Today, America is on the move. Relying on an aging maritime, highway, rail, and airspace infrastructure, entire sectors of American industry are utilizing the nation’s transportation systems to move people and product; with the demand signal to do so faster and more efficiently growing exponentially. In the face of such a demand, we must be careful to not frame our future “infrastructure investments” solely on our terrestrial system of highways and bridges. Instead, any investment in infrastructure must also include investing in our national airspace system. The U.S. aerospace sector of our economy is a uniquely dynamic and innovative sector with tremendous economic impact; one where the U.S. has a significant competitive advantage. Infrastructure investments must consider the entirety of our nation’s air transportation system, including our airports, national airspace system and our air traffic control system, as part of any national reinvestment in infrastructure.

Civil aviation-related investments must be a key part of any new Administration plan to promote economic growth. The overall health of the U.S. economy is highly dependent on the aviation industry, with civil aviation accounting for roughly $1.5 trillion annually to the national economy and constituting 5.4 percent of the gross domestic product. Aviation enables the economic benefits of tourism, shipping and travel for business or pleasure, and delivers economic impact to large and small communities across our nation. The employment benefits are equally as vital, with the Federal Aviation Administration (FAA) citing that civil aviation contributes significantly to the U.S. economy—11.8 million jobs. Infrastructure investment is a significant portion of that number. Yet we must remain keenly focused on the future of aviation to maintain such an important contribution. One such example is the next generation air transportation system (NextGen), which stands as the core of the global aviation framework. Inclusion and robust investment in such an effort as part of the nation’s larger infrastructure investment stands to create more high-skill and high-paying jobs in the U.S., while maintaining a positive safety trend, increasing national productivity, and an overall increasing the quality-of-life for every American.

Background

Aviation assets are critical to the U.S. The U.S. Government defines critical infrastructure as those “systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.” In the context of the National Airspace System (NAS) and aviation services provision, this definition logically includes the “highways in the skies” and the associated elements supporting the optimal use of the airspace—much of it an adaptation of technological solutions developed in other sectors making up the digital economy. This argument for logical inclusion accompanied by the Administration’s energized commitment to infrastructure development presents the opportunity to both efficiently and effectively address the modernization of our national airspace system and its supporting infrastructure. Turning this opportunity into reality requires simultaneously addressing the challenges of new aircraft equipment, modernizing the existing ground infrastructure, quickly transitioning to new technologies, and ensuring a qualified trained workforce of pilots and air traffic controllers.

1 Economic Impact of Civil Aviation, FAA (2015)
2 Patriot Act 2001
3 Aircraft Equipment refers to the procurement, installation and testing of required avionics.
NextGen

The FAA NextGen initiative is focused on development and deployment of new technology and replacing older infrastructure to sustain and improve airspace user benefits. Representing a true “system of systems,” NextGen promotes a series of investments into the interoperability of aircraft avionics, airports, air traffic control facilities, navigation aids, both terrestrial and space-based communication networks, and surveillance systems to ensure a safe, efficient air transportation system for the users, the flying public and all other beneficiaries of air commerce. To be effective, the investment requires aircraft modifications to introduce new technologies into the cockpit that allow pilots to better collaborate with air traffic control—thus reducing flight delays and increasing system capacity—while being socially responsible to the environment through reduced noise and carbon emissions.

To make NextGen and future infrastructure development a success requires continued investment not only from the FAA, but also the National Aeronautics and Space Administration, the Department of Defense and other federal agencies in areas including:

> research and development (R&D),
> system procurement,
> airspace and procedure design,
> training,
> program management, and
> operations.

NextGen Numbers

FAA’s *The Business Case for NextGen* reports $5.8 billion has already been invested as of 2014. The investment from 2015–2030 is projected to be $14.8 billion. As deployment proceeds the realized benefits will accrue at a faster rate. The report projects the FAA’s investment in NextGen improvements through 2030 as $20.6 billion. Using standard budget categories, that cost consists of:

> Capital expenditures from the agency’s Facilities and Equipment (F&E) budget are expected to be $16.0 billion.
> Research and other expenditures in the agency’s R&D budget line are projected to be $1.5 billion.
> Operations expenses are projected to be $3.1 billion.

The estimated NextGen benefits represented here⁴ illustrate there is an opportunity to accelerate the “anticipated improvements,” doubling those projected benefits to $161 billion by 2030. Thus, NextGen represents an outstanding example of a highly cost-beneficial program, with the myriad benefits greatly outweighing the investment.

Ground Infrastructure refers to ground-based hardware and tools that, when paired with capable aircraft and procedures, enable new capabilities. Procedures refers to the development, certification and production of required airspace, flight and traffic management policies, and procedures. Such a well-timed acceleration of NextGen deployment creates an opportunity to showcase America’s best technologies in the global marketplace where many nations are now seeking air transport infrastructure upgrades. Potential buyers of U.S. technology will recognize that NextGen delivers a return on investment of 3-to-1. Further, U.S. leadership in developing infrastructure solutions like NextGen will help ensure that commercial aerospace exports—which grew 69 percent over the five years to 2015—continue to contribute to the nation’s balance of trade.

These investments simultaneously benefit the American public, including:

**Increased**

> Safety
> High Quality Jobs
> Internal FAA cost savings
> Airspace capacity
> Customer satisfaction
> Small Community Access

**Decreased**

> Fuel consumption
> Carbon dioxide emissions
> Aircraft operating costs
> Noise
> Passenger travel time
> Injuries, fatalities and aircraft losses and damages

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⁴ The Business Case for NextGen, dated July 2016
Public-Private Partnerships

Within the construct of the FAA acquisition management system or even the Federal Acquisition Regulation, public-private partnerships (PPPs) are one option to provide capital necessary to supplement government funding. PPPs can also fund aviation infrastructure projects and maximize competition by allowing vendors the flexibility of developing solutions that fit into their current capacities, product lines, and business models, thereby encouraging the most cost-effective and technically appropriate solutions.

Such an approach allows industry the opportunity to compete in the marketplace and the freedom to innovate, along with business models that will incentivize performance. Additionally, companies can leverage their assets by maximizing their use of commercial off-the-shelf solutions, pre-existing infrastructure and resources they already employ, affording the U.S. Government a shared risk approach with a smaller operation and maintenance bill that also allows consideration for divestiture from land-intensive leases currently required for outdated navigation aids and facilities, communication and surveillance inventory.

Finally, and perhaps most importantly, by partnering with U.S. businesses, the U.S. Government can easily and quickly adapt to local air traffic demands with resultant increases or decreases in service provision.

Bottom line

Aerospace infrastructure investment, including substantial funding of NextGen, represents a critical part of our Nation’s infrastructure reinvestment. Congress should ensure that any near-term infrastructure bill includes provisions supporting PPPs, tax incentives or other means to accelerate the development and deployment of NextGen systems and technologies.

To realize NextGen’s system-wide benefits, such a bill should accelerate deployment both on the ground as infrastructure and in the cockpit through operator equipage of aircraft. Doing so will create and support high-paying, skilled jobs for the U.S. aviation industry in all 50 states, benefit small and large businesses, and yield a positive impact on the entire supply chain. Capacity improvements in the NAS will also directly enable more aircraft sales, and allow U.S. technology companies to partner with the U.S. Government to accelerate national airspace improvements.