

Preface

The importance of civil aviation to the economy, to the nation, and to the quality of life of Americans was made readily apparent by the terrible events of September 11, 2001. Layoffs and financial losses in civil aviation, its supplier industries, the tourism industry, and the broader economy rose sharply.

As air traffic returns to pre-September 11 rates of growth—as projected in the Federal Aviation Administration's (FAA) most current forecast¹—air traffic delays will resume and increase dramatically.² Congestion and delay, a function of capacity-constrained airport and airway infrastructure, not only will inconvenience passengers and shippers; it also will impose considerable costs on the United States as a whole. Conversely, investment in this infrastructure will foster economic growth and enhance safety and security.

On November 27, 2001, just 11 weeks after the terrorist attacks, John Marburger, Director of the White House Office of Science and Technology Policy, reiterated the continued need for investment in the nation's airports and airways in remarks to the Commission on the Future of the U.S. Aerospace Industry:

“We need to develop a 21st Century global air transportation system that provides safe, secure, efficient and affordable transportation of people, goods, and information in peacetime and wartime—enabling people and goods to move freely anywhere, anytime, on time. We need a system that:

- Enhances national security by strengthening homeland defense while enabling the military to project power anywhere in the world at any time;
- Increases U.S. economic competitiveness by building a more efficient, higher capacity air transportation system; and
- Improves the quality of life of all Americans by enabling them to do *what* they want to do *when and where* they want to do it.³

This study addresses the economic competitiveness and quality of life benefits that Dr. Marburger describes.

¹ FAA Aerospace Forecasts: Fiscal Years 2002-2013, FAA-APO-02-1, March 2002.

² This study, initiated in the summer of 2001, could not have foreseen the tragic events of September 11. Nonetheless, current expectations of demand reinforce the aviation sector's concern regarding airport and airway capacity. This concern is shared by the Department of Transportation, which, through the FAA, has re-instituted a proceeding to address reducing delays at LaGuardia and has launched a new proceeding to entertain alternative options to broadly address aviation capacity shortfalls and demand management. These developments provide further evidence that calendar year 2000 is an appropriate baseline for analysis.

³ John Marburger, *The Future Belongs to the Mobile*, Presentation to the Commission on the Future of the United States Aerospace Industry, November 27, 2001.

Executive Summary

Civil aviation has become an integral part of the U.S. economy. It is a key catalyst for economic growth and has a profound influence on the quality of life of populations around the globe. It integrates the world economy and promotes the international exchange of people, products, investments, and ideas. Indeed, to a very large extent, civil aviation has enabled small community and rural populations to enter the mainstream of global commerce by linking such communities with worldwide population, manufacturing, and cultural centers. Civil aviation products and services generate a significant surplus for the U.S. trade accounts and are in the forefront in the development and use of advanced technologies. Fundamentally, civil aviation touches nearly every aspect of our lives, and its success will, to a great degree, shape American society and the U.S. economy in the coming decades.

The ability of civil aviation to foster economic growth and engender social mobility is not, however, guaranteed. By 2000, the economic and personal cost of delays caused by constrained airport and airway capacity and reduced aviation system efficiency reached unacceptable levels. The recent economic downturn and the decline in air transportation following the tragic events of September 11, 2001, provided only temporary relief from the growing problem of congestion and delay—it by no means eliminated the problem. Without swift and thorough intervention, the costs of delay will continue to rise, further harming the U.S. economy, the competitiveness of its industries, and all who rely on aviation in the conduct of their business and personal affairs. Conversely, additional investment in the nation's aviation infrastructure will facilitate economic growth and employment.

This study provides insight into the contribution of civil aviation to the U.S. economy, as well as the economic and employment costs of congestion and delay to the nation and its citizens. Analyzing the Federal Aviation Administration's (FAA) Operational Evolution Plan (OEP), which consists of air traffic initiatives aimed at slowing the growth in congestion and delay, as well as a variety of additional runway investments, this study reveals the essential role that increased airport capacity and modernization of the air traffic system play in managing the growth of these problems and points to the need for additional efforts to reduce them.

The study's findings are based on econometric models that capture the detailed workings of the U.S. economy. The framework of the study ensures consistency between its results and those of the U.S. national system of economic accounts. Using a base year of 2000, the study estimates (in year 2000 constant dollars) the total cost of commercial passenger flight delays in the United States for 2000, 2007, and 2012, and the benefits of increased capacity for the two forecast years.⁴

In contrast to a recent U.S. General Accounting Office report,⁵ this study considers the national benefits of making additional capacity-enhancing investments in aviation infrastructure. The study examines the positive economic impact of reducing congestion by increasing capacity, concluding that early investments are more effective in resolving capacity and delay problems, resulting in significant gains for the United States and its citizens. The analysis indicates the following:⁶

⁴ As the Department of Transportation does not gather comprehensive data about the air traffic delays encountered by general, all-cargo, unscheduled, and military aviation, this study does not include those costs. Nonetheless, these costs are believed to be substantial and proportional to those incurred by other users.

⁵ *National Airspace System: Long-Term Capacity Planning Needed Despite Recent Reduction in Flight Delays*, GAO-02-185, December 14, 2001.

⁶ All values are in year 2000 constant dollars.

1. In 2000, the total impact of civil aviation exceeded \$900 billion and 11 million jobs, representing nine percent of the U.S. gross domestic product. This economic contribution is split as 88 percent commercial aviation and 12 percent general aviation.
2. Congestion and delays had a significant negative effect on the economy in 2000. Commercial airline passenger delays, averaging 12.0 minutes per flight segment for a total of 142 million hours of passenger delay, amounted to \$9.4 billion in U.S. delay costs.⁷ Hundreds of millions of dollars in additional delays accrued to general aviation and commercial cargo operators.⁸
3. If committed OEP aviation infrastructure projects are under-funded or not completed on schedule, the present situation will deteriorate significantly. If no new airport construction or air traffic system improvements are completed, *average* delay per flight segment will rise to 14.5 minutes in 2007 and 16.5 minutes in 2012, increases of 21 percent and 38 percent, respectively, over the 2000 average. Between 2000 and 2012 inclusive, the cost to the U.S. economy of no further infrastructure enhancement beyond 2000 would approach \$170.2 billion.
4. Even if currently committed projects are completed on schedule, the situation in 2012 will be worse than in 2000. Average 2012 delay per flight segment would be 14.7 minutes, an increase of almost three minutes over 2000. Total 2012 passenger delay would rise to 231 million hours, a 63 percent increase over 2000. Total U.S. congestion-related costs for 2000-2012 would fall to \$156.7 billion, a \$13.5 billion improvement relative to no investment.
5. Early completion of aviation infrastructure projects would reduce annual passenger delays by 64 million hours (12 minutes per passenger per roundtrip), or 25 percent. Relative to no investment, these savings would translate into U.S. benefits of \$30.7 billion, plus more than a billion dollars saved by business and personal users of general and cargo aviation. If only current OEP projects and timelines are achieved, congestion and delay will remain well above 2000 levels. On the other hand, advancing the completion of OEP projects and widening their scope would positively impact U.S. employment and economic growth.
6. The FAA estimates that \$11.5 billion will be required to implement OEP air traffic control improvement projects in full; an additional \$5 billion is needed for the runway portion of the OEP. However, history and the pace of current efforts suggest that it will be a challenge to complete these projects according to FAA's current schedule and budget. Aggressively timed, additional investments in aviation infrastructure are fully justified on a cost-benefit basis. Accelerated investment in airport and airway capacity will produce compelling national economic paybacks. Every dollar invested will generate up to five dollars in return for the U.S. economy, a function of reduced congestion costs through the year 2020. If only the very brief stream of benefits through 2012 were considered, benefits would still exceed the required investment by a factor of 2.8.⁹

A long-term, sustained effort beyond the OEP is needed to eliminate congestion and delay. Even in the most aggressive scenario investigated in this study, annual passenger delay hours rise to unacceptable levels, largely a function of projected growth in demand. If these delays were greatly mitigated, personal and economic cost savings would stimulate U.S. economic growth and employment; businesses would realize greater efficiencies and thus compete more effectively in the global arena; the U.S. trade surplus from aviation manufacturing activity and air transport services would increase; the quality of life for U.S. citizens would improve; and environmental benefits would accrue from reduced aircraft emissions.

⁷ Total delay costs include \$4.7 billion to the economy and \$4.7 billion to passengers.

⁸ Since estimated delay costs include only scheduled commercial passenger aviation, they underestimate total U.S. delay costs.

⁹ Since airport capacity enhancements typically last well beyond 20 years, these benefit-cost calculations are highly conservative.