



**Senate Commerce, Science, and Transportation Subcommittee on
Aviation Operations, Safety and Security**

**Reauthorization of the Federal Aviation Administration (FAA):
Perspectives of Aviation Stakeholders**

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Chairman Dorgan, Senator DeMint, members of the committee – good morning. It is a pleasure and an honor to testify before this committee once again. I represent the Aerospace Industries Association (AIA) – we are an association of nearly 300 aerospace manufacturing companies and the 657,000 highly skilled employees who make the aircraft that fly in our airspace every day as well as the avionics and air navigation equipment that allow them to do that safely. I’m especially happy to come before you to talk about the FAA Reauthorization, including the modernization of the air transportation system, and the safe use of foreign repair stations.

You know, it’s been said that in this town where you stand on an issue depends on where you sit. Well, when it comes to NextGen, I may have changed seats, but my views on NextGen haven’t changed. Our National Airspace System (NAS) needs NextGen as much today as it did when I was at the Federal Aviation Administration (FAA). In fact, we need it even more. Because NextGen isn’t *just* about reducing delays – although it will certainly do that. And it isn’t *just* about improving civil aviation’s environmental stewardship – although that too will be a welcome benefit of NextGen’s implementation. It isn’t even about the added margin of safety NextGen technology will bring to our complex system of communication, navigation and surveillance. NextGen is no single thing...it’s all of these things. And I would like to explain why we believe it is critical and why the benefits of NextGen may be closer than we think. NextGen is critical to our economy now. To delay or fail to implement the NextGen system risks the U.S. aerospace industry’s position as the nation’s pre-eminent manufacturing exporter (approximately \$95 billion annually). It has the potential to cost the nation about \$35 billion in annual economic loss by 2014, and approximately \$52 billion in annual economic loss by 2024 just in unmet demand.ⁱ If aviation growth is constrained, job growth suffers. Employment trends in aviation-related industries indicate a possible loss of as many as two million new jobs every five years.ⁱⁱ Only through NextGen will the U.S. retain its global aeronautics leadership, which affects not only aviation but numerous other industries and businesses as well because of aviation’s extensive ripple effect throughout the economy.

Environmental Benefits of NextGen

Addressing climate change is high on everyone’s agenda, including those of us in aerospace. We view NextGen and environmental improvement as inseparable. Air traffic control delays waste millions of gallons of fuel annually. For instance, more than 4.3 million hours of delays in 2007ⁱⁱⁱ consumed an additional 740 million gallons of jet fuel, costing carriers more than \$1.6 billion. This produced approximately 7.1 million metric tons of carbon dioxide^{iv}. It’s simple math – a more efficient system means less fuel burn. And less fuel burn means less CO2 emissions.

The cost to the airlines and the cost to the environment are simply unacceptable, especially when we all know they can be significantly reduced. Delays cost the traveling public as well – billions of dollars in lost productivity. And consider, too, that these are unnecessary costs to consumers. Manufacturers are designing and building 21st century aircraft. However our air traffic system has not moved into the 21st century – it is virtually the same system in which the noisier, dirtier aircraft of the 1960s flew.

NextGen will create system efficiencies that will help reduce aviation's contribution to climate change. Forty years of innovative engine, airframe and avionics design have vastly improved aviation's noise and carbon footprint. Compared to the 1970s, ninety percent fewer people are impacted by aircraft noise today. And modern civil aircraft are seventy percent more fuel efficient than they were in the 1960s.

But these improvements have come mostly from technological and procedural improvements within an air traffic system that has not changed fundamentally in more than forty years. It is now time to bring our National Airspace System into the 21st Century.

NextGen is Now

I tell you about aviation's past success as prelude to what we can do in the near future. President Obama has identified implementation of NextGen as a national priority. Recently, Secretary of Transportation Ray LaHood has said that the Administration might be willing to ask Congress to provide extra funds to accelerate NextGen if the FAA and industry can articulate a roadmap that would shorten NextGen implementation to years instead of decades. Industry stands ready to do its part and support FAA on several important fronts. First, FAA needs to define standards and specifications for NextGen applications not yet certified for NAS-wide use, like Automatic Dependent Surveillance-Broadcast (ADS-B) "In," for example. Next, FAA needs to focus its certification of new performance-based procedures at airports and in regions that have the most traffic and delays. Many of NextGen's new operational procedures and technologies will shorten flights, reduce fuel burn, produce quieter approaches and departures and they are available today.

Once we have identified the equipment that can be installed and the procedures that can be put in place, we can predict when and where we will begin collecting benefits. Every airport where performance-based approaches have been installed has demonstrated substantial economic, environmental and delay reduction benefits in the first year of operation. For example, Delta Air Lines reported combined fuel and operations efficiencies of \$34 million in the first year after FAA added two RNAV departure posts at Atlanta Hartsfield International Airport.

NextGen technologies will also bring efficiencies to the en route structure. Lockheed Martin's En Route Automation Modernization (ERAM) system will enable the FAA to increase capacity and improve efficiency in a way that is impossible with the current system, which can not be expanded. The ERAM system adds capabilities needed to support the evolution to NextGen. ERAM is currently scheduled to be operational throughout the nation next year – not decades from now. My friends in the airline industry can go into the details, but these are big savings. When translated into dollars, they can make a huge difference to an industry struggling through difficult times. NextGen can do this, but not without the resolve of this committee, the FAA and the entire civil aviation community.

ADS-B has the potential to reduce delays, reduce fuel burn through more efficient routings and increase capacity – all while improving safety. ADS-B will provide pilots and controllers with better situational awareness, which will substantially reduce runway incursions and enhance traffic flow. But this can only be achieved if the current and future fleet of commercial and general aviation aircraft have the on-board equipment to use this technology.

While these new capabilities will enhance safety, their accuracy will also allow closer separation of aircraft. This will increase system capacity, maintain safety and deliver economic benefits. These economic benefits are critical for operator investment in NextGen avionics equipment. ADS-B can also provide surveillance to areas without radar coverage such as the Gulf of Mexico, safely reducing aircraft separation over the Gulf from 100 miles to a standard 10-mile en route separation.

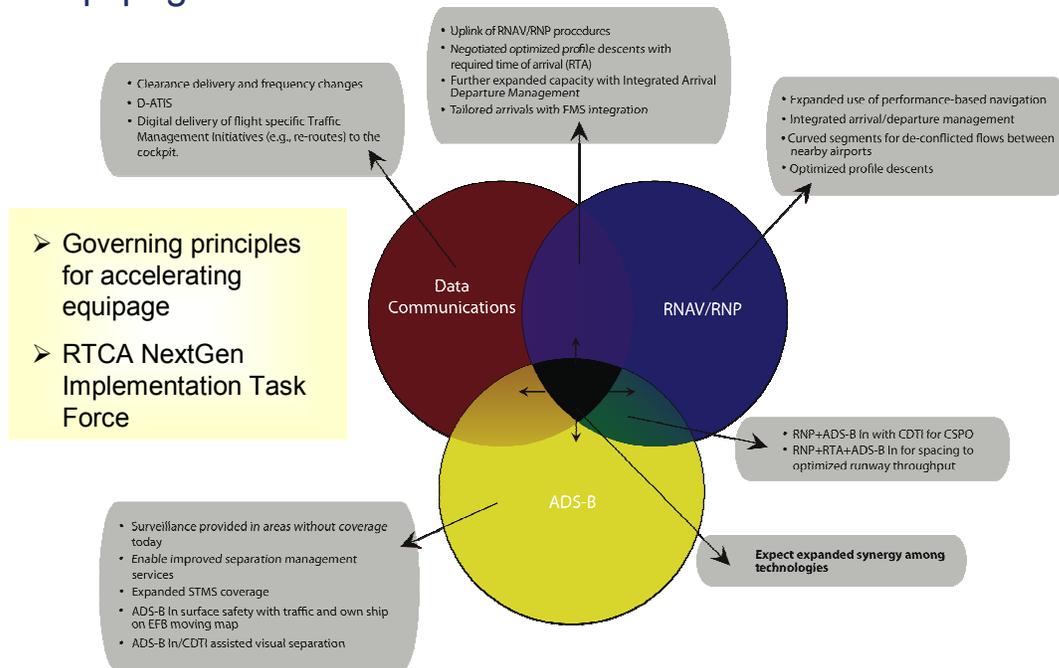
Any doubters of FAA's ability to deliver these new capabilities should take note that in 2008 the General Accounting Office removed FAA modernization from its list of "high-risk" federal programs. Further, the Office of Management and Budget's project management tool called the Earned Value Management (EVM) system (for federal contracts of \$10 million or more) has given the ITT ADS-B contract a score of .97 out of a possible 1.0 for deployment of ground infrastructure and an above perfect score of 1.04 for being under budget.

I also want to draw attention to the growth of the use of unmanned systems for civil missions and the importance of their integration in the NextGen system. Even now, Unmanned Aircraft Systems (UAS) are being used by Customs and Border Protection for surveillance and border patrol. They have the potential to support first responders in disaster relief, provide important weather data and are a cost-effective solution for local law enforcement in a variety of missions. AIA is encouraged by the FAA's efforts to provide a means to operate these aircraft in the NAS, while working to establish safety and operating standards. If the FAA hopes to meet current and projected demand for more routine military training missions as these aircraft return from Iraq and Afghanistan, and support other government agencies in their missions, adequate certification resources must be made available. With the projected demand in UAS services in the coming years, AIA encourages Congress to provide these resources and place more emphasis on this important issue.

Accelerate to NextGen

NextGen Implementation Plan

Equipage is Critical for NextGen Success



Source: Federal Aviation Administration

As the above excerpt from FAA’s NextGen Implementation Plan shows, in order to accelerate NextGen, we need to address three critical areas. Failure to fully implement any one factor means the full benefits of NextGen will not be realized. Therefore, Congress must ensure that all three areas are funded or developed in concert. And, critically, we need a critical mass of user equipage to begin to realize system benefits of NextGen. We must also install ADS-B transmitters across the nation for full coverage, and install Performance-Based Navigation (PBN) procedures at every airport currently capable of accommodating instrument flight rules traffic.

Although the system will always evolve, FAA projects all currently planned aspects of NextGen will be fully operational in 2025. To achieve most of the benefits, I believe we can do much better than 2025, but even under an accelerated schedule, NextGen is a multi-year, multi-billion dollar, nationwide transformation. It is not something that can be accomplished 90 days at a time. Yet, that is how we’ve treated the FAA’s funding and expenditure authority for almost two years. As FAA is dependent on periodic legislation to modify, sustain and improve this essential program, the start-stop process of funding and authorization is impairing the ability to rebuild our aviation infrastructure.

What few realize is that many of these systems are available today. With near term benefits within arms reach, AIA and its industry partners call on this Committee, this Congress and the Obama Administration to pursue the modernization of the air transportation system as the national priority that it is. While this may sound daunting, it is imperative that we continue to flesh out the near term opportunities, and the almost 300 companies that make up AIA believe this is possible by addressing the two key points of modernization - Infrastructure and Equipage.

Near Term Opportunities: Infrastructure

In order to increase the availability of performance-based navigation at airports, AIA recommends the inclusion of proper resources for the FAA Office of Aviation Safety to certify and oversee performance-based procedures developed by third parties. History tells us that huge improvements in efficiency – both economic and environmental – follow at airports that install performance-based navigation procedures. Technologies and procedures can be deployed to save fuel and reduce emissions. Required Navigation Performance, Continuous Descent Arrivals or Tailored Arrivals and Ground-Based Augmentation Systems are three technologies that have been shown to provide significant environmental benefits.

Required Navigation Performance and Continuous Descent Arrivals

Performance-based navigation using Required Navigation Performance (RNP) and Area Navigation (RNAV) relies on Global Positioning System (GPS) and inertial navigation technology to allow aircraft to fly accurate paths independent of classical ground-based navigation infrastructure. This enables flight paths between cities that are more direct, with fewer miles flown, and approach and departure procedures that are shorter and involve little, if any, intervention from air traffic controllers. The result is significant decreases in distance and time flown. Practical, ‘real world’ demonstrations of RNP’s effectiveness abound:

- Australia's Qantas Airlines, for example, has its fleet of Boeing 737s flying more than 100 RNP procedures each day. These procedures in Brisbane alone cut approximately 15 miles and more than 1,600 pounds of CO2 emissions on every approach.
- Southwest Airlines recently operated a Boeing 737 demonstration roundtrip between Dallas Love Field and Houston Hobby using RNP procedures, yielding 904 lb. of carbon dioxide savings, part of its \$175 million program to implement RNP fleet-wide.
- Since 2005, Alaska Airlines, an early RNP pioneer, has documented 5,300 flights that avoided diversions by using RNP procedures. In 2008, these ‘saves’ resulted in cost savings of \$8 million.

Another procedural improvement that doesn’t always require the use of RNP, but generates substantial efficiencies is Tailored Arrivals (TA). These procedures couple the

lateral accuracy provided by RNP with the *vertical* accuracy provided by the aircraft's Flight Management System (FMS) and flight controls. The flight path is coordinated with air traffic control via data link communications. The resulting descent is flown from cruise altitude to final approach with few, if any, level segments and the engines operating continuously at or near idle power.

- UPS uses these procedures at Louisville, with reported savings of between 250 and 465 pounds of fuel (37-69 gallons, 780-1,456 pounds of CO₂) per arrival.
- SAS Airlines have flown more than 1,300 Continuous Descent Arrivals to Arlanda, Sweden, with average fuel savings of 410 pounds of fuel (60 gallons, 1,279 pounds CO₂) per arrival.
- Tailored Arrivals have reduced fuel use by nearly 2 million pounds (or 1 million kilograms) and CO₂ emissions by 6.3 million pounds (or 3.1 million kilograms) over a year at San Francisco International Airport. The data cover 1,000 flights by 777s and 747s from six airlines.

Operational use of these capabilities should be accelerated, in accordance with the following implementation metrics:

- ***First and foremost, accelerate developments of system requirements so both government and industry can comply before 2020 deadline.***
- ***Performance based navigation procedures should be deployed at the 35 Operational Evolution Partnership (OEP) airports by 2013 to include where applicable RNAV/RNP, CDA and Ground-Based Augmentation System (GBAS).***

Near Term Opportunities: Equipage

As you know, efficiencies, delay reductions and environmental benefits are directly related to the number of aircraft equipped to use performance-based procedures once they are installed at a congested airport. The more aircraft equipped to use these new procedures, the higher the benefits. It's as simple as that. No matter how many systems are operational, efficiencies will inevitably depend on an operator's commitment to equip aircraft.

I would like to echo the sentiment of the GAO who earlier this year reported that without widespread user equipage, system-wide economic and environmental benefits of NextGen will not be realized. While I appreciate this Committee's support of equipage incentives in the economic recovery package, it is a shame that billions of dollars were obligated for national infrastructure priorities, but outside of money for airports, we spent virtually nothing on the global transportation infrastructure of the 21st Century – air transportation modernization. We have near-term, “shovel-ready” infrastructure improvements we must make to our fifty-year-old air traffic control system that will benefit our economy both immediately and for the next 50 years. Government and

industry experts alike have long held that aircraft equipage is the “long pole in the tent” to achieve this overdue transformation of our national airspace system. If commercial and general aviation aircraft are not equipped with NextGen-enabling avionics, implementation will not succeed.

We need a two-pronged strategy with regard to user equipage. First, we need to make the purchase and installation of NextGen avionics economically viable in this difficult fiscal environment. The cost for these critical avionics components is prohibitive – especially the expensive and time-consuming process of retrofitting the current fleet. Second, we need to define NextGen’s economic and environmental benefits in a way that makes the equipment purchase defensible to corporate boards and shareholders. The government should not mandate the purchase of new equipment if it is not prepared to commit to its benefits at a point in time. Below is a list of avionics equipment and procedures that will enable NextGen. These are already in use and some, such as Trajectory-Based Operations (TBO) and Closely Spaced Parallel Operations (CSPO), will provide additional benefits down the road.

- ADS-B
- RNP Equipage
- FAA RNAV/RNP Procedure Development
- FAA LPV Procedures Development
- Electronic Display Upgrades (including Electronic Flight Bags),
- GBAS

A few details on some of these capabilities may be helpful:

- Automatic Dependent Surveillance-Broadcast (ADS-B) – ADS-B is a critical component for advancing a next-generation air transportation system. By relying upon satellite and additional technology, ADS-B enables an aircraft to constantly broadcast its current position simultaneously to air traffic controllers and other aircraft. Tremendous safety, security, capacity and environmental improvements are realized. ADS-B has two components – ADS-B “Out” and “In.” ADS-B "Out" continuously transmits an aircraft’s position, altitude and intent to controllers. ADS-B "In" is the reception of the transmitted data by other aircraft, which allows pilots to have a complete picture of their aircraft in relation to other traffic.
- Required Navigation Performance (RNP) procedures (higher performance RNAV) – monitors aircraft performance, enables closer en route spacing without intervention by air traffic control and permits more precise and consistent departures/arrivals. Another immediate infrastructure improvement is available with investments in precision satellite-based instrument approaches, called Localizer Performance with Vertical (LPV) approaches. LPV approach procedures improve safety and provide all weather access at thousands of general aviation airports.

- Area Navigation (RNAV) – enables aircraft to fly on any path within coverage of ground or space-based navigation aids, permitting more access and flexibility for point-to-point operations

- Ground-Based Augmentation System (GBAS) – GBAS is the next generation technology to support precision landings. It provides additional information to aircraft to allow GPS to be used for landings in low visibility conditions. Due to limitations with current ILS equipment, airports routinely lose capacity as visibility decreases. Fifteen of our top U.S. airports experience greater than 25 percent reduced capacity when ceilings are below 200 feet. In these situations, aircraft often waste time and fuel by waiting in holding patterns or, even worse, diverting to alternate airports. This minimizes schedule disruptions due to weather and also enables more environmentally friendly procedures and increased safety during ground operations.

AIA recommends the development of equipage incentives or general fund grants that will increase the population of NextGen equipped aircraft at a rate of at least 20 percent annually at the 35 OEP airports.

Performance Metrics

As with any highly productive operation, NextGen implementation must remain subject to constant oversight by all stakeholders, including Congress, FAA and industry. We encourage FAA to develop, publish and use a simple and clear set of progress-based metrics with 20-year targets and yearly objectives to determine if NextGen plans and implementations are actually achieving the nation’s air transportation objectives. In doing so, industry believes the true test of the initiative’s effectiveness in accomplishing the mission set forth under Vision 100 can be weighed against the following questions:

- Are we continuing to improve safety?
- Are we reducing aviation’s contribution to climate change?
 - Are we reducing noise and emissions?
 - Are we increasing efficiency by making routes more direct and shorter in time?
- Are we increasing capacity by better using the runways we have and adding more runways where needed?

Specific metrics are being developed to measure progress in these areas. We would be pleased to share these metrics with the Committee. It is important that we track progress of the operational impact of NextGen, not just the programmatic accomplishments.

The Funding Dynamic

Since the current reauthorization expired at the end of FY07, FAA has been funded by a series of continuing resolutions and extensions. FAA is a 44,000-employee organization responsible for a multi-billion dollar operation that touches virtually every part of our nation's commercial economy. If FAA were a private entity, it would be a Fortune 500 company, yet we expect it to sustain excellence and global leadership without long-term authority or stability in its programs and funding.

Much of what is needed for NextGen falls under the category of "new starts," which, as you well know, are prohibited under short term continuing resolutions. A large number of FAA NextGen pre-implementation issues, including development and acquisition decisions, have been adversely affected. Failure to fund these NextGen development and application programs as a national priority has a disastrous domino effect on near-, mid- and long-term NextGen efforts. We can not continue this. We have to accept the responsibility of providing cutting-edge air transportation system services on a schedule that is not constantly sabotaged by funding battles. And underlying this is a basic question: Will the U.S. commit to retaining its global leadership position in civil aviation, or will it cede the "gold standard" in aerospace technology development and deployment to the EU, Australia or Canada?

It is critically important that we keep pace with the rest of the world in our modernization efforts to maintain any hope of creating a globally harmonized air traffic system. Whoever sets the standards for equipment and procedures will define the global system. If we want to maintain a leadership position in this market, we need to be in the vanguard of air transportation system modernization. And let's not forget that although NextGen has entered the implementation phase, delayed funding of NextGen R&D will push the timeline further to the right while the European system – Single European Sky ATM Research Programme (SESAR) – and others are moving ahead smartly.

Like other modes of transportation recently gaining considerable support for modernization and expansion, advancing NextGen must be a national commitment. While industry is pleased to hear that the Administration is committed to advancing NextGen, funding must be sound and sustainable for the initiative to become a reality. Because the air traffic control system provides important public policy benefits to our citizens and the military, it is appropriate for the General Fund to fund FAA operations.

Delaying the development and deployment of NextGen is harmful for two simple economic reasons. Every year that R&D work is delayed, the costs of the work increase. Additionally, every year that NextGen is delayed, our economy is denied the benefits of an improved ATC system — and that costs more in fuel, delays, environmental benefits, etc. The cost to promptly and fully fund NextGen is far less than the cost of delay.

Safety and Security of Foreign Repair Stations

I would like to stress the aviation industry's commitment to safety and security at repair stations around the world. As you know, aviation is a global industry and requires an international network of safe and secure repair stations.

AIA is particularly concerned about pending language in the House FAA Reauthorization Bill, which sets a minimum number of inspections by FAA personnel. Our industry operates foreign repair facilities that welcome inspections and oversight by the FAA. Our facilities are constantly inspected by the FAA, foreign aviation authorities, our air carrier customers and by our internal auditors. However, requiring the FAA to inspect each foreign repair station “not fewer than two times” annually presents several problems.

First, the FAA does not have the resources or the inspection personnel required to inspect every foreign repair station with such frequency. Because of this challenge, I believe the agency should employ a risk-based model for inspections in order to use its valuable personnel in the most efficient manner possible. It makes more sense to send additional inspectors to facilities where safety oversight may be called into question rather than use these resources carrying out redundant inspections in locations that have exemplary safety records. Equally concerning is the premise that any foreign repair station that the FAA fails to inspect twice annually - whether or not it is in compliance with FAA safety rules - would lose its FAA repair certificate. This is fundamentally unfair since repair station operators have no ability to control FAA’s oversight operations.

Second, the inspection requirement undercuts the U.S.- European Union (EU) Bilateral Aviation Safety Agreement (BASA), raising the possibility of retaliatory trade practices from one of our most trusted trade allies. This agreement, as a general rule, requires reciprocal maintenance oversight (i.e. the FAA provides surveillance of U.S. based EU certificated repair stations and vice versa). The concept is by no means revolutionary. As a matter of fact, the FAA has operated under reciprocal maintenance agreements with European nations for more than 35 years.

As proposed, this language, will lead to reciprocal actions, ending implementation of the BASA and abrogating existing and future Open Skies agreements. In recent communications, EU officials stated that reciprocal actions will have a significant impact upon three additional areas of focus for international cooperation: acceptance of FAA certification of European pilots (an industry generating \$72 million in annual domestic revenue); acceptance of FAA certification of U.S. airlines entering European airspace (a move that would require domestic airlines to undergo and pay for EU certification prior to flying their profitable transatlantic routes); and an increase in the fees and charges assigned to U.S. aviation manufacturers for EASA validation of products certificated by FAA.

Should these actions come to fruition, U.S.-based repair stations would be subjected to additional certification fees, risking the ability to repair European registered airplanes, all of which could result in a significant loss of business and employment here in the U.S. – an outcome devastating to the hundreds of small businesses that comprise the aviation maintenance industry. As the U.S. currently has a positive balance of trade in repair work with the EU – with 1,237 U.S. based repair stations certificated to repair EU registered airplanes, and only 708 FAA certificated repair stations around the world

(including 425 in the EU) – domestic operators stand to lose far more work than we could ever hope to gain.

In addition to the certification of repair stations, another consequence of backing out of the U.S. – EU agreement is the risk of jeopardizing our access to foreign markets. As stated earlier, the aerospace industry provides the largest trade surplus of any domestic manufacturing industry. A large part of this success rests with our ability to easily export products overseas. In addition to safety oversight, the bilateral provides for reciprocal certification of aircraft. It can take up to five years for a new aircraft to go through the FAA certification process. Under the agreement, the EU accepts the FAA's certification which allows for instant access to their markets. Without this, our manufacturers would have to go through a separate certification process for every European market – an effort that would cost time, money and jeopardize our export base.

We will send our bi-lateral partners a terrible message if we violate this safety agreement. After decades of cooperative oversight, we would signal our lack of faith in their work. Doing so would slight our European partners, undermine the FAA's credibility and make it harder for the FAA to maintain its worldwide leadership on safety issues.

The importance of this agreement simply cannot be overstated. The U.S. – EU safety agreement will serve as a foundation for future negotiations in areas such as licensing and operations that have huge economic impacts for U.S. industry. To endanger this agreement through foreign repair station legislation risks future economic growth and job creation in our country.

For these reasons, I respectfully ask the Committee to take my comments into consideration and continue to examine this issue and its ramifications for the aerospace industry and workforce.

Conclusion

It is important to note that NextGen progress has expansive ramifications for our national economic growth, job creation, and environmental benefits. Aviation is the glue that holds the high-value global economy together. It has been described as the physical internet. More than surface or water transportation, civil aviation has a tremendous ripple effect on our economy. For every dollar invested or job created in aviation, 2.6 to 4 more are created. Aviation carries only two percent of the world's goods – but 40 percent of the value.

FAA and industry are presented with significant funding challenges. But government, industry and many lawmakers are united on one issue – increased funding of FAA from the General Fund is needed to cover FAA operations and to pay for NextGen. While the recently approved omnibus bill increases the General Fund allocation from 18 percent to 24.6 percent that is just enough to pay current FAA expenses. What is required is a general fund contribution well above 25 percent that supports full NextGen implementation.

The important point is that NextGen cannot, must not, be deferred – it has to be developed and implemented concurrently with full funding of FAA’s present operational and capital needs. FAA and industry both must be held to account. We must have concrete measures to assure that our investment is producing results. In this time of limited resources, both the private and public sectors must be extremely judicious in our expenditures, but we need to act boldly. There is no doubt of the public benefit that will be gained, and the boost to economic and job growth, that will come from timely and full funding of FAA and NextGen needs.

ⁱ JPDO.

ⁱⁱ AIA projected estimates based on industry forecasts, incorporating lower commercial airline employment expectations.

ⁱⁱⁱ Delay measurement excludes padding of block times to increase on-time performance; *ibid*, p. 3.

^{iv} *Your Flight Has been Delayed Again*, emissions during taxi and flight time, p. 5.