2015 Educational Series

Road & Bridge Safety

Texas Department of Transportation

Road and Bridge Safety

BACKGROUND

Promoting safety and protecting the lives of Texas Department of Transportation (TxDOT) employees and the traveling public are TxDOT's top priorities. Our key objectives include lowering the state's traffic fatality rate, as well as the total number of traffic fatalities and injuries. TxDOT seeks to accomplish this through the continuous development of a safety culture within the agency, expanded use of safety construction methods, improvement in work zone safety and the development of an innovative behavioral Traffic Safety Program. By incorporating safety planning into every aspect of construction and maintenance, and working closely with a wide range of transportation safety stakeholders, TxDOT strives to protect the lives of those traveling our roadways and the lives of our hardworking employees.

TxDOT crew in a work zone

HIGHWAY SAFETY

Traffic crashes and fatalities in Texas have decreased over the last decade despite an increase in miles driven on state roads and highways. In 2003, Texas had 3,822 traffic-related fatalities. By 2013, this number declined to 3,386. Despite the reduction in deaths statewide, certain factors continue to contribute to traffic crashes. In 2013, speed-related traffic fatalities increased by 2.5 percent, with 765 lives lost in 2012 compared to 784 in 2013.

Although notable progress has been made in highway transportation safety, even a single traffic death in the state is too many and represents a preventable tragedy. As part of our efforts to reach a goal of zero traffic fatalities, TxDOT manages various programs that focus principally on improving transportation safety.

Work Zones

At any given time, there are approximately 1,000 projects underway across more than 80,000 miles of TxDOT-maintained highway. Each year in Texas, approximately 15,000 crashes and over 100 deaths occur in roadway construction and maintenance work zones. The most common causes of these crashes are failure to control speed and driver inattention.

For these reasons, TxDOT has an extremely active statewide effort to increase public awareness about the need to stay alert and slow down when driving through work zones. Held in conjunction each year with National Work Zone Awareness Week in April, this effort involves a statewide news conference and news release as well as local events across the state. In addition to this public information effort to improve work zone safety, TxDOT is also undertaking the following initiatives:

- Developing standards for the use of portable rumble strips in work zones on conventional highways and testing the use of these items in work zones on controlled-access freeways
- Field testing new devices such as automated flagger assistance devices
- Researching ways to improve handheld communications devices during flagging operations
- Allowing workers to use wireless headsets that sync with two-way radio equipment inside TxDOT vehicles.

In addition to these actions, TxDOT works closely with the United States Department of Transportation Federal Highway Administration to continually review our work zones to ensure that they are designed according to all federal and state standards.

TxDOT PROGRAMS

Texas Traffic Safety Program

TThe Texas Traffic Safety Program, enabled under Chapter 723 of the Transportation Code, is a federally funded effort to reduce the number and severity of traffic crashes, injuries and fatalities through education, training and enforcement. The program provides grants to state agencies, private non-profit associations and local jurisdictions for projects focusing on areas such as occupant protection, selective traffic enforcement, driving while intoxicated prevention, traffic records and roadway safety. The goal is to modify driver and passenger behavior and the program is a critical component in TxDOT's effort to improve transportation safety. The Traffic Safety Program's extensive public information and enforcement efforts helped safety belt usage in Texas increase to approximately 94 percent in 2012. Texas also experienced a decrease in alcohol-related traffic fatalities of 4 percent between 2012 and 2013. In 2013 the program budgeted approximately $146.4 million for 310 traffic safety projects statewide.

Public Information Campaigns

TxDOT has a number of traffic safety public information campaigns planned for fiscal year 2015. The following campaigns are designed to deter drunk driving, improve motorcycle safety, and to decrease the incidence of distracted driving, including texting while driving:

- Football Season, Don't Drink and Drive (October to January)
- Christmas and New Year's Holiday Season, Impaired Driving Prevention (December)
- Teen Click It or Ticket (February)
- Energy Sector Safe Driving (February and July)
- Spring Break Impaired Driving for College Students (March)
- Work Zone Safety (March)
- Spring Hispanic Impaired Driving - Easter & Cinco de Mayo (April/May)
- Distracted Driving (April and June)
- Motorcycle Safety, Look Twice/Share the Road (May)
- Click It or Ticket (May/June)
- Labor Day Holiday Impaired Driving Prevention (August /September)
- Back to School (August/ September)
- Child Passenger Safety, Child Safety Seats (September).

Texas Safety Bond Program

Section 222.003 of the Texas Transportation Code authorizes the Texas Transportation Commission to issue bonds and other public securities to develop projects on the state highway system. These bonds are secured and payable from the State Highway Fund. Texas voters approved a constitutional amendment, Proposition 14, in September 2003 that allowed TxDOT to use this method of debt financing.

The 80th Texas Legislature amended

"Click It or Ticket" press conference, El Paso High School

the law in 2007 to increase the maximum amount of bonds that TxDOT may issue to $6 billion with a maximum issue of $1.5 billion annually. Of the total amounts of bonds that may be issued, at least 20 percent ($1.2 billion) must be used for safety-related projects that reduce crashes or correct hazardous locations on the state highway system.

In December 2004, the Commission approved $605 million for 644 projects in the 2005 Safety Bond Program to:

- Widen 1,600 miles of narrow, two-lane highway

- Install 740 miles of new concrete or cable median barrier between the main lanes of divided highways
- Install 171 new left-turn lanes or two-way continuous left-turn lanes on rural highways
- Build 10 grade separations at existing highway intersections.

In February 2009, the commission awarded an additional $600 million for the following improvements:

- 164 projects to widen 588 miles of narrow highways
- 290 miles of new cable or concrete median barrier between the main lanes of divided highways
- 101 new left-turn lanes or two-way, continuous left-turn lanes on rural highways
- Nine projects to convert existing four-lane undivided highways to four-lane divided highways and construct additional shoulders
- 28 grade separations at existing highway intersections

The Texas Transportation Institute estimated that the projects could save up to 90 lives and prevent 1,100 serious injuries annually. A one-year before and after analysis performed on the completed on the first round of cable-barrier projects showed that these projects saved 18 lives and prevented 26 serious injuries.

TxDOT believes that the Texas Safety Bond Program has the potential to save many lives and prevent thousands of injuries over the next 20 years.

Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP), created under 23 USC §148, is a federal safety construction program designed to reduce the number and severity of traffic crashes. This program allows states to target funds to their most critical safety needs which, in turn can significantly reduce traffic fatalities and serious injuries on public roads. The safety program has been extremely successful. TxDOT has seen a decrease in statewide fatal and serious injury crash rates over the last five years.

The High Risk Rural Roads Program is part of HSIP and is also federally funded. The goal of this program is to achieve a significant reduction in traffic fatalities and serious injuries on rural roads. Projects in this program are limited to paved roadways that are classified as rural major or minor collectors or rural local roads. Eligible roadways must have fatal and incapacitating crash rates that exceed the statewide average for that classification of roadway. TxDOT allocates approximately $7.6 million per fiscal year through the rural road program.

Strategic Highway Safety Plan

The Texas Strategic Highway Safety Plan is the state's response to the federal safety program. The plan identifies the most critical transportation safety issues facing Texas and recommends countermeasures to improve transportation safety, and is a requirement to obligate federal safety

construction funding. The Texas plan includes consultation from a variety of stakeholders including the following:

- TxDOT traffic safety personnel which act as the governor's highway safety representative
- Regional and metropolitan transportation planning organizations
- Representatives from major modes of travel
- State officials responsible for administering the federally-funded program to improve safety at railway-highway at-grade crossings
- State and local law enforcement officials including the Texas Department of Public Safety
- Representatives from the state Operation Lifesaver highway-rail crossing safety program
- Officials representing motor carrier safety interests
- Representatives of the Texas Department of Motor Vehicles
- Other major state and local safety stakeholders.

The following are among the safety emphasis areas identified for Texas' 2014 plan:

- Decreasing the number of run-off-the-road crashes, crashes with fixed objects, rollover crashes, head-on crashes, and intersection crashes
- Improving safety in highway construction and maintenance work zones
- Improving safety at highway-rail at-grade crossings
- Improving safety for older drivers, teen drivers, motorcyclists, bicyclists, and pedestrians
- Decreasing the incidence of driving under the influence of drugs and alcohol
- Decreasing the number of speed-related crashes
- Increasing the statewide rate of safety belt and child passenger seat use
- Decreasing the number of crashes involving aggressive drivers
- Decreasing the number of crashes related to distracted driving
- Improving the state's crash record system
- Enhancing the existing emergency services/911 reporting systems
- Improving public awareness of transportation safety issues

TxDOT Efforts to Improve Highway Safety

Examples of TxDOT's work to improve highway safety include the following:

- Eliminate shoulder drop-offs by widening narrow roads and adding pavement-edge improvements.
- Improve highway signing and legibility by using new prismatic and fluorescent sheeting and a new font
- Install shoulder, edgeline and centerline rumble strips where appropriate
- Perform night and daytime reviews of highways in each TxDOT district every year to ensure that they are being properly maintained
- Perform reviews of every fatal crash that occurs on the state highway system
- Continue to enhance the Texas Crash Records Information System and develop better tools to analyze crash data
- Continue to make safety improvements including the installation of lights and gates at approximately 75 highway-rail grade crossings annually under the Federal Railway-Highway Signal Program

Railroad underpass

Bridge Safety

The safety of the traveling public is TxDOT's number one priority. This includes ensuring that all 53,000-plus Texas bridges that are open to public vehicular traffic are safe.

TxDOT is able to ensure the state's bridges are safe through a vigorous and robust bridge inspection program. Each structure must receive a routine safety inspection at least every 24 months. Those requiring additional attention receive an evaluation more frequently. Additional inspections are conducted at least every 60 months on the elements of bridges that are underwater and at least every 24 months on bridges that are susceptible to fatigue damage.

A bridge collapse is defined in state law as the "abrupt failure of the basic structure of a bridge that impairs the ability of the bridge to serve its intended purpose and that damages a highway located on or under the structure." TxDOT also includes collapses that result from an impact by a vehicle or marine vessel or from some other outside force such as water or flooding. During fiscal year (FY) 2013 and FY 2014, there were no fatalities caused by bridge collapse in Texas, as defined above.

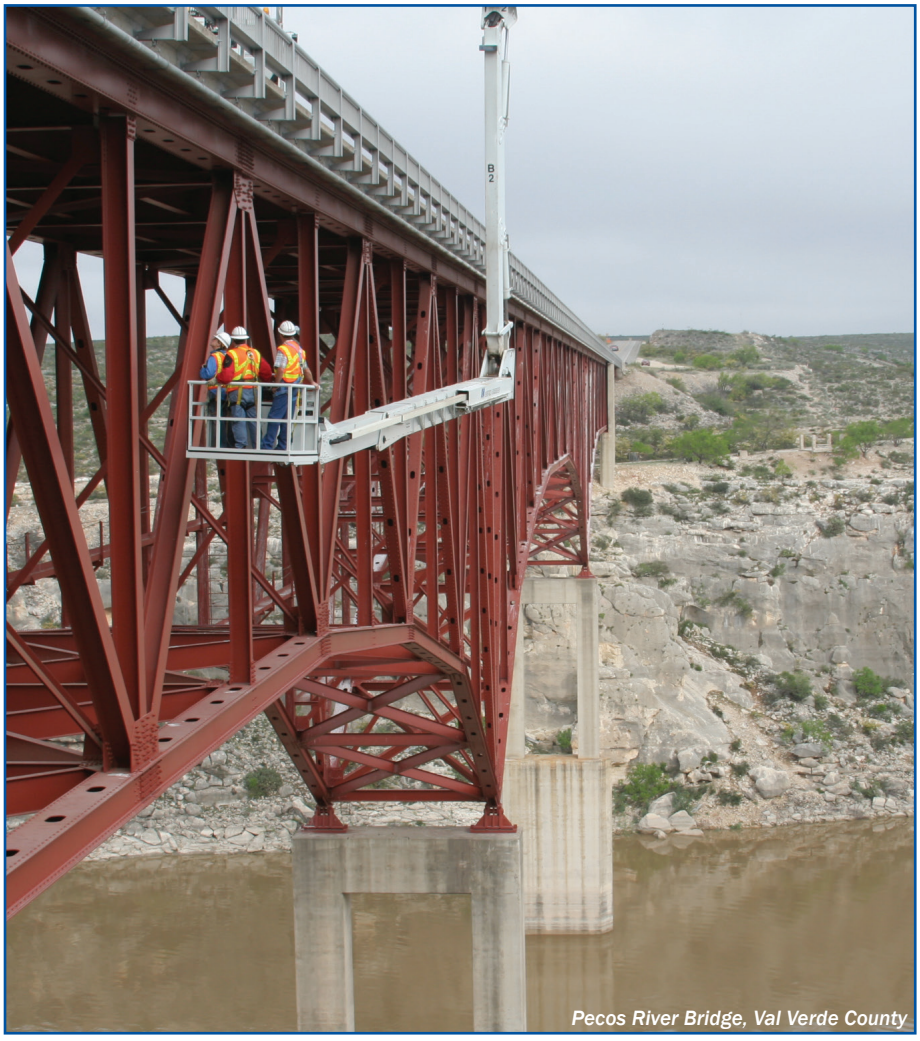
The frequency of bridge inspections are set by the Code of Federal Regulations, 23 CFR 650.311. In addition, and although not mandated in law, each on-system bridge is inspected by TxDOT district maintenance personnel every other year as part of their regular maintenance routine. These safety inspections ensure that every on-system bridge in Texas is visually inspected at least once a year.

Historically, TxDOT has inspected all publicly-owned vehicular bridges in Texas, whether owned and maintained by the state (on-system), county, city, or other local governmental entity (off-system). The findings and recommendations generated during an off-system bridge inspection are provided to the local governmental entity that owns the bridge.

Inspections are carried out using a combination of in-house and consulting engineering resources. Approximately 95 percent of all routine safety inspections are outsourced to consulting engineering firms that have expertise in performing bridge inspections.

TxDOT evaluates bridges for safety load-carrying capacity, monitors the qualifications of inspection personnel, and makes a yearly submission of bridge inventory data to the Federal Highway Administration (FHWA). The qualifications of individuals performing bridge inspections, including contracted and in-house personnel, are monitored by TxDOT to meet the minimum requirements outlined in the Code of Federal Regulations.

To ensure the safety of bridge railings, TxDOT launched the Rail Replacement Program (RRP) in July 2014. The goal of the RRP is to improve safety on bridges and bridge class culverts that do not comply with the Manual for Assessing Safety Hardware (MASH) or the National Cooperative Highway Research Program (NCHRP) Report 350. This program is funded with approximately $5 million annually from the Category 6 Bridge Maintenance and Improvement Program (BMIP).



Pecos River Bridge, Val Verde County

After the Aug. 1, 2007, collapse of the I-35 Mississippi River Bridge in Minneapolis, Minn., many of the technical terms to describe bridge conditions used by the media were misinterpreted by the public. The media and public would often misinterpret the term "structurally deficient bridge" to mean that the bridge was "unsafe." It's very important to realize that these two terms, "structurally deficient" and "unsafe," are not synonymous. TxDOT closes any bridge considered to be unsafe to all traffic.

A structurally deficient bridge is one with routine maintenance concerns that do not pose a safety risk or one that frequently floods. To remain open to the traffic, structurally deficient bridges are often posted with reduced weight limits that restrict the gross weight of vehicles using the bridges. The term structurally deficient is used by FHWA to designate bridges eligible for federal funding. In other words, structurally deficient bridges are safe.

FHWA also uses the term "functionally obsolete" to designate bridges eligible for federal funding. Classification as functionally obsolete means the bridge met current design standards when built, but has become obsolete. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearance to serve current traffic demands or are occasionally flooded.

Relative to the number of bridges in Texas at any given time, our bridges are in better condition now than at any other time in our history. The percentage of structurally deficient bridges is consistently decreasing. The percentage of structurally deficient on-system bridges has decreased from 2.4 percent in 2000 to only 0.6 percent as of September 2013. The percentage of structurally deficient off-system bridges has decreased from 16.3 percent in 2000 to 5.4 percent as of September 2013. The count of structurally deficient on-system bridges has gone from 758 in 2000 to 221 as of September 2013. Likewise, the count of structurally deficient off-system bridges has gone from 2,637 in 2000, down to 973 as of September 2013.

In August 2001, former Texas Transportation Commissioner John W. Johnson established a department goal that at least 80 percent of the bridges in Texas would be in good or better condition within 10 years, or by September 2011. To meet the goal, TxDOT accelerated the upgrade of all structurally deficient on-system bridges.

In 2001, 70 percent of Texas bridges were in good or better condition. By September 2010, that number had risen to 80.3 percent, and this improvement has continued. As of September 2013, 81.4 percent of state bridges were in good or better condition. As mentioned above, the number of structurally deficient on-system bridges was less than 250 statewide as of September 2013.

Finally, it is beneficial to see how the condition of Texas' bridges stacks up against those in other states. According to a recent report by Transportation for America, a Washington-based coalition that periodically reports on transportation, Texas has the third lowest percentage of structurally deficient bridges of the 50 states and the District of Columbia. Only Florida and Nevada have a smaller percentage. In the same article, it reports that Texas ranks lowest in average daily traffic on deficient bridges. This means we have fewer cars driving on deficient bridges than any other state, all this while having more than 53,000 bridges, the largest inventory in the nation.

TxDOT accomplishes all of this while keeping costs low. Texas bridges in FY 2011 cost less than $52 a square foot to build in Texas, the lowest cost per square foot in the nation.

CONCLUSION

Improving the safety of the traveling public is TxDOT's most critical mission. The combination of safety initiatives that encompass engineering, enforcement, education and infrastructure investment ensures that Texans continue to enjoy a highway system that is safe and the envy of other states.

TEXAS DEPARTMENT OF TRANSPORTATION

MISSION STATEMENT

Work with others to provide safe and reliable transportation solutions for Texas.

GOALS

- **Maintain a safe system**
- **Address congestion**
- **Connect Texas communities**
- **Become best-in-class state agency**

VALUES

- **Trust**
- **Integrity**
- **Responsibility**
- **Excellence**
- **Service**

This document is part of an educational series on transportation issues produced by the Texas Department of Transportation.