

JPDO Paper

A Recollection of National Transportation Initiatives in the United States

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This paper recalls national transportation initiatives previously undertaken and achieved in the United States which bear similarity to the Next Generation Air Transportation System (NextGen) in terms of scale and potential historic significance. An appendix specifically considers the National System of Interstate Highways.

A goal of the paper is to suggest that NextGen, while unique in its specific objectives, represents merely the latest in a progression of technological advances which have improved and expanded the means, scope, and benefits of transportation available within the United States and beyond.

This paper is expected to remind or familiarize the reader with specific details of Federal initiatives which have served to improve the nation's means of transportation and thereby promote the country's social, commercial, and defense interests in ways that are commonly enjoyed and naturally accepted today.

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As noted in a study titled “The National Economic Impact of Civil Aviation,” the future of America can scarcely be separated from that of its air transportation system. “Civil aviation has become an integral part of the U.S. economy,” the 2002 report summarized.

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, investment, 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.

Ensuring the success of the Next Generation Air Transportation System (NextGen) may seem daunting. Yet while NextGen represents a vastly complex and historic undertaking to affect and improve the lives of virtually all of America’s citizens, it is by no means the first time that such a broadly ambitious effort has been realized.

In fact, throughout the country’s 232 years and in a variety of applications and arenas, the United States has achieved and enjoyed the fruits of similarly significant, large-scale nationwide efforts. For instance, we have already celebrated the bicentennial for President Thomas Jefferson’s orchestration of the Louisiana Purchase. Despite domestic opposition to the deal and its eventual cost of \$23.2 million (or worth approximately \$321.1 million in 2007), Jefferson understood the advantages of obtaining what today amounts to approximately 23 percent of the country, including all or parts of 15 states. Meanwhile, Jefferson’s commission of Lewis and Clark’s Corps of Discovery blazed the nascent nation’s westward path to the Pacific Ocean, and within 70 years afterward laborers of the Central Pacific and Union Pacific railroads met to drive the golden spike of the Transcontinental Railroad.

Much more recently, leaders during the World War II era who have come to be remembered today as “the Greatest Generation” literally saved the world as we know it by shouldering the tasks put before them for the benefit of all.

Before Japan bombed Pearl Harbor in 1941, there was the Lend-Lease Act in which the United States provided its allies with a total of \$50.1 billion (equivalent to \$595.7 billion in 2007) worth of supplies to Britain, France, the Soviet Union, and China. It proved to be a shrewd economic decision, made with keen discernment even during a time of war when more immediately pressing political priorities were popular despite their inevitable eventual costs.

After the defeat of the Axis powers Germany and Japan came the Marshall Plan, beginning in July 1947 the United States for four years provided some \$13 billion (\$119.1 billion in 2007) worth of economic and technical assistance toward the recovery of the European countries numbering among the precursor of today's Organization for Economic Cooperation and Development (OECD). The Marshall Plan helped promote the growth and prosperity of many regions in Western Europe, and is now widely credited as one of the first steps (with the United Nations Relief and Rehabilitation Administration) toward continental integration and the establishment of the European Union.

Eisenhower Paves the Way to Progress

Even more recently, in the late 1950s President Dwight D. Eisenhower led the United States toward two other, if similarly revolutionary, programs to facilitate and advance America's public, private and commercial domestic interests: the Interstate Highway System, and the National Aeronautics and Space Act.

An automotive traveler within the United States today might be hard pressed to contemplate what life was like before the establishment of the Eisenhower Interstate Highway System. Through his experiences in the Army – both during the 1919 Transcontinental Convoy along the Lincoln Highway, and then during World War II when he recognized the benefits of the German autobahn – Eisenhower realized America's overwhelming need for safer and more efficient highways, and recognized the value that newer, multi-lane highways could provide toward a strong national defense.

Federal funding of roads dates from 1916, and planning for a nationwide highway system began in 1921 when the Bureau of Public Roads (BPR) asked the Army to provide a list of roads which it considered necessary for national defense (what came to be known as the Pershing Map). In the late 1930s and early '40s, President Franklin D. Roosevelt commissioned several studies by the BPR regarding interregional expressways. The Federal Aid Highway Act of 1944 called for the designation of a 40,000-mile National System of Interstate Highways to connect principal metropolitan areas and bolster U.S. national defense against land invasion. It was not until Eisenhower's 1956 signing of the Federal Aid Highway Act, however, that interstate highways effectively began to meet the challenges of burgeoning travel and traffic across the nation.

Earlier critics had balked over costs and funding. In 1939, the Bureau of Public Roads estimated that the price tag for construction of a 29,300-mile, national superhighway network topped \$6 billion (\$88.8 billion in 2007). While the proponents among a national coalition of automakers, truckers, bus operators, oil companies, tiremakers, auto clubs, farmers and politicians all understood what was to be gained by the superhighways, they disagreed over who should pay for such improvements.

While Congress generally failed to act before its collective attention was diverted by the demands of World War II, wealthier states undertook to build their own long-distance superhighways. The first 160-mile stretch of the Pennsylvania Turnpike was completed in 1940,

followed by both the New York State Thruway and New Jersey Turnpike. Within the decade, California too began building its freeways.

By 1956, Eisenhower was in a position to help finally break the Congressional deadlock, even though the massive bond issue which he proposed failed to inspire Capitol Hill's fiscal conservatives. Ultimately, Congressional backers of the Interstate Highway System, most notably Senator Al Gore, Sr., of Tennessee, finally persuaded proponents of the Interstate system that they would have to pay for it through higher fuel taxes.

The 1956 legislation signed by Eisenhower poured those new taxes into a Highway Trust Fund that would pay for 90 percent of Interstate highway construction, with the states providing the remainder. Also known as the National Interstate and Defense Highways Act, it facilitated public, private and commercial transportation while meanwhile providing essential routes for ground transportation of military supplies and troop deployments in an emergency.

Eisenhower signed the act into law on June 29, 1956, at an initial cost estimate of \$25 billion (\$189.1 billion in 2007).

The nation's first transcontinental superhighway, Interstate 80 (linking downtown San Francisco to Teaneck, NJ), was completed in 1986. While construction along the Interstate Highway System continues, the general completion of what was touted as "the greatest public works project ever" was recognized by the removal of the last traffic signal on Interstate 90 in Wallace, Idaho, in 1991.

The Interstate Highway System lived up to its billing by helping America to become more mobile, less affected by regional differences, and vastly wealthier.

The Age of Flight Takes Wing

Only two years after signing the Federal Aid Highway Act, President Eisenhower signed the Federal Aviation Act and created the Federal Aviation Agency (which became the Federal Aviation Administration in 1967), and signed similarly forward-thinking legislation with the National Aeronautics and Space Act, establishing the National Aeronautics and Space Administration (NASA) which in little more than a decade would deliver man to the moon.

While the general origins of modern aeronautics and aviation famously derived from Orville and Wilbur Wright's 1903 flight at Kitty Hawk, NC, the potential of flight quickly and literally took off from there. Within a dozen years, NASA's predecessor -- the National Advisory Committee for Aeronautics (NACA) -- was established to undertake, promote, and institutionalize aeronautical research.

The next quantum leap in flight was achieved by Charles Lindbergh's 1927 successful attempt to become the first to fly nonstop between New York and Paris. The airmail pilot from Little Falls, MN, had gained financial backing from a group of St. Louis businessmen to try and win a \$25,000 prize (\$296,000 in 2007) offered by hotel businessman Raymond Orteig for the first transcontinental flight.

With four other pilots having already died, three others being seriously injured, and another two still missing from their star-crossed attempts, most didn't give the 25-year-old Lindbergh much chance. Heightening the odds against him, most reckoned, was his intentions to fly solo and in a single-engine plane, rather than like the others' multi-engine, co-piloted aircraft. Some newspapers dubbed him "the flying fool."

Paris aside, there was doubt about whether the Spirit of St. Louis (so named for Lindbergh's financial backers) would even get aloft, filled as it was with so much fuel for the trip.

Nevertheless, once his airplane reportedly managed to clear telephone lines strung beyond the end of Roosevelt Field's runway by all of 20 feet, Lindbergh was on his way. With sleep deprivation otherwise proving to be his biggest obstacle, an exhausted Lindbergh nevertheless needed only 33 and a half hours in flight to complete the Atlantic Ocean voyage which a ship would otherwise cover over a week's time.

He touched down outside of Paris to the cheers of hundreds of thousands gathered at Le Bourget Field: The historic achievement made headlines worldwide, and the celebrations continued for months back home throughout a nationwide tour commissioned by businessmen and politicians.

After his return to an estimated 4 million people crowding the streets of New York City for a ticker-tape parade, Lindbergh and his airplane toured 92 American cities in 49 states for a three-month tour to tout the potential of aviation. When that ended, he continued on goodwill promotional tours to Central and South America as Lindbergh promoted aviation's potential to connect countries and better cultural understanding between them.

Lindbergh's phenomenal popularity kept him in the public eye, and he remained a prominent figure in the realm of aviation. The predecessor of TWA hired him as an advisor, and labeled its new transcontinental route as the "Lindbergh Line." He also plotted new routes for PanAm throughout the late 1920s and early 1930s.

Lindbergh's first plan for transcontinental air service, nearly a year in the planning, combined air transportation with rail transit until the air route could be safely lit for flying at night. The itinerary included 10 cities spaced between the coasts, starting with travelers boarding a train at New York's Penn Station for an overnight trip to Columbus, OH, where they would cross the street to a new air terminal and board a Ford Trimotor bound for Waynoka, OK, before boarding another railroad passage and then flying from Clovis, NM, over the Grand Canyon and into Los Angeles: Coast to coast in under 48 hours!

Around the same period, in 1933 Boeing rolled out its 247 model, an all-metal, 10-passenger monoplane which has been described as the first modern airliner.

With these benchmarks, soon the American commercial aviation industry would begin to grow exponentially, especially with the end of World War II, with growth continuing today. In 1945, the major airlines flew 3.3 billion revenue passenger miles (RPMs). With the advent of airlines

deregulation (and its new entrants, lower fares and new routes and services) in the mid-1970s, major carriers flew 130 billion RPMs. By 1988, after a decade of deregulation, the number of domestic RPMs had reached 330 billion.

While the growth in air traffic brought on by deregulation suffered a brief setback in 1981 when the country's professional air traffic controllers went on strike, traffic is once again surging. A record 466 million passengers flew in 1990, with 745 million air passengers flying in 2006, according to the Bureau of Transportation Statistics.

In each of the above instances, not only did the growth of the respective industries surpass original expectations, but the breadth of their effects reached beyond common imagination, as illustrated by an editorial from the pages of *The Economist* magazine in 1957, or the year between Eisenhower's presidential enactments of the two historic initiatives.

In noting the political hurdles to be overcome before gaining popular support to such large-scale initiatives, particularly amid the myopia of an election cycle, the editors ironically noted that "A free society has difficulty in achieving so much concentration — especially when the projects are essentially military and political, with little bearing on economic progress or welfare."

Nevertheless, "in any society, it is better in the long run not to lavish paint on a few Potemkin villages, but to improve the drains in real ones. This applies most particularly [when] problems cannot be solved by spectacular showpieces, but only by an advance on a broad front, with patient improvement of the villager's lot matching the progress of industry."

Facing the Challenges Yet Ahead

As with the 20 feet which once represented the distance between a flying fool's failure and achievement, it remains ever essential to see beyond the immediate doubts of naysayers in order to arrive at the real if unimagined benefits yet to be found in far-off destinations.

Each among the national initiatives described above serves as an historical reminder. There are rewards to be gained by meeting the technological, political and social challenges -- both obvious and unexpected -- which otherwise would constrain the nation's aspirations and achievements. Without the leadership for direction and the efforts undertaken which made each initiative a reality, American society would be vastly different today.

Yet challenges remain in this first decade of the 21st century. The ability of the national air transportation system to keep promoting economic growth and social mobility is not guaranteed. Already, the economic and personal costs of delays caused by increasing demand for a conversely constrained airport and airway capacity have reduced the aviation system's efficiency, and affected its performance to increasingly unacceptable levels. Without swift and thorough intervention, the costs of delay will continue to rise.

Barring timely and thorough response to such conditions, further harm looms as an inevitable outcome against the U.S. economy, its global competitiveness and the industries and individuals who rely upon the air transportation system for their livelihood and lifestyles. On the other hand,

additional and aggressively timed investment in the nation's aviation infrastructure can help facilitate economic growth and positive results through NextGen's solutions to problems of capacity and delay, resulting in significant gains for the United States and its citizens.

As visionary as they were, at the time of their greatest achievements neither Thomas Jefferson imagined that his grandchildren would be able to ride a train to the Pacific Ocean, nor Charles Lindbergh that he'd live to see a man walk on the moon.

Today, NextGen represents a next step along the nation's traditional path, one defined by the American persistence in demonstrating that "there are no dreams too large, no innovation unimaginable, and no frontiers beyond our reach."

Appendix A

A Brief History of the National System of Interstate and Defense Highways

Initial Federal planning for a nationwide highway system began in 1921, originally considered as a national defense necessity by the Bureau of Public Roads (BPR). Local or state highway systems grew independently of any Federal initiative during the 1920s and '30s. As automobile traffic increased, planners saw an immediate need for an interconnected national system of highways. In the late 1930s and early '40s, President Franklin D. Roosevelt commissioned several studies by the BPR on the need for and potential design of interregional expressways. One early idea supporting a national public works highway construction project was the possibility of creating thousands of jobs during the Great Depression-era economic slow-downs. The Federal-Aid Highway Act of 1944 called for the designation of a 40,000-mile National System of Interstate Highways to connect principal metropolitan areas and serve national defense purposes by facilitating the expedient transportation of troops throughout the country in any event of invasion. Subsequently, routes were proposed but no legislation during the 1940s actually authorized funds specifically for the Interstate System. Subsequently, construction progress was slow prior to the mid-1950s.

After minimal funding commitments were included in the Federal-Aid Highway Acts of 1952 and 1954, President Dwight D. Eisenhower announced his "Grand Plan" for highways, a plan both driven by his personal conviction for an imperative of cross-country ground transportation and bolstered by lobbying from the major U.S. automobile manufacturers. The plan reached fruition with the Federal-Aid Highway Act of 1956: Serving as a catalyst for the system's development, the Act increased its proposed length to 41,000 miles, called for nationwide design standards, authorized an accelerated program, established a new method for apportioning funds among the States, changed the name to the National System of Interstate and Defense Highways, and set the funding commitments at 90 percent Federal cost responsibility, 10 percent State. The corresponding Highway Revenue Act of 1956 created the Highway Trust Fund as a "pay-as-you-go" funding source, using revenue from gas and other user taxes to pay the Federal share of the Interstate and all other Federal-aid highway projects. Eisenhower appointed the new position of Federal Highway Administrator (FHWA) to oversee the effort through its completion.

Seven major issues challenged passage of the 1956 Act: 1) total cost, 2) payment apportionment [Federal vs. State], 3) funding source [bonds vs. taxes], 4) project duration, 5) highway network total distance, 6) construction standards, and 7) usage restrictions and access. These problems, particularly proposed funding sources, resurfaced throughout the early '60s. Drivers and commercial users initially resisted gas tax increases during years of funding shortfalls, prompting a vigorous public relations campaign by the FHWA to illustrate the relatively small proportion of a motor vehicle's overall operating cost which went to highway construction and maintenance. Also, the more entrenched socioeconomic problems of urban development and racial segregation that would come to the forefront of American politics in the '60s affected development of the system. Displacement of homes and businesses located in routes slated for new highway construction – mostly in urban and minority-populated areas characterized by economic blight –

drew unrest across the country, often coupling with resistance to President Lyndon B. Johnson's push for public housing and urban renewal.

Nevertheless, the overall consensus and bipartisan commitment to a National System of Interstate and Defense Highways as spearheaded by Eisenhower prevented any project-threatening challenges from taking hold.

