STATEMENT OF

CAPTAIN SEAN P. CASSIDY

FIRST VICE PRESIDENT

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, DC

FEBRUARY 8, 2012

"A Review of Issues Associated With Protecting And Improving Our Nation's Aviation Satellite-Based Global Positioning System (GPS) Infrastructure"

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ON
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Good morning, Mr. Chairman and members of the Subcommittee. I am Captain Sean Cassidy, First Vice President and National Safety Coordinator of the Air Line Pilots Association, International (ALPA). ALPA represents over 53,000 pilots who fly for 37 passenger and all-cargo airlines in the United States and Canada. On behalf of our members, I want to thank you for the opportunity to provide our perspectives on the role of the Global Positioning System (GPS) in the aviation infrastructure. We applaud the Subcommittee for bringing attention to the need for protecting this critically important national safety and security resource.

For the past 15 years, GPS has been an integral component of the aviation infrastructure. GPS was originally developed by the Department of Defense (DOD) in the 1970's as an advanced navigation system for the delivery of high-precision weapons. Following the shoot-down of Korean Air Lines Flight 007 in 1983, which was due to a positioning error that allowed the airliner to stray into then-Soviet airspace, President Ronald Reagan issued a directive making the system available to the public at no cost.

GPS has evolved from a simple aid to navigation worldwide on land, sea, and air, to become a critical technology that has led to significant safety improvements in a wide range of activities. In aviation, GPS is now used to ensure pin point navigation. It is an essential component of the system that has provided the safest form of transportation in human history - and it is critical in safely operating around areas such as our nation's capital. Its broad uses include map-making, land surveying, product manufacturing, agriculture, commercial shipping and recreational boating, and construction. GPS also provides a precise time reference used in many applications including scientific study of earthquakes and synchronization of telecommunications networks for banking. The 911 system is critically dependent on GPS signals from cell phones and transponders so that first responders can more quickly respond to emergencies.

Early Government/Industry GPS Activities

Although GPS had originally been developed for use on military aircraft, the civilian aviation community quickly recognized the potential for GPS applications to that sector. The FAA requested that RTCA, Inc. develop standards for civil GPS equipment to ensure commonality across platforms and therefore commercial viability. RTCA is a private, not-for-profit corporation that develops standards and provides recommendations to the Federal Aviation Administration (FAA) on communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. RTCA functions as a Federal Advisory Committee with the participation of government and industry.

Two RTCA groups involved in GPS issues are noteworthy: RTCA Special Committee 159 (SC-159) and RTCA Task Force 1. Since SC-159's first meeting in March 1985, there have been 87 meetings of the committee and hundreds more of its working groups. Industry and government subject matter experts have literally contributed hundreds of thousands of hours in this effort, and the countless working papers, studies, and evaluations of these experts have yielded 16 comprehensive standards documents from 1988 to the present. Less than one year ago, Working Group 6 of SC-159 published an assessment of LightSquared's proposed use of spectrum adjacent to the GPS frequency spectrum for terrestrial communications. The assessment, which found that the LightSquared proposal would compromise the integrity of GPS signals, served as the aviation community's input to the Federal Communications Commission's (FCC) requirement for a joint LightSquared/industry Technical Working Group.

RTCA Task Force 1 published a report in 1992 on the transition and implementation of GPS. The Task Force concluded that as there were no institutional issues that would preclude implementation of GPS, it should be adopted in an expeditious manner. The report also emphasized the transition should be user driven and evolutionary.

Summary:

- Civil aviation community has been involved with developing GPS equipment standards since 1985
- Civil aviation community has achieved commonality across platforms and commercial viability
- There were no institutional issues to preclude a user–driven, evolutionary, and expeditious implementation of GPS.

GPS Evolves into the Cornerstone of Aviation Infrastructure

I would like to provide four examples of how GPS has become a cornerstone of the aviation infrastructure. These examples cover various areas of flight and include oceanic routes, operations into remote areas, major metropolitan airport complexes, and parallel approaches into busy airports.

GPS equipment has been installed on commercial air carrier aircraft since 1994. Long-range aircraft operating over oceanic routes used GPS as an aid for improving navigation and shortening routes. Before the introduction of GPS for oceanic navigation, aircraft were required to be separated by 20 minutes or approximately 160 nautical miles (NMs) in trail. The oceanic routes were at least 120 NMs apart. These separation standards limited the number of aircraft that could fly the routes at any given time. In addition, the lack of radar and communications capabilities in oceanic areas often meant that aircraft had to fly at less-than-optimum altitudes to avoid conflicting with each other's paths.

Areas like the North Atlantic routes between Europe and North America, and the Pacific routes between North America and Australia/New Zealand were the first areas to use GPS. The use of GPS, combined with satellite communications and automatic position reporting equipment developed for use on the aircraft, allowed air traffic control to have a more accurate position on each aircraft and, therefore, reduce separation on oceanic routes and thus increasing capacity on those routes.

The use of GPS for reducing aircraft separation began in the largest controlled airspace in the world. Together the U.S., Australia, and New Zealand provide air traffic control services to over 23 million square miles of airspace in the Pacific. In 2005, air traffic control providers used this technology to safely reduce the separation between GPS-equipped aircraft to 30 NM in-trail separation and 30 NM separation between routes. The new separation standard now only requires the controller to "protect" – meaning they ensure that no other aircraft encroach on any given aircraft's protected space—only 6% of the airspace previously protected. The net result is safely increased airspace capacity and route flexibility which in turn leads to more efficient routes, substantially decreased fuel burn per flight, and decreased CO2 emissions.

Summary:

- In oceanic routes, precise GPS navigation equipment allows aircraft to fly more efficient routes at optimum altitudes
- GPS has increased capacity of oceanic routes in Atlantic and Pacific
- GPS provides for a safer operation that allows aircraft to fly more efficient routes, substantially decreases fuel burn per flight, and decreases CO2 emissions.

GPS Use in Remote Areas

GPS has also been beneficial to communities in remote areas like Alaska. Very few of the towns and villages in Alaska currently have roads between themselves, much less to the outside world. Consequently, boats or dogsleds were the only way to provide supplies to these communities before air travel. Since the birth of aviation, airplanes have quite literally become the lifeline to these communities.

At over 4 times the land area of California, not only is Alaska massively big, but its desolate terrain and hostile weather have meant that aircraft operations there are subject to significantly

more hazards than those in the rest of the United States. At most airports, ground-based navigational aids have either been limited or unavailable due to terrain, and they are often extremely expensive to maintain. This meant that many of the air carrier flights often had to be cancelled for weather or due to ground equipment being out of service. In that region, air carrier flights are not simply a convenient form of transportation; due to the fact that they are often the only means of connecting a population center with critical services, cancellations of flights have a major impact on public safety.

One of the first airports in Alaska, and in fact the world, with a GPS-based instrument approach was the capital of Alaska, Juneau. Before the advent of GPS, the limited accuracy of conventional navigational aids available combined with very closely situated mountainous terrain dictated that the arrival procedures needed to have high weather minima, meaning that even with instrument flight systems in place, relatively high ceilings and visibility were still necessary to fly there safely. This operating environment, compounded by notoriously dramatic weather swings, limited the number of days the airport could operate. Consequently, a large percentage of flights were cancelled into the state capital-- a city where the longest road only spans 40 miles.

In 1996, ALPA pilots flying for Alaska Airlines pioneered GPS-based procedures, using a concept called Required Navigation Performance or RNP approaches, into Juneau. RNP technology provides computer-generated landing paths with pinpoint accuracy by using a combination of onboard navigation technology and the GPS satellite network. The RNP arrival route for runway 26 descends below the level of surrounding mountains as it takes the airplane down the narrow Gastineau Channel. The precision nature of the RNP approach allows the aircraft to remain over the center of the channel and away from the high terrain nearby. Due to GPS-based RNP technology, the pilot is able to gradually descend and place the aircraft in a position to be safely aligned with the runway. In the case of a missed approach or go-around, the flight crew is still able to safely maneuver the aircraft clear of the terrain- again using RNP guidance. The net result is that it allows aircraft to fly safer, more reliable approaches, and reduces reliance on ground-based navigation aids.

Since the initial RNP operations at Juneau, Alaska Airlines has expanded the use of RNP for operations into other airports in Alaska, Hawaii and the Continental U.S. They have developed and received operational approval from the FAA for over 80 different RNP procedures. In terms of measurable results, in 2011 alone, out of the over 6,300 flights Alaska Airlines operated , more than 1,500 of those flights would have likely resulted in a cancellation or divert but for the benefits of RNP technology. The resulting savings for the company was over $19 million in revenue and 210,000 fewer gallons of fuel burned.

These are significant savings for just one airline for just one year, but that is only one part of the story. Due to GPS technology, many communities now have services that simply would not been possible without those capabilities. ALPA has had a front row seat on the development of these procedures and a unique appreciation for the potential of this technology since our pilots

flying for Alaska Airlines fly into those communities daily using this technology, and have witnessed the benefits firsthand.

Although the previous example of GPS benefits is a compelling one, to suggest that Alaska Airlines and the State of Alaska are the only beneficiaries would be a mistake. Here are two notable examples of benefits in the Lower 48: Palm Springs, CA and Reagan National Airport. Like many of the Alaskan airports, Palm Springs is in an area with very challenging terrain. RNP procedures now allow aircraft to maneuver well clear of the high terrain which is located very close to the airport. At Reagan National, RNP-guided approaches reduce the number of flights delayed, diverted or canceled due to poor weather conditions. The technology also supports noise abatement efforts by allowing more aircraft to fly the preferred approach directly above the Potomac River instead of above nearby residential neighborhoods. And very importantly, RNP provides the ability to overfly extremely precise navigation points - a critical safety and security need for operating so closely to restricted airspace surrounding the nation's capital.

Our FAA partners have been working to develop and expand GPS-based approaches, departures and arrivals around the country. As of the end of 2011, the FAA has published 11,541 GPS-based instrument approach procedures. This is in addition to the 6,675 ground-based conventional approaches. Many of these GPS-based approaches are for airports without conventional approaches to runway ends. This provides a means for airliners to access airports with a far greater level of safety than previously available.

Summary:

- GPS provides computer-generated landing paths with pinpoint accuracy by using a combination of onboard navigation technology and the GPS satellite network
- It allows aircraft to fly safer, more reliable landings, and reduces reliance on ground-based navigation aids
- Results in significant annual savings in operational costs
- Majority of instrument procedures being developed and published are now GPS-based

Metroplex

In 2010, following the recommendations of the aviation community to RTCA, the FAA created an initiative called the Optimization of the Airspace and Procedures in the Metroplex (OAPM).

A metroplex is a geographic area covering several airports, serving major metropolitan areas and a diversity of aviation stakeholders. Congestion, airport activity in close geographical proximity, and other limiting factors such as environmental constraints combine to reduce efficiency in busy metroplexes. A total of 29 metroplexes, situated around the FAA's Core 30 airports, were selected as candidates. Core 30 airports are those with significant activity serving major metropolitan areas and also serve as hubs for airline operations. Whenever possible, closely associated metroplexes were combined. In addition, metroplexes with on-going

airspace redesigns like Chicago and New York were eliminated. The result was a final group of 21 metroplexes that were chosen for the OAPM process.

OAPM is an optimization of the airspace through analysis and provides solutions to these issues on a regional scale, rather than focusing on a single airport or set of procedures. It takes into account all airports and airspace that support metropolitan area operations, including connectivity with other metroplexes. The process considers a myriad of factors including safety, efficiency, capacity, access, and environmental considerations.

Based on feedback from major industry stakeholders, it was decided that a collaborative government/ industry approach for optimization using Performance Based Navigation (PBN), e.g., GPS-based procedures, combined with airspace redesign, would deliver the most efficient operation and benefits to the selected metroplex. Their primary task involves analyzing operational challenges in their regions, assessing planned and potential new solutions and making recommendations for advancement by the design and implementation teams. This collaborative approach has been successful in aligning airline and air traffic control priorities and requirements. The airlines have also contributed pilots and flight simulation resources to ensure that the proposed procedures are operationally flyable and to help derive the benefits from the proposed procedures.

Arrivals and departures into and out of metroplexes extend for hundreds of miles outside of the metroplex airspace and allow air traffic control to coordinate the flow of aircraft from many directions into areas that frequently have multiple large, busy airports. Currently, conventional arrivals and departures are often limited to a single line of aircraft. Weather, slower aircraft, and traffic flow restrictions then compound the challenge for air traffic control to meet the capacity of the airport. In addition, conventional arrivals and departures were designed based only on the major arrival airport and did not consider the dynamic relationship of other airports or metroplexes. The result was that other airports in the metroplex, e.g., Dallas-Ft Worth, Houston, Atlanta, and Charlotte often had conflicting arrival and departure traffic patterns.

GPS is extremely beneficial in JFK just as it is in Juneau. One of the major tools for OAPM is the use of GPS-based arrivals and departures, because these GPS aided procedures have several advantages over the existing conventional ground-based arrivals and departures. Using historical radar data from previous years, the arrival and departure routes can be designed to follow the historical flight tracks. When required, dual flight tracks can be used to funnel multiple streams of aircraft into or out of the metroplex. These dual tracks often allow flight tracks to be shortened thus reducing fuel burn, noise, and CO2 emissions. Whenever possible, descents are based on idle thrust with a minimum of level-offs. This results in a smoother flow and reduced workload for both pilots and controllers.

The OAPM process is moving rapidly. Currently, OAPM has completed several study and design reports for Washington, D.C., North Texas (Dallas-Ft Worth), Charlotte, Northern California, Southern California, and Houston. A Study and Design Team is currently

completing reports at Atlanta. Design and Implementation teams are now underway at Washington DC, North Texas, and Houston.

Let me highlight some additional information about the Houston OAPM to illustrate the advantages. Houston is of significant interest to our members since it is a major hub for several airlines.

The Design and Implementation portion of the Houston OAPM has drawn the attention of the White House and is one of the 14 national infrastructure projects tracked on the President's Federal Infrastructure Dashboard. Based on studies already performed for Houston OAPM, this initiative will translate to an estimated annual savings of up to 6.9 million gallons of jet fuel, equivalent to nearly 21 million dollars at the current fuel cost. Carbon emissions are expected to be reduced by up to 71,000 metric tons-a significant reduction in greenhouse gas emissions by any measure. Additional savings in delay hours and other benefits will continue to be calculated based on the results of the project as more data comes in

All revised arrival and departure procedures must still comply with existing FAA standards, criteria and requirements, and with requirements for environmental reviews. New arrival and departure procedures must also comply with internal FAA approvals as well as review under the National Environmental Policy Act (NEPA). FAA is using an Environmental Management System (EMS) approach to tightly integrate the NEPA reviews into FAA's internal approval process, which will expedite this project. Studying the impacts of the new procedures also will lead to NextGen procedural improvement on future projects. FAA also has developed a NextGen NEPA Plan to help ensure timely, effective, and efficient environmental reviews of proposed NextGen improvements. As part of this plan, the FAA will use a focused Environmental Assessment (EA) approach to yield more concise and timely environmental reviews for proposed FAA actions. All these measures will demonstrate responsible yet streamlined environmental processing for future NextGen procedural improvements.

A typical OAPM project undergoes a development life-cycle of about 3 years from study to implementation. As part of an initiative to expedite reviews of new NextGen enabled procedures, the FAA will further hasten implementation of new, more efficient routes for airports in the Houston area. This new, accelerated process can bring benefits to the Houston metroplex in about 24 months. If this expedited process can be used at the other metroplexes, the result will obviously be expedited savings. Without GPS, these savings will not be possible.

Summary:

- Metroplexes are geographic areas covering several airports, serving major metropolitan areas and a diversity of aviation stakeholders
- Core 30 airports are those with significant activity serving major metropolitan areas and also serve as hubs for airline operations
- OAPM - Optimization of the airspace through analysis and provides solutions to these issues on a regional scale, rather than focusing on a single airport or set of procedures

- OAPM allows dual flight tracks to funnel multiple streams of aircraft into or out of the metroplex
- OAPM allows flight tracks to be shortened, thus reducing fuel burn, noise, and CO2 emissions.
- Descents are based on idle thrust with a minimum of level-offs resulting in a smoother flow and reduced workload for both pilots and controllers
- Houston OAPM is one of the 14 national infrastructure projects tracked on the President's Federal Infrastructure Dashboard
- Houston OAPM uses an expedited environmental assessment process to reduce implementation time from about 36 months to 24 months

Parallel Approaches into Airports

On January 18, 2012, the FAA began allowing the simultaneous use of GPS-based approaches on parallel runways. Without the use of these more accurate technology enhanced procedures, aircraft on parallel paths flying traditional ground based Instrument Landing System or ILS approaches had to be 'staggered' to account for the possibility that the aircraft with the less-accurate navigation capability might stray into the other's protected airspace. With the added accuracy of GPS, aircraft will not have to be sequenced in such a manner, thus increasing the arrival rate. Additionally, aircraft will no longer be restricted from simultaneous operations when an instrument landing system is unavailable on a parallel runway.

Although FAA policy has been slow to change, this policy is a major step forward because it recognizes the well-established benefits of this technology. The simple fact is that GPS-based approaches have long had the capability to allow suitably equipped aircraft to operate safely in proximity to ILS equipped aircraft.

This policy is especially important in light of the announcement of the FAA's Notice of Proposed Policy, published in the Federal Register December 15, 2011. The Proposed Policy, titled "Proposed Provision of Navigation Services for the Next Generation Air Transportation System (NextGen) Transition to Performance-Based Navigation (PBN)" details the FAA's plans to transition from defining airways, routes and procedures using VHF Omni-directional Range (VOR) and other legacy navigation aids towards a NAS that is based on more accurate navigation capability enabled largely by the Global Positioning System (GPS) and further refined by the Wide Area Augmentation System (WAAS). The FAA plans to retain an optimized network of Distance Measuring Equipment (DME) stations and a minimum operational network (MON) of VOR stations to ensure safety and continuous operations for high- and low-altitude en route airspace over the contiguous U.S. (CONUS) and terminal operations at the Core 30 airports. The FAA is also conducting research on Alternate Positioning, Navigation and Timing (APNT) solutions that would enable further reduction of VORs below the MON.

Since VORs do not support or enable more modern GPS-oriented navigation capability, including the emerging Automatic Dependent Surveillance-Broadcast (ADS-B) operations, the FAA plans to reduce costs by drawing down the number of FAA-provided VORs. Currently, over 80% of the 967 VORs in the NAS inventory are past their economic service life and cost the FAA more than $110M per year to operate. Likewise, replacement parts are becoming increasingly difficult to obtain. The replacement of all of the VORs would cost over $1.0 billion. Therefore, the FAA is planning a gradual discontinuance (i.e., removal from service) of VOR facilities in the continental U.S. down to the MON.

The MON would enable non-GPS equipped aircraft anywhere in the CONUS to proceed safely to a destination with a GPS-independent approach within 100 nm. MON coverage is planned to be provided at altitudes above 5,000 feet above ground level (AGL). The FAA would also retain VORs to support international arrival airways from the Atlantic, Pacific, Caribbean, and at the Core 30 airports. The existing U.S. legacy navigation aids outside the continental U.S. will be retained until a longer-term solution can be coordinated with users. The drawdown of VORs to a MON would be completed no later than January 1, 2020. Existing ILSs would provide an alternative approach and landing capability in support of recovery and dispatch of aircraft during GPS outages. ILSs would provide the precision approach and landing segment for APNT.

As the number of VORs is decreased to the level of the MON, more routes will be developed that are based solely on GPS. Known as Q-Routes, several of these routes are already in use in the Western U.S. as well as in the Gulf of Mexico. Aircraft can now fly from central Florida to Louisiana and Texas, navigating accurately beyond the range of land-based navigation aids and avoiding the military warning areas in the Gulf. Before Q-routes, most aircraft were required to fly overland, resulting in increases in miles traveled, fuel, and time.

Summary:

- With the added accuracy of GPS, aircraft on parallel runways may operate independently from each other, increasing the arrival rate
- New FAA policy is a major step forward and will result in increased capacity.
- FAA is proposing a reduction in ground-based navigational aids infrastructure
- As the ground-based navigational aids infrastructure is decreased, more routes will be developed based solely on GPS

GPS and the Future

GPS-based navigation applications are not the only aviation use for GPS. Within the next 10 years, GPS will also be used for surveillance applications – both air-air and air-ground. Surveillance is the term generally used to mean the air traffic controllers' ability to "see" and therefore accurately control, aircraft in the air or even on the ground. The FAA is fielding an Automatic Dependent Surveillance– Broadcast (ADS-B) ground-system as a supplement for

radar surveillance. GPS alone—that is, without supplemental means to augment its accuracy—is capable of providing the accuracy and integrity required by the FAA's ADS-B Out regulations that have a compliance date of January 1, 2020. The FAA is looking at ADS-B as the eventual replacement for most radar surveillance in the U.S.

The tentative approval by the Federal Communications Commission (FCC) for LightSquared to use frequencies adjacent to the GPS band for terrestrial communications was a wake-up call for the GPS community. The results of testing by government agencies and industry concluded that the LightSquared proposal would significantly interfere with GPS operations and signals.

On December 20, 2011, LightSquared filed a request for a Declaratory Ruling to "resolve the regulatory status" of commercial GPS receivers. LightSquared requests specific declarations designed to establish that commercial GPS devices are not entitled to interference protection from LightSquared's operations, so long as LightSquared operates within the technical parameters prescribed by rule and Commission Order. The FCC has requested comments from the public on the petition. The FCC stated that the Interference-Resolution Process, contained FCC's Conditional Waiver Order, IB Docket No.11-109, has not been completed and is still the most appropriate forum for considering LightSquared petition

On December 23, 2011, Congress enacted the 2012 general Government Appropriations Act. The Act prohibits the FCC from using any funds made available by the Act "to remove the conditions imposed on commercial terrestrial operations in the Order and Authorization adopted by the Commission on January 26, 2011 (DA 11-133) [i.e., the Conditional Waiver Order], or otherwise permit such operations, until the Commission has resolved concerns of potential widespread harmful interference by such commercial terrestrial operations to commercially available Global Positioning System devices."

On January 13, 2012 the National Executive Committee (EXCOM) for Space-based Positioning, Navigation, and Timing sent a memo to Assistant Secretary for Communications and Information, Department of Commerce, Lawrence Strickling. The EXCOM Co-chairs, Deputy Secretary of Defense Ashton Carter and Deputy Secretary of Transportation John Porcari stated:

> "It is the unanimous conclusion of the test findings by the National Space-Based PNT EXCOM Agencies that both LightSquared's original and modified plans for its proposed mobile network would cause harmful interference to many GPS receivers. Additionally, an analysis by the Federal Aviation Administration (FAA) has concluded that the LightSquared proposals are not compatible with several GPS-dependent aircraft safety-of-flight systems. Based upon this testing and analysis, there appear to be no practical solutions or mitigations that would permit the LightSquared broadband service, as proposed, to operate in the next few months or years without significantly interfering with GPS."

ALPA believes that the LightSquared's request for a Declaratory Ruling should be denied based on the results of the vast number of tests conducted by the government and industry confirming the potential negative impact to established GPS operations. LightSquared has been either a participant or observer in the testing. As we discussed earlier, the civil aviation community has been developing equipment standards since 1985. These standards have been evaluated and adopted worldwide and long preceded the FCC's rules and LightSquared's request.

Even if LightSquared's proposal is ultimately disallowed, the issue of interference is still significant. The FAA plans to purchase portable interference monitoring-detection systems to help officials in its spectrum engineering services directorate track down and shut down illegal GPS jammer activity. Personal privacy devices, more commonly referred to as GPS jammers, being used on a highway near the Newark International airport, derailed the rollout of a GPS-based instrument landing system at the airport in late 2009. Continental Airlines at the time had equipped a portion of its fleet with avionics to use ground-based augmentation system (GBAS) approaches. After several years of analysis and radio frequency interference (RFI) upgrades to the Honeywell-built ground equipment, United-Continental and the FAA are once again preparing to begin testing GBAS both at Newark and the Houston Intercontinental airport.

Regardless of whether signal interference is intentional or not, it is important that government and industry continue to monitor and protect the GPS infrastructure.

Summary:

- GPS is vital for expanded uses of GPS such as ADS-B
- ADS-B is envisioned as the eventual replacement for most radar surveillance in the U.S.
- Proposal by LightSquared to use spectrum adjacent to GPS spectrum would interfere with civil and military GPS aviation operations
- Although interference or jamming may not be intentional, it is important that government and industry continue to monitor and protect the GPS signal

Conclusion

As you can see, GPS, and GPS-based procedures, have transformed aviation from a ground-based navigation system to a space-based navigation system. In the future, as GPS-enabled surveillance systems evolve, GPS will become an even more integral part of an increasingly safe and efficient aviation infrastructure. By contrast not only do ground based navigation systems have well defined limitations, but the cost of maintaining them is very high. Simply put, when we look at the vastly improved navigational accuracy provided by GPS we see a win-win outcome on safety and operational grounds. If we expect to maintain the world-leading safety record that we point to with pride, the vital component that is GPS must be vigorously protected. The protection must include defenses against electronic interference and provision of sufficient redundancy to ensure continuous operation.

Today, our members safely and efficiently fly 100's of millions of passengers and millions of tons of cargo around the globe using some of the most advanced GPS-equipped aircraft in the world. GPS is a winning technology with well-established benefits and an even brighter future. Please help us continue to preserve, protect and develop this vital national resource.

Summary:

- GPS has transformed aviation from a ground-based navigation system to a space-based navigation system
- As GPS-enabled surveillance systems evolve, GPS will become an even more integral part of the aviation infrastructure
- Cost of maintaining a redundant ground-based navigation system is high
- GPS provides a critical safety benefit to the nation's aviation infrastructure
- GPS' importance must be recognized, supported by funding and other resources, and it certainly must be protected
- GPS protection must include defenses against electronic interference and provision of sufficient redundancy to ensure continuous operation

Thank you for your attention to these remarks. I would be pleased to take any questions that you may have.

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Captain Sean P. Cassidy, First Vice President

Captain Sean P. Cassidy (Alaska) serves as ALPA's first vice president. He was elected on Oct. 13, 2010, at the Association's 43rd Board of Directors meeting, and assumed office on Jan. 1, 2011.

"The airline industry is becoming more global, and issues outside our borders can affect pilots here in North America," said Cassidy. "ALPA's strength comes from identifying the values we have in common as pilots around the globe, and working together as we face the challenges ahead."

Cassidy has served as both chairman and vice chairman of the Alaska Airlines Master Executive Council. He was chairman of the Alaska Air Group Labor Coalition from 1999 to 2009 and has been actively involved in local and national labor issues for over a decade. Hired by Alaska in 1996, Cassidy is currently a Seattle-based B-737 captain.

Prior to his airline experience, Cassidy received an officer commission in U.S. Navy. He attended the Navy's undergraduate pilot training and advanced jet training programs, and was assigned to Whidbey Naval Air Station from 1989 to 1995. Cassidy performed duties as a carrier-based EA-6B pilot in support of numerous military operations, including those in the Persian Gulf, and finished his naval career flying the C-9 as an officer in the reserves.

Cassidy resides in Fox Island, Wash., with his wife, Annemarie, and their two children. He has a BA from the University of Colorado.

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

Truth in Testimony Disclosure

Pursuant to clause 2(g)(5) of House Rule XI, in the case of a witness appearing in a nongovernmental capacity, a written statement of proposed testimony shall include: (1) a curriculum vitae; and (2) a disclosure of the amount and source (by agency and program) of each Federal grant (or subgrant thereof) or contract (or subcontract thereof) received during the current fiscal year or either of the two previous fiscal years by the witness or by an entity represented by the witness. Such statements, with appropriate redaction to protect the privacy of the witness, shall be made publicly available in electronic form not later than one day after the witness appears.

(1) Name: Captain Sean P. Cassidy, First Vice President

(2) Other than yourself, name of entity you are representing:

The Airline Pilots Association, International ("ALPA")

(3) Are you testifying on behalf of an entity other than a Government (federal, state, local) entity?

YES **If yes, please provide the information requested below and attach your curriculum vitae.**

NO

(4) Please list the amount and source (by agency and program) of each Federal grant (or subgrant thereof) or contract (or subcontract thereof) received during the current fiscal year or either of the two previous fiscal years by you or by the entity you are representing:

On July 27, 2010, ALPA was awarded an "Other Transaction Agreement (OTA)" to perform services in support of the Human Intervention and Motivation Study (HIMS) VI. (Requisition/Reference No. WA-10-03230). This OTA was requisitioned by the Federal Aviation Administration (FAA), Office of Aerospace Medicine. The period of performance is one year from the date of the award with two one-year option periods. $200,000.00 is the amount per year. After ALPA completed performance for the base year (7/27/10 – 7/26/11), the FAA exercised option year one (7/27/11 – 7/26/12), and ALPA is currently performing services under that modification. The FAA recently informed ALPA that it is exercising option year two, which will require ALPA to perform work from 7/27/12 – 7/26/13.

With respect to two previous fiscal years ago (FY 10/1/09 – 9/30/10), ALPA was performing work under a contract with the FAA, Office of Aerospace Medicine in support of the HIMS program. On September 25, 2009, the period of performance was extended through March 24, 2010 and additional funds in the amount of $90,000 were provided to fund the work to be performed during that extension period. That contract was requisitioned by the FAA on 9/25/06 (Contract No. DTFAWA-06-C-00069).

Sean P. Cassidy

Signature

2/6/2012

Date