation Systems idea—using real-time system data and wireless communications to make transportation more responsive and dynamic to changing conditions.

Intelligent Transportation Systems scale situational awareness up to a level where traffic and transit management operations are adjusted in real-time, or down to the level of a bike-share customer's mobile device, alerting vehicles as they cross an intersection.

Our ITS program is engaged in cooperative, multi-modal research to develop and implement applications and systems that use GPS, broadband wireless communications, remote sensing technology, real-time data and other innovations to improve transportation safety, efficiency and management.

The ability to communicate and process precision data about position, speed and direction is at the heart of almost every ITS application—and is absolutely essential to the life-saving potential of state-of-the-art vehicle-based safety systems advanced by the Department's connected vehicle program.

Although we've made great strides in reducing the number of deaths on our roadways, threats like distracted driving and shifting travel demands could undermine the progress we've made.

Passive safety measures like safety belts and airbags, in tandem with safety standards and laws, have been crucial to this trend over last four decades—but improving survivability is a limited solution based on limited situational awareness.

The roadway safety issue is as dynamic as the human individual.

If someone behind the wheel is focused, responsible and doing everything right…someone else may not be; or an unexpected, vicious rainstorm makes everything outside a 20 foot radius an uncertainty. This is why the United States needs connected vehicle technology in our new vehicle fleets and on the roads and in the infrastructure of our cities and communities.

Connected vehicles use proven technology to enable motor vehicles, roadside infrastructure and mobile devices to securely and anonymously share critical real-time data and are the culmination of years of cooperative research by the Department, industry and the academic community. This technology offers capabilities far beyond safety belts and air bags by helping vehicle operators avoid crashes via innovative safety features, such as collision-warning applications, which use vehicle-to-vehicle and vehicle-to-infrastructure communications.

What truly makes connected vehicles a game-changing technology for transportation agencies and businesses across the country is that it supports the development of applications designed for specific problems and needs.

So, while the core collision warning capabilities remain effective whether a car or motorcycle is traveling through the District of Columbia, or along Interstate 4 on a trip from Tampa to Cape Canaveral, the data communicated to the vehicle can be designed around the specific threats unique to a locality or region.

This ability to allow applications to be developed for a specific benefit, rather than around a single capability, allows connected vehicles to support innovation and has huge implications for vehicle automation.

Connected vehicles use GPS and other advanced technologies to make drivers, pedestrians and other road users more situationally aware regardless of the weather or line of sight.

In August of 2014, the National Highway Traffic Safety Administration (NHTSA) gave connected vehicle safety technology the green light and is working on a regulatory rulemaking that will require the technology to be installed in all new light vehicles in the coming years.

In May, Transportation Secretary Foxx announced the USDOT would accelerate the deployment of connected vehicles and NHTSA is expected to issue the rule before the end of the year. Secretary Foxx also asked NHTSA to begin work aimed at ensuring our regulatory framework encourages the deployment of innovations demonstrated to increase traffic safety.

As the Department works with automakers and other industry partners to develop an implementation framework for interoperable connected vehicle technology, there will be opportunities ahead to apply what is learned from this process to automated vehicles.

The nation needs to be prepared for the next 20 years, not just the next 10—and if connected vehicle technology is the product of innovation today, then automated and autonomous vehicles are the products of tomorrow. The potential benefits of automated and autonomous vehicles—for transportation usage and management—are why innovators are pursuing the development and commercialization of the technology and why it presents significant policy challenges.

Connected vehicle technologies are fundamental to making automation applications like driverless cars as safe and efficient as possible—on a timeline that reflects current advancements in automation. *Connected automation* enables autonomous and automated vehicles to be safely integrated into the transportation system, because all these vehicles will be communicating data about position, heading and speed using a common language on a single, secure network.

A key part of our strategy is to facilitate opportunities for the private sector to develop connected vehicle applications for proof-of-concept demonstrations under real-world conditions and support cities and communities that step forward to participate as early adopters.

The Connected Vehicle Pilots initiative was launched to encourage industry innovators and communities across the nation to cooperatively develop and test connected vehicle applications that utilize vehicle-to-vehicle and vehicle-to-infrastructure communications.

And I'm pleased to announce that three sites have been selected for this first phase of the Connected Vehicle Pilots initiative. Just yesterday, Secretary Foxx announced awards to sites in:

- New York City, which will now be home to the world's largest demonstration of vehicle-to-vehicle and vehicle-to-infrastructure technology.
- Along I-25 in Wyoming, to improve rural freight movements.
- And right here in Tampa, to address its mobility challenges, including by installing connected technologies on the streetcars.

The connected vehicle program has been successful in no small part due to efforts like the Pilots initiative to share knowledge and lay the groundwork for a new technology that can save lives and make transportation better for all Americans.

The long-term success of any effort to turn promising research into an implementable commercial technology, hinges upon the institutional and technical framework around it. This means mitigating risk for industry and the consumer by helping facilitate a commercial environment that is competitive, fair and capable of maximizing the benefits while promoting further innovation in transportation.

This approach is applicable to the effort to protect space-based PNT services and determine how to ensure the long-term health and resiliency of the system and services. However, doing everything within our power to ensure our GPS system can meet the demands of today and tomorrow is not just about this country.

The world depends on our constellation of GPS satellites and the capabilities they provide—the possibility of a significant disruption in the services we rely on today, without a viable alternative, could have far reaching consequences. As the most reliable and widely used space-based PNT system in the world, GPS must continue to serve as a trusted service-provider and public good and I have great confidence that our partners at Air Force will continue their excellent stewardship of the system.

However, we have to anticipate the problems created by events beyond our control, such as Coronal Mass Ejections, as well as intentional signal jamming and spoofing and be prepared to respond. We must continue to engage PNT stakeholders like you and find areas of common ground that allow us to work together to find the best solutions, recognizing that resiliency cannot be a single solution, given the diversity of space-based PNT applications.

Earlier this month the National Space-Based PNT Executive Committee met and they certainly take the need for a backup or complement to GPS very seriously and are working on next steps that can support critical PNT capabilities during a disruption of GPS services. And in the last week, the Draft GPS Adjacent Band Compatibility Assessment Test Plan was posted in the Federal Register—the Department is seeking public comment by October 9th.

The objective of these tests are to collect data to determine Interference Tolerance Masks for categories of GPS and GNSS receivers processing signals in the 1559-1610 MHz RNSS frequency band.

The Department is holding a workshop on the test plan on October 2—and I encourage you to take advantage of the opportunity to learn more about the proposed plan and provide your input.

The reality is that the demand for use of GPS and GNSS is only going to grow. Therefore, policies and regulatory actions that affect use of spectrum for space-based PNT and other technologies must be guided by science—by data and research.

In closing, I appreciate your participation in the Civil GPS Service Interface Committee meeting and encourage you to take advantage of the opportunities today and in the future to provide input on GPS modernization, the future of the Nationwide Differential GPS System, the GPS Adjacent Band Compatibility Assessment, and Complementary PNT.

I also look forward to the presentations today and having the opportunity to meet many of during the breaks.

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