Testimony of Robert Wunderlich
Submitted to the Texas House of Representatives
Transportation Committee
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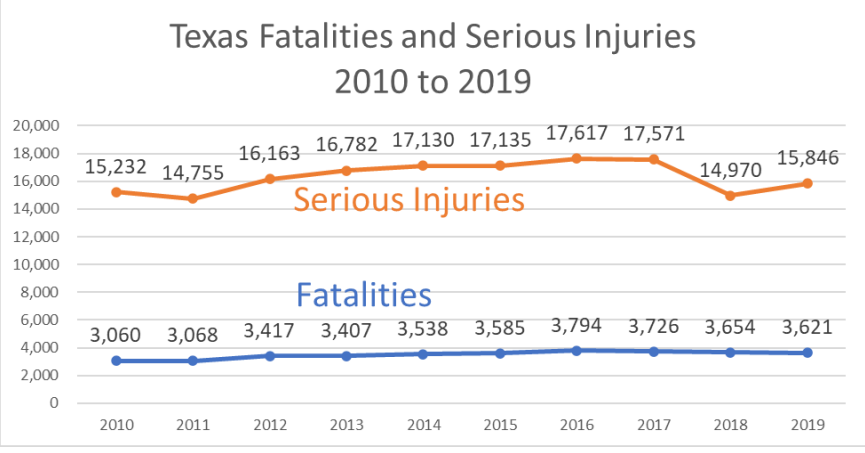
Chairman Canales and members—thank you for the opportunity to provide information on Interim Charge 2, which addresses the state's transportation and road safety efforts. I am submitting this testimony in my capacity as a senior research engineer at the Texas A&M Transportation Institute (TTI), specifically in my role as director of the Center for Transportation Safety.

This testimony focuses on TTI research on the historical trends of the most serious traffic crashes—those that result in death or serious injury. These severe crashes are the focus of the Texas Strategic Highway Safety Plan (www.texasshsp.com), which provides strategies and countermeasures in seven emphasis areas.

Overall Trend in Fatal and Serious Injury Crashes

Texas traffic fatalities grew steadily, by 24%, from 2011 to 2016. However, fatalities decreased in 2017, 2018, and 2019. Although the overall trend has risen and fallen, fatalities have remained at more than 3,500 each year since 2014, with 3,612 occurring in 2019. Serious injuries on Texas roadways increased by 15% from 2010 to 2017 but then dropped by 17% in one year from 2017 to 2018. They rose again in 2019 but not to the level experienced in 2017.

The following figure shows fatalities and serious injuries trends in Texas from 2010 through 2019, compiled by TTI from September 2020 data from the Texas Department of Transportation (TxDOT) Crash Record Information System. The data for 2019 should be considered preliminary because more reports may be filed and processed. Additionally, there was a change nationally in the labeling of serious injury crashes between 2017 and 2018 from "incapacitating" to "suspected serious injury," which may explain the large fluctuation in Texas serious injuries.



Texas traffic crashes are associated with three high-risk behaviors, two high-risk crash types, and three high-risk roadway user groups. These categories overlap, and some crashes fall into more than one of these risk categories.

High-Risk Behaviors

The three high risk behaviors are impaired driving, distracted driving, and speeding.

Impaired Driving

Fatalities in Texas involving impaired driving have been on the rise since 2011 but have declined since a peak in 2017 to a total of 1,256 in 2019. The share of all fatalities associated with impairment has declined from 43% in 2010 to 32% in 2019. Serious injuries have been on a downward trend since 2012. In 2019, there were 2,456 serious injuries associated with impaired driving. Nonetheless, they still comprise a major portion of the traffic safety issues in Texas.

About 60% of these crashes occur between 9 p.m. and 4 a.m. About 60% involve only a single vehicle. Half of severe impaired-driving crashes occur in rural areas. Males between 17 and 60 years of age are overrepresented in these severe crashes compared to their proportion of the population, with a peak at 21 years of age, which diminishes with age. Females between 21 and 24 years of age are overrepresented in these severe crashes compared to their proportion of the population.

In 2019, the average blood alcohol concentration (BAC) of tested drivers in a fatal crash was twice the legal limit of 0.08. About 18% of impaired drivers were unlicensed. Nearly 60% of impaired driving involved only alcohol. About 20% involved both alcohol and drugs. The percentage of drug-only fatal crashes has increased since 2011.

Distracted Driving

It is generally believed that distracted driving crashes are underreported because it is often difficult to determine if drivers were distracted prior to the crash. Fatalities associated with reported distraction increased somewhat after 2011 but have decreased each year since 2015, with 379 reported in 2019. Serious injuries rose from 2011 to 2014 by 13% and then declined 22% by 2019. Serious injuries reported in 2019 numbered 2,501. The percentage of total traffic fatalities associated with distracted driving has declined from 15% in 2010 to 10% in 2019. About 60% of these crashes involved one vehicle striking another, and over 60% occurred in urban areas.

TTI regularly conducts observational studies across the state to determine mobile communication device use while driving. Overall use has declined, but texting has grown, while talking has fallen. TTI also observed that overall use was proportionally higher for drivers without front seat passengers, females, and drivers under 60 years of age. Groups that were more likely to be observed texting than talking were younger drivers, drivers not in a pickup truck, and drivers without a front seat passenger.

Speed and Speeding

Fatalities reached a peak of 814 in 2014 after rising from 717 in 2011. Since then, they have generally been stable with a decrease in 2019 to 714. The percentage of all fatalities associated with speed and speeding has fallen from 25% in 2010 to 20% in 2019. Serious injuries rose to a peak of 2,305 in 2013 and then rose by 4% in 2019, after a decrease of 17% in 2018.

Over 70% of the unsafe speed crashes occur in rural areas, whereas over 60% of the over-the-speed-limit crashes occur in urban areas. Of fatal and serious injury speeding crashes, 70% are either road departure or head-on crashes. Males between 16 and 60 years of age are overrepresented, compared to their proportion of the population, with greatest overrepresentation occurring at younger ages.

High-Risk Crash Types

The two categories of high-risk crash types are roadway/lane departures and intersections.

Roadway and Lane Departures

This crash category represents 43% of all fatal crashes over the past 10 years, but the percentage has declined from 47% to 39%. Both single-vehicle run-off-the-road and head-on crashes are included in this category. Single-vehicle crashes are the predominant crash type, with over 80% of the total. Fatalities in this category rose from 2011 to a peak of 2,415 in 2014. Since then, they have generally fallen to a level of 2,208 in 2019.

Impairment is reported in about 32% of these crashes. About 80% occur in dry weather although wet conditions can contribute to the occurrence of road and lane departure crashes. Speeding is cited as a factor in over 40% of severe crashes. Males between 16 and 70 years of age are overrepresented compared to their percentage of the population, with a peak at 21 years of age. Females between 18 and 25 years of age are overrepresented compared to their proportion of the population.

Intersection Crashes

Over the past 10 years, about 22% of all fatalities have occurred at intersections, but this level has been declining slightly and held at 20% in 2019.

Fatal and serious injury intersection crashes are more prevalent in urban areas (74%) and are split evenly between state and city or county roads. Impairment was cited in 14% of these crashes—distraction in 20%. Males of all ages are overrepresented based on their proportion of the population, as are females between 18 and 36 years of age.

High-Risk Groups

The three high-risk groups of roadway users are pedestrians, young drivers, and older drivers.

Pedestrians

Since 2011, pedestrian deaths have increased over 80%, and the proportion of all traffic deaths has risen from 12% to 18%. These crashes represent an emphasis area that continues to grow in both fatalities and serious injuries. There were 661 fatalities and 1,261 serious injuries in 2019.

Nearly 80% of the fatalities occur at night, and nearly 80% occur in urban areas. Only about 30% are reported to occur at intersections. In the vehicle/pedestrian crashes that involve impairment, about two-thirds involve an impaired pedestrian. Males of all ages are overrepresented compared to their proportion of the population as both pedestrians and drivers. Since 2011, death and serious injury among older pedestrians has more than doubled.

Young Drivers

Young drivers of both genders are overrepresented in traffic crashes compared to their proportion of the population. About 20% of all Texans that died in traffic crashes were in this age group. In general, young drivers have less experience, tend to take risks, and have less development in the portion of their brains that governs judgment. The risk factors, based on national data, associated with younger drivers are:

- *Distractions*—Sources of distraction include cell phone use and other teen passengers.

- *Driving at night*—Almost 60% of teen crash deaths occur between 6 p.m. and 6 a.m.
- *Speeding and street racing*—Males and females 15 to 20 years of age had the highest representation in speed-related fatal crashes compared to all other age groups in 2017.
- *Not wearing a seat belt*—About half of the teenagers involved in a fatal crash were not wearing a seat belt.
- *Driving under the influence*—Teen crash risk is higher than adults', especially at lower BAC levels. Most of those killed in alcohol-related crashes involving teen drivers are the young drivers and their passengers.

Older Drivers

Fatalities and serious injuries in crashes involving drivers that are 65+ years of age are rising. This is due in part to the increase in fragility as people age. Males 75+ years of age and females 80+ years of age are overrepresented in these crashes. Older drivers are more likely to have a crash with another vehicle and are less likely to run off the road compared to younger drivers.

Safe System Approach

TTI has been researching an approach to addressing road safety that looks at designing a transportation system that:

- Reduces the opportunity for mistakes to occur.
- Recognizes that human error will happen.
- Minimizes the consequences of those mistakes in terms of human health and safety.

We have identified four strategies for consideration as part of the safe system approach:

1. *Separate users in space*—Examples are left-turn lanes that separate those who either must stop or slow down when yielding to oncoming traffic from those who are proceeding through. Other examples of separating different users, with different impact characteristics, are installment of sidewalks or bicycle paths.
2. *Separate users in time*—Examples are an exclusive left-turn traffic light phase or an exclusive pedestrian crossing phase.
3. *Use strategies that increase attentiveness or awareness*—Examples for increased visibility are clear sight lines, better illumination, or reflective strips. Other examples are rumble strips or rectangular rapid flashing beacons (for pedestrian crossings).
4. *Simplify the environment or change the physical configuration to reduce the number of conflict points*—Examples at intersections include median U-turns or restricted crossing U-turns, and center line hardening, which channels left-turning motorists to a particular space instead of allowing wide turns. Another important aspect of simplifying the environment is to modify the angle of potential impacts at intersections, an angle of 90% being the most severe.

Speed management is also an important component of the safe system approach but comes with challenges and requires public acceptance. Strategies here may include:

- Changing the physical configuration of the street.
- Sanctions.
- Coordinated signal timing to achieve target speeds.

One tool that encompasses many of the elements of the safe system approach is using roundabouts. Roundabouts have the ability to simplify the number of conflict points, reduce speed, and change the angle of potential impacts—all of which can minimize the consequences of human error.

Safety Initiatives at TTI

TTI analyzes data to identify traffic safety issues and develop countermeasures to address them. Our researchers combine information on crash data, roadway characteristics, vehicle types, and user behaviors to discover relationships and develop potential countermeasures. Working with the health community, we have investigated methods to match trauma data and crash data to improve health outcomes. The need for this understanding is indicated by the unexpected and unexplained drop in serious injuries during 2018. TTI is also at the forefront of analyzing new data sources, such as vehicle onboard sensor data, to help understand and prevent traffic crashes.

Safer Roadways

To improve roadway safety in Texas, professionals and stakeholders need ways to identify locations where there is a high probability for enhancing safety, either because a location's crash experience is greater than expected or because the location has characteristics associated with crashes. Traffic safety professionals also need methods to evaluate the opportunities for maximizing safety in roadway projects.

TTI is developing tools to help TxDOT and other transportation professionals identify segments and intersections that have high potential for safety improvement, as well as providing potential countermeasures to implement them at these locations. We have also developed tools that can be used to select locations for safety improvement, based on a preponderance of characteristics associated with unconcentrated crashes, such as pedestrian and rural road departure crashes.

TTI has worked with TxDOT over the past year to develop a tool that shows roadway project developers how changes in design elements (e.g., shoulder width, curvature, clear zones, and slopes along the roadside) affect safety, as well as provides a safety score to evaluate different design alternatives.

Safer Behaviors

Impaired Driving Plan

Although the number of fatalities and serious injuries related to impaired driving is declining, this behavior still represents over 30% of all motor vehicle crash fatalities. TTI is funded by TxDOT to facilitate the Texas Impaired Driving Task Force and the development of the Impaired Driving Plan, which provides actions that can be taken to reduce the level of impaired driving.

The Impaired Driving Plan covers:

- Prevention.
- Criminal justice.
- Communication.
- Screening, assessment, treatment, and rehabilitation for alcohol and drug misuse.
- Program data and evaluation.
- Program management and strategic planning.

The plan also includes recommendations from the National Highway Traffic Safety Administration's assessment of the Texas Impaired Driving Program, some of which would require legislative action. The action plan is available at https://www.texasimpaireddrivingtaskforce.org/.

TTI works with medical examiners, toxicologists, and county officials to help improve the reporting of blood alcohol and drug concentrations for crashes where toxicology reporting is required. We conduct crash report training, as well as training, outreach, and evaluations on the use of ignition interlock devices across Texas.

Distraction

TTI performs observational studies of cellular device use over time to help inform safety stakeholders about the extent and characteristics of this issue. Results of recent research on texting and driving showed that drivers who were more aware of the statewide ban were generally less likely to text and drive. Drivers in Wichita Falls, for example, had the highest awareness of the anti-texting law (76%) and the lowest texting-while-driving rate (3% of drivers in that city were recorded as texting at any given time). Houston motorists were the least compliant; 9.1% of drivers were recorded as texting at any given time. The existence of a local law in Wichita Falls that requires hands-free cell phone use may influence awareness and behavior.

Safer Groups

Pedestrians

Pedestrian fatalities and injuries continue to increase in Texas, in part reflecting the concentration of growth in urban areas. To combat this trend, TTI is working on methods to identify locations where safety may be improved, and effective countermeasures deployed. We are also working to educate both motorists and pedestrians of safety measures and the laws that pertain to pedestrian movement. We are developing materials and conducting law enforcement officer training on pedestrian and bicycle laws, while also endeavoring to improve the quality and accuracy of pedestrian and bicycle crash data.

Youth Traffic Safety

TTI has a long-standing initiative to deter impaired driving and underage drinking among youth through Teens in the Driver Seat, a statewide peer-to-peer program in colleges, high schools, and junior high/middle schools. The peer-to-peer programs teach youth leaders the risk factors associated with impaired driving and drinking, and provide opportunities to lead culture change within schools. Teens in the Driver Seat covers safety for drivers, passengers, pedestrians, and cyclists. The program has been recognized as a national best practice for this target audience. This year, TTI youth traffic safety programs will have activities on about 250 campuses throughout Texas.

Older Users

TTI provides educational outreach to address the challenges faced by the most senior of older drivers and to improve their safety on Texas roads. TTI is identifying the risk factors that are likely to increase the probability of being involved in a crash for the preparation of materials to help senior drivers select safer routes.

Thank you for the opportunity to provide this material to the committee. Please contact me if you require any further information, such as graphs of the referenced data.

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