



TEXAS SHSP

Roadway & Lane Departure Emphasis Area

2022 - 2027



The development of the *Texas Strategic Highway Safety Plan* was led by the Traffic Safety Division of the Texas Department of Transportation working in conjunction with the Center for Transportation Safety at the Texas A&M Transportation Institute. Hundreds of safety stakeholders from across the state representing local, regional, and state agencies, law enforcement, industry and advocates, engineers, clinicians, and educators actively participated in the process.



Section 6.2 Roadway & Lane Departures

Background

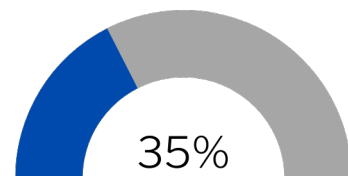
A crash is defined as a roadway/lane departure crash if it involved one of the following two situations:

- ⇒ 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

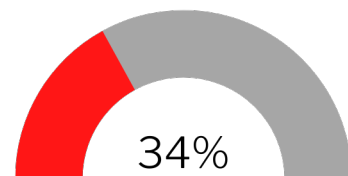
One of the primary elements of the Safe System Approach is the role of infrastructure safety treatments in decreasing the opportunity for crashes and the severity of injuries. In the case of roadway and lane departure crashes, Safe Systems emphasize the predictability of the road course, forgiveness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

Run-off the road crashes 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.

Roadway & Lane Departures



% of Total Fatal & Serious Injury Crashes



% of Total Fatal & Serious Injuries

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.

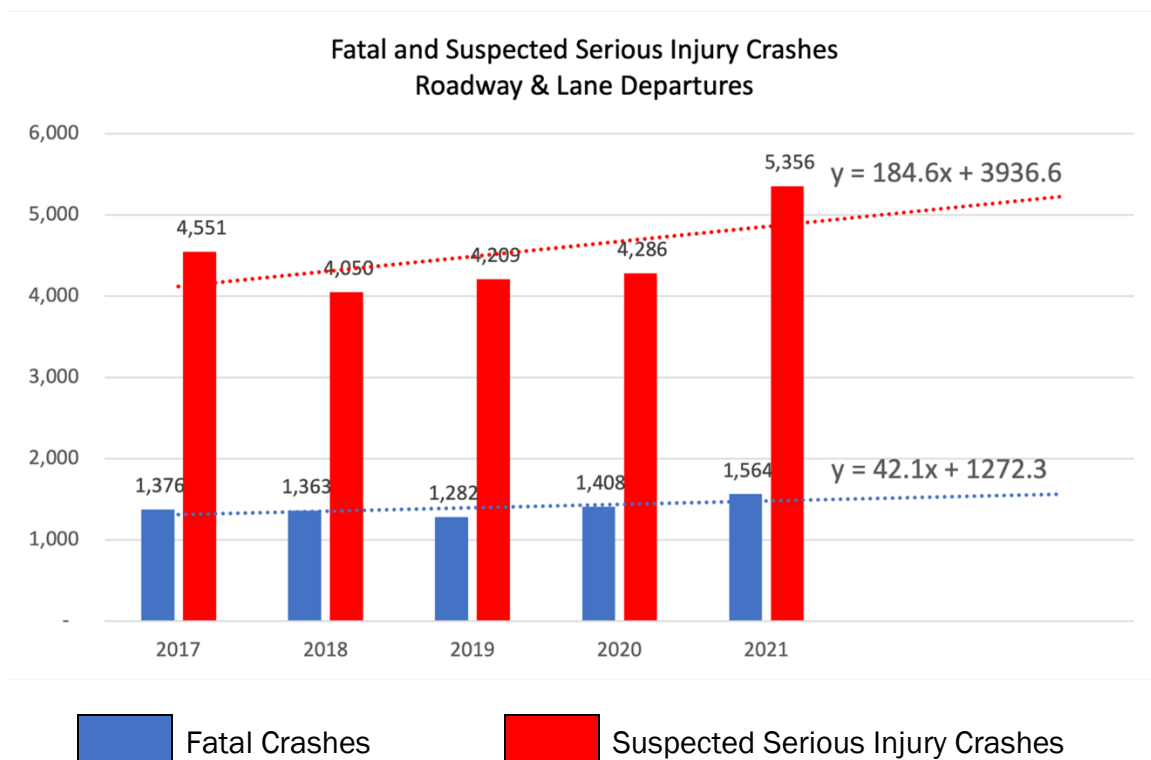


Figure 6.2.1 Roadway and Lane Departure EA: Fatal and Suspected Serious Injury Crashes (2017-2021)

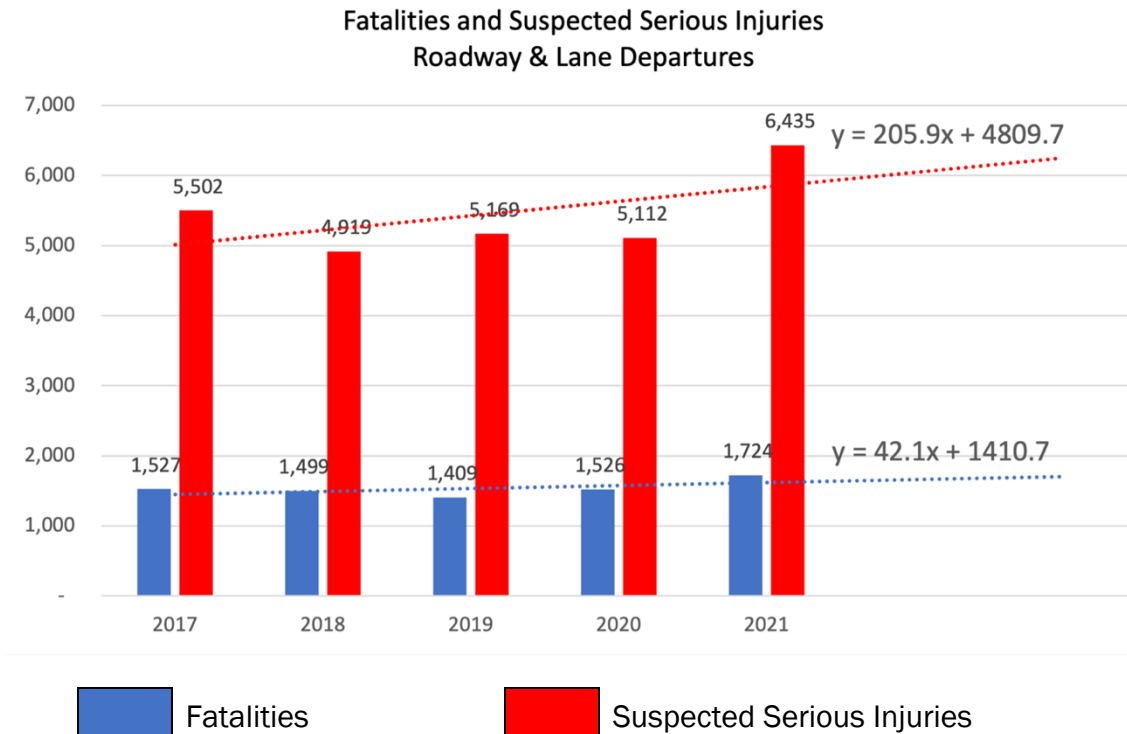
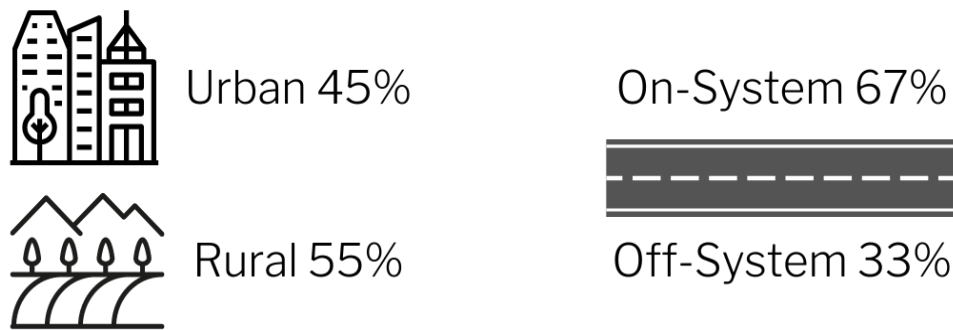


Figure 6.2.2. Roadway and Lane Departure EA: Fatal and Suspected Serious Injuries (2017-2021)

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.

Roadway & Lane Departures % of Fatal & Serious Injury 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

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

EA Team Members current as of September 2022