ECONOMIC BENEFITS OF HIGHWAYS

The United States' economy rolls on trucks, and trucks roll on the Interstates, here on Interstate 15 in San Diego County, Calif.

By Tom Kuennen

Interstate highways spur economic growth and change the national economy

The role of our Dwight D. Eisenhower National System of Interstate and Defense Highways and the National Highway System (NHS) – in growing and sustaining our American economy – is manifest.

The Interstates, now part of the NHS, have supported the rapid expansion – to incomprehensible size – of our post-World War II economy, whether it be embodied in manufacturing, tourism, suburban and urban growth, or the revitalization of rural areas.

But the role of the NHS is changing in many ways, even as it sustains our economy and positions it for the coming generations of citizens.

For example, in the case of "just-in-time" truck deliveries, the highway performs so well that it has become the warehouse – as well as the link – between producer and consumer. Just-in-time deliveries help manufacturers manage inventories to enhance cash flow, but it's done at the expense of the road system.

PHOTO COURTESY OF TOM KUENNEN

The daily commutes have changed, with the suburb-to-suburb commute outstripping the conventional suburb-to-city trip. And today it is not unusual, for example, for workers "inside the Beltway" in Washington, D.C., to make their daily trips from Pennsylvania or West Virginia!

Now, the most significant transportation hubs of the future will be multimodal in nature, with Interstate-type highways linking with rail transfer facilities, airports, or seaports, connected perhaps by new-era transportation corridors that bundle separate passenger lanes with truck lanes, high-speed rail, and much more.

Our superb, ever-changing Interstate system makes it all possible.

Traffic, Economy Explode in Latter 20th Century

In the three decades ending the 20th century, according to the American Association of State Highway & Transportation Officials (AASHTO), travel in the United States grew at a rate three times as fast as the growth in population. Underlying economic factors include population growth, but also employment growth, smaller households, and an increase in the number of licensed drivers and vehicles.

From 1980 to 1991, investments in the total highway system by all levels of government averaged a net rate of return of 14.6 percent, well above the average rate of return for all private investment, according to AASHTO's 1998 report, "Transportation and the Economy: National and State Perspectives." Annual rates of return on National Highway System investments alone were above 20 percent, AASHTO reported.

Even more significantly, one-fifth of the increase in productivity of the U.S. economy in that time period was attributable to investment in highways.

One way that America's businesses are leveraging the highway system for greater profitability is through use of just-in-time deliveries. But this application puts more pressure on already burdened highways.

"Just-in-time practices by manufacturers and retailers leads to smaller and more frequent shipments emphasizing speed and reliability," said the National Cooperative Highway Research Program's (NCHRP's) 1996 report, "The Economic Importance of Transportation: Talking Points and References."

"One consequence is increased highway demand and congestion," NCHRP reported. "Companies require more trucks on the road, not to move more freight, but to move it quicker and within a certain schedule." And AASHTO stated, "Competition based on reducing the time necessary for producing or distributing goods is as real as price or style competition."

Because of just-in-time delivery, inventories can be kept lower at both supplier and manufacturer, and manufacturer and retailer. This keeps capital tied up in inventory low, and minimizes a business' exposure to capital tied up in obsolete inventories.

Highways Essential, Intuitively

It's intuitive that our highway transportation infrastructure is essential to our economy. For every $1 billion invested in federal highway and transit spending, 47,500 jobs are created or sustained, reported the House Committee on Transportation & Infrastructure in summer 2005.

"Highway and transit investments stimulate economic activity," the committee added. "They increase productivity by decreasing time spent on the road, encouraging new development, and increasing property values. Transportation infrastructure generates up to a 6-to-1 net return on investment. [And] increased transportation investment improves freight mobility, [as] more than 67 percent of the nation's freight moves on highways, an annual value to the economy of more than $5 trillion."

A few years earlier, the U.S. Department of Transportation's 1997 Federal Highway Cost Allocation Study balanced the tangible benefits of road travel and transport against their social costs, such as traffic accidents, congestion, and air pollution, estimated at as little as several hundred billion dollars per year.

The study found that the tangible benefits of road travel and transport surpass by trillions of dollars per year the presumed social costs. "The gross value of these benefits ranges from $6 trillion to $10 trillion annually," reports the American Petroleum Institute (API) in its 1998 study, "The Benefits of Road Travel and Transport." "Excluded are the intangible benefits – like the personal security that comes from access to emergency services [and the] civic participation which roads facilitate," API said.

Americans spend 20 percent of their total household budgets on transportation, according to AASHTO. "About 94 percent of household transportation expenditures go to purchase, run, and maintain private vehicles," it said in 1998.

Invest in Highways to Reap Economic Benefits

"In order to fully reap the benefits of economic recovery, we must invest in America's infrastructure to sustain growth and new jobs," said Sen. Jim Talent, R-Mo. "We need to invest in America's infrastructure to lower the cost of doing business in America. New and improved transportation infrastructure will make the American economy more competitive, productive, and efficient and also help stem the export of American jobs overseas," Talent said in 2003. "Every additional $1 billion investment in highway and transit infrastructure creates 47,500 new jobs, supports almost $2 billion in family earnings, and generates $540 million in federal income and social security tax receipts. And for every dollar invested in federal transportation infrastructure, an estimated $5.70 in economic activity is generated," he said.

Talent spoke as he introduced a program to sell government bonds to boost federal investment in highways to a level not possible with the existing TEA-21 surface transportation legislation, since

Outdoor Advertising Association of America photo

Early on, dual-lane highways generated travel-related business for increasing numbers of motorists.

supplanted by 2005's SAFETEA-LU. While his proposal was not enacted, it remains an option for the future as the country grapples with how to meet tomorrow's capacity demands with the limited funding of today.

"Investing in infrastructure is the key to generating long-term economic growth by promoting the efficient and productive flow of goods and services," Talent said. "Transportation infrastructure enables commerce to flourish. By investing more in America's transportation infrastructure, we will not only improve national productivity and stimulate the economy here at home, but also increase America's competitiveness abroad. "Investing in our transportation infrastructure will empower American businesses by increasing their competitive edge domestically and globally."

And the need to improve transportation systems is an intermodal challenge that goes well beyond that of conventional, high-level, Interstate-type highways. "Infrastructure investment is a crucial component of a productive and competitive economy because it underpins most private economic activities," Talent said. "The cars and trucks of private business operate on public, federally funded roads. Private shipping companies depend on public ports and waterways. For example, 84 percent of the $7 trillion worth of commodities delivered annually from sites in the U.S. are transported on American

highways. Improving American transportation infrastructure would increase America's productivity and competitiveness by lowering the cost of doing business in America."

Fully optimizing the system – which would require enormous commitment and expenditures – would pay back the investment in like manner, he said. "If the services provided by our transportation infrastructure are exceptional, private enterprises will prosper," Talent said. "New roads, runways, highways, trains, ports, and transit systems reduce travel time and increase productivity. The link between public investment in our transportation infrastructure systems and private productivity is clear. Traffic congestion costs American motorists $67.5 billion a year in wasted time and fuel costs as Americans spend an additional 4.5 billion hours a year stuck in traffic. A significant investment to build and improve roads has the potential to save U.S. motorists $49 billion a year in extra vehicle repairs and operating costs, averaging $255 per motorist. And these potential savings don't account for the economic benefits we could expect from improvements and enhancements across other modes of transportation."

Growing Service Sector

Because most of the nation's new jobs created since 1970 are in the service sector, timely labor and customer access becomes critical to the nation's growth industries. "Additional investments to improve public transportation and highway access – to help eliminate congestion and reduce travel times – support growth of trade and service companies, which are the main creators of new jobs," NCHRP reported.

America's second largest employer – and its third largest retail sales industry – is travel and tourism. As the number of "empty nesters" and double-income households grows, the demand for short trips and vacations will grow, placing demand on highway facilities, NCHRP reports, adding that the travel and tourism industry is totally dependent on reliable and adequate transportation systems to deliver its product.

"Highway sightseeing is also, in and of itself, a leisure-time activity both during weekends and vacations," NCHRP said. "Growth of the tourism and hospitality industry requires increased investment in transportation capacity and congestion reduction."

In addition to major changes in how the economy uses its highway system to deliver its goods and services, big changes have occurred in how business' employees get to work. The way they use their automobiles has changed dramatically.

In 1987, Alan E. Pisarski demonstrated in "Commuting in America: A National Report on Commuting Patterns and Trends" that most of America's commute had forever changed from a hub-and-spoke pattern – in which commuters traveled from suburb to central city and back – to a pattern in which the majority of commuters traveled from suburb-to-suburb.

"Jobs have tended to locate in the suburbs, following behind the population shift to the suburbs," Pisarski said in 1987. "This has made suburb-to-suburb commuting the dominant national commuting pattern."

Image courtesy of Tom Kuennen

In the 1960s, Interstate highways were welcomed and celebrated, as in this picture postcard.

The phenomenon of "trip chaining" also adds value to the commute experience. The increase in female commuters documented by Pisarski not only fueled use of single occupant vehicles (SOVs) for commutes, but bolstered trip chaining, in which a single trip originating at home would involve dropping off kids at school, dropping off dry cleaning, arrival at work; then in the evening, picking up food and kids, followed by arrival at home.

While end users construe trip chaining as good use of time, some transportation planners who challenge the role of the automobile in our society consider them "garbage" trips that don't fit into their models of travel patterns.

"Most of the [commuting] images [were] derived during the fifties and sixties and involved a suburban worker leaving a dormitory-type suburban neighborhood to go to an office downtown," wrote Pisarski in the 1996 follow-up, "Commuting in America II."

"The new understanding had three parts, a boom in workers, often from two-worker households; a boom in suburb-to-suburb commuting, becoming the dominant flow pattern; and a boom in the use of private vehicles, as America's vehicle fleet exceeded the number of drivers," he wrote. The traditional commute – the suburb-to-central city component of flows – decreased its share of growth, he wrote in 1996, accounting for less than 20 percent of total increase during the 1980 to 1990 period, down from 25 percent the previous decade.

Pisarski's third iteration, "Commuting in America III," was anticipated in spring 2006 and was to describe the lengthening commute, sometimes over very long distances, made possible by our splendid NHS.

Trucks Drive Growth But Pose Challenge

The advent of modern national and global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, and consequently

the quality of a region's transportation system has become a key component in a business' ability to compete locally, nationally, and internationally.

Businesses have responded to improved communications and greater competition by adopting processes that require more frequent and more coordinated shipment of goods. "Location Matters," a 2002 analysis by the University of California Transportation Center, found that distribution centers are increasingly moving to areas that have ample land, labor, and access to less congested highways.

A 2004 study by TRIP, The Road Information Program, a national transportation nonprofit research organization based in Washington, D.C., describes the tremendous challenge the new truck traffic will pose to the highway infrastructure and the Eisenhower National System of Interstate and Defense Highways.

According to the TRIP report, called "America's Rolling Warehouses," the nation's current transportation network is inadequate to safely and efficiently accommodate the projected increase in U.S. freight movement unless needed improvements to the transportation system are made.

"The establishment of a national freight policy would help the country to safely and efficiently accommodate increased freight movement," said Will Wilkins, executive director of TRIP, in 2004.

The TRIP report found that in two-vehicle accidents between a large truck and a smaller vehicle, for every large-truck occupant killed in a crash, 46 occupants of other vehicles are killed. Texas, California, Florida, Georgia, and North Carolina lead the nation in the number of people killed in accidents involving large trucks, excluding large-truck occupants, from 1998 to 2002.

The TRIP report also found that increasing traffic congestion threatens business efficiency, as many businesses rely on logistics processes that require a high level of reliability in the timing of freight movement. Traffic delays have tripled in the nation's largest urban areas from 1982 to 2001, and while travel of large trucks increased by 102 percent from 1980 to 2002, the total lane miles of public roads in the United States increased by only 4 percent during that time.

Transportation officials are starting to consider a variety of solutions to accommodate the increase in trucking, including transportation improvements around ports, highway capacity expansion, truck-only lanes, improved rail transport, and roadway safety improvements such as wider lanes and medians to separate oncoming traffic.

SAFETEA-LU Addresses Freight Growth

The concerns of TRIP, AASHTO, and other stakeholders regarding the threat of excess growth of freight traffic were addressed in the new federal surface transportation legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU), signed by President Bush in August 2005.

Communications from the House Transportation Committee give perspective. In 2002, the committee reports, 8.9 billion tons of freight – at a value of more than $5 trillion – was transported by highway. From 1990 to 2000, U.S. truck travel increased by 38 percent. In the next 20 years, truck travel is expected to increase 90 percent due to an expanding economy and the increased reliance on just-in-time delivery.

In response, SAFETEA-LU funds several programs that are specifically designed to improve the movement of freight. It provides $1.9 billion over five years to fund a National Corridor Infrastructure Improvement program, to fund regional and multi-state corridor projects that will improve mobility and economic growth in areas underserved by existing highway infrastructure.

SAFETEA-LU provides $833 million in funding for the Coordinated Border Infrastructure program, which apportions funds to border states for highway projects that will improve the safe and efficient movement of people and goods at or across the border between the United States and Mexico, and the United States and Canada.

The bill also provides $1.8 billion for a new program to fund projects of regional and national significance. This program is designed to fund projects that will have a significant impact on the movement of goods and people beyond the immediate local area of the project.

A new program to address the shortage of long-term parking for commercial vehicles on the NHS also is provided, to the tune of $25 million between fiscal years 2006 and 2009. The bill also creates an Interstate Oasis program, designed to identify facilities near the NHS that offer 24-hour services and parking for heavy trucks and automobiles.

Port congestion is addressed by SAFETEA-LU in intermodal support. It creates a new Freight Intermodal Distribution Pilot program, funded at $30 million between fiscal years 2005 and 2009. It provides $100 million to complete the core deployment and encourage the expanded deployment of the Commercial Vehicle Information Systems and Networks (CVISN) program, which will improve commercial motor vehicle efficiency by allowing trucks to bypass safety inspections and weigh stations, based on their safety records.

And SAFETEA-LU funds several research programs and studies designed to improve freight mobility, including the Freight Planning Capacity Building Program, the National Cooperative Freight Transportation Research program, and the Motor Carrier Efficiency Study.

Intermodalism and Corridors Spur Economic Growth

Transportation enhancements have driven the industrialization of the world, said Walter L. Sutton Jr. and David Marks in "Highways and the New Wave of Economic Growth," in the Federal Highway Administration (FHWA) journal *Public Roads* of July/August 1999. "Transportation improvements have preceded every stage of industrial development in human history," they wrote.

Sutton and Marks quote Dr. John Kasarda at the University of North Carolina, who described four great waves of industrial development and transportation's role in them. In the first wave, great cities developed around seaports and along trade routes. In the second wave, at the launch of the Industrial Revolution, factories used canals and rivers for power and shipping. The third wave of industrial development started

AAA Foundation for Traffic Safety photo

Booming truck traffic is facilitated by the Interstates, but impacts off-system pavements as well.

with the railroad system, which opened up landlocked resources. And the fourth wave of development began with massive investments in highway infrastructure that increased traffic, expanded personal mobility, and accelerated metropolitan growth.

Now, at the dawn of the 21st century, the United States is in a fifth wave of industrialization that is transforming the global market and changing traditional notions of development, Sutton and Marks said. "This wave is based on innovations in logistics and manufacturing," they wrote. "Frequently, components are manufactured in distant countries, and then they are assembled into products near the point of their final consumption or use. Many companies use high-speed jets to ship components or products quickly to far-flung destinations, but all transactions depend on a fast and reliable transportation network that minimizes the cost of production. A recent report by a leading logistics company notes that nearly 80 percent of executives consider product delivery as important as product quality."

Now, more than ever, businesses require a seamless, intermodal transportation system, they said, describing one of the fastest-growing distribution centers in the United States, the Chesapeake Crescent that stretches from Baltimore to Norfolk. "When goods arrive by air or sea, they can be shipped overnight on Interstate highways or rail lines to more than 30 percent of the nation's population," they said. "Intermodal access has been a major asset for the area near Baltimore/Washington International Airport."

Another such intermodal connector is the Alameda Corridor, one of the largest intermodal projects in American history. The Alameda Corridor is a 20-mile railway that will carry freight from the ports of Los Angeles and Long Beach to Southern California railheads. Four overpasses and three underpasses are being built to improve vehicular mobility, and nearly 200 at-grade intersections of roads and railways will be replaced by grade-separated crossings. "These improvements will better position California for fifth-wave business development," Sutton and Marks said. "Local officials estimate that the Alameda Corridor will support 700,000 new jobs in Southern California by 2020."

Another priority for fifth-wave businesses is congestion relief, they said. Annual studies by the Texas Transportation Institute at Texas A&M University document the costs imposed on citizens, businesses, and the general economy due to congestion, some $63.1 billion a year. "The 2005 Urban Mobility Report" measured traffic congestion trends from 1982 to 2003, reflecting the most recent data available; if late 2005's higher fuel prices are factored in, the cost jumps another $1.7 billion.

"While fuel consumption is a large cost for logistics companies, an even greater burden is the time lost because of congestion,"

TEXAS DOT IMAGE

An engineer's rendering of the proposed Trans-Texas Corridor, to roughly parallel the Interstate 53 corridor, is seen here with relative sizes and positions of truck-only lanes, passenger vehicle-only lanes, railways, and utility lines.

Sutton and Marks said. "In a business where time is money, congestion increases production costs and deprives companies of resources that they might otherwise invest in research or firm expansion.

Yet another corridor in gestation is the Trans-Texas Corridor (TTC), a proposed multi-use, statewide network of transportation routes in Texas that will incorporate existing and new highways, railways, and utility right-of-ways. Specific routes for the TTC have not been determined. As envisioned, each route will include:

- separate lanes for passenger vehicles and large trucks
- freight railways
- high-speed commuter railways; and
- infrastructure for utilities including water lines, oil and gas pipelines, and transmission lines for electricity, broadband, and other telecommunications services.

Plans call for the TTC to be completed in phases over the next 50 years, with routes prioritized according to Texas' transportation needs. Texas Department of Transportation will oversee planning, construction, and ongoing maintenance, although private vendors will be responsible for much of the daily operations.

In 2005, then-FHWA administrator Mary Peters joined Texas Gov. Rick Perry and Ric Williamson, chairman of the Texas Transportation Commission, to announce an agreement between the state and a private consortium of engineering, construction, and financial firms. The consortium, Cintra-Zachry, has proposed investing $7.2 billion to develop the approximately 600-mile, Oklahoma-to-Mexico portion of the Trans-Texas Corridor.

"Texas is a national example for all states and a leader in unleashing the resources, innovation, and efficiency of the private sector to bring transportation improvements to the public faster and at less cost to American taxpayers," said Peters. "Public-private partnerships in transportation hold great promise in cutting the congestion that's choking our economy and keeping families apart from one another."

Rural Counties Benefit

New research released in February 2005 underscores the impact that the introduction of Interstate-type highways can have on rural areas. In "Economic Effects of Selected Rural Interstates at the County Level," two consulting firms examined proposed rights-of-way for new Interstate-type highways, and compared them with rights-of-way of existing Interstate highways.

Nine Interstate or near-Interstate corridors were examined. The research correlated data, generally county-level, on population, employment, income, etc. with the time period before, during, and after completion of the Interstate. "In some counties, the changes in population, employment, income, etc. were similar to changes in counties without Interstates," FHWA said. "In some counties, changes were dissimilar and imply that the influence of the Interstate was positive from an economic development standpoint."

The research confirms previous FHWA statements that highway improvement by itself does not bring economic development but, in some cases, combined with other effects, the highway improvement can lead to such development.

The National Highway System brings more than manufacturing and warehousing jobs; it brings service jobs to meet the needs of travelers and tourists. Spurred by outdoor advertising along the rights-of-way, travelers

are led to cafes, filling stations, local historic districts, caverns, and much more. The role of outdoor advertising in stimulating economic growth in underdeveloped areas is so basic that it goes overlooked.

Laboratory in Appalachia

One of the best "laboratories" for the impact of highways on economies has been Appalachia, that region which includes all of West Virginia and portions of 12 other states from Mississippi to New York. Congress established the Appalachian Regional Commission (ARC) in 1965. In order to promote economic development in the region, Congress authorized the commission to carry out a number of programs, including the development of the federally supported Appalachian Development Highway System. The ADHS is envisaged as a 3,440-mile network of highways (with 3,025 miles authorized for improvements by the ARC) providing essential transportation access for improving the Appalachian Region's economic position.

In 1998, the ARC studied 12 of the 26 ADHS highway corridors that were largely complete to determine the extent to which these corridors had helped the region's economy. The Wilbur Smith Associates study presented economic benefits and costs based upon the travel efficiencies created from the improved highways, which accrue to both automobile and truck users, including reduced travel time, reduced vehicle operating costs, and a reduced number of accidents. "The improved travel efficiency along the ADHS corridors ultimately leads to an increase in economic production, job opportunities, wages, population, and travel benefits to the people and the communities the highways serve," the ARC said.

The report also quantified these impacts, using a regional economic model developed by Regional Economic Models, Inc. (REMI), which is a private sector model that was configured for the defined Appalachian Region impact area.

REMI is a comprehensive economic forecasting and simulation model that has been used to evaluate issues such as investments in infrastructure. Travel efficiency benefits (shorter travel times and reduced vehicle operating costs) are inputs into the REMI model, which generate the regionally specific economic development impact estimates, as measured by jobs, wages and value-added.

The study found:

- ADHS had created jobs. By 1995, a net increase of 16,000 jobs was estimated to have been created that would not have existed without the completed portions of the ADHS. The study further estimated that these 12 corridors will, by the year 2015, have created a net increase of 42,000 Appalachian jobs. "These jobs occurred because the ADHS made the Region a better place to invest, live, and work," the council said.
- ADHS had led to increased production. The net increase in value added was $1 billion in 1995, and will increase to $2.9 billion by the year 2015. The total present value of this increased production is $6.9 billion (1965-2025). These increases in the region's production resulted in increased job opportunities and increased wages, ARC said.
- ADHS had created efficiency. The ADHS highway corridors had created travel efficiencies valued at $4.89 billion over the 1965-2025 period. Improved road conditions and access resulted in greater efficiency. By making Appalachia more accessible, economic opportunity expanded.
- The federal investment in the Appalachian Development Highway System was warranted. In 1998, the economic rate of return from an efficiency perspective was 7.87 percent, and from an economic development perspective was 8.29 percent per year (in inflation-adjusted terms, the rate of return would be higher). "This is a solid return on the investment," ARC said. "Over the life cycle of the ADHS, for each $1 invested, the return is $1.18 in efficiency benefits, and $1.32 in economic impact benefits. These are indicative of a good use of taxpayer funds."
- All ADHS corridors yielded benefits. All of the 12 completed ADHS corridors produce efficiency benefits, from a corridor-specific low of $59 million to a corridor high of $1.2 billion. The individual corridor efficiency returns on investment range from 5.44 percent per year to 10.06 percent. And many people benefited. While the most direct beneficiary of the ADHS is the highway user, non-users of the highways were also positively affected, due to job creation, better jobs and wages, and other opportunities.

- The ADHS had made Appalachia more competitive in the national market. The ADHS highways helped the Appalachian region to be better able to compete for economic opportunity. This competitiveness is valued at $2.7 billion over the 1965-2025 period. Even though the system was not yet complete, it already had been helping the region make progress.

The upshot was that the federally supported ADHS – still incomplete at that time – definitely had stimulated economic development in a region that needed it desperately. "The ADHS cannot take credit for all growth, or even a majority of the growth, in Appalachia's prosperity," the council said. "But it can take credit for enough growth (42,000 jobs, 84,000 people, $2.9 billion in wages, $6.9 billion value added) to demonstrate that the ADHS has been a good investment in Appalachia's, and America's, future."

Highways Don't Work in a Vacuum

But highways do not operate in a vacuum. Instead they are just links to existing and future nodes of economic activity. Highways are best at facilitating growth when other elements are in place, according to a 1993 study by the Strom Thurmond Institute of Government and Public Affairs, Clemson University, S.C. The study, "Highways Spur Economic Growth When Other Factors Are in Place," suggests that new four-lane highways can be helpful in stimulating local economic growth, but are not a panacea. Instead, unless a community already has some growth underway, it is unlikely that the new highways will do much to trigger growth.

This dovetails with the 2005 FHWA research on Interstate highway development described above.

"[T]he amount of economic growth new highways stimulate depends upon other factors in place in communities," the Thurmond Institute said. "[Consider] communities at different stages of economic development. At one extreme are urban places with significant existing development in the form of infrastructure and a highly educated, skilled work force. At the other extreme are rural places with little in the way of infrastructure and a work force that is undereducated and largely unskilled. New highways seem to have little effect on economic growth in either of these places.

"But there are other kinds of communities, places, both rural and urban, that have some basic infrastructure (like water and sewer) in place, a cadre of educated, skilled workers, and that are already showing signs of economic growth," the South Carolina institute said. "In these kinds of communities, new highways have their greatest impact, and capital outlays for highways can be part of a rational economic development strategy."

Even so, the payoffs in economic development do not occur immediately, the institute said. "For South Carolina highways constructed in the 1960s and 1970s, the institute study shows a lag of up to 10 years between the time new highways were opened and the resulting gains in employment and income."

Just how adequate highways can optimize internal economic growth in a state was demonstrated in a March 2005 analysis by TRIP. In "The Road to Economic Development in Indiana: An Analysis of the Ability of Indiana's System of Highways, Roads and Bridges to Facilitate Economic Growth," TRIP found that improved highway access is a critical need for many of Indiana's fastest-growing manufacturing companies, which are being counted on to expand employment in the state.

In 2005, the Indiana Economic Development Council found that manufacturing is expected to remain a driving force in the state's economy. But TRIP contrasted that with two recent reports prepared for the Indiana Department of Commerce, which found the most critical variables determining whether Indiana companies prosper, expand, or locate in the state are access to skilled employees, the quality of the transportation system, particularly of highways, access to capital, and business costs.

TRIP observes that a recent survey of U.S. corporations found that highway accessibility was rated the most important of 25 factors listed in determining where a company would locate a plant, warehouse, or other business facility, and notes another recent Indiana study found high-growth companies said the No. 1 competitive advantage that they enjoyed was their location, and that being close to markets, suppliers, and customers was critical to their effectiveness.

But the state is determined to make sure that highways stay at least adequate for businesses to work efficiently, and for them to plan for a future in Indiana. That's important because the share of manufacturing jobs in Indiana is 77 percent higher than the national average and provides twice the share of overall wages in the state than the national average, TRIP reported in 2005, adding that Indiana's manufacturing sector provided approximately 586,000 jobs in the state – 20 percent of statewide salaried employment in the state – compared to a national average of 11 percent in 2003.

"The Indiana Department of Transportation's long-range transportation plan recognizes the need for improvements to the current system to allow for the economic growth that is dependent on the highway systems, and calls for an emphasis on maintaining current road, highway, and bridge conditions and for making strategic expansions of key highway routes to support economic growth, reduce travel delays, and improve safety," TRIP said.

Indiana's transportation plan through 2025 calls for spending 54 percent of state highway money on preservation, and the remainder on expanding key highway routes connecting major urban areas and improving urban traffic flow. Indiana's transportation plan also looks beyond the state's borders, by calling for improved economic competitiveness in the state by reducing the cost of moving people, goods, and freight, and connecting the Indiana Department of Transportation with regional, national, and international markets.

In 2004, Cambridge Systematics and Bernardin-Lochmueller & Associates analyzed the highway improvement projects in Indiana DOT's long-range plan and found that each $1 in spending on highway expansion in the plan would result in $4.60 in benefits to individuals and businesses. These benefits would include improved safety, reduced travel delays, reduced vehicle operating costs, and increased business productivity.

New Revenue Streams Needed to Save U.S. Highway System

By Thomas J. Donohue

During the last 50 years, the Interstate Highway System has fueled America's growth as the world's most powerful and vibrant economy. It has spurred the growth of our cities, provided the sturdy underpinnings of our economy, served as the nation's lifeline to the global marketplace, and dramatically uplifted the quality of life in America. In short, it's the envy of the world.

And just as homeowners would never allow their houses – one of their most important investments and prized possessions – to fall into disrepair, we should not let our highway system continue to deteriorate to dangerous levels.

Is it hard to imagine any business in the United States that does not rely in some way on the Interstate Highway System to move its products, services, or people. Statistics tell part of the story: 74 percent of the nation's goods are transported exclusively by trucks, and Americans log more than 4.8 trillion passenger-miles of travel annually, or about 17,000 miles for every man, woman, and child. What can't be adequately measured is the freedom and mobility that Americans enjoy because of our network of safe and efficient highways and bridges.

Even the creator of the system, President Dwight D. Eisenhower, could not have fully envisioned its economic and social benefits to American society.

On the 50th anniversary of the Interstate Highway System, where do we go from here? We face a stark reality: Highway funding is running out of gas even as the functional life of much of the system comes to an end. Put simply, that means we need more money just to maintain the current state of our roads and bridges.

Revenues in the federal highway trust fund — the taxes and user fees collected from motorists who pay for highway maintenance and construction — are falling far short of what is needed to improve or even sustain existing infrastructure.

How bad is the problem? Current revenues fall $23 billion short annually of the cost of maintaining our roads and transit systems from now until 2030. If we have any intention of improving them, revenues will fall $1 trillion short.

We need to be thinking about alternative financing mechanisms. Indexing the motor fuel tax to inflation, implementing a vehicle mile tax, expanding the use of tolling, and encouraging public-private partnerships in the construction of roads are ideas that deserve to be studied.

The implementation of these strategies will require policymakers at all levels of government to make difficult decisions, but their leadership is critical to continued U.S. economic productivity and competitiveness.

Earlier this year, the United States Chamber of Commerce's National Chamber Foundation (NCF) released the second part of a study by Cambridge Systematics – "The Future Highway and Public Transportation Finance Study" – that outlined new options to fund the nation's transportation system. Such options include switching from the motor fuel tax to a vehicle mile tax or expanding the use of tolling by state and local governments. The first phase of the study pointed out that the federal funding share falls short of what is needed to maintain and improve our transportation infrastructure.

Moving forward, we need to keep our eyes on the prize — economic growth. We have to devise and implement policies that will result in greater investment in our infrastructure and thereby greater economic prosperity. All stakeholders have a responsibility to engage in this debate and make certain that transportation funding is a priority for lawmakers.

That's what the U.S. Chamber of Commerce is doing – educating lawmakers on Capitol Hill about the importance of adequate funding, clearly defining the benefits of our transportation system to all citizens, and contributing ideas and expertise on how to meet growing fiscal challenges.

Given the tremendous long-term economic, environmental, and security benefits of a modernized transportation system, the Chamber will continue to work with federal lawmakers and transportation stakeholders to ensure that our transportation network meets the nation's 21st century needs.

Thomas J. Donohue is president and CEO of the U.S. Chamber of Commerce, the world's largest business federation representing more than 3 million businesses and organizations of every size, sector, and region.