

U.S. INFRASTRUCTURE

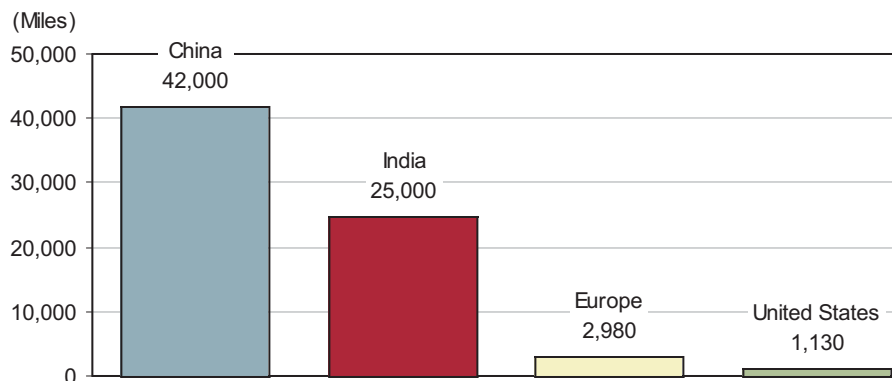
HOW WILL THE NATION SATISFY GROWING DEMAND WITH LIMITED FUNDS?

DEMAND FOR INFRASTRUCTURE: AT AN ALL-TIME HIGH

IHS Global Insight defines infrastructure as comprising the following six major categories: transportation, highways and streets, sewage and waste disposal, water supply, power and public recreation. The following section will discuss why demand for infrastructure is currently so strong. The section will focus primarily on highway and street construction as it is the most critical sector within infrastructure due to the nation's reliance on it for general commerce, productivity, and national competitiveness.

Population growth, urbanization, and globalization have fueled demand for infrastructure. This demand is currently at an all-time high because of a history of under investment. In fact, US investment in infrastructure pales in comparison with that of the rest of the industrialized world. According to statistics acquired by Pennsylvania governor Ed Rendell and reported in *The Wall Street Journal*, the European Union spends six times more than the United States on infrastructure as a percentage of GDP. The United States' deteriorating infrastructure has taken a back seat to other initiatives since Eisenhower's presidency and has struggled particularly hard in light of the war in Iraq, the tightening credit market, mounting housing foreclosures, and the financial meltdown.

MILES OF NEW "INTERSTATE" HIGHWAYS TO BE CONSTRUCTED, 2000-20



Source: World Bank, India's Ministry of Finance, The European Commission, and ARTBA calculations

Although the graph *Miles of New "Interstate" Highways to be Constructed, 2006-20* only depicts highway infrastructure construction, it demonstrates the extent to which investment by the United States is lagging relative to other key countries. Global powers, excluding the United States, have taken their infrastructure

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concerns to the ground and are building the roads necessary to sustain economic growth. According to IHS Global Insight, over the next 10 years, 2008-18, emerging economies will spend US\$17.7 trillion on infrastructure.¹ China is expected to account for the largest share of this spending. India also has an ambitious US\$500 billion plan for power, roads and highways, ports, airports, and telecommunications. Part of the disparity in investment between the United States and China and India is tied to the fact that the United States already has a highly developed infrastructure system.

Highways, Bridges, and Streets: From Potholes to Congestion

In August 2007, the nation's need to replace its infrastructure was highlighted when an interstate bridge in Minneapolis, spanning the Mississippi River, collapsed during rush hour. The collapse killed 13 people and injured 145. This was the first national infrastructure failure to capture the media's attention.

In early January 2008, investigators claimed that the bridge failed because of a design flaw rather than a maintenance malfunction. A metal plate that supported several girders could not support the weight the bridge was holding at the time of the collapse. The bridge was designed in the 1960s and subsequent repairs and renovations had applied an increasing amount of weight to the bridge's supports. The issue with the Minnesota bridge was thus less of an overall inspection problem and more of a design inspection flaw.



August 1, 2008 marked the one-year anniversary of the bridge collapse. Almost a month later, on September 18, a new bridge on Interstate 35 W in Minneapolis crossing the Mississippi River was completed. It was finished within 11 months; construction crews worked 24 hours, seven days a week to build it. The new bridge ended up costing less than the US\$250 million Congress had originally anticipated. The speed and efficiency of this effort highlights the United States' ability to act when required.

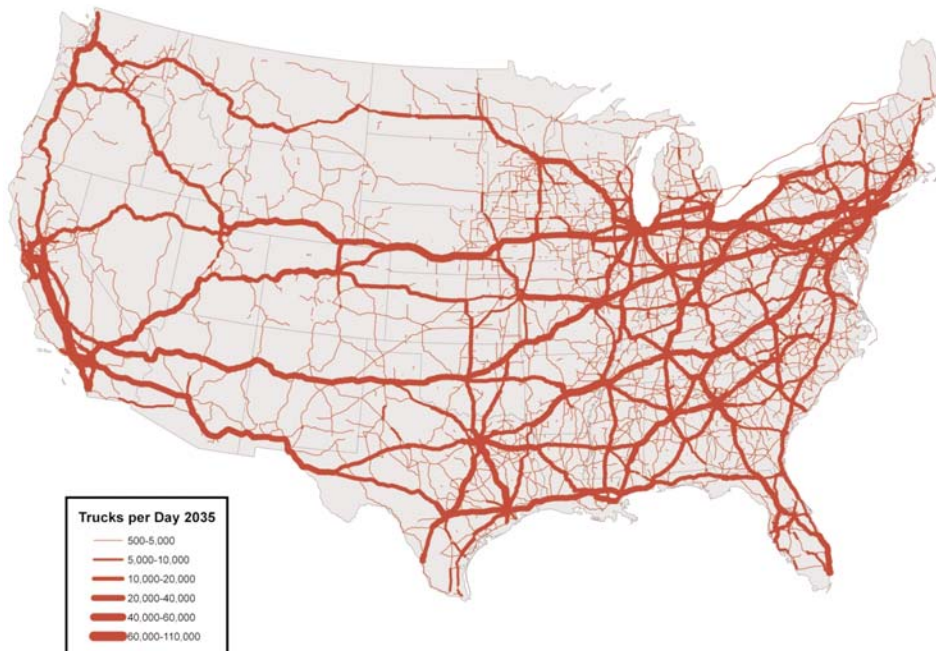
This new bridge is a significant improvement compared with its predecessor. The lanes are much wider, increasing the safety for drivers crossing the river. Approximately 300 sensors were placed inside and outside of the bridge measuring everything from temperature to the strain on the bridge. These sensors will immediately alert the construction management center of any faults or potential issues. Engineers hope that the data they collect will aid in the engineering of other bridges.

The collapse of the Minneapolis bridge alerted the country to the troubling state of its infrastructure. Although the rebuilding of the bridge went smoothly, the rest of the nation's infrastructure is still at a high risk of failure. Extra care and thought was put into the rebuilding of Minnesota's bridge as a result of the lives lost and injuries caused in the collapse, however, the same care and thought is not allotted to the country's other bridges that are in need of repair. As the federal secretary of transportation, Mary E. Peters, stated "It should not take a tragedy to build a bridge this fast in America"

According to recent data from the Federal Highway Administration (FHWA), about 25% of the nation's bridges are in need of repair. Traffic congestion is also becoming a problem. According to the American Association of State Highway and Transportation Officials (AASHTO), congestion on the nation's bridges cause an average of 1.5 million hours in truck delays each year. The FHWA estimates the cost of repairing or modernizing the nation's 600,000 bridges would be US\$140 billion, assuming all bridges were fixed immediately. The average age of the country's bridges is about 43 years old; most were only built to last 50 years.



U.S. TRAFFIC CONGESTION IN 2035: TRUCKS PER DAY BY ROUTE



Source: IHS Global Insight

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U.S. roadways are also of great concern. It is estimated that one of every seven miles of the nation's roads are "not acceptable" according to the National Surface Transportation Policy and Revenue Study Commission. The steel and concrete holding the interstate highways together is between 35 and 40 years old, an estimate established by the Economic Policy Institute. As the nation's roads start to age and deteriorate their use has only increased.

Passenger growth has placed extra demand on land transport. The driving population aged 16 and older is estimated to grow at a compound annual growth rate (CAGR) of 1% during the next ten years (2008-18). By 2018, about 25 million more drivers are expected to be on the road compared with 2008.



The *U.S. Traffic Congestion* map shows those roads that are in the most need of repair, given usage estimates over the next 25 years, and highlights expected bottlenecks. It is no surprise that the majority of congestion falls in the most populous areas of the nation such as Los Angeles – perpetually in a state of gridlock – Dallas Fort Worth, Atlanta, and Boston among others.

According to statistics compiled from a number of sources such as the U.S. Census Bureau, FHWA, and the Texas Transportation Institute, the percent growth of highway demand, capacity and congestion is alarming. From 1982 to 2006, it is estimated the nation's population increased 28.4%, while the number of drivers increased even more, 36.2%. The number of vehicles increased 52.4% and the vehicle miles traveled increased 94.5%. Whereas more people are driving, owning more vehicles, and traveling further, the miles of new roads during this time period only increased 6.6%. This amount of new highway infrastructure is clearly not enough to meet demand as the hours of delay grow an alarming 171.4%. This growth highlights the hours of productivity wasted and dollars of profitability that could have been earned. By 2018, IHS Global Insight expects the total population to grow by 10.1% from its 2008 estimated level. In particular the driving population, aged 16 and above, is expected to increase 10.5% over this period.

Congestion and gridlock are a known problem, but seldom considered is the US\$78-billion annual cost to the U.S. economy through lost productivity. Congestion costs the United States about 2.9 billion gallons of wasted fuel annually, and the average commuter spends 40 hours in gridlock each year – three times the amount spent in 1982. Car and truck traffic is expected to double by 2030, only exacerbating the current problems.

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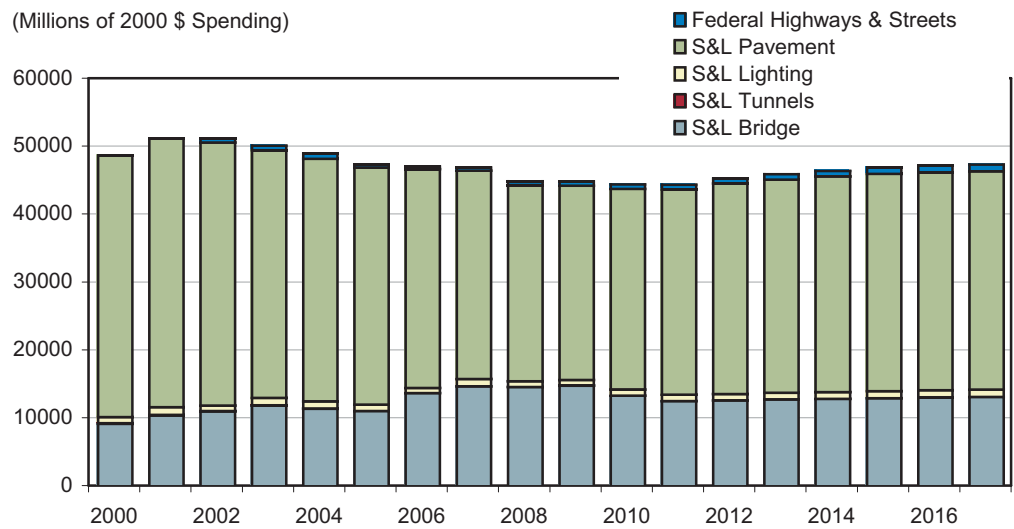
To alleviate the congestion, new roads need to be built or current roads expanded. Minneapolis is one example of a city in need. With the collapsing of the Minneapolis bridge in 2007, the Minnesota legislature felt obligated to commit the majority of new highway funding dollars to repair bridges in the state. One million more people will inhabit the Twin Cities area in 2030 compared with 2000. The Metropolitan Council, the regional planning agency serving the Twin Cities seven-county metropolitan area, claims that US\$40 billion would be needed to add enough highway capacity to meet expected demand in the next 25 years for the Twin Cities area. If the metro area was to accomplish this goal through the gasoline tax alone, gasoline prices would have to increase by more than US\$2 per gallon.² The current gasoline tax stands at 41.9 cents, so that is roughly a 477% increase in the gasoline tax.

In Illinois, a new approach to easing traffic congestion has been proposed. The Northern Illinois Tollway has been documented as the third most traffic-jammed area in the United States. In an effort to reduce traffic, tollway officials have suggested charging a premium for single passenger vehicles traveling in lanes designated for multi-passenger vehicles.³ This would increase the numbers of commuters carpooling and thus, hopefully, decrease the number of vehicles on the road.

Pavement will continue to dominate highway construction spending. At the end of 2007, the pavement on almost 67,000 miles of federal-aid highways was rated “unacceptable.” More roads are being paved with gravel and tar rather than asphalt. This is a direct result of the fact that the cost of a metric ton of asphalt has increased by about 275% in the last 10 years.



HIGHWAYS AND STREETS COMPONENT OUTLOOK



Source: U.S. Census and IHS Global Insight

Transportation demand is expected to grow in conjunction with the globalization of our economy. IHS Global Insight predicts trade will compose 30% of GDP by 2010 compared with 26% in 2000 and 16% in 1990. As trade becomes more important to the United States, the nation’s infrastructure also becomes more critical as it is the key element for transporting goods domestically.

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