Texas Strategic Highway Safety Plan

2022 - 2027

Texas Department of Transportation

Save a Life™ Texas Department of Transportation

Center for Transportation Safety
Texas Transportation Institute

Texas A&M Transportation Institute

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Section 1.0 Introduction & Overview

Vision

Texas envisions a future with zero traffic fatalities and serious injuries.

Mission

Texans will work together on the road to zero traffic fatalities and serious injuries.

Background

The mission of the Texas Strategic Highway Safety Plan (SHSP) is to reduce fatalities and serious injuries on state and local roadways. The SHSP is intended to be a comprehensive approach to address this mission. A critical part of the SHSP development process is to ensure the inclusion of a diverse set of stakeholders as well as a detailed analysis of crash and other appropriate data sets. The Federal Highway Administration (FHWA) has identified the following benefits for states as they develop and revise their SHSP (1):

- Establishes common statewide goals and priorities
- Strengthens existing partnerships
- Builds new local, regional, and statewide safety coalitions
- Promotes data, knowledge, and resource sharing
- Focus on the state's most serious traffic safety problems
- Avoids redundant activities and leverages existing resources (funding, personnel, and leadership)
- Provides a multidisciplinary approach to solving problems
- Incorporates both behavioral and infrastructure strategies and countermeasures

The SHSP is also a significant part of the federal programs to make the nation's roadways safer for all. The following paragraph describes how the SHSP is incorporated with other federal initiatives (2):

> *The SHSP is a critical part of the Highway Safety Improvement Program (HSIP), which is a core Federal-aid program designed to achieve significant reductions in traffic fatalities and serious injuries. It requires a data-driven strategic approach to improving*

> *traffic safety. The SHSP has been included in three of the most recent transportation bills which provide funding for transportation across the U.S., including the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); the Moving Ahead for Progress in the 21st Century (MAP-21), and the Fixing America's Surface Transportation (FAST) Act, which continues the requirement for States to develop, implement, evaluate, and update an SHSP that identifies and analyzes highway safety problems and opportunities on all public roads.*

Transportation safety is a complex domain. The overarching benefit of the SHSP is to bring together a diverse set of disciplines to collaboratively improve safety. These disciplines can include, but are not limited to, the following:

- Engineering (Design & Traffic)
- Construction
- Operations
- Maintenance
- Planning
- Law enforcement
- Data analysis
- Education
- Prevention
- Emergency response
- Safety advocacy
- Tribal groups
- Consulting
- Private industry

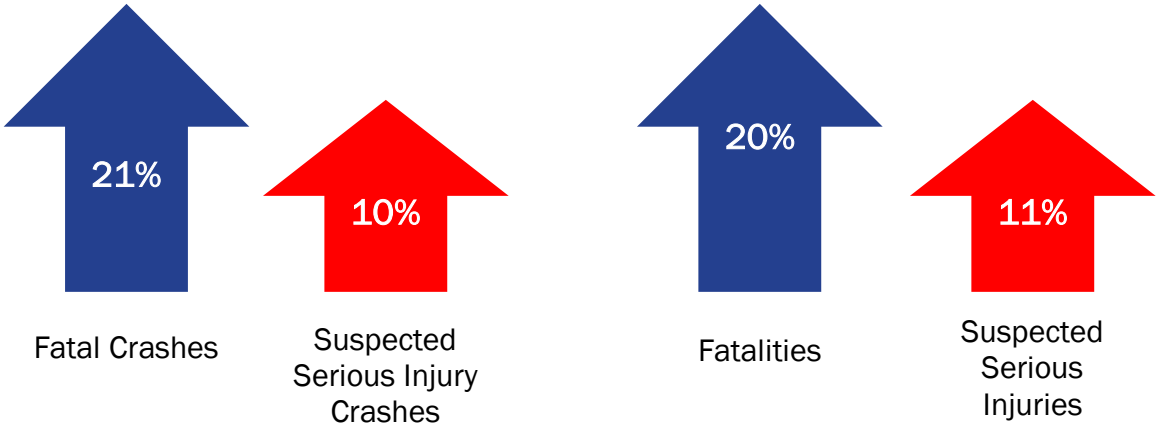
Engaging these disciplines during the SHSP update process is important. This effort included the communication of the SHSP vision, mission, strategies, and countermeasures across the state. Based on the collaboration among stakeholders, Texas was able to achieve during the SHSP development process, it stands to reason that those stakeholders will not only communicate the plan, but also actively support its implementation.

Snapshot of the Overall Crash Data

All the data contained in this revision of the Texas SHSP is from the Texas Department of Transportation's (TxDOT) Crash Records Information System (CRIS). The CRIS is a live

system, therefore the data utilized in the data analysis and target setting was pulled on February 22, 2022. Unless otherwise stated, all data represented in this plan is from that February dataset.

The following data provides an overview of all fatal and suspected serious injury crashes and injuries on an annual basis between 2017 and 2021.



The data and associated trends are further detailed in Figures 1.1 and 1.2.

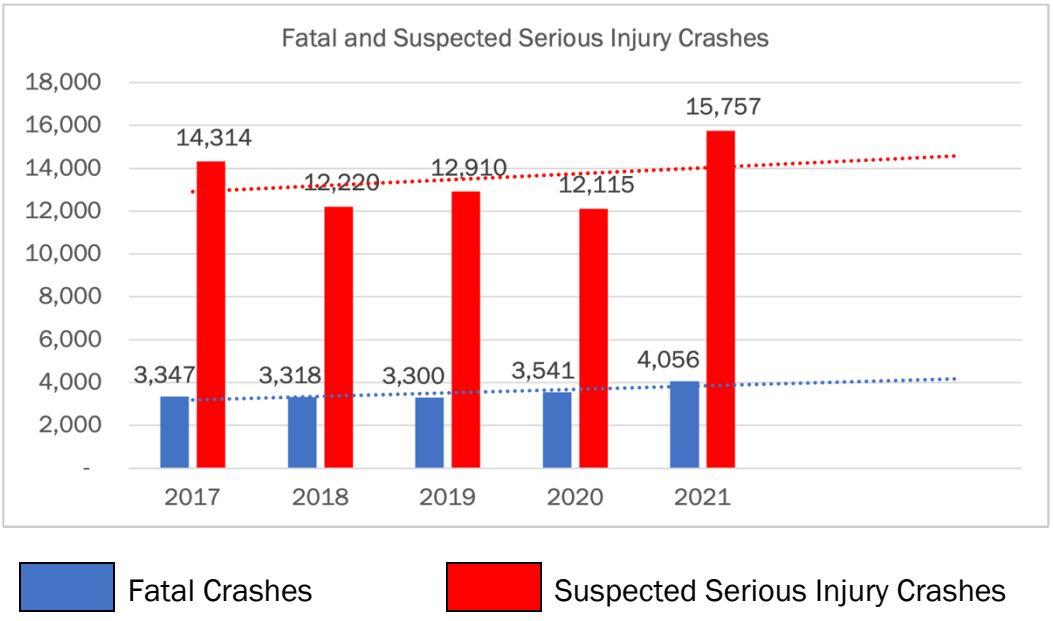


Figure 1.1. Total Fatal & Suspected Serious Injury Crashes (2017-2021)

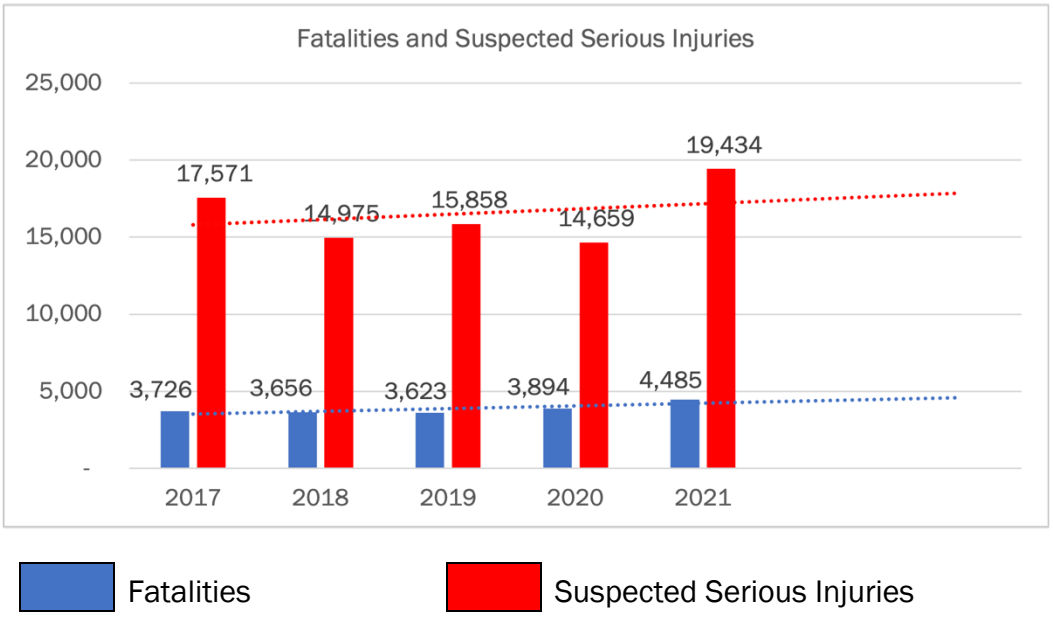


Figure 1.2 Total Fatal & Suspected Serious Injuries (2017-2021)

The crash data from 2017-2021 was analyzed to identify the most cited factors to determine the Emphasis Areas (EA) and overlapping factors. The percent of crashes where a factor or group of factors was identified are detailed in Figure 1.3. Additionally, the percentage of fatal and serious injuries attributed to factors identified in a crash report are summarized in Figure 1.4.

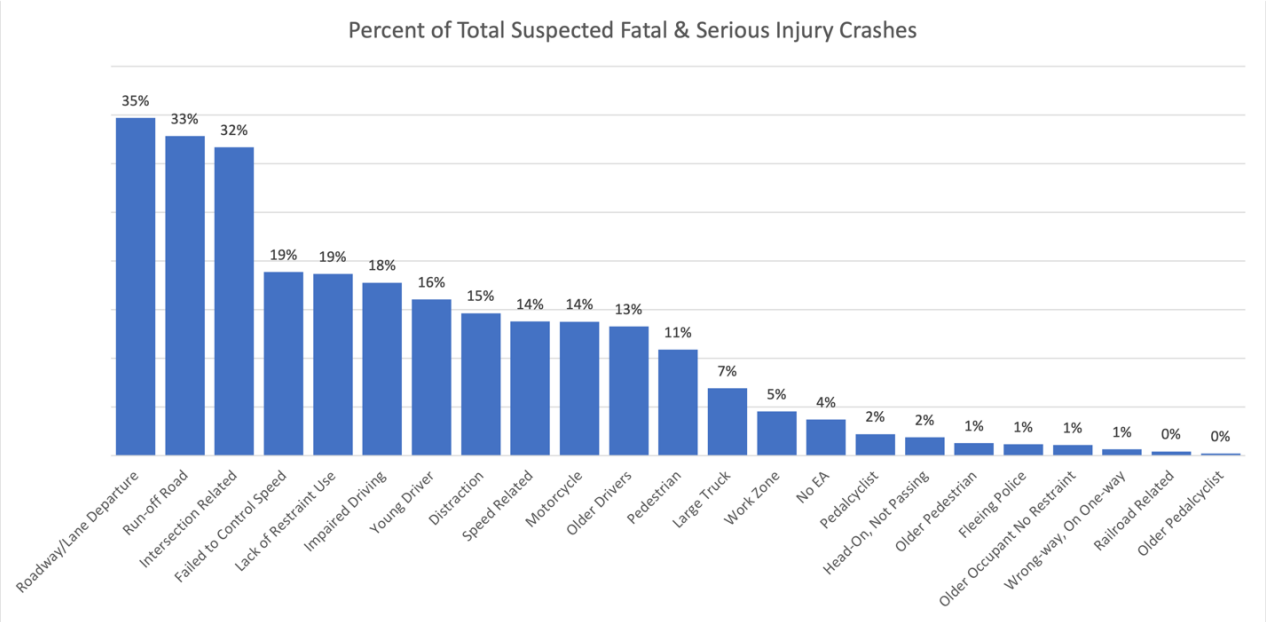


Figure 1.3: Percent of Total Fatal & Suspected Serious Injury Crashes by Crash Factor

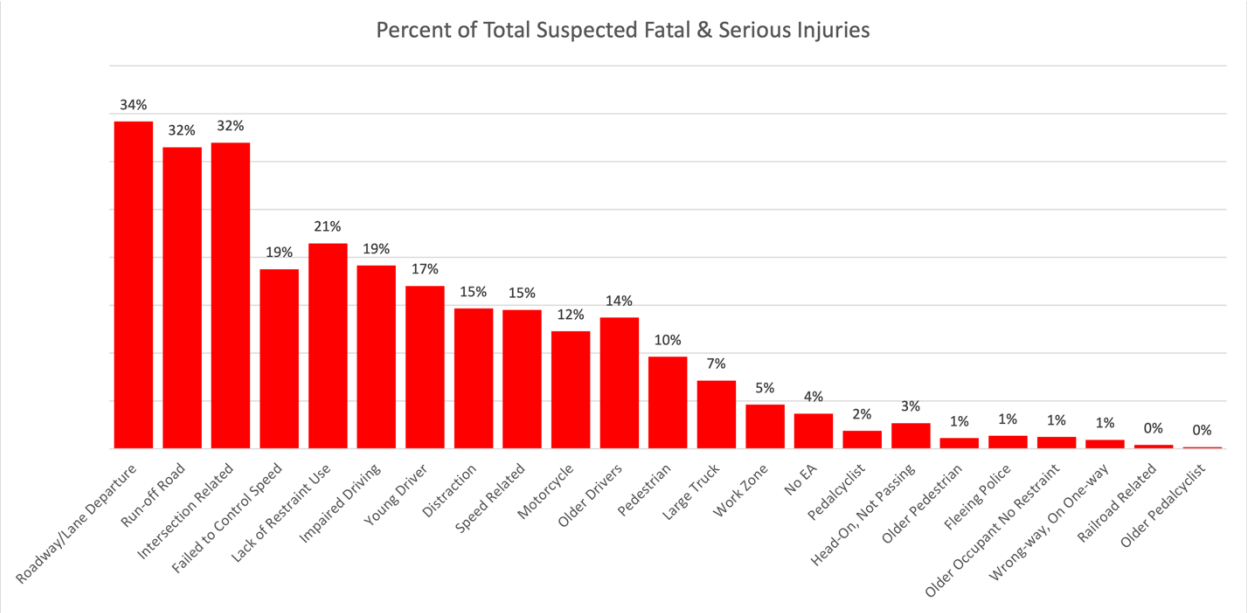
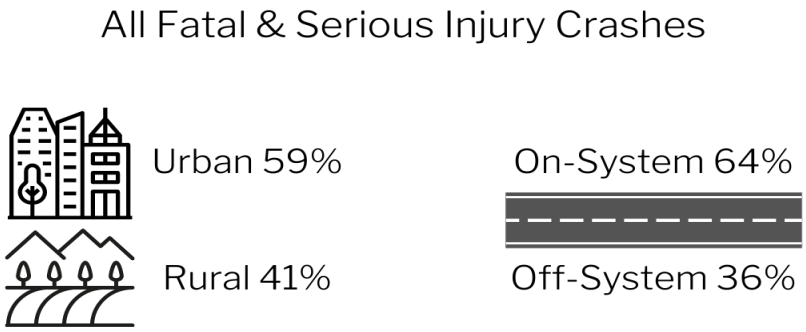


Figure 1.4. Percent of Total Fatal & Suspected Serious Injuries by Crash Factors

The crash data from 2017-2021 was further analyzed to identify the location of crashes in terms of whether they occurred on the state roadway system as well as in an urban or rural area. Each EA has this information cited as well.



Organization of the Texas SHSP

The Texas SHSP is organized into sections to detail the history, analysis of data, development of overall plan, emphasis areas, implementation activities, setting of performance targets, and coordination with other TxDOT plans. During the revision of the 2022 Texas SHSP, there were interim review and approval steps. This provided for prescribed and crucial involvement by the TxDOT Traffic Safety Division (TRF), FHWA, SHSP Executive Committee, statewide MPO association and individual MPOs as well as the approval of the TxDOT Executive Director.

The SHSP is organized into sections and appendices as follows:

1.0 Introduction & Overview
2.0 History & Accomplishments
3.0 SHSP Structure & Development Process
4.0 Target Setting Strategy
5.0 SHSP Plan Coordination
6.0 Emphasis Areas & Implementation Plans
7.0 Appendices
8.0 References

Section 2.0 History & Accomplishments

Texas first developed the state's Strategic Highway Safety Plan (SHSP) in 2006. Subsequent SHSP revisions were built on this initial plan, using new data and input from stakeholders to update goals, objectives, and key Emphasis Areas (EA). The Texas Department of Transportation (TxDOT) has used the SHSP to help guide many safety initiatives since the development of the first plan.

Safety Bond Program

A 2009 Safety Bond Program was funded with $600 million and accomplished the following safety improvements:

- Widened 588 of narrow highways
- Installed 290 miles of new concrete or cable median barrier on divided highways
- Installed 101 new left-turn lanes or two-way, continuous left-turn lanes on rural highways
- Converted 9 projects from existing four-lane undivided highways to four-lane divided highways and constructed additional shoulders
- Build 28 grade separations at existing highway intersections

In conjunction with an earlier safety bond program implemented in 2005, it was estimated these safety improvements saved more than 180 lives and prevented more than 680 incapacitating injuries annually over the life of the projects.

TxDOT has programmed nearly $700 million of highway safety projects for FY 2017 through FY 2020 in the Highway Safety Improvement Program (HSIP), focusing on barriers, curve improvements, intersection improvements, pedestrians, rumble strips, widening highways, and off-system improvements submitted by local agencies. TxDOT developed the Crash Analysis and Visualization Tool to enhance the process of selecting safety projects for HSIP funding.

In 2013, TxDOT began programming an additional $15.5 millions of state funds per year for systemic widening of narrow rural two-lane two-way highways. Projects are evaluated using a systemic analysis method that calculates a total risk factor weight based on roadway

characteristics such as paved surface width, average daily traffic, roadway alignment, and truck percentages. TxDOT also funds $15 million per year in rail-highway grade crossing safety improvements.

In addition to these physical safety improvements, TxDOT also programmed more than $105 million of FY 2017 state and federal funds for traffic safety programs in:

- Alcohol and other drug countermeasures
- Emergency medical services
- Motorcycle safety
- Occupant protection
- Pedestrian and bicyclist safety
- Police traffic services
- Speed control
- Traffic records
- Driver education and behavior
- Railroad/highway crossing safety
- Roadway safety
- Safe communities
- School bus safety

Safety Scoring Tool Development

In 2017, TxDOT initiated an effort with the Texas A&M Transportation Institute (TTI) to develop a series of safety scoring tools, beginning with rural non-freeway roadways to maximize system safety. Together, TxDOT and TTI created a spreadsheet-based scoring tool that allows project developers and designers to determine how changes in geometric design, traffic control and roadside features affect safety. TxDOT requires the use of this tool on all rural roadway projects. The scores are reported to the Texas Transportation Commission monthly and the reports indicate how safety was improved by the project. The effort was recognized in 2021 by the Federal Highway Administration and the Roadway Safety

Foundation with a National Roadway Safety Award. The tool was launched in 2019. In 2022, TxDOT launched the second tool which provides designers with a way to maximize urban intersection safety. The tool includes sections on geometric design, traffic control, pedestrian, and bicycle features.

Texas Transportation Commission Vision

Unfortunately, Texas has not had a day without a death on its roadways since November 7, 2000 – This means that at least one person has been killed on Texas roadways for almost the last 22 years (more than 7,900 days). The fatal crashes can be attributed to several contributing factors including those that involve the vehicle (tires, brakes, steering, lights, etc.), the roadway (intersections, curves, lighting, roadway departure, pedestrian crossing, etc.), and/or human behavior (impairment, speeding, occupant protection use, distraction, etc.). TxDOT has focused on safety with engineering, education, and enforcement efforts. To end the unacceptable streak of deaths on Texas roadways, the state will need to put an increased emphasis on safety in project prioritization, selection and design as well as continuing to address driver behavior through its driver education programs and enforcement. Additionally, the state will address emergency response time and overall emphasis on post-crash care. This approach is the goal for the current revision of the Strategic Highway Safety Plan. It is built on Texas adopting a Road to Zero approach to transportation safety.

In 2019, the Commission directed TxDOT to work toward a goal of reducing the number of deaths on Texas roadways 50% by 2035 and to zero by 2050 (3,4,5). To achieve *The Road To Zero* goal, Commission Chairman J. Bruce Bugg, Jr. said it is essential that TxDOT work closely with its metropolitan planning organizations (MPOs) partners.

The TTC allocated an extra $600 million for Road to Zero by targeting immediate roadway safety engineering improvements. Using these and HSIP funds, TxDOT has focused on increasing the number of roadway miles with rumble strips and median barriers, on intersection safety improvements, modernizing bridge rail and approach guardrails, high-friction surface treatments, widening narrow roadways, and traffic management systems.

As a follow-up to its 2019 order, the TTC created a task force in 2021 with representatives from TxDOT and the state's MPOs to identify and fund safety projects with a persistent focus on reducing the number of fatalities on Texas roadways (5). Initially, the TxDOT/MPO Safety Task Force will develop a short-term plan to immediately invest funding on current ongoing safety initiatives, such as rumble strips that alert drivers to slow down and when they are

veering off the road; cable barriers that prevent head on collisions; shoulder widenings to make room for disabled vehicles or more space to avoid a collision; four-lane divided roadways that help move traffic more efficiently; grade separations for uninterrupted traffic flow and increased safety; intersection improvements to reduce right angle crashes; and other safety measures. In long-term, the task force will establish performance metrics to measure effectiveness and impact along with identifying incentives for the partnership based on the reduction of deaths on Texas roadways.

Section 3.0 SHSP Structure & Development Process

SHSP Structure

The Strategic Highway Safety Plan (SHSP) is a "statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads" (2). In about a third of the states, both the Highway Safety Improvement Program (HSIP) and the Highway Safety Plan (HSP) are administered by the same agency. The HSIP and HSP need to be consistent. Texas has both the engineering and behavioral safety programs housed within the Texas Department of Transportation (TxDOT). TxDOT is also the parent organization for the Traffic Incident Management (TIM) program which leads emergency response and post-crash care initiatives. The state can effectively coordinate the programs since a single agency has oversight for all these programs. The relationship between these plans and programs is illustrated in Figure 3.1.

Figure 3.1. Texas Transportation Safety Plans & Programs

The SHSP Executive Committee (EC) provides oversight for the Texas SHSP revision and implementation process. The EC is comprised of a multidisciplinary group with representatives from agencies and organizations listed in Figure 3.2.

Role of SHSP Executive Committee

- Provide leadership & support to SHSP revision process
- Provide input on Emphasis Area selection
- Approve vision, mission & performance targets
- Review & approve SHSP
- Promote road safety internally & externally

AAA	North Central Texas Council of Governments
Central Texas Families for Safe Streets	Permian Basin Metropolitan Planning Organization
City of Austin	Texas Association of County Engineers & Road Administrators
Denton Police Department	Texas Department of Public Safety
Department of Motor Vehicles	Texas Department of State Health Services
Federal Highway Administration	Texas Department of Transportation
National High Traffic Safety Administration	

Figure 3.2. Executive Team Stakeholder Membership

The SHSP development and implementation process is facilitated and administered by the Management Team which consists of TxDOT, FHWA, and the Texas Transportation Institute (TTI). The Management Team met monthly during the revision process to review progress, suggest next steps, and address challenges. TTI is responsible for facilitating the process and provides a team of data analysts, engineers, transportation planners, communication professionals, and others as needed. The internal team meets monthly to review progress and address any issues that have arisen.

The primary goal for the SHSP is to prevent crashes. If a crash does occur the focus is to reduce severity and enhance emergency response to address fatalities and serious injuries. The SHSP is structured around nine high priority Emphasis Areas (EA) including Distracted Driving, Impaired Driving, Intersection Safety, Occupant Protection, Vulnerable Road Users, Roadway Departure, Speed Related and Post-Crash Care. Each EA involves a group of experienced experts and is led by a Team Leader. The EAs are responsible for developing strategies and countermeasures or programs to address fatalities and serious injuries associated with the particular EA. The alignment of the emphasis area teams is illustrated in Figure 3.3.

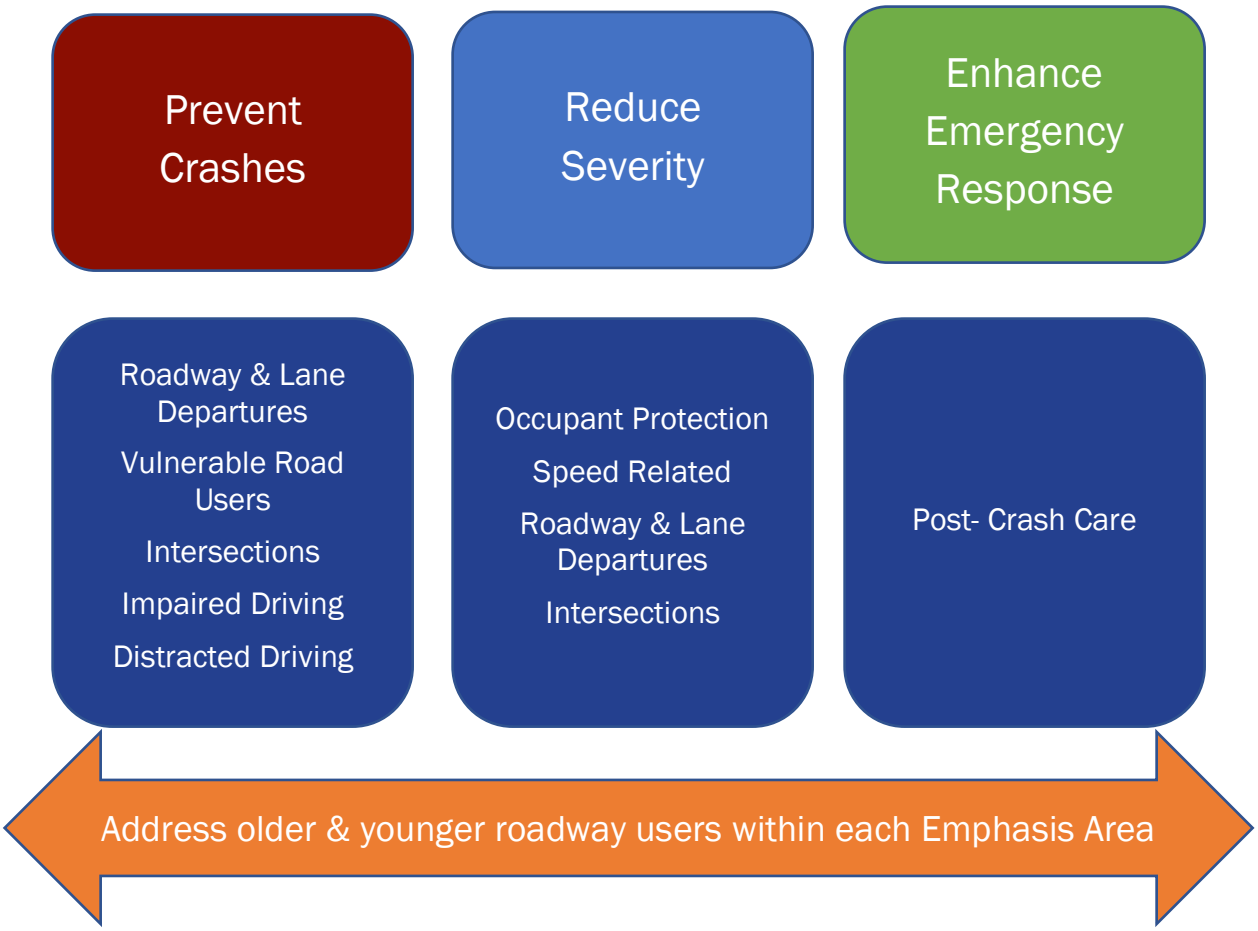


Figure 3.3. SHSP Process: Emphasis Area Teams Alignment

SHSP Update Process

The SHSP Federal rules require states to the update SHSP every five years (6). This review provides an opportunity to step back, reassess, think about progress, next steps, and reevaluate the process. At the beginning of the 2022 SHSP update, the U.S. was in the second wave of a global pandemic which resulted in a lower number of vehicle miles traveled (VMT), but an increase in fatalities. Conventional wisdom has always held that the number of fatalities and VMT moved together in parallel, i.e., if VMT goes up, fatalities increase as well. The pandemic turned this theory on its head. Because of the increase in fatalities in Texas and other states, many are reexamining the SHSP content and the process by which it is developed.

A second phenomenon taking place was increasing attention to what other, more successful countries were doing to save lives and reduce injuries. This has resulted in a major focus on "Safe System". A central tenant of Safe System is that humans will always make mistakes when using the roads, whether intentionally or unintentionally, but when they do, no one should die or be seriously injured in a crash. In other words, Safe System argues for shared responsibility. When a person dies or is seriously injured, it is not solely a human failure; it is a system failure. Therefore, all entities with a responsibility for road safety must work together to ensure all road users are safe, which heightens the need to spread a wide net and create a collaborative, multidisciplinary, multimodal approach to safety.

The traditional SHSP development process was designed to establish such a collaboration. So, what is the difference between implementing an SHSP and a Safe System? States are being encouraged and will eventually be required to move towards a Safe System approach. All states, including Texas, are implementing some elements of a safe system, but the key is to adopt more of those elements.

The 2022 SHSP update is a starting point and the first phase of development included putting factors in place to ensure success. The Management Team reconstituted the Executive Committee and secured commitments from each member. They reevaluated the Emphasis Area team leaders and members. Finally, the team took a deep dive into the data to learn whether the current EAs provide the best framework for success.

After conducting the data analysis, the Management Team facilitated a meeting with the Executive Committee and recommended adopting the eight EAs and suggested older road

user and young driver strategies and countermeasures should be folded into the eight EAs as appropriate because, for the most part, any program or countermeasure to improve the safety of those two will essentially benefit everyone. The Executive Committee approved this approach. The SHSP revision process is illustrated in Figure 3.4.

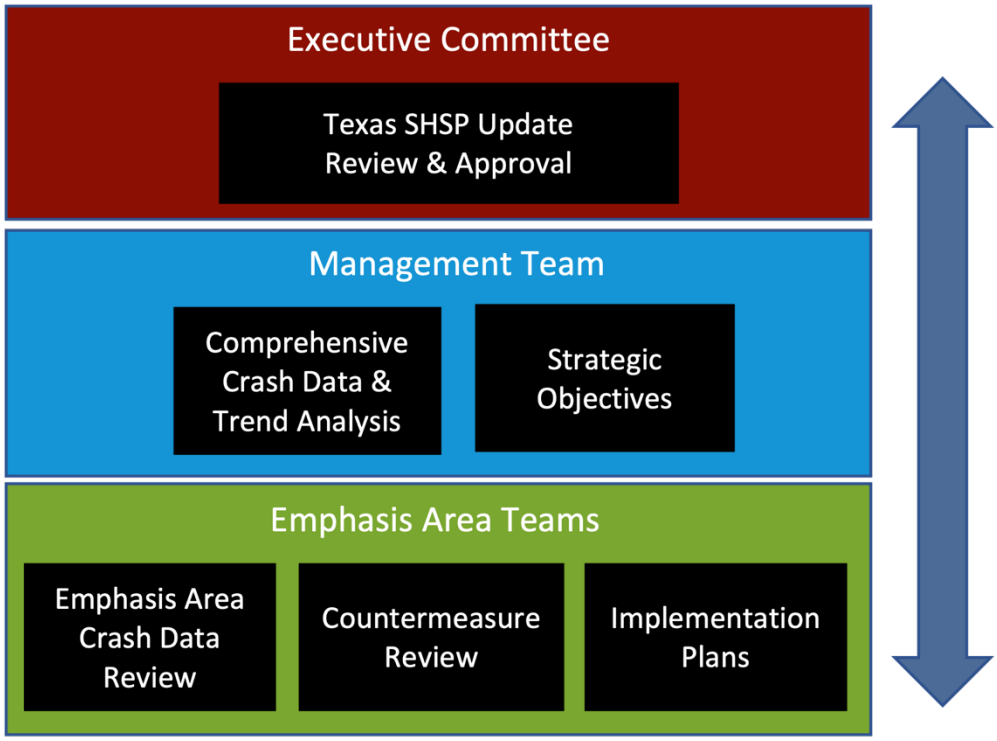


Figure 3.4. SHSP Process: Development & Approval Process

The EA teams are comprised of a diverse set of stakeholders who have expertise and interest in the specific EA that on which they serve. These EA team members include enforcement, education, engineering, and emergency response (4 Es) from local, regional, tribal, state, and federal agencies. Although there were several EA Team members who returned from the 2017 SHSP revision process. Additionally, other stakeholders from each of the four Es were contacted to ensure that all the areas and geographic regions were represented on the EA teams. There were some stakeholder groups who did not participate in the EA area teams. Texas tribal organizations, Alabama-Coushatta, Kickapoo, and the Ysleta del Sur Pueblo, were invited to participate, but were not able to provide representatives. However, traffic safety stakeholders, regardless of their ability to participate in the SHSP EA process, will be included in the implementation of the plan.

SHSP Revision Timeline

The timeline associated with the revision of the Texas SHSP included streamlining the Executive Committee (EC) to ensure representation from all stakeholder types. The Management Team was formed from TxDOT and TTI senior transportation safety staff and operated as the project team. After the Emphasis Areas were confirmed by the EC, the existing members were reconfirmed, and additional members were added as appropriate. The tasks and accomplishments linked to the 2022 Texas SHSP revision process are detailed in Figure 3.5

Months	Accomplishments
2021 September-October	1. Organized the Management Team (MT) 2. Conducted data analysis 3. Recruited and/or reconfirmed Executive Committee (EC) members 4. Identified and confirmed Emphasis Area (EA) Team Leaders
2021 November-December	1. Reviewed analysis results 2. Selected preliminary Emphasis Areas (EA) 3. Reviewed Vision, Mission, and Goals 4. Convened the Executive Committee to approve the update process, the Vision, Mission, Goals, & the EAs 5. 1st round of EA Team meetings to review the data & SHSP process 6. Began drafting the SHSP Engagement Plan 7. Held Management Team meetings
2022 January-February	1. 2nd round of EA Team meetings to begin developing the strategies & countermeasures or programs 2. Continued data analysis 3. Continued work on the SHSP Engagement Plan 4. Held Management Team meetings
2022 March-April	1. 3rd round of EA Team meetings to complete EA plans 2. Continued data analysis with 2021 data 3. Began updating the SHSP 4. Held Management Team meetings

Months	Accomplishments
2022 May	1. Completed first draft of 2022 SHSP & submitted to TxDOT for review 2. Held Management Team meeting
2022 June-July	1. Revised draft SHSP based on TxDOT review/comment 2. EC reviews performance target setting methodology & targets 3. Revised safety performance targets based on EC review 4. Resubmitted safety performance targets to EC for approval 5. Presented safety performance methodology & targets to TxDOT Tactical Steering Committee 6. Presented safety performance methodology & targets to TxDOT Executive Steering Committee 7. Submitted revised SHSP to TxDOT 8. Highway Safety Plan (HSP) Annual Report to NHTSA by TxDOT 9. Presented SHSP update during the Texas Traffic Safety Conference 10. Revised the Draft SHSP based on review/comment 11. Finalized & submitted 2022 SHSP to EC for approval 12. Submitted SHSP to FHWA for approval
2022 August-September	1. Submitted HSIP Annual Report to FHWA 2. Completed the draft Engagement Plan 3. Commenced planning for the SHSP rollout 4. Conducted widespread outreach 5. Developed SHSP implementation & evaluation plan for 2022-2023

Figure 3.5. Outline of the Basic Development Timeline & Accomplishments

Section 4.0 Methodology & Approach for Projecting Performance Targets

Background

To set realistic target levels for fatal and serious injuries, it is important to first develop a data-driven methodology for predicting the level of casualties expected in the absence of the actions taken to implement the SHSP. Projections are based on the premise that casualties and serious injuries are the product of exposure and risk. For traffic crashes, exposure is generally represented as the amount of travel, and risk as the number casualties (fatalities or serious injuries) per unit of travel. The unit of travel chosen for this analysis is million vehicle miles of travel (MVMT), and fatalities risk is expressed as a chance of a fatality per MVMT. Reduction in either risk or exposure, or both, could lead to lower levels of fatalities and serious injuries.

Aspirational Goals: Their Role in the Texas SHSP

The Texas's Strategic Highway Safety Plan details strategies, objectives, emphasis areas, countermeasures, and implementation plans. These elements are operational and tactical in nature. The state expects these to be attainable typically, over the next five years. As important as this approach is to improving roadway safety, it also imperative for state transportation leaders to look at long-range strategy. What does roadway safety look like in 20-30 years? How many fatalities and serious injuries are we willing to accept on our roadways?

As with other types of organizations, it is tremendously difficult to get those who develop strategic plans to be super ambitious since the people creating the plans are expected to achieve the goals. Frequently, the ability to meet the goals rest not only with those setting them, but also requires an integrated approach with multiple stakeholders and coordination. Aspirational goals require multi-faceted, holistic approaches and subsequently can be difficult to visualize. Most people have not been trained in moonshot thinking. We assume, although we may not articulate it, that some things are impossible. Many teams and organizations have realized that the best way to achieve aspirational goals is to set them.

President John F. Kennedy articulated this eloquently best in his *We Choose to Go to the Moon* speech in Houston 60 years ago (7):

> *Because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we're willing to accept. One we are unwilling to postpone.*

What is moonshot thinking for Texas transportation safety? How do our five-year performance targets integrate with our aspirational goals? In support of the governor and the legislature, the Texas Transportation Commission works to address requirements and facilitate the future of transportation in Texas. Safety on our roadways is a critical part of its mission. In 2019, the Texas Transportation Commission used a minute order to point to our transportation safety moonshot – zero deaths on Texas roadways by 2050 (4).

Strategic planning processes require SMART goals (specific, measurable, attainable, relevant, time-based). Ideally, these goals are ambitious in nature, but the attainable in the acronym implies some level of certainty which can limit aspiration. Although aspirational goals may not necessarily be based on past data or trends, they are no less achievable. By adopting Road-to-Zero (RTZ), the Texas Transportation Commission is facilitating future decision-making and directing resources to be focused on eliminating fatalities.

The overarching, aspirational goal for the 2022-2027 Texas Strategic Highway Safety Plan is to eliminate fatalities on our roadways. The steps to move towards this goal and the methodology associated with setting performance targets are detailed in this section.

Aligning SHSP Targets with Road-to-Zero (RTZ)

For the 2022 revision of the SHSP, the targets are aligned with the Road-to-Zero (RTZ) direction by the Texas Transportation Commission. The projections are based on the short-term target of reducing fatalities to approximately 1,800 by 2035 and the long-term target of zero fatalities by 2050. The linear trend line based on the RTZ targets served as the means of projection for the fatalities.

Using a calculated linear trend line based on the last five years of total traffic suspected serious injuries, this injury type was projected into the future to 2027. This is a traditional approach and has been used historically for setting Texas safety goals and it relies on the assumption that recent trends will continue. During the last five years (2017-2021), there

has been considerable variability between the years with 2020 and 2021 demonstrating unexpected increases even during shutdown during the pandemic quarantine periods. Although it is difficult to calculate the potential impact, it is reasonable to assume that the frequency of suspected serious injuries would increase based on the assumption that when fatal crashes are reduced, some of the injuries that once resulted in a fatality would now be less severe and produce a serious injury instead.

Target Setting Strategy

The Texas Strategic Highway Safety Plan (SHSP) is a statewide-coordinated 5-year safety plan that provides the comprehensive framework for reducing highway fatalities and serious injuries on all public roads. To accomplish this mission, the SHSP establishes strategies and countermeasures to address Emphasis Areas. The SHSP further identifies the key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries. In addition to these strategies, the SHSP puts forward performance targets that serve to measure progress in the Road-to-Zero. The following are the five core performance measures identified as drivers for the SHSP:

1. Number of fatalities
2. Rate of fatalities per 100 MVMT
3. Number of serious injuries
4. Rate of serious injuries per 100 MVMT
5. Number of non-motorized fatalities and serious injuries

TEXAS TRANSPORTATION COMMISSION

All Counties
All Districts

MINUTE ORDER

Page 1 of 1

The Texas Transportation Commission (commission) directs the Texas Department of Transportation (department) to work toward the goal of reducing the number of deaths on Texas roadways by half by the year 2035 and to zero by the year 2050. The commission acknowledges a majority of motor vehicle crashes can be prevented, thereby reducing fatalities.

IT IS FURTHER ORDERED that the divisions and districts of the department shall develop and implement strategies required to reduce the number of deaths on Texas roadways by half by the year 2035 and to zero by the year 2050.

Submitted and reviewed by:
Director, Traffic Safety Division

Recommended by:
Executive Director

115481 MAY 30 '19
Minute Number Date Passed

In previous revisions of the SHSP, various methodologies were considered when setting performance targets. For this revision of the SHSP, the Road-to-Zero initiative needed to be incorporated into the target setting methodology. In 2019, the Texas Transportation

Commission issued Minute Order #115481 that directed TxDOT to work towards reducing the number of deaths on the state's roadways to zero by 2050 (4). The Road-to-Zero Minute Order included an interim goal of a 50% reduction in fatalities, based on 2019 data, by 2035. There were fewer fatalities in 2019 than in 2020 and 2021 when Texas saw an increase even while the state was experiencing significant shutdowns during pandemic. The order further directed that TxDOT divisions and districts work together to ensure consistency in setting targets across plans (SHSP, HSIP, HSP and UTP) as well as implement strategies that will reduce fatalities on Texas roadways.

Projection Methodology for Setting Targets

Fatalities & Fatality Rate

As a result of the Road-to-Zero (RTZ) Minute Order, the performance target for the number of fatalities is based on the 2019 crash data as the initial point, 50% of that number as the mid-point on the line (2035) and zero as the final point on the projected line for fatalities. These projects are illustrated in Figure 4.1.

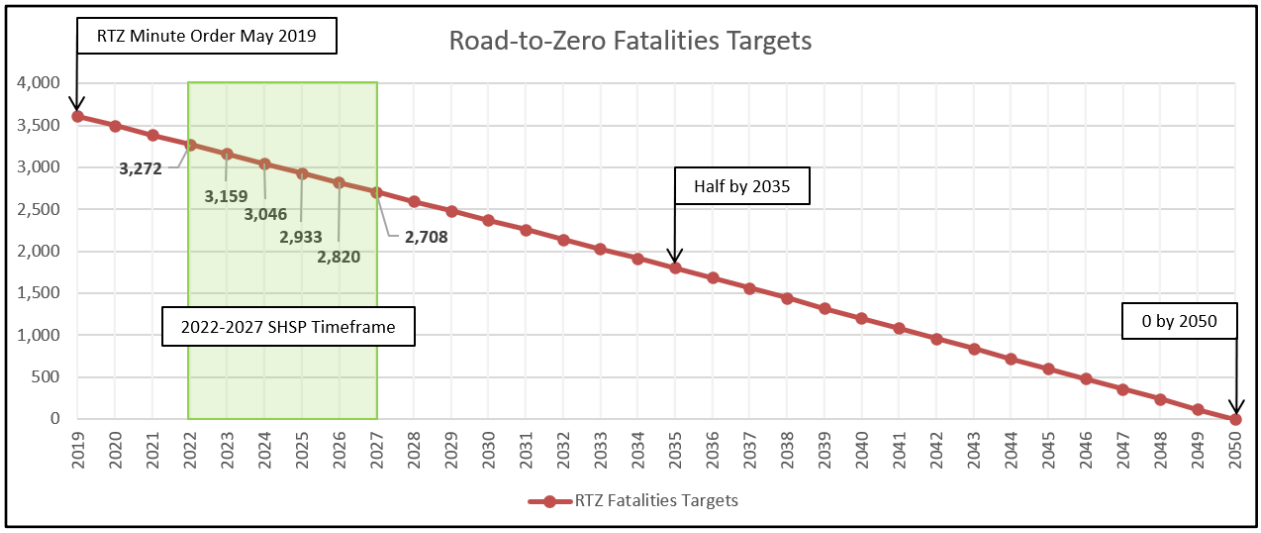


Figure 4.1. Road-to-Zero Fatality Targets 2019-2050.

Based on the RTZ approach and the projection line, the number of fatalities is expected to be reduced by 113 each year to 1,804 in 2035. The rate was calculated based on the projected million vehicle miles travelled as estimated by TxDOT. The project targets for the number of fatalities and the fatality rate per 100 MVMT are detailed in Figure 4.2.

	2022	2023	2024	2025	2026	2027
Number of fatalities	3,272	3,159	3,046	2,933	2,820	2,708
Rate of fatalities per 100 MVMT	1.25	1.20	1.14	1.09	1.03	0.98

Figure 4.2. Projected Fatality Targets for 2022-2027.

Suspected Serious Injuries & Rate

In contrast to the projection methodology for fatalities, the suspected serious injury projection was calculated based on the five-year (2017-2021) trend in crash data. Based on the trend, the projected number of suspected serious injuries would be 19,296. Based on the feedback from the EA teams and the Executive Committee, the target for suspected serious injuries is 18,910. Based on feedback from the Executive Committee and Management Team, the SHSP performance target for suspected serious injuries will be a 2% decrease from the projected trend for each year with a goal of 18,910 in 2027. It should be noted that this is an aggressive goal since the state expects to see at least an initial increase in serious injuries as the fatalities decrease. The projections and targets are illustrated in Figures 4.3 and 4.4.

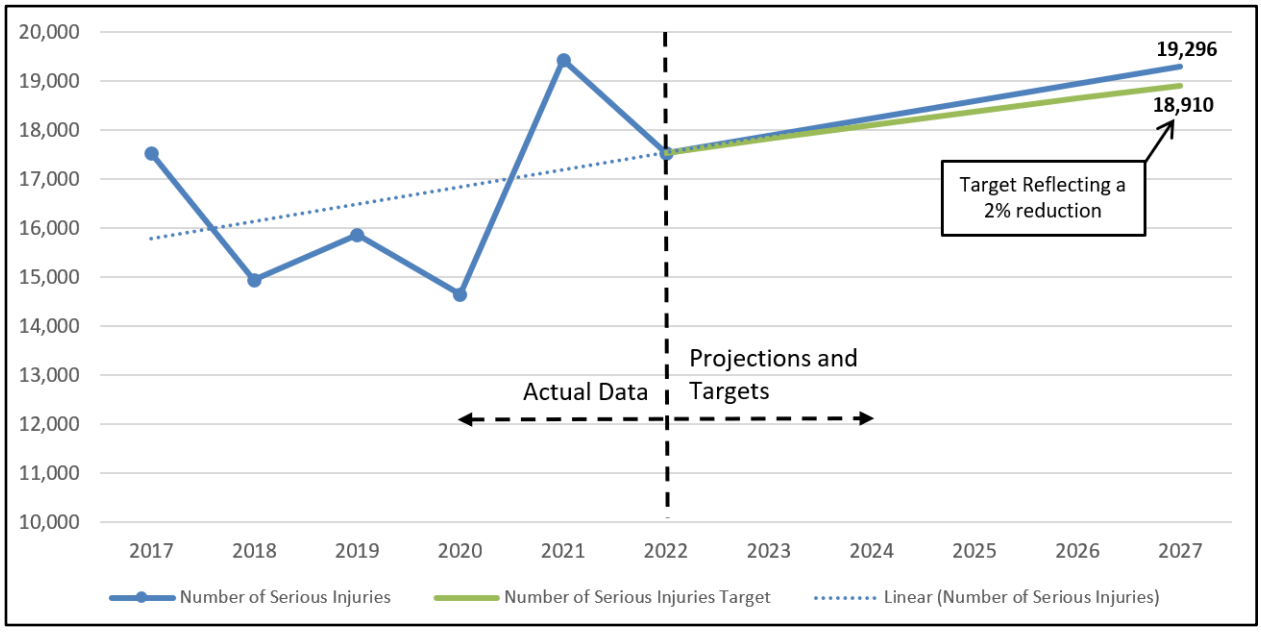


Figure 4.3. Actual Data vs. Projections & Targets: Suspected Serious Injuries 2017-2027

	2022	2023	2024	2025	2026	2027
Number of serious injuries	17,539	17,819	18,096	18,370	18,642	18,910
Rate of serious injuries per 100 MVMT	6.70	6.77	6.77	6.83	6.81	6.84

Figure 4.4. Projected Suspected Serious Injury Targets for 2022-2027.

Non-Motorized Fatalities & Suspected Serious Injuries

Non-motorized users include pedestrians and bicyclists. Since these types of roadway users are particularly vulnerable, the SHSP performance metrics provide for a performance target that is unique to these groups. This is also important to the strategies and implementation planning since some countermeasures focused on pedestrians and bicyclists are unique to the vulnerable road user group, so they require a separate metric to assess progress.

As was previously described in the projected fatality part of this section, the Road-to-Zero (RTZ) Minute Order directs that the performance target for the number of fatalities is based on the 2019 crash data as the initial point, 50% of that number as the mid-point on the line (2035) and zero as the final point on the projected line for fatalities. The target number associated with non-motorized fatalities follows the same direction since it is included in the total number of fatalities.

The SHSP combines the number of fatalities and suspected serious injuries related to non-motorized users into one performance metric. To adequately project this metric and select targets, the calculation was completed in two steps. First the number of non-motorized fatalities was projected using the same approach as the overall fatalities. To calculate the project trend line using the RTZ directive, the baseline was the 2019 data which was reduced by 50% by 2035 and the final point on the line was zero fatalities in 2050. The second step was to calculate the trend in suspected serious injuries based on the previous five years' worth of data (2017-2021). A simple projection line was used to calculate the projections for this type of injury. The suspected serious injury target represents a 2% decrease in each of the next five years. Finally, the results of the two steps were combined to calculate the targets for non-motorized fatalities and injuries from the next five years (2022-2027). The calculated targets are provided in Figure 4.5 for each of those five years.

	2022	2023	2024	2025	2026	2027
Number of non-motorized fatalities & serious injuries	2,321	2,340	2,360	2,378	2,397	2,415

Figure 4.5. Projected Non-Motorized Fatalities & Serious Injury Targets for 2022-2027.

Summary

Once the targets were calculated, the Management Team presented the methodology and the results to the Executive Committee for review and approval. The SHSP Executive Committee reviewed and confirmed the 5 safety targets. Following this approval, the targets were distributed to the state's Metropolitan Planning Organizations (MPOs) through their statewide association (Texas Metropolitan Planning Organizations (TEMPOs). The regional groups will review and provide comments on the targets as well as plan internally how they can contribute. A summary of all the SHSP performance targets is detailed in Figure 4.6.

	Targets					
Performance Measures	2022	2023	2024	2025	2026	2027
Number of fatalities	3,272	3,159	3,046	2,933	2,820	2,708
Rate of fatalities per 100 MVMT	1.25	1.20	1.14	1.09	1.03	0.98
Number of serious injuries	17,539	17,819	18,096	18,370	18,642	18,910
Rate of serious injuries per 100 MVMT	6.70	6.77	6.77	6.83	6.81	6.84
Number of non-motorized fatalities & serious injuries	2,321	2,340	2,360	2,378	2,397	2,415

Figure 4.6. Projected Performance Targets for SHSP Performance Measures for 2022-2027

Section 5.0 SHSP Plan Coordination

Background

The Texas Department of Transportation (TxDOT) developed the Strategic Highway Safety Plan (SHSP) using a cooperative process with federal, state, regional and local agencies in partnership with public and private organizations to ensure the plan is comprehensive and equitable. The plan is data-driven and revised every five years to establish performance targets, strategies and implementation plans that include engineering, education, enforcement, and emergency services countermeasures. The SHSP focuses on the integration of highway safety programs (engineering and behavioral) with the stakeholder activities to leverage resources to tackle the state's transportation safety challenges.

The SHSP implementation and evaluation efforts are strengthened by coordinating with other transportation and safety planning efforts. This ensures the alignment of goals, objectives, strategies, and countermeasures. Coordination, communication, and collaboration can result in shared responsibility and leverage resources. This approach leads to more efficient and effective road safety practices. The first steps include examining existing documentation that is relevant to roadway system safety. The following documents serve as a foundation for the Texas SHSP development and implementation:

- 2017 Revision of the Texas SHSP (8)
- Current Highway Safety Plan (HSP) (9)
- Current Highway Safety Improvement Program (SHIP) Manual (10)
- Unified Transportation Plan (11)
- TxDOT Long Range Transportation Plan (12)
- Solutions for Saving Lives on Texas Roads (13)
- MPO Long Range Transportation Plans
    - Capital Area MPO (CAMPO) (14)
    - North Central Texas Council of Governments (NCTCOG) (15)
    - Houston-Galveston Area Council (HGAC) (16)
    - Alamo Area MPO (AAMPO) (17)
- Commercial Vehicle Safety Plan (18)
- Austin Vision Zero Plan (19)
- San Antonio Vision Zero Plan (20)

SHSP

The 2022 SHSP long-term vision is to achieve zero fatalities and serious injuries on the Texas roadways. As part of the vision, the primary performance targets, fatal crashes, and fatalities, will have a target of zero by 2050. In the interim, the current SHSP establishes five targets to be achieved over the next five years or by the end of 2027. These targets are aligned with the HSIP and the Highway Safety Plan.[1]

Figure 5.1 shows the required SHSP targets and definitions. The 2027 projections are based on a target of zero for fatalities and fatal crashes by 2050. The methodology used to develop the performance targets is included in Section 4 of this SHSP.

Target Area	Definition (During a calendar year)	2027 Target
Number of Fatalities	Total number of persons suffering fatal injuries in a motor vehicle crash	2,708
Rate of Fatalities	Ratio of total number of fatalities to the number of VMT (in 100 million VMT)	0.98
Number of Serious Injuries	Total number of persons suffering at least one serious injury in a motor vehicle crash	18,910
Rate of Serious Injuries	Ratio of total number of serious injuries to the number of VMT (in 100 million VMT)	6.84
Number of Nonmotorized Fatalities & Non-motorized	Combined total number of non-motorized fatalities & non-motorized serious injuries involving a motor	2,415

Figure 5.1. SHSP 2022 Performance Targets.

Texas Traffic Safety Task Force Report

The 2016 Texas Task Force Report (*Solutions for Saving Lives on Texas Roads*) laid out the financial resources required to reduce the number of fatalities and serious injuries. It does not specify goals, objectives, and performance measures, but does identify specific safety initiatives, and recommends tracking progress on those initiatives, such as engineering improvements and behavioral change strategies to measure performance. The SHSP, which identifies emphasis areas, additional actions, and performance measures is consistent with the Task Force approach and includes broader collaboration among partners.

TxDOT Plan and Program Documents

The Texas Transportation Commission has adopted rules governing the planning and development of transportation projects. These rules include guidance for the development of the Unified Transportation Program and any updates. The Statewide Long Range Transportation Plan (SLRTP), also known as the Texas Transportation Plan, identifies the needs to be met and specific goals that projects listed in the UTP are oriented toward achieving. The different plans and programs in this family of documents are shown in Figure 5.2, with the UTP serving as a mid-range programming document linking the planning activities of the SLRTP, the Metropolitan Transportation Plans, and Rural Transportation Plans to the detailed programming activities under the Statewide Transportation Improvement Program (STIP) and TxDOT's 2-year Letting Schedule.

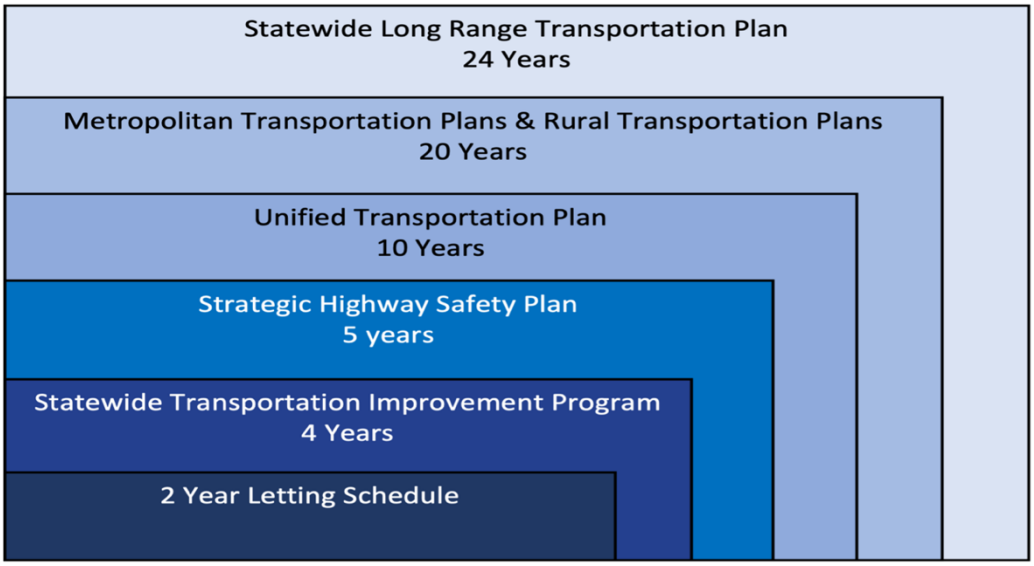


Figure 5.2. UTP in the TxDOT Family of Documents

Statewide Long Range Transportation Plan

The Statewide Long-Range Transportation Plan 2035 (SLRTP) is the state's current plan. This plan will form the basis for the Texas Transportation Plan 2040. The Texas Transportation Commission adopted the Texas Transportation Plan (TTP) 2040 (11) in 2015 to serve as TxDOT's long-range, performance-based transportation plan (LRTP) (12). The TTP 2040 was developed through a collaborative process of MPOs and communities, as well as city, county, transit, stakeholder, and private company officials. TTP 2040 guides planning and programming decisions for the development, management, and operation of the statewide, multimodal transportation system in Texas over the next 25 years. Among other things, the TTP includes a section on performance goals, measures, and targets.

The safety goal stated in the TTP is "improve multimodal transportation safety." The TTP specific objectives follow. Those in bold indicate strategies or objectives also addressed in the SHSP specifically in the Emphasis Areas:

- **Reduce fatalities and serious injuries.**
- Improve safety of at-grade rail crossings.
- **Eliminate conflicts between modes wherever possible (particularly in the section on Intersection Safety).**
- **Increase bicycle and pedestrian safety through education, the design and construction of new facilities, and improvements to existing facilities.**
- **Educate the public on the dangers of high-risk driving behaviors.**
- **Coordinate with enforcement to improve driver compliance with laws.**
- **Improve incident response times.**

The SLRTP is built around the six TxDOT Strategic Plan goals:

1. Develop an organizational structure and strategies designed to address the future multimodal transportation needs of all Texans;
2. Enhance safety for all Texas transportation system users;
3. Maintain the existing Texas transportation system;
4. Promote congestion relief strategies;
5. Enhance system connectivity; and
6. Facilitate the development and exchange of comprehensive multimodal transportation funding strategies with transportation program and project partners.

The TTP performance measures include the number and rate of fatalities and serious injuries by each mode. Specific performance measures for non-motorized users were not included, but TxDOT intends to track the extent to which bicycle and pedestrian needs are met. Bicycle and pedestrian needs include local projects identified to preserve facility infrastructure, enhance connectivity, and improve safety.

SHSP managers work with TxDOT planners to encourage quantification of these four measures overall and by individual mode, and to consider a measure for non-motorized (e.g., pedestrians and bicyclists' fatalities).

LRTP implementation is a multistep process beginning with the Unified Transportation Program (UTP) and ending with the Statewide Transportation Improvement Program (STIP).

Unified Transportation Program (UTP)

The UTP is an intermediate programming document linking the planning activities of the statewide LRTP, the metropolitan transportation plans, and rural transportation plans to the detailed programming activities under the STIP and TxDOT's 24-month (2-year) letting schedule (*11*). Specifically, the UTP lists projects and programs planned for construction and/or developed within the first 10 years of the 24-year SLRTP. Project development includes activities such as preliminary engineering work, environmental analysis, and right-of-way acquisition and design. Attention to safety is not specifically required in project development.

Despite its importance to TxDOT as a planning and programming tool, the UTP is neither a budget nor a guarantee that projects will or can be built. It is a critical tool in guiding transportation project development within the long-term planning context. In addition, it serves as a communication tool for stakeholders and the public in understanding the project development commitments TxDOT is making.

Texas Statewide Transportation Improvement Program (STIP)

The STIP is the programming document that prioritizes and schedules projects (*10*). The Highway Safety Improvement Program (HSIP) projects are included in the STIP and other road safety projects may be included utilizing state funds. While the STIP does not contain

goals and performance measures, it is based on a set of needs set out in the LRTP, the first of which addresses the need to "maintain a safe transportation system for all transportation users." The plan projects more than $3.17 billion on safety projects.

Highway Safety Plan (HSP)

The Highway Safety Plan (HSP) is a requirement from NHTSA to receive federal funding for behavioral traffic activities (9). The Texas highway safety planning process consists of multiple steps covered by three general topics. TxDOT's Traffic Safety Division's (TRF) Behavioral Traffic Safety Section (BTS) uses a planning cycle that consists of ongoing 1) Review, 2) Assessment, and 3) Modifications. These steps are coordinated by the TRF-BTS Program Planner and is an ongoing process of updates and adjustments based on available data and input. The Planner coordinates the following:

- Review of past and current data and trends
- Review of past performance with program area managers
- Meetings with and input from traffic safety partners
- Review of crash data analysis compiled by TxDOT and others
- Validation of draft strategies and targets

Partner/stakeholder input is gathered through various means including regular Traffic Records Coordinating Committee (TRCC) meetings, data analysis from traffic records (TxDOT and other state and local agencies), meetings of the Impaired Driving Task Force, and the Motorcycle SafetyCoalition, grant monitoring sessions, coalition meetings with local law enforcement and partners, meetings and information sharing with Federal partners such as the National Highway TrafficSafety Administration (NHTSA) and the Federal Highway Administration (FHWA), studies and research projects from universities and institutions of higher learning, and survey results frommedia campaigns and learning institutions. It is through the analysis and synthesis of these data and the stringent requirements placed on potential subgrantees and contractors that the State's traffic safety problems are identified and prioritized for inclusion in the annual HSP.

The Planner is responsible for compiling available information and data analysis to document a data-driven problem identification, identification of emphasis program areas, and identification of other topics that need to be addressed with the overall goal of the reduction of crashes, injuries, and deaths on Texas' roadways. The Planner is also

responsible for the coordination of the performance planning process for the Traffic Safety Program. This involves an Annual Performance Plan that details the priority traffic safety performance goals for the coming year. This plan is created through the strategic planning process that includes input from Traffic Safety Program and Project Managers.

Using information gained from the strategic planning process, the Planner analyzes, compiles, andgenerates the HSP for the coming fiscal year, including:

- Comprehensive Statewide problem identification to pinpoint and prioritize program areas to be addressed
- Review and selection of appropriate, evidence-based performance measures
- Review and selection of appropriate, data-driven *targets* for selected performance measures
- Selection of emphasis *areas for priority funding* consideration
- Analysis of available resources including Federal, State, and local *funding* sources
- A *performance report* consisting of the previous year's activities and performance measures

MPO Long Range Plans

The long-range plans for CAMPO, NCTCOG, HGAC, and AAMPO were examined for evidence of safety goals, objectives, and performance measures. The MPO LRTPs typically are used as the guiding force for an MPO. For the most part, the LRTPs were adopted before the FAST Act became law, but the safety planning requirements were enacted into law in the Transportation Equity Act for the 21st Century in 1998. The sample of MPOs demonstrates a consistent commitment to safety; SHSP managers and participants will encourage the MPOs to include performance targets consistent with the SHSP in future planning efforts.

North Central Texas Council of Governments

The NCTCOG LRTP (Mobility 2040) is focused on growth and mobility for the region. The introductory materials acknowledge the MAP-21 planning goals including "safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads"

and discuss safety in the vision statement, "enhancing the safety of the traveling public." The section on goals states, "Goals define the purpose of Mobility 2040 and guide efforts to accommodate the multimodal mobility needs of a growing region. These goals support and advance the development of a transportation system that contributes to the region's mobility, quality of life, system sustainability, and continued project implementation" (*15*). Safety is highlighted under the System Sustainability section as, "Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system." In addition, the Metropolitan Transportation Plan Development Process noted that, "Impacts to system safety and security, Environmental Justice, environmental mitigation, and intermodal planning were also considered throughout the development of Mobility 2040." Searching the website for "safety" reveals a substantial safety program as outlined below. The safety section begins with an overview: "The Transportation Safety program area focuses on improving traffic safety throughout the region by supporting planning efforts to develop safety policies, programs, and projects and the development of the Dallas-Fort Worth Regional Safety Information System" (*8*). The safety program includes Traffic Incident Management and other training programs, a Regional Safety Advisory Committee, the Dallas-Fort Worth Regional Safety Information System, publication of the NCTCOG Regional Crash Rates fact sheet, a Work Zone Safety Working Group, Mobility Assistance Patrols, the Intersection Safety Implementation Plan, and other activities (15).

Houston-Galveston Area Council

The first goal listed in the regional transportation plan is *reduce crash rates*, and both goals three and four list *incident response* as a part of the goal statement. Incident response is a large factor not only in mobility, but also in safety. (*16*)

The 2040 LRTP employs four strategies as implementation tools to realize the goals, one of which is Improve System Management and Operations (maximizing reliability and efficiency of existing assets through intelligent transportation systems, traffic incident management, crash avoidance technology, etc.).

The LRTP acknowledges the MAP-21 requirement to develop safety performance measures. "MPOs across the country will need to adopt and implement programs and priorities based on performance measures—easy to understand indicators of achievement" (*16*). The adopted performance measure is improved safety, which tracks safety measures related to

traffic, bus, and rail to provide a sense of overall system safety. The performance measures most closely related to the SHSP address traffic, bicycle, and pedestrian crash rates.

Capital Area Metropolitan Planning Organization

The first goal listed in the CAMPO 2040 Regional Transportation Plan is the safety goal, "Increase the safety and security of the transportation system because every year our region suffers injury and loss of life due to crashes involving motor vehicles, pedestrians, and bicyclists" (*14*). The plan "affirms that even a single loss is one too many and makes safety its guiding principle." The plan "strongly encourages all recipients of federal, state, and/or local funds to continue making safety a major priority as it develops and implements transportation projects throughout the region."

The one safety objective listed in the action plan is to make "three miles of improvements to high crash corridors," and it is listed under the Social Equity section. A specific safety section is not included in the action plan. Under the section Balance Project Prioritization, an objective is to "prioritize projects by balancing immediate needs to improve safety and mobility with preparation for future growth" (*14*).

Alamo Area Metropolitan Planning Organization (AAMPO)

The LRTP recognizes the federally required planning factors, which include "Increase the safety of the transportation system for motorized and non-motorized users," and the vision statement says, "TXHE 2040 Metropolitan Transportation Plan will meet growing needs while enhancing the safety of the traveling public" (*17*). Among the plan's goals is an objective to maintain a focus on safety. The AAMPO LRTP includes separate sections to address pedestrian and bicycle safety concerns as outlined below.

AAMPO Pedestrian Safety

There is a continued awareness and momentum toward improving pedestrian facilities. In 2012, AAMPO completed and adopted a Pedestrian Safety Action Plan that defines an infrastructure toolbox to make walking safer. As this momentum continues, AAMPO is closer

to developing a truly comprehensive pedestrian facilities system that will accommodate pedestrian mobility needs. Three of AAMPO's goals directly address safety issues (*17*):

- Goal 1—Institutionalize transportation planning for pedestrians: recognize and incorporate walking as a significant and required elements for all persons.
- Goal 3—Make walking safer through education, encouragement, and enforcement.
- Goal 4—Identify and effectively use available funding. Everyone is a pedestrian at one end or the other of their trips whether they are commute or recreational trips. With the growing concerns of congestion, air quality and the public interest in promoting alternative transportation modes, the adoption of policies and performance measures that encourage alternate transportation modes will aid in reducing congestion, improving air quality, and enhancing the community's quality of life" (*17*).

AAMPO Bicycle Safety

In the last five years, the region has continued to see improvements in and the expansion of bicycle projects and programs. Regional leaders understand the importance of creating and maintaining a multimodal transportation system. Various goals and objectives have been identified to ensure this area continues to develop and implement a comprehensive bicycle network. The MPO has adopted the following vision statement for bicycling in the region: "The Alamo Area recognizes bicycling as a clean, healthy, and affordable form of transportation and recreation. A comprehensive on-road and off-road bicycle network will make our community a place where bicycling will be desirable for trips of all kinds by all segments of the population" (*17*). Goal three of the plan's four goals addresses bicycling safety: "Make bicycling safer through education, encouragement, and enforcement: Grow the program to educate elected officials and the public concerning the opportunities, benefits, and safety aspects of bicycling in the region" (*17*).

Vision Zero Plans

Following a growing national trend, Austin and San Antonio have adopted Vision Zero policies and action plans and have joined the national Vision Zero Network. The Dallas/Fort

Worth region is considering joining the Network, as are other Texas communities. Vision Zero started in Sweden as a response to traffic deaths and injuries and has since spread to cities throughout the United States. These cities adopt the goal of reaching zero fatalities and serious injuries. As the SHSP managers conduct outreach to transportation planning organizations, discussions will include attention to the relationship between the Vision Zero cities and other safety plans and the SHSP.

As the title implies, the targets in the current Vision Zero cities are zero. They can be encouraged to develop interim targets in alignment with the statewide and the five required MPO safety performance measures, which would closely align them with the surrounding regional MPO targets.

Austin Vision Zero

Vision Zero holds that traffic deaths and injuries are not unavoidable accidents, but instead a preventable public health problem. Vision Zero is an ongoing effort to eliminate traffic deaths and serious injuries on Austin's streets by 2025 (19). Austin's City Council adopted Vision Zero as a policy within the Imagine Austin Comprehensive Plan in October 2015 and adopted the Vision Zero Action Plan in May 2016, setting the citywide direction to collaboratively improve safety for all road users (19). This effort involves numerous city departments, state and federal agencies, and community groups. The concerted, multipronged approach involves:

- A holistic approach to land use and transportation.
- A complete streets approach to street design.
- Traffic engineering and infrastructure.
- Enforcement and prosecution of dangerous behaviors.
- Education and culture change.
- Public health, equity, and related issues.
- Policy analysis and changes at the local and regional level, including speed management.

The Vision Zero Program is housed within the Active Transportation Division of the Austin Transportation Department. Its task force is made up of city departments, state and federal agencies, and community groups. It continues to meet to guide its implementation.

San Antonio

The San Antonio safety goal is to achieve zero fatalities on the roadways. "The responsibility for roadway safety is shared between those who design the road and those who use the road. Vision Zero is both an attitude toward life and a strategy for designing a safe transportation system" (*20*). San Antonio's Vision Zero action plan documents the process and groups involved in developing key actions and milestones for five essential elements for a safe transportation system. The five elements are: education, encouragement, engineering, enforcement, and evaluation. For San Antonio the key to success in achieving Vision Zero is a holistic, coordinated approach that involves the entire community and uses the five essential elements for a safe transportation system which are detailed in Figure 5.3.

Education	Communicate importance of safety for all on our roads, whether a person is driving, bicycling, walking, or riding.
Encouragement	Encourage all to practice safety and follow all traffic laws.
Engineering	Construct improvements to enhance safety and accessibility on our roads.
Enforcement	Enforce traffic safety and continue to support safety initiatives.
Evaluation	Evaluate traffic safety efforts and implement improvements as needed.
Equity	Prioritize resources to our most marginalized communities.

Figure 5.3. Five Essential Elements for a Safe Transportation System

Summary

The Texas safety and transportation planning documents address safety as an important issue and goal. The SHSP is consistent with, and builds upon, existing traffic safety efforts and plans in the state.

Section 6.0 Emphasis Areas & Implementation Plans

Section 6.1 Identification & Evaluation of Emphasis Areas

Background

According to the Federal Highway Administration's (FHWA) publication Strategic Highway Safety Plans: A Champion's Guidebook to Saving Lives, a state is to identify emphasis areas based on analysis of the available safety data and input from safety stakeholders representing, in Figure 6.1.1, each of the 4 E's of safety (21):

Figure 6.1.1. Stakeholder Champions for the SHSP Process

The number and types of emphasis areas have changed based on the analysis of crash and other data. Texas' primary data focus is its records from the Crash Records Information System (CRIS) that captures input from local and state law enforcement officers who respond to and investigate crashes. To identify relevant emphasis areas, Texas analyzed five years of crash data, vehicle miles traveled and demographics.

The Emphasis Area Teams are a critical part of the SHSP revision process. While the Executive Committee (EC) has the overall responsibility for the SHSP and the Management Team provides the project management services for the plan development, the EA teams dive into the details of the data to establish strategies and implementation activities. The relationship between the EC, Management Team and the EA Teams is illustrated below in Figure 6.1.2.

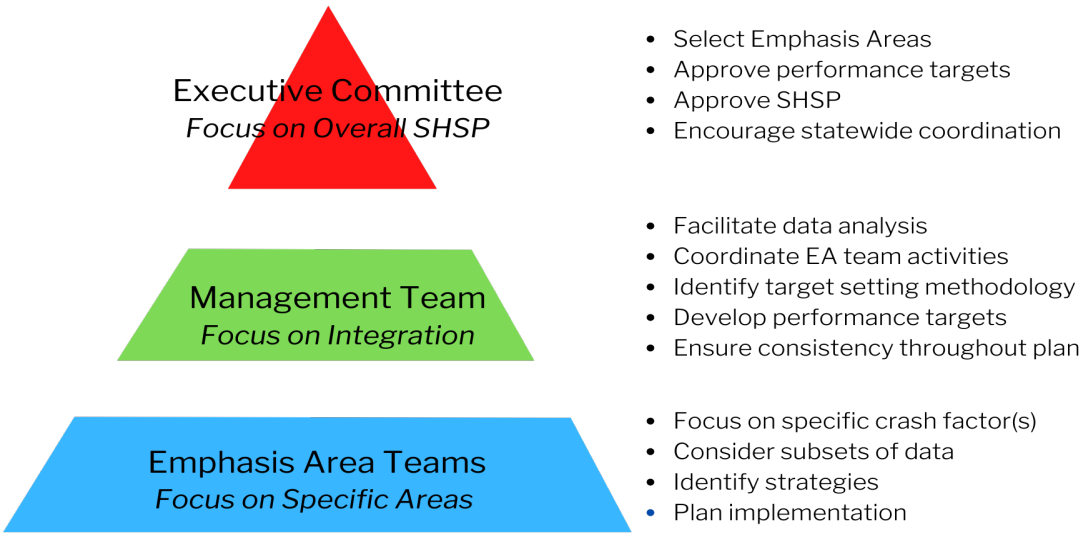


Figure 6.1.2. Team Structure for the SHSP Revision Process

Identification of Emphasis Areas for 2022 Revision of SHSP

Texas assessed crash data and weighed other factors when considering emphasis areas selection, including roadway features that are correlated with crash types, risks associated with certain vehicles, user types and behavioral factors. The state focused on EAs to ensure

the 2022 SHSP was concise and impactful. Recommendations on emphasis areas were reviewed by the Management Team and approved by the Executive Committee.

To identify and subsequently assess EAs, the Management Team considered the following data according to crash factors:

- % of Total Fatalities
- % of Total Suspected Serious Injuries
- Total Fatal & Serious Injury Crashes 2016-2021
- Total Fatalities & Serious Injuries 2016-2021
- Overlapping contributing factors (other emphasis areas and/or individual factors)

The Management Team presented the EA selection methodology and identification to the Executive Committee (EC). Once the EC approved, the Management Team worked to secure appropriate membership for each EA team. Each team met together with a facilitator from the Management Team beginning in October and November of 2021. The EAs and their rankings according to crashes and injuries are summarized in Figure 6.1.1.

Emphasis Area	% Total Fatal & Suspected Injury Crashes	% Total Fatalities & Suspected Serious Injuries
Roadway & Lane Departure	35%	34%
Speed Related	32%	33%
Intersection Safety	32%	32%
Occupant Protection	19%	21%
Impaired Driving	18%	19%
Distracted Driving	15%	15%
Vulnerable Road Users: Pedestrian	11%	10%
Vulnerable Road Users: Pedalcyclist	2%	2%
Post-Crash Care	N/A	N/A
Younger Drivers*	16%	17%
Older Drivers*	13%	14%

Figure 6.1.3. 2022 Emphasis Areas with % of Total Crashes and Injuries

Both the Younger and Older Drivers EAs (*) met throughout the SHSP Process. The strategies and implementation activities that address younger and older drivers were integrated into the other EA sections. The strategies and implementation activities that were specific to younger and older drivers were designated as such in the other EA sections. One example of a specific implementation activity is the CarFit program that educates older drivers.

As part of the first meeting, each EA team was briefed on the SHSP requirements and revision process as well as the data analysis for the specific emphasis area. Following the meeting, the EA members reviewed proposed strategies and identified countermeasures/implementation activities. Each EA team met two additional times (February and March) to finalize the strategies and implementation activities.

Selection of Emphasis Area Team Members

Some of the EA members are new to the process, but most of the team members including the team leaders have participated in one or more of the revisions of the Texas SHSP. The EA teams are formed and facilitated by the Management Team to:

- Include stakeholders & subject matter experts with common interest in a specific area of transportation safety
- Identify strategies & implementation activities based on expertise
- Utilize evidenced-based decision-making
- Work together & separately to advance the implementation of strategies

The Management Team identified EA team leaders based on their expertise in the area and experience with the SHSP revision process. At least one member of the Management Team worked with the EA team leaders to facilitate and document all the EA meetings to ensure consistent approaches across the teams.

Modifications During the Emphasis Area Process

During the EA assessment process, a few modifications were made to the areas. The new EA teams, Occupant Protection and Post-Crash Care, were defined and the objectives and strategies were identified since the areas were not included in the 2017 SHSP. The occupant protection EA was straightforward since the area is well defined in the HSP and previous versions of the SHSP. The Post-Crash Care EA team was created, and members

were recruited to develop objectives, strategies, countermeasures, and performance metrics.

Additionally, the Management Team considered feedback from multiple EA teams and concluded that countermeasures associated with younger and older drivers would be better addressed as part of the other EA teams. The younger and older driver EA teams met and identified specific approaches that need to be included as part of the EA team's documentation. This approach was believed to be more streamlined and was approved by the EC as well as FHWA.

Organization of Emphasis Areas & Implementation Action Plans

The subsequent sections of the SHSP include information regarding each of the emphasis areas including:

- Definition and background for the EA
- Historical and trend crash data
- Overlapping factors of interest
- Objective for the EA
- Strategies and implementation action plans

Due to the newness and nature of the Post-Crash Care EA, the appropriate and available performance data needed to be identified. Therefore, for this revision of the SHSP, Post-Crash Care historical performance data has not been included. Additionally, there is a summary of the younger and older driver focus areas to illustrate how those elements have been integrated into the emphasis areas.

The implementation plans are codified to reflect levels related the cost and ease of implementation as well as perceived effectiveness based on available, evidence-based research and evaluation. The legend for these codes is as follows:

Facilitators

Each of the Implementation Action Plans have a facilitator(s) identified. *Facilitators* are those organizations that have primary ownership of a strategy and its implementation whether as a sponsor of funding and/or reporting requirements.

Participating Organizations

Each of the Implementation Action Plans have one or more participating organizations identified. Participating Organizations are those agencies, institutions and/or groups that are involved with or responsible for acting based on this strategy. Organizations listed may be involved with implementing one or more of the countermeasures identified as part of that strategy.

Effectiveness

Assume each countermeasure will be implemented vigorously, publicized extensively, and funded satisfactorily. Effectiveness describes whether there are demonstrated reductions in crashes. If crash information is not available, are there changes in behavior or knowledge?

***	Demonstrated to be effective by high-quality evaluations with consistent results.
**	Likely to be effective based on the balance of evidence from high-quality evaluations and/or other sources.
*	Limited or no high-quality evaluation evidence.

Cost to Implement

Cost is difficult to measure, so the summary terms are very approximate. This does not include the costs of enacting legislation or establishing policies.

$$$	Requires extensive new facilities, staff, equipment, or publicity, or makes heavy demands on current resources.
$$	Requires some additional staff time, equipment, facilities, and/or publicity.
$	Can be implemented with current staff, perhaps with training, limited costs for equipment, facilities, and publicity.

Time to Implement

The SHSP is a 5-year plan, so a countermeasure that takes longer than 5 years to implement is considered long term. This does not include the time required to enact legislation or establish policies.

Long	More than 5 years
Medium	More than 1 year but less than 5 years
Short	Less than 1 year

Barriers

Identify any barriers or other issues that may arise and thwart countermeasure implementation. For every barrier identified, determine ways to overcome or address the issue.

Summary

The Emphasis Area Teams were productive through the insight their members contributed to the development of strategies and implementation action planning. Although there were only a few individuals who participated in multiple EAs, there was still an interest to ensure that strategies and actions were represented in the appropriate EAs as well as consistent in terms of scope. Texas is fortunate to have existing coalitions and task forces, independent of the EAs, that provided continuity to the EA process as well as carry forward the SHSP beyond the revision process.

Section 6.2 Roadway & Lane Departures

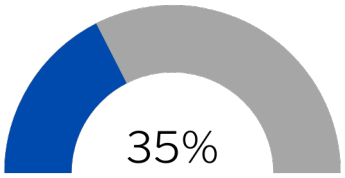
Background

A crash is defined as a roadway/lane departure crash if it involved one of the following two situations:

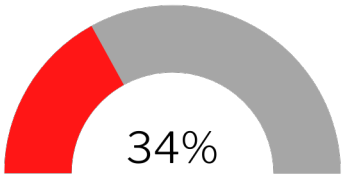
⇒ A single vehicle crash where the first harmful event occurred in the median, on the shoulder or off the roadway; or

⇒ A crash involving two vehicles both traveling straight in opposite directions, and one was going the wrong way, in the lane, but not trying to pass another vehicle

Roadway & Lane Departures



% of Total Fatal & Serious Injury Crashes



% of Total Fatal & Serious Injuries

One of the primary elements of the Safe System Approach is the role of infrastructure safety treatments in decreasing the opportunity for crashes and the severity of injuries. In the case of roadway and lane departure crashes, Safe Systems emphasize the predictability of the road course, forgiveness of the roadway environment and driver behavior. The following strategies address Texas' progress towards a safer system.

Run-off the road crashed are a subset of the roadway/lane departure crashes. The Roadway & Lane Departure EA is made up of run-off the road crashes and head-on, not passing crashes.

Historical & Trend Crash Data Analysis

The fatal and suspected serious injury crashes related to roadway and lane departures represents 35% of all crashes#. Since 2017, roadway and lane departures fatal crash trend had stayed flat with a small increase in 2021. The suspected serious injury crashes and injuries remained steady, but 2021 saw a large increase that increased the projected trend. It is important to attend to this trend to reach the state goal of zero deaths in 2050. The roadway and lane departures crashes along with the trends are illustrated in Figure 6.2.1. Additionally, this EA's fatal and suspected serious injuries and their trends are summarized in Figure 6.2.2.

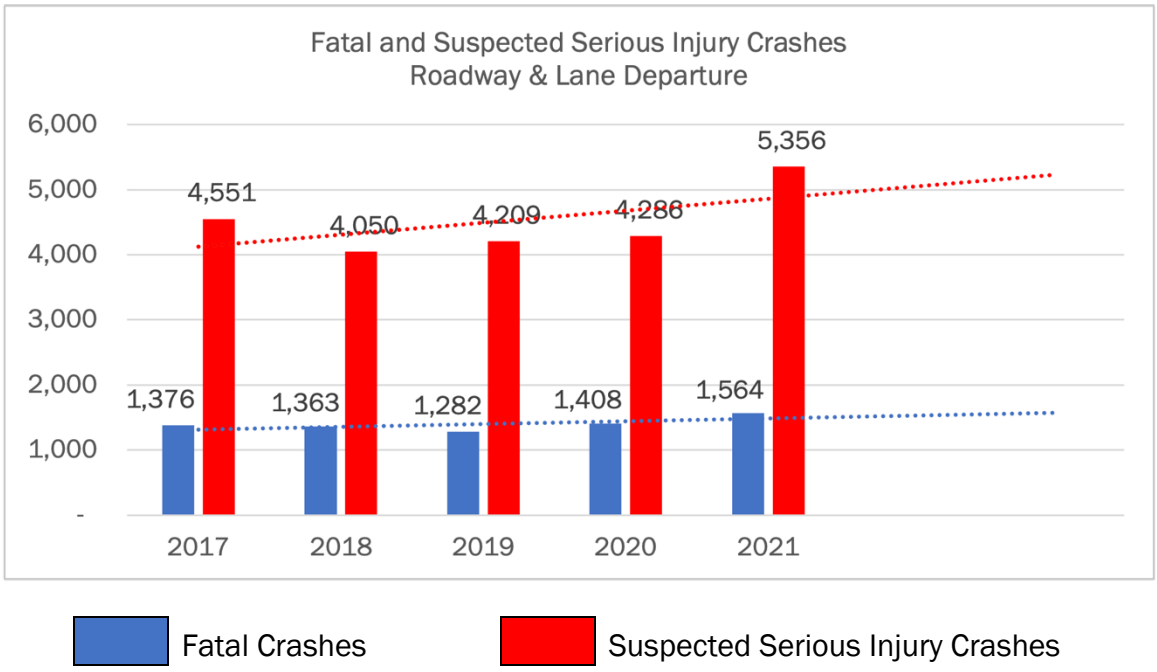


Figure 6.2.1 Roadway and Lane Departure EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

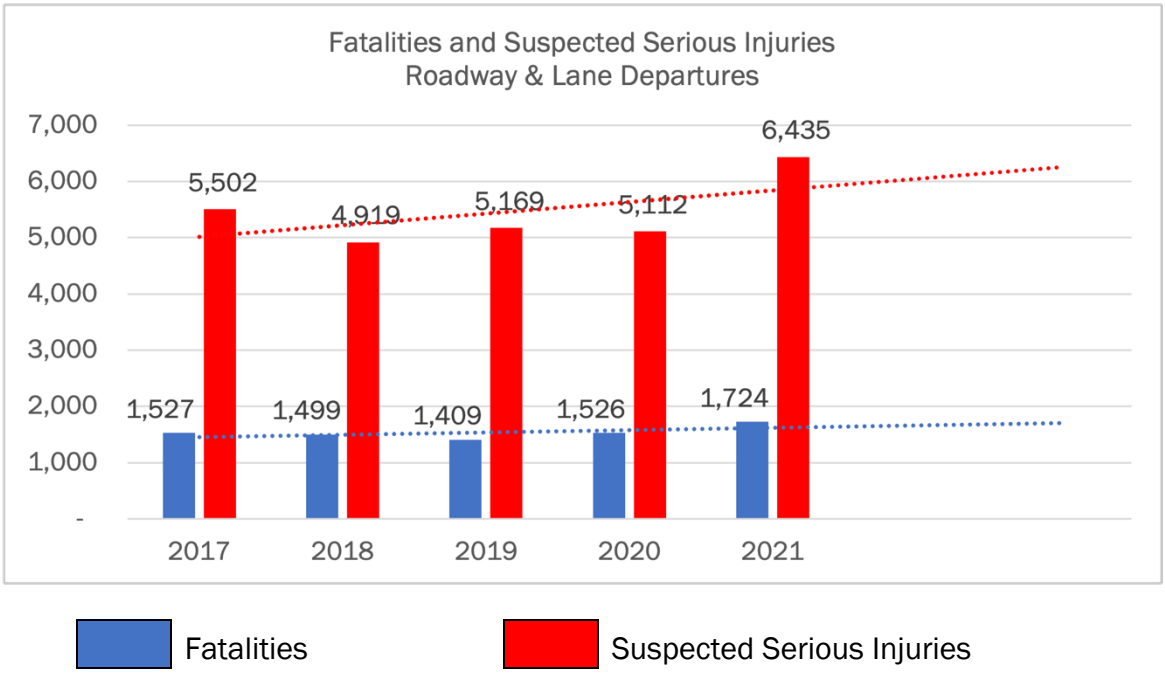
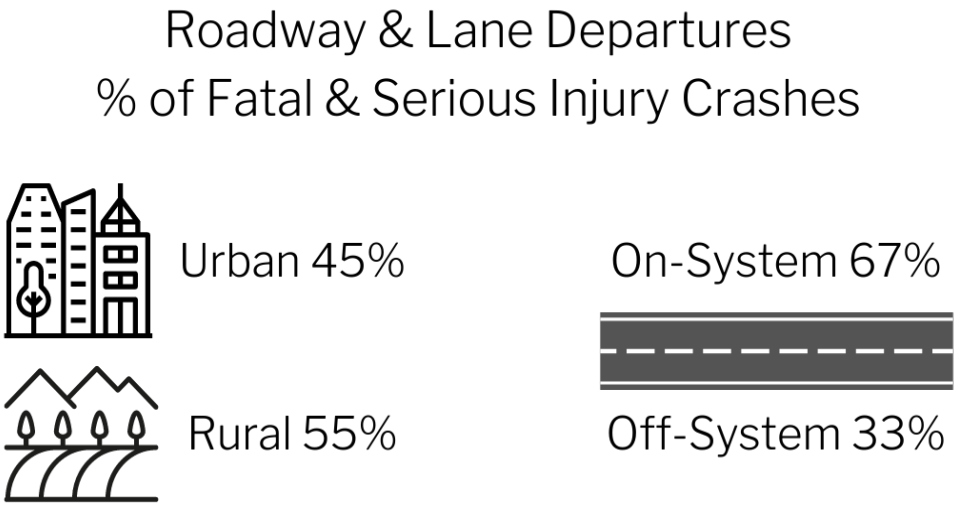


Figure 6.2.2. Roadway and Lane Departure EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. Regarding roadway and lane departure factors, 55% of the crashes occurred in areas designated as rural while 67% of these types of crashes happened on roadways considered on-system.

The EA representatives used this and other data analysis that examined overlapping crash factors, depending on the emphasis area, as they identified strategies and developed implementation plans to address roadway and lane departure related crashes.



From 2017 through 2021, there were 29,445 roadway and lane departure fatal and suspected serious injury crashes. These crashes resulted in 7,685 fatalities and 27,137 additional individuals with suspected serious injuries. Roadway and lane departure is a location type crash factor. Therefore, other factors likely play a role in roadway and lane departure crashes whether it be a behavioral factor or user type. Roadway and lane departure crashes are a significant part of the traffic safety challenges in Texas and represent 40% of the fatal crashes and 40% of the total fatalities. If the state can address the issue of roadway and lane departure crashes, it will have a significant impact on our ability to reach zero deaths. After identifying prevalent crash factors, related to roadway and lane departure crashes, there are several observations that the EA team considered during the identification of strategies and the development of implementation plans. These crash factors include:

- 33% of all fatal and suspected serious injury crashes were run off the road and 32% of all fatalities and suspected serious injuries were run off the road
- 95% of Roadway & Lane Departure crashes were single-vehicle, run-off-the-road
- Run-off-the-road crashes (27,859) – 68% occurred on a roadway section designated as straight and 32% happened on a curved section

- Run-off-the-road crashes that occurred on a curved section of roadway (8,864) – 56% did not have speeding as a factor in the crash
- Run-off-the-road crashes (27,859) – 73% occurred during dark conditions, 25% occurred during daylight, and 2% occurred at dawn or dusk

Objective for Emphasis Area

Reduce the frequency of fatal and serious injury crashes associated with roadway and lane departures through infrastructure improvements and driver behavior.

Strategies & Implementation Plans

Strategy 6.2.1 Keep vehicles from encroaching on the roadside or opposite lane.

Implementation Action Plan	
6.2.1.1	Employ available tools along with advanced methods to be more data driven to identify over-representation of run-off-the-road and head-on crashes on segments. Use predictive modeling along with improving data system queries and mapping to identify locations with a high probability of roadway/lane departure crashes cross referenced with road type, geometric characteristics, horizontal curvature, vehicle type and area type.
6.2.1.2	Revise roadway configuration to provide additional paved recovery area (e.g., convert four-lane roadways to three-lane roadways with design features compatible with surrounding land use context, use of safety edge, etc.).
6.2.1.3	Provide additional positive guidance (rumble strips, striped lines, raised pavement markings, chevrons including light-emitting diodes [LED], curve delineators, speed feedback signs, edge lines/centerlines, wider edge lines, and other technologies, etc.), and conduct public information campaigns to explain purpose and how to navigate the roadway safely.
6.2.1.4	Establish target speeds; Use engineering techniques to manage speeds in areas experiencing or susceptible to roadway and lane departures. Establish design speeds that more closely approximate the anticipated operating speed for the roadway.
6.2.1.5	Provide consistent curve treatments and advisory speeds for similar conditions
6.2.1.6	Use enforcement and educational approaches to encourage lower speeds in target areas and/or roadway sections.

Implementation Action Plan	
Facilitator(s)	TxDOT Traffic Safety & Design Divisions
Participating Organizations	TxDOT, DPS, Local Law Enforcement Agencies, MPOs, Cities and Counties
Effectiveness	***
Cost to Implement	6.2.1.1 $, 6.2.1.2 $$$, 6.2.1.3 $$$, 6.2.1.4 $$, 6.1.1.5 $$$, 6.2.1.6 $$
Time to Implement	6.2.1.1 Short, 6.2.1.2 Short, 6.2.1.3 Long, 6.2.1.4 Medium, 6.2.1.5 Medium, 6.2.1.6 Short
Barriers	Lack of funding

Strategy 6.2.2 Minimize the consequences of vehicles leaving the road.

Implementation Action Plan	
6.2.2.1	Implement barriers, median treatments, and forgiving roadside objects (e.g., use median barriers, safety-treat fixed objects, establish safe-clear policies, and improve slopes) with consideration given to land use context.
Facilitator(s)	TxDOT (Design Division & Traffic Safety)
Participating Organizations	TxDOT (Design Division & Traffic Safety)
Effectiveness	***
Cost to Implement	6.2.2.1 $$
Time to Implement	6.2.2.1 Medium
Barriers	Lack of funding

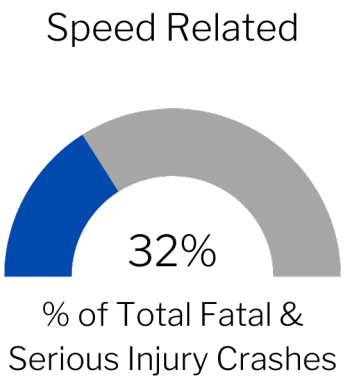
Strategy 6.2.3 Minimize the likelihood of crashing in adverse conditions.

Implementation Action Plan	
6.2.3.1	Identify locations that are overrepresented in terms of nighttime crashes. Develop and use screening and systemic crash analysis tools to identify locations, providing additional roadway delineation, and providing roadway lighting.
6.2.3.2	Identify and address locations subject to wet-weather run-off-the-road crashes.
Facilitator(s)	TxDOT (Design Division & Traffic Safety)
Participating Organizations	TxDOT, MPOs, Cities and Counties
Effectiveness	***
Cost to Implement	6.2.3.1 $$, 6.2.3.2 $$$
Time to Implement	6.2.3.1 Short, 6.2.3.2 Short
Barriers	Lack of funding

Section 6.3 Speed Related

Background

A Safe System Approach underscores the important principle of safe travel speed. Critical speed thresholds depend on the type of crash being assessed as well as other segment characteristics. Driver behavior, including human error and deliberate, unlawful conduct, is an important contributing factor in fatal and serious injury crashes. The strategies in the speed emphasis area employ holistic methods to address engineering, enforcement, and driver behavior to advance a Safe Systems Approach going forward



During the development of the 2022 revision process for the Texas SHSP, the state wanted to ensure that the definitions for each of the emphasis area data were consistent with those in other statewide plans. In the case of speed related crashes, the Texas Highway Safety Plan (HSP) which is required by NHTSA and produced by the TxDOT Behavioral Traffic Safety Section defined speed to include the crash factor *failure to control speed*. Subsequently, the definition for speed related crashes for the 2022 SHSP was amended to include speeding (over the limit), unsafe speed, and failure to control speed (new factor for the 2022 revision).

Historical & Trend Crash Data Analysis

The Texas SHSP definition for speed-related crashes was amended for the 2022 SHSP revision to include speeding (over the limit), unsafe speed, and failure to control speed (new factor for the 2022 revision). The fatal and suspected serious injury crashes related to speed represents 32% of all crashes#. Since 2017, speed-related crashes have increased, therefore it is important to reverse this trend to reach the state goal of zero deaths in 2050. The speed related crashes are illustrated in Figure 6.3.1 and the fatal and serious injuries are summarized in Figure 6.3.2.

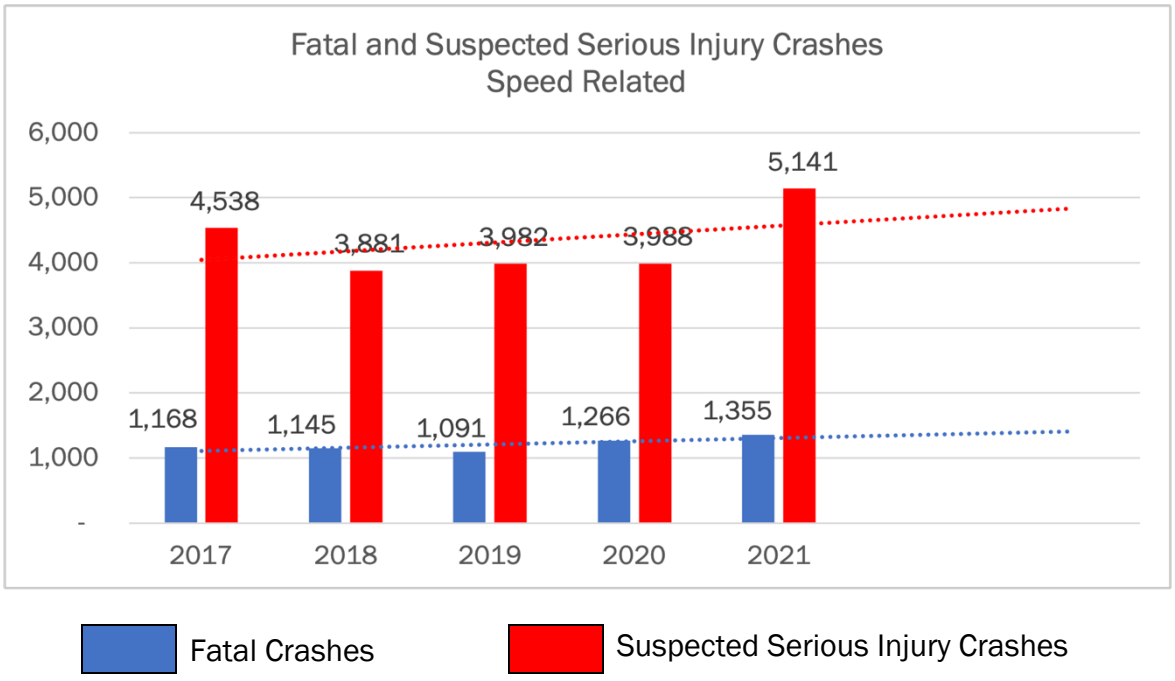


Figure 6.3.1. Speed Related EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

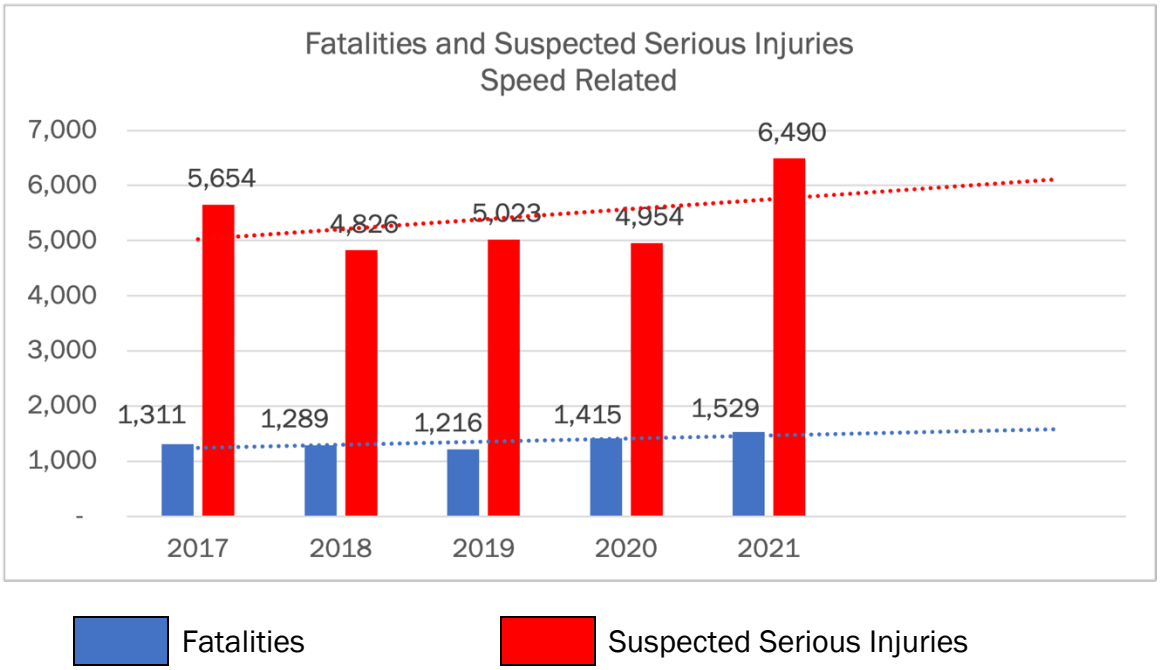


Figure 6.3.2. Speed Related EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. Regarding speed related factors, 56% of the crashes occurred in areas designated as urban while 65% of these types of crashes happened on roadways considered on-system.

Speed Related
% of Fatal & Serious Injury Crashes

Urban 56%

Rural 44%

On-System 65%

Off-System 35%

⇒ 5.4% (1,498) of speeding crashes were work zone related

⇒ 41% of those crashes occurred in dark conditions

Objective for Emphasis Area

Reduce the occurrence of fatal and serious injury crashes by establishing travel speeds that suit the function and level of safety of road segments as well as improve drivers' compliance with speed limits and safe driving based on conditions.

Strategies & Implementation Plans

Strategy 6.3.1 **Establish a target speed limits and road characteristics to reduce speeding on state, county & local roadways.**

Implementation Action Plan	
6.3.1.1	Implement target speeds for arterial, collector, and local roadways with consideration of design and expected operating speeds; Implement target speeds with pedestrian, land use, and roadway context, including options for target speeds of 35 mph or less on arterials, evaluate existing speeds for appropriate target speeds.
6.3.1.2	Establish triggers to review segments prior to construction and maintenance projects to address target speed approach. Consider the revision of state procedures for setting limits included in the TxDOT Design Manual.
6.3.1.3	Establish and/or disseminate procedures for establishing speed zones (regulatory and/or advisory). Coordinate between city, county, and state networks. Identify current best practices and consider adopting new methodologies as appropriate.
6.3.1.4	Complete a roadway network analysis to identify locations with high frequencies of fatal and severe injury crash frequency. Deploy engineering and/or behavior related countermeasures that are proactive/predictive to address hot spots including work zone.
Facilitator(s)	TxDOT Traffic Safety Division & Design Division
Participating Organizations	TxDOT, MPOs, COGs, TTI, Consulting Engineers
Effectiveness	***
Cost to Implement	6.3.1.1 $$, 6.3.1.2 $$, 6.3.1.3 $$, 6.3.1.4 $$
Time to Implement	6.3.1.1 Medium, 6.3.1.2 Medium, 6.3.1.3 Medium, 6.3.1.4 Medium
Barriers	Lack of funding and/or resources

Strategy 6.3.2 **Improve quality of crash data contributing factors related specifically to speed.**

Implementation Action Plan	
6.3.2.1	Review options on the CR-3 for detailing the crash characteristics related to speed. Collaborate with law enforcement to revise the CR-3 form to add more options to detail the elements of speed impacting the crash.
6.3.2.2	Educate law enforcement on the uses of crash data to highlight the need for accurate and comprehensive reporting with special emphasis on speed related characteristics. Include the review definitions for contributing factors & emphasize differences between failure to control speed, speeding over the limit/unsafe for conditions, etc.
6.3.2.3	Ensure crash analysts understand the difference between speeding-related contributing factors and their association with statutes when analyzing crash data.
Facilitator(s)	TxDOT Traffic Safety Division
Participating Organizations	Traffic Records Coordinating Committee (TRCC), TxDOT BTS & Crash Records, DPS, Local & County Law Enforcement Agencies
Effectiveness	**
Cost to Implement	6.3.2.1 $, 6.3.2.2 $, 6.3.2.3 $
Time to Implement	6.3.2.1 Short, 6.3.2.2 Short, 6.3.2.3 Short
Barriers	None known at this time

Strategy 6.3.3 **Leverage data to improve engineering, education, and enforcement.**

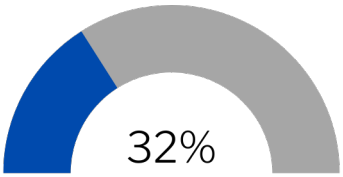
Implementation Action Plan	
6.3.3.1	Train law enforcement officers and urge agencies to effectively use CRIS and other data sources during planning and patrols to maximize impact and resources.
6.3.3.2	Develop case studies to document and communicate how cities implement safe design speeds in various settings.
6.3.3.3	Establish partnerships between state, county, and local agencies to implement safe streets projects including, but not limited to, Safe Routes to Schools.
6.3.3.4	Using a data informed approach, deploy awareness and educational campaigns that are proven effective in reducing speeding.
Facilitator(s)	TxDOT TRF, BTS, & CRS
Participating Organizations	TxDOT, DPS, Sheriffs' Departments, MPOs, Cities & Counties
Effectiveness	***
Cost to Implement	6.3.3.1 $, 6.3.3.2 $, 6.3.3.3 $, 6.3.3.4 $$
Time to Implement	6.3.3.1 Short, 6.3.3.2 Short, 6.3.3.3 Short, 6.3.3.4 Short
Barriers	None known at this time

Section 6.4 Intersection Safety

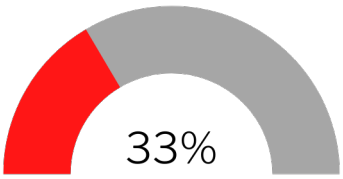
Background

The Federal Highway Administration's The Safe System Approach states that "Humans are unlikely to survive high-speed crashes. Reducing speeds can accommodate human injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility." Intersections are a critical area to address based on this assertion.

Intersection Related



% of Total Fatal & Serious Injury Crashes



% of Total Fatal & Serious Injuries

Addressing infrastructure to reduce fatal and suspected serious injury crashes is a primary focus of a Safe System. Intersections are particularly problematic since they not only involve vehicles, but also vulnerable road users such as pedestrians and bicyclists.

A Safe System approach emphasizes the design of an intersection with consideration of human behavior especially in terms of potential driver errors. The focus of this approach is to reduce risk and, subsequently, death and serious injury related to traffic crashes (vehicle occupants, pedestrians, and bicyclists). The EA team considered behavioral countermeasures as well as engineering solutions addressing conflict points, speed reduction, visibility, and space for vulnerable road users. Some of these approaches are also addressed in the speed related and pedestrian EAs.

Overlapping behavioral factors such as speed, distraction, and impairment exacerbate the intersection issue. Although statutes currently prohibit some of the countermeasures proven effective in other states, Texas is addressing intersection safety with infrastructure and

behavioral strategies along with assessing potential options for technology-based interventions on the system and in vehicles.

Historical & Trend Crash Data Analysis

The fatal and suspected serious injury crashes related to intersections represents 32% of all crashes. Between 2017 and 2020, intersection crashes were decreasing, but there was a sharp increase in both fatal and suspected serious injury crashes in 2021. It is important to reverse this trend to reach the state goal of zero deaths by 2050. The intersection crashes are illustrated in Figure 6.4.1 and the fatal and suspected serious injuries are summarized in Figure 6.4.2.

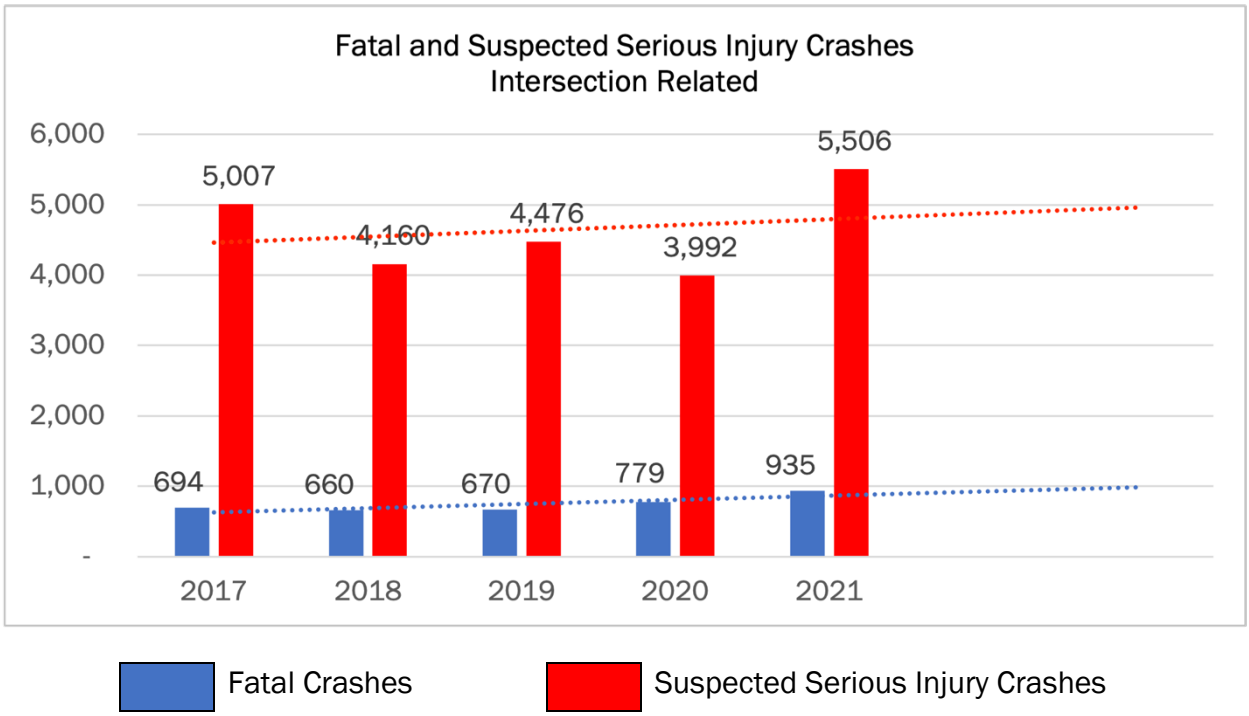


Figure 6.4.1 Intersection EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

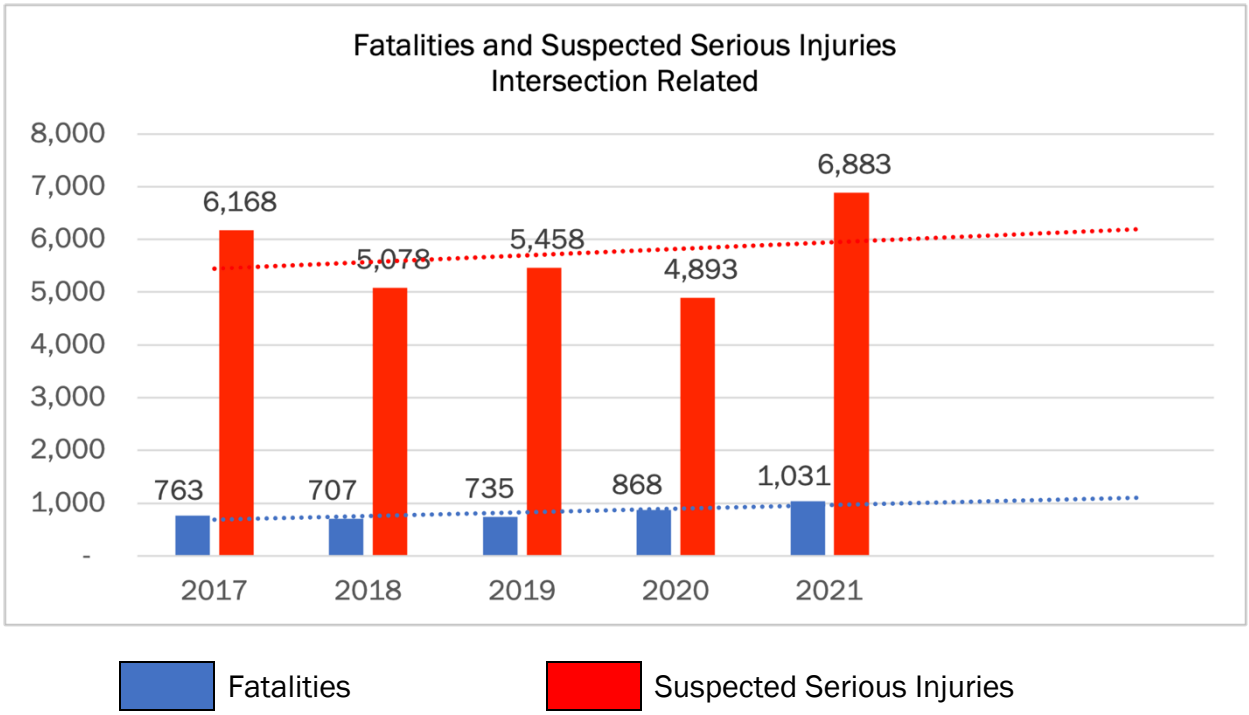
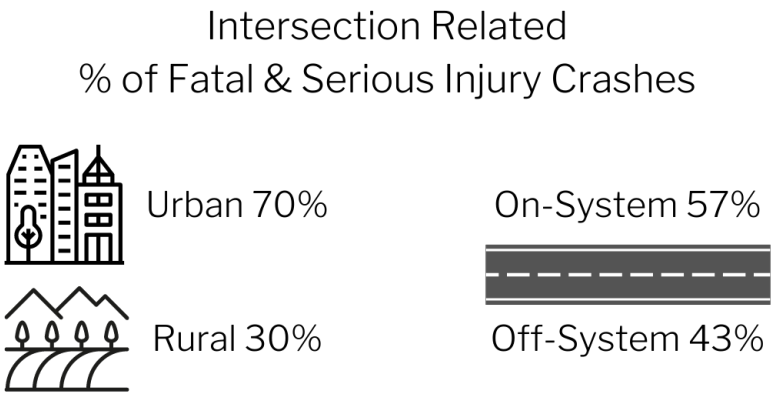


Figure 6.4.2. Intersection EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. Regarding intersection related factors, 70% of the crashes occurred in areas designated as urban while 57% of these types of crashes happened on roadways considered on-system.



Since intersection crashes typically involve at least two vehicles that are frequently entering an intersection from different directions and/or vehicles that are changing directions, it was important to look at crash type. When the EA team discussed the crash data, the EA team was able to consider crash type for the strategy identification and implementation plan development. Angle crashes accounted for 35% and left turn crashes accounted for 28%. These crashes can be a prime opportunity for fatal and serious injury since the struck vehicle receives a side impact.

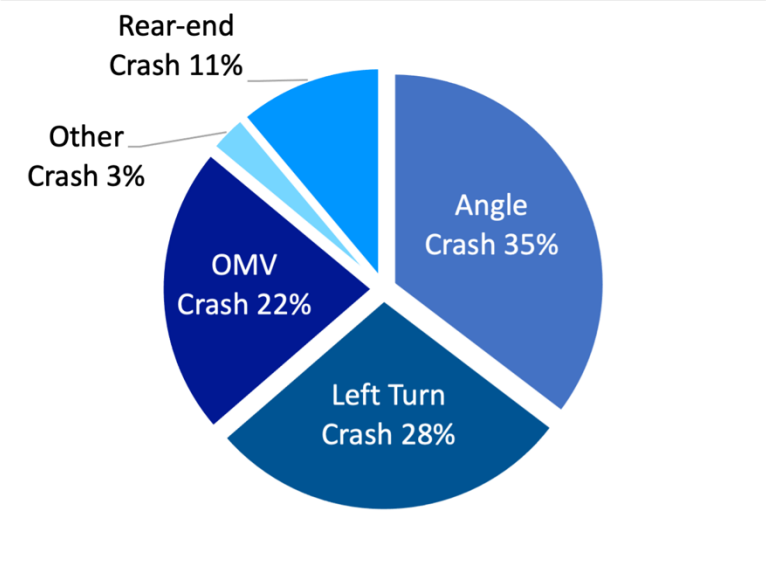


Figure 6.4.4. Intersection EA: Collision Types

From 2017 through 2021, there were 26,879 fatal and suspected serious injury crashes that occurred at intersections. These crashes resulted in 4,404 fatalities and 28,480 additional individuals with suspected serious injuries. Intersections are only a location crash factor. Therefore, other factors likely play a role in intersection. Intersection crashes are a significant part of the traffic safety challenges in Texas and represent 21% of the fatal crashes and 21% of the total fatalities. If the state can address the risk of crashes that occur at intersections, it will have a significant impact on our ability to reach zero deaths. After identifying prevalent crash factors, within intersection crashes, there are several observations that the EA team considered during the identification of strategies and the development of implementation plans. These crash factors include:

- ⇒ 36% (9,561) occurred in dark lighting conditions
  - Of those occurring dark conditions, 11% (1,104) involved a pedestrian
  - Of those occurring dark conditions, 24% (2,280) involved an impaired driver
- ⇒ 16% (4,418) also involved distraction
- ⇒ 23% (6,131) intersection crashes were speed related (over-the-limit, unsafe speed, or failure to control speed)
  - 35% (2,133) of speed related crashes at intersections were **rear-end** collisions
  - 18% (1,099) of speed related crashes at intersections were **left-turn** collisions
  - 16% (986) of speed related crashes at intersections were angle collisions

Objective for Emphasis Area

Reduce the frequency of fatal and serious injury crashes associated with intersections through infrastructure improvements and driver behavior modification.

Strategies & Implementation Plans

Strategy 6.4.1 **Expand intersection safety practices through planning, design, and implementation.**

Implementation Action Plan	
6.4.1.1	Evaluate intersection controls. Use ICE and other appropriate evaluation processes in project development by TxDOT and local agencies. Coordinate with MPOs, required for projects within districts & statewide. Identify threshold for requirements.
6.4.1.2	Expand (state and local systems) implementation of low-cost safety improvements at urban and rural intersections.
6.4.1.3	Identify and develop case studies to illustrate best practices and innovative approaches including alternative intersection designs.
6.4.1.4	Provide training to state and local stakeholders including, but not limited to, external webinar on Safety Scoring Tool for Urban Intersections, how to use data dashboards for DES Safety Tools, and road safety planning.
Facilitator(s)	TxDOT, MPOs
Participating Organizations	TxDOT, MPOs, Cities, Counties
Effectiveness	***
Cost to Implement	6.4.1.1 $, 6.4.1.2 $$$, 6.4.1.3 $$, 6.4.1.4 $
Time to Implement	6.4.1.1 Short, 6.4.1.2 Short, 6.4.1.3 Short, 6.4.1.4 Short
Barriers	Lack of funding

Strategy 6.4.2 Reduce intersection violations.

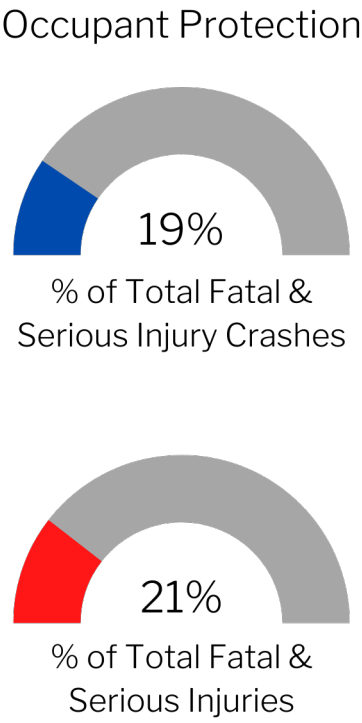
Implementation Action Plan	
6.4.2.1	Train law enforcement agencies on effective techniques to use targeted enforcement at high-volume incident locations. Install signal indicator lights to inform law enforcement of red signal onset.
6.4.2.2	Deploy abbreviated FHWA traffic engineering for law enforcement training. Identify best practices for partnerships between traffic engineering and law enforcement to encourage integrated approach to intersection safety.
6.4.2.3	Develop safety campaigns to educate public on intersection safety including focus on vulnerable road users, older & younger drivers. Employ evidenced based countermeasures focused on those "causing" the risk.
6.4.2.4	Develop case studies to illustrate methods on how to utilize technology to focus on targeted intersections to inform/educate state and local agencies.
6.4.2.5	Improve and expand access to CRIS data through dashboards related to intersection safety.
6.4.2.6	Address signal timing and assess technology - Interconnect traffic signals, optimize traffic signal timings, and/or implement technology to improve traffic flow, encourage safe travel speed and reduce crashes. Identify how we can we better use mature and exploratory data sets to inform the targeting of problematic intersections.

Facilitator(s)	TxDOT (Design Division & Traffic Safety)
Participating Organizations	TxDOT (Design Division & Traffic Safety)
Effectiveness	***
Cost to Implement	6.4.2.1 $, 6.4.2.2 $, 6.4.2.3 $, 6.4.2.4 $, 6.4.2.5 $, 6.4.2.6 $$
Time to Implement	6.4.2.1 Short, 6.4.2.2 Short, 6.4.2.3, Short, 6.4.2.4, Short, 6.4.2.5 Short, 6.4.2.6 Medium
Barriers	Lack of funding, Integration of Resources, Conflicting Priorities

Section 6.5 Occupant Protection

Background

Abundant research has shown correctly using appropriate child restraints or seat belts is the single most effective way to save lives and reduce injuries in crashes. The challenge is to convince all passenger vehicle occupants to buckle up. Despite high observed belt use rates, many unrestrained people die in crashes each year. The most effective strategy for achieving and maintaining restraint use at acceptable levels is well-publicized, High Visibility Enforcement (HVE) of strong occupant restraint use laws. The effectiveness of HVE has been documented repeatedly in the United States and abroad. The strategy's three components – laws, enforcement, and publicity – cannot be separated: effectiveness decreases if any one of the components is weak or missing. (Venkatraman, V., Richard, C. M., Magee, K., & Johnson, K. (2021, July). Countermeasures that work: A highway safety countermeasures guide for State Highway Safety Offices, 10th edition, 2020 (Report No. DOT HS 813 097). National Highway Traffic Safety Administration, pp. 2-2-4).



Historical & Trend Crash Data Analysis

Despite numerous HVE campaigns and a relatively high seatbelt use rate, the number of people who died in 2020 while not wearing a seat belt increased by 16% over 2019, with

1,073 unrestrained drivers and passengers killed on Texas roadways. (Click It or Ticket (txdot.gov))

In 2021, 27% of the fatally injured drivers and passengers were traveling unrestrained. Of those who suffered a serious injury, 14% were not wearing a seatbelt. Fifty-six percent of unrestrained drivers and passengers were killed or seriously injured in rural areas and about two-thirds crashed on the state road system. Often, traveling unrestrained is coupled with other dangerous driving behaviors. For example, 10% were driving impaired by alcohol or other drugs and 18% were speeding. Overlapping contribution crash factors included 21% of road users killed or seriously injured in intersections and 62% were involved in run off road crashes. Being unrestrained and leaving the roadway is a dangerous combination.

The fatal and suspected serious injury crashes related to lack of restraint use represents 19% of all crashes#. Since 2017, lack of restraint use crash trends increased, therefore it is important to reverse this trend to reach the state goal of zero deaths in 2050. The crashes where at least one occupant was found to be unrestrained are illustrated in Figure 6.5.1 and the fatal and serious injuries resulting from those crashes are summarized in Figure 6.5.2.

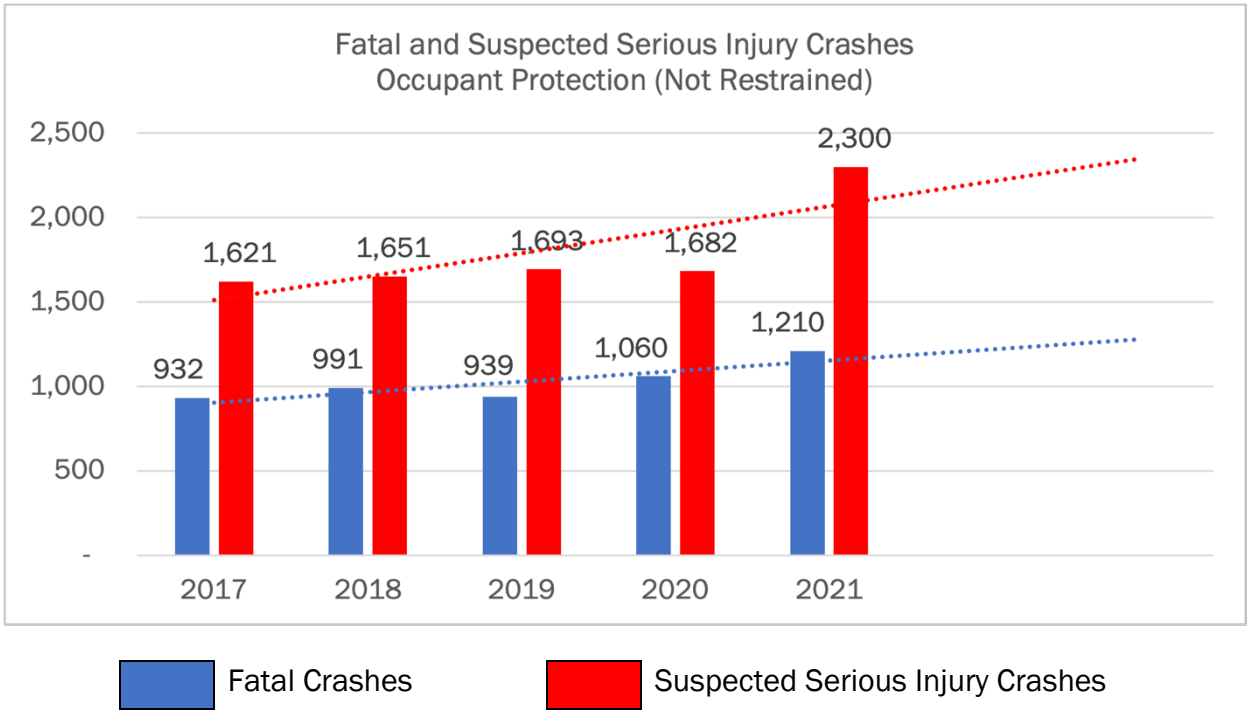


Figure 6.5.1. Occupant Protection (Unrestrained) EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

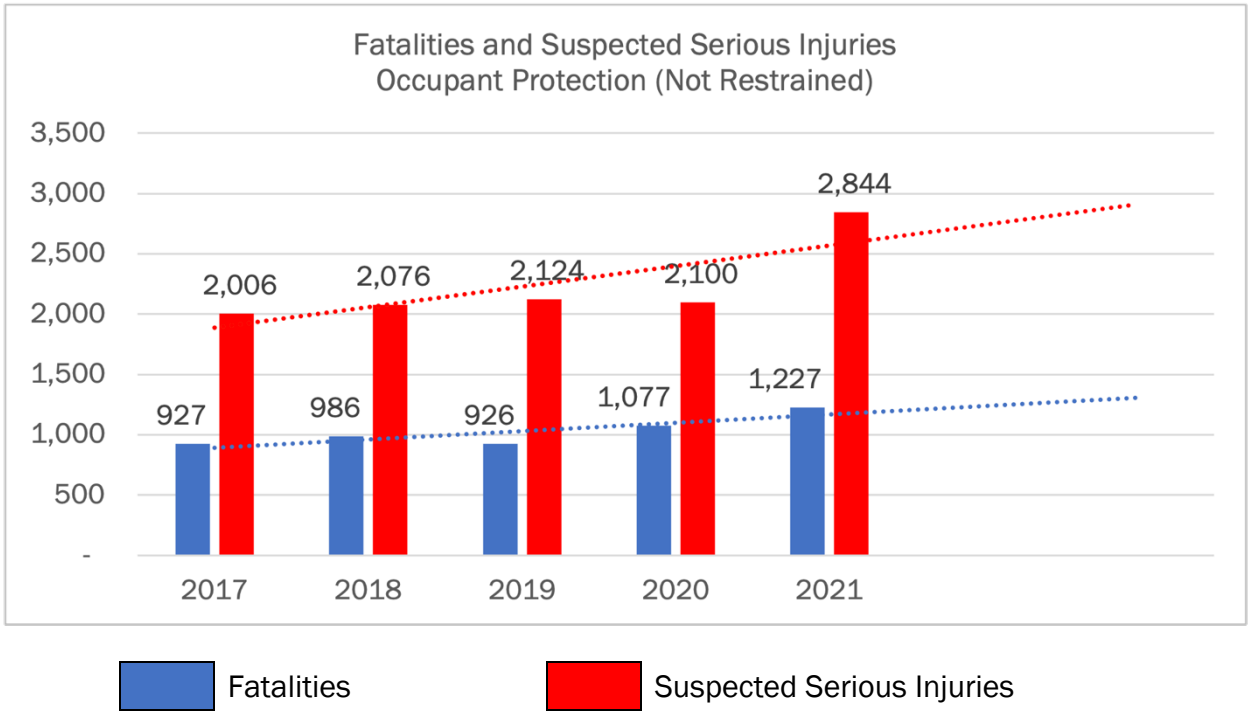
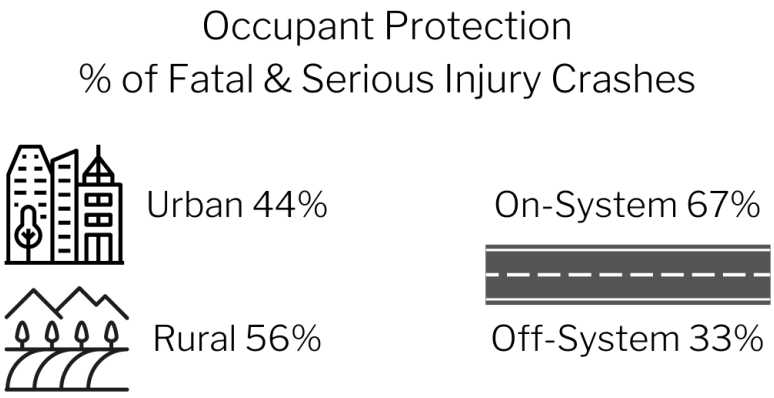


Figure 6.5.2. Occupant Protection (Unrestrained): Fatal and Suspected Serious Injuries (2017-2021)

The EA representatives used this and other data analysis that examined overlapping crash factors, depending on the emphasis area, as they identified strategies and developed implementation plans to address occupant protection related crashes.



From 2017 through 2021, there were 14,079 crashes where at least one occupant was not restrained. These crashes resulted in 5,143 fatalities and 11,150 additional individuals with suspected serious injuries. Although unrestrained may be only one of multiple factors in a fatal crash, it is present in approximately 30% of the fatal crashes and 27% of the total fatalities. If the state can increase the use of occupant protection, it will positively impact on our ability to reach zero deaths by 2050. When lack of restraint use is combined with other overlapping factors, there are several observations that contributed to the identification of strategies and development of implementation plans within the EA team:

- ⇒ 62% (14,078) were one motor vehicle crashes
- ⇒ 57% of crashes (14,078) with at least one unrestrained occupant were single-vehicle, run-off-the-road
- ⇒ 75% of crashes (14,078) with at least one unrestrained occupant were non-intersection related and only 21% were intersection related
- ⇒ 23% of crashes with at least one unrestrained occupant were single-vehicle, run-off-the-road and classified as impaired driving crashes
- ⇒ 18% of crashes with at least one unrestrained occupant were single-vehicle, run-off-the-road and had speed as a factor
- ⇒ 35% of crashes with at least one unrestrained occupant were intersection related and classified as impaired driving crashes
- ⇒ 21% of crashes with at least one unrestrained occupant were intersection related and had speed as a factor

Objective for Emphasis Area

Utilize a data driven approach to identify and target audiences for enforcement and education efforts designed to increase correctly installed and applied safety belts and child car seats.

Strategies & Implementation Plans

Strategy 6.5.1 **Increase occupant restraint use through short term, high-visibility enforcement.**

Implementation Action Plan		
6.5.1.1	Deploy high visibility enforcement activities at state and local levels in conjunction with National Click It or Ticket (CIOT) campaigns.	
6.5.1.2	Deploy targeted media activities at state and local levels in conjunction with National Click It or Ticket (CIOT) campaigns.	
Facilitator(s)		TxDOT BTS, DPS, local law enforcement agencies
Participating Organizations		TxDOT BTS, DPS, local law enforcement agencies,
Effectiveness		***
Cost to Implement		6.5.1.1 $$, 6.5.1.2 $$
Time to Implement		6.5.1.1 Short, 6.5.1.2 Short,
Barriers		Some law enforcement agencies lack resources and/or the desire to engage in campaigns

Strategy 6.5.2 Improve education and outreach efforts.

Implementation Action Plan	
6.5.2.1	Increase intervention efforts by healthcare professionals, teachers, and safety advocates.
6.5.2.2	Increase training /retention of child passenger safety (CPS) technicians and instructors.
6.5.2.3	Develop a consolidated resource tool (website) for advocates to send people for fitting stations, car seats, etc. to assist law enforcement, technicians, health care providers, et al.
6.5.2.4	Educate younger drivers (under 25) to use occupant protection for themselves and other people in the vehicle through formal driver education and targeted outreach through programs such as Teens in the Driver Seat.

Facilitator(s)	TxDOT BTS, Hospitals, AAA
Participating Organizations	TxDOT BTS, Hospitals, AAA, TTI, Agri-Life, First Responders PreK-12 Schools, Driving Schools
Effectiveness	***
Cost to Implement	6.5.2.1 $, 6.5.2.2 $, 6.5.2.3 $, 6.5.2.4 $
Time to Implement	6.5.2.1 Short, 6.5.2.2 Short, 6.5.2.3 Short, 6.5.2.4 Short (Most Ongoing)
Barriers	Lack of funding

Strategy 6.5.3 **Prioritize efforts geographically and demographically based on lower use rates.**

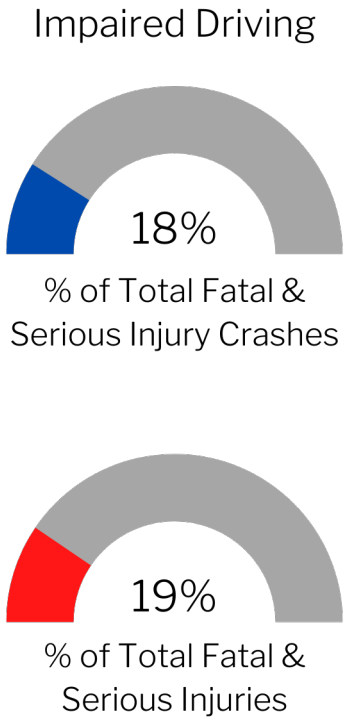
Implementation Action Plan	
6.5.3.1	Focus on enforcement, education, and encouragement activities in the geographic areas with lower use rates.
6.5.3.2	Focus education and outreach activities on demographic groups based on lower use rates and equity.
6.5.3.3	Identify and evaluate innovative means of reaching target areas and populations.
6.5.3.4	Maintain CPS (child passenger safety distribution) seat distribution programs for low-income families.
Facilitator(s)	TxDOT, TTI, AAA
Participating Organizations	TxDOT, TTI, AAA, AgriLife, DPS, First Responders
Effectiveness	*
Cost to Implement	6.5.3.1 $, 6.5.3.2 $, 6.5.3.3 $, 6.5.3.4 $$
Time to Implement	6.5.3.1 Short, 6.5.3.2 Short, 6.5.3.3 Short, 6.5.3.4 Ongoing
Barriers	None currently

Section 6.6 Impaired Driving

Background

The mission of a Safe System is to design and maintain a transportation system that both proactive and redundant. Although much of the Safe Systems language seems to focus on infrastructure, critical parts of redundancy and being proactive are the continued inclusion of behavioral traffic safety to advance the journey towards zero deaths in Texas.

One element of the Safe System is safe road users. Proactively addressing unsafe driving behaviors such as impaired driving through multi-prong behavioral safety countermeasures. As we wait on additional technology to address the element associated with safe vehicles, the state will continue to employ educational and enforcement countermeasures.



Overlapping behavioral factors such as speed, intersections, roadway, and lane departure as well as lack of restraint compound the issue of impaired driving. Although statutes currently prohibit some of the countermeasures proven effective in other states, Texas is addressing impaired driving with infrastructure and behavioral strategies along with assessing potential options for technology-based interventions on the system and in vehicles.

Historical & Trend Crash Data Analysis

The fatal and suspected serious injury crashes attributed to impaired driving represent 18% of all crashes. Since 2017, crashes attributed to impaired driving have decreased in the frequency of fatal crashes and deaths. The suspected serious injury crashes and injury frequency stayed relatively flat until 2021 crash trend has increased; therefore, it is important to reverse this trend to reach the state goal of zero deaths in 2050. The fatal and suspected serious injury crashes attributed to impaired driving are illustrated in Figure 6.6.1 and the fatal and suspected serious injuries are summarized in Figure 6.6.2.

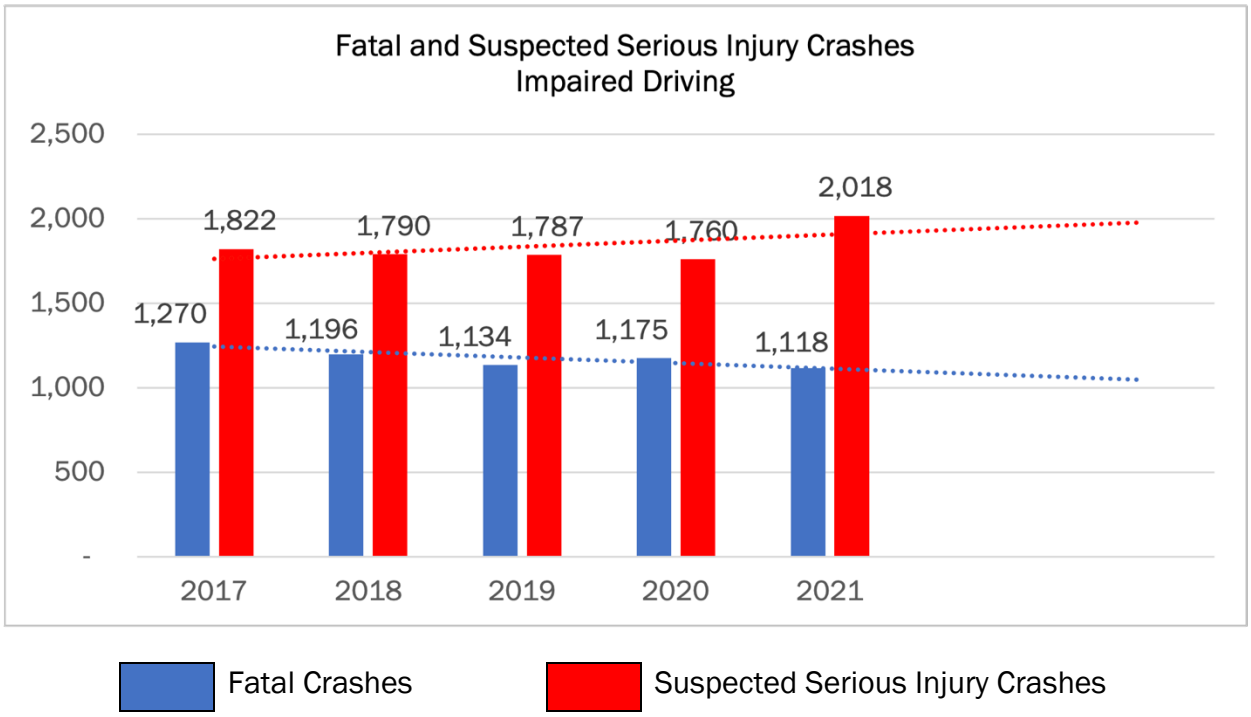


Figure 6.6.1. Impaired Driving EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

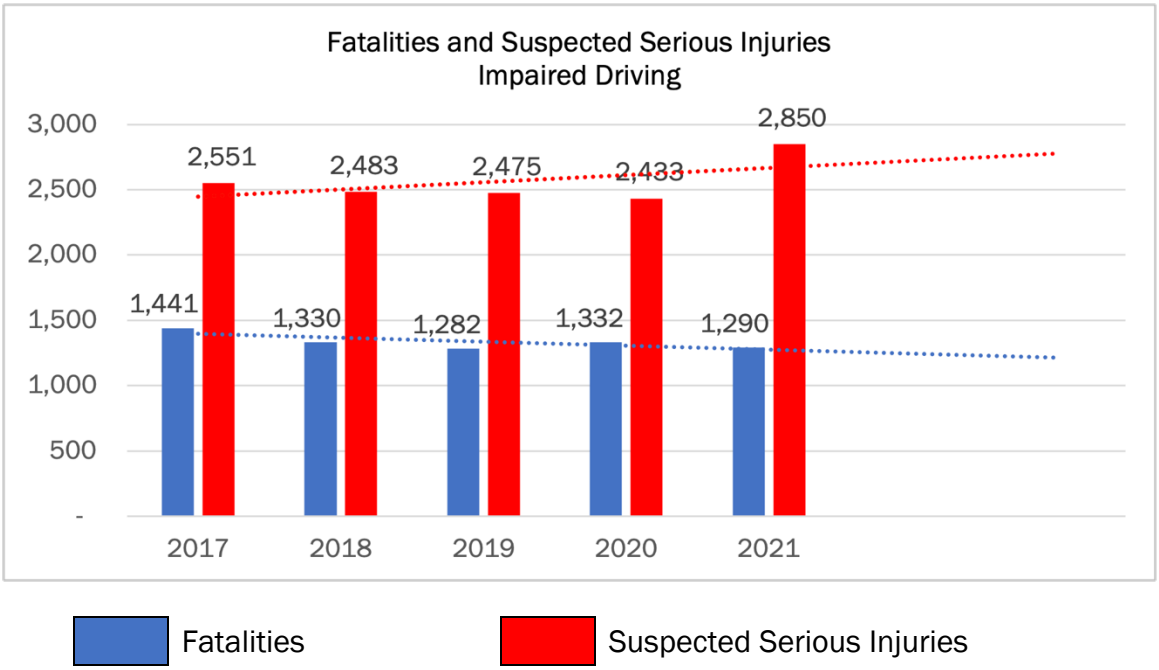
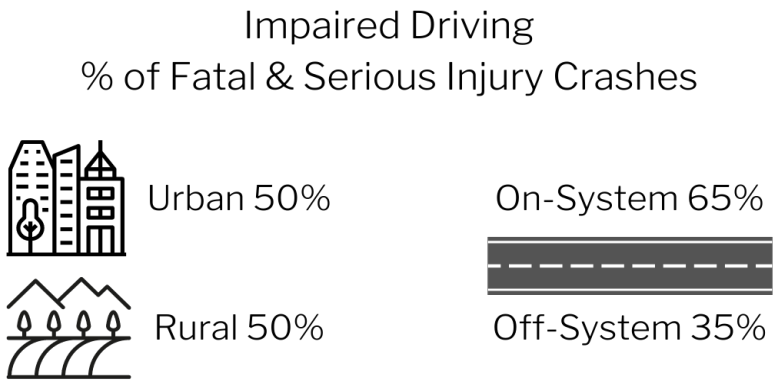


Figure 6.6.2. Impaired Driving EA: Fatal and Suspected Serious Injuries (2017-2021)

The EA representatives used this and other data analysis that examined overlapping crash factors, depending on the emphasis area, as they identified strategies and developed implementation plans to address occupant protection related crashes.



Impaired driving crashes do not occur exclusively at night, but as Figure 6.6.4 illustrates below, the greatest concentration of these types of crashes occur between 10pm and 2am.

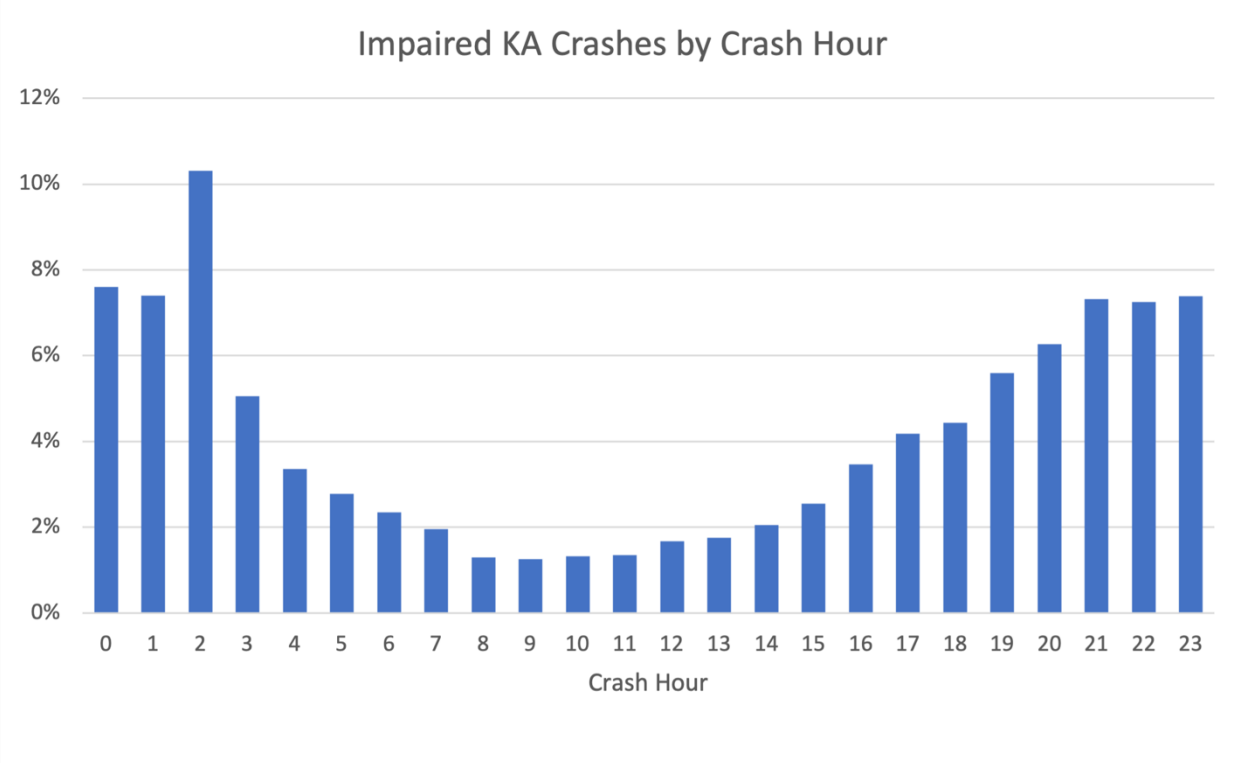


Figure 6.6.4. Impaired Driving EA: Crashes According to Hour

From 2017 through 2021, there were 15,085 fatal and suspected serious injury crashes attributed to impaired driving. These crashes resulted in 6,675 fatalities and 12,792 suspected serious injuries. Impaired driving is only a behavioral crash factor. Therefore, other factors likely play a role in impaired driving crashes whether it be a location factor or user type. Impaired driving crashes are a significant part of the traffic safety challenges in Texas and represent 34% of the fatal crashes and 35% of the total fatalities. If the state can address the occurrence of impaired driving crashes, it will have a significant impact on our ability to reach zero deaths. The EA team discussed the crash factors that overlapped with impaired driving crashes. These crash factors included:

Impaired driving crashes (15,085) by manner of collision:

- ⇒ 60% Single Vehicle Crash
- ⇒ 14% Same Direction Crash
- ⇒ 16% Opposite Direction Crash
- ⇒ 10% Angle Crash

Impaired driving crashes (15,085) by overlapping factors:

- ⇒ 56% of the impaired crashes were also roadway/lane departure crashes
- ⇒ 28% of the impaired crashes were also speeding related
- ⇒ 88% of the impaired driving crashes resulted in the impaired driver(s) sustaining a KA
- ⇒ 4% of the impaired driving crashes resulted in multiple fatalities (1,403 killed)

Objective for Emphasis Area

Reduce the occurrence of fatal and serious injury crashes attributed to impaired driving (alcohol and/or other drugs).

Strategies & Implementation Plans

Strategy 6.6.1 **Increase education for all road users on the impact of impaired driving and its prevention.**

Implementation Action Plan	
6.6.1.1	Deploy robust, longitudinal survey activities to measure attitudes related to impaired driving and the impact of educational and/or media *campaigns* on target audiences. Publish results to stakeholders and program partners.
6.6.1.2	Educate road users on how alcohol and/or other drugs negatively impact driving behavior.
6.6.1.3	Implement effective countermeasures (education and enforcement) specifically addressing DUI (drivers under 21 with any detectable amount of alcohol) with an emphasis on zero tolerance.
6.6.1.4	Demonstrate to all types of road users the consequences associated with violations including the magnitude of the impact of impaired-driving crashes on fatality rates by making comparisons with other causes of death (e.g., murder rate). Emphasis on target audience based on data/community.
Facilitator(s)	TxDOT Behavioral Traffic Safety (BTS)
Participating Organizations	TxDOT BTS, DPS, Sheriffs' Departments, Local law enforcement agencies, Advocacy organizations
Effectiveness	***
Cost to Implement	6.6.1.1 $$, 6.6.1.2 $, 6.6.1.3 $, 6.6.1.4 $
Time to Implement	6.6.1.1 Medium, 6.6.1.2 Short, 6.6.1.2 6.6.1.3 Short, 6.6.1.4 Short (Currently Ongoing)
Barriers	Lack of sufficient funding

Strategy 6.6.2 **Increase officer contacts with impaired drivers through regular traffic enforcement.**

Implementation Action Plan	
6.6.2.1	Educate the police, community leaders, the public, and traffic safety partners on the role of regular traffic enforcement stops as a primary tool in detecting impaired drivers and encourage their use to reduce impaired crashes. Focus on agency administration and local government entities to establish local priorities.
6.6.2.2	Use a data-driven approach to optimize areas and timesfor enforcement. Increase the deployment of Data Driven Approaches to Crime and Traffic Safety (DDACTS) training and local implementation.
6.6.2.3	Educate communities with data through earned media and other means to communicate the impact of impaired driving in the local areas.
6.6.2.4	Identify training opportunities for law enforcement at the state and local levels in locations with high probability for alcohol and/or other drug use frequently leads to impaired driving (including events, communities, entertainment districts, etc.)
Facilitator(s)	TxDOT Behavioral Traffic Safety (BTS)
Participating Organizations	TxDOT BTS, DPS, Sheriffs' Departments, Local law enforcement agencies, Advocacy organizations
Effectiveness	***
Cost to Implement	6.6.2.1 $, 6.6.2.2 $, 6.6.2.3 $, 6.6.2.4 $
Time to Implement	6.6.2.1 Short, 6.6.2.2 Short, 6.6.2.2 6.6.2.3 Short, 6.6.2.4 Short (Currently Ongoing)
Barriers	Lack of sufficient funding

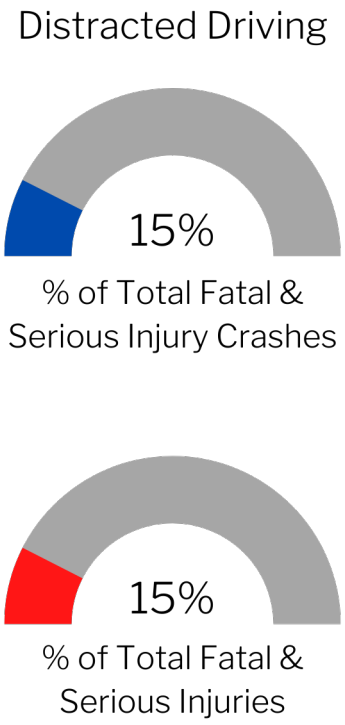
Strategy 6.6.3 **Increase data, training, and resources for law enforcement officers, prosecutors, toxicologists, judges, and community supervision personnel in the area of alcohol and/or other drugged-driving.**

Implementation Action Plan	
6.6.3.1	Train law enforcement in effective DWI detection including Standardized Field Sobriety Testing (SFST), Advanced Roadside Impaired Driving Enforcement (ARIDE) training, and Drug Evaluation and Classification (DEC) Program. Include preparation for testimony.
6.6.3.2	Train prosecutors in the DWI trial process & presentation of evidence. Implement joint training for law enforcement, prosecutors, and laboratory personnel (forensic toxicologists) to assist in presenting scientific evidence of alcohol and/or drug impairment in court.
6.6.3.3	Educate Judges on the DWI process with joint training for judges and appropriate court personnel on the impairing effects of alcohol and/or other drugs on driving, DUI processes (under 21), DWI detection process, and monitoring options (ignition interlock devices, testing, etc.).
6.6.3.4	Train Community Supervision Personnel on the impairing effects of alcohol and/or other drugs on driving and the use of ignition interlock devices/testing (condition of probation).
6.6.3.5	Provide additional resources for laboratories to address testing capacity for evidence associated with DWIs and availability to provide expert testimony.
6.6.3.6	Identify methodologies and resources for improving the identification of drugged driving as a contributing factor in impaired-driving crashes.
Facilitator(s)	TxDOT Behavioral Traffic Safety (BTS)
Participating Organizations	TxDOT BTS, DPS, Sheriffs' Departments, Local law enforcement agencies, Advocacy organizations
Effectiveness	***
Cost to Implement	6.6.3.1 $, 6.6.3.2 $, 6.6.3.3 $, 6.6.3.4 $, 6.6.3.5 $$$, 6.6.3.6 $
Time to Implement	6.6.3.1 Short, 6.6.3.2 Short, 6.6.3.3 Short, 6.6.3.4 Short, 6.6.3.5 Medium, 6.6.3.6 Short (Currently Ongoing)
Barriers	Lack of sufficient funding

Section 6.7 Distracted Driving

Background

NHTSA defines distracted driving as "anything that diverts the driver's attention from the primary tasks of navigating the vehicle and responding to critical events. To put it another way, a distraction is anything that takes your eyes off the road (visual distraction), your mind off the task of driving (cognitive distraction), or your hands off the wheel (manual distraction)". Distracted driving is difficult to measure because it is difficult to observe the behavior, but research shows it is a common practice. Therefore, it can be presumed the data are underreported. (Venkatraman, V., Richard, C. M., Magee, K., & Johnson, K. (2021, July). Countermeasures that work: A highway safety countermeasures guide for State Highway Safety Offices, 10th edition, 2020 (Report No. DOT HS 813 097). National Highway Traffic Safety Administration p. 4-1.)



Even though the data may be underreported, 2021 data show 10.6% of fatalities and 18.6 percent of serious injuries were attributed to distracted driving. These crashes occur more frequently in urban areas (63.2%) than in rural (34.3%) areas, and they are more likely to occur on the state road system (63.2%) rather than off the system (36.8%).

Historical & Trend Crash Data Analysis

Distracted driving often overlaps with other countermeasure areas where both behaviors and circumstances are evident. For example, in 27% of run off the road crashes and 10.8% of impaired driving crashes distraction was also a factor. In addition, nearly 18% of crashes involving a young driver are attributable to distraction.

The definition for distracted driving is straight forward since there is a specific crash factor on the CR-3 form where an officer can indicate whether they believe distraction may have been a factor in the reported crash. The type of distraction is not codified but may be included in the narrative section of the report. The fatal and suspected serious injury crashes related to a distracted driver(s) represents 15% of all crashes. Since 2017, the distracted driving crash trend is flat specifically related to fatal crashes, but 2021 saw a sharp uptick in distraction as a reported crash factor. It is important to reverse this to reach the state goal of zero deaths in 2050. The distracted driving crashes are illustrated in Figure 6.8.1 and the fatal and serious injuries are summarized in Figure 6.8.2.

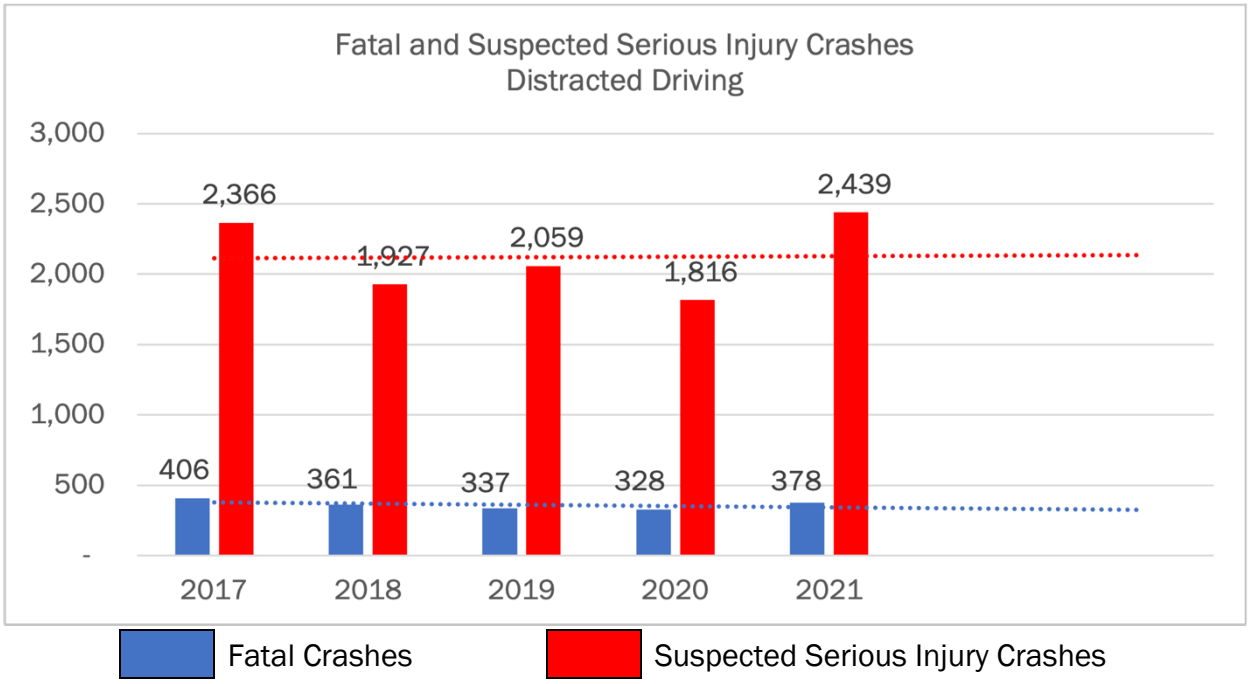


Figure 6.8.1. Distracted Driving EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

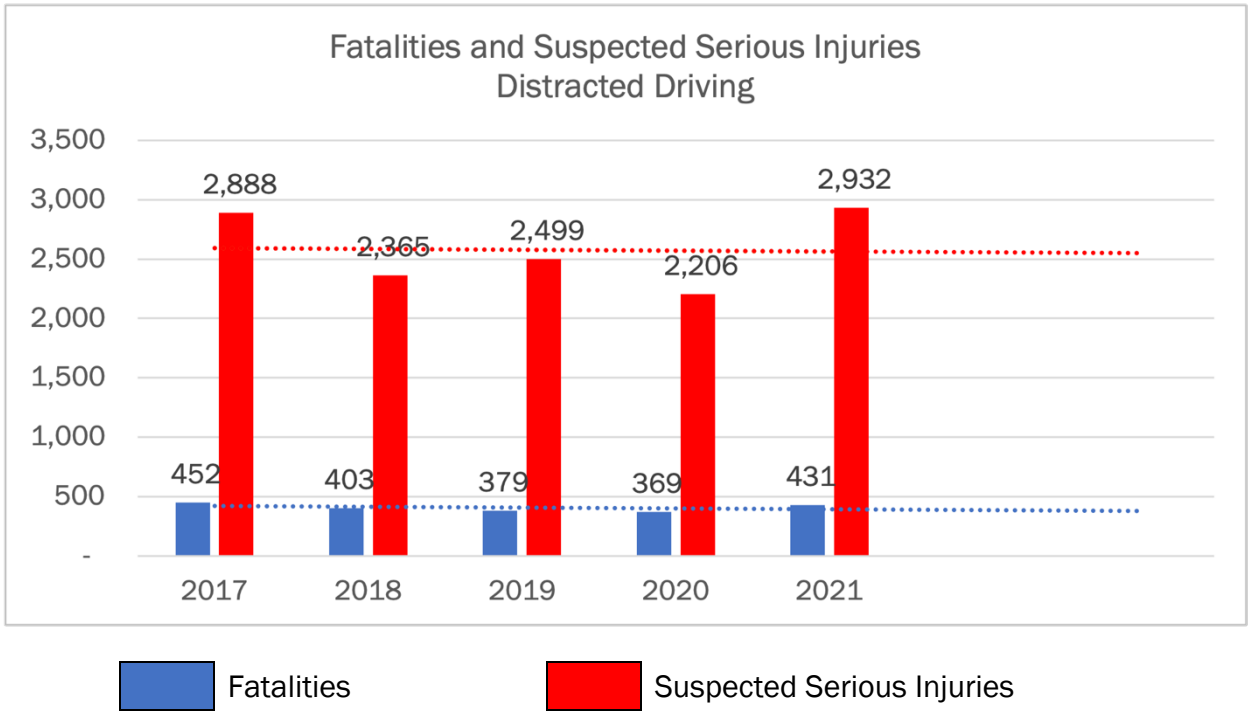
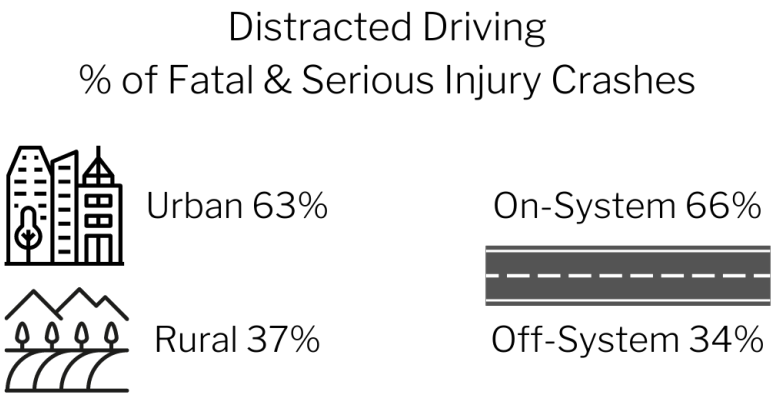


Figure 6.8.2. Distracted Driving EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. Regarding distracted driving, 63%



of the crashes occurred in areas designated as urban while 66% of these types of crashes happened on roadways considered on-system.

From 2017 through 2021, there were 12,417 fatal and suspected serious injury crashes attributed to distracted driving. These crashes resulted in 2,034 fatalities and 12,890 additional individuals with suspected serious injuries. Distracted driving is a behavioral crash factor. Therefore, other factors likely play a role in distracted driving crashes whether it be a location factor or user type. Distracted driving crashes are a significant part of Texas' traffic safety challenges representing 10% of fatal crashes and 10% of total fatalities. If the state can effectively address distracted driving, it will have a significant impact on our ability to reach zero deaths. After identifying prevalent crash factors, related to distracted driving crashes, the EA team considered those overlapping factors in the identification of strategies and the development of implementation plans. These crash factors include:

- ⇒ Distracted Driving Crashes (12,417) – 27% resulted in a run-off the road crash with 53% of those occurring in areas designated as urban
- ⇒ Distracted Driving Crashes (12,417) – 18% involved young drivers (age 15-20)
- ⇒ Distracted Driving Crashes (12,417) – 11% also involved impaired driving
- ⇒ Distracted Driving & Intersections Crashes (4,418) – 71% occurred in areas designated as urban

Objective for Emphasis Area

Reduce fatalities and serious injuries by identifying, implementing, and evaluating awareness strategies to reduce distracted driving.

Strategies & Implementation Plans

Strategy 6.7.1 **Utilize data and information to communicate the dangers of distracted driving to teens, their parents, employers, public officials, and others.**

Implementation Action Plan	
6.1.1	Use crash data and survey results to develop and document a suite of age-specific countermeasures and messages about the dangers of distracted driving.
6.7.1.2	Educate public officials and employers about the human and economic costs of distracted driving through outreach programs.
6.7.1.3	Educate teens and their parents on the Graduated Driver Licensing law with specific attention to the provisions designed to address distracted driving such as limiting the number of passengers and disallowing cell phone use.
6.7.1.4	Implement effective Peer to Peer programs: Teens in the Driver Seat (Junior High and High School) and U in the Driver Seat (College).
Facilitator(s)	TxDOT Traffic Safety Division, Behavioral Traffic Safety
Participating Organizations	TxDOT, MPOs, TTI, Schools, Driving Schools, AAA, NSC
Effectiveness	***
Cost to Implement	6.7.1.1 $, 6.7.1.2 $, 6.7.1.3 $, 6.7.1.4 $
Time to Implement	Currently Ongoing
Barriers	Lack of additional funding and/or resources Some schools unwilling to participate Parents are sometimes too busy or don't take the time to learn about GDL and educate their children

Strategy 6.7.2 **Improve and increase enforcement capabilities for addressing distracted driving.**

Implementation Action Plan	
6.7.2.1	Use Selective Traffic Enforcement Program (STEP) grants and high visibility enforcement techniques to enforce distracted driving state laws and local ordinances, especially where the data document crashes where distraction is a contributing factor.
6.7.2.2	Identify and disseminate model distracted driving policies for law enforcement agencies for guidance on enhancing officer safety. Use the DPS policy as a model that agencies can emulate or revise.
Facilitator(s)	TxDOT Traffic Safety Division, Behavioral Traffic Safety
Participating Organizations	TxDOT, DPS, Local Law Enforcement Agencies
Effectiveness	***
Cost to Implement	6.7.2.1 $$, 6.7.2.2 $
Time to Implement	Currently Ongoing
Barriers	Some law enforcement agencies lack the resources or the interest in participating

Strategy 6.7.3 **Increase installation of engineering countermeasures known to reduce distracted driving.**

Implementation Action Plan	
6.7.3.1	Use network screening techniques to identify and systemically implement engineering countermeasures known to reduce distracted driving, such as edge line, centerline, and transverse rumble strips, wider and brighter striping, and lighting especially in areas associated with distracted driving crashes.

Implementation Action Plan	
Facilitator(s)	TxDOT Traffic Safety Division
Participating Organizations	TxDOT, MPOs
Effectiveness	***
Cost to Implement	6.7.3.1 $$$
Time to Implement	Long
Barriers	Insufficient funding

Strategy 6.7.4 **Use technology to reduce distracted driving crashes, serious injuries, and fatalities.**

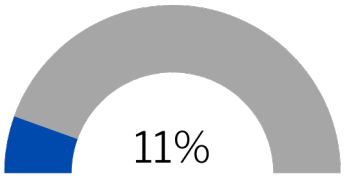
Implementation Action Plan	
6.7.4.1	Test and implement apps to encourage distraction-free driving or discourage distracted driving.
6.7.4.2	Implement an incentive-based app specifically addressing teen drivers.
6.7.4.3	Educate the consumers, parents, employers, and the public with age-specific messages about vehicle safety technologies mycardoeswhat.org) and tools to encourage distraction-free driving through car dealers, the media, and employers.
Facilitator(s)	TxDOT Traffic Safety Division, Behavioral Traffic Safety
Participating Organizations	TxDOT, TTI, Schools, Driving Schools, AAA, NSC
Effectiveness	**
Cost to Implement	6.7.4.1 $, 6.7.4.2 $, 6.7.4.3 $
Time to Implement	Currently Ongoing
Barriers	Lack of additional funding and/or resources Lack of volunteer leaders

Section 6.8 Vulnerable Road Users

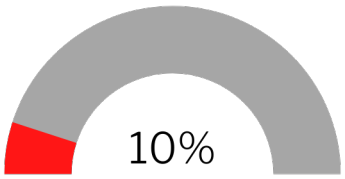
Background

One of the primary tenets of a Safe System Strategy is anticipating human error. Vulnerable road users are more susceptible to fatal or serious injury when they are involved in a crash with a motor vehicle. In the case of pedestrians, pedalcyclists and vulnerable road users, we need to consider separating users in terms of time and/or space. These aspects address both infrastructure and behavior by looking to dedicated transportation space for users moving at different speeds and, subsequently, reduce adverse interactions between users. Ultimately, every road user has a responsibility to use the road safely, whether they are driving, biking, walking, riding, or traveling by other modes and act within the limits of the road system's design (cite ITE).

Pedestrian Related



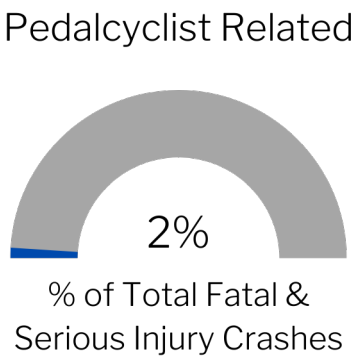
% of Total Fatal & Serious Injury Crashes

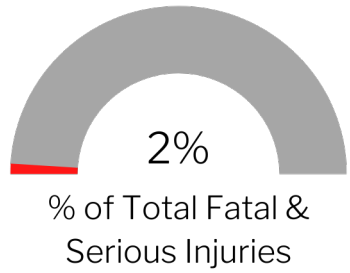


% of Total Fatal & Serious Injuries

The Federal Highway Administration's The Safe System Approach states that "Humans are unlikely to survive high-speed crashes. Reducing speeds can accommodate human injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility." Pedestrians are even more vulnerable road users than those exposed to consequences of speed within the confines of a vehicle, therefore it is critical to consider vulnerable road users.

Addressing infrastructure to reduce fatal and serious injury crashes is a primary focus of a Safe System. Intersections are particularly problematic since they not only involve vehicles, but also vulnerable road users such as pedestrians and bicyclists. Pedestrians use the roadway at intersections as well as other types of infrastructure, so it is important to consider countermeasures that increase visibility through lighting and other approaches proven to be effective. For the part of the driver, there are countermeasures that increase attentiveness so that they can be more aware of the possibility of the presence of pedestrians.





The focus of a Safe System is to reduce risk and, subsequently, death and serious injury related to traffic crashes (vehicle occupants, pedestrians, and bicyclists). The EA representatives considered behavioral countermeasures as well as engineering solutions addressing conflict points, speed reduction, visibility, and space for vulnerable road users. Some of these approaches are also addressed in the speed related and intersection areas.

Pedestrian Historical & Trend Crash Data Analysis

The fatal and suspected serious injury crashes related to pedestrians represents 11% of all crashes. Since 2017, pedestrian crash trend has increased, therefore it is important to reverse this trend to reach the state goal of zero deaths in 2050. The pedestrian related crashes are illustrated in Figure 6.8.1 and the fatal and serious injuries are summarized in Figure 6.8.2.

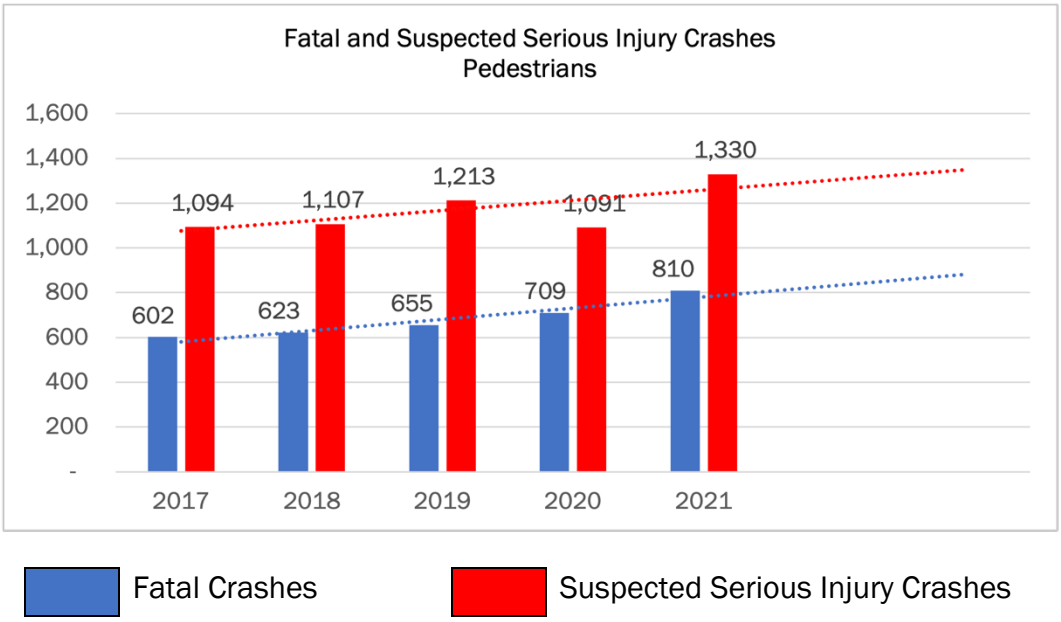


Figure 6.8.1. Pedestrian EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

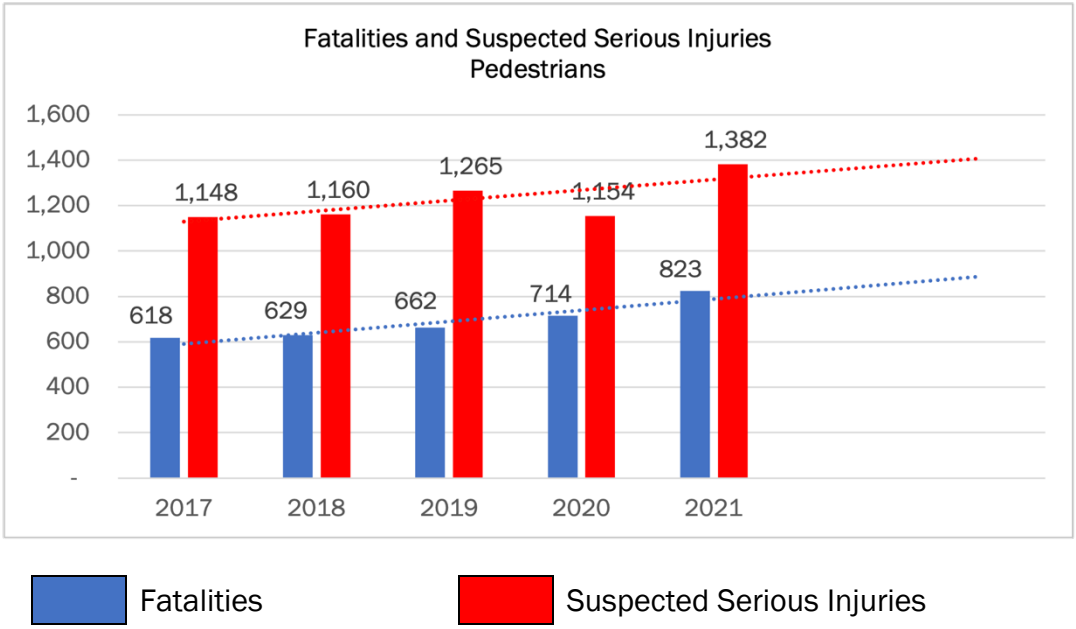
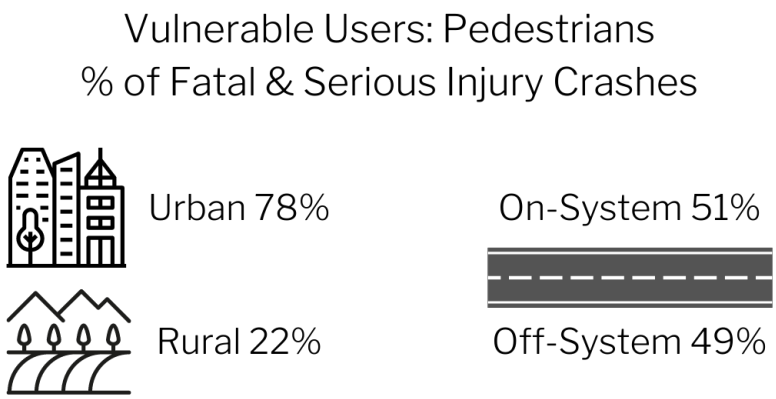


Figure 6.8.2. Pedestrian EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. The vulnerable road user data has been separated to provide details related to pedestrians and pedalcyclists. The following data is only representative of pedestrians involved in fatal or suspected serious injury crashes.



From 2017 through 2021, there were 9,234 fatal or suspected serious injury crashes and 9,555 fatalities and suspected serious injuries. The Pedestrian EA team considered strategies to reduce the number of fatal and serious injury crashes and, subsequently, fatal, and serious injuries that not only addressed infrastructure, but also driver and pedestrian behavior. Of the pedestrian related crashes, one-third (3,399) resulted in at least one fatality while the other two-thirds (5,835) resulted in suspected serious injuries. The same proportions existed when injuries were analyzed with one-third (3,446) of the injuries were fatal and the remaining two-thirds (6,109) were classified as suspected serious injuries.

Pedestrians are especially vulnerable road users and demand specific traffic safety countermeasures to mitigate the risk. The state plans to work on the infrastructure and behavioral aspects of this challenge in partnership with state and local planning organizations as well as advocacy groups (all represented on the Pedestrian EA team). By addressing the occurrence of pedestrian involved crashes, we can have a significant effect on our ability to reach zero deaths. After identifying predominant, overlapping crash factors, related to pedestrian involved crashes, there are several aspects that the EA team

considered during the identification of strategies and the development of implementation plans. The overlapping crash factor observations include:

- ⇒ 41% of the crashes involved a pick-up truck or SUV
- ⇒ 23% of the pedestrian involved crashes occurred at an intersection while 75% occurred at a part of the roadway that was not designated as an intersection
- ⇒ 77% of the pedestrian crashes occurred during dark conditions in an urban setting
- ⇒ 12% (1,134) of the pedestrian crashes were also classified as distracted driver crashes
- ⇒ 18% (3,446) of the total fatal injuries and 6,104 suspected serious injuries were attributed to crashes involving at least one pedestrian

Pedalcyclist Historical & Trend Crash Data Analysis

The fatal and suspected serious injury crashes related to pedalcyclist represents 11% of all crashes. Since 2017, pedalcyclist crash trend has fluctuated. The number of fatal crashes increased from 57 in 2017 to 91 in 2021 while the number of suspected serious injury crashes was 328 in 2017 and 323 in 2021 with decreases in 2018 and 2020. In terms of the injuries, the number of pedalcyclist fatalities increased from 57 in 2017 to 91 in 2021. The number of suspected serious injuries changed from 334 in 2017 and 332 in 2021 after being lower in the years between (2018-2020). As with the other EA areas, there needs to be significant focus to make an impact on the risks faced by vulnerable road users to achieve the state goal of zero deaths in 2050. The pedalcyclist related crashes are illustrated in Figure 6.8.4 and the fatal and serious injuries are summarized in Figure 6.8.5.

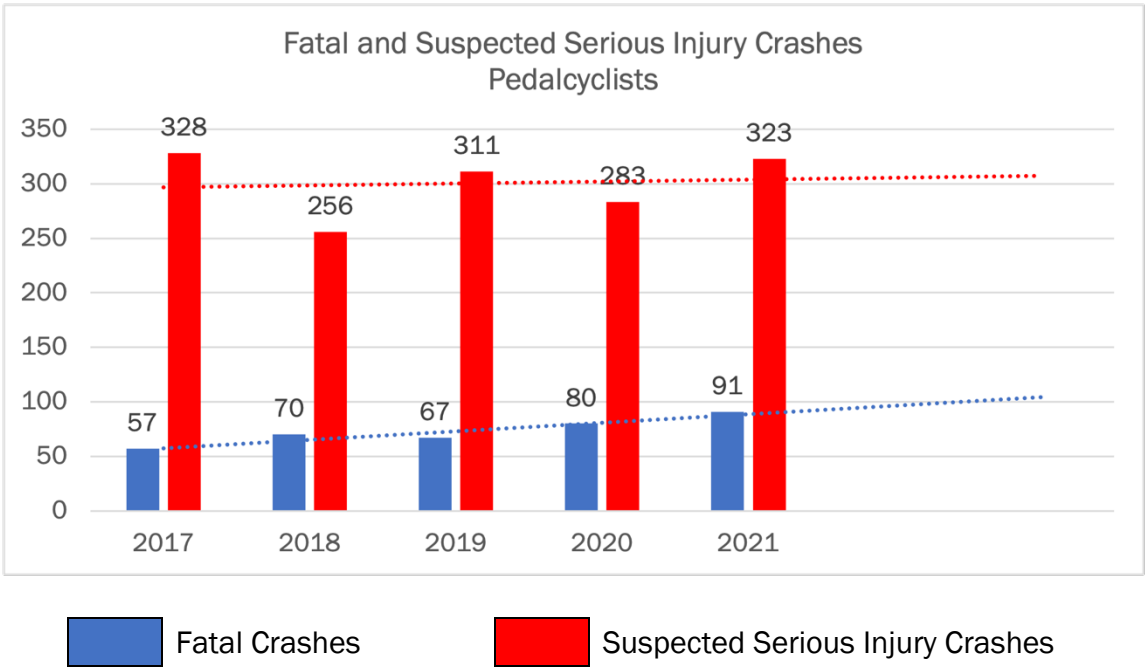


Figure 6.8.4. Pedalcyclist EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

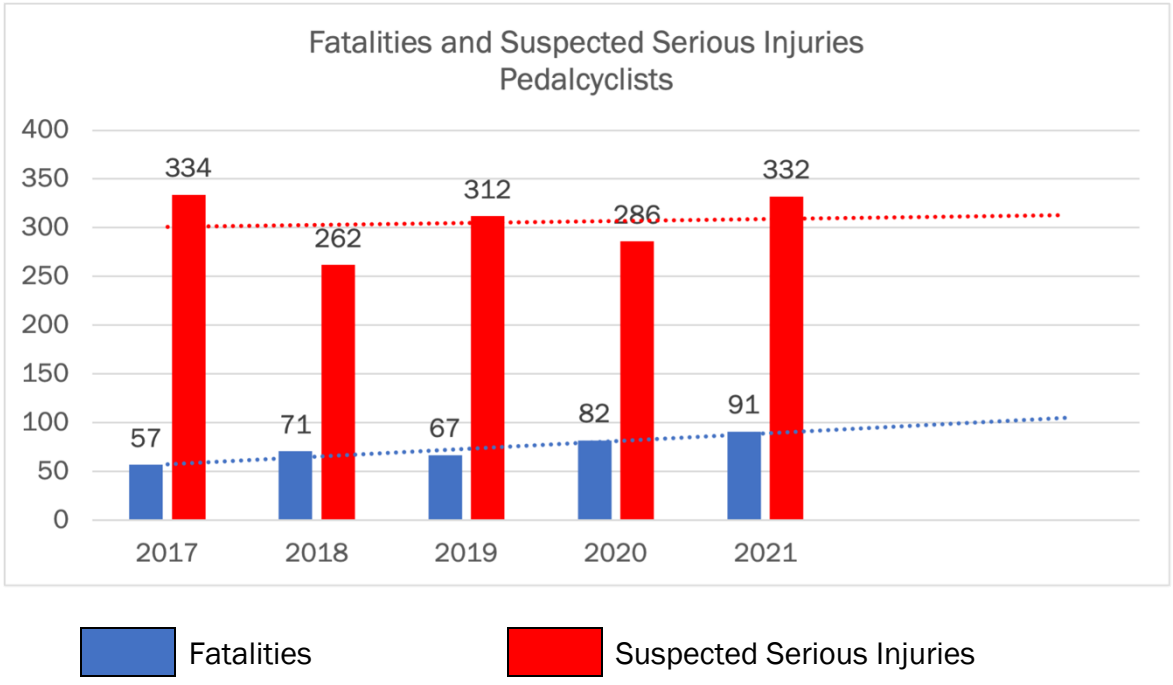
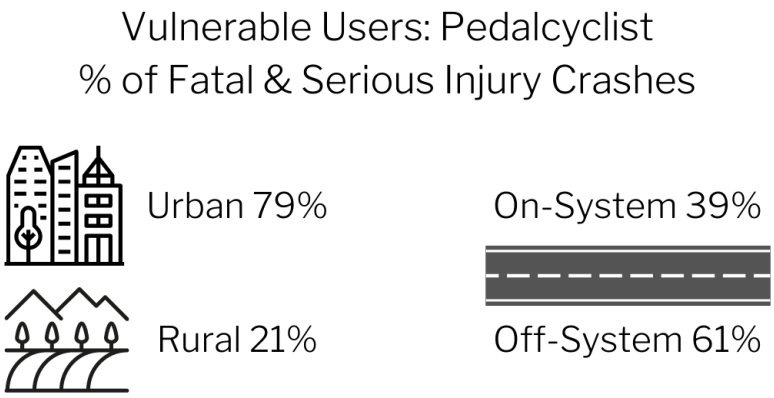


Figure 6.8.5. Pedalcyclist EA: Fatal and Suspected Serious Injuries (2017-2021)

Throughout the Strategic Highway Safety Plan (SHSP) process, the Emphasis Area (EA) teams examined the representation of rural and urban as well as on- and off-system in terms of the crash factors associated with the specific EA. The vulnerable road user data has been separated to provide details related to pedestrians and pedalcyclists. The following data is only representative of pedalcyclists involved in fatal or suspected serious injury crashes.



The Vulnerable Road User EA team considered strategies to reduce the number of fatal and serious injury crashes and, subsequently, fatal, and serious injuries that not only addressed infrastructure, but also driver, pedalcyclist, and pedestrian behavior. Of the pedalcyclist related crashes, 19% (365) resulted in at least one fatality while the other 81% (1,501) resulted in suspected serious injuries. The same proportions existed when injuries were analyzed with 20% (386) of the injuries were fatal and the remaining 80% (1,526) were classified as suspected serious injuries.

In the same way that pedestrian risks are addressed, the state plans to work on the infrastructure and behavioral aspects of this challenge in partnership with state and local planning organizations as well as advocacy groups (all represented on the Vulnerable Road User EA team). By addressing the occurrence of pedalcyclist involved crashes, we can have a significant effect on our ability to reach zero deaths. After identifying predominant,

overlapping crash factors, related to pedalcyclist involved crashes, there are several aspects that the EA team considered during the identification of strategies and the development of implementation plans. For fatal and suspected serious injury crashes, the crash factors observations include:

⇒ Intersections present risks for all roadway users and pedalcyclists are especially vulnerable road users due to several factors – the overlapping factors between pedalcyclists and intersection types is detailed in Figure 6.8.6.

⇒ 68% (574 of 846) of the intersection related crashes occurred in daylight conditions

⇒ 53% (485 of 917) of the non-intersection crashes occurred in dark condition

⇒ 78% (1,455 of 1,866) of the pedalcyclist fatal and suspected serious injury crashes occurred in areas designated as urban

⇒ 61% of the pedalcyclist fatal and suspected serious injury crashes occurred on-system

⇒ 43% of the crashes involved a pick-up truck or SUV

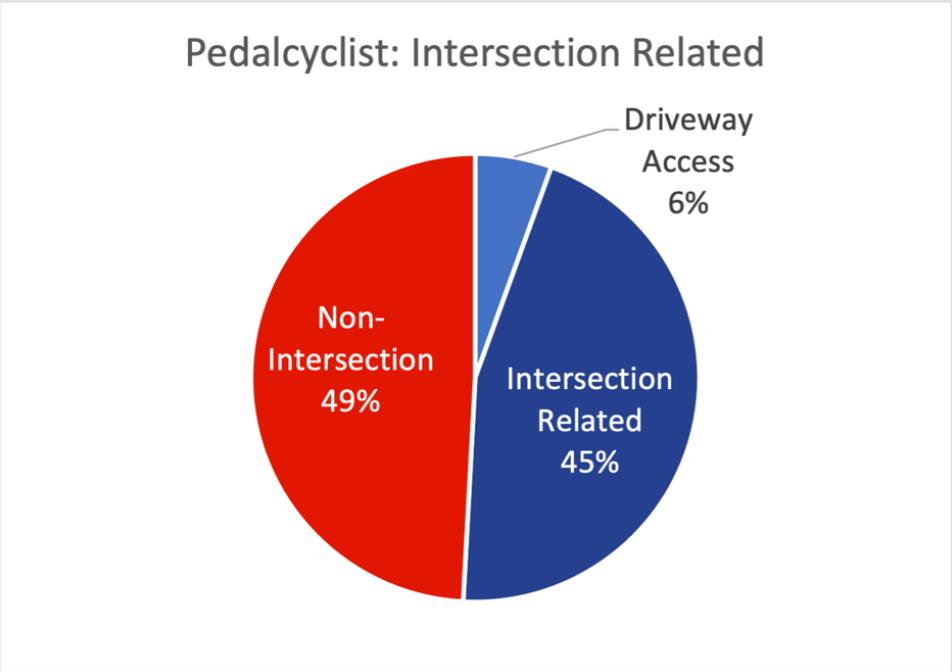


Figure 6.8.6. Pedalcyclist EA: Intersection Type Crashes

Objective for Emphasis Area

Utilize a data driven approach to decrease the number of fatal and serious injuries sustained by vulnerable road users by identifying and targeting audiences for education efforts designed to increase occupant protect usage including correctly installed and applied safety belts and child car seats.

Strategies & Implementation Plans

Strategy 6.8.1 **Improve driver and vulnerable road user safety awareness and behavior.**

Implementation Action Plan	
6.8.1.1	Educate motorists on appropriate actions if they become stranded on a freeway or high-speed roadway to reduce crashes with unintended pedestrians on roadways.
6.8.1.2	Provide driver and pedestrian safety messages and education.
6.8.1.3	Educate vulnerable road users through campaigns like Walk Bike Safe and encourage alternatives such as transit, taxis, and transportation network companies.
6.8.1.4	Improve nighttime visibility of vulnerable road users using educational programs such as Be Safe. Be Seen.
Facilitator(s)	TxDOT, MPOs
Participating Organizations	TxDOT, TTI, MPOs, COGs, Advocacy groups
Effectiveness	**
Cost to Implement	6.8.1.1 $$, 6.8.1.2 $$, 6.8.1.3 $, 6.8.1.4 $
Time to Implement	6.8.1.1 Medium, 6.8.1.2 Long, 6.8.1.3 Long, 6.8.1.4 Short
Barriers	Lack of sufficient funding

Strategy 6.8.2 **Reduce vulnerable road user crashes on urban arterials and local roadways.**

Implementation Action Plan	
6.8.2.1	Complete sidewalk inventory and implement pedestrian-oriented design treatments at high-volume and/or high-risk pedestrian or pedalcyclist locations.
6.8.2.2	Implement proven countermeasures such as leading or exclusive pedestrian intervals at signalized intersections (i.e., pedestrian walk signals activate prior to parallel green), high-volume pedestrian-use signaled intersections, and pedestrian push-button locations.
6.8.2.3	Develop and implement a program (i.e. Vision Zero, Road to Zero, Safe Systems, ped action plans) to assist cities, developers and other agencies to develop policies and implement projects that address common pedestrian and pedalcyclist crash types.
6.8.2.4	Disseminate information and training for traffic safety professionals on the effectiveness and appropriateness of pedestrian traffic control measures.
6.8.2.5	Provide available protected paths when construction impedes on sidewalk, etc.
Facilitator(s)	TxDOT (Design Division & Traffic Safety)
Participating Organizations	TxDOT (Design Division & Traffic Safety), MPOs
Effectiveness	***
Cost to Implement	6.8.2.1 $$, 6.8.2.2 $$, 6.8.2.3 $, 6.8.2.4 $, 6.8.2.5 $$
Time to Implement	6.8.2.1 Medium, 6.8.2.2 Medium, 6.8.2.3, Short, 6.8.2.4, Short, 6.8.2.5 Short
Barriers	Lack of funding, Integration of Resources, Conflicting Priorities

Strategy 6.8.3 Improve vulnerable road user networks.

Implementation Action Plan	
6.8.3.1	Develop policies to analyze vulnerable road user levels of service, delay, and network connectivity as part of project development. Develop and disseminate a complete streets policy support guide with model policy and implementation information for local agencies and MPOs.
6.8.3.2	Create connected vulnerable road user networks and remove barriers to pedestrian/pedalcyclist travel (pedestrian over/underpasses and crossings to overcome physical barriers). Consider setting standards or guidelines for the distance between safe crossings given land uses, densities, and roadway function.
Facilitator(s)	TxDOT, MPOs
Participating Organizations	TxDOT, MPOs, COGs, Cities, Counties
Effectiveness	**
Cost to Implement	6.8.3.1 $$, 6.8.3.2 $$
Time to Implement	6.8.3.1 Medium, 6.8.3.2 Medium
Barriers	Lack of sufficient funding & Priorities

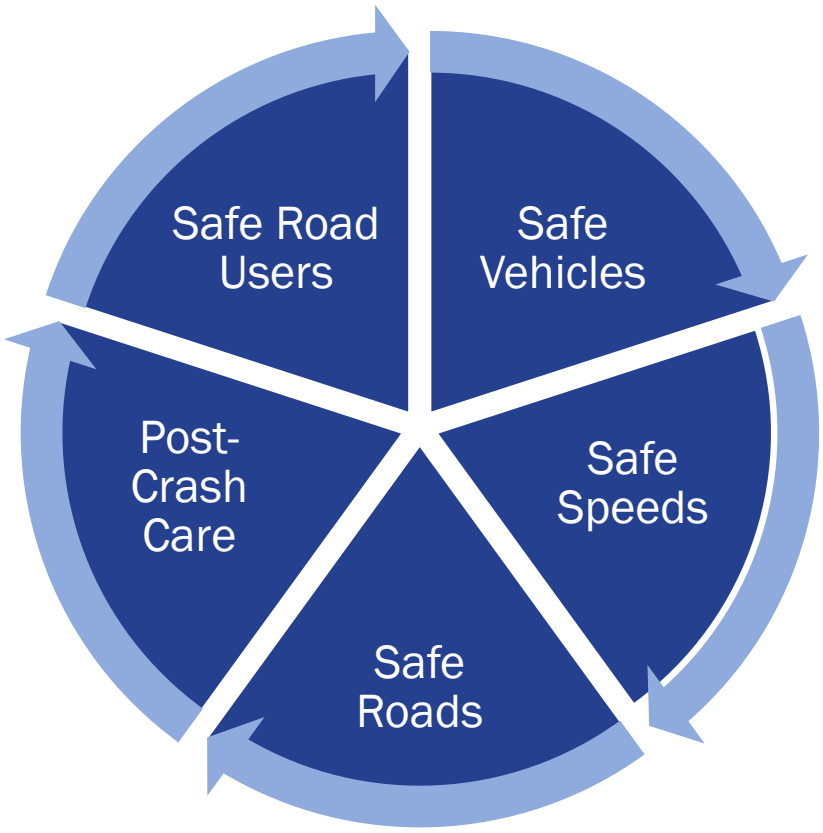
Strategy 6.8.4 Develop strategic pedestrian safety plans tailored to local conditions.

Implementation Action Plan	
6.8.4.1	Develop a statewide inventory of local Pedestrian Safety Action Plans (PSAPs) and a statewide inventory of those PSAPs.
6.8.4.2	Develop a State Pedestrian Safety Action Plan including how equity is to be addressed.
Facilitator(s)	TxDOT, MPOs
Participating Organizations	TxDOT, TTI, MPOs, COGs, Advocacy groups
Effectiveness	**
Cost to Implement	6.8.1.1 $$, 6.8.1.2 $
Time to Implement	6.8.1.1 Medium, 6.8.1.2 Short
Barriers	Lack of sufficient funding & Priorities

Section 6.9 Post-Crash Care

Background

One of the critical tenets of a Safe System is the concept of redundancy throughout the system. This approach provides a *Swiss cheese model* of redundancy layers of protection so that if one layer, element of a Safe System, fails another layer will provide the safety stop gap. The idea is that death and serious injury will only occur if all the layers fail.



Post-crash care is a critical part or layer of a safe road system. In the event of a crash, effective post-crash care, involving emergency treatment and trauma care along with rehabilitation, can help reduce the risk of death and serious injuries. However, post-crash care is not confined to medical treatment. The sub-elements of post-crash care include:

- First responders
- Trauma and emergency medical care
- Crash investigation
- Traffic incident management
- Justice (adjudication, probation, treatment)

Each State in cooperation with its political subdivisions should have a program which provides for rapid, orderly, and safe removal from the roadway of wreckage, spillage, and debris resulting from motor vehicle accidents, and for otherwise reducing the likelihood of secondary and chain-reaction collisions, and conditions hazardous to the public health and safety." (NHTSA, Highway Safety Program Guideline No. 16, p. 1)

Objective for Emphasis Area

Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

Strategies & Implementation Plans

Strategy 6.9.1 Improve data collection and analysis techniques.

Implementation Action Plan	
6.9.1.1	Develop and implement a revised crash report form to increase and improve data collection, especially data on roadway and incident clearance times, response times, secondary crashes, and responder injuries.
6.9.1.2	Increase the use of current and emerging technologies to capture information more efficiently for the crash report and clear crash scenes, especially in rural areas.
Facilitator(s)	6.9.1.1 TxDOT Crash Data Analysis (CDA), 6.9.1.2 TxDOT Traffic Safety Division (TRF), DPS, Sheriffs' Departments, MPOs
Effectiveness	6.9.1.1 ***, 6.9.1.2 ***
Cost to Implement	6.9.1.1 $, 6.9.1.2 $$$
Time to Implement	6.9.1.1 Short, 6.9.1.2 Short
Potential Barrier	Lack of funding

Strategy 6.9.2 ***Increase and improve emergency responder training.***

Implementation Action Plan	
6.9.2.1	Expand TIM basic and refresher training requirements. ▪ Work with TDLR to require TIM training for first responders. ▪ Work with TCOLE to require TIM refresher training for law enforcement personnel. ▪ Work with TCFP to require TIM refresher training for EMS personnel (every 3-5 yrs). ▪ Work with SFFMA to require TIM refresher training for fire/rescue personnel. ▪ Work with DSHS and State EMS Director to require TIM refresher training for EMS personnel at least every 3-5 years. ▪ Expand TIM Train the Trainer training to increase access to training.
Facilitator(s)	6.9.2.1 TXDOT TIM Coordinator, 6.9.2.2 TxDOT Traffic Safety Division (TRF)
Effectiveness	6.9.2.1 **
Cost to Implement	6.9.2.1 $
Time to Implement	6.9.2.1 Medium
Potential Barrier	Partners may be reluctant to commit

Strategy 6.9.3 Facilitate current and future State and Metro TIM teams meetings.

Implementation Action Plan	
6.9.3.1	Increase first responder participation in existing TIM teams and TIM meetings by soliciting support from the TxDOT District Traffic Safety Specialists (TSS).
6.9.3.2	Reach out to TSS personnel and enlist their assistance in a) identifying existing TIM teams and b) starting teams to fill voids, especially in rural areas. ▪ Educate TSS personnel on TIM, how they can help, & what TxDOT TIM personnel can do for them. ▪ Increase participation through the TxDOT District Coalitions. ▪ Create and distribute a TIM Outreach Toolkit to TSS personnel. ▪ Train TSSs on how to deliver TIM training and TIM Train-the-Trainer.
Facilitator(s)	6.9.3.1 TxDOT District Traffic Operations and TIM Coordinator, 6.9.3.2 TxDOT District Traffic Safety Specialists
Effectiveness	6.9.3.1 ***, 6.9.3.2 ***
Cost to Implement	6.9.3.1 $, 6.9.3.2 $
Time to Implement	6.9.3.1 Medium, 6.9.3.2 Medium
Potential Barriers	TSS time constraints, Partners may be reluctant to commit

Strategy 6.9.4 **Utilize technology, policy, and available personnel to investigate and report crashes more efficiently to enable rapid crash scene clearance**

Implementation Action Plan	
6.9.4.1	Identify and implement effective technologies designed to more efficiently capture crash report information and clear crash scenes.
6.9.4.2	Support an Open Roads Policy statewide supporting quick clearance strategies.
6.9.4.3	Develop crash investigation training materials for delivery to Sheriffs' deputies and work with the Law Enforcement Liaisons and District Traffic Safety Specialists to deliver the training, especially in rural areas.
Facilitator(s)	6.9.4.1 DPS, local law enforcement, 6.9.4.2 TxDOT Executive Director, 4.3 TCOLE
Effectiveness	6.9.4.1 **, 6.9.4.2 **, 6.9.4.3 **
Cost to Implement	6.9.4.1 $$$, 6.9.4.2 $, 6.9.4.3 $
Time to Implement	6.9.4.1 Short, 6.9.4.2 Short, 6.9.4.3 Medium
Potential Barriers	Funding for technology Sheriffs' agencies support Understanding/support for the Open Roads policy

Strategy 6.9.5 **Identify and implement engineering solutions where possible to reduce response times.**

Implementation Action Plan	
6.9.5.1	Identify and catalog engineering techniques affecting timely response to crashes.
6.9.5.2	Reach out to the District Traffic Safety Specialists, MPOs, and others with information on engineering solutions that decrease response times.
Facilitator(s)	6.9.5.1 TxDOT Traffic Safety, 6.9.5.2 TxDOT Traffic Safety
Effectiveness	6.9.5.1 *, 6.9.5.2 *
Cost to Implement	6.9.5.1 $, 6.9.5.2 $
Time to Implement	6.9.5.1 Short, 6.9.5.2 Short
Potential Barriers	Lack of funding for a consultant to document information Lack of funding for countermeasures implementation

Section 6.10 Other Considerations for Emphasis Areas

In order address the connection that younger and older drivers had to the emphasis areas, it was important to consider those roadway users. There were stakeholder teams formed for each and they met along with the other teams during the SHSP development process. As the Older Drivers and Younger Drivers EAs discussed their specific strategies and countermeasures, it was evident to the team members that the most efficient way to represent these users was integrated into the other EA implementation plans. The exception of a few countermeasures that specifically targeted a user group, all the strategies and implementation activities could apply to all roadway users.

Emphasis Area	% Total Fatal & Suspected Injury Crashes	% Total Fatalities & Suspected Serious Injuries
Younger Drivers	16%	17%
Older Drivers	13%	14%

Figure 6.10.1 Roadway Users: Younger and Older Drivers

Younger Drivers

The average age of a younger driver who was involved in a fatal or suspected serious injury crash was 18 years of age regardless of gender. Two-thirds of the drivers were male. In terms of the most common time of day for a younger driver to be involved in a fatal or suspected serious injury crash, approximately 50% of these crashes occurred between 3pm and 11pm. The number of fatal and suspected serious injury crashes involving younger drivers is represented in Figure 6.10.1. The number of fatal and suspected serious injuries involving younger drivers is detailed in Figure 6.10.2

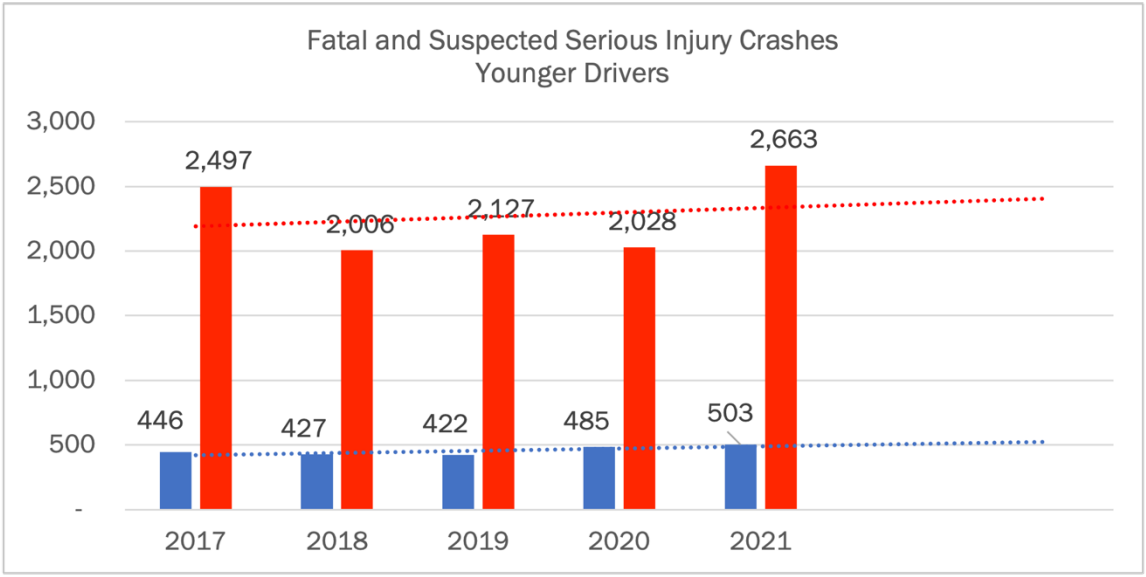


Figure 6.10.2. Younger Drivers: Fatal & Suspected Serious Injury Crashes

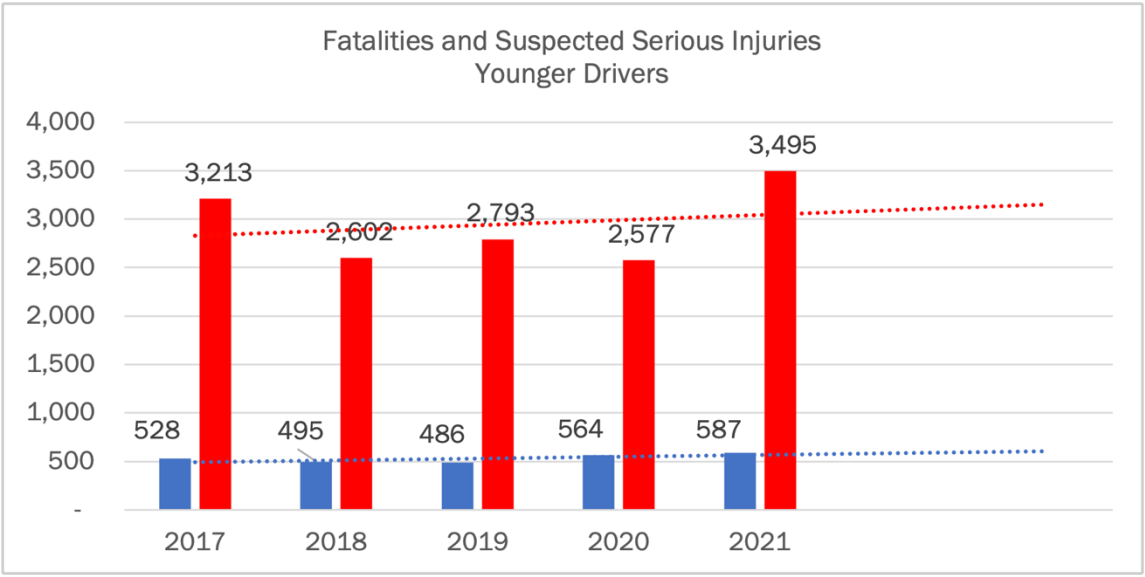


Figure 6.10.3. Younger Drivers: Fatal & Suspected Serious Injuries

Older Drivers

The average age of an older driver who was involved in a fatal or suspected serious injury crash was 72 years of age for males and 73 years of age for females. Two-thirds of the drivers were male. These crashes occurred at intersections 44% of the time and involved a left turn 22% of the total number of fatal and suspected serious injury crashes that involved at least one older driver. In terms of the most common time of day for an older driver to be involved in a fatal or suspected serious injury crash, approximately 50% of these crashes occurred between 10am and 3pm. The number of fatal and suspected serious injury crashes involving older drivers is represented in Figure 6.10.3. The number of fatal and suspected serious injuries involving older drivers is detailed in Figure 6.10.4.

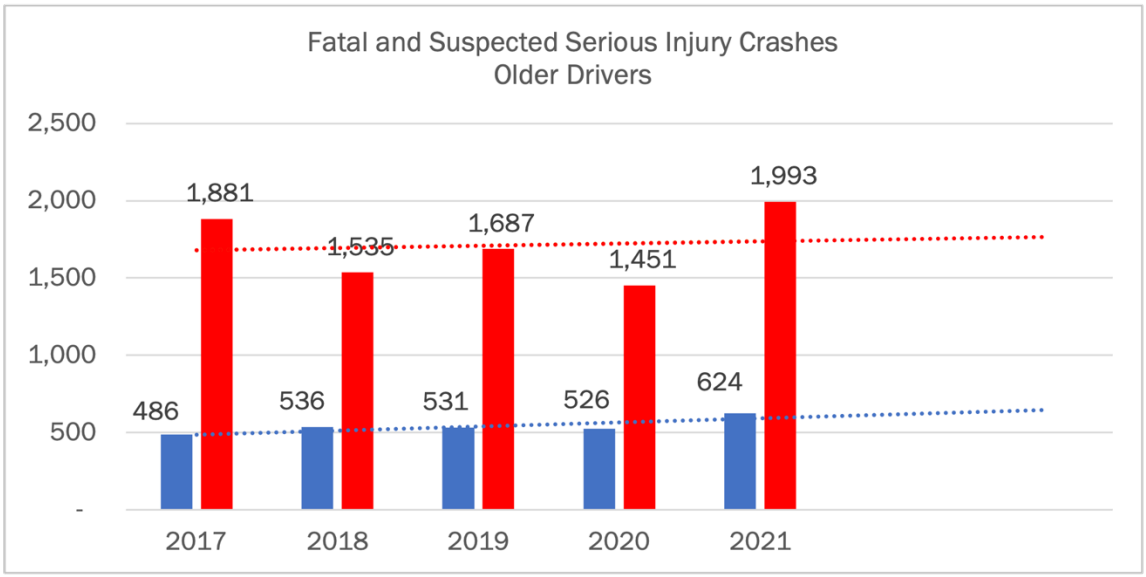


Figure 6.10.4. Older Drivers: Fatal & Suspected Serious Injury Crashes

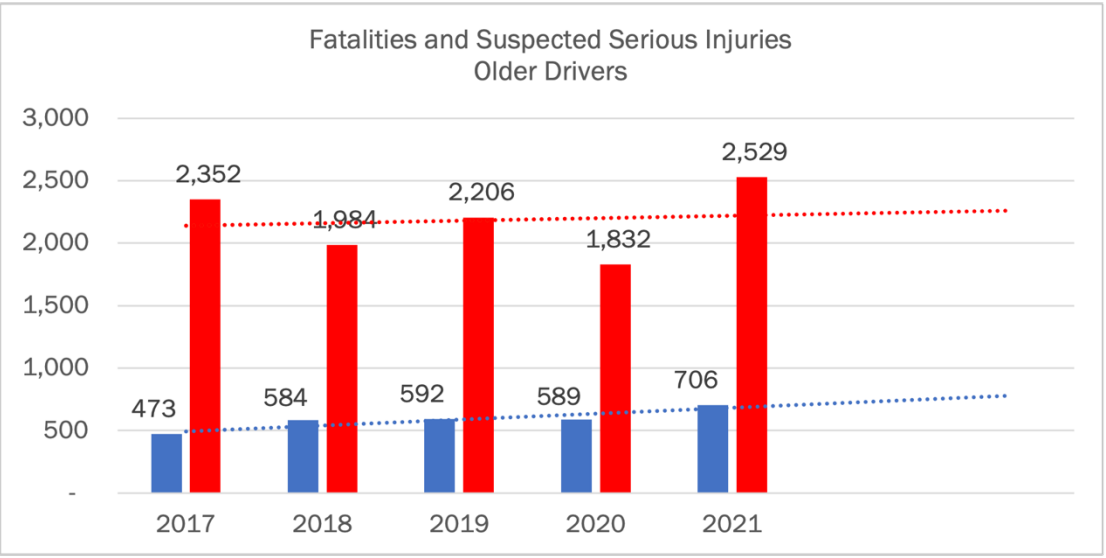


Figure 6.10.5. Older Drivers: Fatal & Suspected Serious Injuries

Summary

The Emphasis Area Teams were productive through the insight their members contributed to the development of strategies and implementation action planning. Although there were only a few individuals who participated in multiple EAs, there was still an interest to ensure that strategies and actions were representing in the appropriate EAs as well as consistent in terms of scope. Texas was fortunate to have existing coalitions and task forces, independent of the EAs, that provided continuity to the EA process as well as carry forward the SHSP beyond the revision process.

7.0 Appendices

Appendix A: Acknowledgements

Appendix B: Executive Committee & Management Team

Appendix C: Emphasis Area Teams

Appendix D: Data Sources & Glossaries

Appendix A: Acknowledgements

The 2022 Revision of the Texas Strategic Highway Safety Plan (SHSP) was accomplished through the hard work of many dedicated individuals. Lead by the Texas Department of Transportation's (TxDOT) Traffic Safety Division (TRF) and facilitated by the Texas A&M Transportation Institute's (TTI) Center for Transportation Safety (CTS), this planning effort included a diverse set of transportation safety stakeholders that represented the geography, demography, disciplines, and interests of the state.

The SHSP Executive Committee provided strategic direction and expertise for the revision efforts. This resource allowed the process to progress efficiently and effectively in terms of structure, process, and target setting.

The Management Team served as the conduit between the Executive Committee and the Emphasis Area Teams. This group of transportation professionals was responsible for integrating all data analysis and subject matter expertise with the state's strategic direction of Road to Zero to produce the 2022 SHSP.

The Emphasis Area Teams and their respective leadership volunteered their time and expertise to inform the data analysis as well as develop strategies, countermeasures and implementation plans to address the transportation safety challenges in that area.

Texas took the intentional approach to represent the Safe System model as defined by FHWA which lays the foundation for future revisions to the SHSP. This year's effort would not have been possible without the support, guidance, and passion for reducing fatalities, suspected serious injuries, and crashes on Texas roadways.

Thank you to all the individuals and organizations who supported the development of the 2022 Texas Strategic Highway Safety Plan.

Appendix B: Executive Committee & Management Team

Texas Strategic Highway Safety Plan – Executive Committee			
Stakeholder Type	First Name	Last Name	Organization
State DOT	Michael	Chacon	Texas Department of Transportation (TxDOT) – Traffic Safety Division (TRF)
Federal DOT	Al	Alonzi	Federal Highway Administration (FHWA)
Federal DOT (Behavioral)	Maggi	Gunnels	National Highway Traffic Safety Administration (NHSTA) Regional Office
State Law Enforcement	Jodie	Tullos	Texas Department of Public Safety (DPS)
Licensing	Whitney	Brewster	Texas Department of Motor Vehicles (DMV)
Public Health	Michael	Spencer	Texas Department of State Health Services (DSHS)
Regional Planning	Cameron	Walker	Permian Basin Metropolitan Planning Organization (MPO)
Regional Planning	Natalie	Bettger	North Central Texas Council of Governments (NCTCOG)
Local Planning - City	Robert	Spillar	City of Austin
Local Law Enforcement	Frank	Dixon	Denton Police Department
Local Planning - County	Joe	Trammel	Texas Association of County Engineers & Road Administrators (TACERA)
Safety Advocate - National	Kara	Throp	American Automobile Association (AAA)
Safety Advocate - State	Kathy	Sokolic	Central Texas Families for Safe Streets

Texas Strategic Highway Safety Plan - Management Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF)
Eva	Shipp	Texas A&M Transportation Institute Center for Transportation Safety (CTS)
Ed	Burgos-Gomez	Federal Highway Administration (FHWA)
Michelle	Canton	Texas A&M Transportation Institute Center for Transportation Safety (CTS)
Michael	Chacon	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF)
Srinivas	Geedipally	Texas A&M Transportation Institute Center for Transportation Safety (CTS)
Larbi	Hanni	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF) - Crash Data Analysis
Ann	Hatchitt	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF)
Amelia "Millie"	Hayes	Federal Highway Administration (FHWA)
Susan	Herbel	SUB Consulting Services, LLC.
Jim	Hollis	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF) - Crash Data Analysis
Heather	Lott	Texas Department of Transportation (TxDOT) Traffic Safety Division (TRF)
Emily	Martin	Texas A&M Transportation Institute Center for Transportation Safety (CTS)

Texas Strategic Highway Safety Plan - Management Team		
First Name	Last Name	Organization
Marcie	Perez	Texas A&M Transportation Institute
Jason	Person	Texas Department of Transportation (TxDOT)
Stephen	Ratke	Federal Highway Administration (FHWA)
George	Villarreal	Texas Department of Transportation (TxDOT)
Letty	von Rossum	Texas Department of Transportation (TxDOT)
Melissa	Walden	Texas A&M Transportation Institute
Robert	Wunderlich	Texas A&M Transportation Institute

Appendix C: Emphasis Area Teams

Common Organizational Abbreviations/Acronyms

Acronym	Organization
AAA	American Automobile Association
COG	Council of Governments
DMV	Texas Department of Motor Vehicles
DPS	Texas Department of Public Safety
DSHS	Texas Department of State Health Services
FHWA	Federal Highway Administration
EMS	Emergency Medical Services
MPO	Metropolitan Planning Organization
NHSTA	National Highway Traffic Safety Administration
TTI	Texas A&M Transportation Institute
TRF	Traffic Safety Division
TxDOT	Texas Department of Transportation
	Emphasis Area Team Lead
	Management Team Facilitator for Emphasis Area Team

Distracted Driving Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Rick	Alexander	Mobisoft
Ed	Burgos-Gomez	FHWA – TX
Craig	Casper	Corpus Christi MPO
Clifton	Hall	Alamo MPO
Amelia "Millie"	Hayes	FHWA
Russell	Henk	Texas A&M Transportation Institute
Susan	Herbel	SUB Consulting Services, LLC.
Major	Hofheins	San Angelo MPO
Michael	Howell	Tyler Texas MPO
Sonia	Jimenez	Alamo MPO
Sonya	Landrum	North Central TX Council of Governments
Heather	Lott	TxDOT
Pete	Madrid	San Angelo MPO
Yang	Ouyang	North Texas Tollway Authority
David	Palmer	DPS
Jason	Person	TxDOT
Stephen	Ratke	FHWA – TX
Buck	Russel	Union Pacific Railroad Public Safety
Kara	Thorp	AAA

Impaired Driving Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Ed	Burgos-Gomez	FHWA - TX
Carlos	Champion	Texas Drug Evaluation & Classification Program (DECP/DRE) State Coordinator
Leanna	Depue	Consultant
Camille	Fountain	North Central TX Council of Governments
Brian	Grubbs	LEADRS Program Manager
Amelia "Millie"	Hayes	FHWA
Nicole	Holt	Texans for Safe and Drug-Free Youth
Michael	Howell	Tyler Texas MPO
Heather	Lott	TxDOT
David	Mcgarah	Texas Standardized Field Sobriety Testing (SFST) State Coordinator
Ned	Minevitz	Texas Municipal Court Education Center
Lisa	Minjares-Kyle	TTI – Youth Transportation Program
Karen	Peoples	TxDOT
Jason	Person	TxDOT
Stephen	Ratke	FHWA - TX
Nina	Saint	SafeWay Driving
Robert	Severance	City of Cleburne Police Department
Melissa	Walden	TTI – Center for Transportation Safety
Troy	Walden	TTI – Center for Alcohol & Drug Education Studies (CADES)

Intersection Safety Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Chris	Adkins	Professional Pavement Products
Ed	Burgos-Gomez	FHWA – TX
Craig	Casper	Corpus Christi MPO
Jay	Crossley	Vision Zero Austin
John	Denholm	Lee Engineering
Rafael	Guzman	TxDOT
Carly	Haithcock	City of Austin Pedestrian Council
Clifton	Hall	Alamo MPO
Amelia "Millie"	Hayes	FHWA
Curtis	Jarecki	City of Frisco
Sonia	Jimenez	Alamo MPO
James	Keener	TxDOT
Kevin	Kroll	North Central TX Council of Governments
Ben	LaBorde	Abilene MPO
Heather	Lott	TxDOT
Amanda	Martinez	TxDOT
Ruby	Martinez	TxDOT
Brian	Moen	City of Frisco
Jason	Person	TxDOT
Stephen	Ratke	FHWA - TX
Robyn	Root	City of McKinney
Buck	Russel	Union Pacific Railroad Public Safety
Gabby	Tassin	ATG
Melissa	Walden	TTI – Center for Transportation Safety
Rebecca	Wells	TxDOT – Atlanta District
Robert	Wunderlich	Texas A&M Transportation Institute

Occupant Protection Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Katie	Alexander	Texas Municipal Police Association (TMPA)
Lance	Anderson	Harris County Precinct 5
Lt. Elizabeth	Carter	DPS
Isabel	Colunga	Women & Infants Specialty Health
Lauren	Grove	City of Houston Planning & Development
Susan	Herbel	SUB Consulting Services, LLC.
Johnny	Humphreys	Texas Heatstroke Task Force
Bev	Kellner	Texas A&M AgriLife
Ruby	Martinez	TxDOT-Campaign Program Manager
Briana	McCulloch	Kailee Mills Foundation
Amy	Moser	Education Service Center, Region VI
Christine	Reeves	Central Texas Regional Advisory Council
Katie	Womack	TTI
Karen	Beard	Driscoll Children's Hospital
Steven	Bockenfeld	Safety City of Abilene
Ed	Burgos-Gomez	FHWA – TX
Randy	Chhabra	Austin-Travis County EMS
Lisa	Delgado	Texas Children's Hospital
Amelia "Millie"	Hayes	FHWA
Wanda	Helgesen	Border Regional Advisory Council
Rubiana	Mares	TTI
Frank	Marrero	NHTSA – Regional Office
Jason	Person	TxDOT
Sgt. Kelvin	Pope	Dallas Police Department
Stephen	Ratke	FHWA – TX
Anna	Red	TxDOT
Michael	Spencer	DSHS
Diana	Suarez Martinez	Texas Children's Hospital
Lydia	Valdez	TxDOT
Letty	von Rossum	TxDOT

Older Users Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Marcus	Brewer	Texas A&M Transportation Institute
Ed	Burgos-Gomez	FHWA - TX
Sue	Chrysler	Texas A&M Transportation Institute
Gregory	Driskell	Professinoal Pavement Products
Amelia "Millie"	Hayes	FHWA
Susan	Herbel	SUB Consulting Services, LLC.
Major	Hofheins	San Angelo MPO
Myung	Ko	TTI
Sonya	Landrum	North Central TX Council of Governments
Heather	Lott	TxDOT
Kim	Marckmann	NCTCOG
Jason	Person	TxDOT
Stephen	Ratke	FHWA - TX
Heather	Singleton	TxDOT
Kara	Thorp	AAA
Eric	Watson	Dallas Sheriff's Office

Vulnerable Road Users - Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Maggie	Bergeron	Victoria MPO
Ed	Burgos-Gomez	FHWA - TX
Michelle	Canton	TTI
Craig	Casper	Corpus Christi MPO
Jay	Crossley	Vision Zero ATX
Kay	Fitzpatrick	TTI
Camille	Fountain	North Central TX Council of Governments
Carly	Haithcock	City of Austin Pedestrian Council
Clifton	Hall	Alamo MPO
Amelia "Millie"	Hayes	FHWA
Noah	Heath	TxDOT
Major	Hofheins	San Angelo MPO
Jeff	Howell	El Paso MPO
Joan	Hudson	TTI
Sonia	Jimenez	Alamo MPO
Lisa	Johnson	TxDOT
Tommy	Johnson	San Antonio PD
Brooks	Jonathan	LINK Houston
Elizabeth	Jones	TxDOT
James	Keener	TxDOT
Myung	Ko	TTI
Gaby	Kolodzy	TTI
Pete	Krause	TxDOT

Vulnerable Road Users - Emphasis Area Team		
First Name	Last Name	Organization
Deidra	Lee	DSHS
Heather	Lott	TxDOT
Tim	McDaniel	El Paso MPO
Jason	Person	TxDOT
Wayne	Powell	City of Dallas
Stephen	Ratke	FHWA – TX
Robyn	Root	City of McKinney
Barbara	Russell	TxDOT
Joe	Schmider	Department of State Health Services
Brian	Shamburger	Kimley-Horn
Bonnie	Sherman	TxDOT
E'Lisa	Smetana	Abilene MPO
Freddie	Summer	TxDOT
Monica	Thompson	Professional Pavement Products
Lauren	Wolf	TxDOT

Post-Crash Care Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Ed	Burgos-Gomez	FHWA – TX
Craig	Casper	Corpus Christi MPO
Lieutenant Aaron	Fritch	DPS
Amelia "Millie"	Hayes	FHWA
Susan	Herbel	SUB Consulting Services, LLC.
Joseph	Hunt	TxDOT
Fire Chief Scott	Lail	Cleburne Fire Department
Gaberiela	Lopez	El Paso MPO
David	McDonald	TxDOT
Ron	Moore	TIM Master Trainer
Ronny	New	Owner Southside Wrecker
Sonia	Perez	El Paso MPO
Jason	Person	TxDOT
Stephen	Ratke	FHWA - TX
Jack	Sullvian	Responder Safety
Lieutenant Marc	Taddonio	Grand Prairie Police Department
Nicole	Tyler	TxDOT and EMS
Cesar	Villarreal	Texas Highway Patrol

Roadway & Lane Departures Emphasis Area Team		
First Name	Last Name	Organization
Chris	Adkins	Professional Pavement Products
Nicholas (Nick)	Aiello	TxDOT (TRF)
Raul	Avelar Moran	TTI
Ed	Burgos-Gomez	FHWA - TX
Juanita	Daniels-West	TxDOT
Rafael	Guzman	TxDOT
Amelia "Millie"	Hayes	FHWA
Eric	Hemphill	North Texas Tollway Authority
Lisa	Johnson	TxDOT
Frank	Julian	High Friction Surface Treatment Assoc.
Sonya	Landrum	North Central TX Council of Governments
Heather	Lott	TxDOT
Ken	Mora	TxDOT - DES
Sophia	Morris	TxDOT
Yang	Ouyang	North Texas Tollway Authority
Jason	Person	TxDOT
Harrison	Plourde	El Paso MPO
Stephen	Ratke	FHWA - TX
Buck	Russel	Union Pacific Railroad Public Safety
Barbara	Russell	TxDOT
Maryam	Shirinzad	Walter P Moore
Jeanne	Tarrants	TxDOT
Caludia	Valles	El Paso MPO
Melissa	Walden	TTI
Rebecca	Wells	TxDOT - ATL

Speeding Emphasis Area Team		
First Name	Last Name	Organization
Nicholas (Nick)	Aiello	TxDOT (TRF)
Ed	Burgos-Gomez	FHWA - TX
Craig	Casper	Corpus Christi MPO
Jay	Crossley	Vision Zero ATX
Clifton	Hall	Alamo MPO
Amelia "Millie"	Hayes	FHWA
Michael	Howell	Tyler Texas MPO
Sonia	Jimenez	Alamo MPO
Larry	Krantz	TxDOT - TRF
Kevin	Kroll	North Central TX Council of Governments
Lewis	Leff	City of Austin
Heather	Lott	TxDOT
David	Palmer	DPS
Jason	Person	TxDOT
Harrison	Plourde	El Paso MPO
Stephen	Ratke	FHWA - TX
Stephen	Ratke	FHWA - TX
Nina Jo	Saint	The Foundations for Safe Driving
Bryon	Vecera	Houston Police Department
Melissa	Walden	TTI

Young Drivers Emphasis Area Team		
First Name	Last Name	Organization
Sarah	Abbott	Memorial Hermann
Ed	Burgos-Gomez	FHWA - TX
Debbie	Callahan	Driver Education
Deon	Cockrell	DPS
Cara	Cook	Farm & City
Liz	De La Garza	Texas Municipal Courts Education Center
Denise	Gelietsman	City of Austin
Amelia "Millie"	Hayes	FHWA
Russell	Henk	TTI
Susan	Herbel	SUB Consulting Services, LLC.
Cindy	Leonard	NSC
Lisa	Minjares	TTI
Jason	Person	TxDOT
Stephen	Ratke	FHWA – TX
Buck	Russel	Union Pacific
Nina	Saint	TEA/Driver Education
Marsha	Scott	TxDOT

Appendix D: Data Sources & Glossaries

Crash Identification Glossary

Crash Type & Location Crash	Definition	CRIS Data Codes
Run Off the Road Crash—All	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 – Median, and COLLSN_ID = 1 - OMV Vehicle Going Straight, or 2 - OMV Vehicle Turning Right, or 3 - OMV Vehicle Turning Left, or 4 - OMV Vehicle Backing, or 5 - OMV Other
Run Off the Road Crash— Hit Fixed Object	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway and which resulted from hitting a fixed object.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 - Median, and COLLSN_ID = 1 - OMV Vehicle Going Straight, or 2 - OMV Vehicle Turning Right, or 3 - OMV Vehicle Turning Left, or 4 - OMV Vehicle Backing, or 5 - OMV Other, and HARM_EVNT_ID = 7 - Fixed Object
Run Off the Road Crash— Overturned	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway and which resulted in the vehicle overturning.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 - Median, and COLLSN_ID = 1 - OMV Vehicle Going Straight, or 2 - OMV Vehicle Turning Right, or 3 - OMV Vehicle Turning Left, or 4 - OMV Vehicle Backing, or 5 - OMV Other, and HARM_EVNT_ID = 10 - Overturned

Crash Type & Location Crash	Definition	CRIS Data Codes
Head On Crash—All	A crash involving two vehicles going straight, that were traveling in opposite directions prior to impact.	COLLSN_ID = 30 - OD Both Going Straight
Head On Crash—Wrong Side, Not Passing	A crash involving two vehicles going straight that were traveling in opposite directions prior to impact. One of vehicles was on the wrong side of the roadway but was not passing.	COLLSN_ID = 30 - OD Both Going Straight, and CONTRIB_FACTR_ID = 70- Wrong Side - Not Passing
Intersection and Intersection Related Crash—All	A crash that occurs within the boundaries of an intersection or in which the first harmful event occurred on an approach to or exit from an intersection and resulted from an activity, behavior- or control-related to the movement of traffic units through the intersection.	INTRST_RELAT_ID = 1 - Intersection, or 2 - Intersection Related
Intersection and Intersection Related Crash-Failure to Yield Right of Way	A crash in which the first harmful event occurred on an approach to or exit from an intersection and resulted from an activity, behavior- or control-related to the movement of traffic units through the intersection and in which at least one vehicle failed to yield right of way.	INTRST_RELAT_ID = 1 - Intersection, or 2 - Intersection Related), and CONTRIB_FACTR_ID = 32 - Failed To Yield Row – Emergency Vehicle, or 33- Failed To Yield Row – Open Intersection, or 35 - Failed To Yield Row – Stop Sign, or 36 - Failed To Yield Row – To Pedestrian, or 37 - Failed To Yield Row – Turning Left, or 38 - Failed To Yield Row – Turn On Red, or 39 - Failed To Yield Row – Yield Sign

Crash Type & Location Crash	Definition	CRIS Data Codes
Work Zone Crash	A crash in a construction zone or other maintenance area, whether or not it was construction related.	CRASH ROAD CONSTRUCTION ZONE FLAG_ID = Y, or CRASH ROAD CONSTRUCTION ZONE WORKER FLAG_ID = Y, or OTHR_ FACTR = 49-Construction Zone - Not Construction Related), or 50-Construction Zone - Construction Related, or 51-Other Maintenance Area - Not Construction Related, or 52-Other Maintenance Area - Construction Related
Railroad Grade Crossing Crash	A crash at an at-grade railroad/highway crossing, whether or not a train was involved.	CRASH RAILROAD RELATED FLAG ID = Y, or HARM_EVNT = 3 - RR Train, or PHYSICAL FEATURE = 17 – RR Grade Crossing, or OBJECT STRUCK = 10 - Hit Train Moving Forward) , or 11 - Hit Train Backing), or 12 - Hit Train Standing Still, or 13 - Hit Train-Action Unknown, or 24 - Hit Railroad Signal Pole or Post, or 25 - Hit Railroad Crossing Gates

System User Crashes	Definition	CRIS Data Codes
Older Driver Crash	A crash involving at least one driver age 65 or older.	Drivers Age ≥ 65
Young Driver Crash	A crash involving at least one driver 15–20 years of age.	Drivers Age ≥ 15 and ≤ 20
Motorcyclist Crash	A crash involving at least one motorcycle, motor scooter, or moped, includes police motorcycles. Casualties related to motorcyclist crashes are reported for motorcycle operators and passengers only.	VEH_BODY_STYLE_ID = 71 - Motorcycle, or 90 - Motorcycle Police OR PERSN_TYPE_ID = 5 - Driver Of Motorcycle Type Vehicle, or 6 - Passenger On Motorcycle Type Vehicle
Bicyclist Crash	A crash involving at least one bicycle and one motor vehicle. Casualties related to bicyclist crashes are reported for bicyclists only.	HARM_EVNT_ID = 5 - Pedalcyclist, or PERSN_TYPE_ID = 3 - Pedalcyclist
Pedestrian Crash	A crash involving at least one pedestrian and one motor vehicle. Casualties related to pedestrian crashes are reported for pedestrians only.	HARM_EVNT_ID = 1 - Pedestrian, or PERSN_TYPE_ID = 4 - Pedestrian
Large Truck Crash (Formerly Commercial Driver Crash)	A crash involving at least one large truck, defined as a truck tractor or semi-trailer.	VEH_BODY_STYL_ID = 87 - Truck-Tractor, or 91 – Semi-Trailer

User Behavior Crash	Definition	CRIS Data Code
Driving Under the Influence (DUI) of Alcohol or Drugs Crash	A crash involving at least one driver under the influence of alcohol or other drug.	Unit_Desc_ID = 1 - Motor Vehicle, or 5 - Motorized Conveyance, or 7 – Non-Contact AND CONTRIB_FACTR_ID = 67 - Under Influence – Alcohol, or 45 - Had Been Drinking, or 68 - Under Influence – Drug, or 62 - Taking Medication, or Unit Alcohol Factor Flag='Y', or Unit Drug Factor Flag='Y', or Driver BAC Positive Count>0, or Driver Drug Positive Count>0
Speeding Related Crash	A crash in which at least one driver was speeding above the limit or driving at an unsafe speed below the limit.	CONTRIB_FACTR_ID = 60 - Speeding - Unsafe (Under Limit), or 61 - Speeding - (Over limit), or 22 - Failure to Control Speed (Added in 2022 Revision)
Lack of Restraint Use—Unrestrained Casualty	An injury or death to a vehicle driver or occupant (where restraint usage is known and applicable), involved in any crash, who was not restrained.	PRSN_TYPE_ID = 1 – Driver 2 – Passenger/Occupant, and REST_ID = 8 - None
Distracted Driving	A crash in which at least one driver was distracted, inattentive, or using a cell phone.	CONTRIB_FACTR_ID = 19 – Distraction In Vehicle 20 – Driver Inattention 72 – Cell/Mobile Phone Use

General Glossary with Acronym Definitions

Term	Definition	Acronym
85th percentile Speed	A speed at or below which 85 percent of people drive at any given location under good weather and visibility conditions may be considered as the maximum safe speed for that location.	
AARP Smart Driver ™	Online and self-paced refresher course focusing on effective safe driving practices, skills, and strategies you can use on the road every day, state laws and traffic rules, how to deal with aggressive drivers, and proper vehicle maintenance.	
Advanced Life Support Equipment	First responder equipment beyond the required basic life support equipment.	ALS
Advanced Roadside Impaired Driving Enforcement	Program that bridges the gap between the SFST and DEC/DRE programs by providing officers with general knowledge related to drug impairment and by promoting the use of DREs in states that have the DEC Program. The program stresses the importance of the signs and symptoms of the seven drug categories.	ARIDE
Advanced Yield Bars	An advance stop or yield line placed 20 to 50 ft ahead of the crosswalk can greatly reduce the likelihood of a multiple-threat crash at unsignalized midblock crossings.	
Annual Average Daily Traffic	A measure of how busy a roadway is (the total volume of vehicle traffic of a highway or road for a year divided by 365 day).	AADT
Bicyclist Crash	A crash involving at least one bicycle and one motor vehicle. Casualties related to bicyclist crashes are reported for bicyclists only.	
Bulb Outs	A curb extension that extends the sidewalk into the parking lane to narrow the roadway and provide additional pedestrian space at key locations.	
CarFit	An educational program that offers older adults the opportunity to check how well their personal vehicles fit them. The program also provides information and materials on community-specific resources	

Term	Definition	Acronym
	that could enhance their safety as drivers, and/or increase their mobility in the community.	
CR-3	Texas Peace Officer's Crash Report Form to be used to report all reportable crashes.	CR-3
Data-Driven Approaches to Crime & Traffic Safety	A law enforcement operational model that integrates location-based crash, crime, calls for service and enforcement data to establish effective and efficient methods for deploying law enforcement resources.	DDACTS
Design Speed	A selected speed used to determine the various geometric features of the roadway. The assumed design speed should be a logical one for the topography, anticipated operating speed, the adjacent land use, and the functional classification of the highway.	
Distracted Driving	A crash in which at least one driver was distracted, inattentive, or using a cell phone.	
Driving Under the Influence of Alcohol or Drug Crash	A crash involving at least one driver under the influence of alcohol or other drug.	DUI
Drug Evaluation and Classification	A standardized and systematic process to recognize impairment in drivers who are under the influence of drugs other than, or in addition to, alcohol.	DEC
Drug Recognition Evaluator	A police officer who is trained to recognize impairment in drivers who are under the influence of drugs other than, or in addition to, alcohol.	DRE
Dynamic Display Speed Devices	Device that measures and displays the speed of vehicles approaching the face of the device.	DDSD
Federal Highway Administration	An agency within the U.S. Department of Transportation that supports state and local governments in the design, construction, and maintenance of the nation's highway system (Federal Aid Highway Program) and various federally and tribal owned lands (Federal Lands Highway Program).	FHWA

Term	Definition	Acronym
Geographic Information System	A system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data.	GIS
Head-on Crash	A crash involving two vehicles going straight, that were traveling in opposite directions prior to impact.	
High Risk Rural Road	A high-risk rural road is defined as any rural major collector, minor collector or local road with a crash risk classified as high or very high using the crash rate and ADT ranges identified in the Highway Safety Improvement Program Screening Tool developed in TxDOT project: 58-7XXIA001 *23*.	HRRR
Highway Safety Improvement Program	A core federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land.	HSIP
Impact Texas Teen Drivers	An eight-part video that explains with hard facts the dangers of distracted driving along with real life stories of teens that have lost their life from distracted driving.	ITTD
Institute of Transportation Engineers	An international membership association of transportation professionals who work to improve mobility and safety for all transportation system users and help build smart and livable communities.	ITE
Intersection & Intersection Related Crash	A crash that occurs within the boundaries of an intersection or in which the first harmful event occurred on an approach to or exit from an intersection and resulted from an activity, behavior- or control-related to the movement of traffic units through the intersection.	
Intersection Control Evaluation process	The process and framework to provide a more balanced or holistic approach to the consideration and selection of access strategies and concepts during transportation planning, project identification and initiation processes that contemplate the addition, expansion, or full control of major intersections.	ICE
Intersection Safety Implementation Plan	Plan that provides the specifics on countermeasures, actions, key steps, schedules, and investments needed to significantly improve intersection safety.	ISIP

Term	Definition	Acronym
Lack of Restraint Use – Unrestrained Casualty	An injury or death to a vehicle driver or occupant (where restraint usage is known and applicable), involved in any crash, who was not restrained.	
Large Truck Crash	A crash involving at least one large truck, defined as a truck tractor or semitrailer.	
Leading Pedestrian Intervals	A 3- to 10-second pedestrian-only phase within a signalized intersection timing schedule that gives pedestrians a head start over cars going in the same direction or turning across the pedestrians' paths.	
Metropolitan Planning Organization	A local decision-making body that is responsible for overseeing the metropolitan transportation planning process.	MPO
Model Minimum Uniform Crash Criteria Guideline	A minimum, standardized data set for describing motor vehicle crashes and the vehicles, persons, and environment involved.	MMUCC
Motorcyclist Crash	A crash involving at least one motorcycle, motor scooter, or moped, includes police motorcycles. Casualties related to motorcyclist crashes are reported for motorcycle operators and passengers only.	
National Association of City Transportation Officials	A 501(c)(3) non-profit association with mission is to build cities as places for people, with safe, sustainable, accessible and equitable transportation choices that support a strong economy and vibrant quality of life (Nacto.org).	NACTO
National Highway Institute	The training and education arm of FHWA.	NHI
Offset Left-Turn Lanes	Alignment that places the vehicles waiting to make a left turn as far to the left as practical, maximizing the offset between the opposing left-turn lanes, providing improved visibility of opposing through traffic.	

Term	Definition	Acronym
Older Driver Crash	A crash involving at least one driver age 65 or older.	
Pedestrian & Bicycle Crash Analysis Tool	A software product intended to assist state and local pedestrian and bicycle coordinators, planners, and engineers with this problem.	PBCAT
Pedestrian Crash	A crash involving at least one pedestrian and one motor vehicle. Casualties related to pedestrian crashes are reported for pedestrians only.	
Pedestrian Hybrid Beacon	A pedestrian-activated warning device located on the roadside or on mast arms over midblock pedestrian crossings (also known as the High intensity Activated crossWalK [or HAWK]).	PHB
Pedestrian Island	A space between roadways where pedestrians can await a break in vehicular traffic	
Pedestrian Safety Action Plan	A plan developed by community stakeholders that is intended to improve pedestrian safety in the community.	PSAP
Railroad Grade Crossing Crash	A crash at an at-grade railroad/highway crossing, whether or not a train was involved.	
Raised Crosswalks	A traffic calming measure that involves extending the sidewalk across the road and bringing motor vehicles to the pedestrian level.	
Rectangular Rapid Flash Beacon	User-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks.	RRFB
Run Off the Road Crash	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway.	ROR
Safe Clear Policies	Policies to reduce traffic congestion and to make freeways safer by removing vehicles that are stalled due to any reason.	

Term	Definition	Acronym
Selective Traffic Enforcement Program	Projects reimburse for overtime activities by local law enforcement to reduce the incidence of speeding, failure to use occupant restraint systems, intersection traffic control violations, driving while intoxicated, and/or driving under the influence of alcohol by a minor, and enforcement of state and local ordinances on cellular and texting devices.	STEP
Speeding Related Crash	A crash in which at least one driver was speeding above the limit or driving at an unsafe speed below the limit.	
Standardized Field Sobriety Testing	Three tests administered and evaluated in a standardized manner by law enforcement officers at roadside to assist them in making an arrest decision. Horizontal gaze nystagmus is an involuntary jerking of the eyes that occurs as the eyes move to the side. When a person has consumed alcohol, nystagmus is exaggerated and may occur at lesser angles depending on the degree of impairment. The Walk and Turn and One-Leg Stand tests require a person to listen to and follow instructions while performing simple physical movements. Since these tests are alcohol sensitive, impaired persons have difficulty with these divided attention tasks. During the tests, officers observe and record clues that are indicators of impairment.	SFST
Strategic Highway Safety Plan	A statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads.	SHSP
Target Speed	A selected speed used to determine the various geometric features of the roadway that will encourage drivers to drive at the selected speed.	
Texas Alcohol Beverage Commission	State agency that regulates all phases of the alcoholic beverage industry in Texas. The duties of the commission include regulating sales, taxation, importation, manufacturing, transporting, and advertising of alcoholic beverages.	TABC
Texas Department of Transportation	State agency responsible for the construction and maintenance of the state's highway system and overseeing aviation, rail and public transportation. It is comprised of 25 geographical districts and 34 divisions.	TxDOT
Texas District of the Institute of	Texas division of the international membership association of transportation professionals who work to improve mobility and safety	TexITE

Term	Definition	Acronym
Transportation Engineers	for all transportation system users and help build smart and livable communities.	
Texas Municipal Police Association	Organization to protect the rights and interest of Texas law enforcement officers by providing the best legal assistance in the country, effective lobbying at state and local levels, affordable training, and exemplary member support.	TMPA
Texas A&M Transportation Institute	One of the premier higher education-affiliated transportation research agencies in the nation. TTI develops solutions to the problems and challenges facing all modes of transportation.	TTI
Vision Zero	A multinational road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries in road traffic.	
Work Zone Crash	A crash in a construction zone or other maintenance area, whether or not it was construction related.	
Young Driver Crash	A crash involving at least one driver 15–20 years of age.	
Z Crossings	An at-grade channel in median at a 45° angle toward advancing traffic to encourage pedestrians to look for oncoming traffic.	

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