



THE OHIO STATE UNIVERSITY

JOHN GLENN SCHOOL OF PUBLIC AFFAIRS

A Call for Supporting a Next Generation Airspace System for the State of Ohio



Ohio, as the nation's "Birthplace of Aviation", is well positioned to be a national leader in providing a 21st century aviation system for its residents and businesses, creating increased economic growth and reducing aviation associated environmental impacts. Implementation of policy that actively supports and commits to the state-wide implementation of the FAA's Next Generation Airspace System, known as, NextGen, is the key for success.

Similar to the United States' interstate highway system that facilitates the transport of people and goods across the nation, the United States' National Airspace System (NAS) is a critical element of the nation's transportation infrastructure, serving as a backbone to economic vitality and growth. Despite increased demand for air travel and improved technologies in computing, satellite navigation, and digital communications in other industries, modernization to a 21st century NAS infrastructure has been slow to evolve. This slow progress is reducing the effectiveness of the Ohio economy.

Through public-private-partnerships with the Federal Aviation Administration (FAA) and leading aviation technology companies, the state of Ohio has an opportunity to be among the leading states in the nation to substantially increase the efficiency and safety of air transportation for all of its 88 counties, while reducing the cost and environmental impacts of aviation operations. Being a leader in adopting the FAA's Next Generation Airspace System, known as NextGen, is the key to capitalizing on such an opportunity.

By Shawn Pruchnicki, Seth Young,
Jeffrey Green, & Caroline S. Wagner

Center for Aviation Studies and
the Battelle Center for Science and
Technology Policy

The Ohio State University
October, 2014

For more information on this
study, please contact Caroline
Wagner at 614.292.7791



Background

Originally developed in the early 20th century, the current NAS is a complex system of navigational and communications infrastructure, primarily built on visual lighting and ground-based analog radio frequency navigation and communications systems, relying on pilots to determine their flight paths by interpreting analog dials and gauges and communicating via the equivalent of a citizens-band radio to air traffic controllers interpreting analog radar displays. Due to the innate inaccuracies and inefficiencies associated with visual, analog, and audio communications systems, the current NAS has a relatively limited capacity to manage high volumes of air traffic.

While the FAA has made incremental upgrades to the NAS over the last 60 years, the NAS still fundamentally operates using an infrastructure that has become dated and in many ways insufficient to accommodate the air transportation demands of the 21st century. As a result, significant delays in air transportation exist, particularly during instances of adverse weather, many airports become inaccessible, and in rare instances, aircraft tragically are lost, as was the case with Malaysian Airlines Flight 370 in March, 2014. Overall, the obsolescence of the current NAS infrastructure has negatively impacted economic growth in the nation.

NextGen is in effect a revolutionary modernization of the NAS. NextGen is based on a navigational infrastructure that leverages the capabilities of the satellite-based Global Positioning System (GPS) and a digital communications system that allows for highly efficient communications among aircraft and air traffic controllers. Using this infrastructure, NextGen will include policies and procedures that allow aircraft to fly more efficient routes, open access to smaller airports, and more accurately and continuously track aircraft, allowing for both increased system capacity as well as system safety. While much of the NextGen infrastructure is being rolled out on a national level and certain select regions where air traffic demand is among the highest in the world, state and local level investments in infrastructure and policy will be necessary to introduce the benefits of NextGen to most other regions within the nation. Ohio's investment in NextGen would certainly position the state as a leader in taking advantage of this system modernization, and as a result be one of the first states to benefit economically from a modernized NAS environment.

Benefits for Ohio

Ohio proudly claims to be the "Birthplace of Aviation." From the Wright brothers, to the pioneering flights of John Glenn and Neil Armstrong, Ohio has enjoyed a long history of shaping the aviation industry. To maintain this tradition, and to accommodate the economic needs of the future, Ohio should be a leader in proliferating NextGen.

Ohio's constituents, if willing to support the NextGen initiative, stand to gain in enhancing the ability to enjoy enhanced air travel in terms of safety, capacity, and efficiency, all of which leads to greater economic growth. NextGen is more than just precise navigation, it is also about data communications and analytics, large scale systems engineering and more. These systems will be manufactured and serviced in those locales that take the lead in NextGen. This should be Ohio.

Investing in NextGen infrastructure in Ohio would enhance an already attractive destination for all air operators including commercial air carriers and the tens of millions of dollars generated for Ohioans from general aviation activities. The implementation and subsequent development of NextGen policy and operational procedures would allow for traffic to make this transition with increased precision and flight paths that can be designed irrespective of the location of traditional ground-based navigation infrastructure. An additional benefit of this design flexibility is the ability



Policy Recommendations for the State of Ohio

NextGen technology is designed to address the increasing challenge of moving growing amounts of air traffic from point to point as quickly and safely as possible¹. This transition is expensive, however, and funds to install NextGen infrastructure in place in Ohio are currently scarce. Educating regional governments and businesses about the importance of NextGen to Ohio's economy, it is more likely that funds will be allocated for this important investment. The following recommendations focus on making Ohio a national leader in more efficient and safer air travel.

■ **Commit to being the first state in the nation where every airport is NextGen capable.** Ohio is home to more than 100 public use airports, ranging from some of the nation's largest commercial service airports to smaller but highly valued general aviation facilities that serve smaller communities. Implementing a statewide NextGen infrastructure will provide increased operational capacity to the larger airports, which in turn will provide for the opportunity to increase air service, increased access to smaller airports, where otherwise poor weather conditions preclude the ability for aircraft to depart and land, and improved safety and reduced environmental impacts for all airports within Ohio.

■ **Provide incentives for NextGen equipped airlines and general aviation operators to base operations and/or increase service presence in Ohio.** Upfront investments in NextGen will lead to reduced operational costs at airports. These savings may be passed along to air carriers, aircraft manufacturers, and other airport customers, making the state of Ohio more competitive to do business.

■ **Partner with the Federal Aviation Administration in supporting further NextGen technologies and policies.** Universities in Ohio have become active NextGen research partners with the Federal Aviation Administration. As such, the state of Ohio is poised to be a leader in testing and implementing the latest advancements in NextGen technologies within the state, creating a "silicon valley" of NextGen.

■ **Encourage high technology companies developing NextGen infrastructure and operational procedures to base in Ohio.** By being a national leader in NextGen support and design, businesses would do well to think of Ohio as a location to flourish.

to mitigate airport noise for local residents by shaping approach and departure paths away from noise sensitive airports. This is a significant concern of many Ohio residents that live close to airport flight operations.

Beyond the reduced delays and more efficient air operations offered by NextGen, one downstream effect of this enhanced capacity is more new aircraft orders. This means more jobs and job security for Ohioans that work for suppliers which serve as the largest supplier to both Boeing and Airbus². This increase could mean expansion for the over 400 aerospace and aviation firms in Ohio³.

¹Burian, B, Pruchnicki, S., Christopher, B., Human factors evaluation of the implementation of the navigation reference system (NRS) Phase 1 report. NASA study 09-AJP61FGI-0101 and funded through FAA AJP-61. Pp. 1-57. March, 2010.

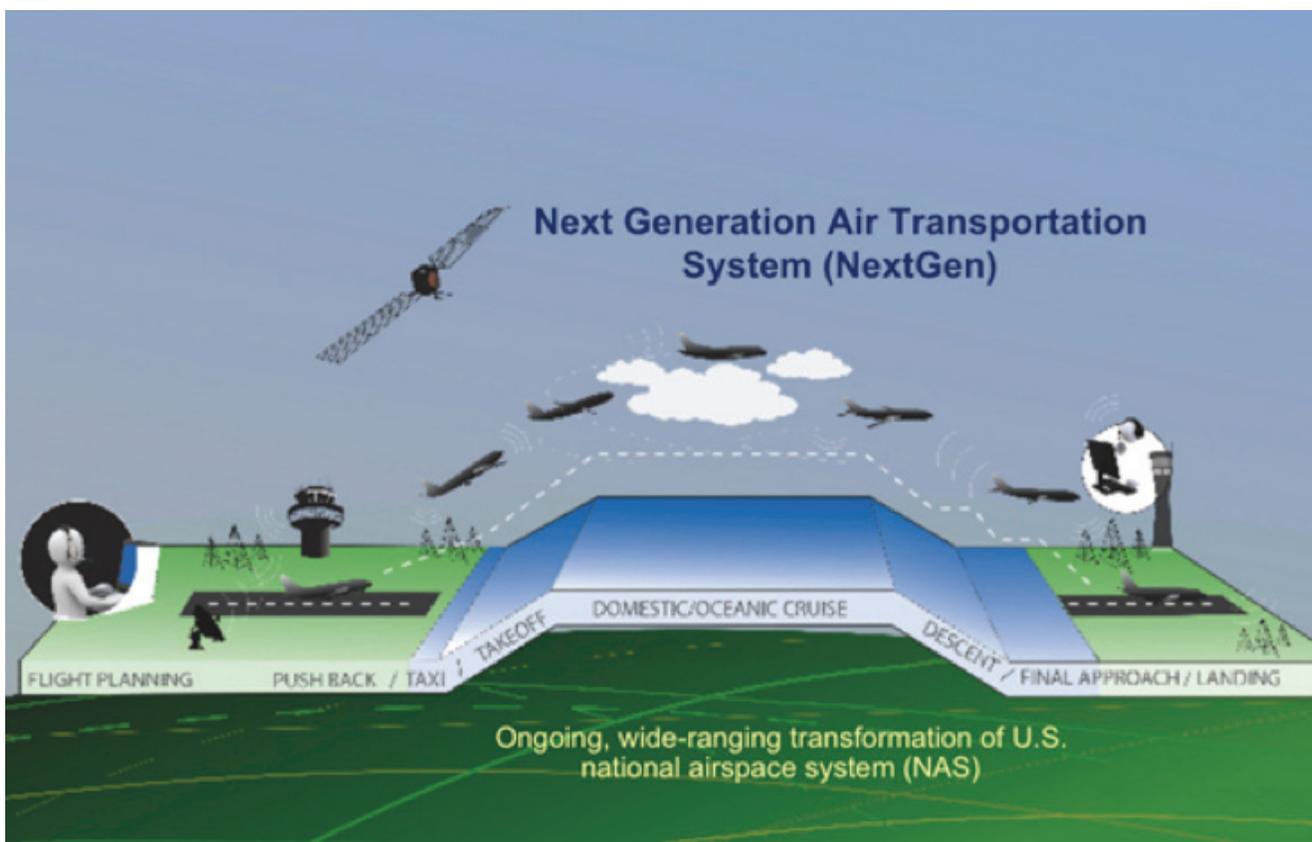
²Jobs Ohio. (2013). Ohio Aerospace & Aviation. Columbus, OH, USA.

³ Green, Jeffery. (2014). NextGen Air Traffic Control: Ohio's Role. Student paper submitted for Science, Engineering, and Public Policy 5800.



Challenges Ahead

Despite the real economic benefits for communities that become early adopters of NextGen, challenges will remain. Ohio has the resources to work with the FAA on operational issues that will be attached to future implementations, yet, local support for the implementation of NextGen in Ohio has been scarce. A statewide coalition of economic development agencies would be well positioned to decide how best to utilize increased airspace capability and to forge the public-private partnership to accomplish the goal of bringing NextGen to Ohio. Making an investment in NextGen could, in fact, be the best aviation opportunity for Ohio since Wilbur and Orville took to the skies.



Source: Federal Aviation Administration

This paper details the results of a symposium on this topic. "International Aviation: Technology and Policy in the 21st Century," was organized by the Battelle Center for Science and Technology Policy at the John Glenn School of Public Affairs in the Spring, 2014, by Caroline S. Wagner and Kelsey Nelson.