MODERNIZING OKLAHOMA'S TRANSPORTATION SYSTEM:

Progress and Challenges in Providing Safe, Efficient and Well-Maintained Roads, Highways and Bridges

June 2014

TRIP
a national transportation research group
202-466-6706
www.tripnet.org

Founded in 1971, TRIP ® of Washington, DC, is a nonprofit organization that researches, evaluates and distributes economic and technical data on surface transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway and transit engineering and construction; labor unions; and organizations concerned with efficient and safe surface transportation.

Executive Summary

Oklahoma's extensive system of roads, highways and bridges provides the state's residents, visitors and businesses with a high level of mobility. This transportation system forms the backbone that supports the state's economy and contributes to the provision of a high quality of life in Oklahoma.

A decade ago, Oklahoma had significant road, highway and bridge deterioration and high rates of traffic fatalities. But beginning with legislative action in 2005 and continuing through state legislative action as recent as 2013, Oklahoma has undertaken a sustained commitment to upgrade the condition and efficiency of its roads, highways and bridges and to reduce traffic fatalities by modernizing its highway system.

By making this effort, Oklahoma has been able to reverse the deterioration of major roads, highways and bridges and has begun to improve traffic safety in the state by modernizing urban and rural roads and highways. These efforts have resulted in a large reduction in the number of state-maintained deficient bridges, the rehabilitation and reconstruction of thousands of miles of roadways, and the completion of safety improvements that are saving numerous lives each year.

But the state still has far to go to meet its initial goals through 2021 for the reconstruction and modernization of the state highway system, additional improvements in road and bridge conditions, and further traffic safety enhancements. Achieving the state's goals for a modern, well-maintained and safe transportation system will require "staying the course" with Oklahoma's current transportation program and doubling down on this effort by proceeding with further transportation improvements well through the next decade.

Population and economic growth have placed increased demands on Oklahoma's major roads and highways, leading to mounting wear and tear on the transportation system.

- Oklahoma's population reached approximately 3.8 million in 2012, a 21 percent increase since 1990, when the state's population was approximately 3.1 million. Oklahoma has approximately 2.4 million licensed drivers.

- Vehicle miles traveled (VMT) in Oklahoma increased 45 percent from 1990 to 2012 – from 33.1 billion VMT in 1990 to 47.9 billion VMT in 2012, higher than the rate of VMT growth nationally, which increased by 38 percent since 1990.

- By 2030, vehicle travel in Oklahoma is projected to increase by another 25 percent.

- From 1990 to 2012, Oklahoma's gross domestic product (GDP), a measure of the state's economic output, increased by 59 percent, when adjusted for inflation.

Oklahoma has been able to rehabilitate approximately a quarter of state-maintained roads and highways since 2006 as the state continues to reconstruct and modernize its highways. While further improvements in roadway structural conditions, safety design and capacity are planned for the state's major roads, Oklahoma will continue to face a challenge in maintaining surface pavement conditions and the need to further modernize its highway system.

- Since 2006, Oklahoma has made significant progress in improving the overall quality and condition of its 12,265 miles of state-maintained roadways, largely due to the increased funding approved by the state legislature beginning in 2005.

- Since 2006, 301 miles of Oklahoma's 673 miles of Interstate were rehabilitated or reconstructed.

- Since 2006, Oklahoma has resurfaced, rehabilitated or reconstructed more than 3,000 miles of non-Interstate state roads and highways.

- Currently, 4,600 miles of Oklahoma's state-maintained roads lack paved shoulders, reducing safety and limiting capacity on these routes. The state's current transportation plan calls for improving 567 miles of these two-lane roads, including the addition of paved shoulders, by 2021, making these routes safer and more efficient.

- Currently 11.5 percent of state-maintained roads and highways in Oklahoma have pavements in deficient condition and this share is anticipated to increase to 12.2 percent in 2021.

The number of Oklahoma's state-maintained structurally deficient bridges has been cut in half in recent years as a result of accelerated bridge replacement and rehabilitation efforts that were made possible by additional funding provided by the state legislature. By 2021 the Oklahoma Department of Transportation (ODOT) anticipates reducing the number of state-maintained structurally deficient bridges to near zero.

- A total of 468 of Oklahoma's 6,800 state-maintained bridges were rated structurally deficient in 2013. This represents a significant reduction since 2004 when 1,168 state-maintained bridges were structurally deficient. From 2006 through 2013 ODOT replaced or rehabilitated 823 bridges.
- By 2021, the state expects to replace or provide major rehabilitation to 924 state-maintained bridges, reducing the number of state-maintained, structurally deficient bridges to near zero.
- As a result of the significant improvement in Oklahoma's state-maintained bridges the state's overall share of structurally deficient bridges, including locally maintained bridges, that dropped from 27 percent in 2006 (the highest share nationally) to 18 percent in 2013 (the fifth highest share nationally).
- A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for

lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks and emergency services vehicles. Structurally deficient bridges are safe for travel and are maintained and monitored on a regular basis by the agencies responsible for their upkeep.

While Oklahoma has made significant safety improvements to its roadways in recent years, the state's traffic fatality rate is still significantly higher than the national average. Improved safety features on Oklahoma's roads and highways are needed to decrease traffic fatalities and serious crashes in the state. It is estimated that roadway features are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.

- Between 2008 and 2012, 3,559 people were killed in traffic crashes in Oklahoma, an average of 712 fatalities per year.

- Oklahoma's overall traffic fatality rate of 1.48 fatalities per 100 million vehicle miles of travel in 2012 is 31 percent higher than the national average of 1.13.

- The traffic fatality rate in Oklahoma declined from 1.57 fatalities per 100 million vehicle miles of travel in 2006 to 1.48 fatalities in 2012 – a six percent decrease. During that time, the national fatality rate decreased 20 percent from 1.41 to 1.13 fatalities per 100 million vehicle miles of travel.

- The traffic fatality rate on Oklahoma's non-Interstate rural roads in 2012 was more than two-and-a-half times higher than on all other roads and highways in the state – 2.52 fatalities per 100 million vehicle miles of travel compared to 0.92.

- Since 2006, 635 miles of cable median barriers have been completed or are under construction on Oklahoma's divided high-speed roads. These barriers have dramatically reduced the number of fatalities resulting from crossover collisions. From 2007 to 2012, the number of fatalities due to crossover collisions in Oklahoma dropped from 39 to six.

- Nearly a third – 31 percent – of miles of state-maintained highways in Oklahoma (3,862 of 12,265 miles) are rated as either critical or inadequate for safety, based on an evaluation of safety features such as passing opportunities, adequate sight distances, existence of paved shoulders, recovery areas for errant vehicles and the severity of hills and curves.

- By 2021, the miles of state-maintained highways in Oklahoma that are rated either critical or inadequate for safety are anticipated to be reduced from 3,862 to 3,680.

- Several factors are associated with vehicle crashes that result in fatalities, including driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes.

- Where appropriate, highway improvements can reduce traffic fatalities and crashes while improving traffic flow to help relieve congestion. Such improvements include removing or shielding obstacles; adding or improving medians; improved lighting; adding rumble

strips, wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; and better road markings and traffic signals.

- Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the Texas Transportation Institute (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.

Federal funding for Oklahoma's roads, highways and bridges may be cut as early as this summer because of a lack of adequate federal transportation revenue. The current federal transportation program, which provides funding for the state's roads and bridges, is set to expire this fall and will require Congressional action to continue beyond September 30th, 2014. Future state highway spending will also be reduced by $75 million annually, which will be required to pay off bonds that were issued to help pay for the state's recent road and bridge improvements.

- The MAP-21 program, approved by Congress in July 2012, increased funding flexibility for states and improved project approval processes to increase the efficiency of state and local transportation agencies in providing needed transportation improvements.

- The impact of inadequate federal surface transportation revenues could be felt as early as summer of 2014, when federal funding for road, highway and bridge projects is likely to be delayed because the balance in the Highway Account of the federal Highway Trust Fund is expected to drop below $1 billion. This delay and uncertainty in funding will likely result in the postponement of numerous projects.

- MAP-21 does not provide sufficient long-term revenues to support the current level of federal surface transportation investment. Nationwide federal funding for highways is expected to be cut by almost 100 percent from the current investment level for the fiscal year starting October 1, 2014 (FY 2015) unless Congress provides additional transportation revenues. This is due to a cash shortfall in the Highway Trust Fund as projected by the Congressional Budget Office.

- If the funding shortfalls into the federal Highway Trust Fund are addressed solely by cutting spending it is estimated that federal funding for highway and transit improvements in Oklahoma will be cut by $625 million for the federal fiscal year starting October 1, 2014, unless Congress provides additional transportation revenues.

- Oklahoma is obligated to pay $75 million annually to retire bonds issued over the last decade to help pay for road, highway and bridge improvements in the state.

The efficiency of Oklahoma's transportation system, particularly its highways, is critical to the state's economy. Businesses are increasingly reliant on an efficient and reliable transportation system to move products and services. A key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers.

- Annually, $117 billion in goods are shipped from sites in Oklahoma and another $135 billion in goods are shipped to sites in Oklahoma, mostly by truck.

- Eighty percent of the goods shipped annually from sites in Oklahoma are carried by trucks and another seven percent are carried by courier services or multiple mode deliveries, which include trucking.

- Highway accessibility was ranked the number one site selection factor in a 2011 survey of corporate executives by Area Development Magazine.

Sources of information for this report include the Federal Highway Administration (FHWA), the Oklahoma Department of Transportation (ODOT), the Bureau of Transportation Statistics (BTS), the U. S. Census Bureau, the Congressional Budget Office (CBO),the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA). All data used in the report are the most recent available.

Introduction

Oklahoma's roads, highways and bridges form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, schools, shopping, natural resources and recreation. To foster a high quality of life and to support a high level of economic competitiveness in the Sooner State, it is critical that Oklahoma's roads, highways and bridges continue to be improved and modernized.

Starting with state legislative efforts in 2005 and continuing through further legislative action in 2012, Oklahoma has been able to reverse decades of infrastructure deterioration and make significant improvements to its transportation system. These improvements include a large reduction in the number of deficient bridges, the rehabilitation of thousands of miles of roadway, and safety improvements that are saving numerous lives each year.

As Oklahoma faces the challenge of making further progress in preserving, modernizing and improving its roads, highways and bridges, the future level of federal, state and local highway funding will be a critical factor in whether the state's residents and visitors gain the benefit of a well-maintained, efficient and safe transportation system.

This report examines the condition, use and safety of Oklahoma's roads, highways and bridges; recent improvements in the state's transportation system; the status of road, highway and bridge funding in the state; and future plans for further state transportation improvements. Sources of information for this report include the Federal Highway Administration (FHWA), the Oklahoma Department of Transportation (ODOT), the U. S. Census Bureau, the Texas Transportation Institute (TTI), the Congressional Budget Office (CBO), the Bureau of Transportation Statistics (BTS), and the National Highway Traffic Safety Administration (NHTSA).

Population, Travel and Economic Trends

Oklahoma residents and businesses require a high level of personal and commercial mobility. Population and economic growth results in an increased demand for mobility and an increase in vehicle miles of travel. To foster a high quality of life and continued economic development in Oklahoma, it will be critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, recreation and vehicle travel.

Oklahoma's population grew to approximately 3.8 million in 2012, a 21 percent increase since 1990, when the state's population was approximately 3.1 million.[1] There are approximately 2.4 million licensed drivers in Oklahoma.[2] From 1990 to 2012, Oklahoma's gross domestic product, a measure of the state's economic output, increased by 59 percent, when adjusted for inflation.[3]

Population and economic growth in Oklahoma have resulted in an increase in vehicle travel in the state. From 1990 to 2012, annual vehicle miles of travel in Oklahoma increased by 45 percent, from 33.1 billion miles traveled annually to 47.9 billion miles traveled annually.[4] Based on population and other lifestyle trends, TRIP estimates that travel on Oklahoma's roads and highways will increase by another 25 percent by 2030.[5]

Road Conditions

The life cycle of Oklahoma's roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[6] As roads and highways continue to age, they will reach a point of deterioration where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

Using the proceeds from increased funding provided by the state legislature beginning in 2005, Oklahoma has made significant progress in improving the overall condition of its roadways, including their underlying surfaces. Since 2006, 301 miles of the state's 673 miles of Interstate highways have been rehabilitated or reconstructed.[7] While Oklahoma's Interstate system represents only 5.5 percent of the centerline miles of the state's system, 33.5 percent of daily travel occurs on the Interstate.[8] The Oklahoma Department of Transportation (ODOT) has also resurfaced, rehabilitated or reconstructed more than 3,000 miles of non-Interstate highway pavements since 2006. [9]

Despite the significant investment made in pavement repair by ODOT since 2005, and projected to continue through 2021, the state continues to face a significant challenge in maintaining pavement conditions on its state-maintained highways.

Currently 11.5 percent of state-maintained roads and highways in Oklahoma have pavements in deficient condition and this share is anticipated to increase slightly to 12.2 percent in 2021.[10] Roads rated deficient may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced but often are too deteriorated and must be reconstructed.

Oklahoma plans to further rehabilitate its state-maintained highways, including making improvements that will provide significant safety benefits. Currently, 4,600 miles of state-maintained roads lack paved shoulders, reducing safety and limiting capacity on these routes. The state's transportation plan calls for improving 567 miles of these two-lane roads, including the addition of paved shoulders, by 2021, making these routes safer and more efficient. These improvements will reduce the miles of state-maintained two-lane roads in Oklahoma without paved shoulders to 4,033.[11] An additional 184 miles of Oklahoma's Interstate system are also slated to be improved by 2021 as part of ODOT's current Eight-year Plan.[12]

Bridge Conditions

Additional transportation funding has allowed ODOT to reverse the trend of deteriorating bridges and eliminate the state's former status of having the highest percentage of structurally deficient bridges in the nation. The number of structurally deficient state-maintained bridges has been cut in half in recent years as a result of accelerated bridge replacement and rehabilitation efforts that were made possible by additional funding provided initially by the state legislature in

2005 and continuing through state legislative action as recent as 2012. ODOT plans to reduce the number of state-maintained structurally deficient bridges to near zero by 2021.[13]

A total of 468 of Oklahoma's 6,800 state-maintained highway bridges were rated structurally deficient in 2013.[14] This represents a significant reduction since 2004 when 1,168 highway bridges were structurally deficient.[15] From 2006 through 2013 ODOT replaced or rehabilitated 823 bridges.[16] By 2021, ODOT plans to replace or rehabilitate an additional 924 bridges, including all structurally deficient state-maintained bridges.[17]

As a result of the significant improvement in Oklahoma's state-maintained bridges the state's overall share of structurally deficient bridges, including local bridges, has dropped from 27 percent in 2006 (the highest share nationally) to 18 percent in 2013 (the fifth highest share nationally).[18]

A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks and emergency services vehicles. Structurally deficient bridges are safe for travel and are maintained and monitored on a regular basis by the agencies responsible for their upkeep.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, ensuring that a facility has good drainage and replacing deteriorating components. But most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

Traffic Safety

While Oklahoma has made significant safety improvements to its roadways in recent years, the state's traffic fatality rate is still significantly higher than the national average. Making additional safety design improvements on Oklahoma's roads and highways would likely result in further decreases in traffic fatalities and serious crashes in the state.

A total of 3,559 people were killed in motor vehicle crashes in Oklahoma from 2008 through 2012, an average of 712 fatalities per year.[19]

Chart 1. Oklahoma Traffic fatalities 2008 – 2012.

Year	***Fatalities***
2008	749
2009	738
2010	668
2011	696
2012	708
Total	**3,559**

Source: National Highway Traffic Safety Administration

Oklahoma's overall traffic fatality rate of 1.48 fatalities per 100 million vehicle miles of travel in 2012 is 31 percent higher than the national average of 1.13 fatalities per 100 million vehicle miles of travel.[20] And while the state has seen a modest reduction in its overall traffic fatality rate, it lags behind the nationwide average fatality rate decrease. Since 2006, the fatality rate in Oklahoma declined from 1.57 fatalities per 100 million vehicle miles of travel to 1.48 fatalities in 2012 – a six percent decrease. During that time, the national traffic fatality rate decreased 20 percent from 1.41 to 1.13 fatalities per 100 million vehicle miles of travel.[21]

Recent safety improvements completed in the state have resulted in a significant traffic safety improvement. Since 2006 ODOT has completed or has under construction 635 miles of cable median barriers on the state's divided high-speed roads.[22] These barriers have dramatically reduced the number of fatalities resulting from crossover collisions. From 2007 to 2012, the number of fatalities due to crossover collisions in each year dropped from 39 to six, resulting in an annual reduction of 33 traffic fatalities.[23]

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

Improving safety on Oklahoma's roadways can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and a variety of improvements in roadway safety features.

The severity of serious traffic crashes could be reduced through roadway improvements such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals where appropriate.

Roads with poor geometry, with insufficient clear distances, without turn lanes, inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Numerous Oklahoma roads and highways still lack adequate safety design features, although the state expects to continue to make progress in improving safety design on some of its key routes.

Nearly a third – 31 percent – of miles of state-maintained highways in Oklahoma (3,862 of 12,265 miles) are rated as either critical or inadequate for safety, based on an evaluation of safety features such as passing opportunities, adequate sight distances, existence of paved shoulders, recovery areas for errant vehicles and the severity of hills and curves.[24] By 2021, the miles of state-maintained highways in Oklahoma that are rated either critical or inadequate for safety are anticipated to be reduced to 3,680.[25]

Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the Texas Transportation Institute (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.[26]

Importance of Transportation to Economic Growth

Local, regional and state economic performance is improved when a region's surface transportation system is expanded or repaired. This improvement comes as a result of the initial job creation and increased employment created over the long-term because of improved access,

reduced transport costs and improved safety. Highway accessibility was ranked the number one site selection factor in a 2011 survey of corporate executives by Area Development Magazine.[27]

Businesses have responded to improved communications and the need to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management and Internet commerce. The result of these changes has been a significant improvement in logistics efficiency as firms move from a push-style distribution system, which relies on large-scale warehousing of materials, to a pull-style distribution system, which relies on smaller, more strategic movement of goods. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Highways are vitally important to continued economic development in Oklahoma, particularly to the state's tourism, agriculture, energy and manufacturing sectors. As the economy expands, creating more jobs and increasing consumer confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the state's highways and major arterial roads.

Every year, $117 billion in goods are shipped from sites in Oklahoma and another $135 billion in goods are shipped to sites in Oklahoma, mostly by trucks.[28] Eighty percent of the goods shipped annually from sites in Oklahoma are carried by trucks and another seven percent are carried by multiple-mode deliveries, including trucks.[29]

The cost of road and bridge improvements are more than offset by the reduction of user costs associated with driving on rough roads, the improvement in business productivity, the reduction in delays and the improvement in traffic safety. The Federal Highway Administration estimates that each dollar spent on road, highway and bridge improvements results in an average

benefit of $5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.[30]

Transportation Funding

Investment in Oklahoma's roads, highways and bridges is funded by local, state and federal governments. The federal government provides funding for the state's transportation system largely as part MAP-21, the current two-year federal surface transportation program, which expires in September 2014.

The federal government remains a critical source of funding for Oklahoma's roads, highways and bridges and provides a significant return to Oklahoma in road and bridge funding based on the revenue generated in the state by the federal motor fuel tax. From 2008 to 2012, the federal government provided $1.33 for road improvements in Oklahoma for every one dollar paid in the state in federal motor fuel fees.[31]

While MAP-21 increased funding flexibility for states and improved project approval processes to improve the efficiency of state and local transportation agencies in providing needed transportation improvements, it did not provide sufficient long-term revenues to support the current level of federal surface transportation investment.

The impact of inadequate federal surface transportation revenues could be felt as early as summer of 2014, when federal funding for road, highway and bridge projects is likely to be delayed because the balance in the Highway Account of the federal Highway Trust Fund is

expected to drop below $1 billion. This delay and uncertainty in funding will likely result in the postponement of numerous projects.

Nationwide, federal funding for highways is expected to be cut by almost 100 percent from the current investment level for the fiscal year starting October 1, 2014 (FY 2015) unless Congress provides additional transportation revenues. This is due to a cash shortfall in the Highway Trust Fund as projected by the Congressional Budget Office.

If the funding shortfalls into the federal Highway Trust Fund are addressed solely by cutting spending it is estimated that federal funding for highway and transit improvements in Oklahoma will be cut by $625 million for the federal fiscal year starting October 1, 2014, unless Congress provides additional transportation revenues.[32]

Another concern for future highway investment in Oklahoma is the need to pay off bonds that were issued over the last decade to assist in funding the road, highway and bridge repairs in the state. Oklahoma is obligated to pay $75 million annually to retire highway bonds issued over the last ten years.

The level of investment in the state's roads, highways and bridges has a significant impact on the health of Oklahoma's economy, because of the large number of jobs created. A 2007 analysis by the Federal Highway Administration found that every $1 billion invested in highway construction would support approximately 27,800 jobs, including approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.[33]

Conclusion

Nearly a decade ago Oklahoma committed itself to modernizing its aging network of roads, highways and bridges, which literally are the backbone of the state's economy and play a critical role in the daily lives of its citizens and visitors.

Today Oklahomans are benefiting from this commitment to an improved transportation system in the form of roads, highways and bridges that are in better condition, more reliable and safer. The state has a transportation program in place to ensure further progress through 2021 in the condition, reliability and safety of its most heavily-traveled roads, highways and bridges.

But with the level of future federal transportation expenditures uncertain and the need for the state's leaders to maintain their current level of commitment to supporting a strong state transportation program through 2021 and beyond, it will be critical that Oklahomans remain steadfast in their support for adequate funding to provide a safe, well-maintained and efficient transportation system in the Sooner State.

# # #

Endnotes

[1] U.S. Census Bureau (2012). http://www.census.gov/popest/data/state/totals/2012/index.html
[2] Highway Statistics (2012). Federal Highway Administration. http://www.fhwa.dot.gov/policyinformation/statistics/2011/dl1c.cfm
[3] TRIP analysis of Bureau of Economic Analysis data.
[4] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 1990 and 2012.
[5] TRIP calculation based on U.S. Census and Federal Highway Administration data.
[6] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
[7] *Update on Oklahoma Bridges and Highways*. Oklahoma Department of Transportation, November 2013.
[8] Ibid.
[9] Ibid.
[10] Oklahoma Department of Transportation, 2014. Response to TRIP survey.
[11] *Update on Oklahoma Bridges and Highways*. Oklahoma Department of Transportation, November 2013.

[13] Ibid.
[14] Ibid.
[15] Ibid.
[16] Ibid.
[17] Ibid.
[18] Federal Highway Administration (2014). National Bridge Inventory.
[19] TRIP analysis of National Highway Traffic Safety Administration data (2013).
[20] TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2013).
[21] TRIP analysis of 2006 and 2012 National Highway Traffic Safety Administration and Federal Highway Administration data.
[22] *Update on Oklahoma Bridges and Highways*. Oklahoma Department of Transportation, November 2013.
[23] Ibid.
[24] Ibid.
[25] Ibid.
[26] Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Texas Department of Transportation. http://tti.tamu.edu/2012/08/09/tti-study-analyzes-roadway-improvements/
[27] Area Development Magazine (Winter, 2012). 26th Annual Survey of Corporate Executive Results.
[28] Bureau of Transportation Statistics (2010), U.S. Department of Transportation. 2007 Commodity Flow Survey, State Summaries. http://www.bts.gov/publications/commodity_flow_survey/2007/states/
[29] Ibid.
[30] FHWA estimate based on its analysis of 2006 data. For more information on FHWA's cost-benefit analysis of highway investment, see the 2008 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance.
[31] TRIP analysis of Federal Highway Administration data. 2008 to 2012 Highway Statistics sf-1.
[32] U.S. Senate Committee on Environment and Public Works (2013). http://www.epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=cf1dfe4e-8e60-4506-a9e0-205fe809f314

[33] Federal Highway Administration, 2008. Employment Impacts of Highway Infrastructure Investment.