

# ***FUTURE MOBILITY IN TEXAS:***

## The Cost of Meeting the State's Need for Safe and Efficient Mobility

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*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, construction and finance; labor unions; and organizations concerned with an efficient and safe surface transportation network.*

## Executive Summary

Transportation is more than just driving on Texas' roads and bridges or using public transit. It's about receiving packages in a timely manner, easily grabbing groceries on the way home, or safely traveling across the state. Transportation provides the connections that keep businesses up and running. It not only moves people, it makes the movement of goods and services possible and provides the state's residents with a high quality of life. The quality of Texas' extensive system of roads, highways, bridges and public transit has a significant impact on the level of safety and mobility of the state's residents, visitors and businesses.

As the backbone that supports the Lone Star State's economy, Texas' transportation system impacts each resident every day. It provides for travel to work and school, visits to family and friends, and trips to tourist and recreation attractions. Transportation connects Texas businesses with customers and the world. It provides the goods and services people need each day and plays a role in every product manufactured and every customer businesses serve.

With a current unemployment rate of 7.1 percent and with the state's population continuing to grow, Texas must improve its system of roads, highways and bridges to foster economic growth and keep businesses in the state. In addition to economic growth, transportation improvements are needed to ensure safe, reliable mobility and quality of life for all Texans.

### **An inadequate transportation system costs Texas residents a total of \$23.2 billion every year in the form of traffic crashes, additional vehicle operating costs (VOC) and congestion-related delays.**

- A lack of available transportation funding in the future is projected to lead to increasingly deteriorated road and bridge conditions and additional congestion in Texas' major urban areas. Without additional funds, the state will be unable to complete many needed transportation improvement projects.
- TRIP estimates that Texas' roadways that lack some desirable safety features, have inadequate capacity to meet travel demands or have poor pavement conditions cost the state's residents approximately \$23.2 billion annually in the form of traffic crashes, additional vehicle operating costs and the cost of lost time and wasted fuel due to traffic congestion.
- TRIP has calculated the annual cost to Texas' residents of driving on roads that are deteriorated, congested and lack some desirable safety features both statewide and in the state's four largest metropolitan areas. The following chart shows the annual cost breakdown per driver for each of these areas and also a statewide total.

Location	VOC	Congestion	Safety	TOTAL
Austin	\$ 235	\$ 743	\$ 256	\$ 1,234
DFW/Arlington	\$ 364	\$ 924	\$ 255	\$ 1,543
Houston	\$ 415	\$ 1,171	\$ 305	\$ 1,891
San Antonio	\$ 545	\$ 591	\$ 290	\$ 1,426
<b>Statewide Total</b>	<b>\$6.1 billion</b>	<b>\$10.8 billion</b>	<b>\$6.3 billion</b>	<b>\$23.2 billion</b>

**Population increases and economic growth in the Lone Star State have resulted in increased demands on the state’s major roads and highways.**

- Texas’ population reached approximately 25.7 million in 2011, an increase of 51 percent since 1990. The state’s population is expected to grow to 37.3 million by 2030.
- From 1990 to 2010, annual vehicle-miles-of-travel (VMT) in the state increased by 44 percent, from approximately 162 billion VMT to 234 billion VMT. Based on travel and population trends, TRIP estimates that vehicle travel in Texas will increase another 35 percent by 2030, reaching approximately 304 billion VMT.
- From 1990 to 2010, Texas’ Gross Domestic Product (GDP), a measure of the state’s economic output, increased by 88 percent, when adjusted for inflation.

Nearly half of Texas’ state and locally maintained urban roads are deteriorated. Without additional transportation funding, pavement conditions will worsen in the future.

- In 2010, 18 percent of Texas’ major urban roads were in poor condition and an additional 27 percent were in mediocre condition.
- The pavement data in this report is provided by the Federal Highway Administration, based on data submitted annually by the Texas Department of Transportation (TxDOT) on the condition of major state and locally maintained roads and highways in the state.
- Roads rated in poor condition 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. Roads in need of repair cost the average Texas motorist \$400 annually in extra vehicle operating costs – \$6.1 billion statewide. Costs include accelerated vehicle depreciation, additional repair costs and increased fuel consumption and tire wear.
- Driving on roads in need of repair carries a heavy financial price tag, especially for residents of the state’s major metropolitan areas, where pavement deterioration may be worse than the statewide average. The chart below details pavement conditions and the extra vehicle operating cost (VOC) borne by the average motorist in the state’s four largest urban areas.

URBAN AREA	Percent of Pavement in Poor Condition	Percent of Pavement in Mediocre Condition	Percent of Pavement in Fair Condition	Percent of Pavement in Good Condition	Additional Vehicle Operating Costs Per Motorist
Austin	9	14	21	56	\$ 235
DFW/Arlington	11	36	26	26	\$ 364
Houston	19	28	23	30	\$ 415
San Antonio	33	24	17	26	\$ 545
STATEWIDE	18	27	22	33	\$ 400

- The functional life of Texas’ roads is greatly affected by the state’s ability to perform timely maintenance and upgrades to ensure that structures last as long as possible. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.

**Eighteen percent of bridges in Texas show significant deterioration or do not meet current design standards. This includes all bridges that are 20 feet or more in length and are maintained by state, local and federal agencies.**

- Three percent of Texas’ bridges were structurally deficient in 2011. A bridge is structurally deficient if there is significant deterioration of the bridge deck, superstructure or substructure or if the bridge was designed to carry light loads. Structurally deficient bridges may be closed in some situations, but more often are posted for lower weight limits, which restricts or redirects larger vehicles, including commercial trucks, school buses and emergency services vehicles.
- Fifteen percent of Texas’ bridges were functionally obsolete in 2011. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

**Improving safety features on Texas’ roads and highways would likely result in a decrease in traffic fatalities in the state. TRIP estimates that roadway features are a contributing factor in approximately one-third of all fatal and serious traffic crashes. Texas’ rural traffic fatality rate is significantly greater than the fatality rate on all other roads in the state.**

- Between 2006 and 2010, 16,635 people were killed in traffic crashes in Texas, an average of 3,327 fatalities per year.
- Texas’ traffic fatality rate of 1.30 fatalities per 100 million vehicle miles of travel in 2010 was higher than the national average of 1.11 fatalities per 100 million vehicle miles of travel.
- The traffic fatality rate in 2010 on Texas’ non-Interstate rural roads was 1.67 traffic fatalities per 100 million vehicle miles of travel, which is higher than the 1.17 fatalities per 100 million vehicle miles of travel on all other roads and highways in the state.

- A disproportionate share of highway fatalities occurs on Texas’ rural, non-Interstate roads. In 2010, 34 percent of traffic fatalities in Texas occurred on rural, non-Interstate routes, while only 23 percent of vehicle travel in the state occurred on these roads.
- The cost of serious traffic crashes in Texas in 2010, in which roadway features were likely a contributing factor, was approximately \$6.3 billion. Roadway features which 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. The cost of serious crashes includes lost productivity, lost earnings, medical costs and emergency services.
- 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 a contributing factor in approximately one-third of fatal traffic crashes.
- TRIP has calculated the cost of serious traffic crashes in which roadway features were likely a contributing factor for each of Texas’ four largest urban areas.

<b>Location</b>	<b>Fatalities</b>	<b>Safety Cost Per Driver</b>
Austin	78	\$ 256
DFW/Arlington	312	\$ 255
Houston	366	\$ 305
San Antonio	146	\$ 290
<b>Statewide Total</b>	<b>2,998</b>	<b>\$6.3 billion</b>

- Roadway features which 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.
- 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.
- The Texas Transportation Institute (TTI) found that recent TxDOT projects 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.
- The Federal Highway Administration has found that every \$100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.

**Commuting and commerce in Texas are constrained by growing traffic congestion, which will increase in the future unless additional highway and transit capacity is provided.**

- According to the Texas Transportation Institute, congestion will cost the state’s economy an average of \$20 billion per year over the next 15 years, rising from a current cost of approximately \$10.8 billion per year to almost \$30 billion in 2025.
- If roadway efficiency and capacity needs are not addressed, the average congestion-related delay per commuter in Texas’ urban and metropolitan areas will double in 15 years from 37 hours per year to 74 hours per year.
- The total annual statewide cost to Texas’ motorists of lost time and wasted fuel due to congestion is \$10.8 billion. Commuters in the state’s four largest metro areas lose from several hundred to over one thousand dollars annually in the cost of lost time and wasted fuel due to congestion.

<b>URBAN AREA</b>	<b>Yearly Delay Per Commuter (Hours)</b>	<b>Gallons of Fuel Wasted Annually</b>	<b>Annual Congestion Cost Per Commuter</b>
Austin	38	10	\$ 743
DFW/Arlington	45	22	\$ 924
Houston	57	28	\$ 1,171
San Antonio	30	9	\$ 591

**Unless transportation funding is increased, Texas’ roads and bridges will become increasingly deteriorated and congested and needed safety improvements will remain unfunded. The state faces a significant funding shortfall in the amount needed just to maintain the transportation system in its current condition.**

- Over the past decade, roadway maintenance and capacity in Texas have been largely funded through bond proceeds. However, all bonding programs have now been exhausted, resulting in a 50 percent drop in funding levels from a decade ago and leaving no funds available for new construction.
- A report issued by the [2030 Committee](#) calculated that an annual investment of \$9.9 billion was needed just to maintain road and bridge conditions and congestion at 2010 levels. However, after fiscal year 2013, annual state highway investment is anticipated to average \$2.6 billion annually.
- Under current funding scenarios, overall pavement quality is projected to decrease by 30 percent by 2022. Failing to address pavement deterioration in a timely manner increases repair costs over time. In Texas, underfunding maintenance on the state’s roads will increase the cost to preserve and restore the pavement by \$6.5 billion over the next ten years.
- While the growth and expansion of Texas’ oil, gas and wind energy sectors has been beneficial for the state’s economic well being, increased traffic (especially by heavy trucks) has had a significant impact on the condition of the state’s roads and highways. A new report by the Texas Transportation Institute found that the cost of additional road

repairs needed as a result of the energy boom's wear and tear on state and county roads in Texas is estimated to be \$2 billion each year for the next 20 years.

**The efficiency of Texas' transportation system, particularly its highways, is critical to the health of the state's economy. Businesses are increasingly reliant on an efficient and reliable transportation system to move products and services. Expenditures on highway repairs create a significant number of jobs.**

- Every year, \$1.2 billion in goods are shipped from sites in Texas and another \$1.2 billion in goods are shipped to sites in Texas, mostly by trucks. Sixty percent of the goods shipped annually from sites in Texas are carried by trucks and another nine percent are carried by parcel, U.S. Postal Service or courier services, which use trucks for part of their deliveries.
- 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.
- [Site Selection magazine's 2010 survey](#) of corporate real estate executives found that transportation infrastructure was the third most important selection factor in site location decisions, behind only work force skills and state and local taxes.
- 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.

*All data used in the report is the latest available. Sources of information for this report include the Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), the U.S. Census, The Bureau of Transportation Statistics (BTS), the National Highway Traffic Safety Administration (NHTSA) and the Texas Transportation Institute (TTI).*

## **Introduction**

Texas' roads, highways, bridges and public transit systems form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping and recreation, as well as to technology centers, manufacturing plants and industrial zones.

Today, with the state continuing to experience growth in population and travel, the modernization of Texas' transportation system is crucial to providing safe and efficient mobility, while improving the economic livelihood of the state and accommodating future growth.

As the nation looks to rebound from the recent economic downturn, improving Texas' transportation system could play an important role in advancing the state's economic well being by providing critically needed jobs in the short term and by improving the productivity and competitiveness of the state's businesses in the long term.

This report examines the condition, use and safety of Texas' roads, highways and bridges and calculates the cost to the state's motorists of driving on a deteriorated and congested system that lacks some desirable safety features.

All data used in the report is the latest available. Sources of information for this report include the Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), the U.S. Census, The Bureau of Transportation Statistics (BTS), the National Highway Traffic Safety Administration (NHTSA) and the Texas Transportation Institute (TTI).

### ***Population, Travel and Economic Trends in Texas***

Despite the recent economic downturn, population and economic growth in the Lone Star State over the past two decades resulted in a significant increase in the demand for mobility and



an increase in vehicle miles of travel (VMT). To support a high quality of life in Texas, it will be critical that the state provide and preserve a safe and modern transportation system that can accommodate future growth in population, vehicle travel and economic development.

Texas' population grew 51 percent between 1990 and 2011, increasing from 17 million in 1990 to approximately 25.7 million residents in 2011.<sup>1</sup> The population of Texas is projected to increase to 37.3 million by 2030.<sup>2</sup> The state also has experienced significant economic growth over the last two decades. From 1990 to 2010, Texas' gross domestic product (GDP), a measure of the state's economic output, increased by 88 percent, when adjusted for inflation.<sup>3</sup>

Steady population increases and economic growth in Texas have resulted in a significant increase in vehicle travel in the state. From 1990 to 2010, annual vehicle miles of travel in Texas increased 44 percent, from approximately 162 billion miles traveled annually to 234 billion miles traveled annually.<sup>4</sup> TRIP estimates that travel on Texas' roads and highways will increase another 35 percent by 2030, to approximately 304 billion miles of travel.<sup>5</sup>

## **Condition of Texas' Roads**

According to the Federal Highway Administration (FHWA), in 2010, nearly half of Texas' urban state and locally maintained roads and highways were deteriorated. The FHWA pavement data in this report is based on data submitted annually by the Texas Department of Transportation (TxDOT) on the condition of major state and locally maintained roads and highways in the state. Eighteen percent of Texas' major urban roads were rated in poor condition, providing motorists with a rough ride.<sup>6</sup> Roads rated poor 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. An additional 27 percent of Texas' major urban roads were rated in mediocre condition.<sup>7</sup> Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition. An additional 22 percent of the state's major urban roads were in fair condition and 33 percent were in good condition.<sup>8</sup>

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.<sup>9</sup>

As Texas' roads and highways continue to age, they will reach a point 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.

### **The Costs to Motorists of Roads in Inadequate Condition**

TRIP has calculated the additional cost to motorists of driving on roads in poor or unacceptable condition. Roads in poor condition – which may include potholes, rutting or rough surfaces – increase the cost to operate and maintain a vehicle. These additional vehicle operating costs include accelerated vehicle depreciation, additional vehicle repairs, increased fuel consumption and increased tire wear. TRIP estimates that additional vehicle operating costs

borne by Texas motorists as a result of poor road conditions total \$6.1 billion annually, or \$400 per motorist.<sup>10</sup>

The chart below details pavement conditions in Texas’ four largest metropolitan areas in 2010 and the annual additional vehicle operating cost per motorist in each area.

**Chart 1. Pavement conditions and vehicle operating costs.**

<b>URBAN AREA</b>	<b>Percent of Pavement in Poor Condition</b>	<b>Percent of Pavement in Mediocre Condition</b>	<b>Percent of Pavement in Fair Condition</b>	<b>Percent of Pavement in Good Condition</b>	<b>Additional Vehicle Operating Costs Per Motorist</b>
Austin	9	14	21	56	\$ 235
DFW/Arlington	11	36	26	26	\$ 364
Houston	19	28	23	30	\$ 415
San Antonio	33	24	17	26	\$ 545
STATEWIDE	18	27	22	33	\$ 400

**Source: TRIP analysis of Federal Highway Administration Data.**

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.<sup>11</sup>

The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP’s additional vehicle operating cost estimate is based on taking the average number of miles driven annually by a motorist, calculating current vehicle operating costs based on

AAA's 2012 vehicle operating costs and then using the HDM model to estimate the additional vehicle operating costs paid by drivers as a result of substandard roads.<sup>12</sup> Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored in to TRIP's vehicle operating cost methodology.

## **Bridge Conditions in Texas**

Texas' bridges form key links in the state's highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, and facilitating commerce and access for emergency vehicles.

In 2011, 18 percent of Texas' bridges were in need of repair or replacement.<sup>13</sup> Three percent of Texas' bridges were rated as structurally deficient in 2011.<sup>14</sup> This includes all bridges that are 20 feet or more in length and are maintained by state, local and federal agencies.

A bridge is structurally deficient if there is significant deterioration of the bridge deck, superstructure or substructure or if the bridge was designed to carry light loads. Bridges that are structurally deficient may be closed in some situations, but more often are posted for lower weight limits if their condition warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Fifteen percent of Texas' bridges were rated as functionally obsolete in 2011.<sup>15</sup> Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment with the approaching roadway.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, insuring 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 Congestion in Texas

Traffic congestion in Texas is a growing burden in key urban areas and threatens to impede the state's economic development. Congestion on Texas' urban highways is growing as a result of increases in vehicle travel and population. Highways that carry high levels of traffic are also vulnerable to experiencing lengthy traffic delays as a result of traffic accidents or other incidents.

The chart below details the impact of congestion on drivers in the state's four largest urban areas, including the yearly hours of delay, gallons of fuel wasted each year, and the annual cost to the average motorist in the form of wasted time and congestion related delays.<sup>16</sup>

### **Chart 2. Impact of congestion on drivers in Texas' four largest urban areas.**

<b>URBAN AREA</b>	<b>Yearly Delay Per Commuter (Hours)</b>	<b>Gallons of Fuel Wasted Annually</b>	<b>Annual Congestion Cost Per Commuter</b>
Austin	38	10	\$ 743
DFW/Arlington	45	22	\$ 924
Houston	57	28	\$ 1,171
San Antonio	30	9	\$ 591

Source: Texas Transportation Institute Urban Mobility Report, 2011.

### Traffic Safety in Texas

A total of 16,635 people were killed in motor vehicle crashes in Texas from 2006 through 2010, an average of 3,327 fatalities per year.<sup>17</sup> The state's traffic fatality rate of 1.30 fatalities per 100 million vehicle miles of travel in 2010 was higher than the national average of 1.11 traffic fatalities per 100 million vehicle miles of travel.<sup>18</sup>

Chart 3. Traffic fatalities in Texas from 2006 – 2010.

<i>Year</i>	<i>Fatalities</i>
2006	3,521
2007	3,462
2008	3,479
2009	3,120
2010	3,053
<b>Total</b>	<b>16,635</b>

Source: TxDOT

Texas' rural, non-Interstate roads have a fatality rate which is higher than other roads in the state. The traffic fatality rate in 2010 on Texas' non-Interstate rural roads was 1.67 traffic fatalities per 100 million vehicle miles of travel, higher than the 1.17 fatalities per 100 million vehicle miles of travel on all other roads and highways in the state.<sup>19</sup>

A disproportionate share of highway fatalities occurs on Texas' rural, non-Interstate roads. In 2010, 34 percent of traffic fatalities in Texas occurred on rural, non-Interstate routes, while only 23 percent of vehicle travel in the state occurred on these roads.<sup>20</sup>

Three major factors are associated with fatal vehicle accidents: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes. Roadway features which 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 Texas' 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 cost of serious traffic crashes in Texas in 2010, in which roadway features were likely a contributing factor, was approximately \$6.3 billion.<sup>21</sup> The cost of serious crashes includes lost productivity, lost earnings, medical costs and emergency services.

TRIP has calculated the cost of traffic crashes in which roadway features were likely a contributing factor per driver for Texas' four largest urban areas.<sup>22</sup>

**Chart 4. Fatalities and safety costs in Texas' four largest metropolitan areas.**

<b>Location</b>	<b>Fatalities</b>	<b>Safety Cost Per Driver</b>
Austin	78	\$ 256
DFW/Arlington	312	\$ 255
Houston	366	\$ 305
San Antonio	146	\$ 290
<b>Statewide Total</b>	<b>2,998</b>	<b>\$6.3 billion</b>

**Source: TRIP analysis of National Highway Traffic Safety Administration Data.**

Where appropriate, 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, improving lighting, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals.

Recent improvements provided by TxDOT on numerous state roadways have resulted in a significant reduction in the number of fatalities and injuries on these routes. The Texas Transportation Institute (TTI) found that recent TxDOT projects that widened lanes, improved shoulders, and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities and 895 fewer injuries 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.<sup>23</sup>

## **Transportation Funding in Texas**

Texas faces a significant funding shortfall in the amount needed just to maintain the transportation system in its current condition, let alone make needed expansions or undertake



new projects. Unless transportation funding is increased at the local, state and federal level, Texas' roads and bridges will become increasingly deteriorated and congested.

Over the past decade, roadway maintenance and capacity in Texas have been funded largely through bond proceeds. However, all bonding programs have now been exhausted, resulting in a 50 percent drop in funding levels from a decade ago and leaving no funds available for new construction.<sup>24</sup>

A report issued by the [2030 Committee](#) calculated that an annual investment of \$9.9 billion was needed just to maintain road and bridge conditions and congestion at 2010 levels. However, after fiscal year 2013, annual state highway investment is anticipated to average \$2.6 billion annually.<sup>25</sup>

Under current funding scenarios, overall pavement quality is projected to decrease by 30 percent by 2022.<sup>26</sup> Failing to repair pavement deterioration in a timely manner will increase repair costs over time. In Texas, underfunding maintenance on the state's roads will increase the cost to preserve and restore the pavement by \$6.5 billion over the next ten years.<sup>27</sup>

While the growth and expansion of Texas' oil, gas and wind energy sectors has been beneficial for the state's economic wellbeing, increased traffic (especially by heavy trucks) has had a significant impact on the condition of the state's roads and highways. A new report by the Texas Transportation Institute found that the cost of additional road repairs needed as a result of the energy boom's wear and tear on state and county roads in Texas is estimated to be \$2 billion each year for the next 20 years.<sup>28</sup>

## **Importance of Transportation to Economic Growth**

All of Texas' businesses are dependent on an efficient, safe, and modern transportation system, one that will foster continued business diversification and opportunity. A system of well-maintained and efficient roads, highways and bridges is critical to retaining economic competitiveness and continued economic growth.

Every year, \$1.2 billion in goods are shipped from sites in Texas and another \$1.2 billion in goods are shipped to sites in Texas, mostly by trucks.<sup>29</sup> Sixty percent of the goods shipped annually from sites in Texas are carried by trucks and another nine percent are carried by parcel, U.S. Postal Service or courier services, which use trucks for part of their deliveries.<sup>30</sup>

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.<sup>31</sup>

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.<sup>32</sup>

## **Conclusion**

Roads, highways, bridges and public transit are the lifeline of the Lone Star State's economy. Today, Texas' surface transportation system is under multiple pressures from aging and deteriorating roads and bridges and increasing traffic congestion. As it looks to enhance and build a thriving, growing and dynamic state, it will be essential that Texas is able to provide a

21<sup>st</sup> Century network of roads, highways, bridges and public transit that can safely and efficiently accommodate the mobility demands of a modern society.

Addressing Texas' needs for a safe, efficient and well-maintained transportation system will require a significant boost in investment. But not addressing the state's need for an improved transportation system will result in even greater costs to the public.

A modernized highway system in Texas will help the state accommodate continuing population growth, offer congestion relief and improve safety. Completing critical, unfunded projects would increase mobility, better support commerce and tourism, enhance economic development and improve traffic safety statewide, boosting the quality of life for residents and visitors alike.

Making needed improvements to Texas' roads, highways, bridges and transit could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

The future provisions and funding levels at the local, state and federal level will be a critical factor in whether Texas is able to reap the benefits of a modern surface transportation system.

## Endnotes

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- <sup>1</sup> U.S. Census Bureau annual population estimate, 2011.
- <sup>2</sup> Texas Data Center.
- <sup>3</sup> TRIP analysis of data from the U.S. Bureau of Economic Analysis. The nation's Gross Domestic Product has been adjusted for inflation based on the Consumer Price Index.
- <sup>4</sup> U.S. Department of Transportation – Federal Highway Administration: Highway Statistics 1990 and 2010.
- <sup>5</sup> TRIP calculation based on U.S. Census and Federal Highway Administration data.
- <sup>6</sup> TRIP Analysis of 2010 Federal Highway Administration data. The data includes 2010 International Roughness Index (IRI) data for urban Interstates, other freeways and expressways, other principal arterials and minor arterials. 2008 Present Serviceability Ratings (PSR) data for urban minor arterials was also included because Texas 2010 PSR data is not yet available.
- <sup>7</sup> Ibid.
- <sup>8</sup> Ibid.
- <sup>9</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop, Transportation Research Board. 1999. Figure 1.
- <sup>10</sup> TRIP analysis of Federal Highway Administration data.
- <sup>11</sup> Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. C. Bennett, I. Greenwood. 2000.
- <sup>12</sup> Your Driving Costs. AAA. 2012.
- <sup>13</sup> USDOT Federal Highway Administration National Bridge Inventory 2011
- <sup>14</sup> Ibid.
- <sup>15</sup> Ibid.
- <sup>16</sup> Texas Transportation Institute. 2011 Urban Mobility Report.
- <sup>17</sup> TRIP analysis of Texas Department of Transportation, National Highway Traffic Safety Administration and Federal Highway Administration Data.
- <sup>18</sup> Ibid.
- <sup>19</sup> Ibid.
- <sup>20</sup> Ibid.
- <sup>21</sup> TRIP estimates based on National Highway Traffic Safety Administration (NHTSA) data.
- <sup>22</sup> For TRIP's traffic fatality estimates, the state's top urban areas are defined by the following counties: Austin – Travis County; Dallas/Fort Worth/Arlington – Tarrant and Dallas Counties; Houston – Harris County; San Antonio – Bexar County.
- <sup>23</sup> Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Texas Department of Transportation.
- <sup>24</sup> The Cost of Doing Nothing: An Informational Reference. June 2012. [www.infrastructuretexas.org](http://www.infrastructuretexas.org)
- <sup>25</sup> It's About Time: Investing in Transportation to Keep Texas Economically Competitive. 2030 Committee. March 2011. Additional analysis provided by TRIP.
- <sup>26</sup> The Cost of Doing Nothing: An Informational Reference. June 2012. [www.infrastructuretexas.org](http://www.infrastructuretexas.org)
- <sup>27</sup> Ibid.
- <sup>28</sup> Texas Energy Development and TxDOT Right-Of-Way." 2012. Texas Transportation Institute.
- <sup>29</sup> Bureau of Transportation Statistics, U.S. Department of Transportation. 2007 Commodity Flow Survey, State Summaries.
- <sup>30</sup> Ibid.
- <sup>31</sup> Federal Highway Administration, 2008. Employment Impacts of Highway Infrastructure Investment.
- <sup>32</sup> 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.