

*Air Traffic Control Modernization and NextGen:
Near-Term Achievable Goals*



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before the
Subcommittee on Aviation
of the
House Committee on Transportation and Infrastructure**

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AIR TRANSPORT ASSOCIATION

INTRODUCTION

The time to jump-start air traffic control (ATC) system modernization is now. A meaningful down payment over the next few years will pay dividends in the form of greatly improved system performance and corresponding public benefits.

The shortcomings of the existing ATC system are well known. Technologically, it is outdated and limited in its capabilities. It relies on ground-based radar for surveillance and navigation, and voice communications to relay instructions between controllers and pilots. Compared to modern and emerging technologies, our ATC system is slow and cumbersome. These limitations force operational procedures such as separation standards and indirect point-to-point routings that are inefficient because they appropriately put safety first. Consequently, as U.S. civil aviation has grown and become more complex – including scheduled commercial, nonscheduled business, public and private charter, air taxi and private recreational flying – the ATC system has become strained and, in some geographic areas, overwhelmed. This is especially true when severe winter or summer weather disrupts normal operations. The result is congestion and delay for all system users, unhappy passengers and shippers, and airlines who struggle to recover normal operations and rebook passengers when forced to cancel flights.

The current ATC system limitations impose significant costs on our society in general, and the airline industry in particular. The Joint Economic Committee estimates air travel delays impose \$41 billion annually in costs on the U.S. economy.¹ In the 12-month period ending September 2008, 138 million system delay minutes drove an estimated \$10 billion in direct operating costs for scheduled U.S. passenger airlines and cost airline passengers an estimated \$4.5 billion in lost wages and productivity. These figures do not capture the costs of extra gates and ground personnel to passenger airlines or the direct costs incurred by cargo airlines and their customers. The airline industry cannot survive, and the public will not invest in it, if these conditions remain *status quo*.

Looking forward, these problems will only worsen unless and until change occurs. By 2025, the Federal Aviation Administration (FAA) forecasts there will be approximately 30,000 more operations per day than the 2007 estimate of 44,000 daily operations. The current ATC system cannot handle this projected future demand, even if the forecast is reduced to account for current economic conditions. Even if the forecasted growth is significantly reduced, today's ATC system is so inefficient that it will not be able to handle a modest increase in activity.

Why is this important?

The ATC system is a critical national infrastructure that serves the American people and the commerce of the United States, and all system users rely on it, especially the scheduled airline industry. The airline industry is the foundation of the commercial aviation sector, which comprises airlines, airports, manufacturers and associated vendors. **U.S. commercial aviation ultimately drives \$1.1 trillion per year in U.S. economic activity and 10.2 million U.S. jobs.** By any measure, the U.S. airline industry is a valuable national asset and its continued economic health should be a matter of national concern. Without a modern, efficient ATC system, the airline industry will slowly strangle, U.S. commerce and productivity will be impaired and U.S. businesses will not be able to compete effectively in the global economy. For these reasons, modernizing the ATC system now is critically important to the growth and competitiveness of our economy.

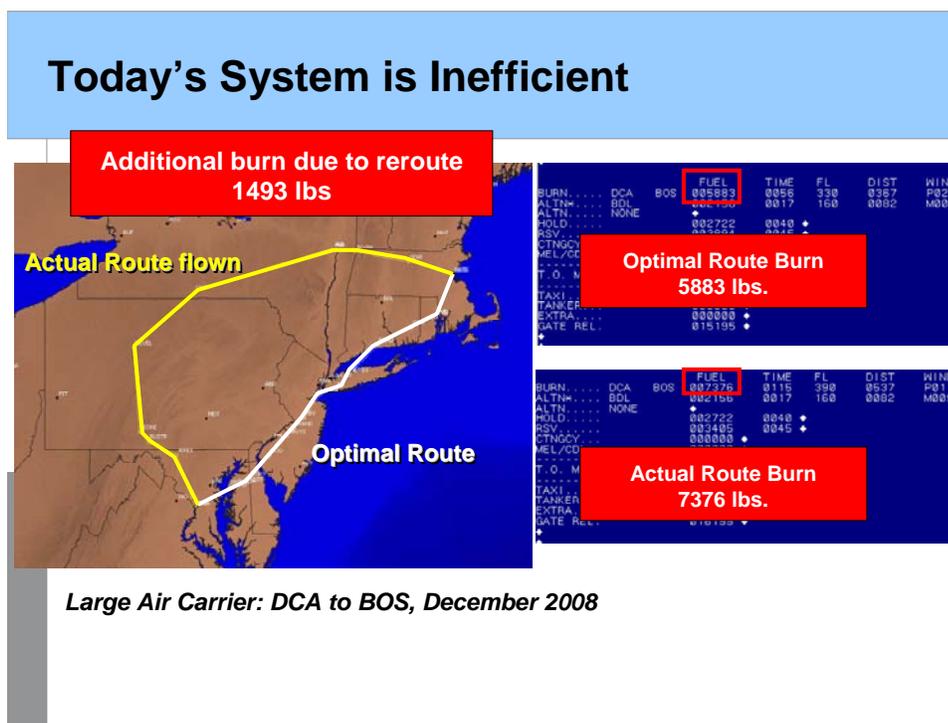
ATC MODERNIZATION – NEXTGEN – WILL PROVIDE CRITICALLY NEEDED BENEFITS

¹ http://jec.senate.gov/index.cfm?FuseAction=Reports.Reports&ContentRecord_id=11116dd7-973c-61e2-4874-a6a18790a81b&Region_id=&Issue_id=

The FAA ATC modernization project – the Next Generation Air Transportation System (NextGen) – will usher in a new era of air traffic management and control that promises enormous benefits for all stakeholders and the American people. Public benefits include improved operational efficiency, reduced fuel consumption and emissions and lower operating costs for airlines. ATA strongly supports NextGen because it addresses numerous critical needs:

- **Capacity.** The current ATC system is saturated and, in some locations, cannot provide the capacity to meet public demand for convenient, safe air transportation. This situation inhibits competition and industry growth. It also is the source of unnecessary congestion and delays, and compounds the effect of weather-related delays. NextGen will enable more precise spacing of aircraft and flight paths, which will allow FAA to handle safely and efficiently the traffic growth that it forecasts.
- **Efficiency and Productivity.** NextGen will enable more efficient flying. Today’s ground-based radar system requires planes to fly over specific points on the ground to maintain radar and communications contact. Navigational aids, radar and controllers are all terrestrial. They are linked to form a complex network system that supports airways, through which aircraft fly. Today’s system also requires spacing to accommodate the time it takes for radar to detect objects. Consequently, aircraft fly indirect routings and aircraft spacing – required for safety – wastes capacity. Today’s ATC system cannot, and never will be able to, take full advantage of available technology or integrate and fully exploit emerging technology.

The environmental and economic impact of today’s inefficient ATC system is illustrated below. The flight in this example burned an additional 1,493 pounds of fuel (218 gallons). This added an extra 4,560 pounds of carbon dioxide (CO₂) that was released into the air and cost the carrier an extra \$688 in fuel (given razor-thin margins, this is significant).



In contrast to today's ATC system, NextGen will enable: optimized, direct routings between airports; reduced aircraft spacing; continuous descent arrivals, precise arrival and departure routings (known as RNAV and RNP procedures), and closely spaced approaches on parallel runways in instrument flight rule conditions. These are just a few of the operational benefits of NextGen.

These efficiency enhancements will drive significant improvements in productivity – both in terms of asset utilization and personnel. That, in turn, will reduce operating costs, which will help keep fares down and enable those savings to be plowed back into wages and benefits and operating capital.

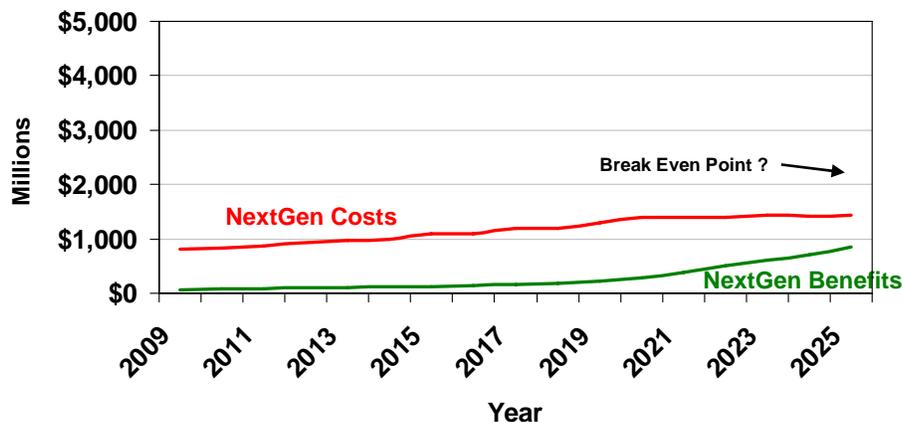
Improved ATC efficiency also will benefit private aircraft owners. Corporations use private aircraft with the expectation that such use is efficient. While we disagree with that proposition, ATC modernization will provide corporate aircraft owners the same kind of efficiency benefits that commercial airlines will enjoy if their aircraft are properly equipped. Even if they are not properly equipped, they still will enjoy a spinoff benefit simply from operating in the same airspace as more efficient commercial aircraft.

- **Environmental Benefits.** More efficient operations also will use less fuel, increasing aircraft fuel efficiency and reducing greenhouse gas and other emissions. It was estimated initially that full implementation of NextGen would reduce emissions significantly. The environmental benefits of ATC modernization are real and important. Improved fuel efficiency also will reduce operating costs and contribute to improved financial conditions that, like the productivity improvements discussed above, will benefit the public and employees.
- **Operational Integrity and Customer Satisfaction.** Closely linked to capacity, efficiency and productivity is operational integrity. By expanding capacity and enabling more efficient operations, NextGen will enable better on-time performance and improved customer satisfaction. Today's outdated ATC system contributes to delays and disruptions that could be avoided and will be avoided when NextGen is implemented. With improved operational integrity comes fewer delays, fewer missed connections, fewer misplaced checked bags and more satisfied customers.
- **Safety.** The NextGen satellite-based system will look and act much like a network to which aircraft and ATC are interconnected. It will provide more precise information to both controllers and pilots about aircraft locations, both in the air and on the ground, and will enable aircraft to constantly know one another's locations. This locational awareness and corresponding digital communications capability will provide critical real-time flight status information not available today. Some of the technology and operating procedures already have been tested and produced dramatic results. A sharp drop in aircraft accidents in Alaska occurred under the Capstone Program, introduced earlier this decade, which utilizes ADS-B technology, a foundational technology for NextGen.
- **Scalability.** NextGen will be considerably more nimble than today's facility- and labor-intensive system. Accordingly, it will be much easier for the FAA to scale the system to meet demand from all aviation sectors, whether that demand is a steady growth curve or fluctuates from time to time. Automation and digital data communications will make it easier for the FAA to adjust the system as needed.
- **Improved Financial Performance.** Modernization will respond to legitimate shareholder expectations that the airlines they invest in will earn a positive return on investment. The current ATC system hobbles the industry's ability to achieve financial stability because of the costs it drives by being inefficient. As noted above, these failures lead to costly delays and congestion.

THE NEXTGEN PLAN FLAW – DELAYED BENEFITS

While we strongly support NextGen, the current FAA plan does not produce significant benefits – the capacity, efficiency and economic benefits described above – for the traveling and shipping public or for system users until 2025. For system users – airlines, business aviation and general aviation – this delay presents a special problem. The plan contemplates significant stakeholder investment, in addition to FAA investment, but no real benefit for many years. Without a timely return on investment, there is little incentive for airlines and other users to invest in new equipment and training. In short, the current FAA plan does not make a strong business case. Airlines, air taxis, charter operators and corporate aircraft owners have a fiduciary responsibility to their shareholders and owners to achieve a reasonable return on their investment in this context, just as they do with respect to any other major capital expense.

Current NextGen Cost/Benefit Projection



Note: Cost projection based on 2009 FAA NextGen budget proposal with 5% annual increase through 2025. Benefit projections based on ATA analysis of estimates by government and industry sources.

This flaw is particularly troublesome given the fragile state of the U.S. airline industry. 2008 saw U.S. airlines lose an estimated \$8 billion (final, audited results are not yet available) on top of the \$31 billion lost since 2000. Airlines reduced operations sharply and were forced to slash 28,000 jobs in 2008; additional reductions are already in place for 2009 and softening demand will require even further reductions as carriers continue to cut back operations. Should jet fuel prices move sharply upward, the industry could easily see 2009 losses approaching the magnitude of losses in 2008.

THE NEXTGEN SOLUTION: ACCELERATE READY CAPABILITIES TO DRIVE EARLY BENEFITS

The flaws in the NextGen plan can be overcome. There is a real and achievable solution, and that is to advance the point in time when the investment in NextGen begins to pay off for both the public and vested stakeholders. If the public and aviation stakeholders begin to realize the benefits in a few years instead of 10 or more, then the NextGen business case improves dramatically.

To accomplish this critical shift, the government must accelerate its near-term investment in NextGen, with a corresponding reduction in later years, in order to leverage existing technology in the near term. This investment will stimulate accelerated manufacture and installation of ground infrastructure facilities, required avionics, and development and certification of new operations procedures. This proposal includes only those elements that are proven and ready to deploy:

- Automatic Dependent Surveillance-Broadcast (ADS-B) – ADS-B is a critical component of NextGen. 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. Unlike ground radars, ADS-B offers much more precise data on an aircraft's position in the sky or on the runway, including altitude, category of aircraft, airspeed and identification. 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, both in the air and on the ground. ADS-B has the potential to reduce delays, reduce fuel burn through more efficient routings, and increase capacity – all while improving safety.
- 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 efficient point-to-point operations.
- Required Navigation Performance (RNP) – like RNAV, RNP enables aircraft to fly on any path within coverage of ground- or space-based navigation aids, but also includes an onboard performance monitoring capability; RNP enables closer en route spacing without intervention by air traffic control, and permits more precise and consistent departures/arrivals.
- Electronic Display Upgrades – will allow the display of traffic information that becomes available with ADS-B deployment and reduce the risk of runway incursions. Whether upgrades to existing forward displays or the addition of a supplemental display (such as an Electronic Flight Bag), users will be able to see other traffic while taxiing and have access to surface navigation tools, electronic versions of airport maps and pilot handbook materials.
- 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. This minimizes schedule disruptions due to weather, and also enables more environmentally friendly procedures and increased safety during ground operations.
- Localizer Performance with Vertical Guidance (LPV) – approaches leverage satellite-based precision to improve safety and provide all-weather access at thousands of general aviation airports, critical to the general aviation community.

In addition to accelerating the government’s investment in NextGen, we also propose targeted deployment to those metropolitan areas and regions of the country where it is most needed to address congestion and delays, such as New York/Philadelphia, Chicago, Atlanta, San Francisco and Los Angeles. Deploying these capabilities in high-value locations before expanding to other areas will maximize NextGen benefits for the greatest number of people.

To support the earliest possible delivery of benefits and further investment by carriers, we also endorse the FAA “best equipped/best served” principle included in the governing principles of the NextGen 2009 Implementation Plan. Under this principle, consistent with safe and efficient operations, FAA will provide priority in the National Airspace System to Next-Gen equipped aircraft.

Accelerated and targeted deployment will produce significant benefits for the flying public in terms of airspace capacity and efficiency. It will lead to improved reliability and on-time performance, thereby greatly diminishing (if not eliminating) the single biggest source of the public’s dissatisfaction with flying. It should also drive improvements in other customer service areas such as checked baggage delivery and long taxi-out times.

OTHER CHALLENGES ALSO MUST BE OVERCOME TO REALIZE NEXTGEN BENEFITS

Investment, equipment and technology development/deployment are critical to delivering the benefits that NextGen promises. But they are not the only critical factors. The operational, environmental and economic benefits of NextGen can still be lost, and the investment in equipment and technology wasted, if other important challenges are not met head-on by the FAA. It is essential that each FAA organization executes its NextGen responsibilities in a timely fashion and that they all work together pursuant to a coordinated and unified strategy that prioritizes NextGen implementation. These challenges include:

- **Promptly complete airspace redesign.** FAA has underway a major overhaul of the NY/NJ/PHL airspace that is essential to improving the flow of traffic into, out of and through these metropolitan areas. It will significantly improve operational efficiency in this region and the entire NAS. Because it changes noise patterns, however, it has met stiff local political and public opposition and is the subject of multiple legal challenges. It is imperative that FAA push through these political and legal challenges and stay the course. And it must stay the course as it implements airspace redesign initiatives elsewhere in the NAS, such as Chicago and the West Coast corridor.
- **Develop new separation standards and approve new operations procedures.** For NextGen to deliver new capacity and efficiency, the FAA must develop new, reduced separation standards that take advantage of NextGen technological capabilities. In addition to separation standards, FAA also must establish criteria for the development and approval of new operations procedures such as simultaneous operations on closely spaced parallel runways, curved approaches, multiple precise departure paths, continuous descent approaches and optimized profile descents. Bureaucratic roadblocks and turf battles must be avoided. New standards and procedures must be viewed as going hand in glove with new technology.
- **Controller acceptance and implementation of new procedures.** FAA must partner with its controller workforce and make them part of the NextGen process. If controllers do not accept new separation standards and utilize new precision operations procedures, then the equipment investment for NextGen will be wasted. FAA must find a way to resolve the contract dispute with the controllers, which to date has served as a roadblock to controller input into NextGen development.
- **Maintain a sufficient constellation of satellites to meet FAA safety standards.** There is an assumption that the GPS satellite constellation servicing NextGen surveillance, navigation and communications functions will be adequate to meet stringent FAA safety standards. However, in some models, the minimum number of satellites FAA assumes for its performance-level safety analysis is not sufficient. FAA and the Department of Defense must come to agreement on the minimum satellites needed for NextGen to provide the performance level required by FAA safety criteria, and Congress must provide the necessary funds.

CONCLUSION

We have arrived at a pivotal moment for U.S. aviation. Industry stakeholders support the FAA NextGen program – an event not to be overlooked – and the FAA has developed a comprehensive implementation plan. The plan’s flaw, which delays NextGen benefits for too long, can be overcome by an immediate boost in funding to jump-start equipment deployment on the ground and in the air. We urge the Subcommittee to make the rapid, successful implementation of NextGen happen now.