

BY HAILEY PHELPS

When Interstates Paved the Way

The construction of the Interstate Highway System helped to develop the U.S. economy

In 1939, the New York World's Fair offered attendees a time traveling look at the "World of Tomorrow." In the General Motors Futurama exhibit, visitors toured an enormous scale model of what a city would look like in 1960. Futurama simulated a low-flying airplane journey; the 18-minute ride gave guests a bird's-eye view of 36,000 square feet of miniatures, including more than 500,000 buildings, 1 million trees of 13 different species, and nearly 50,000 motor vehicles. Probably the most advanced technology in the diorama was the remote-controlled 14-lane multispeed interstate highway system, which introduced the general American public to the concept of a network of expressways connecting the nation. Today, there are several interstate highways in the United States that boast 14 or more lanes. But these mega highways were not built overnight; it took many years of work to receive congressional approval and decades more to construct the network that millions of Americans travel on every day. The improved mobility that the interstate highway system provides has done more than make road trips easier — it has contributed to the growth of the U.S. economy.

FROM DIRT TO PAVEMENT

In the early 20th century, Henry Ford and his assembly line made the Model T car affordable to working-class citizens, which increased mobility exponentially. As cars became more accessible, there was an increased need for greater funding for car-friendly roads. In the 19th century, most roads were constructed for horses and wagons out of dirt or gravel and generally used to travel short distances. To accommodate the Model T craze and meet the demand for better roads, Congress passed the Federal-Aid Road Act in 1916, which granted \$75 million to states for road construction and improvement. It was the first legislation that provided federal aid to the states for their highways. But most states' road construction projects were delayed or slowed in 1917 as labor and capital were shifted to help the war effort, leaving few resources available for other projects. By the end of World War I, only five federal-aid projects had been completed, totaling just 17.6 miles of road.

Railroads were initially the primary method of shipping freight, consumer goods, and people across states. The increased number of shipments required by the war, however, caused the railroads to become congested. One solution to this problem was to ship some of the cargo on trucks. So interstate transportation of freight by truck

became essential, yet interstate roads were still primarily made of dirt, and the trucks caused substantial damage to them. For example, according to the U.S. Federal Highway Administration (FHWA), roads in New York that cost \$11,000 per mile to build in 1912 were estimated to cost \$32,000 per mile to repair at inflated 1918 costs. Despite these costs, it soon became evident that the cost savings of shipping by truck outweighed the costs of repairing roads.

During the Great Depression, the Public Works Administration, part of President Franklin D. Roosevelt's New Deal program, advanced national road construction, created jobs, and improved the economy by building thousands of miles of roads. These roads were part of the U.S. Numbered Highway System, a paved network of two-lane roads, carrying a U.S. route number that crisscrossed the United States. One of the most famous highways constructed during this time was U.S. Route 66, a 2,448-mile stretch of road that linked Chicago to California. In addition to bringing farm workers to California from the Midwest, many Americans enjoyed driving on Route 66 simply for the sake of traveling and seeing the sights along the way.

As passenger and truck traffic on the U.S. highway system grew, however, it became apparent that these roads were beset with deficiencies of design, efficiency, location, and safety. And there was an increased interest in an upgraded interstate network. In 1939, around the time of the world's fair, Roosevelt addressed Congress with a call to action for the development of "a special system of direct interregional highways ... to meet the requirements of the national defense and the needs of peacetime traffic." But following the attack on Pearl Harbor in December 1941, the United States entered World War II, and plans for a national highway system were mostly delayed.

Following World War II, the need for efficient transportation networks became a priority again as the United States emerged as a world leader in goods production. To jumpstart this process, Roosevelt signed the Federal-Aid Highway Act of 1944, authorizing a 40,000-mile national system of interstate highways. Budget legislation did not provide any funding programs for building such a system, however, so development of the interstates would have to wait.

LAUNCHING A NEW PROGRAM

The development of the interstate highway system as we know it today can be attributed to President Dwight D. Eisenhower. As a military officer during World War II, he

was impressed by the German autobahns and wanted a similar highway system for the United States. When he became president in 1953, he revived interest in constructing a national interstate system. On June 29, 1956, Eisenhower signed the \$25 billion Federal Aid-Highway Act of 1956, sanctioning a highway system (later named the Dwight D. Eisenhower System of Interstate and Defense Highways) of 41,000 miles of highways, with strict standards, including nearly 2,000 miles of already-completed toll roads, with the goal of being completed by 1975. In 1968, Congress increased the total length to 42,500 miles.

The interstate system was initially designed to serve three main purposes: to connect the principal metropolitan areas, cities, and industrial centers; to serve the national defense; and to connect at suitable border points with routes in Canada and Mexico. Eisenhower additionally stated four key principles of its construction, which remain to this day: to reduce fatalities and injuries; to keep the roads maintained and in good condition to reduce vehicle operating costs; to permit a means of quick evacuation, military mobilization, and movement of goods; and to manage congestion.

To raise money for the construction of roads on a national scale, Congress created the Highway Trust Fund, which funded 90 percent of construction costs. This fund generated revenue through federally imposed user fees on motor fuels, increasing the price of a gallon of gasoline by one cent. States would pay the remaining 10 percent. By the summer of 1957, most states had begun construction of their segments of the interstate system. Today, more than 46,700 miles of interstate highways are open to traffic. The Dwight D. Eisenhower System of Interstate and Defense Highways serves most large U.S. urban areas and 49 of the 50 states, all but Alaska.

Up until 1956, most Americans viewed a national highway system favorably. When the bulldozers came in 1957 and 1958, however, some urban residents questioned how well big highways and big cities mixed. In 1959, San Franciscans staged the first large-scale rejection of urban freeway planning in the United States, known as the “freeway revolt,” a series of protests and petitions. As a result, the San Francisco Board of Supervisors halted further freeway construction, leaving the Embarcadero Freeway and most of the planned freeway network permanently unfinished. In the following years, negative reactions to freeway construction increased, and there were anti-freeway protests in over 50 cities. Oftentimes, these revolts pitted city residents, who



Interstate 81 under construction in Botetourt County, Va., in June 1964.

cared about the local quality of life, against city planners, who saw interstates as a key to growth.

In a recent working paper, Philadelphia Fed economists Jeffrey Brinkman and Jeffrey Lin found evidence that these revolts were inspired by the diminished quality of life from freeway side effects such as noise and pollution. Additionally, they showed that downtown neighborhoods closer to newly opened freeways exhibited less growth in population and income than neighborhoods farther away from the freeways. They concluded that freeways likely played a significant role in the decentralization of U.S. cities.

INTERSTATES AND THE ECONOMIC ENGINE

As the miles of constructed interstate increased, so did the movement of freight and people. The interstate connected people and places throughout the country to rail yards, marine ports, and airports, improving economic efficiency and productivity. Hard-to-travel areas, such as mountainous regions, became accessible and this opened up east-west travel and transport, directly adding to the economic development of those regions. In rural areas, the interstate highway system made less expensive land more accessible and encouraged development in places that had experienced limited economic growth prior to being connected to a larger system. A 2019 study by Taylor Jaworski and Sergey Nigai of the University of Colorado Boulder and Carl Kitchens of Florida State University found that the construction of the Appalachian Development Highway System, a system of state, U.S., and interstate routes in the Appalachia region, led to national economic gains of nearly \$54 billion (\$22 billion in the Appalachia region) and boosted incomes in that region by reducing the costs of trade.

Productivity in the United States has increased since the development of the interstate highway system, and there is evidence that the interstates are one reason why. According to research by the FHWA, “From 1950 to 1989, approximately one-quarter of the nation’s productivity increase is attributable to increased investment in the highway system.” By improving transportation between regions, the interstate highway system has helped to expand the national market for goods as firms can supply their products to much larger geographical areas at lower costs.

Other research has examined the effect that interstates have had on domestic and international trade costs. In a recent NBER working paper, Jaworski, Kitchens, and Nigai found that removing the interstate highway system would reduce real GDP by \$619.1 billion (3.9 percent), and that 25 percent of that loss would result from reduced international market access. Additionally, they quantified the value of each of the 20 longest interstates; two of the most valuable cross the Fifth District, namely I-40 and I-95.

“These transnational routes are important because they connect the most cities and the most major markets to one another,” says Kitchens. “The routes that are important are not only those that are transnational, but also those that connect ports. Because of this, I-5 [which runs from Canada to Mexico on the West Coast] and I-95 are extremely valuable.”

One reason that I-95 is one of the most valuable segments of the interstate highway system is that it is connected to the Port of Savannah, Ga., otherwise known as “The Quiet Giant.” Twenty-five thousand tons of cargo are transported through this port every day, making it the fourth busiest in the nation. Between 7,000 to 9,000 trucks enter and leave this port daily with goods on their way to retail stores across the Southeast, Midwest, and Gulf Coast, 80 percent of which are distributed on I-95.

When Eisenhower pitched the interstate system to Congress, he justified the cost of the project as a national security measure, but he knew the real value of the investment was the effect it would have on the U.S. economy in the short and long run. Dissertation research by Daniel Leff Yaffe of the University of California, San Diego estimates that the output effects of building the interstate highway system has had a long-run relative multiplier of 1.8, meaning that every dollar spent on interstates has led to \$1.80 of additional economic output. In 1991, one year before its completion, the FHWA issued the final cost estimate of the interstate system at \$128.9 billion, over five times the original estimated cost in 1959 — \$27 billion — adjusted for inflation. Assuming the long-run multiplier is 1.8, the interstate highway system has generated over \$283 billion in additional economic output.

Since the interstate highway system was completed in 1992, the federal government has continued to provide funding for interstates to states through a series of grant



President Dwight D. Eisenhower opens an extension to the George Washington Memorial Parkway in November 1959.

programs collectively known as the Federal-Aid Highway Program. Research published in NBER *Macroeconomics Annual* by San Francisco Fed Economists Sylvain Leduc and Daniel Wilson examined current federal public infrastructure investment and found that federal highway grants given to states boost economic activity in the short and medium term. Overall, each dollar of current federal highway grants received by a state raises that state’s annual economic output by at least \$2.

TAPPING THE BRAKES

Today, as in the 1950s, the interstate system has critics. For example, some people are calling for the “defederalization” of the transportation system to change the incentives created by its current top-down, federally driven decision-making. In a 2017 working paper, Santiago Pinto, a Richmond Fed economist, examined the economic implications of shifting from an institutional arrangement in which transportation decisions are made in a centralized way to one that gives a larger role to local or regional agencies. He found that in a decentralized arrangement, local transport authorities tend to overinvest in transportation that connects the city’s residential areas to local employment centers — compared to a centralized system — but tend to underinvest in transportation that connects cities to one another.

A handful of defederalized transportation authorities, including the Chicago Transit Authority in Illinois, the Metropolitan Transportation Authority in New York, and the Jacksonville Transportation Authority in Florida, exemplify Pinto’s model of a decentralized transportation authority. “An important contribution of these agencies is that transportation decisions would tend to be coordinated among participants, so they would internalize their impact on the local areas,” he says.

Another consequence of the interstate was that many small towns, centered around old state roads and U.S. routes, were left in the dust after the construction of larger interstate roads. These small towns suffered financially after the

construction of the interstate because people were able to bypass these towns in favor of the faster route of transportation. One example of a small town negatively affected by the interstate is Peach Springs, Ariz. In the 1880s, Peach Springs was built as a watering station for steam locomotives. The railroad necessitated the construction of train facilities, housing for railroad workers, a terminal, and a hotel. During the next few years, the town's several businesses catered to travelers and railroad workers. Additionally, Peach Springs advertised itself as the first gateway to the Grand Canyon to attract tourism dollars. When Route 66 was built, Peach Springs prospered and built motels, diners, and gas stations to attract travelers. But when I-40 was built in the 1960s and 1970s, it bypassed Peach Springs entirely. Of the 32 active businesses in Peach Springs before the bypass in 1978, only two businesses remain in the town today: a grocery store and a motel.

The development of the interstate highway system led to economic growth, but it has had mixed results for the quality of life for the people who use it. Some argue the time savings from reduced commuting times has translated into additional time for preferred activities. On the other hand, some argue that the time savings from using interstates are reduced or eliminated because of induced traffic from induced highway demand — that is, increasing the supply or quantity of roads makes people want to use them more. Research published in the *American Economic Review* by Gilles Duranton of the University of Pennsylvania and Matthew Turner of Brown University examined the effect of lane kilometers of roads on vehicle-kilometers traveled (VKT) in U.S. cities. They found that VKT increases proportionately to roadway lane kilometers for interstate highways, and that the sources for this extra VKT are increases in driving by current residents, increases in commercial traffic, and migration. “The provision of roads essentially does nothing for congestion,” Duranton explains. “When new roads are built, they fill up very quickly, and travel conditions do not change.”

In some respects, the construction of the interstate has played a positive role in U.S. urban areas, despite initially being excluded from early stages of interstate planning. The interstate highways increase mobility in urban areas by reducing travel times for cars, buses, and trucks, while lessening traffic congestion on noninterstate roads. The addition of the interstate also allowed cities to expand their

physical size. “In a world where people can only walk or ride a horse, cities cannot be very big, but in a world with widely available transit and cars, cities can grow a lot bigger,” says Duranton.

The interstate connected suburban and rural communities to city centers, but it divided and destroyed urban neighborhoods, particularly in minority communities. For example, within the Fifth District, neighborhoods in Southwest Washington, D.C., were sacrificed to construct I-395, forcing those residents to move to other areas. In an article published in 2007 in the *Quarterly Journal of Economics*, Nathaniel Baum-Snow of the University of Toronto's Rotman School of Management studied the effects of interstate highway construction on population in central cities. His results showed that between 1950 and 1990, the population of U.S. central cities in the United States declined by 17 percent, on average, despite the overall population growth of 72 percent in metropolitan areas. His model estimated an 18 percent population reduction for each addition of a new highway through a central city. His findings showed that if the interstate highway system had not been built, central city populations would have grown by about 8 percent, on average, implying highways played a substantial role in suburbanization in the United States.

Today, many cities are reconsidering highway policies that pushed elevated interstate highways through central cities and caused damage to housing, businesses, and neighborhoods. Since the 1970s, at least two dozen U.S. cities have contemplated removing central-city elevated expressways. So far, a few cities have successfully removed or modified such highways: Boston replaced its Central Artery with a network of tunnels, known as the Big Dig; New York's West Side Highway is now a street-level boulevard; and Harbor Drive in Portland, Ore., is now a waterfront park.

CONCLUSION

In the 65 years since the creation of the interstate highway system in the United States, the growth of the economy and the quality of life and mobility of Americans has substantially increased. Yet the future has turned out to be more complicated than the one presented by Futurama; the transportation arteries presented in miniature in 1939 have delivered challenges as well as benefits after being brought to life. **EF**

READINGS

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