

ROADS

A logo consisting of the letters 'D+' in a bold, orange font, enclosed within a thin black rectangular border.

2014 Report Card for Illinois' Infrastructure

Between 1990 and 2012, vehicle travel on Interstate highways in Illinois increased 25 percent, while population grew by 13 percent during the same period. Severe traffic congestion costs Illinois' economy tens of billions of dollars in lost productivity each year. Congestion is estimated to cost \$4.2 billion for the Chicago area alone. 42 percent of Illinois' major roads are in poor or mediocre condition. Driving on roads in need of repair costs Illinois motorists \$3.7 billion a year in extra vehicle repairs and operating costs. The economic loss related to motor vehicle crashes in Illinois cost \$9 billion annually, \$723 for each resident.

Condition & Capacity

Illinois ranks among the top five states in terms of the longest commuting times in the country. Illinois' interstate system carries 29 percent of all vehicle travel in the state. Between 1990 and 2012, vehicle travel on Interstate highways in Illinois increased 25 percent, while lane miles on the system increased 11 percent. Capacity improvements and physical road conditions are not keeping pace with growth in surface travel demand.

Illinois roads are rated to be in better condition than the national average by a slight margin. Compared to larger populous city areas in the country, Chicago roads are generally in fair condition.

Illinois is ranked fourth highest in the nation for tonnage moved by trucks on roadways. The costs associated with congestion delays account for \$9.2 billion worth of freight unable to be transported. Congested interchanges have a major impact on the flow of freight. In fact, two of the nation's top five most highly congested interchanges are located in Chicago where I-90/94 meets I-290 and where I-90 and I-94 meet.

The Chicago area ranks poorly in terms of congestion levels in the category of very large urban areas. Chicago accounts for 189 million hours of delay per year, as compared to an average of 167 million hours for similar very large urban areas, with an annual total loss of \$4.2 billion.

In 2006, 2009, 2012, and 2013 the number of traffic related deaths on roadways in Illinois was 1,254, 911, 956, and 973 respectively. In 2006, Illinois' fatality rate per 100 million vehicle miles traveled (VMT) was lower than the national average. In 2007, 2008, and 2009, Illinois' fatality rate decreased each year for a combined decrease of 26.5 percent over that three-year timeframe. In 2012, Illinois' fatality rate increased slightly since 2006, but it continued to be lower than the national average fatality rate.

Just as the fatality rate has slowly improved, the negative impacts of Illinois' ailing roads are starting better themselves. In 2006, the economic loss due to traffic crashes in Illinois was estimated at \$10.7 billion. In 2009, the estimated economic loss due to traffic crashes in Illinois decreased to \$5.3 billion.

Illinois has the fourth highest freight rate in ton miles (tons of freight moved one mile) and is responsible for facilitating movement of more tons of freight over its roadway network than nearly every other state in the country. The rate of 167,342 million ton miles represents 5.3 percent of the total ton-miles moved in the country in 2002. Every year, \$442 billion in goods is shipped from sites in Illinois and another \$416 billion in goods is shipped to sites in Illinois, with more than 75 percent traveling by truck.

Bottlenecks on the nation’s major roads and highways create significant delays for the U.S. freight industry. The Texas Transportation Institute’s 2012 *Urban Mobility Report* estimates truck congestion resulted in \$27 billion in delay costs in 2011. This delay cost must then be passed onto families and businesses in the form of higher prices.

The high volume of truck traffic on Illinois’ roads exacerbates conditions at the most congested interchanges involving passenger traffic. The Chicago area ranks third in the nation in annual truck delay (22.8 million hours) and delay cost (\$1.72 billion). According to an FHWA’s *Freight Facts and Figures 2012*, Chicago has two of the top six most congested highways in the nation. These locations are:

- I-90/I-94 at I-290, Peak Period Average Speed: 22.44 mph, Congestion Rank: 1
- I-94 at I-90, Peak Period Average Speed: 21.56 mph, Congestion Rank: 6

Pavement Condition Rating and Ranking

According to Federal Highway Administration (FHWA), Illinois has over 139,000 miles of roads - the fourth most in the nation - and represents nearly 3.5 percent of all roadway miles in the U.S. Illinois currently has 2.5 roadway miles to every square mile of land. Other states with greater road miles than Illinois do not have a higher density of roadway miles to square miles of land, such as Texas and California. Illinois’ roadway density is more than double the roadway densities in those states.

	State Highway Agency	County	Town, Township, Municipal	Other Jurisdiction ¹	Federal Agency ²	Total
United States	780,046	1,788,730	1,312,864	60,199	135,917	4,077,756
% of Total	19.13%	43.86%	32.20%	1.48%	3.33%	100.00%
Illinois	15,995	16,513	105,998	743	249	139,498
% of Total	11.47%	11.84%	75.99%	0.53%	0.18%	3.42%

In order to measure the condition of highways and roadways, states are required to report the International Roughness Index (IRI) for the interstate system, other principal arterials, rural minor arterials, and the National Highway System to the Federal Highway Administration (FHWA). This method of measuring the condition of highways and roadways is calculated by dividing the amount of a standard vehicle’s accumulated suspension motion while traveling on a highway or roadway by the total distance traveled during the measurement. The IRI method of rating highways and roadways is recommended by FHWA because it is a standardized and objective measurement. Currently, FHWA does not require all roadways to use this methodology. Roadways that are exempt from measuring the IRI are major and minor collectors and local roads and streets.

¹ Includes State Park, state toll, other state agency, other local agency, and other roadways not identified by ownership

² Roadways in federal parks, forests, and reservations that are not part of the state and local highway systems

The data presented in Table 2 provides Illinois' road condition ratings as compared to the nationwide conditions using the IRI. Pavement rating data for collectors (urban and rural) or local roads (urban and rural) were not included in this data.

Illinois roadways have an average IRI of 131, compared to a national average of 123. An IRI rating less than 95 indicates "good" ride quality. An IRI rating of less than or equal to 170 indicates an "acceptable" ride quality, thus an IRI rating of greater than 171 indicates a "not acceptable" or "poor" ride quality. The ratings only look at the number of roads and not the total roadway miles. From the data presented in Table 2 below, Illinois' roadway system is below the national average and is ranked 36th in terms of best-to-worst roadway conditions in the country when compared with all other states.

	Very Good (IRI <60)	Good (IRI 60–94)	Acceptable (IRI 95–170)	Not Acceptable (IRI 171–220)	Poor (IRI >220)	Not Reported	Overall Avg.
United States	81,203	210,274	303,749	78,258	62,290	24,875	123
% of Total	10.68%	27.64%	39.93%	10.29%	8.19%	3.27%	
Illinois	1,718	9,594	15,960	3,854	4,108	171	131
% of Total	4.85%	27.10%	45.08%	10.89%	11.60%	0.48%	

The Illinois Tollway is an integral part of the state's roadway infrastructure. The Tollway, with approximately 2,049 lane miles and 286 miles long, is operated with toll revenue and is generally not eligible for federal and state funds. With nearly 32 percent of the current Tollway pavement having a life expectancy of less than 5 years, the Tollway's future annual and capital programs are focused on repairing and/or replacing the aging infrastructure.

The current capital programs will replace or repair over 99 percent of the entire Tollway system by 2026 including reconstruction and widening of 84 percent of the entire mainline system. The Tollway network's average pavement surface age is 6.7 years, while the original pavement age is 24.4 years, which includes the age of the concrete pavement and base. It is important that capital programs continue to be implemented by the Tollway.

TRIP, a national transportation research group, states, 42 percent of Illinois' major roads are in poor or mediocre conditions. TRIP also finds that driving on roads in need of repair, costs Illinois motorists \$3.7 billion a year in extra vehicle repairs and operating costs, or \$441 per motorist.

In comparing the pavement conditions in Illinois urban areas to other cities nationally with populations of 500,000 or greater, Chicago ranks 26th out of 68 in terms of road conditions with 42 percent of Chicago-area roads in poor or mediocre condition. Atlanta ranks first with 5 percent and Los Angeles ranks last with 91 percent of its roads in poor or mediocre condition.

Driving on roads in rough condition increases consumer and commercial vehicle costs by accelerating vehicle deterioration, increasing the frequency of necessary maintenance and increasing fuel consumption and tire wear. Rough roads can also increase the crashes on the roadways due to its poor condition. In urban areas with populations of 500,000 or greater, the Chicago area ranks 24th out of 68 in additional vehicle operating costs at \$332 per year.

Travel Times

Illinois has 2,169 miles of interstate routes running the length of the state and connecting the state's major urban areas. Illinois' interstate system includes 3 percent of all roadway lane miles in the state and carries 29 percent of all vehicle travel in the state.

Between 1990 and 2012, vehicle travel on Interstate highways in Illinois increased 25 percent, while lane miles on the system increased just 11 percent.

In 2006, the average travel time to work for an Illinoisan was 27.9 minutes, ranking the state fifth highest nationally and above the national average of 25 minutes. Furthermore, in 2012, commuters in the Chicago metropolitan area experienced an average annual delay of 51 hours per traveler, making it the seventh most delayed metropolitan area in very large urban areas. To compare, the St. Louis metropolitan area has an average delay of 31 hours per commuter.

In the category of very large urban areas with populations of more than 3 million people, a 2012 study conducted by Texas Transportation Institute indicated the Chicago-urban area as ranking third out of the 15 most congested areas in total delay in hours, following New York-Newark and Los Angeles-Long Beach-Santa Ana, California.

The Chicago area ranks second in the U.S. in the amount of extra time spent on an average trip with 43 percent more time spent on the roads due to congestion. Chicago follows Los Angeles and is ahead of the San Francisco – Oakland, California area. Chicago's 189 million annual hours of delay is greater than the national average of 166 million hours in very large urban areas. The study indicates a consistent trend of high congestion since 1982 in the Chicago area. The total congestion provided by the Texas Transportation Institute has cost the economy approximately \$6.2 billion. The average cost of congestion per commuter in Chicago area is \$1,153.

Traffic Safety

Roadway-related deaths and injuries have a significant impact on the well-being of highway users and the state's economic health. In 2006, 2009, 2012, and 2013 the number of traffic fatalities in Illinois was 1,254, 911, 956, and 973 respectively. According to IDOT, in 2006, the economic loss due to traffic crashes in Illinois was estimated to be \$10.7 billion. In 2009, the estimated economic loss decreased 50.5 percent to \$5.3 billion. In 2006, Illinois' fatality rate per 100 million VMT was 1.17 which was lower than the national average of 1.42. In 2009, the fatality rate per 100 million VMT decreased 26.5 percent to 0.86 which was still lower than the national average that decreased 20.4 percent to 1.13. In 2012, the fatality rate per 100 million VMT increased 6.9 percent to 0.92, but it continued to be lower than the national average. There has been a significant reduction in the Illinois fatality rate; it has decreased by 27.6 percent from 1.27 in 2005 to 0.92 in 2012. More importantly, the number of fatalities has dropped steadily from 1,454 in 2003 to 956 in 2012, and the number of incapacitating injuries has decreased from 18,375 in 2003 to 12,401 in 2012, reductions of 34.3 percent and 32.5 percent respectively.

These significant reductions have occurred for several reasons, but are primarily due to legislation. In 2003, a primary seat belt law was passed in Illinois and the Safe, Accountable, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) went into effect in 2005. SAFETEA-LU shifted the focus of transportation safety programs to severe crashes rather than all crashes, held agencies accountable for reducing severe crashes, and

supported an integrated approach which coordinated efforts from engineering, education, enforcement and emergency medical services (commonly referred to as the “4 E’s”).

As a result of SAFETEA-LU, Illinois endorsed the Comprehensive Safety Plan (ICHSP) which targeted a reduction in the number of traffic fatalities to fewer than 1,000 per year by 2008. While Illinois had slightly more than 1,000 fatalities in calendar year 2008, the update of the ICHSP to the Illinois Strategic Highway Safety Plan (ISHSP) included a revised goal of zero fatalities with interim percentage reductions. The ISHSP has 10 emphasis areas for achieving the zero fatality goal:

- Alcohol and other impaired driving,
- Driver behavior and awareness,
- Highway-railroad grade crossings,
- Information systems for decision making,
- Intersections,
- Large trucks,
- Roadway departure,
- Safety belts/occupant protection,
- Vulnerable users, and
- Work zones.

Multi-disciplinary implementation teams are focusing efforts on the emphasis areas to reduce severe and fatal crashes on both the state and local systems using the “4 E’s” approach. As a result of these efforts, many safety programs have either been put in place or enhanced. For example, low-cost safety improvements, such as curve delineation for rural curves and cable median barrier installations along freeways, have been implemented on a system-wide basis.

Targeted enforcement and education programs have also been implemented based on locations and information provided in the 5 percent Report published by IDOT, which identifies the most hazardous locations in the state. Illinois has also focused additional resources on improving the safety of the local road system and improved data quality and availability. The intent of the 5 percent Report is to gain an understanding of the nature and extent of safety problems, to provide guidance to the states as to where safety investments are needed, and to provide a basis for tracking the progress toward improving safety in each state. The FHWA was providing guidance for the process and content of the report. The FHWA Resource Center recommended that the report be as comprehensive as possible. However, MAP-21 no longer requires states to submit a transparency report describing at least 5 percent of a state's highway locations exhibiting the most severe safety needs. Since this information will no longer be maintained by the states, FHWA has removed past reports from the website. Beginning in 2013, FHWA is required to post the state's annual HSIP report to the website instead.

The safety improvements in Illinois are significant when compared to both previous years and other states across the country.

Policy and Funding

IDOT and the Illinois Tollway are the principal agencies that fund roadway improvements in

the state. IDOT has budgeted for a \$10.8 billion capital improvement program between 2009 and 2014 and the Illinois Tollway has budgeted \$12.1 billion for its capital improvement program between 2012 and 2026. The American Recovery and Reinvestment Act of 2009 awarded a total of \$1.3 billion to Illinois for statewide road and bridge projects, of which \$392 million were disbursed by mid-December 2009. Illinois' present capital bill has budgeted approximately \$14.3 billion for projects on roads and bridges in the state. This bill expires in 2014. According to the Transportation For Illinois Coalition (TFIC), once the Illinois Capital Bill expires, the funds available for transportation-related construction projects will decline by about \$2 billion by Fiscal Year 2018. That would result in a two-thirds decline in projects and impact about 20,000 jobs.

IDOT's present Highway Improvement Program includes \$14.314 billion for fiscal years 2010-2015 and \$2.4 billion for FY 2010. Funding for the six-year program is made up of \$7.499 billion in federal funds, \$6.111 billion in state funds and \$704 million in local funds. Approximately 64 percent of the state program is allocated for roadway system and bridge maintenance.

The program is designed to maintain existing facilities with limited budgets to expand the current system or mitigate congestion. Approximately 5,260 miles of interstate and non-interstate roadways will receive some form of system maintenance, which would include reconstruction, resurfacing, widening and/or safety projects, while only 55 miles of roadway would receive funding for major projects that reduce traffic congestion in urban areas and/or improve traffic flow. Only one mile of roadway has been identified for system expansion, which includes projects that increase access and promote economic development.

By focusing on maintenance, the overall condition of roads has, for the most part, remained unchanged, but commuter delays and congestion continue to increase. This will have a negative impact on the state's economy if the freight transportation industry seeks and finds alternate routes around Illinois to avoid the costs associated with congested roadways. Combined with the state's poor fiscal forecast, indications are the roadway system will be unable to adequately meet the increasing demands placed on it in the coming years.

In August 2011, the Illinois Tollway Board of Directors approved a new capital program called Move Illinois (MI): The Illinois Tollway Driving the Future. The new \$12.1 billion capital program includes development and implementation of green lanes and funding for an interchange improvement program to continue congestion-relief and mobility improvements, while introducing new opportunities for regional environmental and economic benefits. The MI capital program was initiated in 2012 and will run through 2026.

Conclusions

The challenges posed by Illinois' highway infrastructure require a large increase in both public and private capital investment. The failure to adequately invest in the state's highways and roads will lead to increased congestion and delays for motorists, further deterioration of pavement conditions, and increased safety concerns. An overstressed infrastructure will slow freight delivery and increase the cost of consumer goods. Previous legislation in Illinois addressed maintenance of the current roadway system, but did not adequately provide for congestion mitigation and increased traffic delays.

Nationally, it is clear that the current funding model for the Highway Trust Fund is failing to produce the revenue required for expanding maintaining transportation infrastructure. While acknowledging the need for a move to a new, sustainable funding system in the long term, other revenue sources in the near-term, such as increased taxes on gasoline and diesel, need to be considered in order to address the current revenue and transportation infrastructure funding shortfalls. However, this measure by itself is not a long-term solution. The U.S. cannot continue to rely upon gasoline and diesel taxes to generate necessary revenues forever, yet currently, simply raising the motor fuels tax to reflect our current needs would be the most efficient means of raising needed revenue. MAP-21 continues the present funding modeling of gasoline and diesel tax rates and does not address a framework based on transportation infrastructure performance nor considers a fully accountable user system which more directly aligns user fees with the benefits, derived by such users. Additionally future legislation must also encourage innovative thinking and solutions from all stakeholders: public, private and academia.

In the absence of adequate funding, the engineering community has responded, providing innovative solutions, with the limited available resources, to maximize benefits. Some examples include diversifying travel between transportation modes (intermodalism - road, rail, port and air), consolidating freight and people transfer points, and focusing on efficient travel nodes (intersections, i.e. roundabout, continuous flow intersections.).

Recommendations

Since decaying roadways are outpacing rehabilitation efforts, the American Society of Civil Engineers (ASCE) Illinois Section makes the following recommendations:

- Create sustainable, long-term funding mechanisms at all levels of government to repair, improve and expand the Illinois surface transportation system and fill or narrow the gap between existing funding available and funding required;
- Implement congestion pricing strategies on the expressways including managed lanes to decrease the highway congestion, to relieve the congestion costs for travelers, and aid economic development;
- Increase funding for long-term, advanced highway research;
- Continue and increase federal funding provided to Illinois under MAP-21;
- Address the long-term viability of fuel taxes for transportation funding and explore the viability of the most promising options to strengthen this funding;
- Evaluate non-traditional practices, including road user fees, public-private partnerships, and design-build practices.

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