

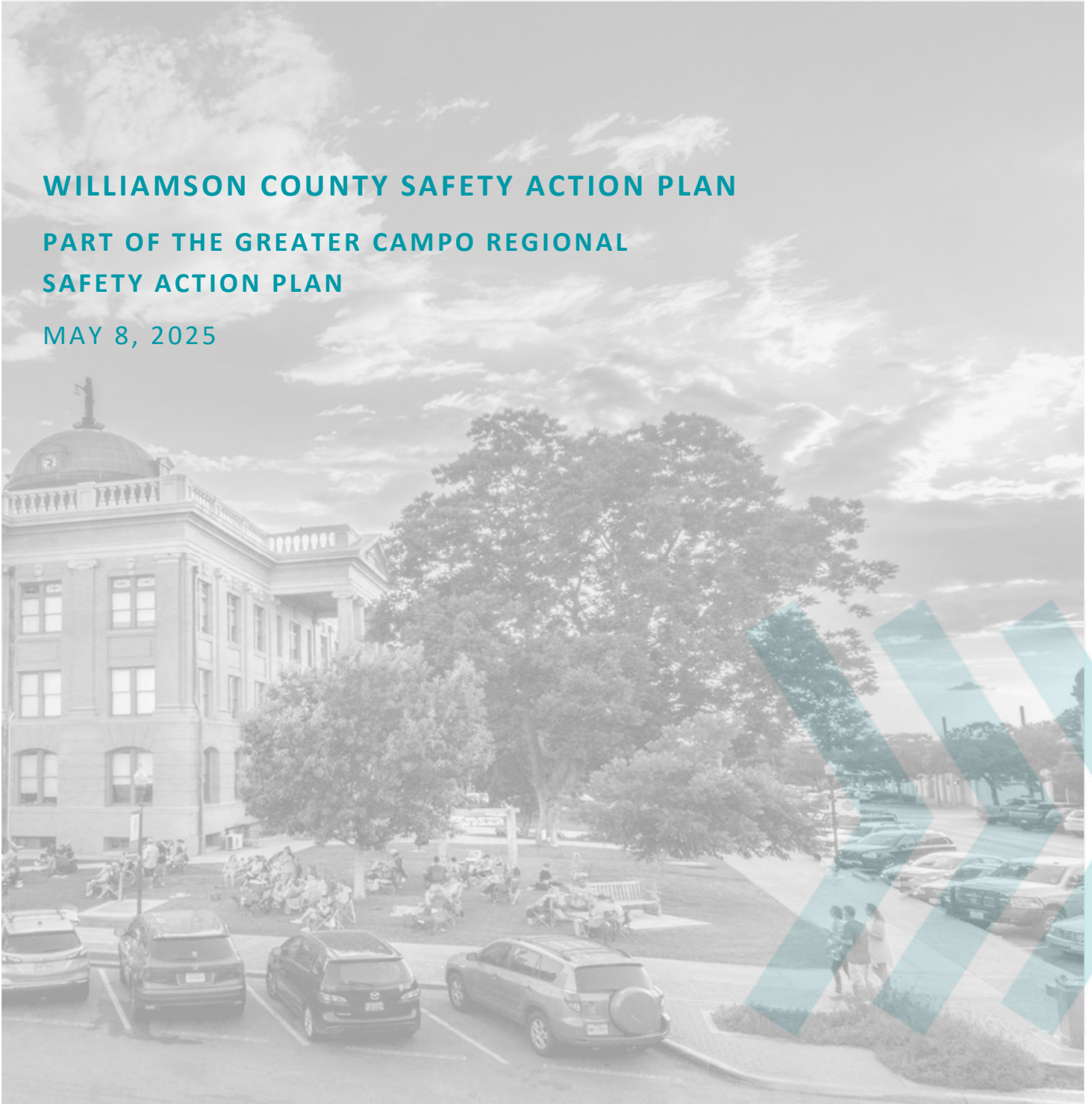


CAPITAL AREA METROPOLITAN
PLANNING ORGANIZATION

WILLIAMSON COUNTY SAFETY ACTION PLAN

**PART OF THE GREATER CAMPO REGIONAL
SAFETY ACTION PLAN**

MAY 8, 2025



ACKNOWLEDGMENTS

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DEDICATION

THIS PLAN IS DEDICATED TO ALL THE LIVES LOST AND TO THOSE WHO HAVE BEEN FOREVER CHANGED BECAUSE OF A TRAFFIC CRASH IN WILLIAMSON COUNTY. A SINGLE DEATH OR SERIOUS INJURY ON OUR ROADWAYS IS ONE TOO MANY.

LET US ACHIEVE THE ROAD TO ZERO **TOGETHER.**

ACRONYMS

CAMPO – Capital Area Metropolitan Planning Organization

CARTS – Capital Area Rural Transportation System

CRIS – Crash Records Information System

FHWA – Federal Highway Administration

HIN – High Injury Network

HSIP – Highway Safety Improvement Program

KABCO – Crash Severity Scale

K – Fatal Injury

A – Suspected Serious Injury

B – Suspected Minor Injury

C – Possible Injury

O – Non-injury

KA – Combined Fatal and Serious Injury

RSAP – Regional Safety Action Plan

SHSP – Strategic Highway Safety Plan

SAP – Safety Action Plan

SS4A – Safe Streets and Roads for All

TxDOT – Texas Department of Transportation

TxHSO – Texas Highway Safety Office

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Executive Summary

This Executive Summary describes the road safety challenge in Williamson County, provides an overview of the core content in this Safety Action Plan, and describes why this will support a safer future.

The Road Safety Challenge in Williamson County

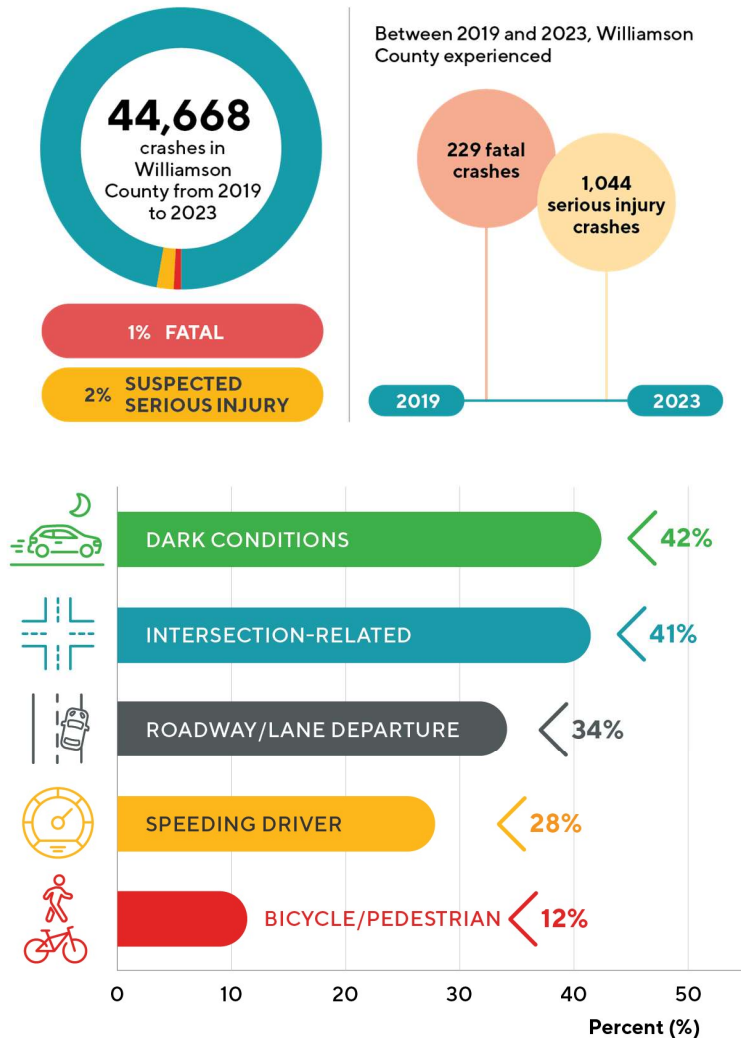
Every day, people travel on Williamson County roads expecting to arrive safely. Unfortunately, recent years have shown a troubling reality. Between 2019 and 2023, Williamson County experienced 229 fatal crashes and 1,044 serious injury crashes. The individuals in these crashes are our families, friends, and neighbors. The effects of these roadway tragedies affect all communities in Williamson County.

A detailed safety analysis identified the most common contributors to fatal and serious injury crashes, as illustrated in the graphic to the right.

The good news is that we know these tragedies are preventable, and we are committed to changing this story.

The project team carried out a series of analyses and key activities to inform the development of this Safety Action Plan. These activities included safety analysis, underserved communities analysis, community engagement efforts, and a policy review. Through these efforts and collaboration with stakeholders, a set of policy recommendations, infrastructure projects, and behavioral strategies were identified.

This plan includes 23 corridor enhancements and 37 intersection improvements. The goal for these recommendations is to enhance road safety, ensuring that all residents and visitors can work, live, and enjoy their activities in Williamson County.



Proposed Safety-Driven Infrastructure Improvements:

23
Corridor
Improvements



36
Intersection
Improvements

The Safety Action Plan

Williamson County and its member jurisdictions have joined forces with regional and federal partners to tackle the traffic safety issue directly. The Williamson County Safety Action Plan (SAP) is a strategic initiative to establish a safer transportation system. Embracing the vision that "All streets and roads in Williamson County are safe, accessible, and well-connected for all road users of all abilities—pedestrians, cyclists, transit users, and drivers," the SAP aspires to cut roadway fatalities and serious injuries in half by 2035 and eliminate them entirely by 2050. Simply put, everyone traveling in Williamson County should be able to reach their destination safely every time.



THE SAFETY ACTION PLAN
ASPIRES TO CUT
ROADWAY FATALITIES AND
SERIOUS INJURIES IN HALF
BY 2035 AND ELIMINATE
THEM ENTIRELY BY 2050

This plan is part of the broader CAMPO Regional Safety Action Plan (RSAP), which aims to enhance traffic safety across the region by addressing systemic safety needs and facilitating access to funding. Each member agency, including Williamson County and its cities, contributes a county-level plan that aligns with the overarching goals of CAMPO and the statewide Road to Zero initiative. This means our communities are not working alone – we are coordinating with neighboring counties and aligning with national best practices.

The following subsections describe the core outcomes of the SAP: key strategies, community actions, countermeasure identification and prioritization, and accountability and transparency.

KEY STRATEGIES

Achieving safer travel in Williamson County requires a comprehensive, multi-faceted approach. The SAP outlines a range of proven strategies that address roadway safety from different angles:



Safer Roads. Improving the design and operation of our roadways involves engineering solutions like better signage, pavement markings, lighting, and intersection upgrades, as well as innovative designs such as roundabouts and safer crosswalks. Many of these measures are low-cost, high-impact changes that can dramatically reduce risk for all road users.



Safer Road Users. Fostering a culture of safety supports educational campaigns and law enforcement to encourage responsible driving behavior and protect vulnerable road users. This means expanding public outreach – from school programs for young drivers to awareness campaigns about distracted and impaired driving – so that everyone understands their role in keeping our roads safe.



Safer Alternatives. Providing and promoting safe options other than driving reduces exposure to high-speed traffic, which reduces the risk of fatal and serious injury. Treatments include expanding sidewalks, bike lanes, and trails; developing and expanding Safe Routes to School programs; and enhancing public transit services and facilities to make travel safer and more accessible for those who walk, bike, and roll.

COMMUNITY ACTIONS



Equally important, the Williamson County SAP is community-focused. It was shaped by local input and calls for ongoing collaboration with cities, law enforcement, schools, businesses, and residents to ensure the solutions make sense for our community. Community engagement and underserved community considerations are foundational to the SAP. Public outreach was conducted to gather input on safety priorities, revealing concerns about aggressive and distracted driving, speeding, and insufficient infrastructure for pedestrians and cyclists. The underserved communities analysis ensures that safety improvements are prioritized in high-risk areas disproportionately affecting underserved populations.

Crucially, the plan brings everyone to the table. Engineers, law enforcement, health professionals, educators, local officials, and residents are all partners in this effort. This collaboration combines local knowledge with broad buy-in, making safety initiatives more effective and reflective of community needs.

COUNTERMEASURE IDENTIFICATION AND PRIORITIZATION



By understanding where and why crashes happen, we can take targeted action before the next tragedy occurs, rather than simply reacting afterward. The SAP employs a data-driven, systemic safety approach, recommending strategies aligned with the Texas Strategic Highway Safety Plan (SHSP) and the associated Road to Zero framework.

Proposed countermeasures include low-cost systemic safety treatments such as signing and pavement markings; behavior-focused initiatives including public education, enforcement programs, and community engagement; and policy and program recommendations like developing a Safe Routes to School program or a Complete Streets policy. These over-arching programs are supported with high-impact capital project recommendations at those intersections and roadway segments exhibiting the most severe crash history.

Implementing the SAP involves prioritizing projects based on factors such as potential for crash reduction, cost-effectiveness, benefits to vulnerable road users (e.g., bicyclists and pedestrians), and readiness for implementation. Funding strategies encompass federal grants like the Safe Streets and Roads for All (SS4A) program, TxDOT-administered funds from the Highway Safety Improvement Program (HSIP), and other state, regional, and local sources. Collaborative efforts with entities such as TxDOT, CAMPO, local jurisdictions, transit agencies, law enforcement, and community organizations are essential to the plan's success.

ACCOUNTABILITY AND TRANSPARENCY



To ensure accountability, the SAP includes a performance measurement and evaluation framework that tracks the funding, design, and construction of safety strategies over time, policy revisions implemented, and the resulting changes in the number and severity of crashes on city, county, and state roads.

A Safer Future Ahead

The Williamson County SAP is a commitment to action and a roadmap to a safer future. By fully understanding our safety challenges and working together on proven countermeasures, we are improving communities, so no family fears a preventable, life-altering crash. We acknowledge that the challenge is serious, but we approach it with hope and determination, knowing that even one death on our roads is one too many.

THE JOURNEY TOWARD ZERO
FATALITIES AND SERIOUS INJURIES
WILL NOT BE EASY OR IMMEDIATE,
BUT IT IS ACHIEVABLE.

With strong leadership, engaged community partners, and a focus on saving lives, Williamson County, its cities, and all safety stakeholders are on a clear path toward safer roads for all residents and visitors. Each step we take—every intersection improved, every safety campaign launched, every risky behavior changed—makes Williamson County a safer place for *all*.

How Did We Get Here?

This section describes the need for safety planning and how it fits into a regional safety action plan.

Setting the Stage for Safety

Texas roads have seen at least one traffic fatality every day since November 7, 2000 — a tragic streak that continues through today, May 8, 2025. With focused efforts and a shared commitment to safety, Texas can one day mark another death-free day on its roads. Right here in Williamson County, there were 248 fatalities from 2019 to 2023. These were not just numbers; they were our friends, our family, our neighbors. Every loss is a tragedy, and as a community, we must refuse to accept this as the norm.

Williamson County and CAMPO recognize the level of tragedy and depth of this problem and are dedicated to keeping our community and region safe. In 2022, the U.S. Department of Transportation granted CAMPO funding from the Safe Streets for All Grant Program to develop a Regional Safety Action Plan to improve roadway safety for all users. The plan specifically aims to decrease fatal and serious injury crashes in the region through a data-driven, comprehensive plan of action.

CAMPO Regional Safety Action Plan

CAMPO is developing a regional safety action plan from the bottom up, starting with county-level safety planning. Each county within the CAMPO region will create its own safety action plan, which will be included as a chapter in the CAMPO RSAP. The Williamson County Safety Action Plan is included in the larger CAMPO Regional Safety Action Plan.

Vision, Goals, and Objectives to Achieve a Safer Williamson County

This section provides the county's transportation safety vision, supporting goals, and objectives. The objectives are organized around safer traffic, fostering a culture of safety, and reducing risk exposure through active transportation and transit. This section also includes a discussion on measuring and evaluating the performance of the goals and objectives.

A Vision for the County

Everyone traveling on streets and roads in Williamson County should be able to reach their destination safely every time. This inspired the vision statement for the Williamson County Safety Action Plan:

ALL STREETS AND ROADS IN WILLIAMSON COUNTY ARE SAFE, ACCESSIBLE, AND WELL-CONNECTED FOR ALL ROAD USERS OF ALL ABILITIES – PEDESTRIANS, CYCLISTS, TRANSIT USERS, AND DRIVERS.



Williamson County's transportation safety goals and objectives are based on research and analyses of the roadway safety goals, objectives, and strategies set by the federal government, TxDOT, and various municipalities, regional planning organizations, and agencies. The specific objectives differ from one department and agency to the next, but the goals they are attempting to achieve are consistent. Across the U.S., the State of Texas, and Williamson County, the reduction and elimination of fatalities and serious injury crashes on streets and roads is always identified as the top priority.

The objectives described herein are divided into separate categories (Traffic, Culture, Active Transportation Modes and Transit), but these categories are not stand-alone objectives. The objectives listed in each category are not exhaustive either, but they serve as a starting point. Individuals focused on each category must actively and continually work together to achieve Williamson County's goal of reducing and eliminating traffic-related deaths and serious injuries by creating a safer, more reliable, connected, and accessible environment for all transportation system users in Williamson County.

Williamson County's Road to Zero Goals

In May 2019, the Texas Transportation Commission (TTC) set the Road to Zero Goal—the first statewide, official roadway safety goal in Texas to reduce and eventually eliminate transportation-related deaths. Multiple regional, county, and local agencies in Texas have since adopted the same or similar goals to support the TTC's efforts. The Road to Zero Goal has guided TxDOT to work toward the goal of reducing the number of deaths on Texas streets and roads by half by the year 2035 and to zero by the year 2050.

Williamson County's Goals: Williamson County set their transportation safety goals consistent with the TTC's Road to Zero Goal:

- 1 REDUCE THE NUMBER OF FATAL AND SERIOUS INJURY CRASHES IN WILLIAMSON COUNTY BY HALF BY 2035.
- 2 ELIMINATE ALL FATAL AND SERIOUS INJURY CRASHES IN WILLIAMSON COUNTY BY 2050.

Road to Zero Safety Objectives

Williamson County recorded a consistent year-after-year rise in the total number of crashes from 2020 to 2023.

To achieve Williamson County's safety goals, regional leadership and member agencies must outline measurable objectives and a strategic plan of action.

These objectives are divided into three categories:





SAFER TRAFFIC FOR ALL

The objectives in the Traffic category aim to find specific ways to make street and road traffic (which includes pedestrians, cyclists, and transit users) safer in Williamson County communities.

Traffic Safety Objectives:

- 1 Reduce the number of fatal and serious injuries related to roadway and lane departure crashes and angle collisions.
- 2 Reduce the number and severity of crashes at intersections or related to intersections that result from disregarding traffic rules.
- 3 Reduce the number and severity of crashes in dark, unlighted conditions.
- 4 Reduce the number and severity of crashes linked to speeding, distracted driving, and impaired driving due to alcohol or drugs, particularly during late-night and early-morning hours.
- 5 Coordinate with TxDOT to reduce the number and severity of crashes on state-owned facilities, along major highways, and at intersections involving on-system roadways.
- 6 Reduce the number of fatal and serious injury crashes involving bicycles and pedestrians.
- 7 Reduce emergency and incident response time to crash events throughout the county.



FOSTERING A CULTURE OF SAFETY

The objectives laid out in the Culture category aim to shift the current roadway user and driver culture to one more focused on safety, particularly that of vulnerable road users.

Culture of Safety Objectives:

- 1 Introduce enforcement and educational campaigns to reduce the number of people who choose to drive under the influence of alcohol or other drugs.
- 2 Reduce distracted driving, driving under the influence of alcohol or other drugs, aggressive driving, and speeding in the CAMPO region.
- 3 Educate the public on their role in keeping their streets and roads safe to create a prosocial traffic safety culture.
- 4 Educate younger and older drivers on safe transportation practices.
- 5 Educate transportation professionals and key decision-makers on best practices related to traffic safety.



REDUCING RISK EXPOSURE THROUGH ACTIVE TRANSPORTATION AND TRANSIT

Mode shift from personal motor vehicle travel to active transportation and transit is key to improving transportation safety by reducing exposure to motor vehicle travel. First, reducing vehicle miles traveled reduces the potential for crashes to occur. Additionally, providing non-driving travel options can have an even greater benefit when statistically riskier driver types (based on crash history) choose these modes. Examples include young and novice drivers, aging drivers, impaired drivers, and drowsy drivers.

These objectives aim to improve transit and active modes of transportation, since shifting more trips to these modes will help reduce and eventually eliminate the number of fatal and serious injury crashes.

Active Transportation and Transit Safety Objectives:

- 1 Connect key corridors throughout the county so that pedestrians, cyclists, and transit users have safe access and connections to all parts of the region.
- 2 Provide and maintain a safe, efficient, reliable, and well-connected transit system throughout the county.
- 3 Provide safe and frequent roadway crossings for pedestrians and cyclists.

Performance Measures and Evaluation

It is important to ensure ongoing transparency with stakeholders and the public regarding the progress of projects and strategies in this plan and their effects. As part of an ongoing task within the CAMPO RSAP, a Program of Safety Planning framework and a toolkit for project tracking is being developed to measure progress over time during the implementation of this county SAP and future updates, looking at both outputs and outcomes. CAMPO is expected to maintain progress-tracking tools and rely on Williamson County and its member jurisdictions to routinely provide applicable data related to policies and projects.

PROJECT PROGRESS: OUTPUTS

The measured outputs are the direct projects and strategies implemented from this safety plan. Each is evidence that activities were performed toward the goal of reducing the number and severity of collisions in Williamson County. Examples can include progress toward completion of:

- Safety projects (infrastructure improvements such as new pedestrian crossing upgrades and installation of rumble strips)
 - Number of safety projects completed on the High Injury Network
 - Number of bicycle, pedestrian, and transit enhancement projects completed
- Policy revisions (such as speed limit setting and neighborhood traffic calming)

For projects, this progress includes securing federal, regional, state, or local funding; completion of plans, specifications, and estimates; and construction of the project on the street. For policy revisions or additions, steps include assessment and analysis of a current policy, draft and final versions of revisions submitted to local governing bodies, and implementation of the new policy that may lead to a safer roadway system.

PROJECT EFFECTIVENESS: OUTCOMES

Beyond tracking each action and activity, it is important to know how effective those projects, strategies, and policy changes are to the ultimate outcome - improving safety in Williamson County. The most common measures in traffic safety are the number, type, and severity of roadway collisions:

- Total number of fatal crashes and serious injury crashes
 - Separated by mode (motorists, pedestrians, and cyclists)
 - Number of fatal crashes and serious injury crashes that involve risky road user behaviors (e.g., speeding, driving impaired by substances)
- Rate of fatal crashes and serious injury crashes, often normalized by population or vehicle miles traveled

CAMPO will continue to maintain a publicly accessible [Crash Records Information System \(CRIS\) Dashboard](#) that displays available crash data, including, at a minimum, the number, type, and severity of crashes occurring for member counties, including Williamson. In addition, CAMPO will consider incorporating datasets gained through the RSAP into its existing dashboards. Williamson County and its member jurisdictions are encouraged to track the effectiveness of each project and strategy, using data available based on the type of implementation. For example, before-and-after crash data can be used to study the change in annual collisions at an intersection or along a corridor. For behavior-based strategies, studying the public's awareness of a campaign and their self-identified behavior in a survey are considered outcomes, as these metrics can indicate the benefits of outreach and engagement.

Safety Analysis

This section describes the need to improve roadway safety in Williamson County, the data analysis methodology, and the safety analysis results.

Why Does the County Need to Improve Roadway Safety?

Williamson County experienced 229 fatal crashes and 1,044 serious injury crashes from 2019 to 2023. These are our friends, our family, our neighbors – our Williamson County community – and these deaths and life-altering injuries are unacceptable. Many of these crashes were preventable, which is why Williamson County has committed to improving roadway safety.

The Williamson County SAP aims to reduce and eventually eliminate fatal and serious injury crashes by 2050. The recommended ways to achieve this goal are based on the results from the safety analysis conducted for the County.

Crash data from the most recent five years (2019 – 2023) was obtained for Williamson County, and crash patterns by many contributing factors (e.g., severity, lighting condition, weather condition, impaired driving involvement) were studied and presented in this Plan. Analyzing crash patterns by contributing factors helped identify focus areas with high potential safety risks in Williamson County.

These findings are presented in a systemic analysis that helps identify location characteristics more susceptible to fatal and serious injuries. Hotspot and high injury network (HIN) analyses enable us to specifically locate safety issues related to the high risk of fatal and serious injuries, traffic stress for active transportation, excessive speeding, and safe transit access.

The recommendations and countermeasures in this analysis aim to support local safety planning efforts to eliminate fatal and serious injury crashes and reduce crashes overall for all roadway users in the County.

See **Appendix A** for the detailed Williamson County Crash Safety Analysis, including the methodology and results.

Data Analysis Methodology

This section describes the core data analysis methodology: how crash data was gathered and used, how the county's crash history was evaluated, how commonalities and crash risks are evaluated, and how a high injury network was used in the analysis.

HOW WAS CRASH DATA GATHERED AND USED?

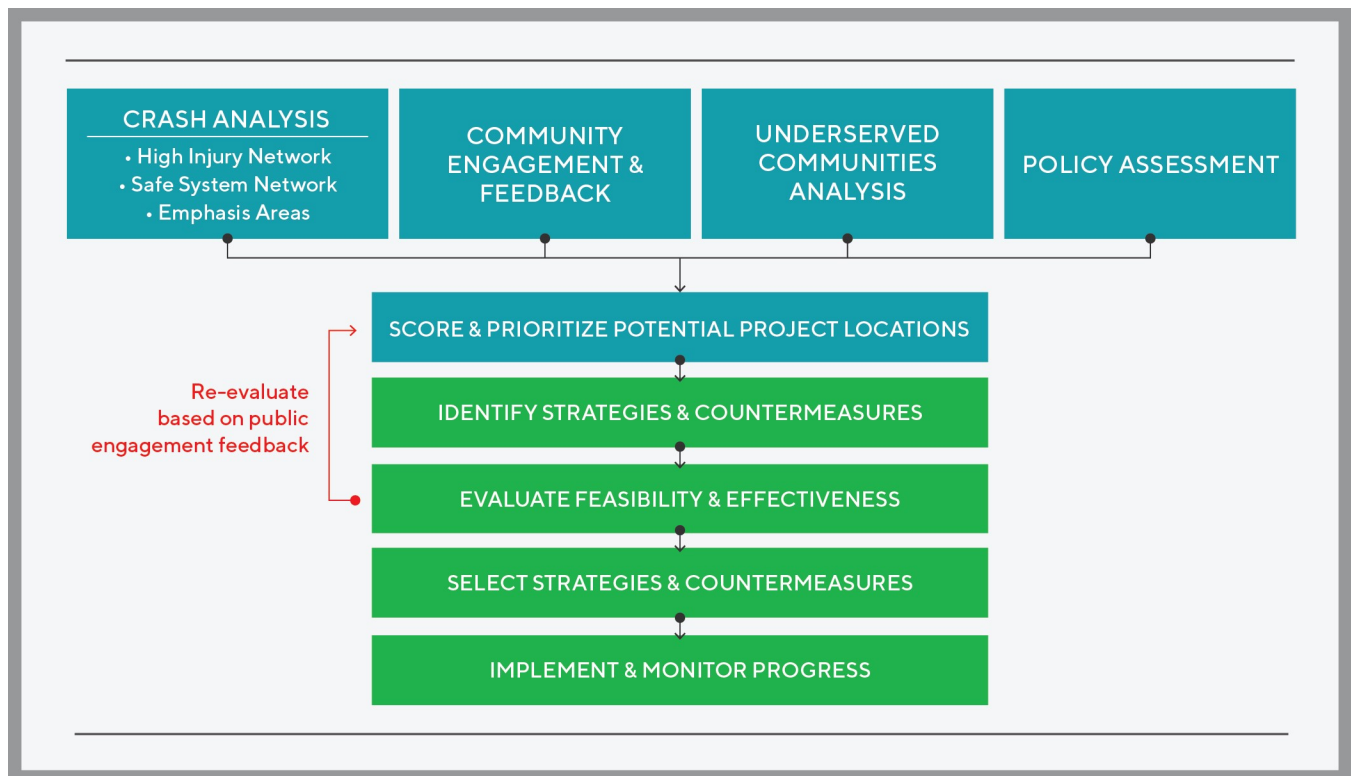
Crash data from 2019 to 2023 was collected from the Texas Crash Records Information System maintained by TxDOT. The crash data consists of crashes by severity using the KABCO scale¹: fatal injury (K), suspected serious injury (A), suspected minor injury (B), possible injury (C), non-injured (O), and unknown. This dataset also contains information such as different crash contributing factors, manner of collision, and date and time. This dataset relies on law enforcement reporting and may not have all the information for all the crashes. For example, hit and run crashes where the driver's injury is unknown fall under the “unknown” crash severity type.

¹ The KABCO scale, developed by the Federal Highway Administration (FHWA), is a standardized system used by law enforcement to classify traffic crash injuries, ranging from K (fatal injury), A (serious injury), B (minor injury), C (possible injury), to O (property damage only, no injury).

As part of the systemic and high injury network analysis, crash and roadway inventory datasets are used to conduct the analysis. The crashes are associated with the respective roadway corridors that provide an understanding of crash patterns by different roadway characteristics such as type of roadway it is, who owns and maintains it, and length of the corridor.

HOW DO WE EVALUATE WILLIAMSON COUNTY'S CRASH HISTORY?

A historical crash analysis was conducted for all of Williamson County and then broken down by state-owned roadways and locally owned roadways. The state-owned roadways are freeways, ramps, and highways. The locally owned roads are all other roadways, excluding the state-owned ones. Crash patterns by years, severity type, and combined fatal and suspected serious injury type are studied. The figure below shows how the various analyses support plan development. The following subsections describe statewide safety emphasis areas and county-specific emphasis areas.



Statewide Emphasis Areas

In a Strategic Highway Safety Plan context, "emphasis areas" refer to specific focus areas identified to address key safety issues on roadways. These areas are prioritized based on data analysis, crash trends, and overall safety goals. By concentrating resources and efforts on these emphasis areas, agencies aim to reduce fatalities and serious injuries more effectively.

The Texas SHSP recommends the following emphasis areas for reducing highway fatalities and serious injuries on all public roads of Texas.

EMPHASIS AREA	DESCRIPTION
 ROADWAY OR LANE DEPARTURES	Crashes where a vehicle departs from the traveled way by crossing an edge line, a centerline, or otherwise leaving the roadway
 OCCUPANT PROTECTION	Crashes involving improper or complete lack of vehicle occupant protection such as wearing a seatbelt or using a car seat for children
 OLDER DRIVERS	Crashes involving drivers 65 years old or older
 YOUNGER DRIVERS	Crashes involving drivers between the ages of 15 and 20
 SPEED RELATED	Crashes where speeding was a contributing factor
 IMPAIRED DRIVING	Crashes involving drug or alcohol impairment
 INTERSECTION RELATED	Crashes occurring at or near an intersection
 DISTRACTED DRIVING	Crashes involving inattention or distractions such as use of a cell phone

EMPHASIS AREA	DESCRIPTION
 PEDESTRIAN	Crashes involving pedestrians
 PEDALCYCLIST	Crashes involving cyclists
 POST CRASH CARE	Secondary, tertiary, etc. crashes occurring due to another primary crash

The Texas SHSP framework was used to identify crashes in the above-mentioned emphasis areas. Given that the crash database does not contain sufficient data on post-crash care, this emphasis area is not analyzed in this Plan.

County-specific Emphasis Areas

The countywide crash trends are analyzed to capture regional emphasis areas in addition to the statewide emphasis areas. The following additional emphasis areas are identified:

COUNTY-SPECIFIC EMPHASIS AREA	DESCRIPTION
 SCHOOL ZONES	Crashes occurring at or near schools
 DARK CONDITIONS	Crashes occurring at night or in areas with low to no lighting
 WORK ZONES	Crashes occurring within road construction or maintenance areas
 MOTORCYCLES	Crashes involving motorcyclists

HOW DO WE EVALUATE COMMONALITIES AND CRASH RISKS IN THE COUNTY?

The systemic safety approach used the same fatal and suspected serious injury (KA) crash dataset from the historical crash analysis, emphasizing areas associated with the highest crash proportions. This data-driven methodology aims to uncover patterns and commonalities across emphasis areas to identify the most critical crash types and their corresponding contributing factors. By analyzing these relationships, the study targeted systemic characteristics associated with high crash proportions rather than isolated hotspots, enabling a broader and more effective application of countermeasures. See **Appendix A** for the detailed Systemic Safety Analysis, including the methodology used to develop the analysis and the results.

HOW WAS A HIGH INJURY NETWORK USED IN THE ANALYSIS?

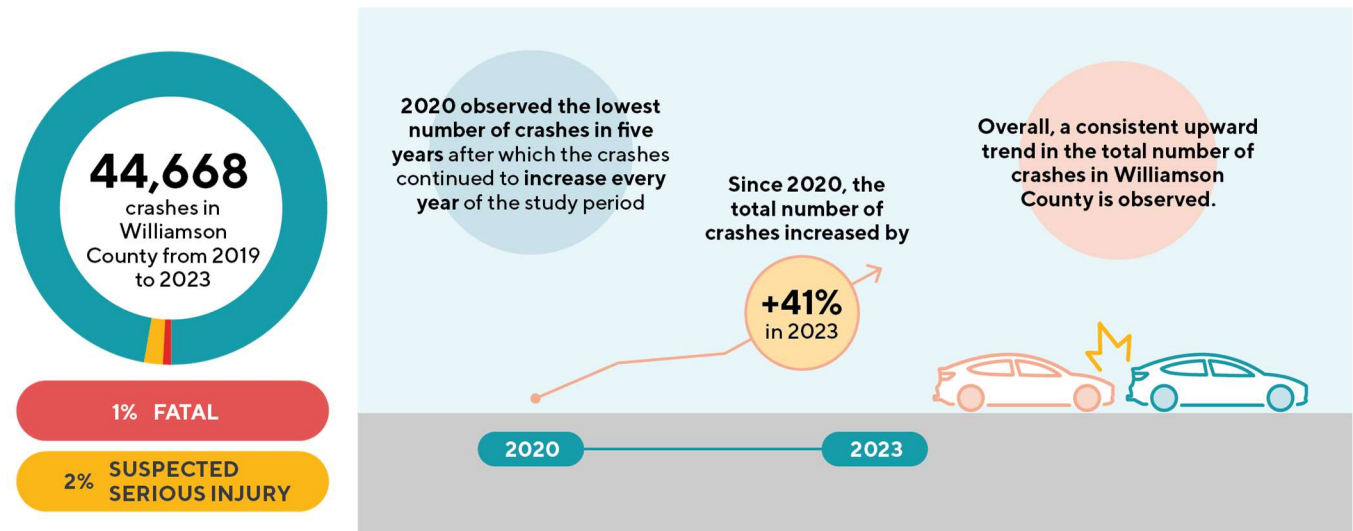
A vital component of regional safety analysis is the development of a high injury network that identifies areas with a high need for safety enhancements. To conduct a more localized and thorough evaluation of transportation safety issues in Williamson County, both an intersection HIN and a road segment HIN were developed. Establishing these two networks can identify high-priority intersections and segments of roadways that require improvements to reduce potential safety risks.

See **Appendix A** for the detailed High Injury Network analysis, including the methodology used to develop the analysis.

Safety Analysis Results

The following subsections provide safety analysis results, including historical crash trends, systemic safety findings, and the high injury network.

CRASH TRENDS IN WILLIAMSON COUNTY



Since 2020, the total number of crashes increased by 41% in 2023. Overall, **a consistent upward trend in the total number of crashes in Williamson County is observed.** While 2020 was an unusual year with lower traffic due to the pandemic, it is included to show the full trend, and we note that the number of crashes from that year were impacted by those conditions.

Figure 1 summarizes the crashes in Williamson County by year and severity for all roadway types. **Figure 1** does not include non-injury and unknown crashes.

See **Appendix A** for the detailed historical crash analysis results, including location details, temporal details, and details on other contributing factors for all crash types and severities.

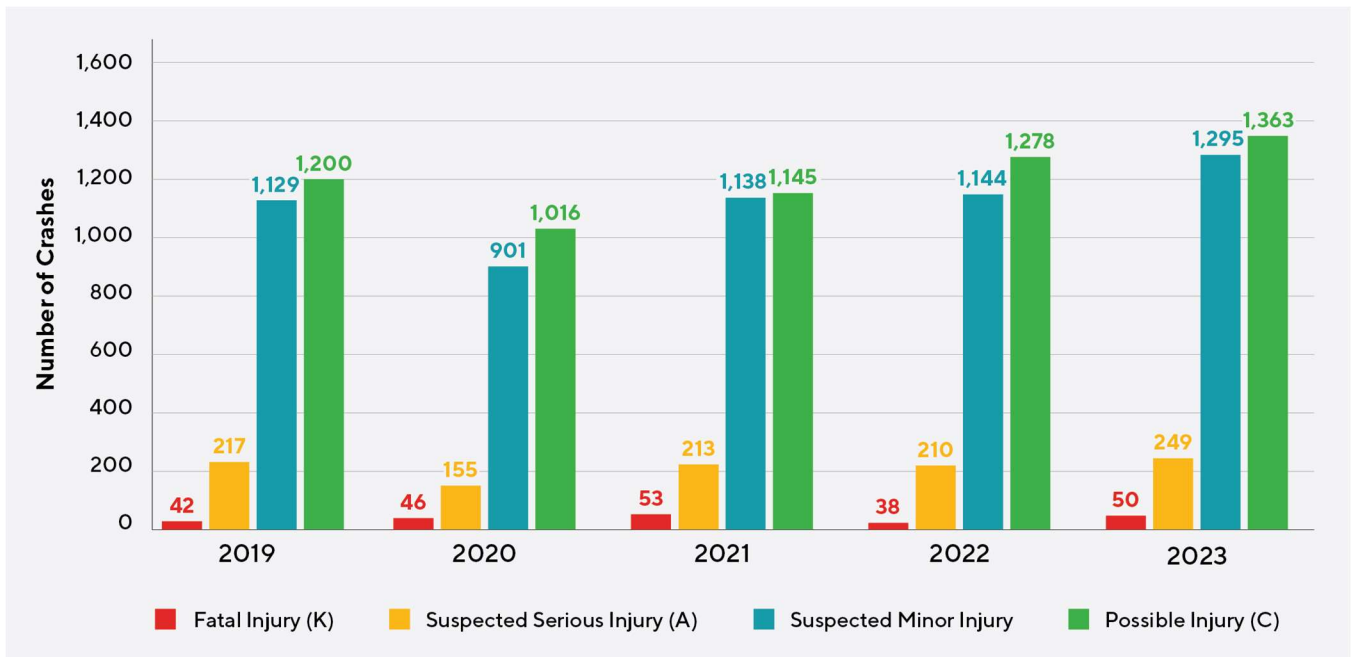
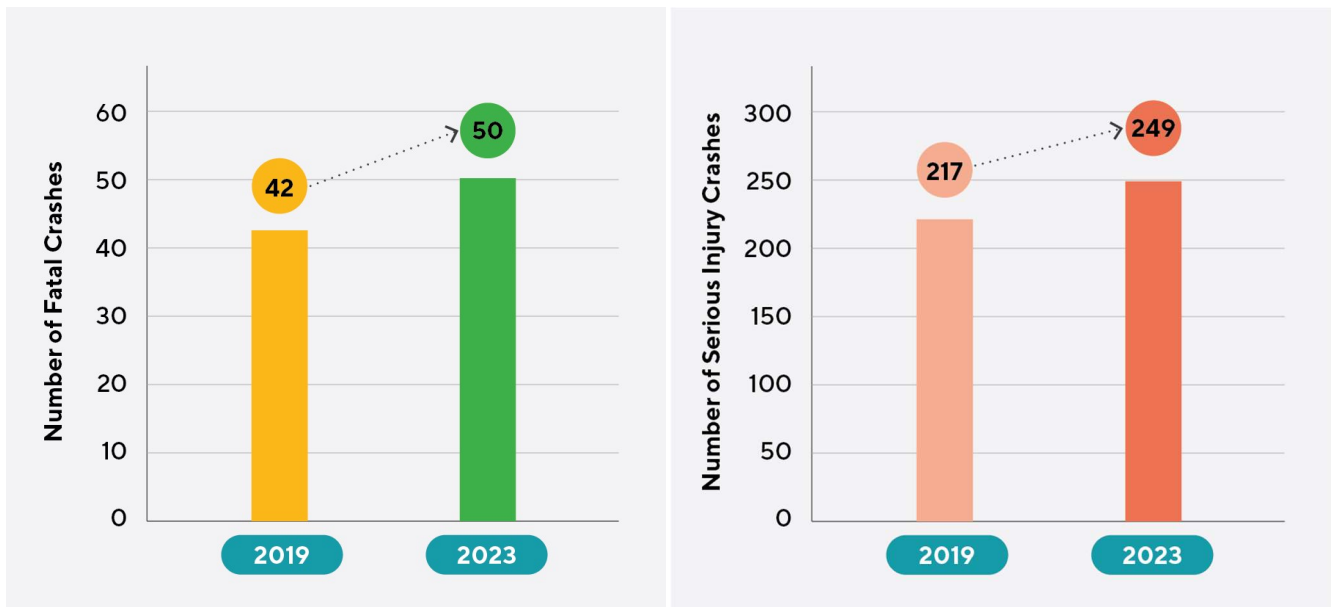


FIGURE 1: CRASHES (2019-2023) BY YEAR AND BY SEVERITY

The following subsections summarize crash trends for fatal and serious injury crashes, crash analysis by other factors, intersection and non-intersection crash density heat maps, and emphasis area analysis.

Fatal and Serious Injury Crashes in Williamson County



The highest number of fatal crashes, 53, was observed in 2021, and the lowest, 38, was observed in 2022. The serious injury crashes show a consistent upward trend, increasing from 217 in 2019 to 249 in 2023. **Figure 2** presents the crash trend of fatal and suspected serious injury crashes and **Figure 3** summarizes fatal and serious injury crashes by crash type in Williamson County from 2019 to 2023.



FIGURE 2: FATAL (K) AND SUSPECTED SERIOUS INJURY (A) CRASHES (2019-2023) BY YEAR

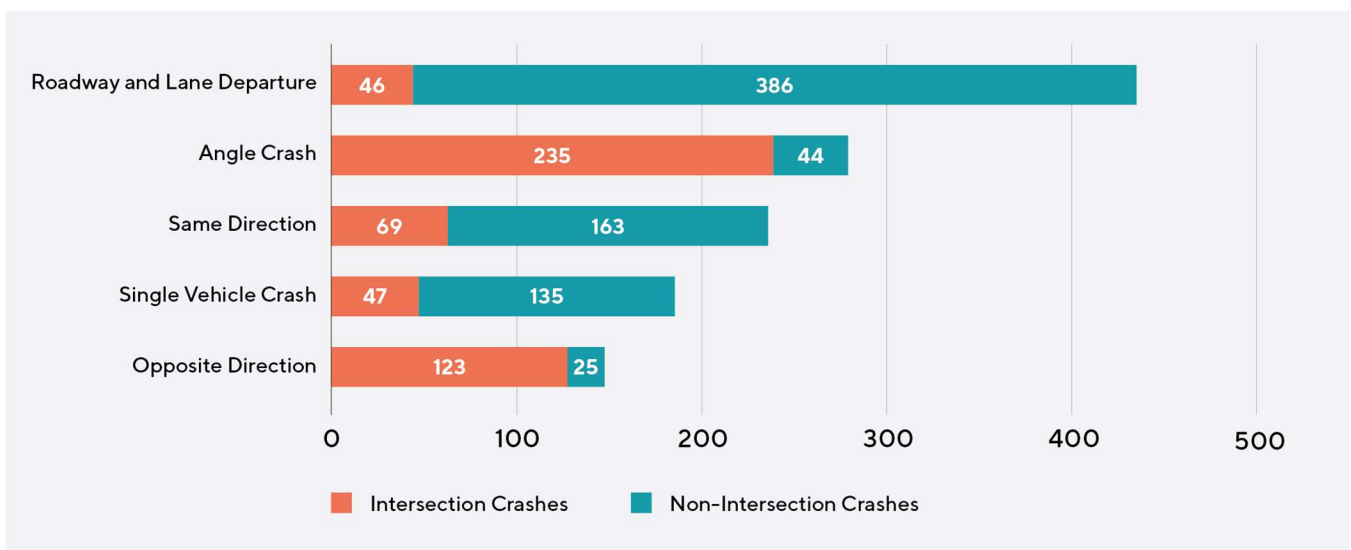
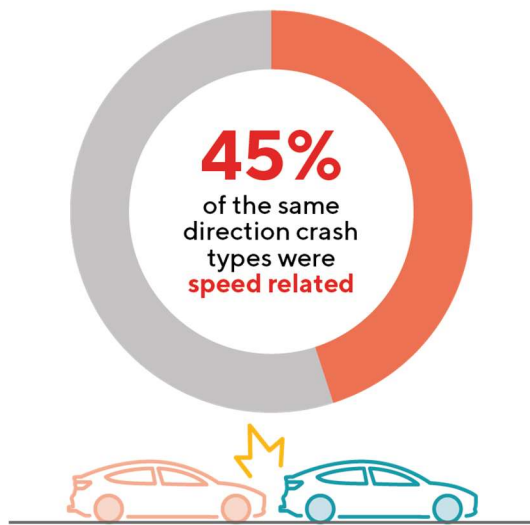


FIGURE 3: FATAL AND SERIOUS INJURY CRASHES BY TYPE (2019-2023)

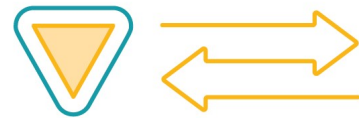
Crash Analysis by Other Factors

The following summarizes key findings from the analysis of crash patterns in Williamson County based on contributing factors, crash types, time of day, and day of week:

- Overall, **speed-related, failure to yield right of way, aggressive driving, and distracted driving contribute to 80% of crashes in Williamson County.**
- Almost half of the same direction crash types were speed related.
- Over 90% of angle and opposite direction crashes took place at intersections, with failure to yield the right of way identified as the primary contributing factor for both crash types.
- Speed related and failed to yield right of way were highest contributing factors with more than 40% of all crashes.
- Aggressive and distracted driving are the third and fourth highest contributing factors; most of these are same direction crash types.
- The number of crashes during the weekdays peak during the AM and PM peak hours of traffic – 7 AM to 8 AM and 4 PM to 6 PM, respectively. During the weekend, the peak number of crashes occurs during weekend lunch hours, between 12 PM and 2 PM.
- Crashes are more frequent during the afternoon and evening rush hours, particularly on weekdays, and drop during early morning and late evening hours.
- During the week, Fridays experienced the highest number of crashes, and Sundays had the lowest. During the weekend, the peak number of crashes occurs during weekend lunch hours, between 12 PM and 2 PM.
- In a day, the highest number of crashes were observed between 3 and 6 p.m., which coincides with the evening rush hour traffic. The highest number of crashes overall occurred around 5 p.m., particularly on Fridays.



More than **90%** of the angle and opposite direction crash types occurred at intersections



Failure to **yield right of way** was the major contributing factor for angle and opposite direction crashes

Intersection and Non-Intersection Crash Density Heat Maps

Two heat maps were developed using the available Williamson County crash data for 2019 to 2023. The **Figure 4** heat map shows the crash density at intersections in the County, while the **Figure 5** heat map shows the crash density at non-intersections (segments).

Most of the intersection crash density occurred in urban areas where state-owned roads intersect with one another or a local road. Most of the non-intersection (segment) crash density also occurred in urban areas where state-owned roads intersect with one another or a local road.

See **Appendix A** for the detailed list of intersections and segments labeled “High” or “Very High” crash density.

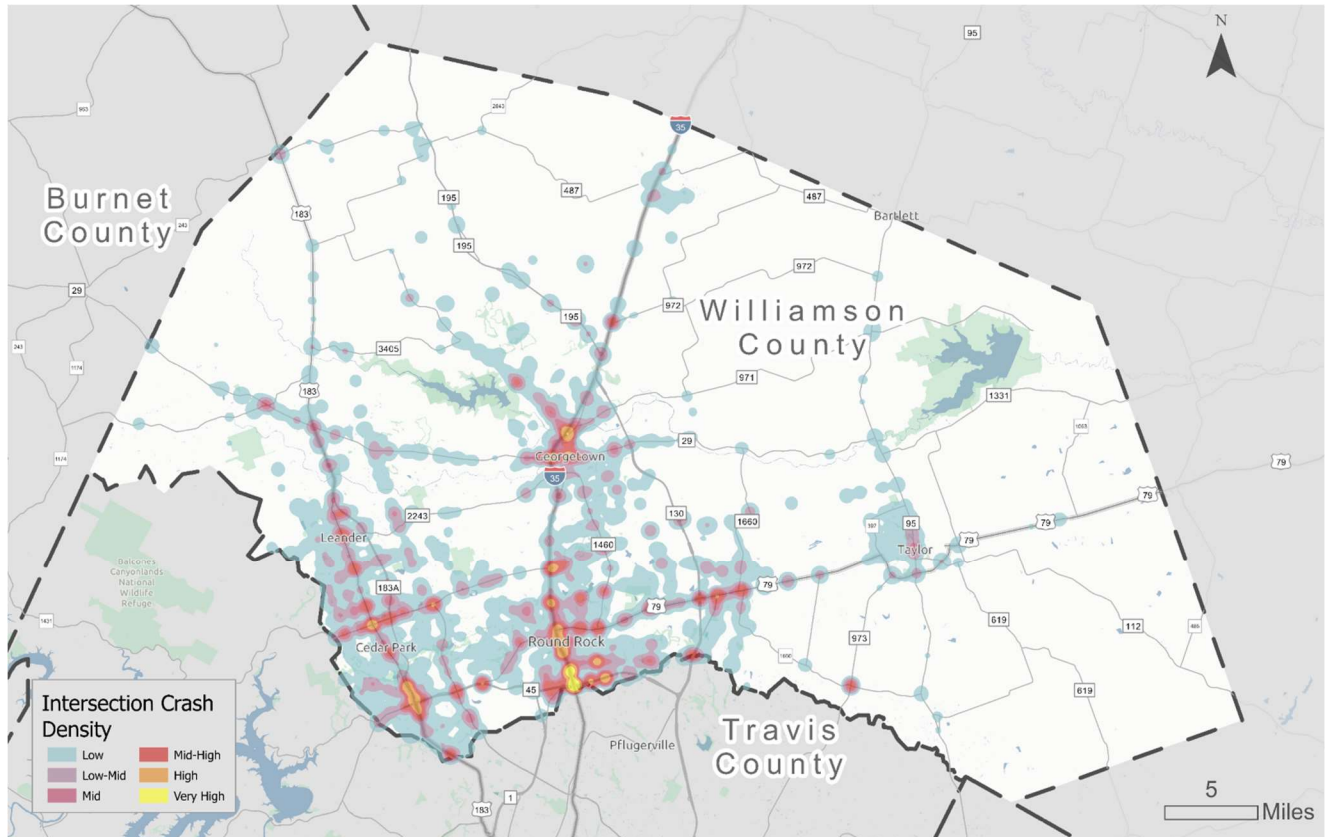


FIGURE 4: HEAT MAP OF INTERSECTION CRASH DENSITY (2019-2023)

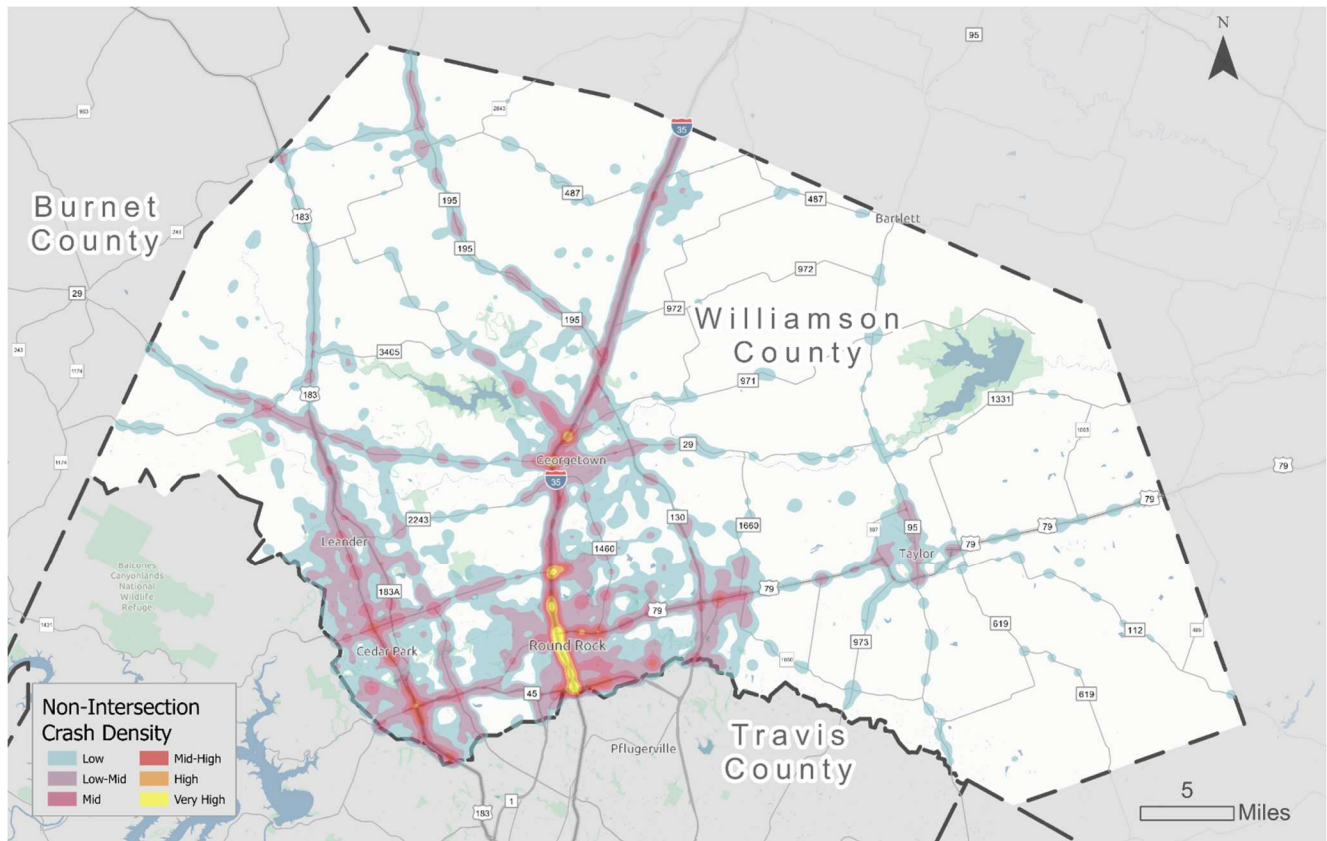


FIGURE 5: HEAT MAP OF NON-INTERSECTION CRASH DENSITY (2019-2023)

Emphasis Area Analysis

Figure 6 illustrates the top 10 emphasis areas with the highest reported fatal and serious injury crashes in Williamson County from 2019 to 2023. The leading four areas of emphasis in terms of fatal and serious injury crashes are dark conditions, intersection-related incidents, roadway departures, and young or older driver crashes. Notably, roadway departures, motorcycle-related incidents, occupant protection issues, impaired driving, crashes occurring during dark conditions, and crashes involving vulnerable road users—including pedestrians and bicyclists—are disproportionately represented in fatal and serious injury statistics compared to all severity crashes. This suggests a higher likelihood of severe injuries in these emphasis areas.

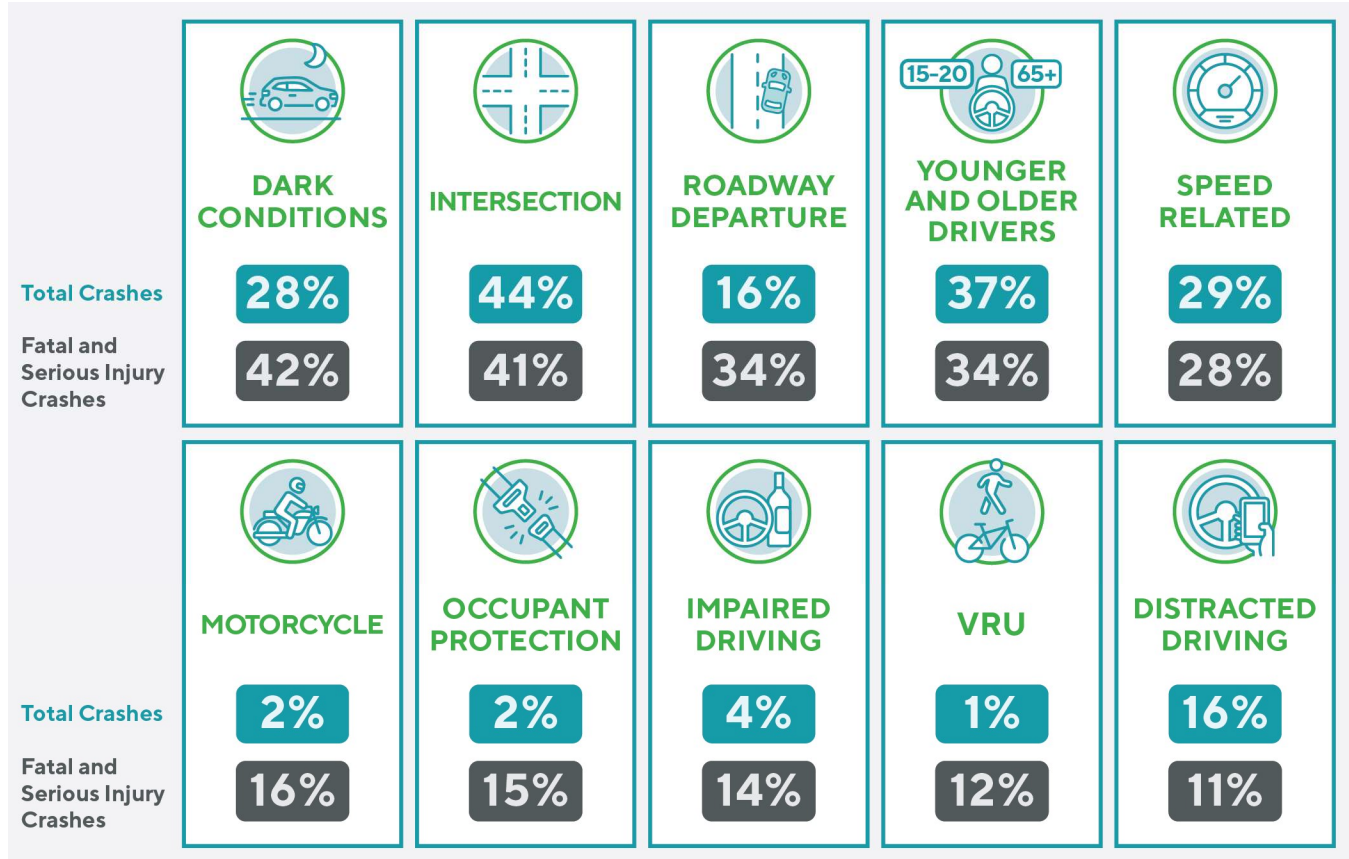


FIGURE 6: EMPHASIS AREAS WITH THE MOST FATAL AND SERIOUS INJURY CRASHES (2019-2023)

SYSTEMIC SAFETY ANALYSIS RESULTS

A historical crash analysis is vital to understanding the historical trends and patterns of crashes in Williamson County; however, it is a reactive approach. A systemic safety analysis considers the crash history alongside a multitude of other crash factors to find locations that are systemically unsafe based on a variety of metrics, not just the crash data from the last five years.

By identifying patterns across these dimensions, we can identify commonalities and overlaps among emphasis area crash types, aiding in a more holistic understanding of systemic safety issues and needs. This will not only help develop a more holistic approach to countermeasures but also provide the County with a **proactive approach** to identifying safety issues and providing appropriate solutions in the future.

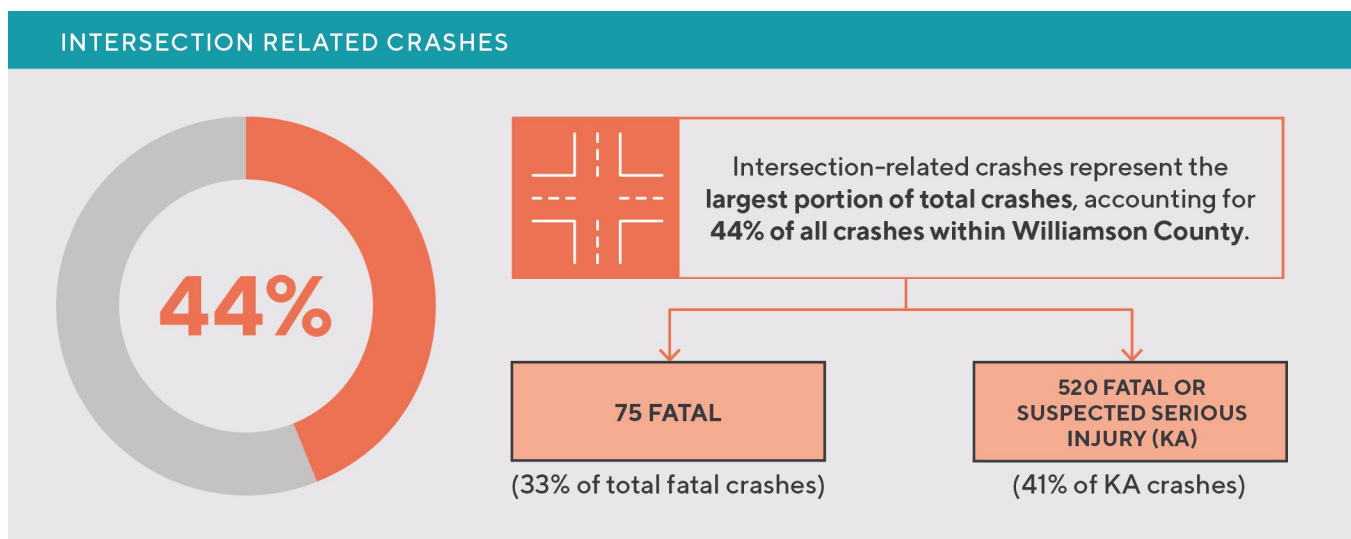
Shared Patterns Across Emphasis Areas

This analysis revealed significant commonalities across the emphasis areas, bringing attention to the interconnected nature of crash factors. Dark conditions are critical across various crash types and strongly linked to intersections, roadway departures, and speed-related incidents. Similarly, intersections are consistently connected to speed-related crashes, young driver involvement, and dark conditions. Roadway departures and speed-related crashes are also linked strongly with dark conditions, intersections, and impaired driving. These overlaps highlight the need for integrated strategies addressing multiple emphasis areas. The results below provide detailed insights into these relationships. See **Appendix A** for the detailed emphasis area analysis methodology and results.

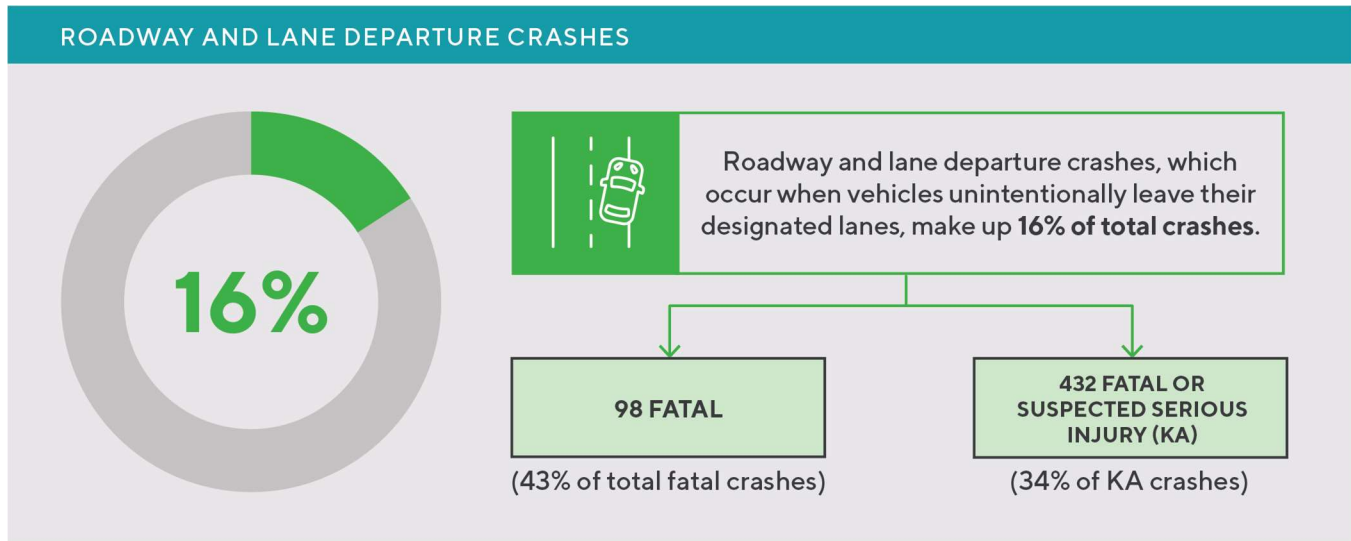
Focus Crash Types

Based on results from the emphasis area analysis, Williamson County has identified several focus crash types that are significantly associated with serious injuries and fatalities. Each focus area highlights specific conditions and contributing factors that demand targeted safety improvements.

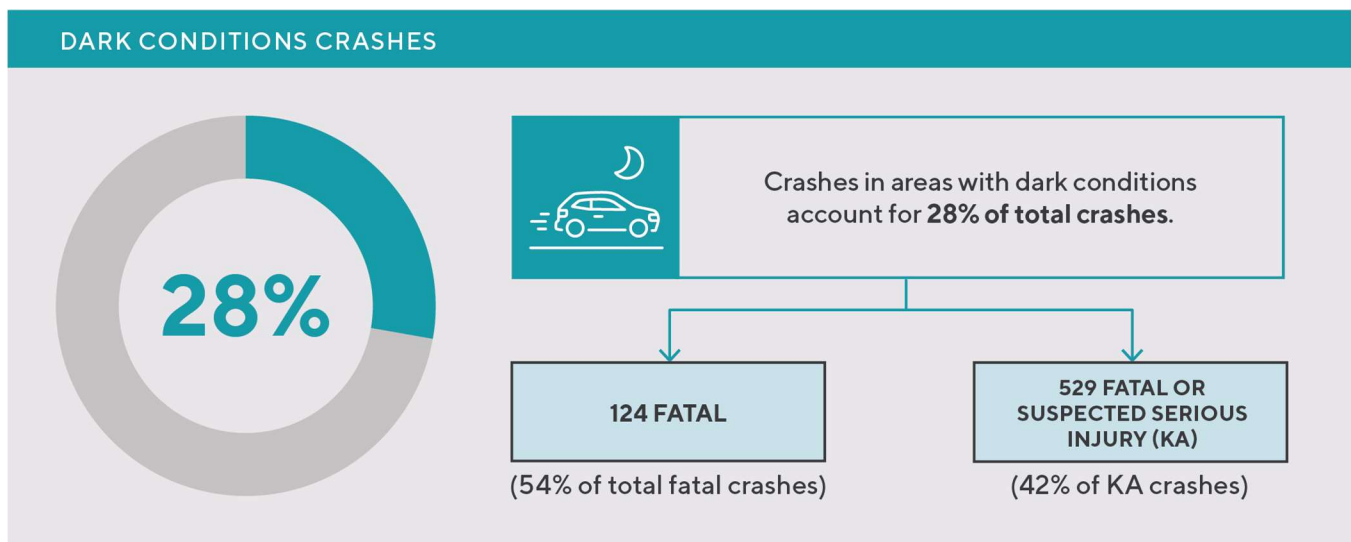
Intersection Related: Intersections present complex traffic interactions contributing to higher crash frequencies, warranting interventions to reduce conflict points.



Roadway and Lane Departure: Roadway and lane departure was one of the most severe crash types with over 40% of all fatal crashes.



Dark Conditions: Crashes in areas with dark conditions emphasize the need for improved lighting in dark roadway segments and intersections to enhance visibility and reduce nighttime crash risks.



Countermeasure Selection

The systemic approach to safety in Williamson County focuses on deploying countermeasures across the network to address crash types at multiple locations with similar risk characteristics. This allows Williamson County's jurisdictions to implement cost-effective safety measures across a broader range of sites with similar high-risk site characteristics, supporting widespread safety improvements.

Countermeasures for Williamson County's focus crash types were selected based on data-driven analysis and TxDOT's Highway Safety Improvement Program guidance. Systemic countermeasures align with TxDOT's HSIP guidelines, which define each safety countermeasure using specific "work codes" for streamlined planning and deployment. See **Appendix A** to view the focus crash types and the corresponding systemic countermeasures selected for evaluation across the County.

HIGH INJURY NETWORK ANALYSIS AND RESULTS

The High Injury Network (HIN) identifies the specific roadways and intersections where a disproportionate number of severe and fatal crashes occur. By focusing on locations with the highest concentrations of serious injuries and fatalities, the HIN serves as a foundational tool for prioritizing safety improvements and resource allocation. It highlights critical areas where targeted interventions can have the greatest impact on reducing severe crash outcomes and improving overall roadway safety.

An online GIS webmap was developed to represent the HIN of intersection and non-intersection (segment) crashes in Williamson County, using crash data from 2019 to 2023. The webmap displays detailed information about crash severity, emphasis areas, roadway ownership, and segment lengths for both intersections and roadway segments.

Given the level of technical detail, the webmap — along with a supporting data dashboard containing crash trends and statistics for each HIN location— were provided to and are managed by stakeholders for a more in-depth review. Neither the webmap nor the dashboard are included directly within this plan, but they serve as key resources to guide ongoing safety efforts.

Intersection High Injury Network Results

Figure 7 represents all the intersections in Williamson County classified as “high injury” based on the crash data from 2019 to 2023. A small number of intersections are driving a large share of crashes in Williamson County. Only 7% of intersections that experienced at least one crash during the study period (118 out of 1,461 total intersections) observed:

- 55% of all fatal crashes
- 35% of all reported crashes



Over half of all fatal intersection crashes in Williamson County occurred on **only 7%** of the county's intersections

These findings point to clear opportunities for **prioritizing safety improvements at a focused set of locations.**

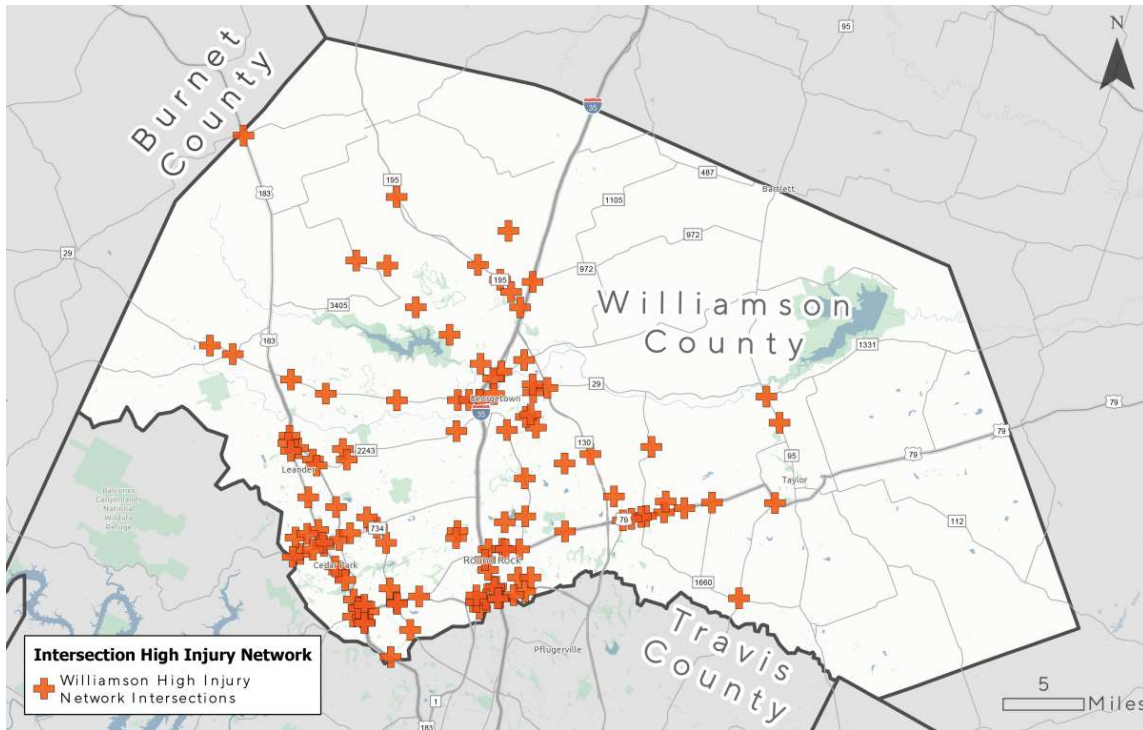


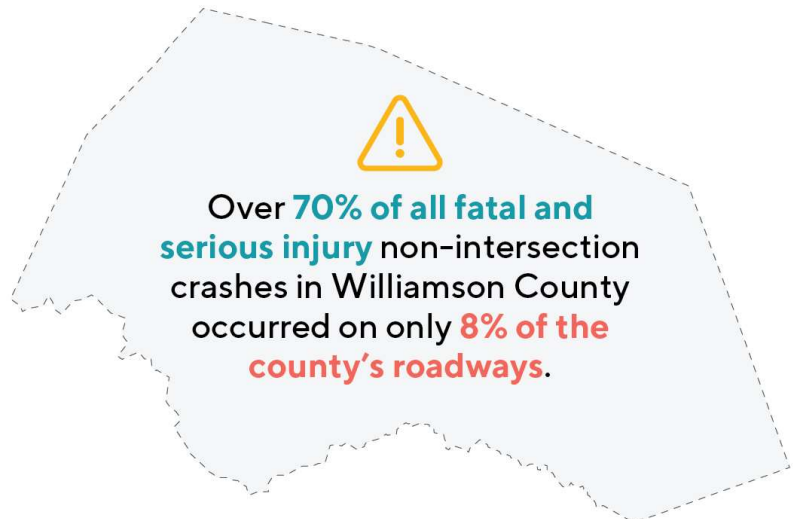
FIGURE 7: HIGH INJURY NETWORK (INTERSECTIONS) (2019-2023)

Segment High Injury Network Results

Figure 8: represents all the non-intersections (segments) in Williamson County classified as “high injury” based on the crash data from 2019 to 2023. A small portion of the roadway network accounted for a disproportionate share of crashes. Just 8% of roadway miles (approximately 171 out of 1,867 miles) where crashes occurred in the past 5 years observed:

- 71% of all fatal and serious injury crashes
- 51% of all reported crashes

This indicates a strong concentration of severe safety issues on a limited portion of the network, **highlighting key opportunities for targeted improvements.**



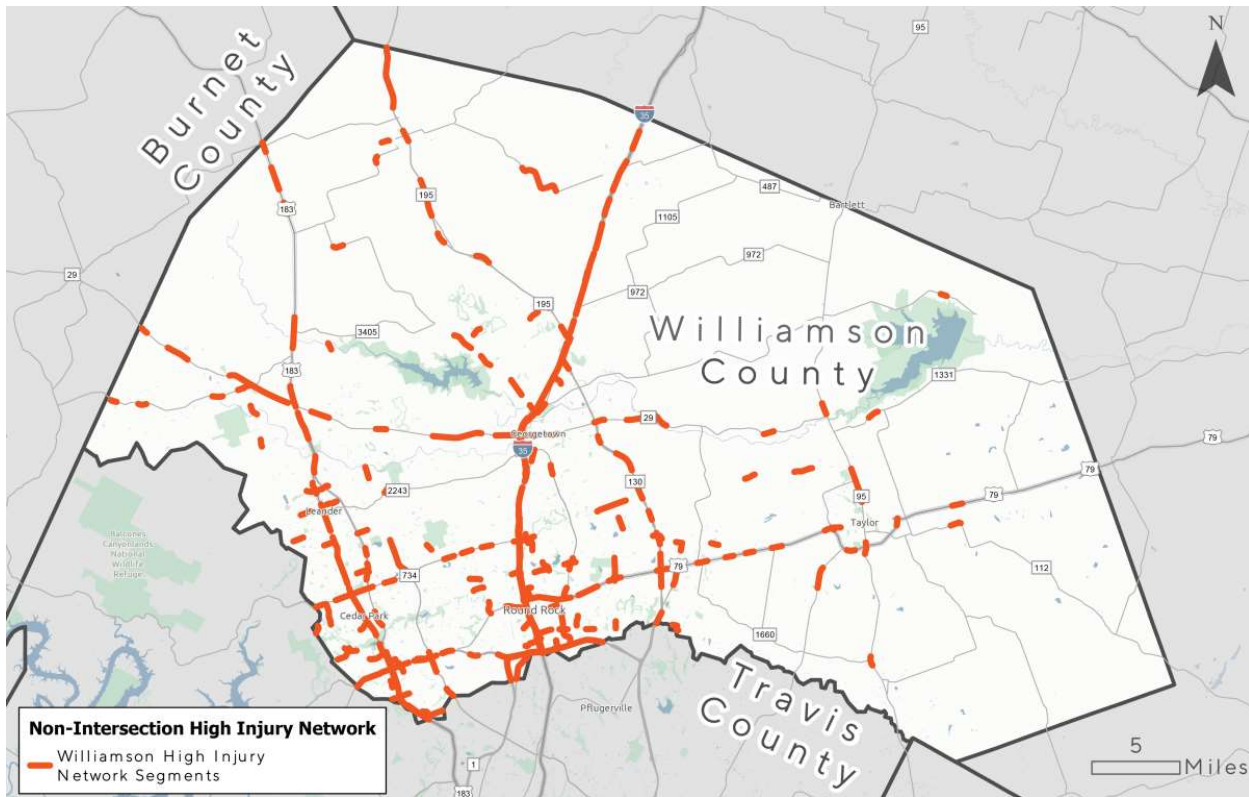


FIGURE 8: HIGH INJURY NETWORK (SEGMENTS) (2019-2023)

Underserved Communities Analysis

This section describes who is most affected by roadway safety in Williamson County and provides a summary of how the county's underserved need areas play a role.

Who is Most Affected by Safety in the County?

An underserved communities analysis aims to identify the populations in Williamson County disproportionately affected by the safety risks within the transportation system. Historically underserved communities face mobility challenges because they may be unable to drive or are less likely to have access to a vehicle or public transportation. As a result, this plan can promote investments in facilities and services designed to alleviate these obstacles.

The findings of this analysis identify the areas and populations in Williamson County that are disproportionately affected by safety risks within the transportation system. These insights offer essential ways to improve the way safety investments are prioritized.

This analysis is limited to available data and may not fully capture how transportation safety affects all underserved populations. The methodology to identify an underserved need area and the follow-up analysis is consistent with the analysis conducted for the CAMPO RSAP. To identify the underserved community, the following three publicly available datasets were used:

1. **Areas of Persistent Poverty** information from the U.S. Department of Transportation. An area is defined as "Areas of Persistent Poverty" if its poverty rate is at least 20 percent.
2. **Title VI** - Census Tracts with less than 50% of the population identifying as "White, non-Hispanic" using the most recent American Community Survey (ACS) data.
3. **Vulnerable Population** – CAMPO used a sociodemographic index to identify Vulnerable Populations. This index combines seven demographic measures to create a vulnerability score for each census block group and tract. These measures include low-income populations, minority populations, senior populations, school-aged populations, disabled populations, limited English proficiency populations, and zero-car households. This approach is consistent with federal planning guidance (e.g., Title VI of the Civil Rights Acts of 1964).

Using the Geographic Information System to join the datasets, the underserved need area is defined as any area that overlaps with at least one of the three mentioned datasets.

Figure 9 presents the underserved need area in the Williamson County region. This area covers 22% of the county's total land area, is home to 40% of the population, and contains 39% of the county's roadway lane miles. The underserved area follows Interstate 35, mostly on the east side of the corridor. The north of the county is made up mostly of *Vulnerable Populations* and the south side has *Title VI* and *Area of Persistent Poverty* areas. Some of the cities in the underserved communities need areas are Taylor, Hutto, Round Rock, Cedar Park, Leander, and Georgetown.

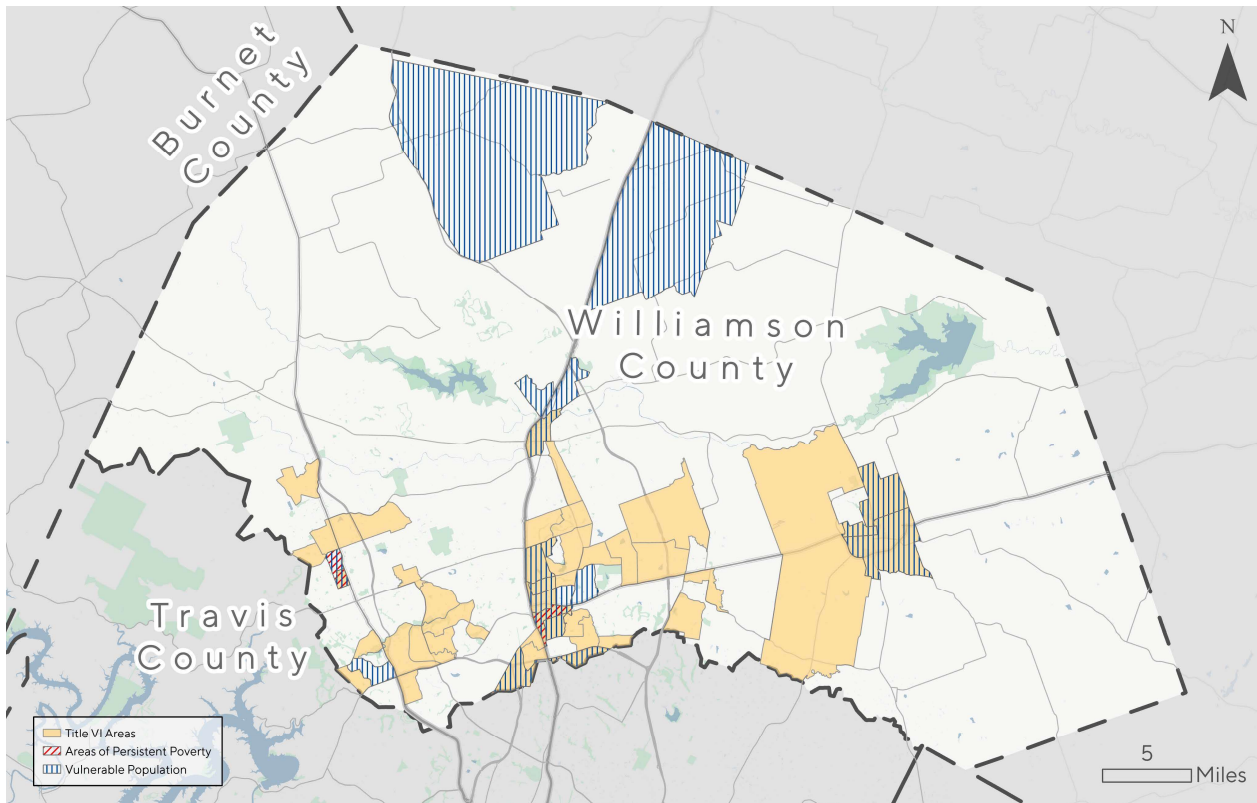


FIGURE 9: UNDERSERVED NEED AREAS IDENTIFIED IN WILLIAMSON COUNTY

There were 112 fatal crashes and 575 serious injury crashes in the underserved areas identified in Williamson County. Compared to the countywide numbers, underserved areas experienced 63% of the total crashes and over half of the fatal and serious injury crashes. **Figure 10** presents the fatal and serious injury crash rates by area, population, and roadway lane miles. All three rates are higher in the underserved areas. **The crash rate by area is four times higher in the underserved need area compared to the non-underserved need area.** The crash rates by population and by road miles in the underserved need area are twice as high as the non-underserved need areas.

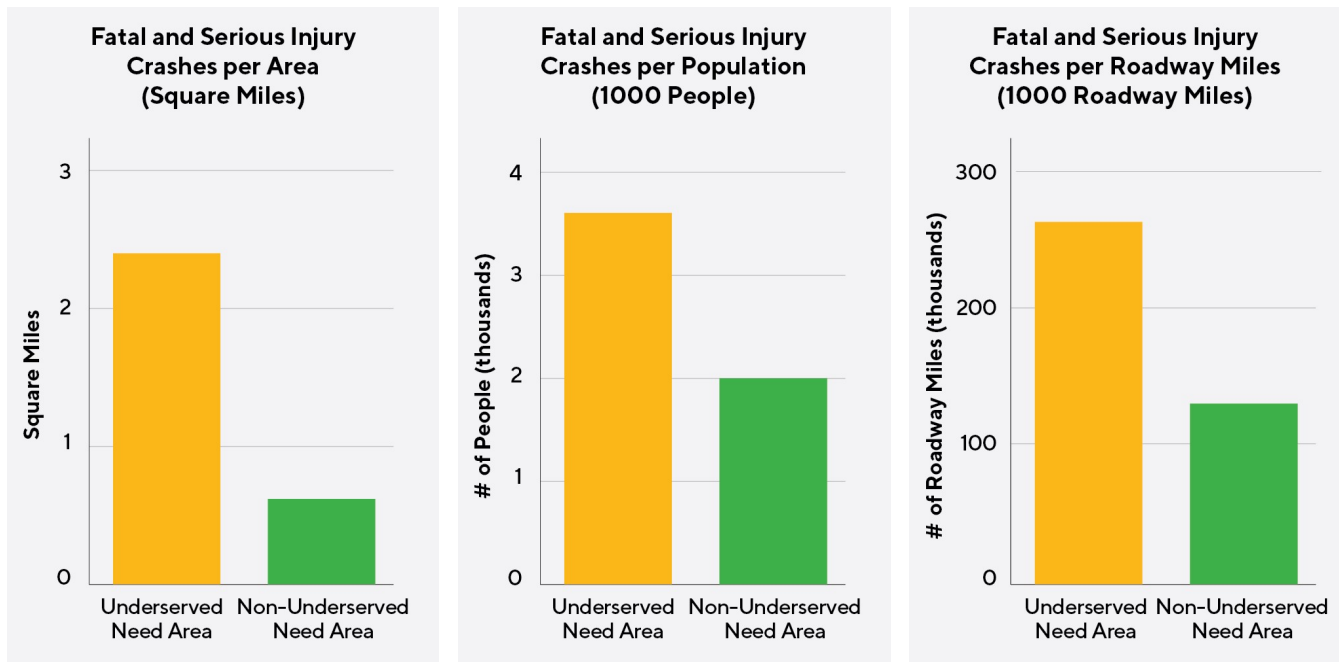


FIGURE 10: FATAL AND SERIOUS INJURY CRASH RATE BY AREA, POPULATION, AND LANE MILES

Table 1 presents the summary of fatal and serious injury crashes by emphasis areas in the underserved areas.

This analysis evaluates the over-representation of fatal and serious injury crashes in underserved need areas by comparing their share of these crashes to the area's proportion of land (22%), roadway lane miles (39%), and population (40%). An emphasis area is considered overrepresented if its percentage exceeds these three benchmarks, indicating a higher risk in underserved areas. Crashes involving construction zones, poor visibility, and young drivers are the most overrepresented factors. However, all emphasis areas exceed all three benchmarks (land area, population, and roadway miles), highlighting a broader pattern of over-representation.

TABLE 1: FATAL AND SERIOUS INJURY (KA) CRASHES (2019-2023) BY EMPHASIS AREAS IN THE UNDERSERVED NEED AREAS

EMPHASIS AREAS		NUMBER OF KA CRASHES IN UNDERSERVED NEED AREA	% OF ALL WILLIAMSON COUNTY KA CRASHES IN THE UNDERSERVED NEED AREA
	CONSTRUCTION ZONE RELATED	38	64%
	DARK CONDITIONS	308	58%
	YOUNGER DRIVER RELATED	130	57%
	DISTRACTED RELATED	79	57%
	INTERSECTION RELATED	292	56%
	MOTORCYCLE RELATED	116	56%
	OLDER DRIVER RELATED	109	54%
	SPEEDING RELATED	192	54%
	IMPAIRED RELATED	92	53%
	VULNERABLE ROAD USER RELATED	76	52%
	ROADWAY OR LANE DEPARTURE RELATED	208	48%
	OCCUPANT RESTRAINED RELATED	92	48%
TOTAL KA CRASHES		687	54%

Summary of Transportation Safety in Underserved Need Areas of Williamson County

The analysis identifies underserved need areas based on persistent poverty, Title VI Census Tracts, and vulnerable populations in Williamson County. The crash rate trends observed in Williamson County are consistent with the CAMPO regional trends. **Overall, fatal and serious injury crashes are four times higher in underserved need areas compared to non-underserved need areas.** The emphasis areas that are overrepresented in the crash rates and countywide fatal and serious injury crashes are dark conditions, intersections, motorcycle-involved, younger drivers, distracted driving, and construction zones.

This analysis will serve as a guiding framework for selecting projects. Benefits to underserved communities is a key prioritization criterion, and the identified emphasis areas will help determine effective countermeasures to reduce fatal and serious injury crashes in the County.



OVERALL, FATAL AND
SERIOUS INJURY CRASHES
ARE FOUR TIMES HIGHER
IN UNDERSERVED NEED
AREAS COMPARED TO
NON-UNDERSERVED
NEED AREAS.

Engaging the Community

CAMPO invited the public to participate in the Regional Safety Action Plan outreach efforts. The efforts were divided into two rounds of engagement done regionally, focusing on supporting the county Safety Action Plans. Both rounds of outreach included an online open house and in-person pop-up engagement events in Bastrop, Burnet, Caldwell, Hays, and Williamson counties. All the outreach events and planning were done concurrently with the CAMPO 2050 Regional Transportation Plan. This section describes both rounds of engagement.

Round 1 Engagement

Round 1 of the outreach efforts introduced the project to the public and collected input from the community on the most pressing roadway safety issues and specific areas of concern.

The first public engagement phase included an in-person engagement event in Williamson County, an online open house, and a comment period open from October 14 through November 27, 2024. The same information was made available online and in-person. The open house materials included downloadable informational exhibits, a fact sheet, a survey, and an interactive mapping tool. All the outreach materials were posted online and available in English and Spanish.

Public input was collected through printed or online survey responses, emailed comments, the mapped comment tool, or verbally at in-person engagement events.

The following subsections describe the engagement approach and what we heard from the community.

THE ENGAGEMENT APPROACH

This section provides an overview of the approach for an in-person engagement event and the notification tools used for outreach.

In-Person Engagement Events

A pop-up engagement event in Williamson County occurred at the City of Georgetown Parks and Recreation Department's Trick-or-Treat Trail on October 24, 2024. The project team collected verbal comments about safety concerns, promoted the survey and mapping tool, and distributed push cards with additional information about the online open house and comment period. An estimated 405 people engaged with the project team at this event through verbal comments, push card distribution, and survey responses. One of the most noted comments regarded an area of concern at the intersection of State Highway 195 and Cattleman Drive.



ROUND 1 ENGAGEMENT EFFORTS AT THE TRICK-OR-TREAT EVENT IN THE CITY OF GEORGETOWN

Notification Tools

This section describes the notification tools used- webpage, social media, ads, media, emails, and other methods.

CAMPO Webpage Announcement

An announcement was posted on the webpage on October 15, 2024, notifying the public about the launch of the online open house and open comment period.

Social Media

From October 16 through November 27, 2024, CAMPO's X (formerly known as Twitter), Facebook, Instagram, and LinkedIn distributed information about the plan and how to participate.

Advertisements

Print and digital advertisements were placed in *Community Impact* from October 15 through November 16, 2024, and in local newspapers from October 16 to 18, 2024. Digital advertisements were also placed on *Community Impact* online from October 16 through November 16, 2024.



COMMUNITY IMPACT REGIONAL ADVERTISEMENTS	
REGION	RUN DATE
LEANDER / LIBERTY HILL	October 15, 2024
GEORGETOWN	October 18, 2024
CEDAR PARK/FAR NORTHWEST AUSTIN	November 2, 2024
ROUND ROCK	November 5, 2024
PFLUGERVILLE	November 8, 2024

LOCAL NEWSPAPER ADVERTISEMENTS	
PUBLICATION	RUN DATE
WILLIAMSON COUNTY SUN	October 16, 2024
EL MUNDO NEWSPAPER (SPANISH-SPEAKING REGIONAL NEWSPAPER)	October 17, 2024

Media Outreach

A media release was distributed to local media outlets throughout the region on October 21, 2024.

Emails

To promote participation, email notices were sent to stakeholders, task force members, and community partners on October 21 and October 24, 2024.

Additional Outreach

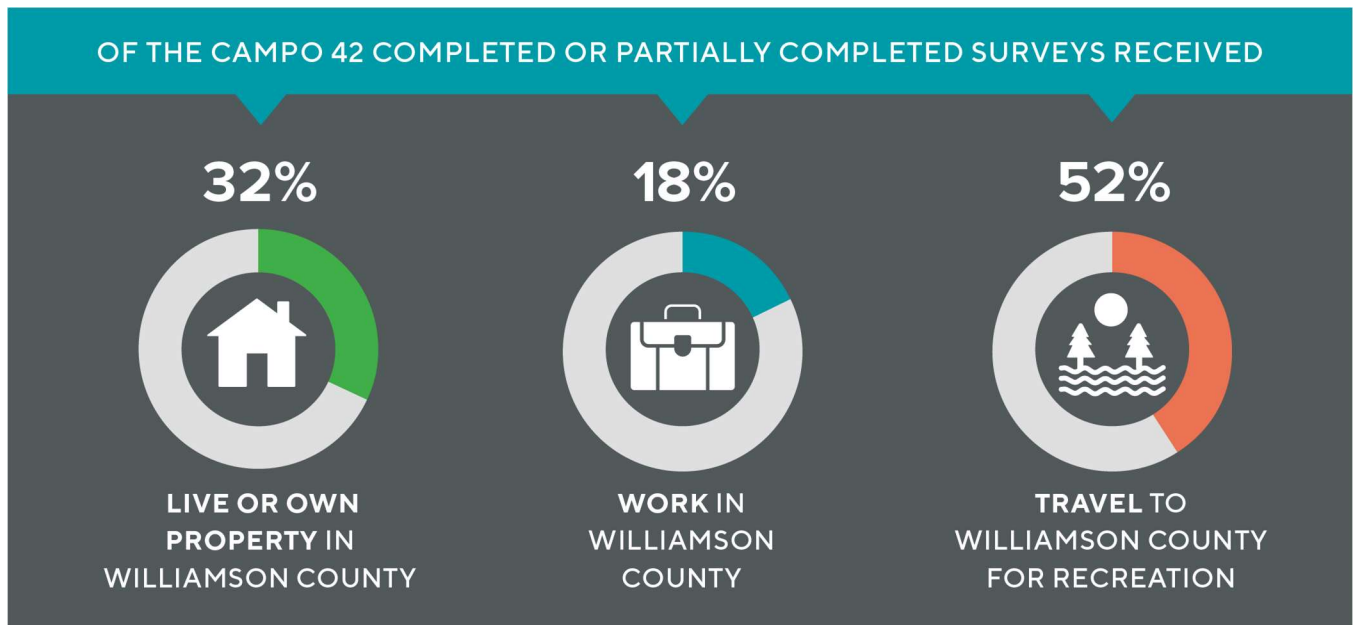
The outreach team made direct phone calls and emails throughout the comment period to promote and encourage the distribution of online open house materials throughout October and November. Push cards were distributed to local jurisdictions, Meals on Wheels deliveries throughout the CAMPO region, health centers, libraries, senior centers, churches, and CARTS stations throughout the comment period. Additionally, the outreach team shared a social media toolkit, including a newsletter and social media content with task force members, regional public information officers, and communications directors from October 16 through November 21, 2024.

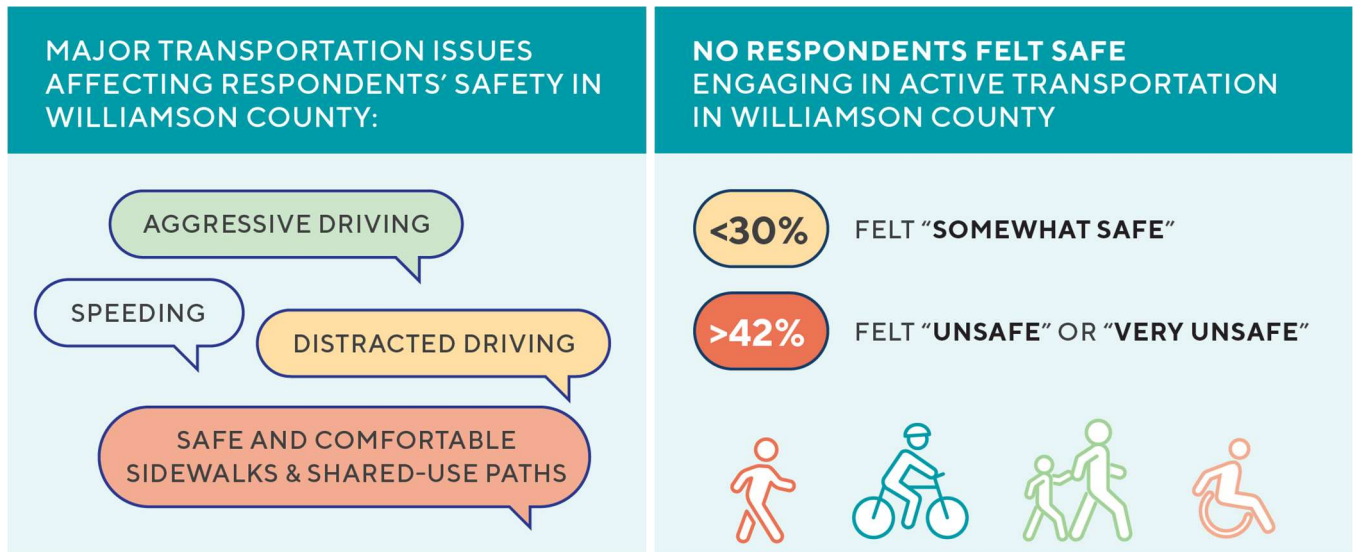
WHAT WE HEARD FROM THE COMMUNITY

CAMPO received 42 survey submissions and 71 online mapped comments. Verbal comments and questions from in-person engagement events were also noted.

Survey Feedback

During the Round 1 comment period, CAMPO received 42 completed or partially completed surveys





In Williamson County, aggressive driving, distracted driving, speeding, and lack of safe and comfortable sidewalks and shared-use paths were the most cited major transportation issues affecting respondents' safety. None of the respondents felt safe engaging in active transportation in Williamson County, with less than 30% of respondents feeling "somewhat safe" and over 42% feeling "unsafe" or "very unsafe" engaging in active transportation in the County.

Interactive Comment Map Feedback

The overarching themes of the interactive mapped comments within Williamson County:

- Lack of adequate lighting throughout the County, but especially along school bus pick-up and drop-off areas
- Speeding vehicles
- Lack of safe routes to school
- Lack of safe pedestrian crossings, especially mid-block

Round 2 Engagement

Round 2 of the outreach efforts shared with the public a map with suggested improvement locations and descriptions of the proposed safety countermeasures. Public input was collected via survey whether the listed safety countermeasures for each respective county addressed their personal roadway safety concerns.

The second public engagement phase included two in-person events, an online open house, and a comment period open from February 14, 2025, through April 15, 2025. The same information was made available online and in-person. The open house materials included downloadable informational exhibits, a fact sheet, a brief survey, and an interactive map. All the outreach materials were posted online and available in English and Spanish.

Public input was collected through printed or online survey responses, emailed comments, or verbal comments at in-person engagement events.

The following subsections describe the engagement approach and what we heard from the community.

THE ENGAGEMENT APPROACH

This section provides an overview of the approach for in-person engagement events and the notification tools used for outreach.

In-Person Engagement Events

Two pop-up engagement events in Williamson County occurred during the Round 2 outreach efforts. The project team held an event in the City of Cedar Park on March 11 and one in the City of Round Rock on March 21, 2025. The project team collected verbal and written responses to the survey inquiring about whether the safety countermeasures addressed the roadway safety concerns. If their concerns were not addressed, the project team documented the details about their concerns. Additionally, the team distributed push cards with more information about the Safety Action Plan, the online open house, and the comment period. An estimated 57 people engaged with the project team at these events in Williamson County.



ROUND 2 ENGAGEMENT POP-UP IN THE CITY OF CEDAR PARK

Notification Tools

This section describes the notification tools used- webpage, social media, ads, media, emails, and other methods.

CAMPO Webpage Announcement

An announcement was posted on the CAMPO webpage on February 14, 2025, notifying the public of the launch of the online open house and open comment period.

Social Media

Information about the plan and how to participate was distributed through CAMPO's X (Formerly Twitter), Facebook, Instagram, and LinkedIn accounts from February 14 to April 15, 2025.

Advertisements

Print and digital advertisements were placed in Community Impact and local newspapers from February 14 to March 14, 2025.

COMMUNITY IMPACT REGIONAL ADVERTISMENTS	
REGION	RUN DATE
CEDAR PARK/FAR NORTHWEST AUSTIN	February 19, 2025
LEANDER/LIBERTY HILL	February 21, 2025
GEORGETOWN	February 27, 2025
COMMUNITY IMPACT REGIONAL ADVERTISMENTS	
REGION	RUN DATE
WILLIAMSON COUNTY SUN	February 14, 2025
EL MUNDO NEWSPAPER (SPANISH-SPEAKING REGIONAL NEWSPAPER)	February 20, 2025

Media Outreach

A media release was distributed to local media outlets throughout the region on February 14, 2025.

Emails

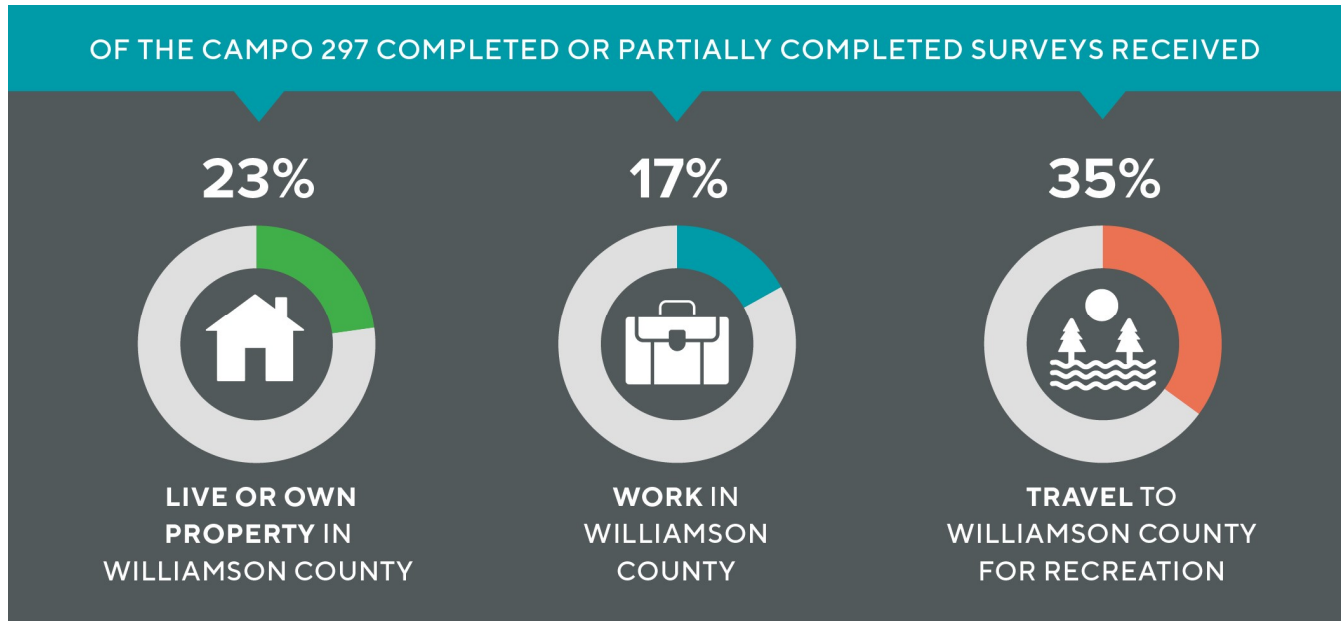
Email notices were sent on February 17, February 28, March 5 and March 14, 2025 to stakeholders, task force members, and community partners to promote participation.

Additional Outreach

The outreach team made direct phone calls and emails throughout the comment period to promote and encourage participation in the online open house. Push cards were distributed to health centers, libraries, senior centers, churches, CARTS stations, city offices, and others throughout the comment period. Additionally, the outreach team shared a social media toolkit including a newsletter blurb and social media content with local jurisdictions, agencies, and community partners on February 14 through April 15, 2025.

WHAT WE HEARD FROM THE COMMUNITY

CAMPO received 297 survey submissions during the Round 2 outreach efforts. From the survey respondents that answered the question about where they live, work, own property, and travel to for recreation, nearly 41% of them cited an answer involving Williamson County.



In the survey, community members were asked whether they feel that the presented safety countermeasures adequately address their roadway safety concerns. If they feel they did not, survey respondents were prompted to give specific feedback on their areas of concern. During the development of the safety plan, community members across Williamson County shared feedback highlighting concerns about traffic congestion, truck traffic, roadway design, and speeding. Residents emphasized the need for safety-focused road expansions, better roadway lighting and signage, and stronger enforcement and education to address reckless driving and speeding, particularly in work zones.

In response, additional targeted projects, behavioral strategies, and policy recommendations were incorporated into the plan. These include roadway improvements to address congestion and freight concerns, expanded driver education and enforcement initiatives, and policy refinements aimed at broader roadway safety enhancements — except in areas where existing or planned projects are already mitigating the identified concerns.



ROUND 2 ENGAGEMENT POP-UP IN THE CITY OF ROUND ROCK

Williamson County Task Force

The Williamson County Safety Action Plan Task Force was formed to guide the development of this SAP. The Task Force included state, regional, and local agencies and met with the project team on four occasions starting in July of 2024 to February of 2025.

The agencies represented in the Williamson County Safety Action Plan Task Force:

- | | | |
|-------------------------|----------------------|------------------------|
| ● Williamson County | ● City of Cedar Park | ● City of Liberty Hill |
| ● TxDOT Austin District | ● City of Georgetown | ● City of Round Rock |
| ● CARTS | ● City of Hutto | ● City of Taylor |
| ● CapMetro | ● City of Jarrell | ● CAMPO |
| ● CTRMA | ● City of Leander | |

The Task Force was updated throughout the development of the SAP beyond the four meetings via email and one-on-one sessions. The individual meetings also provided the project team with vital feedback on the recommended improvements specific to their jurisdiction. **Figure 11** provides a timeline of Task Force engagement throughout the development of the SAP.

The Task Force was engaged at key project milestones, provided input on all components of the SAP, and helped the project team coordinate engagement efforts in their respective jurisdictions. The Task Force will also serve as a body for monitoring the progress on implementing the recommended improvements.



WILLIAMSON COUNTY TASK FORCE MEETING

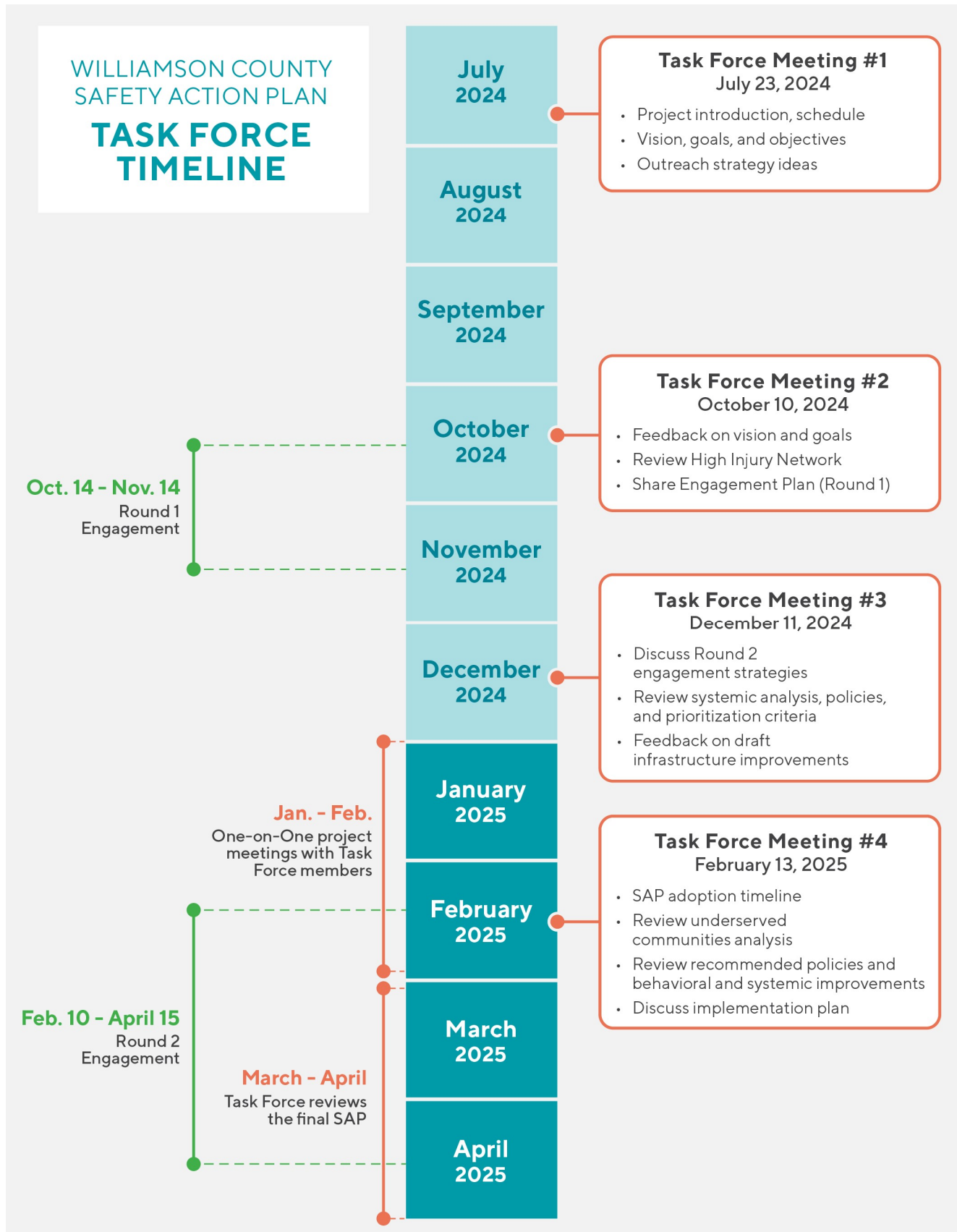


FIGURE 11: WILLIAMSON COUNTY SAFETY ACTION PLAN TASK FORCE MEETINGS SUMMARY

Policy Recommendations

This section summarizes the review of existing plans, policies, programs, guidelines, and standards regarding transportation safety and recommends updating these policies and programs and adopting new ones.

Policy Review

As part of the development of the Williamson County Safety Action Plan, an assessment was conducted of existing policies, guidelines, standards, and plans related to transportation planning and the current prioritization of safety. The review concentrated on important county and city documents that affect the safety of roadways, sidewalks, trails, and other transportation facilities within Williamson County. This process established a baseline and outlined a path for identifying county- and city-level policy recommendations and opportunities to enhance transportation safety for all road users.

This review highlighted how safety and transportation reflect a commitment to public safety, targeting enhancements that better protect and serve the transportation network and its users.

Policy and Program Recommendations for Williamson County

The review of safety needs through data analysis and public feedback, coupled with a review of current policies and practices, resulted in the following policy and program recommendations to improve transportation safety in Williamson County and its cities. These recommendations focus on closing communication gaps, promoting better coordination among local agencies, schools, and law enforcement, reducing fatal and serious injuries, and ensuring safer travel for everyone on the road. Each recommendation is rooted in the core elements of the Safe System Approach and aligned with the emphasis areas of the Texas Road to Zero effort as described in the 2022-2027 Strategic Highway Safety Plan. By aligning with these frameworks, the recommendations focus on creating a transportation system that is safe, reliable, and resilient, prioritizing both proactive measures and system-level improvements.

A full list of Policy, Plan, and Program recommendations can be found in **Appendix B**. The following are a few representative policy recommendations:

- **Speed Management.** Assess current regulatory speed limits and motor vehicle operating speeds to develop a research-backed speed limit setting policy. Consider infrastructure, education, and enforcement actions to support safer speeds, including traffic calming strategies where appropriate.
- **Occupant Protection Enforcement.** Use data analytics to identify high-risk areas and times for targeted enforcement associated with seat belt use. Ensure strategies align with state-wide enforcement campaigns for consistency.
- **Traffic Signal Improvement for First Responders.** Follow TxDOT's Traffic Signal Manual guidelines for integrating preemption control technologies to enhance traffic flow and emergency response times.
- **Intersection Control Evaluation Policy.** Develop an Intersection Control Evaluation (ICE) policy consistent with TxDOT's framework to determine appropriate intersection improvements.
- **School Zone Speed Enforcement.** Develop programs that collaborate with schools and parent-teacher associations to identify areas of enhanced safety improvements (rapid flashing beacons, speed feedback signs, etc.).
- **Truck/Freight Route Policy.** Develop a policy per TxDOT's guidelines on truck routes and parking restrictions. Consider local ordinances for designated truck routes and parking to identify areas where freight and vulnerable road user paths intersect. Implement measures such as designated truck lanes or time-based restrictions.
- **Public Awareness Campaign.** Develop a program aligned with TxDOT's safety campaigns to increase public awareness of traffic safety issues.

Safety Countermeasures

The proposed improvements and strategies incorporate a range of safety countermeasures tailored to Williamson County's specific needs. This section briefly describes each infrastructure improvement, behavioral strategy, and policy recommendation, the types of collisions they address, and high-level cost estimates. Safety countermeasures are categorized into segment-related (non-intersection), intersection-related, and vulnerable road users. See **Appendix C** for a detailed list of the safety countermeasures described in this section.

Segment-Related Safety Countermeasures

Roadway and lane departure crashes account for 59% of fatal and serious injury crashes in Williamson County. **Table 2** provides a list of recommended segment-related safety countermeasures including infrastructure treatments, behavioral strategies, and policy recommendations.

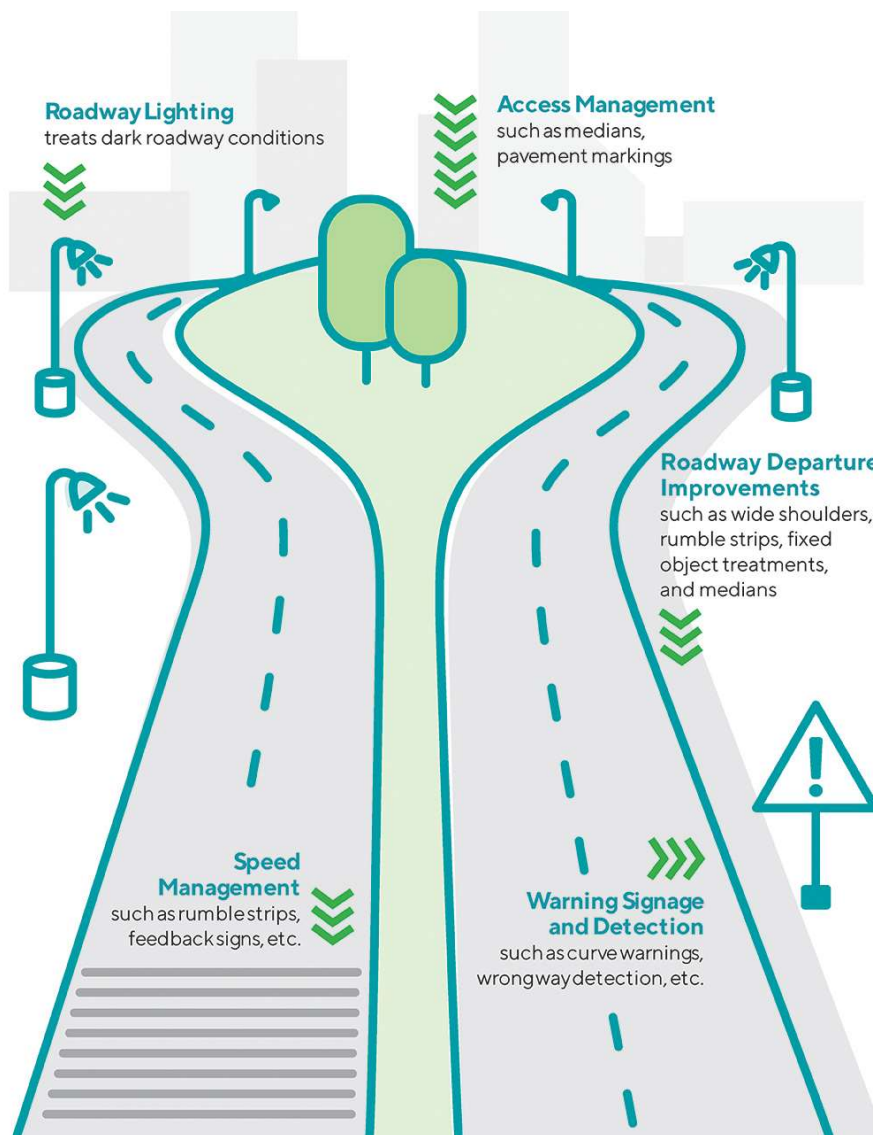


TABLE 2: RECOMMENDED SEGMENT-RELATED SAFETY COUNTERMEASURES

STRATEGY	COUNTERMEASURES
Infrastructure Treatments 	• Install: ○ Centerline rumble strips ○ Raised medians or median barriers ○ Raised pavement markers or profiled center lines ○ Chevron signs, curve warning signs, posted speed limit reductions, and/or sequential flashing beacons in curves ○ High friction pavement surface treatments ○ Wider, brighter, and more durable edge lines, especially on curves ○ Signage to increase awareness of vulnerable road users who may be in the clear zone or in a sight-limited location such as a curve or tunnel ○ Roadside safety hardware such as guardrail, cable barrier, or concrete barrier • Locate and inventory fixed objects inside the clear zone to support development of programs and projects to reduce the severity of lane departure crashes. • Widen shoulders. • Reconfigure vehicle lanes to mixed-use lanes.
	• Disseminate outreach materials and social media posts educating the public on the major causes of lane departure crashes (e.g., speeding). • Host the National Highway Transportation Safety Administration (NHTSA) Speed Management Program course for local engineers, planners, and law enforcement. • Use dynamic speed feedback signs on sections of roadways where speed related crashes are of concern. • Encourage the use of coordinated high-visibility enforcement activities addressing high-risk driving behavior, particularly on weekends and evenings for alcohol and drug-impaired crashes. • Use Texas Highway Safety Office (TxHSO) Law Enforcement Liaisons to improve participation from law enforcement in conducting high-visibility enforcement to address impaired driving and distracted driving.

Behavioral Strategies



STRATEGY	COUNTERMEASURES
Policy Recommendations 	• Develop a policy consistent with TxDOT's and the Illuminating Engineering Society's guidelines for roadway lighting installation, focusing on areas identified with CRIS data analysis. • Implement a feedback mechanism for road users to report maintenance issues in real time. • Follow TxDOT's and Department of Public Safety's guidelines for high-visibility enforcement operations and public awareness campaigns targeted at aggressive driving. • Partner with local organizations in Central Texas to implement interactive workshops and virtual reality simulations to demonstrate the dangers of impaired driving and distracted driving. • Develop a program that aligns with TxDOT's "Talk. Text. Crash." campaign aimed at informing drivers of the risks of distracted driving. • Incorporate data from the HIN to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized. • Deploy automated speed enforcement tools in work zones. Ensure compliance with TxDOT's work zone safety regulations. • Develop an implementable regular maintenance schedule of existing road signs to ensure sign visibility and compliance. • Develop a speed limit policy and procedures process based on current research and methodologies that include contextual factors and align with TxDOT's Speed Zone Manual.

Intersection-Related Safety Countermeasures

Intersection-related crashes account for 41% of fatal and serious injury crashes in Williamson County. Intersections present complex traffic interactions that contribute to higher crash frequencies. **Table 3** provides a list of recommended countermeasures to reduce potential conflicts at an intersection.

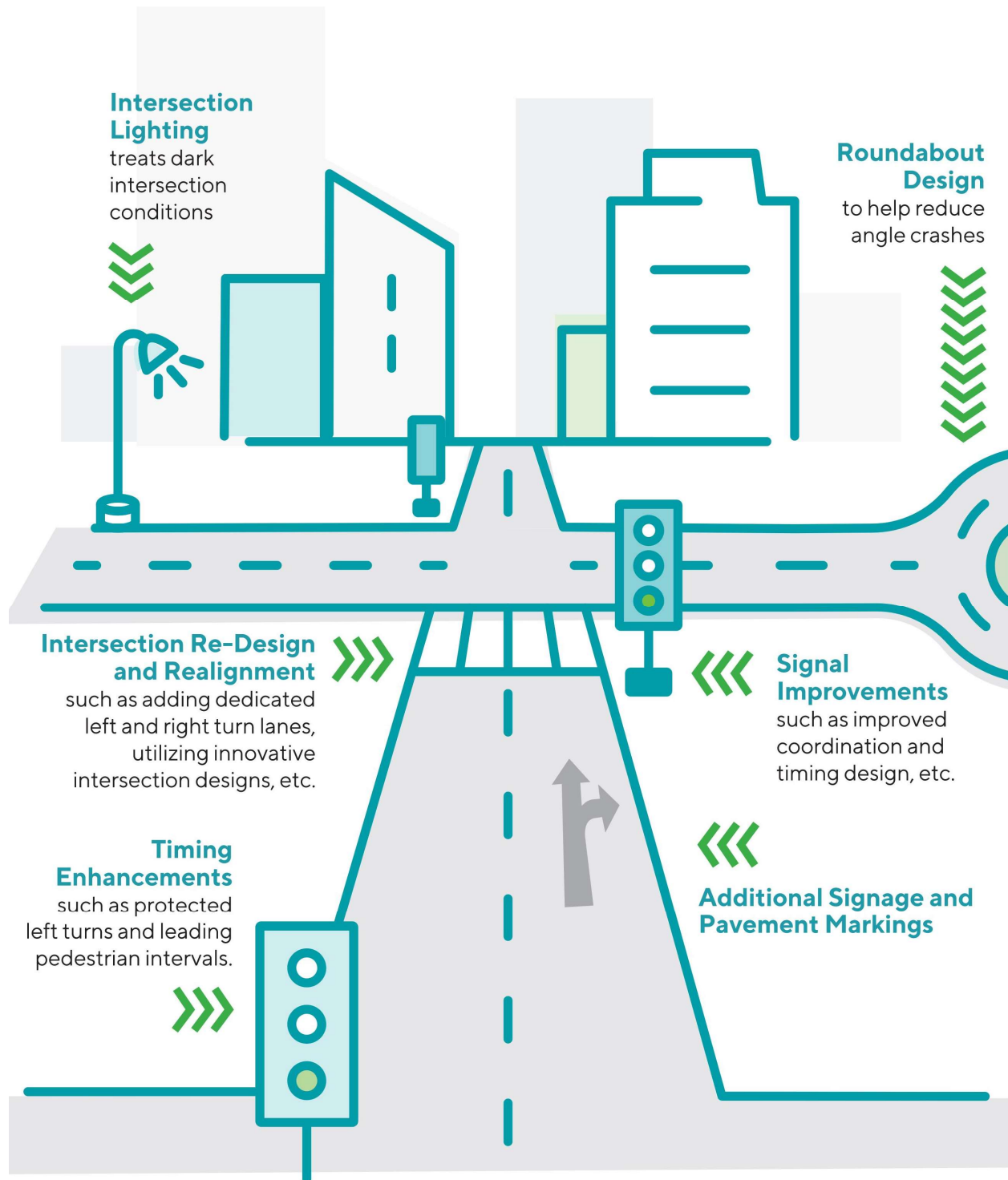


TABLE 3: RECOMMENDED INTERSECTION-RELATED SAFETY COUNTERMEASURES

STRATEGY	COUNTERMEASURES
Infrastructure Treatments: Speed Reduction/Management 	• Install transverse rumble strips on rural stop-controlled approaches. • Provide advanced dilemma zone detection (real-time warning) for high-speed approaches at rural signalized intersections. • Install curb extensions or daylighting treatments at intersections.
Infrastructure Treatments: Intersection Reconfiguration 	• Install or convert intersections to roundabouts. • Convert permitted left turns to protected left turns at signals. • Use intersection conflict warning systems (real-time warning) to warn drivers on mainline or side roads of conflicting traffic at rural intersections. • Increase pavement friction using high-friction surface treatments at intersection approaches. • Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists. • Restrict access to properties/driveways adjacent to intersections using closures or turn restrictions.
Infrastructure Treatments: Traffic Signal Improvements 	• Install emergency vehicle signal preemption. • Modify signal phasing to implement a leading pedestrian interval. Add bicycle traffic signals where bike lanes are installed. • Implement flashing yellow arrows at signals. • Optimize traffic signal clearance intervals, including consideration for leading pedestrian intervals. • Coordinate arterial signals.

STRATEGY	COUNTERMEASURES
Infrastructure Treatments: Intersection Visibility Improvements 	• Increase sight distance (visibility) of intersections on approaches such as applying daylighting treatments (e.g., markings, curb bulb outs) and increasing vegetation management. • Add retroreflective borders to traffic signal head back plates. • Increase the visibility of signals and signs at intersections. • Add lighting, including pedestrian-scale lighting. • Install retroreflective markings and pavement treatments to enhance visibility at night.
Behavioral Strategies 	• Support and educate the public on the safety advantages of using emerging technologies such as intelligent transportation systems and connected vehicles. • Use TxHSO Law Enforcement Liaisons to improve participation from law enforcement in conducting high-visibility enforcement to address red light running. • Conduct focused intersection enforcement patrols with high-visibility behavioral campaigns (e.g., impaired driving, occupant protection, distracted driving). • Encourage the use of coordinated high-visibility enforcement activities addressing high-risk driving behavior, particularly on weekends and evenings for alcohol and drug-related crashes. • Conduct impaired driving training for law enforcement personnel, including Drug Recognition Expert (DRE) and Advanced Roadside Impaired Driving Enforcement (ARIDE) training programs.
Policy Recommendations 	• Develop an Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements. • Develop a traffic calming program. • Follow FHWA and TxDOT guidance for adaptive signal control to improve traffic flow and emergency response.

Vulnerable Road User Safety Countermeasures

Vulnerable road users include pedestrians and pedalcyclists. Pedestrians accounted for 88 fatal and serious crashes, and pedalcyclists accounted for 41 fatal and serious injury crashes within Williamson County from 2019 to 2023. **Table 4** provides a list of recommended countermeasures to improve the safety of vulnerable road users.



NOTE: Pedestrian and Bicyclist Safety Countermeasures are also used in the segment and intersection countermeasures.

TABLE 4: RECOMMENDED VULNERABLE ROAD USER SAFETY COUNTERMEASURES

STRATEGY	COUNTERMEASURES
Infrastructure Treatments: Enhance Pedestrian and Bicycle Crossings 	- Update existing or develop new pedestrian crossings with additional features such as marked crosswalks, rectangular rapid flashing beacons, curb extensions, raised crosswalks, or advanced warnings. - Increase sight distance and visibility at pedestrian and bicyclist crossings by clearing vegetation, extending crossing times, adding pedestrian and bicyclist leading intervals, and/or adding pedestrian-scale illumination. At mid-block locations, provide adequate distance between stop bars and the crossing; apply speed management as needed to provide sufficient stopping time for motorists; and consider the use of raised crossings. - Add refuge islands and raised pedestrian and bicyclist crossings and shorten crossing distances with bicycle-friendly curb extensions or daylighting treatments where these crosswalk enhancements are needed.
Infrastructure Treatments: Improve Lighting 	Illuminate crosswalks with positive contrast to make it easier for a driver to identify the pedestrian visually.
Infrastructure Treatments: Roadway Reconfiguration 	- Reduce the number of travel lanes, assess posted speed limit, narrow travel lanes, and install separated bicycle and pedestrian facilities in areas with high multi-modal use. - Install center and/or bicycle-friendly edge line rumble strips. - Install separated pedestrian facilities (sidewalks and multi-use paths), especially in urban areas and adjacent to schools, bus stops, and school walk areas. Right-size the facilities to the projected pedestrian and pedalcyclist demand.

STRATEGY	COUNTERMEASURES
Infrastructure Treatments: Intersection Improvements Designed for Active Transportation User Safety 	• Install left turn lanes designed and operated with explicit consideration for safety of active transportation users. • Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists. • At traffic signals, add bicycle signal heads and provide a leading signal interval. At intersections, install colored bicycle boxes where appropriate for bicycle movements.
Infrastructure Treatments: Separated Pedestrian/Bicycle Facilities 	• Remove permissive left turn signals that conflict with pedestrian/bicyclist movements, eliminate right turn on red at signals, and provide protected signal phases for pedestrian/bicyclist movements. • Install separated pedestrian and bicycle facilities such as sidewalks, buffered or protected bike lanes, shared use paths, and regional trails. Right-size the facilities to the projected pedestrian and pedalcyclist demand. • Add a delay between pedestrian walk phase and vehicle green phase.

STRATEGY	COUNTERMEASURES
Behavioral Strategies 	• Educate the public about the need to be self-aware when traveling and be conspicuous, particularly when walking or biking. Encourage the public to wear bright-colored clothing and carry a flashlight. Provide reflective tapes and materials to the public. • Partner with local law enforcement to conduct high-visibility speed enforcement in and around school zones during start and end times. • Use dynamic speed feedback signs in school zones during start and end times. • Promote public awareness of vulnerable user safety issues, contributory circumstances, and provide education/ training for pedestrians, bicyclists, and motorists of all ages on ways to avoid crashes. • Coordinate and support vulnerable road user safety and enforcement by law enforcement to conduct high-visibility enforcement of bicyclists, pedestrians, and motorists who are violating traffic safety laws that may endanger them or other multi-modal travelers. • Disseminate outreach materials and provide training to educate the public and law enforcement personnel on new traffic control device installations, such as Pedestrian Hybrid Beacons (HAWK signals).

STRATEGY	COUNTERMEASURES
Policy Recommendations 	• Increase enforcement strategies (speed feedback signs, high-visibility enforcement, etc.) that comply with Texas state laws regarding speeding within a school zone. • Develop a policy to include crash data analysis and community input involving vulnerable road users in Central Texas to identify specific needs and concerns. • Develop initiatives to improve safety for vulnerable road users and adhere to TxDOT's design standards and national best practices. These include pedestrian countdown signals, protected bike lanes, and public engagement campaigns. • Develop a Complete Streets policy to enhance the pedestrian/bicyclist environment along roadways with higher-than-normal pedestrian/bicyclist activity. • Consider developing a policy based on TxDOT's methodologies for assessing pedestrian and bicyclist level of traffic stress (LTS). • Develop a plan to assess existing Americans with Disabilities Act (ADA) and TxDOT's accessibility guidelines to prioritize improvements in areas with high ped/bike activity and documented accessibility issues. • Develop a policy in accordance with TxDOT's guidelines on truck routes and consider local ordinances for designated truck routes to identify areas where freight routes and ped/bike paths intersect and implement measures such as designated truck lanes or time-based restrictions. • Develop a program that collaborates with local schools and parent-teacher associations to identify areas for enhanced safety improvements (e.g., rectangular rapid flashing beacons, speed feedback signs). • Develop a program that follows national best practices for traffic calming guidelines.

Systemic Safety Countermeasure Packages

Systemic safety countermeasure packages are a proactive approach to eliminating traffic fatalities and serious injuries. Unlike traditional safety measures that react to past crashes, systemic safety focuses on identifying and addressing high-risk factors before crashes occur. By analyzing roadway design, traffic patterns, and human behavior, these improvements implement proven countermeasures to create safer streets for all users. Emphasizing data-driven decision-making, systemic safety projects aim to build a transportation network where mistakes do not result in severe harm, ultimately advancing the goal of zero traffic deaths.

For example, a package of systemic treatments to improve safety at rural stop-controlled intersections could include several of the following HSIP-eligible countermeasures:

- Install Overhead Signs
- Install Advanced Warning Signals (Intersection - Existing Warning Signs)
- Install Advanced Warning Signals and Signs (Intersection)
- Install Advanced Warning Signs (Intersection)
- Install Flashing or LED-embedded Stop Signs
- Install Pavement Markings

This combination of treatments addresses crash patterns in which drivers fail to stop, including angle, turning vehicle, and rear-end crashes.

Appendix D outlines the systemic safety countermeasure packages for Williamson County, organized by Texas Road to Zero Emphasis Area. Where several safety countermeasures can be applied to a location with common characteristics, packages of treatments are proposed that can be applied in combination to produce a more comprehensive safety project.

Targeted Improvement Development and Prioritization

This section describes the development of targeted safety improvements and prioritization of those improvements.

Targeted Improvement Development

Targeted safety improvements focus on locations within the high injury network where the severity and frequency of crashes are most concentrated. By prioritizing these high-risk areas, these improvements aim to deliver immediate, life-saving interventions where they are needed most. Using crash data, local knowledge, and community input, proven countermeasures are recommended to mitigate safety risks. These improvements were developed for many of the highest-ranking corridors and intersections within the Williamson County High Injury Network and other locations identified by the Task Force and the public. The location of each targeted improvement is shown in **Figure 12** for corridors and **Figure 13** for intersections and spot locations. The corresponding improvement list with descriptions are included in **Table 5** for corridors and **Table 6** for intersections.

Prioritization

This section outlines the Prioritization Criteria Process to guide the implementation of safety-driven infrastructure improvements within Williamson County. The prioritization criteria are tailored towards selecting the most beneficial safety projects that implement the vision of the Williamson County Safety Action Plan.

The criteria are also intended to be a helpful framework for ranking identified safety projects to use multiple funding sources through local, regional, statewide, and national programs. Through prioritization, Williamson County and its partner agencies can employ data-driven decision-making regarding the allocation of limited funds to address the most prominent safety issues and support the County in moving towards zero traffic fatalities and serious injuries.

Each improvement is evaluated based on a set of **five criteria**:

1. **Crash Reduction Potential**, estimates the potential for crash reduction, with greater weight given to projects addressing more severe and numerous crashes.
2. **Cost Estimate**, categorizes projects based on high-level ballpark estimated costs, providing a sense of financial investment and a proxy for constructability.
3. **Vulnerable Road Users Benefits**, assesses the project's ability to improve safety for pedestrians and cyclists, the most vulnerable road users facing the highest risk of serious or fatal crashes. Pedestrian and bicycle crashes are also often underreported, highlighting the importance of prioritizing projects for these users to address unrecorded safety risks.
4. **Underserved Communities Benefits**, prioritizes projects benefiting underserved or vulnerable communities.
5. **Readiness Level**, evaluates the project's readiness for implementation, considering design status and funding availability.

After evaluating projects based on the prioritization criteria, each improvement receives a total score by summing the points across all five criteria. The total score comprehensively measures the improvement's overall benefit, feasibility, and alignment with County goals.

Improvements are grouped into a three-tiered system, the thresholds for each tier were determined using natural breaks in the score distribution. Tier 1 is the highest priority, Tier 2 is medium priority, and Tier 3 is lower priority. This approach supports effective resource allocation, focusing on improvements that best use safety funding to reduce fatal and serious injury crashes in Williamson County while maintaining flexibility in implementation.

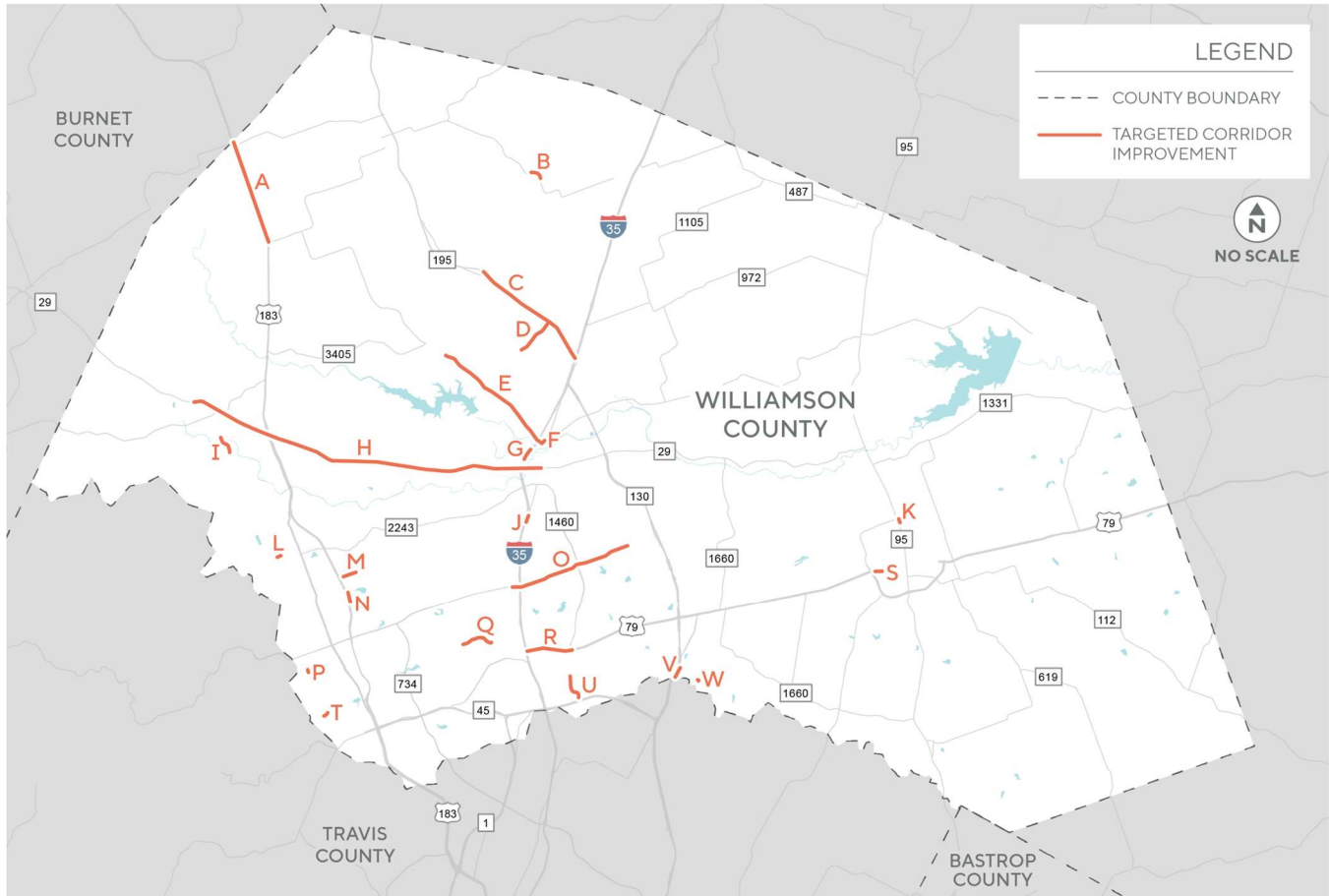


FIGURE 12: TARGETED IMPROVEMENT LOCATIONS - CORRIDORS

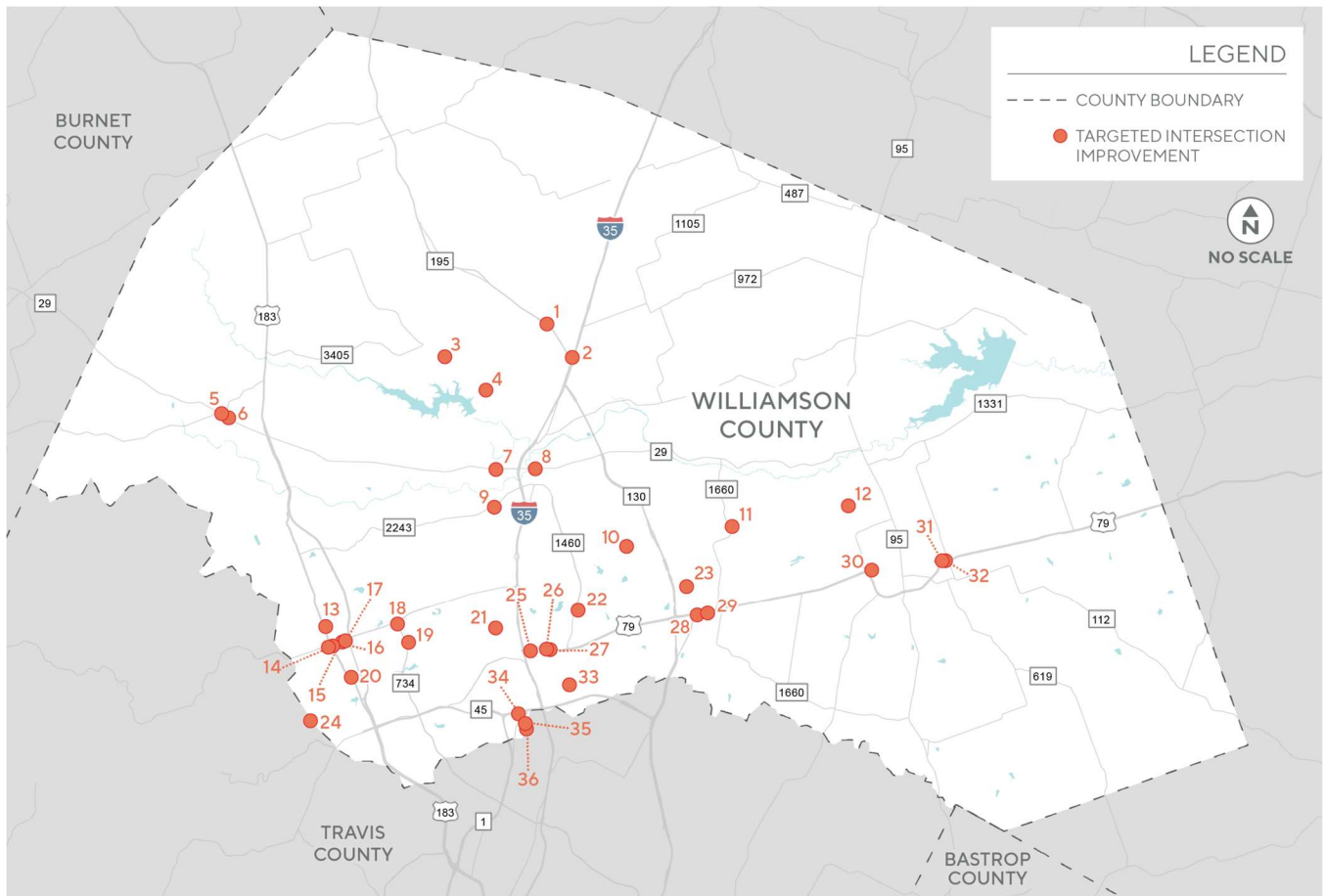


FIGURE 13: TARGETED IMPROVEMENT LOCATIONS - INTERSECTIONS/SPOT LOCATIONS

TABLE 5: LIST OF TARGETED CORRIDOR IMPROVEMENTS

ID	ROADWAY NAME	LIMITS FROM	LIMITS TO	IMPROVEMENT DESCRIPTION	SAFETY ISSUES	LEAD AGENCY	TIER
A	US 183	FM 970	Williamson County Line	Add centerline rumble strips and refresh edgeline rumble strips, add roadway safety lighting, widen shoulder.	Angle, Head-on	TxDOT	Tier 3
B	FM 487	Spears Ranch Road	CR 234	Add curve advisory signs and chevrons.	Roadway and Lane Departure, Speed Management	TxDOT	Tier 3
C	SH 195	Ronald Reagan Boulevard	IH 35	Add rumble strips and roadway lighting. Install wrong-way detection system. Replace "signal ahead" warning sign with roadside flashing beacon and "signal ahead" warning sign at IH 35.	Roadway and Lane Departure, Dark Conditions	TxDOT	Tier 2
D	Shell Road	Shell Spur	SH 195	Add edge line and center line rumble strips. Widen paved shoulder.	Roadway and Lane Departure	Williamson County	Tier 3
E	Williams Drive	Jim Hogg Road	Austin Avenue	Add raised median with strategically placed hooded lefts, raised profile lane line markings, raised profile markers, safety treat fixed objects, and roadway lighting.	Angle Crashes, Roadway and Lane Departure, Dark Conditions	Georgetown	Tier 2
F	Austin Avenue	Williams Drive	Approximately 0.2 miles north of Williams Drive	Add a raised median with hooded lefts.	Angle Crashes, Pedestrian/Bicyclist Crashes	Georgetown	Tier 3
G	IH 35 Southbound Frontage Road	Rivery Blvd	River Hills Dr	Add roadway lighting.	Dark Conditions	TxDOT	Tier 2

ID	ROADWAY NAME	LIMITS FROM	LIMITS TO	IMPROVEMENT DESCRIPTION	SAFETY ISSUES	LEAD AGENCY	TIER
H	SH 29/University Avenue	CR 200/LP 332	South Austin Avenue	Add raised median at strategic locations. Add rumble strips. Fill sidewalk gaps at strategic locations. Add chevrons, curve ahead/speed advisory signs. Widen shoulder and extend the guardrail around curve (safety treat fixed objects).	Speed Management, Roadway and Lane Departure, Pedestrian/Bicyclist Crashes	TxDOT	Tier 3
I	CR 279	S-curve on either side of the bridge crossing the South Fork San Gabriel River	-	Add curve advisory signs and chevrons. Add rumble strips where they do not exist. Widen paved shoulder.	Angle Crashes	Williamson County	Tier 3
J	IH 35 Southbound	Southwest Bypass Entrance Ramp	Approximately 0.5 miles south of Entrance Ramp	Relocate southbound entrance ramp farther from Southwest Bypass, approximately 3,000 ft. south from its current location.	Roadway and Lane Departure, Rear End Crashes Unsafe weaving	TxDOT	Tier 3
K	SH 95	Carlos G Parker Boulevard	Approximately 0.1 miles south of Carlos G Parker Boulevard	Fill sidewalk gap.	Roadway and Lane Departure, Dark Conditions	TxDOT	Tier 3
L	Hero Way	Bagdad Road	Approximately 0.3 miles east of Bagdad Road	Extend raised median.	Roadway and Lane Departure, Dark Conditions	Leander	Tier 3
M	Crystal Falls Parkway	US 183A	Ridgmar Road	Close cross-overs where possible and align left-turns for a positive offset where possible. Add roadway lighting.	Angle Crashes	Leander	Tier 3
N	US 183A Northbound Frontage Road	Volta Drive	North of Scottsdale Drive	Add a speed limit sign near the exit ramp. Add guardrail on the east side of the roadway.	Roadway and Lane Departure	TxDOT	Tier 3

ID	ROADWAY NAME	LIMITS FROM	LIMITS TO	IMPROVEMENT DESCRIPTION	SAFETY ISSUES	LEAD AGENCY	TIER
O	FM 1431/University Boulevard	Railroad tracks west of IH 35	CR 110	Add rumble strips and median cable barrier at strategic locations.	Angle Crashes, Rear End Crashes, Pedestrian/Bicyclist Crashes	TxDOT	Tier 3
P	Lakeline Boulevard	Cedar Park Drive	West Park Street	Add raised profile markings.	Roadway and Lane Departure	Cedar Park	Tier 3
Q	Hairy Man Road	Great Oaks Drive	Creek Bend Blvd	Add additional guardrail and remove trees from clear zone where applicable.	Head On Crashes, Rear End Crashes	Williamson County	Tier 3
R	US 79	IH 35	AW Grimes Boulevard	Fill sidewalk gaps.	Pedestrian/Bicyclist Crashes, Head On Crashes	TxDOT	Tier 1
S	US 79	Carlos G Parker Boulevard	Sloan Street	Add raised median with strategically placed hooded lefts.	Angle Crashes	Taylor	Tier 3
T	Cypress Creek Road	Sun Chase Boulevard	Lakeline Boulevard	Add edgeline delineators. Evaluate speed limit using USLIMITS2.	Angle Crashes, Pedestrian/Bicyclist Crashes	Cedar Park	Tier 3
U	AW Grimes Boulevard	Thompson Trail	SH 45N	Add chevrons and curve ahead/speed advisory signs. Extend median to create hooded lefts.	Speed Management, Roadway and Lane Departure	Round Rock	Tier 3
V	SH 130 Northbound Frontage Road	CR 138	FM 685	Add rumble strips. Add channelization at driveways to prevent wrong-way turns.	Roadway and Lane Departure	TxDOT	Tier 3
W	CR 138	West of Spring Valley St	-	Add/replace curve advisory signs and chevrons.	Roadway and Lane Departure	Williamson County	Tier 3

TABLE 6: LIST OF TARGETED INTERSECTION/SPOT LOCATION IMPROVEMENTS

ID	LOCATION	IMPROVEMENT DESCRIPTION	LEAD AGENCY	TIER
1	SH 195 and Shell Rd	- Signal head backplates - Additional intersection signage - Signal head improvements	TxDOT	Tier 2
2	South of SH 195 at IH 35 SBFR	Replace "signal ahead" warning sign with roadside flashing beacon with "signal ahead" warning sign	TxDOT	Tier 3
3	Williams Dr and Jim Hogg Dr	- Signal head backplates - Pavement marking improvements - Signal timing evaluation	Georgetown	Tier 3
4	DB Wood Rd and Williams Dr	- Supplemental signal heads - Additional intersection signage - Intersection lighting - Signal head backplates	Georgetown	Tier 1
5	SH 29 at Ranch Road 1869	- Add pedestrian signals and crosswalks to existing signal - Signal timing evaluation - Pavement marking improvements - Signal head backplates	TxDOT, Liberty Hill	Tier 1
6	SH-29 at Main St	Evaluate a pedestrian hybrid beacon	TxDOT, Liberty Hill	Tier 3
7	University Ave and DB Wood Rd	- Signal head backplates - Additional intersection signage	TxDOT, Georgetown	Tier 3
8	W University Ave at Hart St	Evaluate a pedestrian hybrid beacon	TxDOT, Georgetown	Tier 3
9	Leander Rd and Southwest Bypass	- Signal head backplates - Replace "signal ahead" warning sign with roadside flashing beacon with "signal ahead" warning sign - Additional intersection signage	TxDOT, Georgetown	Tier 2
10	University Blvd and CR 110	- Signal head backplates - Pavement marking improvements	Round Rock	Tier 2
11	FM 1660 and Chandler Rd	- Pavement marking improvements - Roadside flashing beacons	TxDOT, Hutto	Tier 2
12	CR 366 and Chandler Rd	Evaluate a new traffic signal	Taylor	Tier 3
13	New Hope Dr and Bell Blvd	- Additional intersection signage - Signal timing evaluation - Signal head backplates	Cedar Park	Tier 1
14	W Whitestone Blvd at Walton Way	Signal timing evaluation	TxDOT, Cedar Park	Tier 3
15	W Whitestone Blvd at US 183	- Signal timing evaluation - Evaluate Leading Pedestrian Interval (LPI) - Additional signage at intersection	TxDOT	Tier 2
16	E Whitestone Blvd and Quest Pkwy	Realign left turn lanes to improve sight distance	TxDOT, Cedar Park	Tier 3

ID	LOCATION	IMPROVEMENT DESCRIPTION	LEAD AGENCY	TIER
17	E Whitestone Blvd and Discovery Blvd	Evaluate LPI	TxDOT, Cedar Park	Tier 3
18	Whitestone Blvd at Parmer Ln	Supplemental signal heads	TxDOT	Tier 3
19	Parmer Ln at Ranch Trails/Kenal Dr	- Supplemental signal heads - Intersection lighting	Cedar Park	Tier 2
20	Cypress Creek Rd and Bell Blvd	- Supplemental signal heads - Signal head backplates	TxDOT, Cedar Park	Tier 3
21	Old Settlers Blvd and Creek Bend Blvd	- Signal timing evaluation - Signal head backplates - Intersection lighting	Round Rock	Tier 2
22	Grimes Blvd and Old Settlers Blvd	- Signal head backplates - Pavement marking improvements - Supplemental signal heads - Additional signage at intersection	TxDOT, Round Rock	Tier 1
23	CR 108 and Limmer Loop	- Adjust pavement markings to create a left-turn lane - Roadside flashing beacons - Intersection lighting - Evaluate a new traffic signal	Hutto	Tier 1
24	Cypress Creek Rd at El Sol Dr	Evaluate a roundabout	Cedar Park	Tier 3
25	US 79 (650 ft) west of Palm Valley and Mays St (At U-Turn)	Close median opening and facilitate u-turns at adjacent signalized intersections	TxDOT	Tier 2
26	US 79 at Egger Ave	Pedestrian crosswalk	TxDOT, Round Rock	Tier 2
27	US 79 at Georgetown St	- Pedestrian crosswalk - Evaluate LPI - Intersection lighting - Pavement marking improvements	TxDOT, Round Rock	Tier 1
28	US 79 and Chris Kelley Blvd / Ed Schmidt Blvd	- Supplemental signal heads - Evaluate LPI - Signal timing improvements - Intersection lighting - Additional signage at intersection	TxDOT, Hutto	Tier 1
29	US 79 at Exchange Blvd	Signal timing evaluation	TxDOT, Hutto	Tier 3
30	Carlos G Parker Blvd Northbound to Westbound US 79 Loop	Add chevrons to curve	TxDOT	Tier 3
31	Loop from US 79 to Carlos G Parker Blvd	Add chevrons to curve	TxDOT	Tier 3

ID	LOCATION	IMPROVEMENT DESCRIPTION	LEAD AGENCY	TIER
32	Loop from Carlos G Parker Blvd to US 79	Add chevrons to curve	TxDOT	Tier 3
33	Gattis School Rd and Grimes Blvd	- Signal head backplates - Pavement marking improvements	Round Rock	Tier 2
34	SH 45 Toll and CR 172	- Signal head backplates - Additional intersection signage - Intersection lighting - Signal ahead roadside flashing beacon - Pavement marking improvements	TxDOT, Williamson County	Tier 1
35	600 ft North of Grand Avenue Pkwy and Quick Hill Rd on Quick Hill Rd	Evaluate a rectangular rapid flashing beacon	Williamson County	Tier 3
36	Grand Avenue Pkwy and Quick Hill Rd	- Pedestrian crosswalk - Additional intersection signage - Evaluate a roundabout	Williamson County	Tier 3

Implementation Plan

The suggested improvements, proposed safety countermeasures, and recommended policy updates identified in the Williamson County SAP require guidance and transparency. The County SAP Implementation Plan includes a general approach to different funding sources for implementing the project strategies, methods for championing and achieving policy updates, and a method to measure and monitor progress in reaching the Road to Zero goal.

Funding Safety Improvements

To be awarded funding from most sources, the suggested improvements, safety countermeasures, and policy updates need to be identified in a publicly available document, which this SAP accomplishes. The suggested improvements and project strategies in this plan are more likely to be awarded funding if they are included in other plans or programs, such as local agency long-range transportation plans or a transportation/capital improvement program. Incorporating the identified improvements in other areas allows the agency to cast a wider net for funding sources.

Funding to help implement the suggested project strategies and improvements and to advocate and enact policy updates can come from various federal, regional, state, and local sources. State funding for roadway safety improvements include, but are not limited to, programs such as the Highway Safety Improvement Program and Transportation Alternatives (TA) set-aside program. Regionally, agencies can apply for funding from sources such as the CAMPO call for projects. Improvements identified in this SAP can also be used to apply for federal funds from programs such as the federal Safe Streets and Roads for All Grant Program.

Championing Policy Changes

Policy changes and adoption can become an unexpected uphill battle, frequently shouldered by the most passionate advocates who find themselves fighting for these changes seemingly alone. The updates to roadway safety policies in Williamson County require fierce championing and cross collaboration within agencies and departments such as planning departments, public works departments, zoning departments, public health departments, transit agencies, school district boards, and city council members, to name a few.

Task Force members can help achieve the Road to Zero goal in the County and propel these policy changes locally. Task Force members can:

- Identify a governing body and/or official, ideally one that advocates transportation or roadway safety.
- Contact the governing body and/or official about the SAP, inform them of policy improvements identified in the plan, and encourage the legislation and development and adoption of the policy update(s).
- Publicly promote the policy update(s) with other advocates.
- Facilitate a public commitment to achieving the county's Road to Zero goal through the various policy updates.

Measuring & Monitoring Progress

CAMPO is developing a process for monitoring the implementation of the suggested improvements, safety countermeasures, and policy updates to measure the projects' effectiveness and desired outcomes. Member jurisdictions of Williamson County can continue to work with CAMPO to measure and monitor progress. This process will measure the outcomes of the SAP goals and objectives (i.e., the number and severity of roadway crashes in the county) in achieving the Road to Zero goal.



CAPITAL AREA METROPOLITAN
PLANNING ORGANIZATION

APPENDIX

CONTENTS

APPENDIX A: WILLIAMSON COUNTY SAFETY ANALYSIS TECHNICAL MEMORANDUM

APPENDIX B: WILLIAMSON COUNTY POLICY RECOMMENDATIONS TECHNICAL MEMORANDUM

APPENDIX C: WILLIAMSON COUNTY SAFETY COUNTERMEASURES TECHNICAL MEMORANDUM

APPENDIX D: WILLIAMSON COUNTY SYSTEMIC SAFETY PACKAGES





Appendix A

WILLIAMSON COUNTY SAFETY ANALYSIS TECHNICAL MEMORANDUM

WILLIAMSON COUNTY SAFETY ANALYSIS

TECHNICAL MEMORANDUM

Introduction

Improving the safety of Williamson County roadways is imperative to the Capital Area Metropolitan Organization (CAMPO), local agencies, and the community. CAMPO is developing a county-level safety action plan (SAP) for Williamson County, including local agencies and other partners within the county. The Williamson County SAP will roll into the greater Regional Safety Action Plan (RSAP) that CAMPO is conducting concurrently. The safety analysis aims to provide key observations about the state of safety and recommend targeted safety improvements in Williamson County.

This report summarizes the historical crash analysis, the systemic safety analysis, and the development of a hotspot and high-injury network (HIN) for Williamson County. This county-level analysis considers all roadway classes, including local roads (i.e., the analysis is not constrained by the regional significance thresholds defined in the 2045 Regional Transportation Plan). Crash data from the most recent five years (2019 – 2023) was obtained for Williamson County, and crash patterns by severity, lighting condition, weather condition, intersections, impaired driving and many other contributing factors were studied and presented in this report. Analyzing crash patterns by contributing factors helps identify focus areas that are areas of high potential safety risks in Williamson County. These findings are presented in a systemic analysis that allows the project team to identify location characteristics that are more susceptible to fatal and serious injuries. Hotspot and high injury network development enables the project team to geospatially locate safety issues related to the high risk of fatal and serious injuries, traffic stress for active transportation, excessive speeding, and safe transit access.

The Williamson County safety analysis follows the Texas Strategic Highway Safety Plan (SHSP) and the RSAP. The recommendations and countermeasures in this analysis aim to support local safety planning efforts to eliminate fatal and serious injury crashes and reduce crashes overall for all roadway users in the County.

Crash Analysis Methodology

Crash analysis was conducted using the most recent five years of crash data from 2019 to 2023 in Williamson County. The project team obtained crash data from the Texas Crash Records Information System (CRIS) maintained by the Texas Department of Transportation (TxDOT). Crash data was obtained in CSV file format via the public request portal available at <https://cris.dot.state.tx.us/>. The crash data consists of crashes by severity type using the KABCO scale¹: fatal injury (K), suspected serious injury (A), suspected minor injury (B), possible injury (C), non-injured (O), and unknown. This dataset also contains information on different crash contributing factors, manner of collision, date and time, and other information. This dataset relies on law enforcement reporting and may not have all the information for all the crashes. For example, hit and run crashes where the injury of the driver is unknown fall under the “unknown” crash severity type.

A roadway inventory dataset of Williamson County was downloaded from the TxDOT Geographic Information System (GIS) Portal. The crash data is overlaid on this roadway layer. This layer has information on the name, functional classification, and facility type of the roadway. As part of the systemic and high injury network analysis, crash and roadway inventory datasets were used to conduct the analysis. The crashes are associated with the respective roadway corridors that allow the project team to understand crash patterns by different roadway characteristics such as facility type, length of the corridor, etc.

As part of the HIN analysis, crashes are weighted based on the Texas Highway Safety Improvement Program (HSIP) cost per crash:

- \$4,000,000 for a fatal or suspected serious injury crash
- \$330,000 for a suspected minor injury crash

Fatal (K) and suspected serious injury (A) crashes are weighted 12 points ($\$4,000,000/\$330,000$) Suspected minor injury (B) and possible injury crashes (C) are weighted 1 point.

Historical Crash Analysis

The existing condition analysis was conducted for the whole of Williamson County and then broken down by state-owned roadways and local roadways. The state-owned roadways are freeways, ramps, and state-owned highways. The local are all other roadways excluding the state-owned ones. Crash patterns by years, severity type, and combined fatal and suspected serious injury type were studied.

STATEWIDE EMPHASIS AREAS

In the context of the Strategic Highway Safety Plan, "emphasis areas" refer to specific focus areas identified to address key safety issues on roadways. These areas are prioritized based on data analysis, crash trends, and overall safety goals. By concentrating resources and efforts on these emphasis areas, agencies aim to reduce fatalities and serious injuries more effectively.

¹ The KABCO scale, developed by the Federal Highway Administration (FHWA), is a standardized system used by law enforcement to classify traffic crash injuries, ranging from K (fatal injury), A (serious injury), B (minor injury), C (possible injury), to O (property damage only, no injury).

The Texas SHSP recommends the following emphasis areas for reducing highway fatalities and serious injuries on all public roads of Texas:

- Roadway or Lane Departures – Crashes where a vehicle departs from the traveled way by crossing an edge line, a centerline, or otherwise leaving the roadway
- Occupant Protection – Crashes involving improper or complete lack of vehicle occupant protection such as wearing a seatbelt or using a car seat for children
- Older Drivers – Crashes involving drivers 65 years old or older
- Younger Drivers – Crashes involving drivers between the ages of 15 and 20
- Speed Related – Crashes where speeding was a contributing factor
- Impaired Driving – Crashes involving drug or alcohol impairment
- Intersection Related – Crashes occurring at or near an intersection
- Distracted Driving – Crashes involving inattention or distractions such as use of a cell phone
- Pedestrian – Crashes involving pedestrians
- Pedalcyclist – Crashes involving cyclists
- Post Crash Care – Secondary, tertiary, etc. crashes occurring due to another primary crash

The project team used the Texas SHSP framework to identify crashes for the above-mentioned emphasis areas. It should be noted that there is insufficient data involving post crash care in the crash database, so this emphasis area was not analyzed in this study.

COUNTY-SPECIFIC EMPHASIS AREAS

The countywide crash trends were analyzed to capture regional emphasis areas in addition to the statewide emphasis areas. The following additional emphasis areas were identified:

- School Zones – Crashes occurring at or near schools
- Dark Conditions – Crashes occurring at night or in areas with low to no lighting
- Work Zones – Crashes occurring within road construction or maintenance areas
- Time of Day/Day of Week – Crash patterns related to the time of day and day of the week

Systemic Safety Analysis

The systemic safety approach used fatal and suspected serious injury (KA) crash data from 2019-2023, focusing on the Texas SHSP emphasis areas associated with the highest crash proportions. This data-driven methodology aimed to uncover patterns and commonalities across emphasis areas to identify the most critical crash types and their corresponding contributing factors. By analyzing these relationships, the study targeted systemic characteristics associated with high crash proportions rather than isolated hotspots, enabling a broader and more effective application of countermeasures.

To support this analysis, crash tree diagrams were developed that visualized the distribution of crashes based on characteristics such as lighting conditions, roadway type, and ownership. These diagrams highlighted focus crash types, such as crashes occurring under dark conditions, roadway and lane departures, and intersection-related incidents, alongside focus facilities like urban, rural, state-owned, and local roadways. The findings informed the recommendation of low-cost, systemic countermeasures tailored to specific crash types and facility characteristics, such as improved lighting, enhanced signage, and targeted intersection safety improvements. This proactive, systemic approach ensures that safety investments address both high-crash locations and underlying risk factors to maximize their effectiveness countywide.

High Injury Network Analysis

A vital component of regional safety analysis is the development of a high injury network that identifies areas with a high need of safety enhancements. To carry out a more localized and thorough evaluation of transportation safety issues in Williamson County, the project team created both an intersection HIN and a road segment HIN. By establishing these two networks, the team identified high-priority intersections and segments of roadways that require improvements to reduce potential safety risks.

INTERSECTION HIGH INJURY NETWORK

The following is the methodology adopted to identify intersection HIN:

1. The project team obtained crash data from TxDOT CRIS in Williamson County between 2019 and 2023.
2. The base roadway network with all roadway types was required to perform this study. The Roadway Inventory dataset from the TxDOT GIS Portal served as the base roadway linework.
3. Intersections were identified by creating points where the lines from the base roadway linework intersected, using the Unsplit Lines and Intersection GIS tools. A 10-foot tolerance was applied to ensure that intersections were accurately captured, even when lines did not fully intersect due to minor data creation errors.
4. The intersection crashes were joined by intersections created in Step 3 using the Spatial Join tool with the closest matching option. This resulted in identifying intersection crashes with geolocated intersection information.
5. The crash data with intersection information was exported to Excel to provide a summary of crashes by severity type for each intersection. This summary table was joined to the intersection layer in GIS. This resulted in intersections with information on the total number of crashes by severity type.
6. The project team followed the Texas HSIP cost per crash to weigh crashes based on severity type. Fatal (K) and suspected serious injury (A) crashes were given 12 points and suspected minor injury (B) and possible injury crashes (C) were given 1 point. No points were given to non-injured or unknown crash types. Total points for each intersection were calculated based on these weighted points. Intersections with high severity type crashes have high weighted points.
7. Through trial-and-error visualization in GIS, the project team determined that a crash weight score of 25 serves as an effective threshold for identifying high-injury intersections. This score corresponds to the equivalent of two fatal or suspected serious injury crashes (each weighted at 12) plus one suspected minor injury or possible injury crash (weighted at 1).

SEGMENT HIGH INJURY NETWORK

The project team adopted the Sliding Window methodology to identify segment HIN. A recent technical report on innovative safety analysis tools in identifying highway safety improvement projects² recommended this method to perform network screening in Texas.

Sliding Window Method

In this method, a window of a certain length is moved by incremental length along a study segment from start to end of the study segment. For each window of the segment, performance measures are calculated that are used to rank the segments.

² (N.d.). (rep.). [Statewide Implementation of Innovative Safety Analysis Tools in Identifying Highway Safety Improvement Projects: Technical Report 5-6912-01-R1](#)

Figure 1 shows an example from the technical report of conducting the sliding window method using a window length of 0.3 miles and an increment distance of 0.1 miles.

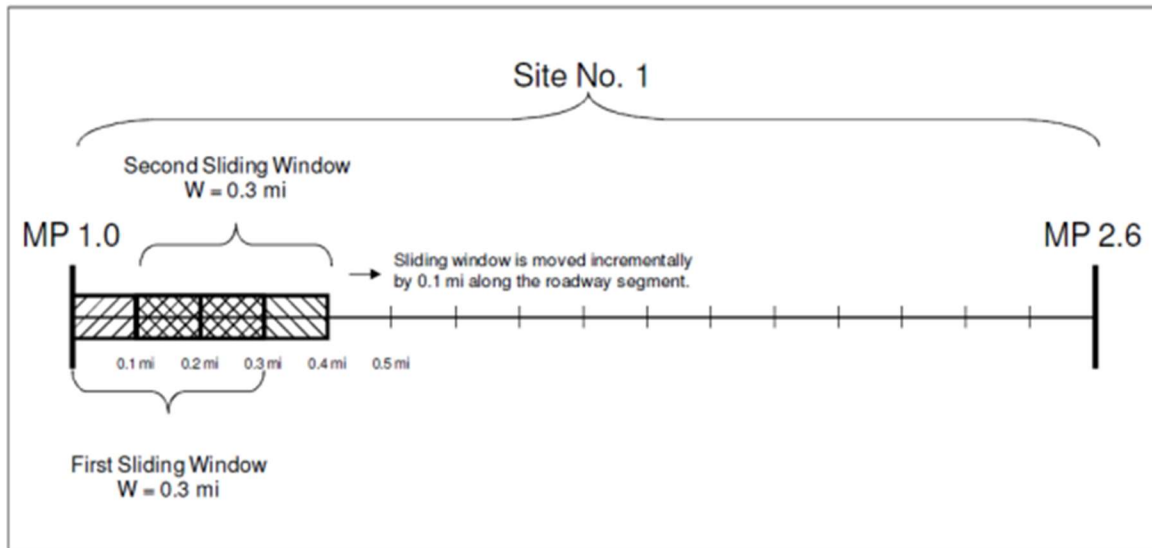


FIGURE 1: ILLUSTRATION OF THE SLIDING WINDOW METHOD

In this study, the project team, in coordination with the other counties in the CAMPO region, decided to use a window of 0.5 miles with a 0.1-mile increment. The following steps were used to perform the sliding window method:

1. The TxDOT GIS roadway layer was used as the base network roadway layer. Using the Dissolve tool, this roadway layer was dissolved based on the name and facility type of the roadway.
2. The dissolved roadway layer was used to generate points along each corridor for every 0.1 mile. This point layer was then used to split each corridor into 0.1-mile-long segments.
3. Only crashes that occurred on segments were used. These crashes were joined to the 0.1-mile segment layer. The Spatial Join tool with matching street name fields between the crash data and the centerline only layer was used. Approximately 75% of the crashes were joined to their respective roadway layer.
4. The remaining crashes that did not get joined to a roadway layer in the above step were spatially joined based on the closest matching option using a search distance of 200 feet with one-to-one mapping.
5. Once the crashes were joined by roadway layer, the table was exported to Excel. A table that summarizes the 0.1-mile segment layer's unique ID and crashes by severity was created.
6. The crash summary table was joined to the 0.1-mile segment layer. This layer now had 0.1-mile or smaller segments with information on the total number of crashes by severity type. This table was then exported to CSV file format.
7. Python coding was used to summarize the crashes by severity for five smaller segments. Five was used because it summarized crashes for 0.5 miles or less. Additional fields such as fatal and injury, equivalent injury (KA - 12, BC - 1), total crashes per mile, and equivalent injury per mile were calculated. This table was then exported to CSV file format.
8. The above table was then joined to the centerline roadway layer in GIS using the unique ID as the matching field.

Historical Crash Analysis Results

Table 1 and **Figure 2** summarize the crashes in Williamson County by year and severity for all roadway types; it should be noted that **Figure 2** does not include non-injury and unknown crashes. There were 44,668 crashes from 2019 to 2023 of which 1 percent were fatal injury type and 2 percent were suspected serious injury type crashes. There were 1,311 (3%) crashes with 'unknown' severity type. The year 2020 observed the lowest number of crashes in five years after which the crashes continued to increase every year. Since 2020, the total number of crashes increased by 41% in 2023. Overall, a consistent upward trend in the total number of crashes was observed.

TABLE 1: SUMMARY OF CRASHES (2019-2023) BY SEVERITY TYPE

YEAR	FATAL INJURY (K)	SUSPECTED SERIOUS INJURY (A)	SUSPECTED MINOR INJURY (B)	POSSIBLE INJURY (C)	NOT INJURED (O)	UNKNOWN	TOTAL
2019	41	180	991	1,176	6,142	253	8,783
2020	39	149	842	928	5,057	260	7,275
2021	48	215	1,004	1,216	6,022	266	8,771
2022	59	255	1,275	1,368	6,303	285	9,545
2023	42	245	1,495	1,314	6,951	247	10,294
TOTAL	229	1,044	5,607	6,002	30,475	1,311	44,668
%	1%	2%	13%	13%	68%	3%	100%

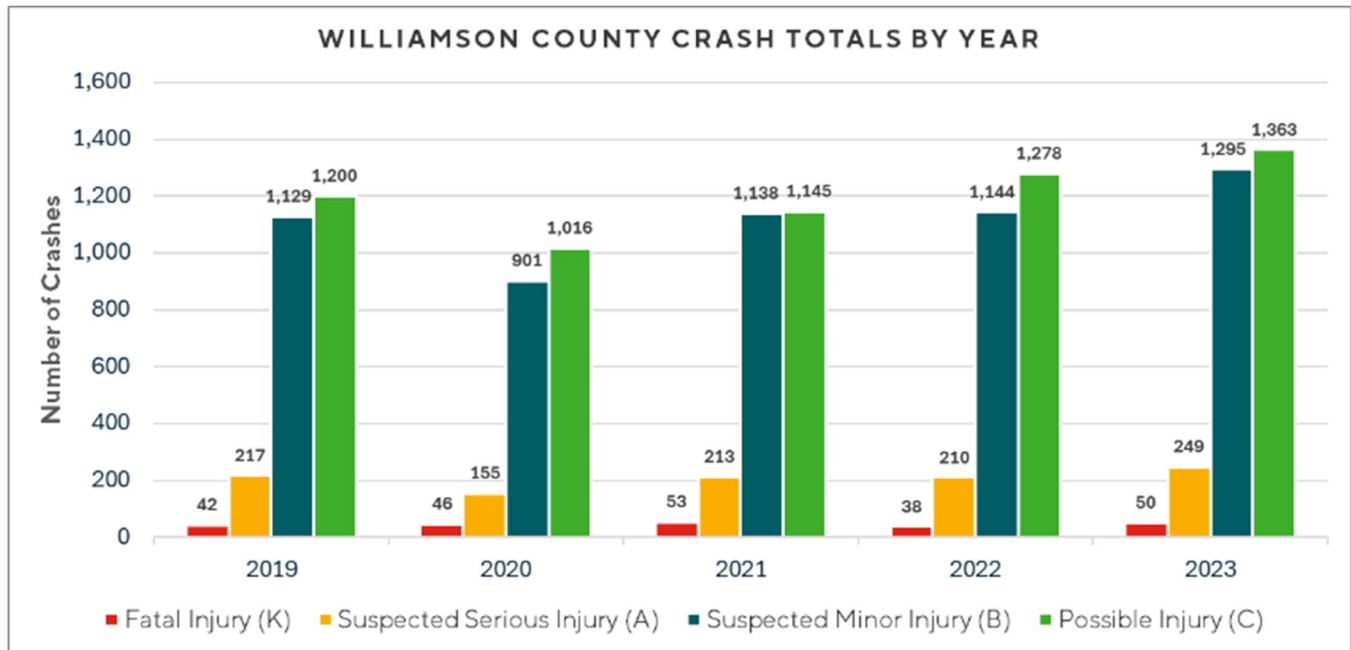


FIGURE 2: CRASHES (2019-2023) BY YEAR AND BY SEVERITY

Fatal and Serious Injury Crashes in Williamson County

The highest number of 53 fatal crashes occurred in 2021, and the lowest of 38 fatal crashes in 2022. The serious injury crashes show a consistent upward trend, increasing from 217 serious injury crashes in 2019 to 249 in 2023. **Figure 3** presents the crash trend of fatal and suspected serious injury crashes and **Figure 4** summarizes fatal and serious injury crashes by crash type in Williamson County from 2019 to 2023.

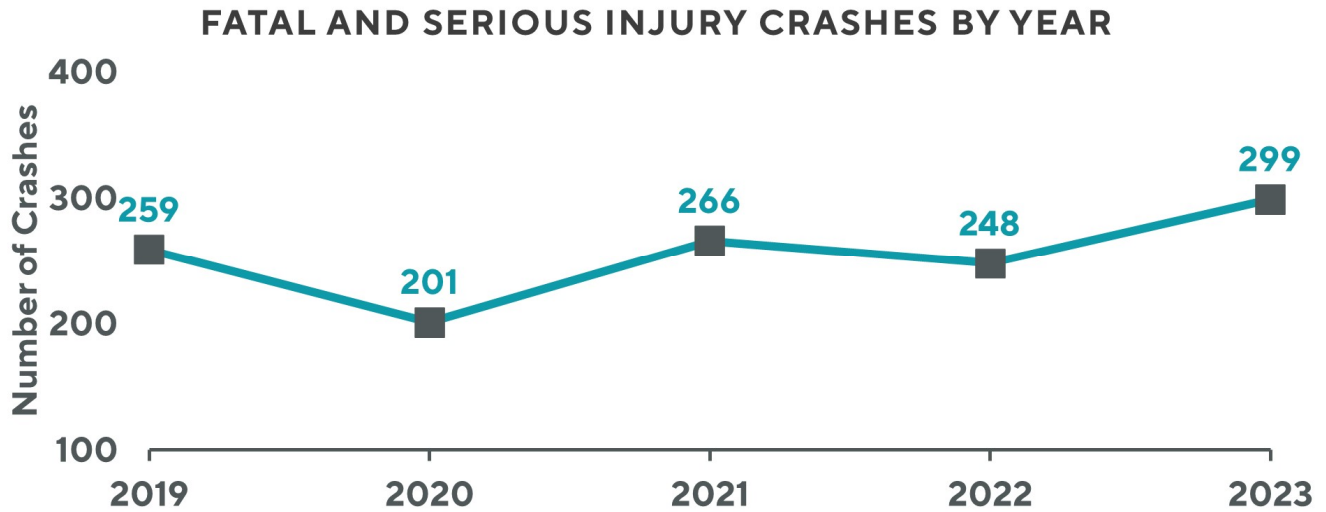


FIGURE 3: FATAL (K) AND SUSPECTED SERIOUS INJURY (A) CRASHES (2019-2023) BY YEAR

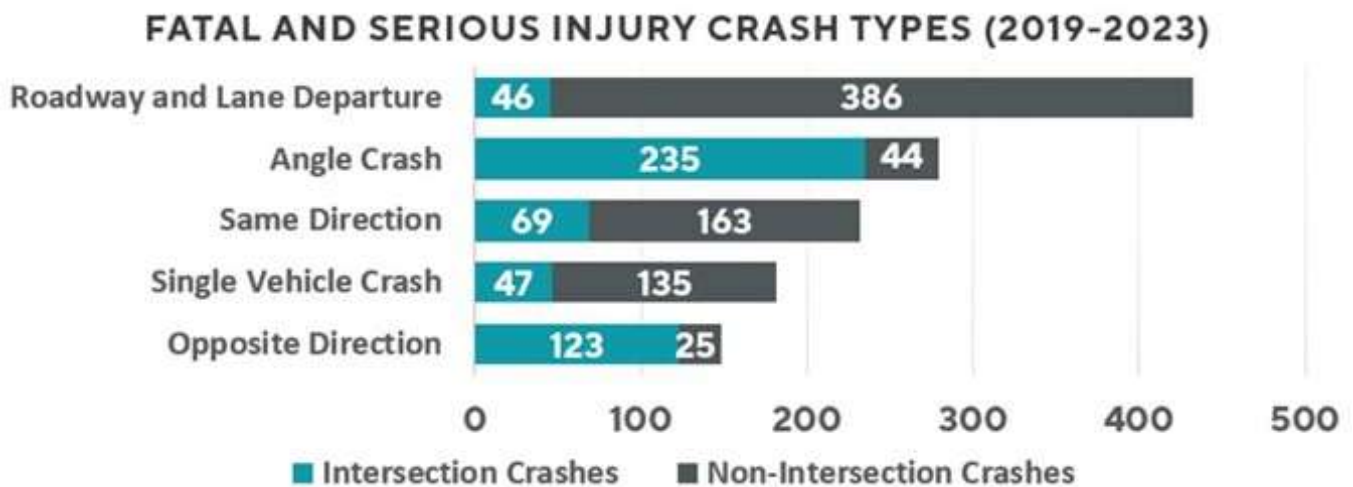


FIGURE 4: FATAL AND SERIOUS INJURY CRASHES BY TYPE (2019 - 2023)

Crash Analysis by Other Factors

Figure 5 presents percentage distribution of crashes for lighting condition, weather condition, and road surface condition. More than 70 percent of crashes occurred in daylight, clear sky, and dry road surface condition. The percentage of combined KA crashes was higher in dark condition.

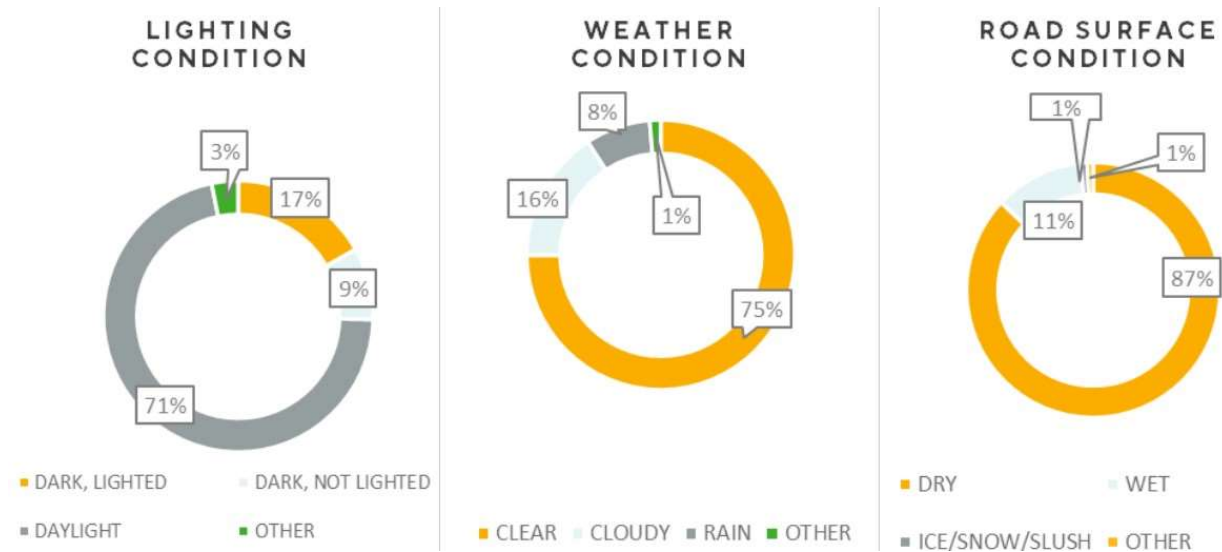


FIGURE 5: LIGHTING, WEATHER, AND ROAD SURFACE CONDITIONS FOR CRASHES IN WILLIAMSON COUNTY (2019 - 2023)

Table 2 summarizes the number of crashes by crash type in Williamson County from 2019 to 2023, including fatal and serious injury crashes in particular.

TABLE 2: SUMMARY OF CRASHES (2019-2023) BY CRASH TYPES

CRASH TYPE	NO. OF CRASHES	%	KA	%KA
SAME DIRECTION	18,968	42%	232	18%
ANGLE CRASH	10,057	23%	279	22%
ROADWAY AND LANE DEPARTURE	7,367	16%	432	34%
OPPOSITE DIRECTION	4,272	10%	148	12%
SINGLE VEHICLE CRASH	3,693	8%	182	14%
OTHER	311	1%	0	0%
TOTAL	44,668	100%	1273	100%

The crash types were further analyzed by crash contributing factors. In the crash database, there were more than 70 contributing factors, which were aggregated into 14 categories. **Table 3** presents a summary of crashes by crash types and contributing factors.

Overall, speed related, failure to yield right of way, aggressive driving, and distracted driving contribute to 80% of crashes in Williamson County. Speed related (45%) was a major contributing factor for same direction crash types. More than 90% of the angle and opposite direction crash types occurred at intersections; failure to yield right of way was the major contributing factor for these two crash types. Aggressive driving and distracted driving were the third and fourth highest contributing factors; the majority of these were same direction crash types.

TABLE 3: SUMMARY OF CRASHES (2019-2023) BY CRASH TYPES AND CRASH CONTRIBUTING FACTORS

CONTRIBUTING FACTORS	SAME DIRECTION	ANGLE CRASH	ROADWAY AND LANE DEPARTURE	OPPOSITE DIRECTION	SINGLE VEHICLE CRASH	OTHER	TOTAL	(%)
SPEED RELATED	8,590	258	2,066	49	362	13	11,338	25%
FAILED TO YIELD ROW	103	5,020	39	2,588	115	13	7,878	18%
AGGRESSIVE DRIVING	4,233	586	687	266	141	6	5,919	13%
DRIVER DISTRACTION	2,389	905	1,056	290	690	36	5,366	12%
OTHER	1,298	720	1,202	456	985	195	4,856	11%
NONE	1,108	511	535	231	638	35	3,058	7%
DISREGARD TRAFFIC SIGN	242	1,816	52	284	6	2	2,402	5%
FAILURE TO FOLLOW RULE	387	126	582	35	100	5	1,235	3%
IMPAIRED	297	75	582	39	209	5	1,207	3%
ANIMAL	16	2	160	2	360	0	540	1%
FATIGUED OR ASLEEP	59	5	327	1	47	0	439	1%
PASSING RELATED	243	24	6	25	18	1	317	1%
WRONG SIDE	3	4	72	6	10	0	95	0%
PEDESTRIAN	0	5	1	0	12	0	18	0%
TOTAL	18,968	10,057	7,367	4,272	3,693	311	44,668	100%
PERCENT	42%	23%	16%	10%	8%	1%	100%	

Table 4 presents a summary of crashes by time of day and day of week. Friday (17 %) had the highest and Sunday (10%) had the lowest number of crashes. In a day, from 3 PM to 6 PM had the highest number of crashes, which coincides with the evening rush hour traffic. The highest number of crashes occurred at 5 PM, particularly on Fridays. The morning crashes began to increase significantly starting at 6 AM, with a peak between 7 AM and 9 AM. Crash frequency was also high around midday (12 PM to 2 PM), peaking at 1 PM. Overall, crashes were more frequent during the afternoon and evening rush hours, particularly on weekdays, and dropped during early morning and late evening hours.

TABLE 4: SUMMARY OF CRASHES IN WILLIAMSON COUNTY (2019-2023) BY TIME OF DAY AND DAY OF WEEK

HOUR	MON	TUES	WED	THURS	FRI	SAT	SUN	TOTAL
0	81	55	62	84	89	148	153	672
1	40	46	48	68	62	109	111	484
2	47	41	52	57	65	142	145	549
3	44	37	29	41	37	107	99	394
4	45	32	44	53	44	70	77	365
5	102	93	93	111	106	76	73	654
6	236	289	294	274	220	99	69	1,481
7	397	466	481	442	391	146	68	2,391
8	384	457	460	413	386	174	94	2,368
9	288	325	298	301	271	202	126	1,811
10	278	275	267	281	302	259	185	1,847
11	322	274	319	326	377	366	232	2,216
12	372	396	432	392	478	441	298	2,809
13	410	384	404	397	511	414	319	2,839
14	415	384	401	413	460	408	313	2,794
15	491	476	436	481	513	403	295	3,095
16	554	585	565	621	695	354	280	3,654
17	523	649	627	638	711	358	289	3,795
18	453	488	512	518	595	387	279	3,232
19	242	293	319	352	431	313	268	2,218
20	211	215	226	230	295	273	205	1,655
21	176	193	202	207	261	233	191	1,463
22	100	119	164	149	228	231	146	1,137
23	80	68	88	87	169	151	102	745
Total	6,291	6,640	6,823	6,936	7,697	5,864	4,417	44,668

Table 5 presents a summary of crashes by time of day and month. October (9%) had the highest number of crashes and February (8%) had the lowest. The winter months from October to December had more crashes, particularly in the evening peak hours from 4 PM to 7 PM. The dark condition crash types occurred more during these winter months.

TABLE 5: SUMMARY OF CRASHES (2019-2023) BY TIME OF DAY AND MONTH

HOURL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
0	60	56	56	51	62	52	71	61	52	54	47	50	672
1	40	36	34	39	39	43	42	40	39	50	52	30	484
2	46	37	33	49	55	42	43	47	39	60	49	49	549
3	33	32	28	25	34	24	43	41	42	32	26	34	394
4	39	25	28	27	21	43	19	28	38	41	28	28	365
5	53	75	51	44	36	62	56	53	54	61	54	55	654
6	139	156	125	124	104	81	92	89	134	154	140	143	1,481
7	218	219	213	175	170	139	140	218	219	270	206	204	2,391
8	213	192	209	172	190	149	152	209	229	255	207	191	2,368
9	171	133	146	129	147	150	144	144	154	170	163	160	1,811
10	147	146	159	132	145	175	143	170	158	158	163	151	1,847
11	166	135	170	156	196	200	178	197	193	214	197	214	2,216
12	216	186	201	206	258	223	241	270	255	247	234	272	2,809
13	217	214	217	209	248	227	295	257	221	269	221	244	2,839
14	217	192	244	225	228	215	244	265	239	237	247	241	2,794
15	269	218	264	238	273	256	267	262	271	260	251	266	3,095
16	272	260	280	319	318	283	273	334	320	332	330	333	3,654
17	278	292	315	324	322	309	298	302	336	398	324	297	3,795
18	297	217	218	219	214	213	224	263	229	269	430	439	3,232
19	182	192	203	133	143	189	170	155	158	238	219	236	2,218
20	127	128	162	122	123	95	121	134	158	181	163	141	1,655
21	102	87	115	114	103	145	146	157	122	130	124	118	1,463
22	84	74	94	77	110	132	105	109	80	92	90	90	1,137
23	65	55	39	54	64	72	51	62	64	63	76	80	745
Total	3,651	3,357	3,604	3,363	3,603	3,519	3,558	3,867	3,804	4,235	4,041	4,066	44,668

Figure 6 shows the number of crashes (y-axis) by time of day and day of week (x-axis) in Williamson County from 2019 to 2023. The graph shows the aggregate number of crashes (All Severities) over a five-year period (2019–2023) during a typical weekend day (Sat-Sun) versus a typical weekday (Mon-Fri). The number of crashes during the weekdays (green line) predictably peaked during the AM and PM peak hours of traffic – 7 AM to 8 AM and 4 PM to 6 PM, respectively. During the weekend (purple line), the peak number of crashes occurred between 12 PM and 2 PM.

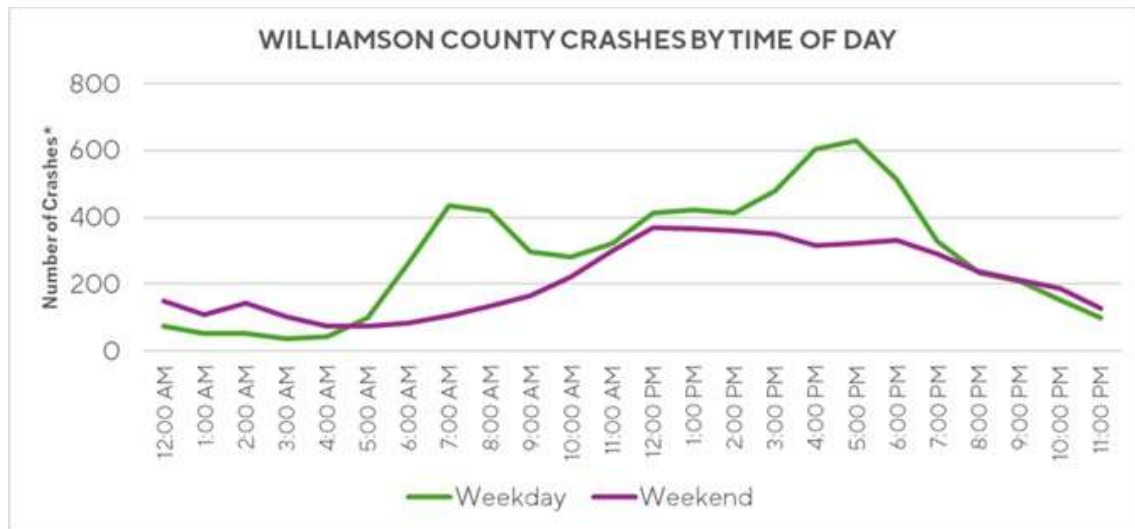


FIGURE 6: CRASHES BY TIME OF DAY AND DAY OF WEEK (2019-2023)

Heat Maps

The project team developed two heat maps using the available Williamson County crash data from 2019 to 2023. **Figure 7** shows the crash density at intersections in the County, while **Figure 8** shows the crash density at non-intersections (segments) in the County.

Most of the intersection crash density occurred in urban areas where state-owned roads intersect with one another or a local road. The following intersections have a “High” or “Very High” crash density:

- IH 35 Northbound Frontage Road and RM 2338
- SH 29 and IH 35
- US 183 and RM 1431
- RM 1431 and FM 734
- US 183 and Lakeline Boulevard
- US 183 and Lakeline Mall Drive
- US 183 and FM 620
- FM 620 and Pearson Ranch Road
- US 183 and Pecan Park Boulevard
- IH 35 and SH 45
- SH 45 and Greenlawn Boulevard
- SH 45 and South A.W. Grimes Boulevard
- South A.W. Grimes Boulevard and Gattis School Road
- IH 35 and McNeil Road
- IH 35 and Round Rock Avenue
- IH 35 and US 79
- IH 35 and Old Settlers Boulevard
- IH 35 and RM 1431
- US 79 and FM 685

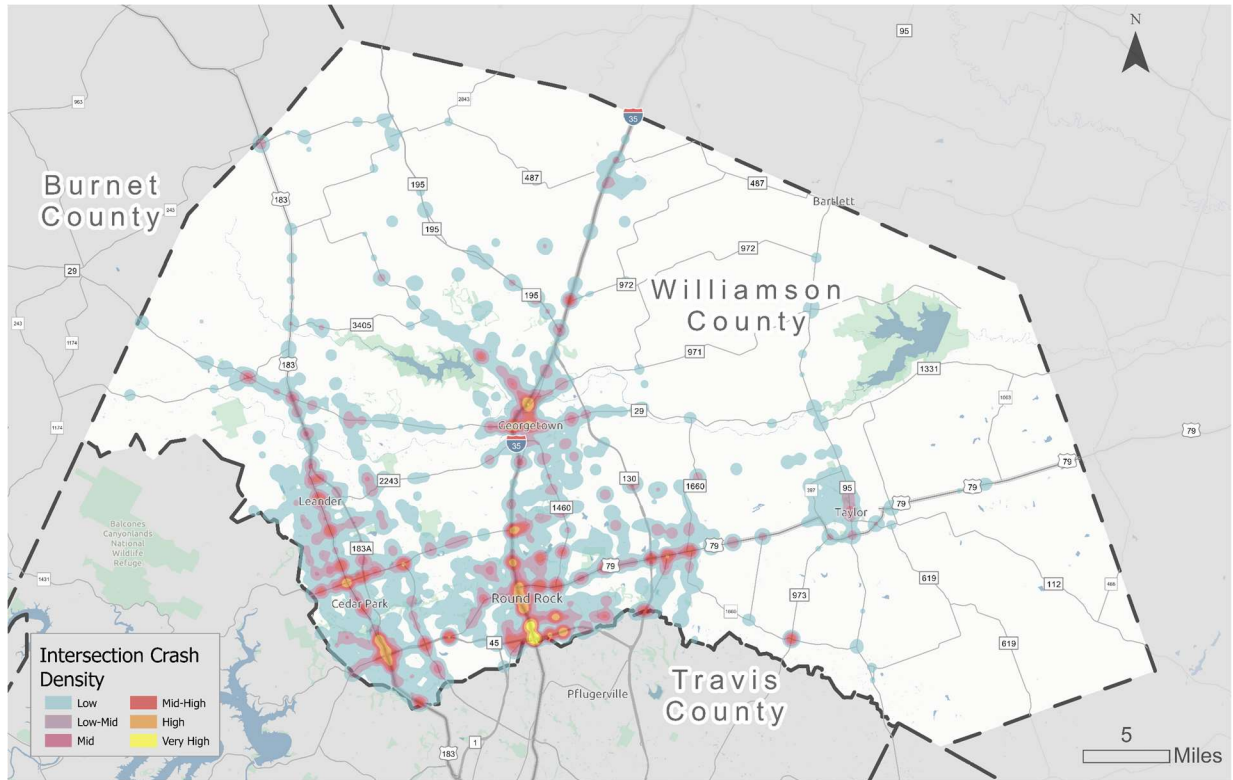


FIGURE 7: HEAT MAP OF INTERSECTION CRASH DENSITY IN WILLIAMSON COUNTY (2019-2023)

Most of the non-intersection (segment) crash density also occurred in urban areas where state-owned roads intersect with one another or a local road. The following intersections have a “High” or “Very High” crash density:

- RM 2338 (Williams Drive/North Austin Avenue) from Southbound IH 35 Frontage Road to FM 971
- Williams Drive from Southbound IH 35 Frontage Road to south of Rivery Boulevard
- SH 29 from west of D.B. Wood Road to east of South Rock Street
- IH 35 from south of Blue Springs Boulevard to south of San Gabriel Village Boulevard
- RM 1431/University Boulevard from west of IH 35 Northbound Frontage Road to Sunrise Boulevard
- North Mays Street from about 1,300 feet north of University Boulevard to 1,000 feet south of University Boulevard
- IH 35 from SH 45 to Old Settlers Boulevard
- SH 45 from Pecan Park Boulevard to Lyndhurst Street
- US 183 from south of Pond Springs Road to north of SH 45

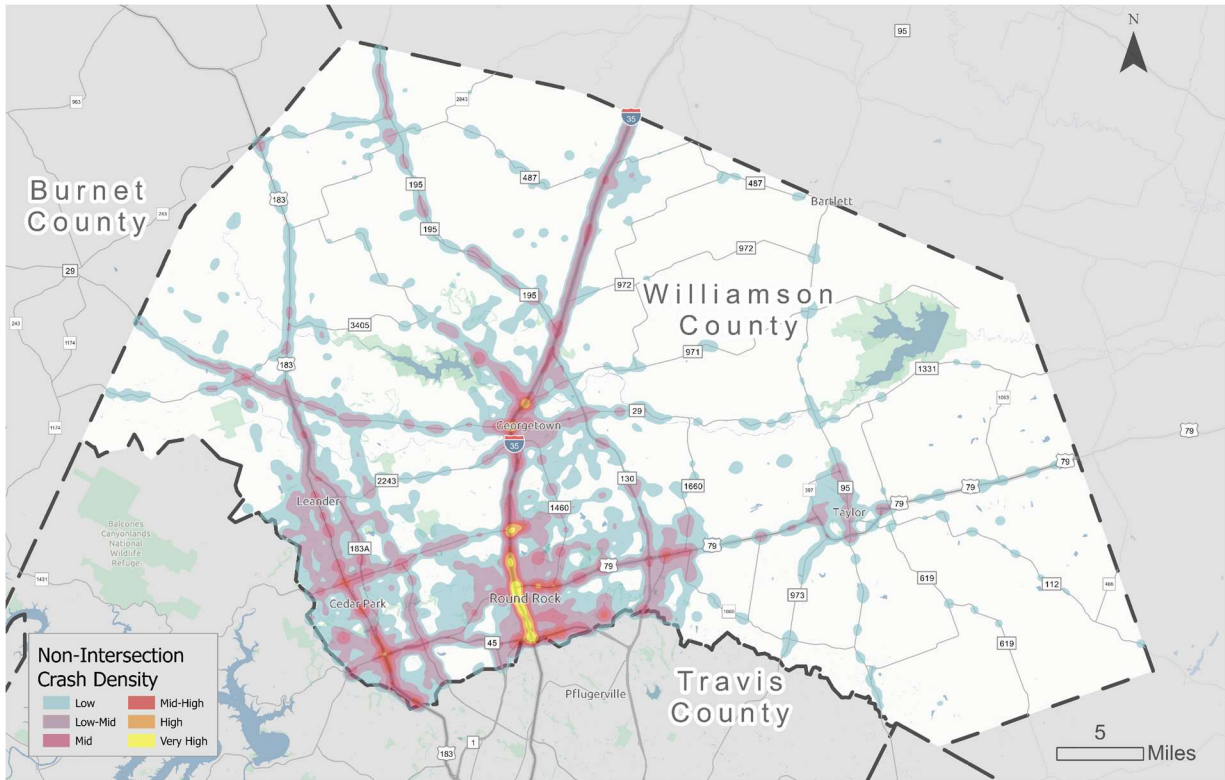


FIGURE 8: HEAT MAP OF NON-INTERSECTION CRASH DENSITY (2019-2023)

Emphasis Area Analysis

Crash data from 2019 to 2023 was analyzed for the emphasis areas identified in this study. **Table 6** summarizes the crashes by year and emphasis area for all public roadways in Williamson County. Trendline rates in this table present a linear trendline fitted by the crashes and year, where the higher trendline rate relates to an increase in crashes over the years. **Table 7** summarizes total crashes and combined fatal and serious injury crashes. The percentages are respective of countywide total crashes and total combined fatal and serious injury crashes, respectively.

Year	Crash Type	Primary Emphasis Area	Secondary Emphasis Area	Tertiary Emphasis Area
2019	Intersection	Intersection Safety	Intersection Safety	Intersection Safety
	Side-impact	Intersection Safety	Intersection Safety	Intersection Safety
	Front-end	Intersection Safety	Intersection Safety	Intersection Safety
2020	Intersection	Intersection Safety	Intersection Safety	Intersection Safety
	Side-impact	Intersection Safety	Intersection Safety	Intersection Safety
	Front-end	Intersection Safety	Intersection Safety	Intersection Safety
2021	Intersection	Intersection Safety	Intersection Safety	Intersection Safety
	Side-impact	Intersection Safety	Intersection Safety	Intersection Safety
	Front-end	Intersection Safety	Intersection Safety	Intersection Safety
2022	Intersection	Intersection Safety	Intersection Safety	Intersection Safety
	Side-impact	Intersection Safety	Intersection Safety	Intersection Safety
	Front-end	Intersection Safety	Intersection Safety	Intersection Safety
2023	Intersection	Intersection Safety	Intersection Safety	Intersection Safety
	Side-impact	Intersection Safety	Intersection Safety	Intersection Safety
	Front-end	Intersection Safety	Intersection Safety	Intersection Safety

Emphasis Areas	2019	2020	2021	2022	2023	Total Crashes	Trendline Rate of Increase in Crashes per Year*
Intersection Related	3,934	3,174	3,828	4,201	4,551	19,688	226.1
Speed Related	2,551	2,192	2,560	2,765	2,990	13,058	145.1
Dark Conditions	2,475	2,161	2,426	2,649	2,912	12,623	136.2
Roadway Departures	1,435	1,231	1,446	1,603	1,652	7,367	80.6
Distracted Driving	1,389	1,117	1,505	1,582	1,677	7,270	104.1
Younger Drivers	461	385	398	441	533	2,218	20
Impaired Driving	341	339	384	388	412	1,864	19.1
Older Drivers	327	291	280	371	423	1,692	27.2
Work Zone	332	237	300	355	431	1,655	31.6
Occupant Protection	166	119	155	175	183	798	9

EMPHASIS AREAS	2019	2020	2021	2022	2023	TOTAL CRASHES	TRENDLINE RATE OF INCREASE IN CRASHES PER YEAR*
VRU: PEDESTRIANS	63	60	67	68	77	335	3.6
VRU: PEDALCYCLISTS	52	29	46	57	47	231	1.8
SCHOOL ZONE RELATED	6	13	11	10	10	50	0.5

*NOTE: THE TRENDLINE RATE OF INCREASE IN CRASHES PER YEAR REPRESENTS THE ESTIMATED NUMBER OF ADDITIONAL CRASHES EACH YEAR BASED ON A LINEAR TRENDLINE; IT IS EXPRESSED AS A COUNT, NOT A PERCENTAGE.

Except for the school-related emphasis area, all other categories had the lowest number of crashes in 2020, aligning with the countywide trend. Since 2020, crashes have continued to rise each year, except in the school and pedalcyclist emphasis areas.

The five emphasis areas with the highest number of total crashes are dark conditions, intersection related, speed related, roadway departure, and distracted driving. These five emphases also have the highest trendline rates; the crashes in these five emphasis areas are increasing at a higher rate compared to other emphasis areas.

Table 7 breaks down the number of total crashes and the number of total fatal and serious injury crashes (KA) for each of the identified statewide and countywide emphasis areas. **Table 7** also shows the percentage of total crashes and KA crashes that were reported in each emphasis area. For example, 1,655 total crashes were reported under the “work zone” emphasis area, which accounts for 4% of the total crashes in Williamson County from 2019 to 2023; 59 fatal and serious injury crashes were reported under the “work zone” emphasis area, accounting for 5% of all the fatal and serious injury crashes in Williamson County from 2019 to 2023.

Figure 9 shows the six emphasis areas with the most reported fatal and serious injury crashes in Williamson County from 2019 to 2023.

TABLE 7: SUMMARY OF KA CRASHES (2019-2023) FOR EMPHASIS AREAS

EMPHASIS AREAS	TOTAL CRASHES	% OF TOTAL CRASHES	TOTAL KA CRASHES	% OF KA CRASHES
INTERSECTION RELATED	19,688	44%	520	41%
SPEED RELATED	13,058	29%	355	28%
DARK CONDITIONS	12,623	28%	529	42%
YOUNGER DRIVERS	9,583	21%	227	18%
ROADWAY DEPARTURES	7,367	16%	432	34%
DISTRACTED DRIVING	7,270	16%	139	11%
OLDER DRIVERS	6,814	15%	202	16%
IMPAIRED DRIVING	1,864	4%	174	14%
WORK ZONE	1,655	4%	59	5%
OCCUPANT PROTECTION	798	2%	190	15%
VRU: PEDESTRIANS	335	1%	88	7%
VRU: PEDALCYCLISTS	231	1%	41	3%
SCHOOL ZONE RELATED	50	0%	2	0%

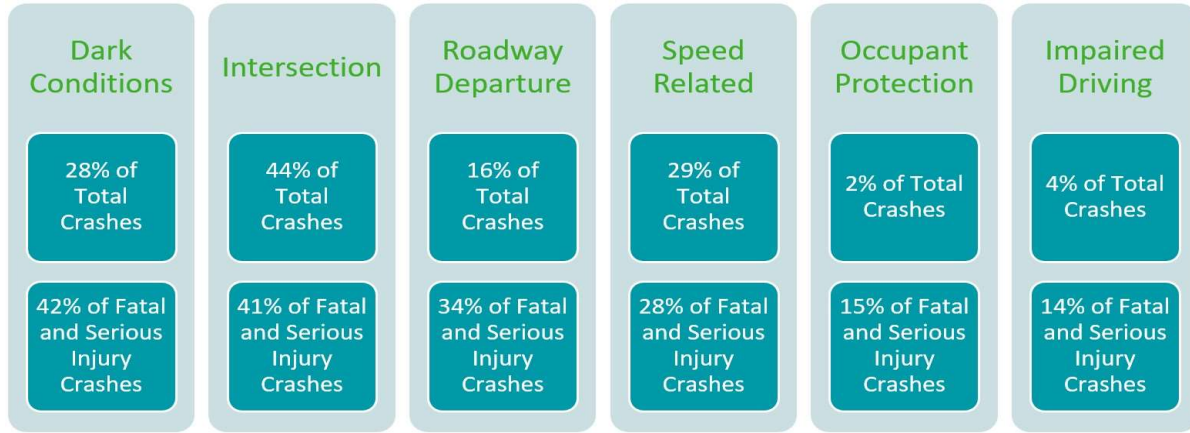


FIGURE 9: EMPHASIS AREAS WITH THE MOST REPORTED FATAL AND SERIOUS INJURY CRASHES (2019-2023)

The project team examined emphasis areas on both state-owned versus local roadways. **Table 8** and **Table 9** summarize the distribution of total and combined KA crashes for each emphasis area, respectively. The data revealed that pedestrian, pedalcyclist, and school-related crashes occur more frequently on local roadways, while speed-related, dark conditions, and work zone crashes are more prevalent on state-owned facilities. Emphasis areas where the percentage of crashes is equal to or exceeds 10% between state-owned and local roadways are highlighted in red within the tables for easier identification of pattern over-representation.

TABLE 8: SUMMARY OF CRASHES (2019-2023) FOR EMPHASIS AREAS BY STATE-OWNED AND LOCAL ROADWAYS

EMPHASIS AREAS	COUNTYWIDE	STATE-OWNED		LOCAL	
	NO. OF CRASHES	NO. OF CRASHES	%	NO. OF CRASHES	%
INTERSECTION RELATED	19,688	10,213	52%	9,475	48%
SPEED RELATED	13,058	8,030	61%	5,028	39%
DARK CONDITIONS	12,623	6,964	55%	5,659	45%
YOUNGER DRIVERS	9,586	4,860	51%	4,723	49%
ROADWAY DEPARTURES	7,367	3,625	49%	3,742	51%
DISTRACTED DRIVING	7,270	3,788	52%	3,482	48%
OLDER DRIVERS	6,814	3,577	52%	3,237	41%
IMPAIRED DRIVING	1,864	888	48%	976	52%
WORK ZONE	1,655	1,141	69%	514	31%
OCCUPANT PROTECTION	798	400	50%	398	50%
VRU: PEDESTRIANS	335	102	30%	233	70%
VRU: PEDALCYCLISTS	231	47	20%	184	80%
SCHOOL ZONE RELATED	50	4	8%	46	92%

NOTES:

1. THE PERCENTAGES FOR STATE-OWNED AND LOCAL ARE CALCULATED BASED ON RESPECTIVE EMPHASIS AREA COUNTYWIDE CRASH NUMBERS.
2. THE RED FONT INDICATES A 10 % OR MORE DIFFERENCE BETWEEN STATE-OWNED AND LOCAL PERCENTAGES. HIGHEST PERCENTAGE IS HIGHLIGHTED.

TABLE 9: SUMMARY OF KA CRASHES (2019-2023) FOR EMPHASIS AREAS BY STATE-OWNED AND LOCAL ROADWAYS

EMPHASIS AREAS	KA CRASHES				
	COUNTYWIDE	STATE-OWNED		LOCAL	
	NO. OF CRASHES	NO. OF CRASHES	%	NO. OF CRASHES	%
DARK CONDITIONS	529	355	67%	174	33%
INTERSECTION RELATED	520	294	57%	226	43%
ROADWAY DEPARTURES	432	265	61%	167	39%
SPEED RELATED	355	223	63%	132	37%
YOUNGER DRIVERS	227	128	56%	99	44%
OLDER DRIVERS	202	119	59%	83	41%
OCCUPANT PROTECTION	190	117	62%	73	38%
IMPAIRED DRIVING	174	113	65%	61	35%
DISTRACTED DRIVING	139	83	60%	56	40%
VRU: PEDESTRIANS	88	47	53%	41	47%
WORK ZONE	59	44	75%	15	25%
VRU: PEDALCYCLISTS	41	18	44%	23	56%
SCHOOL ZONE RELATED	2	0	0%	2	100%

NOTES:

1. THE PERCENTAGES FOR STATE-OWNED AND LOCAL ARE CALCULATED BASED ON RESPECTIVE EMPHASIS AREA COUNTYWIDE KA CRASH NUMBERS.
2. THE RED FONT INDICATES 10 % OR MORE DIFFERENCE BETWEEN STATE-OWNED AND LOCAL PERCENTAGES. HIGHEST PERCENTAGE IS HIGHLIGHTED.

Systemic Safety Analysis Results

The project team used the Texas Strategic Highway Safety Plan-defined Emphasis Areas as a foundation for the Williamson County systemic safety analysis to uncover patterns in crash data specific to common emphasis area crash types. This approach enabled analysts to examine where these crashes are occurring, distinguishing between rural and urban areas, segments versus intersections, and state-maintained (state-owned) versus locally owned (local) facilities. By identifying patterns across these dimensions, we identified commonalities and overlaps among emphasis area crash types, aiding in a more holistic understanding of systemic safety issues and needs. To visualize these patterns and support data-driven decision-making, we developed crash tree diagrams to illustrate the relationships and contributing factors associated with emphasis area crashes.

Shared Patterns Across Emphasis Areas

This analysis revealed significant commonalities across the emphasis areas, bringing attention to the interconnected nature of crash factors. Dark conditions played a critical role across various crash types, strongly linked to intersections, roadway departures, and speed-related incidents. Similarly, intersections consistently intersected with speed-related crashes, young driver involvement, and dark conditions. Roadway departures and speed-related crashes also shared strong ties with dark conditions, intersections, and impaired driving. These overlaps highlight the need for integrated strategies addressing multiple emphasis areas. The results in **Table 10** provide insights into these relationships.

TABLE 10: COMMONALITIES IN FATAL AND SERIOUS INJURY CRASHES BY EMPHASIS AREA (2019-2023)

	DARK CONDITIONS	INTERSECTION RELATED	ROADWAY OR LANE DEPARTURE	SPEED RELATED	YOUNG DRIVER	OLDER DRIVER	NO SEATBELT	IMPAIRED	DISTRACTED DRIVING	VRU
DARK CONDITIONS	-	31%	44%	27%	18%	8%	19%	24%	8%	12%
INTERSECTION RELATED	32%	-	9%	18%	23%	22%	9%	9%	11%	8%
ROADWAY OR LANE DEPARTURE	54%	11%	-	37%	16%	8%	25%	21%	10%	2%
SPEED RELATED	40%	26%	45%	-	17%	13%	19%	15%	10%	2%
YOUNG DRIVER	41%	52%	30%	27%	-	11%	15%	11%	10%	5%
OLDER DRIVER	21%	56%	17%	23%	12%	-	9%	4%	13%	9%
NO SEATBELT	54%	24%	56%	36%	18%	9%	-	25%	14%	2%
IMPAIRED	72%	26%	53%	32%	14%	5%	27%	-	4%	12%
DISTRACTED DRIVING	31%	41%	31%	26%	17%	19%	19%	5%	-	7%
VRU	50%	33%	5%	5%	9%	15%	3%	16%	8%	-

NOTES:

IT IS IMPORTANT TO READ TABLE 11 CAREFULLY TO DETERMINE THE RELATIONSHIPS BETWEEN THE EMPHASIS AREAS. THE "OVERLAPS" CAN BE DESCRIBED IN TWO DIFFERENT WAYS FOR EACH PAIR OF INVOLVED FACTORS. HERE ARE TWO EXAMPLES TO DESCRIBE HOW IT WORKS:

- OF ALL CRASHES OCCURRING IN DARK CONDITIONS, 44% OF THOSE CRASH EVENTS INVOLVED A ROADWAY OR LANE DEPARTURE.
- OF ALL ROADWAY OR LANE DEPARTURE CRASHES, 54% OCCURRED IN DARK CONDITIONS.

EACH ROW (EMPHASIS AREA) HAS TWO DATA POINTS DIFFERENTIATED IN RED TEXT. THESE DATA POINTS REPRESENT THE TOP TWO COMMON EMPHASIS AREAS ASSOCIATED WITH THAT ROW (E.G., OF THE CRASHES OCCURRING IN DARK CONDITIONS, 31% ARE INTERSECTION RELATED AND 44% ARE ROADWAY OR LANE DEPARTURE RELATED).

Focus Crash Types

Based on results from the emphasis area analysis in **Table 10**, we identified several focus crash types that are significantly associated with serious injuries and fatalities. Each focus area highlights specific conditions and contributing factors that demand targeted safety improvements. A summary of crash severity by focus crash types is provided in **Table 11**.

TABLE 11: CRASH SEVERITY BY FOCUS CRASH TYPE (2019-2023)

FOCUS CRASH TYPE	K	KA	TOTAL CRASHES
DARK CONDITIONS	124 (54%)	529 (42%)	12,623 (28%)
INTERSECTION RELATED	75 (33%)	520 (41%)	19,688 (44%)
ROADWAY AND LANE DEPARTURE	98 (43%)	432 (34%)	7,367 (16%)

NOTE: PERCENTAGES DO NOT SUM TO 100% BECAUSE NOT ALL CRASHES ARE ATTRIBUTED TO A FOCUS CRASH TYPE, AND SOME CRASHES MAY BE ATTRIBUTED TO MULTIPLE FOCUS CRASH TYPES.

Intersection Related: Intersection-related crashes represent the largest portion of total crashes, accounting for 44% of all crashes within Williamson County. These crashes resulted in 75 fatal crashes (33% of total fatal crashes) and 520 fatal or suspected serious injury (KA) crashes (41% of KA crashes). Intersections present complex traffic interactions that contribute to higher crash frequencies, warranting interventions to reduce conflict points.

Roadway and Lane Departure: Roadway and lane departure crashes, which occur when vehicles unintentionally leave their designated lanes, make up 16% of total crashes. These incidents led to 98 fatal crashes (43% of total fatal crashes) and 432 fatal or suspected serious injury (KA) crashes (34% of KA crashes), marking them as one of the most severe crash types.

Dark Conditions: Crashes in areas with dark conditions account for 28% of total crashes. Low visibility conditions contributed to 124 fatal crashes (54% of total fatal crashes) and 529 fatal or suspected serious injury (KA) crashes (42% of KA crashes), emphasizing the need for improved lighting in dark roadway segments and intersections to enhance visibility and reduce nighttime crash risks.

Crash Tree Diagrams

The project team developed a crash tree diagram for each of the top two emphasis areas with the highest percentage of fatal and serious injury crashes relative to the total among the emphasis area of focus (i.e., those highlighted in red in **Table 10**). These diagrams explore where crashes are occurring, such as whether they are state-owned or locally-owned (local), on urban or rural facilities, and at intersections or along roadway segments. The analysis aimed to reveal systemic safety challenges within these critical emphasis areas, providing insights to target specific location types with effective countermeasures.

The crash tree diagram visualizes the distribution of fatal and serious injury crashes across different categories, with percentages shown at each decision level. Each level splits crashes based on a specific characteristic, such as lighting conditions, urban versus rural location, roadway ownership (local or state), and whether the crashes occur at intersections or roadway segments. The percentages represent the proportion of crashes in each category relative to the total crashes at that level. Thicker lines are used exclusively on the right-hand branch, as this branch corresponds to the emphasis area under study. The thickness of these lines is proportional to the total crashes within the emphasis area, illustrating their relative contribution. The red lines further highlight the branches at each level with the highest number of crashes, drawing attention to key patterns and critical locations for safety countermeasures. Recommended safety treatments should target facilities with the highest concentration of over-represented crash events, ensuring interventions are directed to areas with the greatest safety improvement potential. An example of the tree diagram is shown in **Figure 10**.

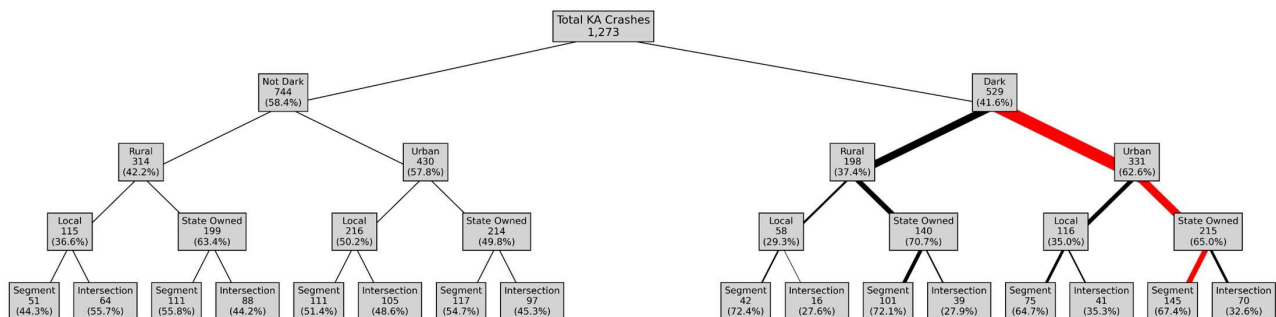


FIGURE 10. EXAMPLE OF A CRASH TREE DIAGRAM USED IN THE EMPHASIS AREA ANALYSIS

In **Figure 10**, the crash tree diagram shows that crashes in dark conditions (the emphasis area analyzed in this tree) occur most often (62.6%) on urban roadways. Of those, 65.0% occur on state-owned routes (versus local roads); and of those, 67.4% occur on segments (versus intersections). Therefore, it can be concluded that state-owned route segments in urban areas are a good target location type for systemic treatment of dark condition crashes. These treatments may include delineators along the roadway (e.g., on roadside appurtenances), lighting along segments, or other identified countermeasures.

Countermeasure Selection

The systemic approach to safety in Williamson County focuses on deploying countermeasures across the network to address crash types that occur at multiple locations with similar risk characteristics. This allows Williamson County's jurisdictions to implement cost-effective safety measures across a broader range of sites that share similar high-risk site characteristics, supporting widespread safety improvements.

Countermeasures for Williamson County's focus crash types were selected based on data-driven analysis and guidance from TxDOT's Highway Safety Improvement Program. Systemic countermeasures align with TxDOT's HSIP guidelines, which define each safety countermeasure using specific "work codes" for streamlined planning and deployment. **Table 12** summarizes the focus crash types and the corresponding systemic countermeasures selected for evaluation across Williamson County. The primary facility types are identified in the crash tree diagrams and the countermeasures are accompanied by the associated HSIP work code numbers in parentheses.

TABLE 12: FOCUS CRASH TYPES AND SYSTEMIC COUNTERMEASURES

ROADWAY CRASH TYPE	SYSTEMIC COUNTERMEASURE (HSIP WORK CODE)	PRIMARY FACILITY TYPE (FROM CRASH TREE DIAGRAMS)
Intersection Related	Install Traffic Signal (107), Signal Head Backplates, Yellow Change Intervals (108), Install Advanced Warning Signals and Signs (124), Safety Lighting at Intersection (305), Transverse Rumble Strips (545)	Urban state-owned signalized and unsignalized (Dark Conditions), Urban local unsignalized
Roadway and Lane Departure	Install Delineators (113), Install Advanced Warning Signals (123), Install Advanced Warning Signals and Signs (125), Install Advanced Warning Signs (130), Install LED Flashing Chevrons (136), Install Chevrons (137), Install Surface Mounted Delineators on Centerline (139), Install Median Barrier (201), Safety Treat Fixed Objects (209), Install Impact Attenuation System (217), Install Pavement Markings (401), Install Edge Marking (402), Install Centerline Striping (404), Install Safety Edge (532), Milled Edgeline Rumble Strips (532), Profile Edgeline Markings (533), Raised Edgeline Rumble Strips (534), Install Milled Centerline Rumble Strips (542), Profile Centerline Markings (543), Raised Centerline Rumble Strips (544)	Rural state-owned segments
Dark Conditions	Install Delineators (113), Safety Lighting (304)	Urban state-owned segments

High Injury Network Analysis and Results

The High Injury Network identifies the specific roadways and intersections where a disproportionate number of severe and fatal crashes occur. By focusing on locations with the highest concentrations of serious injuries and fatalities, the HIN serves as a foundational tool for prioritizing safety improvements and resource allocation. It highlights critical areas where targeted interventions can have the greatest impact on reducing severe crash outcomes and improving overall roadway safety.

The project team developed two maps to represent the high injury network of intersection and non-intersection (segment) crashes in Williamson County from 2019 to 2023.

Intersection High Injury Network Results

Figure 11 below represents all the intersections in Williamson County that are classified as “high injury” based on the crash data from 2019 to 2023. Only 7% of intersections in Williamson County that experienced at least one crash (118 out of 1,461 total intersections) account for 55% of fatal crashes and 35% of all crashes.

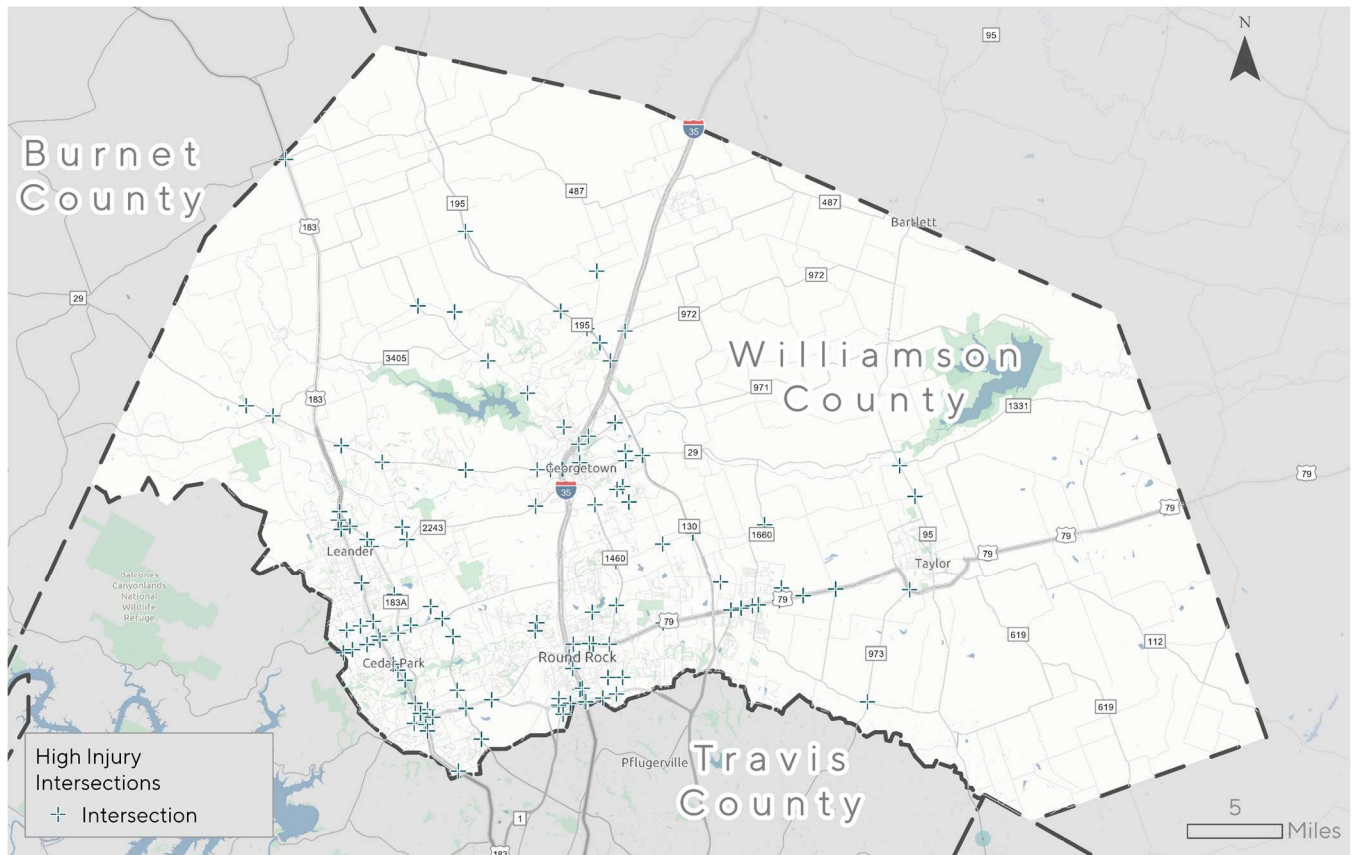


FIGURE 11: HIGH INJURY INTERSECTIONS IN THE HIGH INJURY NETWORK (2019-2023)

Segment High Injury Network Results

Figure 12 below represents all the non-intersections (segments) in Williamson County that are classified as “high injury” based on the crash data from 2019 to 2023. Only 8% (~171 of 1,867 total roadway miles) of all roadways that experienced at least one crash in the past 5 years account for 71% of fatal and serious injury crashes and 51% of all crashes.

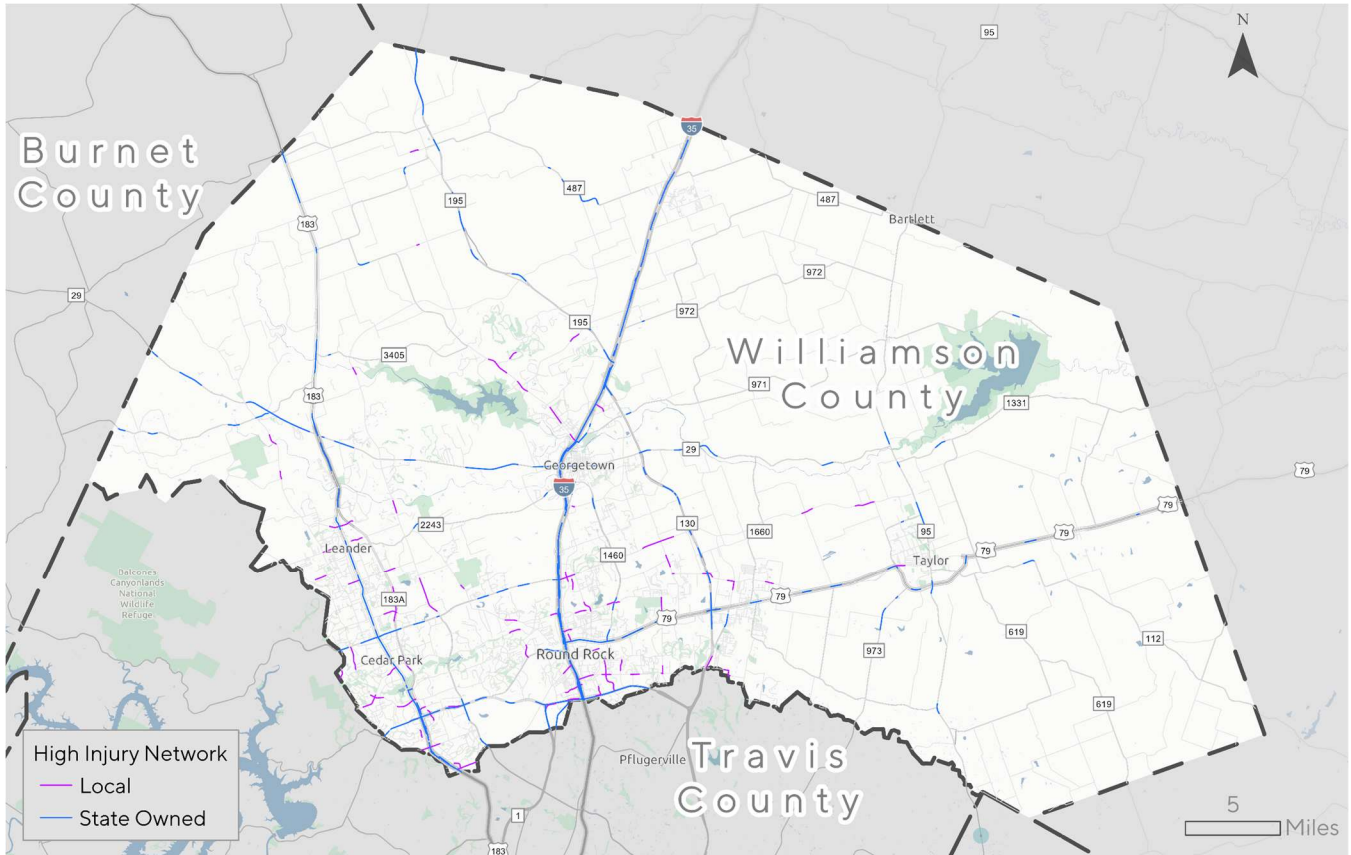


FIGURE 12: HIGH INJURY SEGMENTS IN THE HIGH INJURY NETWORK (2019-2023)



Appendix B

WILLIAMSON COUNTY POLICY RECOMMENDATIONS TECHNICAL MEMORANDUM

WILLIAMSON COUNTY POLICY RECOMMENDATIONS TECHNICAL MEMORANDUM

Introduction

The Capital Area Metropolitan Planning Organization (CAMPO) is developing a county-level safety action plan (SAP) for Williamson County, including local agencies and other partners within the county. The Williamson County-level SAP will be integrated into the Regional Safety Action Plan (RSAP) that CAMPO is developing simultaneously. The purpose of the SAP is to find specific, actionable projects and strategies to improve roadway safety for all road users in all communities throughout the CAMPO region.

As part of the SAP development, an assessment was conducted of existing plans, policies, guidelines, and standards pertaining to transportation planning and how safety is currently being prioritized in Williamson County. The review focused on significant county and city documents that impact the safety of roadways, sidewalks, trails, and other transportation facilities. This process established a baseline and provided a path forward for the identification of county- and city-level policy recommendations and opportunities to improve transportation safety for all road users, including the most vulnerable.

Assessment of Existing Policies and Plans

The initial region-wide assessment of existing policies, plans, and guidelines included reviewing several safety-related search terms on a sample of documents in each county, including Williamson. These key search terms were *safe; traffic; signal; intersection; speed; calming; crash; seatbelt; texting; stop sign; construction zone; safe routes; light and signal synchronization; speed bumps; pedestrian; bike or bicycle; driver safety; complete streets; curb cuts; and access management*. The list of assessed documents is included at the end of the document.

The assessment provided the team with an understanding of the safety-related efforts already in place across the county and cities and a foundation for making the recommendations in this memo.

Policy and Program Recommendations

A set of targeted policy and program recommendations were formulated based on the comprehensive assessment and a review of safety needs through crash data analysis and public engagement efforts. This review will assist transportation safety enhancements in the county and its cities. These recommendations are designed to address existing gaps; enhance coordination among local agencies, educational institutions, and law enforcement; implement effective strategies to reduce fatal and serious injury collisions; and promote safer travel for all road users.

Each recommendation is rooted in the core elements of the Safe System Approach and aligned with the emphasis areas of the Texas Road to Zero effort as described in the 2022-2027 Strategic Highway Safety Plan. By aligning with these principles, the recommendations focus on creating a transportation system that is safe, reliable, and resilient, prioritizing both proactive measures and system-level improvements.

An Excel-based workbook has been developed to organize and track each policy and program recommendation, with each categorized under the relevant Safe Systems Approach element. This structure allows for a clear overview of how each contributes to the overarching goal of improving transportation safety for all road users in Williamson County. **Tables 1 through 6** summarize the recommended policies and programs, including a description, the targeted emphasis area, and who may lead the effort along with their primary and secondary support.

TABLE 1: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING POST CRASH CARE

SAFE SYSTEM APPROACH CORE ELEMENT: POST CRASH CARE						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
TRAFFIC SIGNAL IMPROVEMENT PROGRAM	Follow TxDOT's Traffic Signal Manual guidelines for integrating preemption control technologies to enhance traffic flow and emergency response times.	Intersection Related	Intersection Design	Task Force	City and County Staff	Public Works
COLLISION DATABASE PROGRAM	Develop a centralized database to track and monitor collision data and response outcomes, aligning with local Central Texas emergency response protocol and data-sharing agreements. Leverage ongoing efforts of the Central Texas Traffic Management System.	Post Crash Care	Partnerships	Task Force, Central Texas Traffic Management System Partners	Emergency Responders (Police, EMS, Fire)	Hospitals

TABLE 2: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING SAFER ROAD USERS

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER ROAD USERS						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
DISTRACTED DRIVING EDUCATIONAL PROGRAM	Develop a program that aligns with TxDOT's "Talk. Text. Crash." campaign aimed at informing drivers of the risks of distracted driving.	Distracted Driving	Partnerships	Task Force	Schools	Enforcement
IMPAIRMENT EDUCATIONAL PROGRAM	Partner with local organizations in Central Texas to implement interactive workshops and virtual reality simulations to demonstrate the dangers of impaired driving.	Impaired Driving	Partnerships	Task Force	Schools	Enforcement
SEAT BELT EDUCATIONAL PROGRAM	Incorporate seat belt safety modules into local school curriculums and driver's education programs that use TxDOT's "Click it or Ticket" initiative materials and support.	Occupant Protection	Partnerships	Task Force	Schools	Enforcement
SAFE DRIVING EDUCATIONAL PROGRAM	Develop mentorship programs supported by TxDOT or Students Against Destructive Driving (SADD) to educate younger and older drivers of safe driving practices.	Younger Drivers, Older Drivers	Partnerships	Task Force	Schools	TxDOT and/or SADD
YOUNG DRIVER EDUCATIONAL PROGRAM	Partner with the Texas Department of Public Safety to provide information on new driver requirements and Impact Texas Teen Driver Course material access to local driver's education programs.	Younger Drivers	Partnerships	Task Force	Schools	Texas Department of Public Safety
OLDER DRIVER EDUCATIONAL PROGRAM	Establish a confidential reporting system for medical professionals to refer at-risk drivers for evaluation.	Older Drivers	Partnerships	Task Force	Health Departments	Enforcement
GDL ENFORCEMENT PROGRAM	Develop a program to enforce the Graduated Driver License (GDL) and Hardship licensing program.	Younger Driver, Distraction	Partnerships	Task Force	Schools	Texas Department of Public Safety

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER ROAD USERS						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
SCHOOL ZONE SPEEDING ENFORCEMENT PROGRAM	Increase enforcement strategies (speed feedback signs, high-visibility enforcement, etc.) that comply with Texas state laws regarding speeding within a school zone.	Speed Related	Safe Speeds	Task Force	Enforcement	Schools
SEAT BELT ENFORCEMENT PROGRAM	Use data analytics to identify high-risk areas and times for targeted enforcement associated with seat belt use. Ensure strategies align with state-wide enforcement campaigns for consistency.	Occupant Protection	Enhanced Enforcement	Task Force	Enforcement	
AGGRESSIVE DRIVING ENFORCEMENT PROGRAM	Follow TxDOT's guidelines for high-visibility enforcement operations and public awareness campaigns targeted at aggressive driving.	Speed Related	Enhanced Enforcement	Task Force	Enforcement	
WORK ZONE SPEED ENFORCEMENT PROGRAM	Deploy automated speed enforcement tools in work zones to enhance safety. Ensure compliance with TxDOT's work zone safety regulations.	Speed Related	Enhanced Enforcement	Task Force	Enforcement	
WORK ZONE SAFETY ENHANCEMENT POLICY	Establish comprehensive safety protocols aligned with TxDOT's work zone safety regulations, using smart work zone technologies.	Speed Related	Safe Speeds	Task Force	City and County Staff	

TABLE 3: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING SAFER ROADWAYS

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER ROADWAYS						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
DATA COLLECTION AND ANALYSIS PROGRAM	Develop a policy that uses TxDOT's Crash Records Information System (CRIS) to regularly update analysis methods incorporating the latest predictive analytic techniques to identify potential areas of transportation safety risks.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
PRIVATE DEVELOPMENT STANDARDS	Develop a policy/program requiring private developments to meet current roadway, lighting, and pedestrian facility standards.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Developers
PEDESTRIAN AND BICYCLE SAFETY PROGRAM	Develop initiatives aimed at improving safety for non-motorized road users and adhering to industry best design practices. This includes treatments such as installing pedestrian countdown signals, creating protected bike lanes, and implementing public engagement campaigns.	Speed Related, Pedestrians, Pedalcyclists	Local Policies	Task Force	City and County Staff	Public Works
CRASH ANALYSIS POLICY	Develop a policy to include crash/collision data analysis and community input involving vulnerable road users into development or updates to city or county plans.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
COMPLETE SREETES POLICY	Consider developing jurisdictional Complete Streets policies to enhance the pedestrian/bicyclist environment along roadways with higher-than-normal pedestrian/bicyclist activity.	Speed Related, Pedestrians, Pedalcyclists	Local Policies	Task Force	City and County Staff	Public Works
ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS) IMPLEMENTATION	Enhance/improve an ATMS to monitor and manage traffic flow using real-time data that is compatible with existing infrastructure and adheres to regional intelligent transportation system (ITS) architectures. Work with neighboring agencies to communicate traffic flows and traffic issue response needs.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER ROADWAYS						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
INTERSECTION CONTROL POLICY	Develop an Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements.	Intersection Related	Local Policies	Task Force	City and County Staff	Public Works
DATA COLLECTION AND MANAGEMENT PROGRAM	Develop program that incorporates Geographic Information System (GIS) data collection of existing organizational assets (roadway signs, lighting, guardrail, etc.). Leverage ongoing efforts of the Central Texas Traffic Management System.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
ROADWAY SIGN MANAGEMENT POLICY	Develop an implementable regular maintenance schedule of existing road signs to ensure sign visibility and compliance of retroreflectivity.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
PAVEMENT MARKING MANAGEMENT POLICY	Develop an implementable regular maintenance schedule of existing pavement markings to ensure visibility and compliance of usage and retroreflectivity.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
ROADWAY ASSET IMPLEMENTATION POLICY	Incorporate data from the High Injury Network (HIN) to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized.	Applicable to All Emphasis Areas	Street Design that Protects People	Task Force	City and County Staff	Public Works
OPERATIONS AND MAINTENANCE PROGRAM	Develop a systematic approach to roadway maintenance, focusing on timely repairs, following TxDOT's maintenance guidelines and prioritizing tasks based on safety impact assessments.	Applicable to All Emphasis Areas	Local Policies	Task Force	City and County Staff	Public Works
COMMUNITY INPUT WEBPAGE DEVELOPMENT	Implement a feedback mechanism for road users to report maintenance issues in real time, such as potholes, lighting concerns, and road sign maintenance needs. Provide feedback to submitted concerns resolution.	Applicable to All Emphasis Areas	Partnerships	Task Force	City and County Staff	Information Technology Departments

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER ROADWAYS

POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
STREET LIGHTING POLICY	Develop a policy consistent with industry standard/best practices for roadway lighting installation focusing in areas identified with CRIS data analysis.	Roadway or Lane Departure	Street Design that Protects People	Task Force	City and County Staff	Public Works
LEVEL OF STRESS ASSESSMENT POLICY	Consider developing a policy based on industry standards and best practices methodologies for assessing pedestrian and bicyclist stress levels.	Pedestrian, Pedalcyclists	Street Design that Protects People	Task Force	City and County Staff	Public Works
ADA TRANSITION PLAN	Develop a plan to assess existing Americans with Disabilities Act (ADA) and TxDOT's accessibility guidelines to prioritize improvements in areas with high vulnerable road users (VRU) activity and documented accessibility issues.	Pedestrian	Street Design that Protects People	Task Force	City and County Staff	Public Works
TRANSPORTATION TECHNOLOGY PROGRAM	Evaluate emerging transportation technology and perform pilot tests for applications that enhance safety, such as video analytics that activate warning systems when pedestrians approach a crossing or traffic signal detection that supports timing changes that address the dilemma zone. [See also Vehicle Advancement (V2X) Program in the Safer Vehicles table.]	Applicable to All Emphasis Areas	Street Design that Protects People	Task Force	City and County Staff	Public Works

TABLE 4: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING SAFER SPEEDS

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER SPEEDS						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
PROCEDURE FOR ESTABLISHING SPEED ZONES	Develop a speed limit policy and procedures process based on current research and methodologies that include contextual factors and align with TxDOT's Speed Zone Manual.	Speed Related	Local Policies	Task Force	City and County Staff	Public Works
SCHOOL ZONE ENHANCEMENT PROGRAM	Develop a program that collaborates with local schools and parent-teacher associations to identify areas of enhanced safety improvements (rapid flashing beacons, speed feedback signs, etc.).	Speed Related	Street Design that Protects People	Task Force	City and County Staff	Local School Districts
TRAFFIC CALMING PROGRAM	Develop a program that follows industry standards/best practices for traffic calming guidelines.	Speed Related	Set Safe Speeds	Task Force	City and County Staff	

TABLE 5: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING SAFER VEHICLES

SAFE SYSTEM APPROACH CORE ELEMENT: SAFER VEHICLES						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
VEHICLE ADVANCEMENT (V2X) PROGRAM	Evaluate and identify Texas’ initiatives on connected and autonomous vehicles (Connected and Autonomous Vehicle Task Force) in order to provide the necessary infrastructure and facility upgrades.	Applicable to All Emphasis Areas	Autonomous Vehicles	Task Force	City and County Staff	Public Works
TRUCK/FREIGHT ROUTE POLICY	Develop a policy in accordance with TxDOT's guidelines on truck routes and truck parking restrictions. Consider local ordinances for designated truck routes and parking to identify areas where freight routes and VRU paths intersect and implement measures such as designated truck lanes or time-based restrictions to enhance safety.	Pedestrian, Pedalcyclists	Commercial Vehicle	Task Force	City and County Staff	Public Works
PUBLIC TRANSPORTATION SAFETY POLICY	Develop a safety protocol for public transit systems that includes regular vehicle inspections, driver training programs, and emergency preparedness plans. Align with state and federal transit safety regulations and collaborate with transit agencies to implement best practices.	Applicable to All Emphasis Areas	Transit Vehicles	Task Force	Transit Organization	

TABLE 6: RECOMMENDED TRANSPORTATION POLICIES AND PROGRAMS ADDRESSING SAFETY LEADERSHIP AND CULTURE

SAFE SYSTEM APPROACH CORE ELEMENT: SAFETY LEADERSHIP AND CULTURE						
POLICY OR PROGRAM RECOMMENDATION	DESCRIPTION	EMPHASIS AREA	CATEGORY	LEAD	PRIMARY SUPPORT	SECONDARY SUPPORT
ROAD TO ZERO COMMITMENT	Commit to a “Zero” Goal. Elected officials and department leaders adopt public commitment for zero traffic fatalities and serious injuries goal within a specific timeframe.	Applicable to All Emphasis Areas	Leadership	Task Force	City and County Officials	
SAFETY GRANTS INITIATIVE	Develop a program to continue efforts in applying for and receiving funding for safety improvements (safe routes to schools, Highway Safety Improvement Program, etc.)	Applicable to All Emphasis Areas	Stakeholder Engagement	Task Force	City and County Staff	
TRANSPORTATION TECHNOLOGY PROGRAM	Develop a program/policy to participate in existing TxDOT Strategic Initiatives and Innovation Division staying informed of new programs, emerging technologies, digital roadway data, enterprise artificial intelligence (AI) strategies and future traffic management centers and systems.	Applicable to All Emphasis Areas	Leadership	Task Force	City and County Staff	Information Technology Departments
PUBLIC AWARENESS CAMPAIGN	Develop a program aligned with TxDOT's safety campaigns to increase public awareness of traffic safety issues.	Applicable to All Emphasis Areas	Leadership	Task Force	City and County Staff	Community Organizations

Sample Documents Identified and Reviewed

WILLIAMSON COUNTY

LONG RANGE TRANSPORTATION PLAN¹

CITY OF CEDAR PARK

2023 MOBILITY MASTER PLAN²

CITY OF GEORGETOWN

2023 FUTURE MOBILITY PLAN³

AUSTIN AVENUE IMPROVEMENTS⁴

SIDEWALK MASTER PLAN⁵

BICYCLE MASTER PLAN⁶

NEIGHBORHOOD TRAFFIC MANAGEMENT POLICIES⁷

CITY OF LEANDER

2020 COMPREHENSIVE PLAN⁸

CITY OF ROUND ROCK

2023 TRANSPORTATION MASTER PLAN⁹

¹ <https://www.wilcotx.gov/1>

² <https://www.cedarparktexas.gov/DocumentCenter/View/5782/Cedar-Park-Mobility-Master-Plan-Report?bidId=>

³ https://2030.georgetown.org/wp-content/uploads/sites/6/2023/12/Future_Mobility_Plan_12-12-2023-web1.pdf

⁴ <https://georgetowntexas.gov/>

⁵ https://2030.georgetown.org/wp-content/uploads/sites/6/2024/02/GeorgetownSidewalkMasterPlan_FINAL_02142024-c.pdf

⁶ <https://transportation.georgetown.org/wp-content/uploads/sites/46/2019/12/Georgetown-Bicycle-Master-Plan-and-Appendix-11-10-2019.pdf>

⁷ <https://georgetowntexas.gov/>

⁸ <https://www.leandertx.gov/DocumentCenter/View/1058/2020-Comprehensive-Plan---All-Chapters-PDF?bidId=>

⁹ <https://www.roundrocktexas.gov/wp-content/uploads/2024/01/11.6-Round-Rock-TMP-Final-Report-reduced-size.pdf>



Appendix C

WILLIAMSON COUNTY SAFETY COUNTERMEASURES TECHNICAL MEMORANDUM

WILLIAMSON COUNTY SAFETY COUNTERMEASURES TECHNICAL MEMORANDUM

Introduction

The proposed improvements and strategies incorporate a range of safety countermeasures tailored to Williamson County's specific needs. This section briefly describes each infrastructure improvement, behavioral strategy, and policy recommendation, along with the types of collisions they address and high-level cost estimates. Safety countermeasures are categorized into segment-related (non-intersection), intersection-related, and vulnerable road users.

Segment-Related

Roadway and lane departure crashes account for 59% of fatal and serious injury crashes in Williamson County. **Table 1** provides a list of recommended segment-related countermeasures including infrastructure treatments, behavioral strategies, and policy recommendations.

TABLE 1: RECOMMENDED SEGMENT-RELATED COUNTERMEASURES

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Infrastructure Treatments			
Install centerline rumble strips.	Mid-term	\$, \$\$	Lane Departure, Head-On
Install raised medians or median barriers.	Mid-term	\$, \$\$	Lane Departure, Head-On, Angle
Install raised pavement markers or profiled center lines.	Near-, Mid-term	\$, \$\$	Lane Departure, Head-On
Install chevron signs, curve warning signs, posted speed limit reductions, and/or sequential flashing beacons in curves.	Near-, Mid-term	\$\$	Lane Departure, Curve-Related, Speed-Related
Install high friction pavement surface treatments.	Mid-, Long-term	\$\$, \$\$\$	Lane Departure
Install wider, brighter, and more durable edge lines, especially on curves.	Near-, Mid-term	\$\$, \$\$\$	Lane Departure, Curve-Related
Install signage to increase awareness of vulnerable road users who may be in the clear zone or in a sight-limited location such as a curve or tunnel.	Near-, Mid-, Long-term	\$, \$\$, \$\$\$	Lane Departure, Curve-Related, Pedestrian

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Install roadside safety hardware such as guardrail, cable barrier, or concrete barrier.	Near-term	\$, \$\$	Lane Departure
Locate and inventory fixed objects inside the clear zone to support development of programs and projects to reduce the severity of lane departure crashes.	Mid-, Long-term	\$\$, \$\$\$	Lane Departure, Pedestrian
Widen shoulders.	Mid, Long-term	\$\$, \$\$\$	Lane Departure, Bicyclist
Reconfigure vehicle lanes to mixed-use lanes.	Mid-, Long-term	\$\$	Pedestrian/Bicyclist, Speed Management
Behavioral Strategies			
Disseminate outreach materials and social media posts educating the public on the major causes of lane departure crashes, (e.g., speeding).	Near-term	\$, \$\$	Lane Departure
Host the National Highway Transportation Safety Administration (NHTSA) Speed Management Program course for local engineers, planners, and law enforcement.	Mid-term	\$, \$\$	Lane Departure, Speed Management
Use dynamic speed feedback signs on sections of roadways where speed related crashes are of concern.	Near-, Mid-term	\$, \$\$	Lane Departure, Speed Management
Encourage the use of coordinated high-visibility enforcement activities addressing high-risk driving behavior, particularly on weekends and evenings for alcohol and drug-impaired crashes.	Near-, Mid-term	\$, \$\$	Lane Departure, Impairment
Use Texas Highway Safety Office (TxHSO) Law Enforcement Liaisons (LELs) to improve participation from law enforcement in conducting high-visibility enforcement to address impaired driving.	Near-, Mid-term	\$, \$\$	Lane Departure, Impairment
Use TxHSO LELs to improve participation from law enforcement in conducting high-visibility enforcement to address distracted driving.	Near-, Mid-term	\$\$	Lane Departure, Distracted Driving
Policy Recommendations			
Develop a policy consistent with TxDOT's and the Illuminating Engineering Society's guidelines for roadway lighting installation, focusing on areas identified with CRIS data analysis.	Mid-term	\$, \$\$	Lane Departure, Dark Conditions

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Implement a feedback mechanism for road users to report maintenance issues in real time.	Mid-, Long-term	\$, \$\$	Lane Departure
Follow TxDOT's and Department of Public Safety's guidelines for high-visibility enforcement operations and public awareness campaigns targeted at aggressive driving.	Mid-, Long-term	\$, \$\$	Lane Departure, Speed Management
Partner with local organizations in Central Texas to implement interactive workshops and virtual reality simulations to demonstrate the dangers of impaired driving and distracted driving.	Mid-, Long-term	\$, \$\$	Lane Departure, Impairment, Distracted Driving
Develop a program that aligns with TxDOT's "Talk. Text. Crash." campaign aimed at informing drivers of the risks of distracted driving.	Mid-, Long-term	\$, \$\$	Lane Departure, Distracted Driving
Incorporate data from the HIN to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized.	Mid-term	\$, \$\$	Lane Departure
Deploy automated speed enforcement tools in work zones. Ensure compliance with TxDOT's work zone safety regulations.	Mid-, Long-term	\$\$, \$\$\$	Speed Management, Work Zone
Develop an implementable regular maintenance schedule of existing road signs to ensure sign visibility and compliance.	Near-, Mid-term	\$, \$\$	Lane Departure
Develop a speed limit policy and procedures process based on current research and methodologies that include contextual factors and align with TxDOT's Speed Zone Manual.	Mid-, Long-term	\$\$	Speed Management

Intersection-Related

Intersection-related crashes account for 41% of fatal and serious injury crashes in Williamson County. Intersections present complex traffic interactions that contribute to higher crash frequencies. **Table 2** provides a list of recommended countermeasures to reduce potential conflicts at an intersection.

TABLE 2: RECOMMENDED INTERSECTION-RELATED COUNTERMEASURES

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Infrastructure Treatments: Speed Reduction/Management			
Install transverse rumble strips on rural stop-controlled approaches.	Near-, Mid-term	\$, \$\$	Angle
Provide advanced dilemma zone detection (real-time warning) for high-speed approaches at rural signalized intersections.	Mid-term	\$\$	Speed Management, Angle, Rear-End
Install curb extensions at intersections.	Near-, Mid-term	\$, \$\$	Pedestrian/Bicyclist, Speed Management
Infrastructure Treatments: Intersection Reconfiguration			
Install or convert intersections to roundabouts.	Long-term	\$\$\$	Angle, Speed Management
Convert permitted left turns to protected left turns at signal.	Mid-, Long-term	\$\$\$	Angle
Use intersection conflict warning systems (real-time warning) to warn drivers on mainline or side roads of conflicting traffic at rural intersections.	Mid-, Long-term	\$\$\$	Angle
Increase pavement friction using high friction surface treatments at intersection approaches.	Near-, Mid-term	\$\$	Rear-End, Angle
Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists.	Near-, Mid-term	\$, \$\$	Angle, Pedestrian
Restrict access to properties/driveways adjacent to intersections using closures or turn restrictions.	Near-, Mid-term	\$, \$\$	Angle
Infrastructure Treatments: Traffic Signal Improvements			
Install signal preemption at intersections.	Mid-term	\$\$, \$\$\$	Emergency Vehicles, Rear-End, Angle
Modify signal phasing to implement a leading pedestrian interval. Add bicycle traffic signals where bike lanes are installed.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian, Bicyclist
Coordinate arterial signals.	Near-term	\$\$	Rear-End, Angle
Implement flashing yellow arrows at signals.	Near-, Mid-term	\$\$, \$\$\$	Angle

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Optimize traffic signal clearance intervals, including consideration for leading pedestrian intervals.	Near-. Mid-term	\$\$, \$\$\$	Angle, Pedestrian
Infrastructure Treatments: Intersection Visibility Improvements			
Increase sight distance (visibility) of intersections on approaches such as applying daylighting treatments (e.g., markings, curb bulb outs) and increasing vegetation management.	Near-. Mid-term	\$, \$\$	Angle
Add retroreflective borders to traffic signal head back plates.	Near-term	\$, \$\$	Dark Conditions
Increase the visibility of signals and signs at intersections.	Near-. Mid-term	\$, \$\$	Dark Conditions
Add lighting, including pedestrian-scale lighting.	Mid-, Long-term	\$\$\$	Dark Conditions, Pedestrian
Install retroreflective markings and pavement treatments to enhance visibility at night.	Near-term	\$	Dark Conditions, Lane Departure
Behavioral Strategies			
Support and educate the public on the safety advantages of using emerging technologies such as intelligent transportation systems and connected vehicles.	Mid-, Long-term	\$, \$\$	Angle
Use TxHSO Law Enforcement Liaisons to improve participation from law enforcement in conducting high-visibility enforcement to address red light running.	Near-, Mid-term	\$, \$\$	Angle
Conduct focused intersection enforcement patrols in conjunction with high-visibility behavioral campaigns (e.g., impaired driving, occupant protection, distracted driving).	Mid-, Long-term	\$\$, \$\$\$	Impairment, Distracted Driving, Seatbelt Use
Encourage the use of coordinated high-visibility enforcement activities addressing high-risk driving behavior, particularly on weekends and evenings for alcohol and drugged-related crashes.	Near, Mid-term	\$, \$\$	Impairment, Speed Management
Conduct impaired driving training for law enforcement personnel, including Drug Recognition Expert and Advanced Roadside Impaired Driving Enforcement training programs.	Near-, Mid-term	\$, \$\$	Impairment
Policy Recommendations			
Develop an Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements.	Mid-term	\$\$	Angle, Speed Management
Develop a traffic calming program.	Mid-term	\$, \$\$	Speed Management
Follow FHWA's Adaptive Signal Control Technologies guidance when planning and implementing adaptive signal control systems to improve emergency response times.	Near-, Mid-term	\$\$	Angle, Speed Management

Vulnerable Road Users

Vulnerable road users include pedestrians and pedalcyclists. Pedestrians accounted for 88 fatal and serious crashes and pedalcyclists accounted for 41 fatal and serious injury crashes within Williamson County from 2019 to 2023. **Table 3** provides a list of recommended countermeasures to improve the safety of vulnerable road users.

TABLE 3: RECOMMENDED VULNERABLE ROAD USER-RELATED COUNTERMEASURES

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Infrastructure Treatments: Enhance Pedestrian and Bicycle Crossings			
Update existing or develop new pedestrian crossings that include additional features such as marked crosswalks, rectangular rapid flashing beacons, curb extensions, raised crosswalks, or advanced warnings.	Near-, Mid-, Long-term	\$	Pedestrian/Bicyclist
Increase sight distance and visibility at pedestrian and bicyclist crossings by clearing vegetation, extending crossing times, adding pedestrian and bicyclist leading intervals and/or adding pedestrian-scale illumination. At mid-block locations, provide adequate distance between stop bars and the crossing; apply speed management as needed to provide sufficient stopping time for motorists; and consider the use of raised crossings.	Near-, Mid-, Long-term	\$, \$\$, \$\$\$	Pedestrian/Bicyclist, Speed Management
Add refuge islands and raised pedestrian and bicyclist crossings and shorten crossing distances with bicycle friendly curb extensions or daylighting treatments where these crosswalk enhancements are needed.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist, Speed Management
Infrastructure Treatments: Improve Lighting			
Illuminate crosswalks with positive contrast to make it easier for a driver to identify the pedestrian visually.	Long-term	\$\$\$	Pedestrian/Bicyclist, Dark Conditions
Infrastructure Treatments: Roadway Reconfiguration			
Reduce the number of travel lanes, assess posted speed limit, narrow travel lanes, and install separated bicycle and pedestrian facilities in areas with high multi-modal use.	Near-, Mid-, Long-term	\$\$\$	Pedestrian/Bicyclist, Speed Management
Install center and/or bicycle-friendly edge line rumble strips.	Mid -, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist, Roadway Lane Departure
Install separated pedestrian facilities (sidewalks and multi-use paths), especially in urban areas and adjacent to schools, bus stops, and school walk areas. Right-size the facilities to the projected pedestrian and pedalcyclist demand.	Mid -, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Infrastructure Treatments: Intersection Improvements Designed for Active Transportation User Safety			
Install left turn lanes designed and operated with explicit consideration for safety of active transportation users.	Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist, Angle
Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists.	Near-term	\$\$	Pedestrian/Bicyclist, Angle
At traffic signals, add bicycle signal heads and provide a leading signal interval. At intersections, install colored bicycle boxes where appropriate for bicycle movements.	Mid-, Long-term	\$\$\$	Pedestrian/Bicyclist
Infrastructure Treatments: Separated Pedestrian/Bicycle Facilities			
Remove permissive left turn signals that conflict with pedestrian/bicyclist movements, eliminate right turn on red at signals, and provide protected signal phases for pedestrian/bicyclist movements.	Near-, Mid-term	\$\$\$	Pedestrian/Bicyclist
Install separated pedestrian and bicycle facilities such as sidewalks, buffered or protected bike lanes, shared use paths, and regional trails. Right-size the facilities to the projected pedestrian and pedalcyclist demand.	Long-term	\$\$\$	Pedestrian/Bicyclist
Add a delay between the pedestrian walk phase and vehicle green phase.	Near-term	\$	Pedestrian
Behavioral Strategies			
Educate the public about the need to be self-aware when traveling and conspicuous, particularly when walking or biking. Encourage the public to wear bright-colored clothing and carry a flashlight. Provide reflective tapes and materials for handing out.	Near-term	\$	Pedestrian/Bicyclist
Partner with local law enforcement to conduct high-visibility speed enforcement in and around school zones during start and end times.	Near-, Mid-term	\$, \$\$	Pedestrian/Bicyclist, Speed Management
Use dynamic speed feedback signs in school zones during start and end times.	Near-, Mid-term	\$, \$\$	Pedestrian/Bicyclist, Speed Management
Promote public awareness of vulnerable user safety issues, contributory circumstances, and provide education/ training for pedestrians, bicyclists, and motorists of all ages on ways to avoid crashes.	Mid-, Long-term	\$, \$\$	Pedestrian/Bicyclist

STRATEGY	TIMELINE	COST	CRASH TYPES ADDRESSED
Coordinate and support vulnerable road user safety and enforcement by law enforcement to conduct high-visibility enforcement of bicyclists, pedestrians, and motorists who are violating traffic safety laws that may endanger them or other multi-modal travelers.	Near-, Mid-term	\$, \$\$	Pedestrian/Bicyclist
Disseminate outreach materials, and training to educate the public and law enforcement personnel on new traffic control devices, such as Pedestrian Hybrid Beacons (HAWK signals).	Mid-term	\$, \$\$	Pedestrian/Bicyclist
Policy Recommendations			
Increase enforcement strategies (speed feedback signs, high-visibility enforcement, etc.) that comply with Texas state laws regarding speeding within a school zone.	Near-, Mid-term	\$, \$\$	Pedestrian/Bicyclist
Develop a policy that includes crash data analysis and community input involving vulnerable road users in Central Texas to identify specific needs and concerns.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist
Develop initiatives to improve safety for vulnerable road users and adhere to TxDOT's design standards and national best practices. These include pedestrian countdown signals, protected bike lanes, and public engagement campaigns.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist
Develop a Complete Streets policy to enhance the pedestrian/bicyclist environment along roadways with higher-than-normal pedestrian/bicyclist activity.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist
Consider developing a policy based on TxDOT's methodologies for assessing pedestrian and bicyclist level of traffic stress (LTS).	Mid-, Long-term	\$, \$\$	Pedestrian/Bicyclist
Develop a plan to assess existing Americans with Disabilities Act (ADA) and TxDOT's accessibility guidelines to prioritize improvements in areas with high ped/bike activity and documented accessibility issues.	Mid-, Long-term	\$, \$\$	Pedestrian/Bicyclist
Develop a policy in accordance with TxDOT's guidelines on truck routes and consider local ordinances for designated truck routes to identify areas where freight routes and ped/bike paths intersect and implement measures such as designated truck lanes or time-based restrictions.	Mid-, Long-term	\$\$, \$\$\$	Pedestrian/Bicyclist
Develop a program that collaborates with local schools and parent-teacher associations to identify areas for enhanced safety improvements (e.g., rectangular rapid flashing beacons, speed feedback signs).	Mid-, Long-term	\$\$	Pedestrian/Bicyclist
Develop a program that follows national best practices for traffic calming guidelines.	Mid-, Long-term	\$\$	Pedestrian/Bicyclist



Appendix D

WILLIAMSON COUNTY SYSTEMIC SAFETY PACKAGES

Williamson County Systemic Safety Packages

Emphasis Area	Package Name	HSIP Work Code(s)	Countermeasures	Area Type	Location	Intersection Control	Crash Patterns and Candidate Locations Guidance
Intersections	Close Median Openings	516	Close Crossover	Urban, Rural	Segment, Intersection	Stop-Controlled	Removing existing median opening to eliminate certain movements at the intersection (to and from the minor road). This includes locations where improvements to sight distance or installing traffic signals are not feasible.
Intersections	Dedicated Right- and Left-Turn Lanes	509, 520, 521, 522, 526	Channelization; Add Left-Turn Lane; Lengthen Left-Turn Lane; Add Right-Turn Lane; Lengthen Right-Turn Lane; Positive Offset Left-Turn Lanes	Urban, Rural	Intersection	Stop-Controlled	Addresses rear-end crash patterns involving stopped or slowed vehicles making a turn. Recommended for corridors with posted speeds greater than 50 mph. Projects should include all intersection standard signing and pavement markings.
Intersections	Enhanced Rural Warning Upgrades	145, 545	Flashing or LED-embedded Stop Signs; Transverse Rumble Strips	Rural	Intersection	Stop-Controlled	Addresses crash patterns where drivers fail to stop due to inattentive or drowsy driving. Addresses right-angle crashes at unsignalized intersections.
Intersections	Enhanced Signal Operation Upgrades	111, 138	Interconnect Signals Install Flashing Yellow Arrow	Urban	Intersection	Signalized	Addresses left-turn crashes where drivers fail to yield.
Intersections	Install Intersection Lighting	305	Safety Lighting at Intersection	Urban, Rural	Intersection	Stop-Controlled	Crash Modification Factors should be applied to individual locations or groups of intersections with a history of nighttime crashes. AASHTO has not established safety lighting warrants for non-freeway locations. FHWA has provided examples fo guidance for intersection lighting warrants based upon Functional Class and AADT: https://highways.dot.gov/safety/other/visibility/fhwa-lighting-handbook-august-2012/4-analysis-lighting-needs .
Intersections	Install Median Turn Arounds or U-Turns	510, 550	Construct Turn Arounds; Restricted Crossing U-Turn (RCUT)	Urban	Intersection	Signalized	Consider for divided roadways with a median that has heavy through traffic and moderate left-turn volumes.
Intersections	Install or Improve Traffic Signals	107, 108, 118	Install Traffic Signal; Improve Traffic Signals; Replace Flashing Beacon with a Traffic Signal	Urban	Intersection	Signalized	The TxDOT Traffic and Safety Analysis Procedures (TSAP) Manual includes an Intersection Control Selection Matrix for considerations and guidance on the applicable Operational Analysis Tools per each type of signalized intersection.
Intersections	Leading Pedestrian Intervals	109	Implement Leading Pedestrian Interval (LPI) Timing	Urban	Intersection	Signalized	Prioritize locations with a high volume of pedestrian traffic. Eligible LPI projects should let to contract with the installation of Audible Pedestrian Signals.
Intersections	Roundabouts	547	Construct a Roundabout	Urban, Rural	Intersection	Stop-Controlled, Signalized	This package is limited to conversion of existing intersections to single-lane roundabouts only. Requires Intersection Control Evaluation.
Intersections	Signalized Intersection Visibility Upgrades	119, 122, 124, 128, 401, Other	Install Overhead Signs; Install Advanced Warning Signals (Intersection - Existing Warning Signs); Install Advanced Warning Signals and Signs (Intersection); Install Advanced Warning Signs (Intersection); Install Pavement Markings; Signal Head Backplates	Urban, Rural	Intersection	Stop-Controlled	Addresses crash patterns where drivers disregard the signal, fail to stop, or fail to yield (angle, turning, rear end).
Intersections	Stop-Controlled Visibility Upgrades	119,122, 124, 128, 145, 401	Install Overhead Signs; Install Advanced Warning Signals (Intersection - Existing Warning Signs); Install Advanced Warning Signals and Signs (Intersection); Install Advanced Warning Signs (Intersection); Flashing or LED-embedded Stop Signs; Install Pavement Markings	Rural	Intersection	Stop-Controlled	Addresses crash patterns where drivers fail to stop (angle, turning, rear end). Where Overhead Flashing Beacons (OFBs) previously funded by the HSIP are removed due to the installation of roadside flashers or embedded LEDs, the OFBs must have met the 10-year service life.
Other (Left-Turn Crashes)	Positive Offset Left-Turn Lanes	203, 519	Install Raised Median; Add Left Turn Lane	Urban, Rural	Intersection, Segment	Stop-Controlled	Installing left-turn lanes and/or right-turn lanes should be considered for the major road approaches for improving safety at both three- and four-leg intersections with stop control on the minor road where significant turning volumes exist or where there is a history of left-turn crashes.
Other (Left-Turn Crashes)	Raised Medians	203	Install Raised Median	Urban	Segment	N/A	Raised medians should be considered for replacing two-way left-turn lanes when AADT is approximately 20,000 vehicles or more. Medians should also be located where they can also serve as refuge for pedestrian crossings.
Other (Left-Turn Crashes)	Two-Way Left-Turn Lanes	518	Install Continuous Turn Lane	Urban, Rural	Intersection	Stop-Controlled	Recommended where turn lanes were not previously provided and the stop control is located at the minor approaches.
Roadway Lane Departure	Enhanced Delineation on Curves	113, 123, 125, 130, 136, 137, 139, 401, 402, 404, 532, 533, 534, 542, 543, 544	Install Delineators; Install Advanced Warning Signals (Curve- Existing Warning Signs); Install Advanced Warning Signals and Signs (Curve); Install Advanced Warning Signs (Curve); Install Chevrons (Curve); Install LED Flashing Chevrons (Curve); Install Surface Mounted Delineators on Centerline; Install Pavement Markings; Install Edge Marking; Install Centerline Striping; Milled Edgeline Rumble Strips; Profile Edgeline Markings; Raised Edgeline Rumble Strips; Milled Centerline Rumble Strips; Profile Centerline Markings; Raised Centerline Rumble Strips	Urban, Rural	Curve	N/A	Consider in advance of or within curves, particularly on rural, two-lane undivided roadways.

Williamson County Systemic Safety Packages

Emphasis Area	Package Name	HSIP Work Code(s)	Countermeasures	Area Type	Location	Intersection Control	Crash Patterns and Candidate Locations Guidance
Roadway Lane Departure	Install Median or Roadside Barriers	201, 217	Install Median Barrier; Install Impact Attenuation System	Urban, Rural	Segment	Not Applicable (N/A)	TxDOT HSIP Guide: - Existing median width must be <= 70' - Cable median barriers are for use only on medians > 25' in width - Concrete median barriers can be used on all median widths Locations of projects will be prioritized in as follows: 1) By Functional Class (Interstate, non-Interstate freeways, other principal arterials, all others) 2) 0-45' median widths in urban and rural areas 3) Greater than 45' median widths in rural areas 4) Greater than 45' median widths in urban areas AASHTO's Roadside Design Guide (RDG): Recommended: High-speed fully controlled-access roadways with median is less than 30' in width and AADT is greater than 20,000 Optional: Median is greater than 50' and AADT is less than 20,000 Analysis Required: Median is between 30' and 50' to determine the cost effectiveness of median barrier installation.
Roadway Lane Departure	Install Segment Lighting	304	Safety Lighting	Urban, Rural	Segment, Curve	N/A	Per the TxDOT Highway Illumination Manual, continuous lighting is eligible for: 1) Urban Freeways 2) Multi-lane arterials with partial access At least one of four warrants must also be met. https://onlinemanuals.txdot.gov/TxDOTOnlineManuals/TxDOTManuals/hwi/continuous_lighting1.htm
Roadway Lane Departure	Widen Roadway or Shoulders	502, 503, 504, 534, 536, 537, 541	Widen Lane(s); Widen Paved Shoulder (to 5 ft. or less); Construct Paved Shoulders (1-4 ft.); Widen Paved Shoulders (to >5 ft.); Construct Paved Shoulders (>= 5ft.); Provide Additional Paved Surface Width; Raised Edgeline Rumble Strips	Rural	Segment, Curve	N/A	Consider for rural two-lane, two-way undivided highways with a pavement surface less than or equal to 24' in width.
Speeding	Dynamic Speed Feedback Signs	150	Install Dynamic Speed Feedback Signs	Urban, Rural	Segment	N/A	Dynamic speed feedback signs are recommended in advance of school zones, work zones, and on segments where the speed limit has been reduced due to sharp horizontal curves. Facility owners may also use discretion to install signs at locations with a history of speed-related crashes or active transportation crossing activity
Speeding	Reduce Street Width	409, Other	Install Pedestrian Refuge Islands; Install Curb Extensions	Urban	Segment	N/A	Table 3.1 of the ePrimer noted that all these measures are "5 – traffic calming measure may be appropriate" for Arterials and lower functional classification.
Speeding	Traffic Calming	409, Other	Install Pedestrian Refuge Islands; Install Curb Extensions; Install Vertical or Horizontal Deflection	Urban	Segment	N/A	See FHWA Traffic Calming ePrimer, Module 3: Toolbox of Individual Traffic Calming Measures. https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer
Vulnerable Road Users	Activated Warning Devices at Uncontrolled Crossing Locations	143, 144	Pedestrian Hybrid Beacon; Install Rectangular Rapid Flashing Beacon (RRFB)	Urban	Crossing Locations	N/A	Per the TxDOT guidelines issued on 9/11/2018, both RRFBs and PHBs must meet the following requirements: - an established crosswalk with adequate visibility, markings, and signs - a posted speed limit of 40 mph or less (does not include school speed zones) - 20 pedestrians or more crossing in one hour - location deemed as a high risk area (e.g. schools, shopping centers) - crosswalk is more than 300 ft. from an existing traffic-controlled pedestrian crossing PHBs must also complete an engineering study per Chapter 4F of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). https://ftp.txdot.gov/pub/txdot/crossroads/trf/rrfb-and-phb-revised-guidelines-memo-sep-2018.pdf
Vulnerable Road Users	Enhanced Pedestrian Crossing Upgrades	203, 409	Install Raised Median; Install Pedestrian Refuge Islands	Urban	Segment, Intersection	Signalized	Pedestrian refuge islands should always be considered at a marked uncontrolled crossings on roadways with 4+ lanes without raised medians, as shown in Table 1 of the FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations. Raised crosswalks are candidate countermeasures on roadways with 2 or 3 lanes, with or without raised medians, and where the posted speed limit is less than or equal to 30 mph. Curb extensions are candidate countermeasures at all marked uncontrolled crossings.
Vulnerable Road Users	Pedestrian Crossing Deterrents	225	Pedestrian Crossing Deterrents	Urban	Segment	N/A	Package is applicable on segments of divided highways to prohibit pedestrian crossings.
Vulnerable Road Users	Pedestrian Level Lighting Upgrades	304, 305	Safety Lighting at Intersection; Safety Lighting	Urban, Rural	Crossing Locations	N/A	These crosswalk visibility enhancements should always be considered or occur at a marked uncontrolled crossing, based upon the roadway configuration, AADT, and posted speed limit, as shown in Table 1 of the FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.
Vulnerable Road Users	Sidewalks or Paths	407, 408	Install Sidewalks; Add Shared Use Path	Urban, Rural	Segment	N/A	Install sidewalks or shared-use paths where none existed previously on corridors identified as Potential Risk Segments on Focus Facilities in the District-specific summaries of the Texas Pedestrian Safety Action Plan (PSAP): https://www.txdot.gov/about/advisory-committees/bicycle-pedestrian-advisory-committee/pedestrian-safety-action-plan.html
Vulnerable Road Users	Uncontrolled Crossing Upgrades	114, 133, 134, 403	Install Pedestrian Crosswalk; Install Advanced Crossing Signage; Install School Zones; Improve School Zone	Urban, Rural	Intersection, Segment	Stop-Controlled	Parking should be restricted a minimum of 20' from crosswalks where posted speeds are 25 mph or less and 30' where speeds are higher. TMUTCD Section 2B.12, In-Street and Overhead Pedestrian Crossing Signs, contains additional information about in-street pedestrian crossing signs.