CENTRAL TEXAS

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION


*Courtesy of Fox7Austin.com (https://www.fox7austin.com/news/new-hays-county-public-safety-facilities-completed-open )*

# HAYS COUNTY

# SAFETY ACTION PLAN

PART OF THE GREATER CAMPO REGIONAL SAFETY ACTION PLAN

June 2025

# ACKNOWLEDGMSENTS


## PLAN DEVELOPMENT TEAM

Capital Area Metropolitan Planning Organization (CAMPO) – Nicholas Samuel, William Lisska, Doise Miers

Cambridge Systematics – Alex Kone, Matt Miller, Crystal Mercedes, Seema Singh, Ryan Klitzsch, Taraneh Ardalan, Qi Si, Charly Gutierrez, Sha'Von Terrell

CD&P – Alysa DeRosa, Melissa Navarro, Cheyenne Miles, LaMarriol Smith

## HAYS COUNTY SAFETY TASK FORCE

Hays County Transportation Department - Jennifer Moczygemba, Marti Reich, Brandon Elliott

Hays County Sheriff Department – Gary Cutler

City of Wimberley - Nathan Glasier, Tim Patek

City of Dripping Springs - Dane Sorenson, Tory Carpenter

City of Kyle - Melissa McCollum, Lu Zhang

City of San Marcos - Julia Cleary, Rohit Vij, Ning Zou, Tim Wilson, Shaun Condor

City of San Marcos Police Department – Garner Ames

City of Buda - Angela Kennedy

TxDOT Austin District – South Travis/Hays County Area Office - William Semora Jr., Luisa Morales, Adam Ramirez

Texas State University - Steven Herrera


# DISCLAIMER

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists, compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

# DEDICATION

THIS PLAN IS DEDICATED TO ALL THE LIVES LOST AND TO THOSE WHO HAVE BEEN FOREVER CHANGED BECAUSE OF A TRAFFIC CRASH IN HAYS 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 Municipal 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

# TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# Executive Summary

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

## The Road Safety Challenge in Hays County

Hays County is one of the fastest-growing counties in Texas, experiencing rapid residential and commercial development, resulting in rising demands on its transportation system. As roadways grow more congested, safety risks have increased, particularly for vulnerable road users such as pedestrians, bicyclists, and older adults. Between 2019 and 2023, fatal crashes in the county increased from 27 to 32, while serious injury crashes rose from 123 to 127. This upward trend in crash severity coincided with expanding roadway infrastructure, intensifying land development, and changing travel behaviors.

A detailed safety analysis identified the most common factors contributing to these fatal and serious injury crashes, as illustrated in **Figure 1**.

The good news is that we know these tragedies are preventable, and we are committed to changing this story. To support the development of this SAP, the Hays County Safety Action Plan Task Force carried out a series of analyses and key activities, including a safety analysis, an assessment of underserved community needs , community engagement efforts, and a policy review. These efforts and collaboration with stakeholders led to the identification of proposed policy recommendations, infrastructure improvements, and behavioral interventions.

Proposed targeted safety projects include 30 corridor enhancements and 37 intersection improvements. The goal for these recommendations is to enhance road safety, helping all residents and visitors work, live, and enjoy their activities in Hays County.

## The Safety Action Plan

The SAP provides a coordinated, data-driven roadmap to reduce and eliminate traffic-related deaths and serious injuries in the county. Developed in partnership with CAMPO as part of its Regional Safety Action Plan (RSAP), the SAP reflects input from a multi-agency Task Force composed of representatives from Hays County, municipalities, the Texas Department of Transportation (TxDOT), regional transit providers, and emergency services. The SAP builds upon crash data analysis, community engagement, and coordination with local agencies to identify priority strategies, policies, and infrastructure investments. The SAP is grounded in the **Safe System Approach**, which recognizes that human mistakes are inevitable and emphasizes designing roadways to minimize the severity of mistakes. The plan also aligns with the Texas Road to Zero goals by integrating the following:


FIGURE 1: CRASH EMPHASIS AREA FINDINGS FOR HAYS

- A comprehensive crash analysis and High Injury Network (HIN) mapping.
- A shared safety vision, goals, and measurable objectives.

- Policy and process recommendations to institutionalize safety practices across jurisdictions.
- A prioritized list of systemic and location-specific countermeasures tied to the identified crash risk factors and network gaps.

The SAP helps Hays County and its partner agencies compete for federal safety funding, including the U.S. Department of Transportation's (USDOT's) Safe Streets and Roads for All (SS4A) program. It builds upon local and regional efforts already underway and provides a framework for advancing implementation in a coordinated and measurable way.


FIGURE 2: COUNT OF TOTAL SAFETY IMPROVEMENTS FOR HAYS COUNTY

The core outcomes of the SAP include key strategies, community actions, countermeasure identification and prioritization, and accountability and transparency.

## KEY STRATEGIES

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

**Safety Leadership & Culture.** Making safety a core value across all transportation decisions by: formalizing Hays County's Road to Zero goal, identifying local leaders to champion and coordinate action, tracking progress and maintaining accountability across jurisdictions, and initiating public awareness campaigns and interagency coordination to strengthen the culture of safety at all levels. This will help embed safety in project delivery, policy development, and community engagement.

**Safer Roads.** Investing in road improvements that reduce crash likelihood and severity, including systemic safety upgrades at high-risk corridors and intersections, enhanced signal operations, and policies that embed safety into roadway design and maintenance. Proven countermeasures such as improved lighting, signage, and lane departure treatments will be deployed throughout the county to prevent severe crash types.


**Safer Speeds.** Developing a speed management policy grounded in TxDOT guidance and context-sensitive design. A new traffic calming program and school zone enhancement initiative will focus on reducing speeds in neighborhoods, near schools, and on priority corridors. Speed feedback signs and data-driven enforcement will help reinforce appropriate speeds and increase driver awareness.

**Safer Road Users.** Expanding public education efforts, enhancing coordination with law enforcement, and providing targeted outreach to young, older, and vulnerable road users. These efforts will focus on discouraging risky behaviors such as speeding, distraction, and impaired driving, while encouraging safer choices and shared responsibility for all road users.

**Safer Vehicles.** Implementing policies to manage freight movement and prepare for emerging vehicle technologies. This includes identifying designated truck routes that minimize conflict with pedestrian and bicycle facilities and exploring upgrades to infrastructure that support connected and automated vehicles. The County will also assess opportunities to modernize agency fleets with vehicles featuring advanced driver assistance systems.

**Post-Crash Care.** Coordinating with local Emergency Management Services (EMS) and traffic management agencies to enhance incident response protocols and data-sharing practices. Upgrades to adaptive traffic signals and the development of a countywide collision database will improve emergency access and enable continuous improvement in post-crash care outcomes.

## COMMUNITY ACTIONS

To help proposed safety solutions meet's the County's needs, the SAP is shaped by input from Hays County residents and ongoing collaborations with local agencies, schools, law enforcement, and nonprofits as key implementation partners. The plan outlines specific roles for stakeholder groups to maintain momentum, track progress, and help ongoing coordination. Community and institutional coordination are central to successful implementation. Key recommendations include:

- Establishing a permanent Hays County Road to Zero Task Force
- Designating Road to Zero Coordinators at local and county levels
- Tracking progress via annual safety reports
- Raising public awareness through campaigns and educational outreach

Community input mechanisms, including an online feedback tool and ongoing collaboration with school districts to support Safe Routes to School, are integral parts of the community action framework.

## COUNTERMEASURE IDENTIFICATION AND PRIORITIZATION

The plan includes a prioritized list of location-specific and systemic safety countermeasures. Using data-driven criteria—such as crash history, effects on underserved communities, project readiness, and crash reduction potential—the Task Force has developed a shortlist of high-priority improvements. These include intersection reconfigurations, pedestrian crossing upgrades, roadway lighting, and corridor-level safety packages. The SAP applies a dual approach to countermeasure identification, which includes:

- **A High Injury Network (HIN)** analysis to direct resources to the most crash-prone corridors and intersections
- **Systemic screening** to identify and treat facilities with similar risk characteristics, even if they are not yet overrepresented in crash data

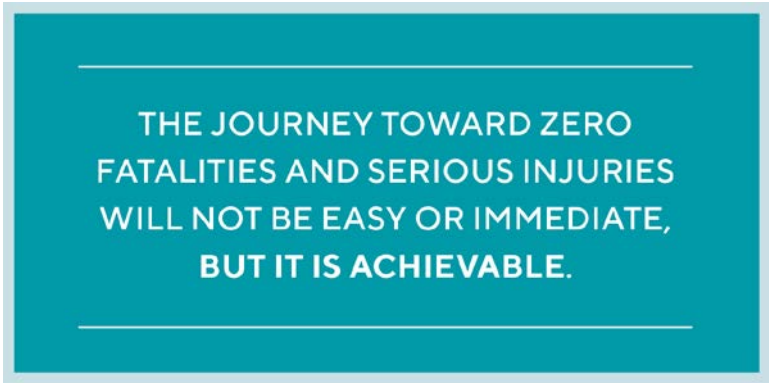
Recommended countermeasures include enhanced lighting, lane departure prevention (e.g., rumble strips), intersection control improvements, and infrastructure upgrades for pedestrians and cyclists.

## ACCOUNTABILITY AND TRANSPARENCY

To help 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 SAP is more than a document—it is a collective commitment to protect life on our roadways and eliminate all traffic fatalities and serious injuries. By adopting the Texas Road to Zero goal and expanding it to include serious injuries, Hays County affirms that no loss of life is acceptable, and every step toward safer roadways is necessary and worthwhile.




Grounded in local data, evidence-based strategies, and the Safe System Approach, this plan recognizes that the journey to zero traffic deaths and serious injuries will not be easy or immediate, but it is achievable. Through targeted infrastructure improvements, cultural change, and coordinated leadership, Hays County is laying the foundation for a safer, more connected future.

With strong leadership, active community partnerships, and an unwavering commitment to saving lives, Hays County and its local jurisdictions are taking decisive steps toward building a safer, more inclusive transportation network for all who live in and visit the county.

The Hays County Task Force—formed during the development of this plan—will continue to serve as a central body for advancing projects, monitoring outcomes, and adapting strategies as new data and needs emerge.

Each redesigned intersection, newly established safe roadway segment, and improved road user behavior brings us closer to our vision: a Hays County where all people—regardless of how they travel—can do so safely and confidently.

# How We Got Here

This section describes the need for safety planning and how it fits into an RSAP.

## Setting the Stage for Safety

Since November 7, 2000, not a single day has passed without a traffic fatality on Texas roads. In Hays County alone, there were 152 fatal crashes and 657 suspected serious injury crashes from 2019 to 2023. These are not just statistics—they represent lives lost and families forever changed. As a community, we must refuse to accept these tragedies as inevitable.

Hays County, in partnership with CAMPO, is taking bold steps to reverse this trend. In 2022, the U.S. Department of Transportation (US DOT) granted CAMPO funding from the Safe Streets and Roads for All (SS4A) Grant Program to develop an RSAP to improve roadway safety for all users. The SAP is a critical piece of this regional initiative, focused on eliminating fatal and serious injury crashes by adopting a data-driven, comprehensive plan of action. This plan reflects a county-wide effort to identify and implement safety strategies tailored to the specific needs of Hays County's communities.

## CAMPO Regional Safety Action Plan

CAMPO is developing an RSAP through a coordinated, county-level planning approach. Each county in the CAMPO region—Bastrop, Burnet, Caldwell, Hays, Travis, and Hays—is developing its own SAP, which will be included as a chapter in the broader RSAP.

# Vision, Goals, and Objectives to Achieve a Safer Hays County

This section presents the Hays 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

Hays County envisions a future where all people can travel safely, whether walking, biking, driving, or riding transit. That vision is encapsulated in the following statement:


Hays County's transportation safety goals, objectives, and strategies 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 and strategies differ from one department and agency to the next, but the goals they aim to achieve are consistent. Across the U.S., the State of Texas, and Hays County, safety goals are shifting from the reduction of roadway crashes in general to the specific elimination of fatalities and serious injuries for all users.

The objectives presented in this plan are organized into three focus areas: Traffic, Culture, and Active Transportation & Transit. These categories help structure the County's approach, representing a starting point for collaborative, sustained action requiring ongoing coordination across agencies, disciplines, and communities. Achieving Hays County's goal of reducing and eliminating roadway-related deaths and serious injuries for all transportation system users will require ongoing collaboration among all stakeholders working across these categories.

## Hays 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. 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 guides TxDOT 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**.

Hays County's transportation safety goals are consistent with the TTC's Road to Zero Goal:

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

## Road to Zero Safety Objectives

Hays County recorded an increase in the number of fatal crashes from 27 in 2019 to 32 in 2023. Serious Injury crashes increased from 123 in 2019 to 127 in 2023. Addressing this trend and achieving Hays County's safety goals requires setting clear, specific, and measurable objectives.

As previously noted, Hays County's safety objectives are structured around three categories: Traffic, Culture, and Reducing Risk Exposure through Active Transportation and Transit. These objectives form the backbone of Hays County's commitment to Road to Zero and are informed by crash trends, stakeholder input, and federal and state guidance.

### SAFER TRAFFIC FOR ALL

The following objectives focus on designing safer roads through a comprehensive program of maintenance, rehabilitation, reconstruction, and new construction of roadways across Hays County communities.

| Traffic Safety Objectives: | |
|---|---|
| 1 | Reduce the number of fatal and serious injuries related to roadway and lane departure crashes. |
| 2 | Reduce the number of intersection-related fatal and serious injury crashes. |
| 3 | Reduce the number of bicycle and pedestrian fatal and serious injuries. |
| 4 | Reduce risk exposure around safe routes, active transportation network (e.g., biking and walking), and transit to primary, secondary, and higher educational institutions. |
| 5 | Reduce the number of fatal and serious injuries where speeding is a contributing factor. |
| 6 | Reduce the number of fatal and serious injuries resulting from large truck crashes. |
| 7 | Reduce the number of fatal and serious injuries in and around work zones. |
| 8 | Increase coordination with TxDOT to reduce the number and severity of crashes on on-system facilities and at the intersections of on-system (TxDOT) with off-system (local) roadways. |
| 9 | Promote cross-jurisdictional coordination to ensure consistent design, operations, and road user accommodations on roadways continuing beyond Hays County. |

## FOSTERING A CULTURE OF SAFETY

The following objectives aim to shift the current focus from a -driver-centric culture to one that is more focused on all roadway users, particularly those who are most vulnerable.

### Culture of Safety Objectives:

1. Participate in statewide enforcement and educational campaigns to reduce the number of people who choose to drive under the influence of alcohol or other drugs, drive aggressively, or speed.
2. Create a prosocial traffic safety culture by educating the public on their role in keeping their streets and roads safe.
3. Maintain leadership by the County, Cities, and other agencies in promoting safe driving policies and practices.
4. Increase educational opportunities for younger and older drivers on safe driving, biking, and walking practices.
5. Promote the education of 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 all crashes to occur, since crash risk is correlated with a person's overall travel. Additionally, providing non-driving travel options can have an even greater benefit when certain drivers choose those modes. For example, offering attractive transit and active transportation options may reduce how often young and novice drivers, older drivers, and impaired drivers choose to drive a motor vehicle.

The objectives laid out in this category aim to provide safe travel for all road users by minimizing and hazards and reducing users' exposure to them.

**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 key destinations.
2. Provide new accessible connections across highways and railroads where there are substantial distances between crossings.
3. Provide and maintain a safe, efficient, reliable, and well-connected transit system throughout the county.
4. Reduce the number of fatal and serious injuries at railroad crossings.
5. Provide safe routes and connected routes for bicycling, walking and transit access to primary, secondary, and higher educational institutions.
6. Reduce emergency and incident response time to crash events throughout the county.
7. Reduce the number of low-water crossings that contribute to flood-related incidents or hinder emergency response.

## CONSIDERING PERFORMANCE MEASURES AND EVALUATION

To help share the progress of safety projects and strategies included in this plan, as well as their resulting effects, a future task within the CAMPO RSAP will develop a toolkit for program and project tracking to measure progress over time. It is expected that CAMPO will maintain progress tracking tools and rely on Hays County and its member jurisdictions to routinely provide applicable data related to policies, programs, and projects. Additional details regarding performance measures and evaluation are provided in the implementation section of the SAP.

# Safety Analysis

This section presents the data-driven foundation of the Hays County Safety Action Plan, including the methodologies used to collect and analyze crash data, identify common risk factors, and develop a county-specific High Injury Network (HIN). The results of this analysis provide the basis for identifying priority locations, selecting appropriate countermeasures, and guiding the implementation of strategies that align with Safe System principles.

**Performance and Evaluation Snapshot**

**Outputs (What's Being Done)**

- **Safety Projects:** Pedestrian upgrades, rumble strips, lighting, signage
- **Programs:** Driver education (younger/older), enforcement campaigns, task force meetings

**Outcomes (Why it Matters)**

- Reduction in **fatal and serious injury crashes**
- Crash data by **mode** and **behavioral factors**
- Crash data by **population** or **vehicle miles traveled**

## Why the County Needs to Improve Roadway Safety

**Hays County experienced 152 fatal crashes and 645 serious injury crashes from 2019 to 2023.** The individuals involved in these crashes are our friends, family, and neighbors – our Hays County community – and these deaths and life-altering injuries are unacceptable. Many of these crashes were preventable, which is why Hays County has committed to improving roadway safety.

An analysis of Hays County crash data from the most recent five years (2019 – 2023) revealed crash patterns and hot spots, crash severity, and contributing factors (e.g., lighting condition, weather condition, impaired driving involvement, etc.). Analyzing crash patterns by contributing factors helped identify high-risk areas and systemic safety needs in Hays County.

An HIN was also developed 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 Hays County Safety Analysis, including the methodology and results.

## Data Analysis Methodology

This section describes the core data analysis methodology, including how crash data was collected and used, how the county's crash history, commonalities, and risks were evaluated, and how the HIN informed the analysis.

### HOW CRASH DATA WAS GATHERED AND USED

Crash data from 2019 to 2023 was collected from the Texas Crash Records Information System (CRIS) maintained by TxDOT. CRIS uses the KABCO scale[1] to classify crash severity: 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. The dataset relies

[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).

on law enforcement reporting and may not have all the information for all crashes. For example, hit and run crashes where the driver's injury is unknown fall under the "unknown" crash severity type.

A HIN analysis and crash and roadway inventory datasets were used to assess crashes. Associating crashes with roadway type, owner, maintenance provider, and roadway length helped provide insights into crash patterns.

## HOW WE EVALUATED HAYS COUNTY'S CRASH HISTORY

A historical crash analysis was conducted for all of Hays County and then broken down by state-owned roadways and locally owned roadways. State-owned roadways include freeways, ramps, and highways. All other roadways are considered locally-owned. Crash patterns were studied by year, severity type, and combined fatal and suspected serious injury type. **Figure 3** shows how the various analyses supported development of the SAP.

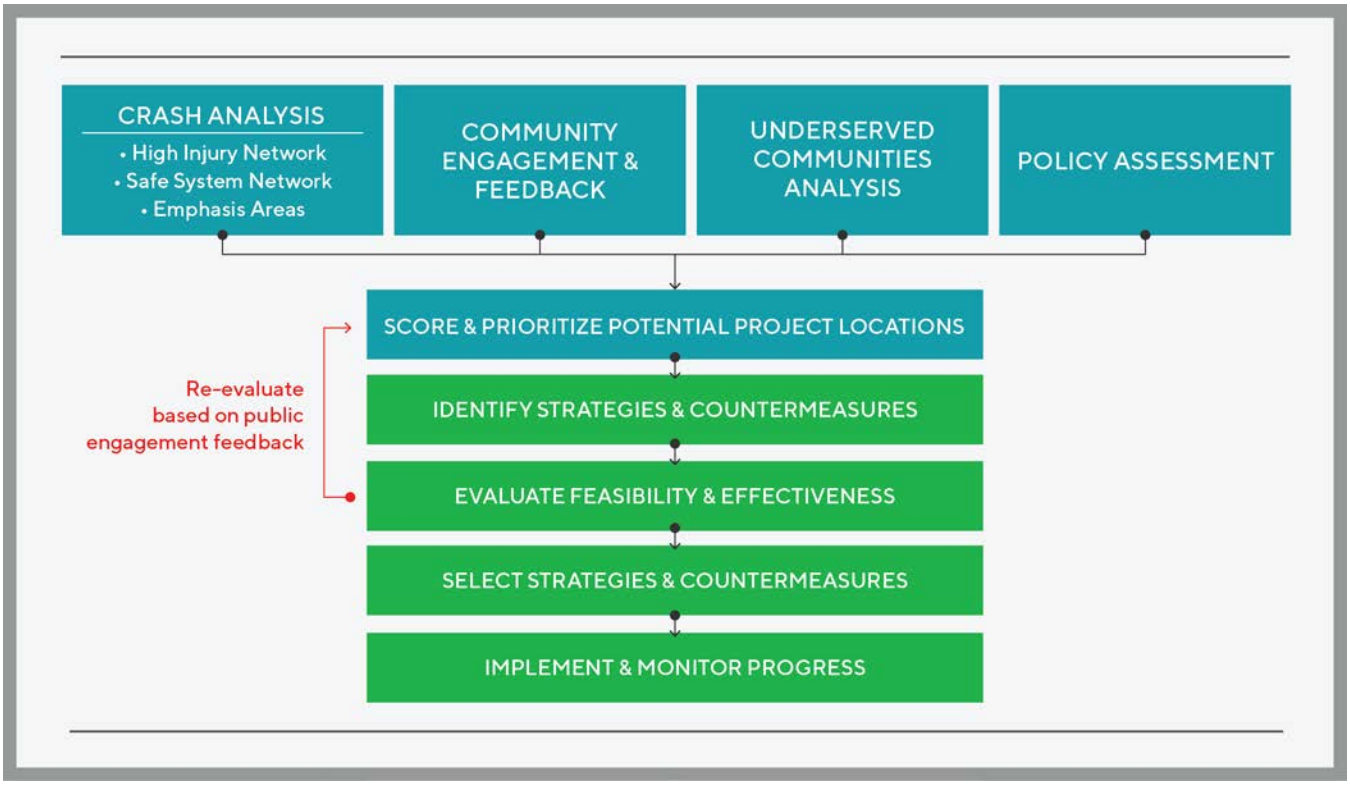


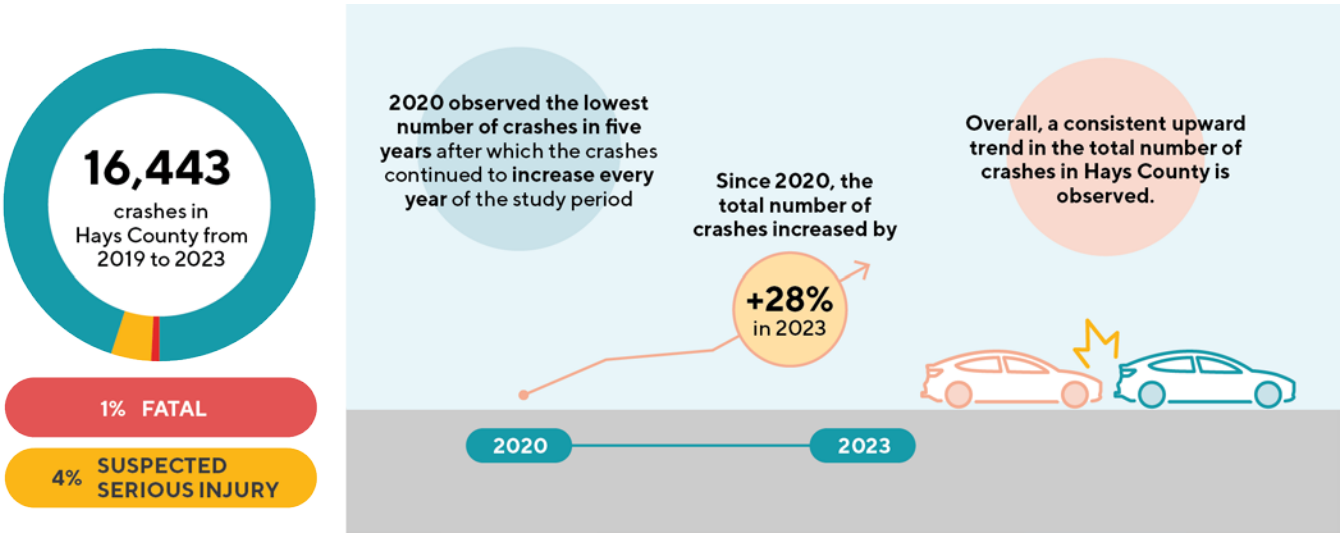

FIGURE 3: SAFETY ANALYSIS FRAMEWORK

## Safety Analysis Results

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

### CRASH TRENDS IN HAYS COUNTY

The total number of crashes increased by 28% from 2020 to 2023. While 2020 saw fewer crashes due to the pandemic's influence on travel,, **a consistent overall upward trend in the total number of crashes in Hays County was observed.**




The highest number of fatal crashes, 38, was observed in 2022, and the lowest, 25, was observed in 2021. The serious injury crashes fluctuated between a low of 97 in 2021, and a high of 151 in 2022. Figure 4 presents the crash trend of fatal and suspected serious injury crashes and summarizes fatal and serious injury crashes by crash type in Hays County from 2019 to 2023.

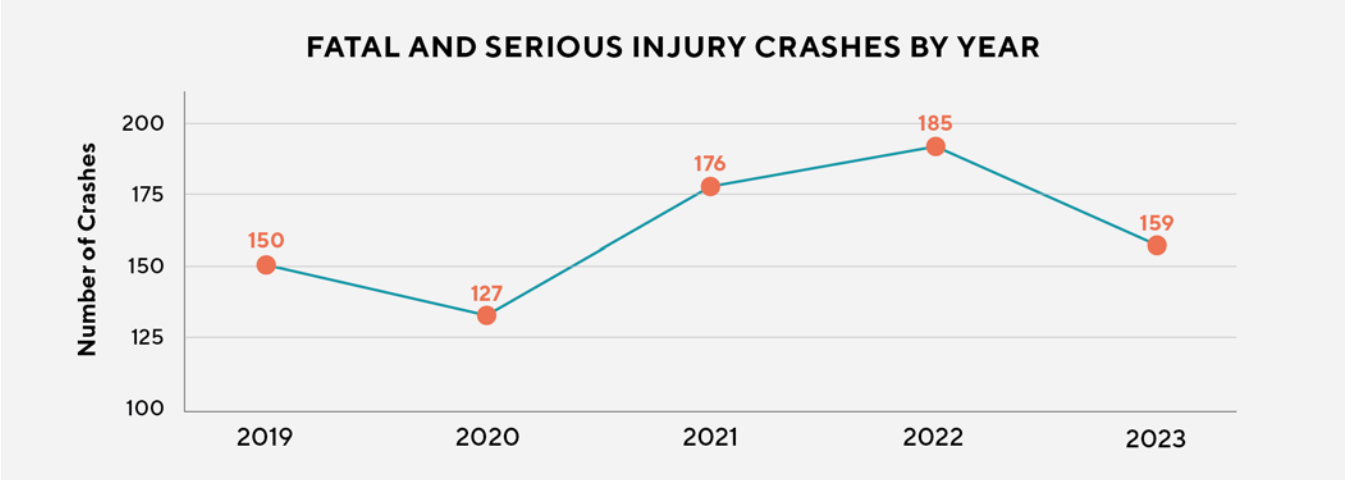



FIGURE 4: FATAL (K) AND SUSPECTED SERIOUS INJURY (A) CRASHES (2019-2023) BY YEAR

**Figure 5** summarizes the injury crashes in Hays County by year and severity for all roadway types. The figure does not include non-injury and unknown-injury crashes.

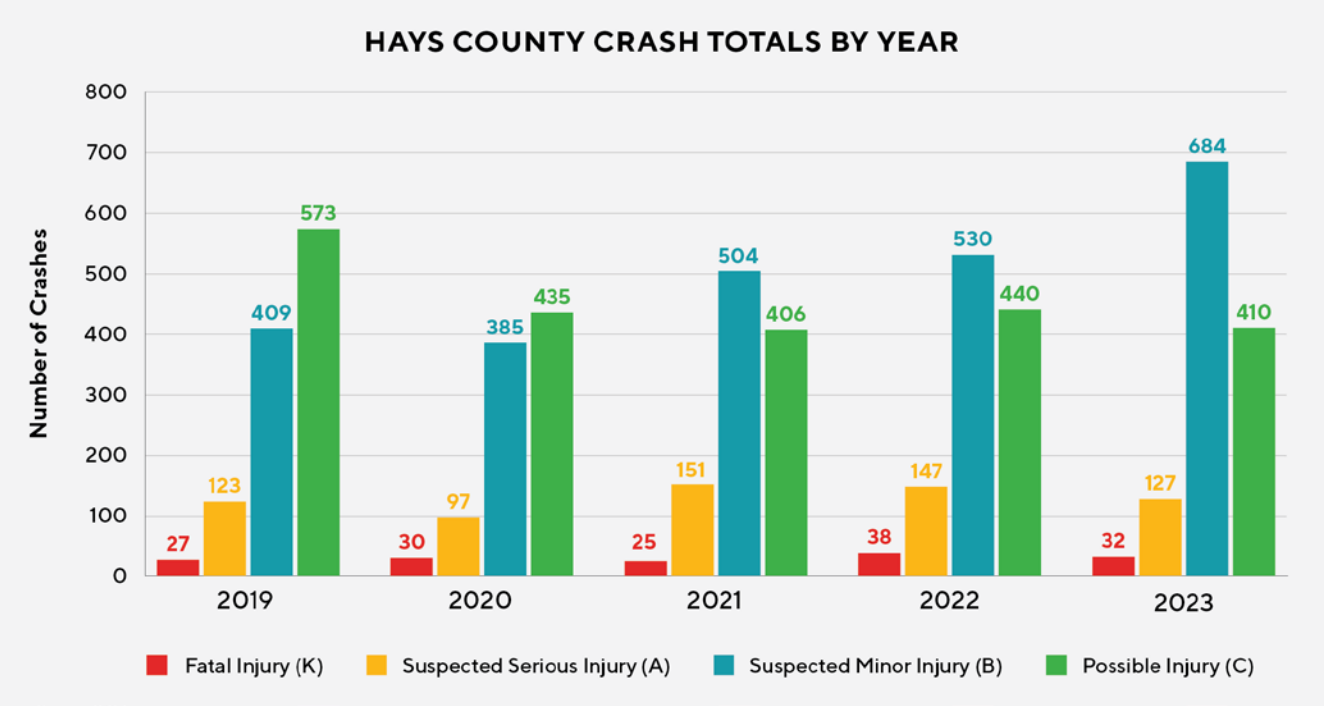



FIGURE 5: CRASHES (2019-2023) BY YEAR AND BY SEVERITY

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

## CRASH TYPES AND CONTRIBUTING FACTORS

**Figure 6** shows fatal and serious injury crashes by crash type in Hays County from 2019 to 2023. Roadway and lane departure crashes were the most prevalent type of crash resulting in fatalities and serious injuries, accounting for 42% of all KA crashes.

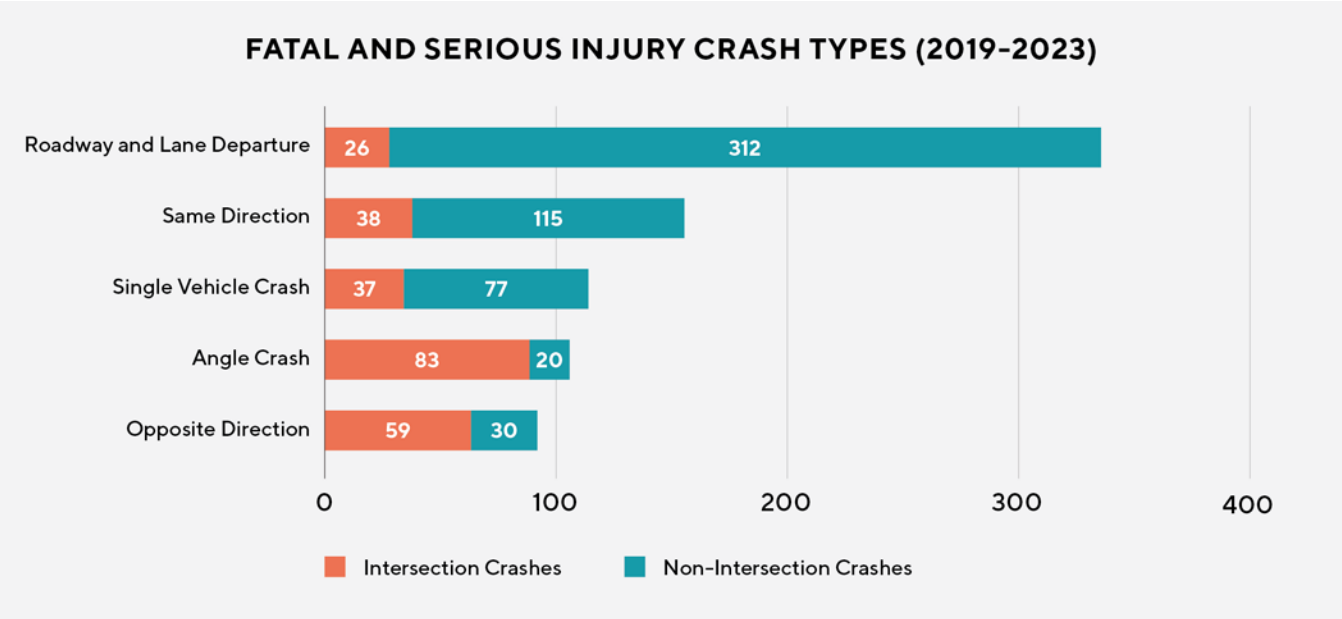



FIGURE 6: FATAL AND SERIOUS INJURY CRASHES BY TYPE (2019-2023)

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

- Speeding, failure to yield right of way, impaired driving, and distracted driving were among the top contributing factors, together accounting for over 40% of fatal and serious injury (KA) crashes in Hays County.
- Failure to yield right of way was the leading contributing factor for angle and opposite direction crash types, which together made up 29% of all crashes and 24% of fatal and serious injury (KA) crashes.
- 20% of same direction crashes were speed-related.
- 24% of angle crashes were due to failure to yield.
- Distraction-related and aggressive driving crashes were also significant contributors, each representing 30% of total crashes.
- Most crashes occurred during the afternoon and evening hours, especially between 3 PM and 7 PM, which aligns with evening peak traffic.
- Friday had the highest number of crashes, while Sunday had the lowest, according to weekday analysis.
- On a typical day, the peak crash hour was 5 PM.
- Crashes were generally less frequent during early morning (12 AM – 6 AM) and late evening (10 PM – 12 AM) periods.

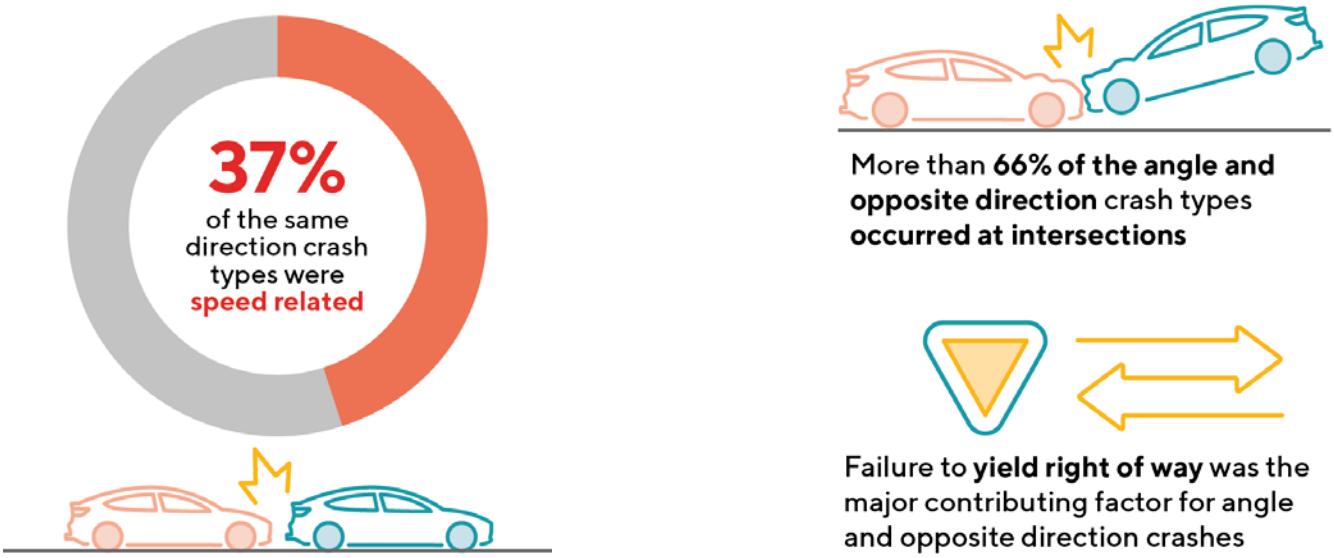



FIGURE 7: CONTRIBUTING CRASH FACTORS AND COMMON CRASH TYPES IN HAYS COUNTY

### Intersection and Non-Intersection Crash Density Heat Maps

Two heat maps were developed using the available Hays County crash data for 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).

Most of the intersection and non-intersection (segment) crashes occurred in urban areas where state-owned roads intersect with another state-owned or local road.

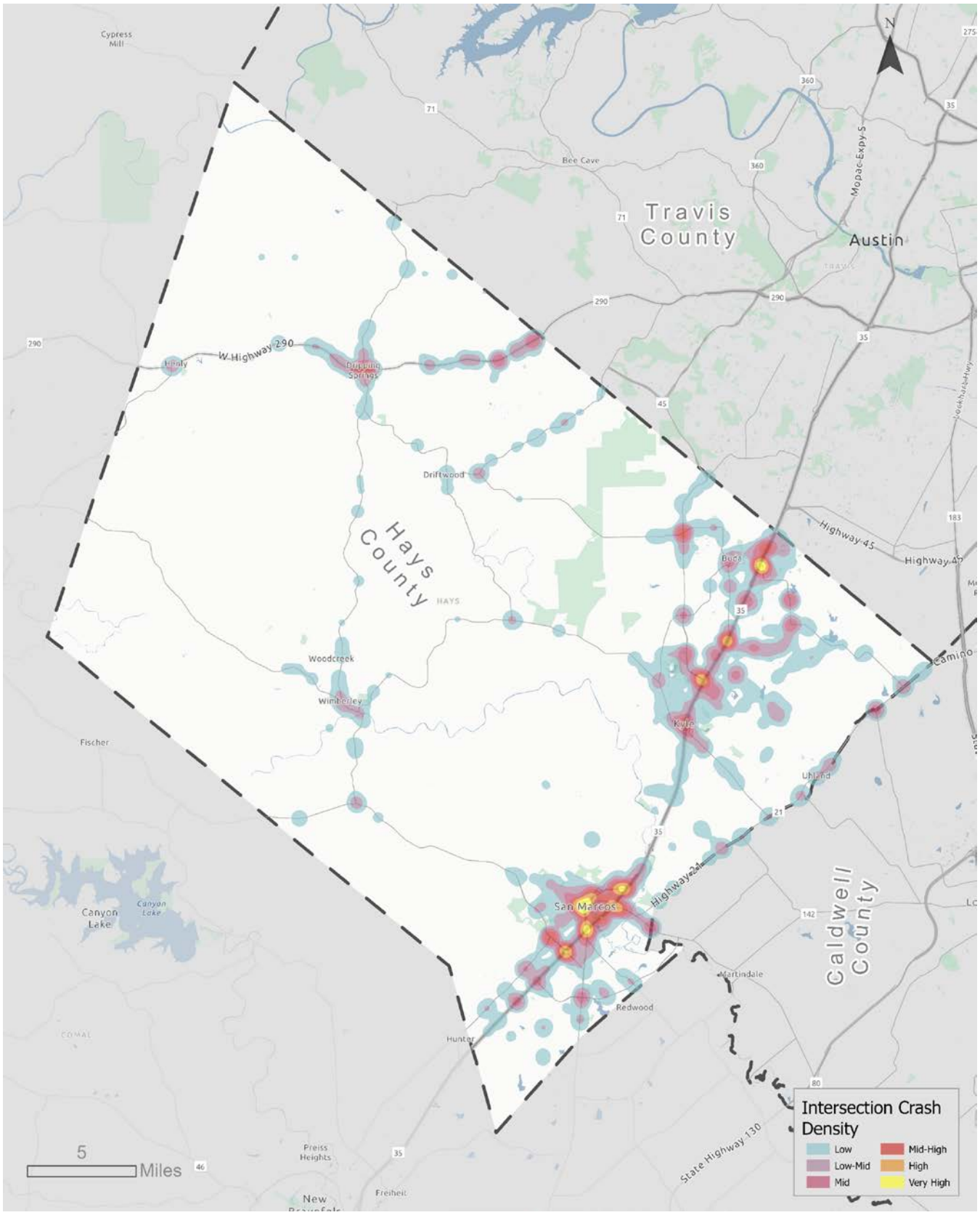



FIGURE 8: HEAT MAP OF INTERSECTION CRASH DENSITY IN HAYS COUNTY (2019-2023)

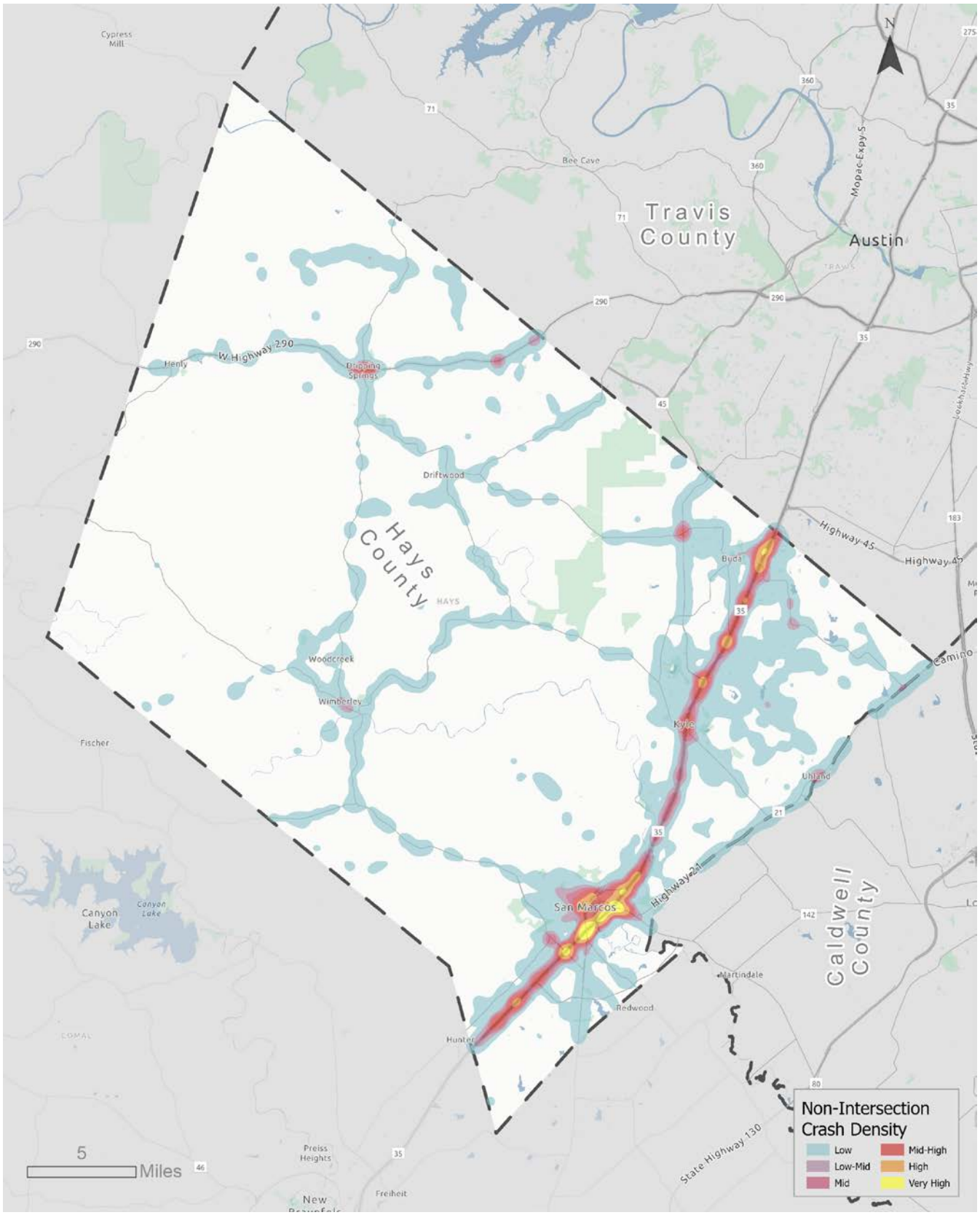



FIGURE 9: HEAT MAP OF NON-INTERSECTION CRASH DENSITY IN HAYS COUNTY (2019-2023)

## STATEWIDE EMPHASIS AREAS

In a Strategic Highway Safety Plan (SHSP) 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 in Texas.

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 was not analyzed in this Plan.

**TABLE 1: TEXAS STRATEGIC HIGHWAY SAFETY PLAN (SHSP) EMPHASIS AREAS AND DEFINITIONS**

| 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 |

| EMPHASIS AREA | DESCRIPTION |
|---|---|
| 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 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 was not analyzed in this Plan.

### County-specific Emphasis Areas

Crash trends throughout Hays County were analyzed to identify regional emphasis areas in addition to the statewide emphasis areas. These additional emphasis areas included the following:

| 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 |

### Emphasis Area Analysis

**Figure 10** illustrates the top 10 emphasis areas with the highest reported fatal and serious injury crashes in Hays County from 2019 to 2023. The leading four areas of emphasis associated with fatal and serious injury crashes were dark conditions, roadway departures, speed related, and intersection-related crashes. Notably, crashes involving roadway departures, motorcycles, impaired driving, occupant protection issues, and vulnerable road users—including pedestrians and bicyclists—were disproportionately represented in fatal and serious injury statistics compared to all severity crashes. Because individual crashes can involve multiple emphasis areas, these categories may overlap; nonetheless, their elevated share of severe outcomes suggests a higher likelihood of severe injuries when these factors are present.

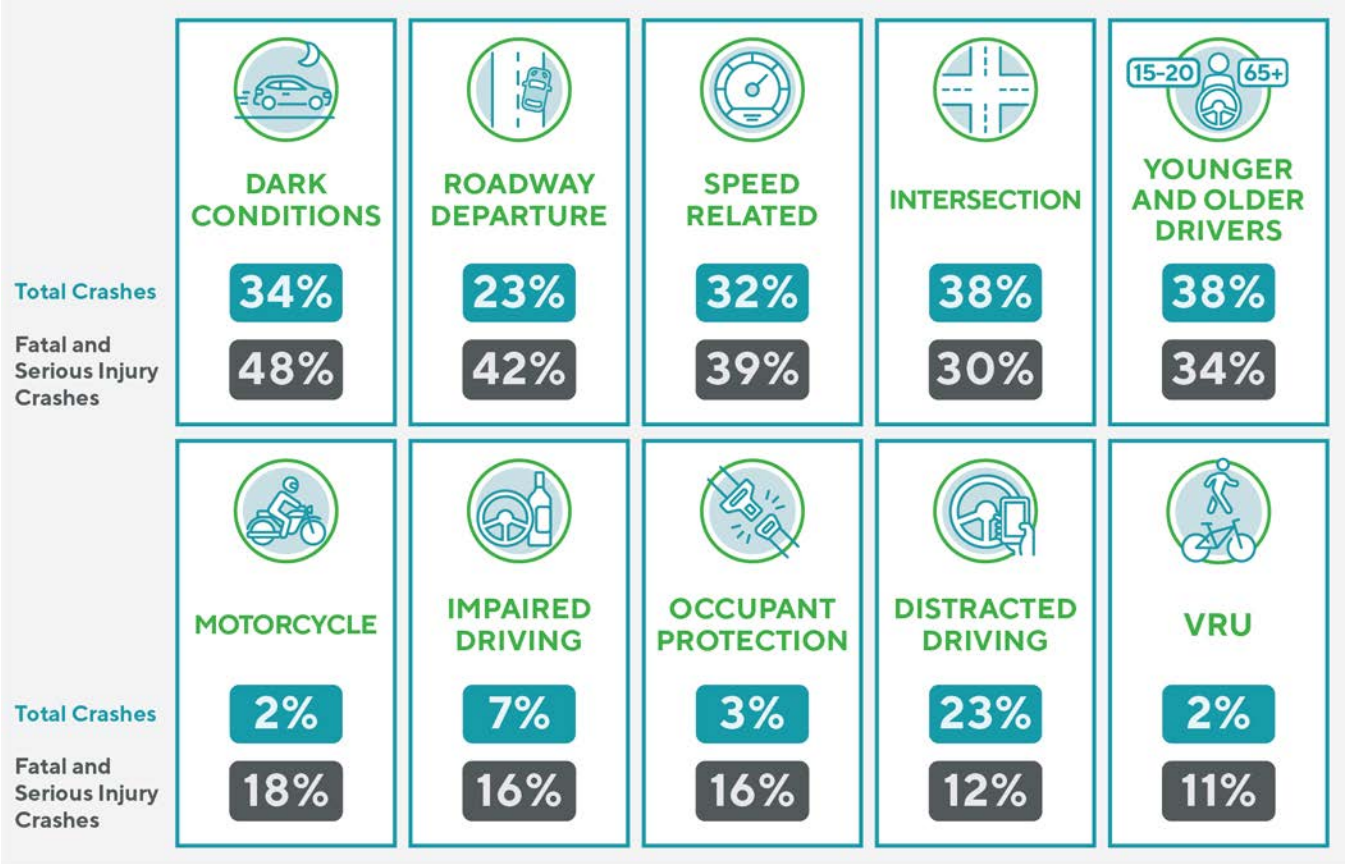



FIGURE 10: EMPHASIS AREAS WITH THE MOST FATAL AND SERIOUS INJURY CRASHES IN HAYS COUNTY (2019-2023)

### Shared Patterns Across Emphasis Areas

This analysis revealed significant commonalities across the emphasis areas, bringing attention to the interconnected nature of crash factors. For example, dark conditions were critical across various crash types and strongly linked to intersections, roadway departures, and speed-related incidents. Similarly, intersections were consistently connected to speed-related crashes, young driver involvement, and dark conditions. Roadway departures and speed-related crashes were also strongly linked 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.

## High Injury Network Analysis and Results

The 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 effect on reducing severe crash outcomes and improving overall roadway safety.

To conduct a more localized and thorough evaluation of transportation safety issues in Hays County, both an intersection HIN and a road segment HIN were developed. Establishing these two networks helped identify high-priority intersections and segments of roadways that require improvements to reduce potential safety risks.

See **Appendix A** for the detailed HIN analysis, including the methodology used.

### HIGH INJURY NETWORK INTERSECTIONS

**Figure 11** depicts all intersections in Hays County classified as "high injury" based on the crash data from 2019 to 2023. Only 5% of intersections that experienced at least one crash during the study period (49 out of 969 total intersections) accounted for 44% of all intersection-related fatal and severe injury crashes and 25% of all intersection-related reported crashes.

**44%** of all fatal and severe injury intersection crashes in Hays County occurred on **only 5%** of the county's intersections

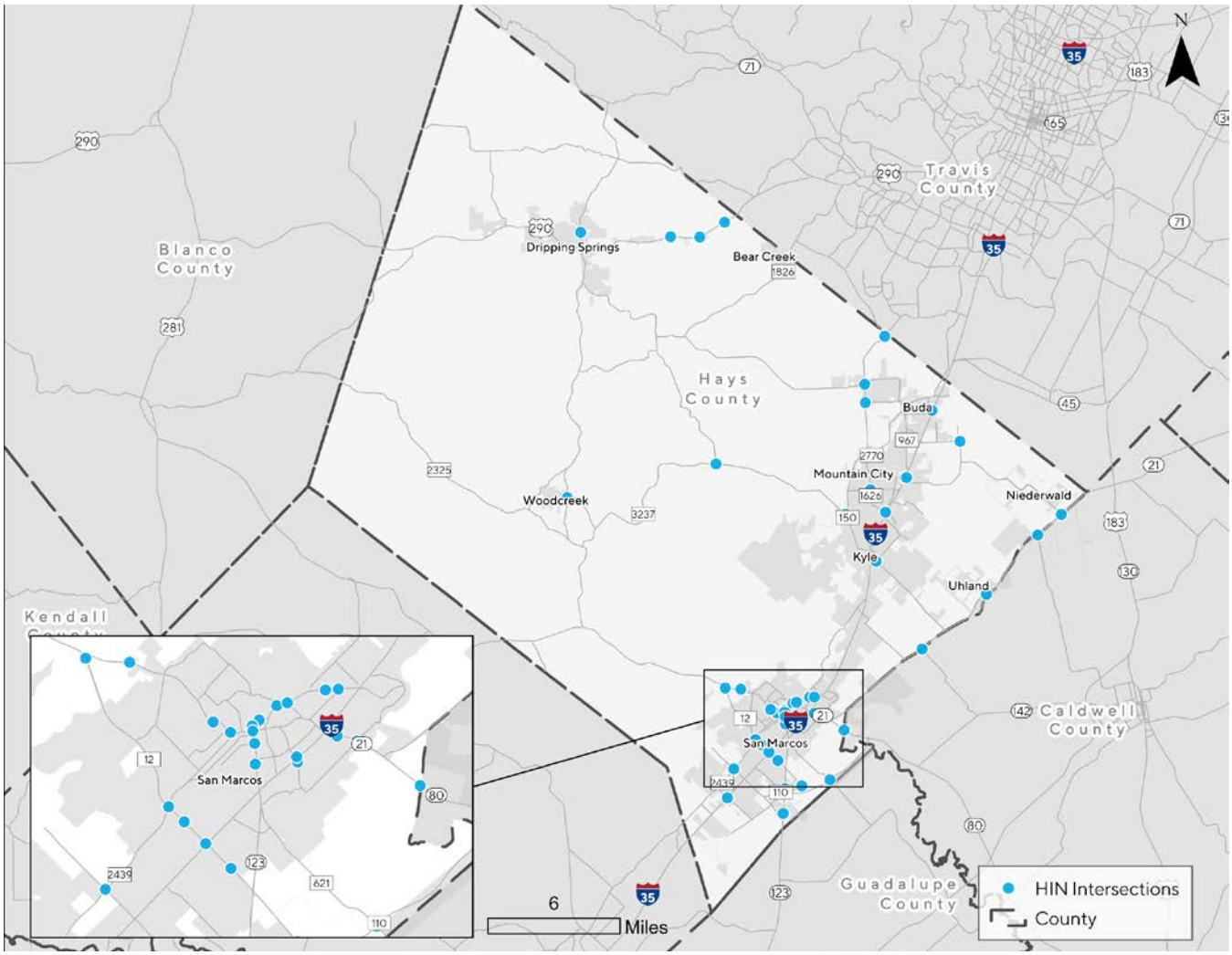



FIGURE 11: HIN INTERSECTIONS IN HAYS COUNTY (2019-2023)

## HIGH INJURY NETWORK SEGMENTS

**Figure 11** depicts the HIN road segments (non-intersections) (in Hays County based on the crash data from 2019 to 2023. Just 4% of roadway miles (approximately 611 out of 1,600 miles) where crashes occurred in the study period accounted for 36% of all fatal and serious injury crashes and 16% of all reported crashes.

**36%** of all fatal and severe injury non-intersection crashes in Hays County occurred on **only 5%** of the county's roadways.

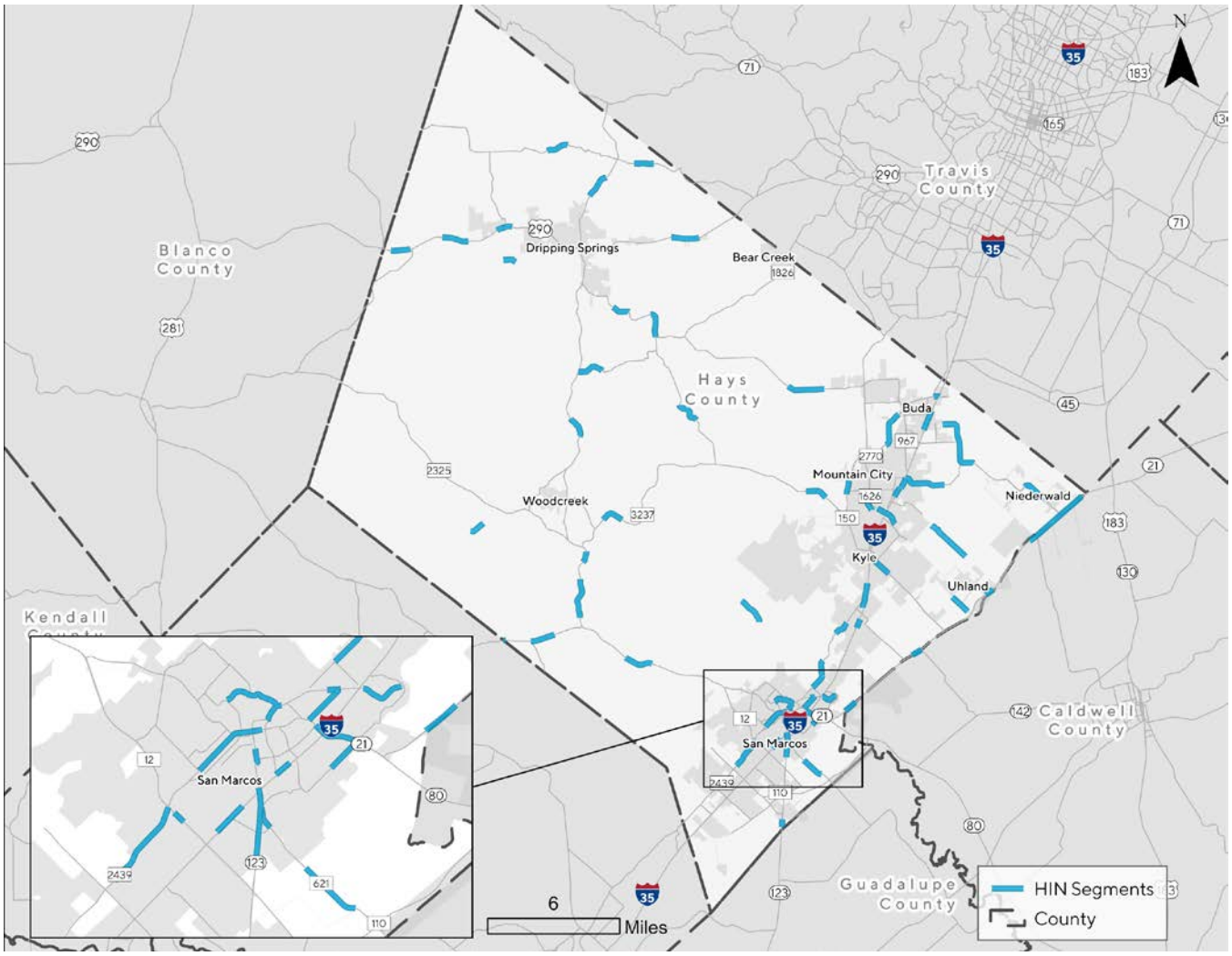



FIGURE 12: HIN SEGMENTS IN HAYS COUNTY (2019-2023)

## Systemic Safety Analysis

While a historical crash analysis is vital to understanding the historical trends and patterns of crashes in Hays County, it is inherently a reactive. In contrast, a systemic safety analysis considers the crash history alongside a range of contributing roadway, operational, and other built environment factors to identify locations that have systemic risk

By analyzing patterns across these dimensions, we can uncover commonalities among emphasis area crash types, leading to a more holistic understanding of systemic safety issues and needs. This approach not only supports the development of more effective countermeasures, but also enables the County to ***proactively identify*** and address future safety issues.

See **Appendix A** for the detailed Systemic Safety Analysis, including the methodology used to develop the analysis and results.

### FOCUS CRASH TYPES

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

**Dark Conditions**: Crashes occurring in poorly lit areas highlight the need for improved lighting on dark roadway segments and intersections to enhance visibility and reduce nighttime crash risks. **Figure 13** presents crash trends involving dark conditions in Hays County from 2019 to 2023.

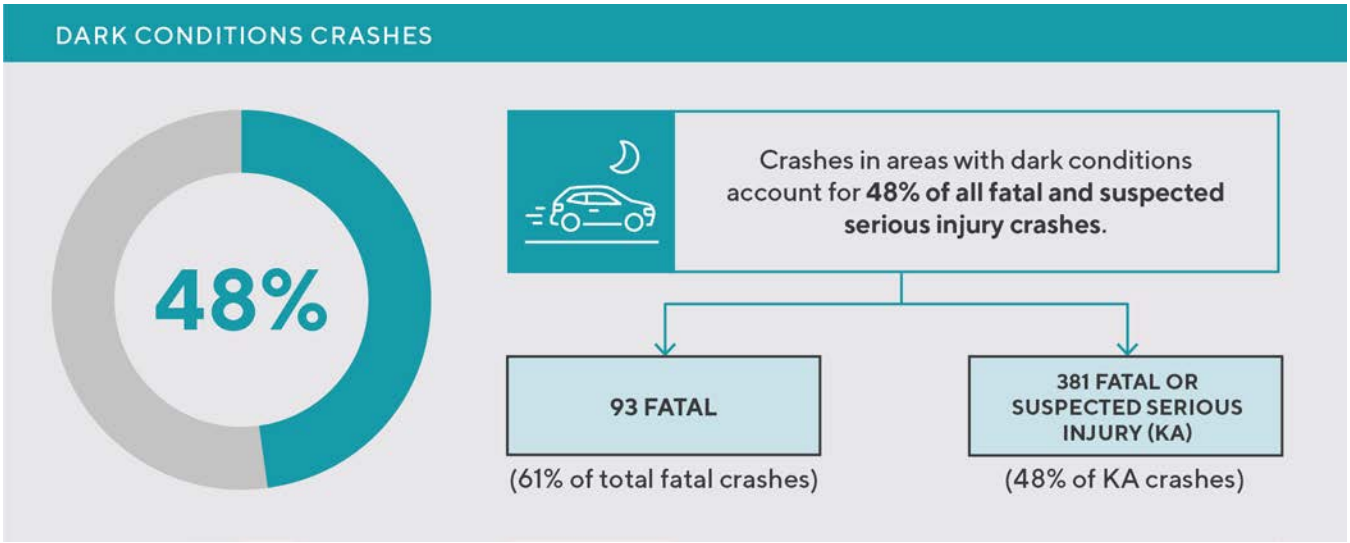



FIGURE 13: DARK CONDITIONS CRASHES (2019-2023)

**Roadway and Lane Departure**: Crashes where a vehicle leaves the roadway – by crossing an edge line or centerline, or veering off entirely – highlight the need for measures that help keep vehicles on the road or support safe recovery. **Figure 14** shows data related to roadway and lane departure crashes in Hays County from 2019 to 2023.

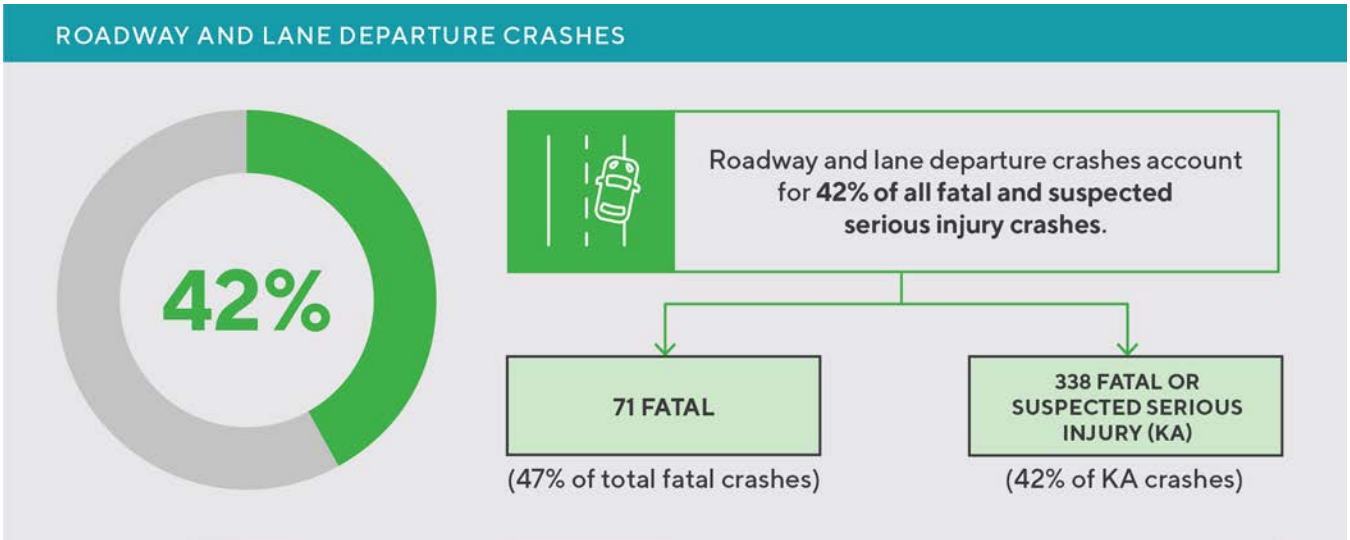



FIGURE 14: ROADWAY AND LANE DEPARTURE CRASHES (2019-2023)

**Speed Related**: Speed is a major contributing factor in the incidence of crashes and the increase in severity of those that occur. **Figure 15** displays data on speed related crashes that occurred in Hays County between 2019 and 2023.

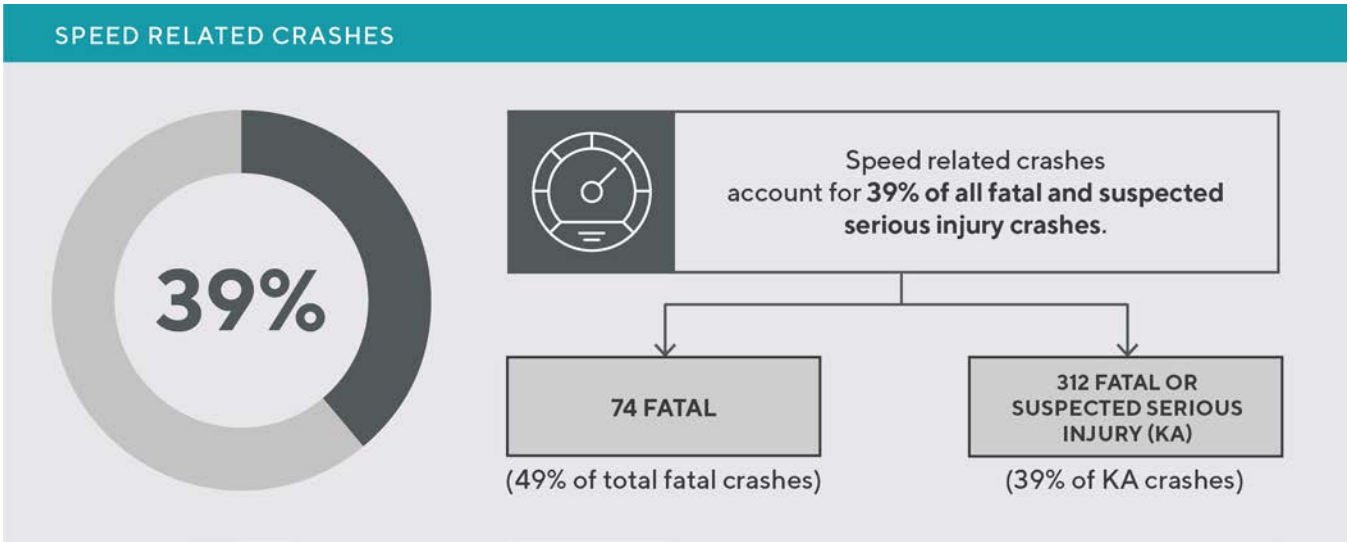



FIGURE 15: SPEED RELATED CRASHES (2019-2023)

**Intersection Related**: Intersections present complex traffic interactions contributing to higher crash frequencies, warranting interventions to reduce conflict points. **Figure 16** presents data on intersection related crashes that occurred in Hays County between 2019 and 2023.

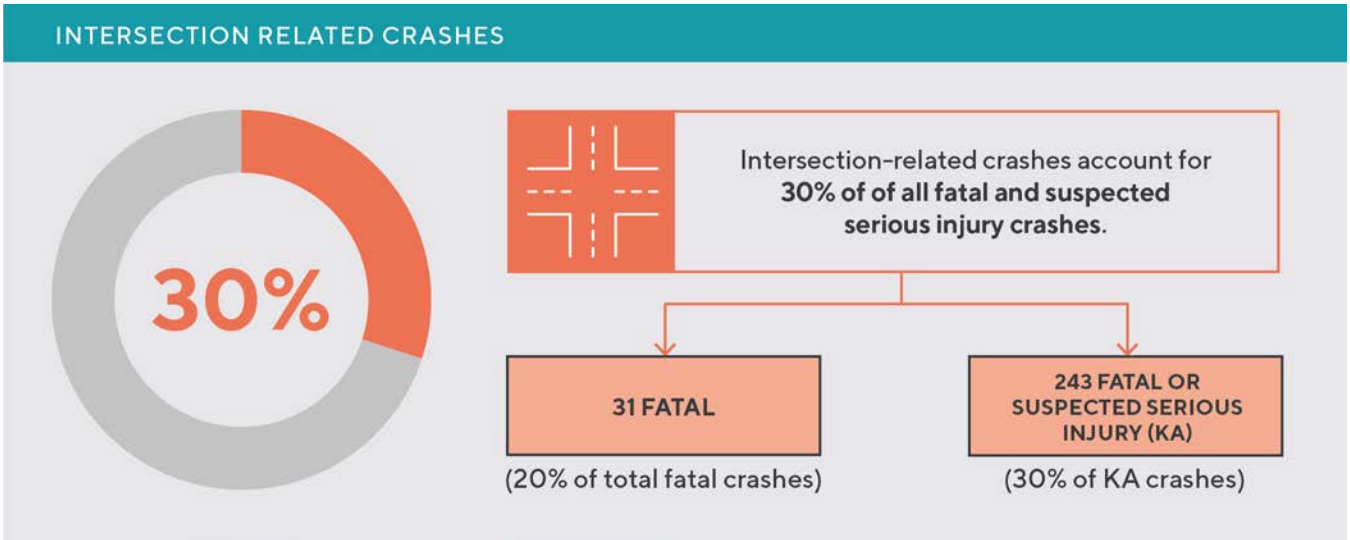



FIGURE 16: INTERSECTION RELATED CRASHES (2019-2023)

### COUNTERMEASURE SELECTION

Systemic safety countermeasure were identified to address focus crash types at multiple locations with similar risk characteristics across the network. This will allow Hays 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 Hays County's focus crash types were selected based on data-driven analysis and TxDOT's Highway Safety Improvement Program (HSIP) 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 Hays County.

## Underserved Communities Analysis

This section describes who is most affected by roadway safety in Hays County and how underserved communities are particularly affected.

### Communities Most Affected by Safety in the County

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. An analysis of underserved communities identified the areas and populations in Hays 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 and can be used to promote investments in facilities and services designed to overcome safety obstacles for underserved communities.

The methodology identifies 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 in 2022. An area is defined as "Areas of Persistent Poverty" if its poverty rate is at least 20%.
2. **Title VI** information from the 2019-2023 American Community Survey (ACS) released in December 2024. Title VI areas are defined as census tracts with less than 50% of the population identifying as "White, non-Hispanic."
3. **Vulnerable Population** data based on CAMPO's sociodemographic index. 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 17** presents the underserved need area in Hays County. This area covers 34% of the county's total land area, 59% of the population, and 52% of the county's roadway lane miles. The underserved need area all parts of the county east of I-35 and areas surrounding San Marcos. Portions of the San Marcos, Kyle, and Buda also fall within underserved need areas.

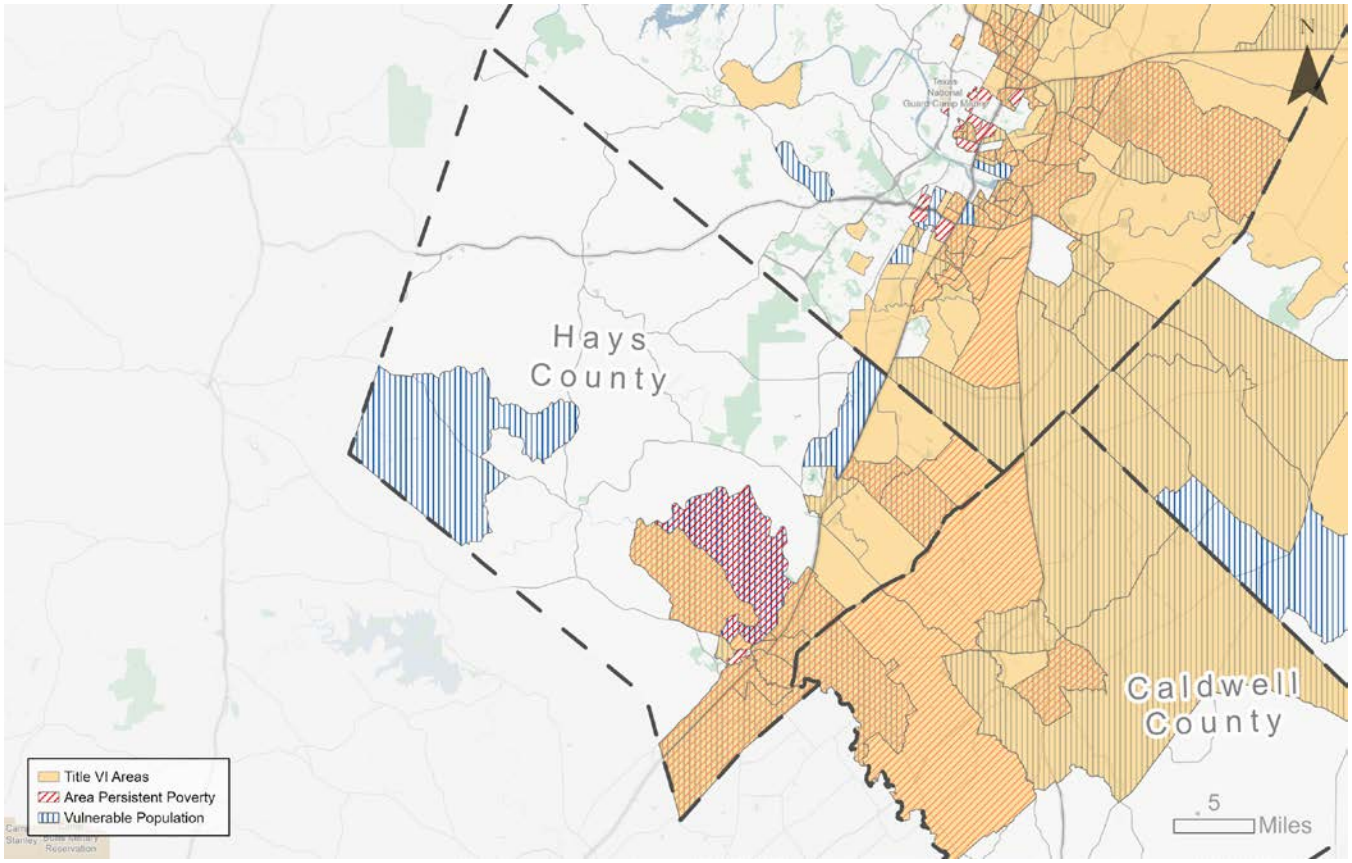



FIGURE 17: UNDERSERVED COMMUNITY NEED AREAS IDENTIFIED IN HAYS COUNTY

There were 104 fatal crashes and 452 serious injury crashes in the underserved need areas identified in Hays County from 2019 to 2023. Compared to the countywide numbers, underserved community need areas experienced 73% of the total crashes and 70% of the fatal and serious injury crashes during this time. **Figure 18** presents the fatal and serious injury crash rates by area, population, and roadway lane miles. All three rates were higher in the underserved need areas**. The crash rate by area was 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 were twice as high as the non-underserved need areas.

Several emphasis areas – such as crashes in dark conditions, at intersections, and in work zones – were notably overrepresented in fatal and serious injury crashes within underserved need areas, underscoring the need for focused safety interventions.

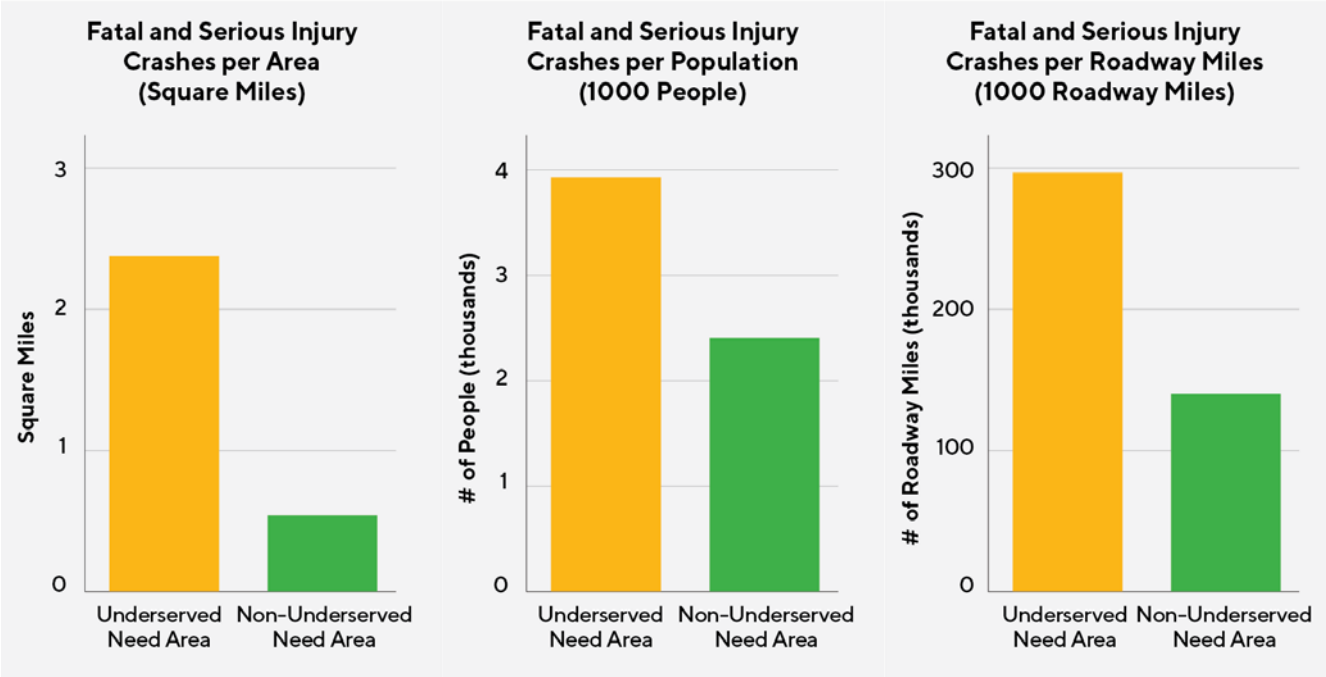



FIGURE 18: FATAL AND SERIOUS INJURY CRASH RATE BY AREA, POPULATION, AND ROADWAY LANE MILES IN HAYS COUNTY (2019 – 2023)

**Table 2** presents the summary of fatal and serious injury crashes by emphasis areas in the underserved community need areas. This analysis evaluated 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 (34%), roadway lane miles (52%), and population (59%). An emphasis area was considered overrepresented if its percentage exceeded these three benchmarks, indicating a higher risk in underserved need areas. Crashes involving dark conditions, distracted driving, and vulnerable road users were the most overrepresented factors. However, all emphasis areas exceeded all three benchmarks (land area, population, and roadway miles), highlighting a broader pattern of over-representation in underserved communities, as shown in **Table 2**.

TABLE 2: SUMMARY OF FATAL AND SERIOUS INJURY CRASHES (2019-2023) BY EMPHASIS AREAS IN THE UNDERSERVED COMMUNITY NEED AREAS

| | EMPHASIS AREAS | NUMBER OF KA[2] CRASHES IN UNDERSERVED COMMUNITY AREAS | % OF ALL HAYS COUNTY KA CRASHES IN UNDERSERVED COMMUNITY AREAS |
|---|---|---|---|
|  | DARK CONDITIONS | 290 | 76% |
|  | SPEED RELATED | 219 | 70% |
|  | ROADWAY OR LANE DEPARTURE RELATED | 211 | 62% |
|  | INTERSECTION RELATED | 182 | 75% |
|   | YOUNGER DRIVER RELATED | 106 | 71% |
|  | MOTORCYCLE RELATED | 98 | 69% |
|  | IMPAIRED DRIVING RELATED | 90 | 71% |
|  | OCCUPANT PROTECTION RELATED | 88 | 71% |
|  | DISTRACTED DRIVING RELATED | 73 | 74% |

[2] KA: Includes Fatal (K) and Serious Injury (A) crashes according to FHWA's KABCO Crash Injury Scale

| | EMPHASIS AREAS | NUMBER OF KA[2] CRASHES IN UNDERSERVED COMMUNITY AREAS | % OF ALL HAYS COUNTY KA CRASHES IN UNDERSERVED COMMUNITY AREAS |
|---|---|---|---|
|  | OLDER DRIVER RELATED | 69 | 56% |
|  | VULNERABLE ROAD USER RELATED | 62 | 72% |
|  | WORK ZONE RELATED | 43 | 83% |
| | TOTAL KA CRASHES | 556 | 70% |

# Engaging the Community

Public engagement played a key role in shaping the SAP. As part of the broader CAMPO RSAP, CAMPO conducted two rounds of outreach across the region, which included opportunities for Hays County residents to share concerns and feedback about roadway safety. Each round included an online open house and multiple in-person events in Bastrop, Burnet, Caldwell, Hays, and Williamson Counties. All outreach events and planning were conducted in conjunction with the CAMPO 2050 Regional Transportation Plan, with the goal of helping each SAP reflect community priorities by addressing location-specific safety concerns. This section describes both rounds of engagement.

## Public Engagement

The outcomes of the RSAP and Hays County SAP will impact all travelers in the CAMPO region, prompting the engagement of a diverse group of stakeholders. The project team used a wide range of activities and tools to facilitate convenient access to information and gather public input. Feedback from each phase of engagement was summarized and used to inform the development of the regional and county-level SAPs.

### ENGAGEMENT APPROACH AND TIMELINE

Two rounds of public engagement events were conducted at key milestones throughout the study to help shape the development of the county-specific and regional plans. These events were conducted concurrently with engagement for the CAMPO 2050 Regional Transportation Plan.

**Round One – Fall 2024.** The initial round of engagement included one in-person pop-up event in Hays County with a concurrent online open house available from October 14 to November 27, 2024. The purpose of this engagement was to introduce the SAP effort to the public and seek community input on the most urgent roadway safety issues and locations of concern.

**Round 2 – Spring 2025.** During the second round of engagement, two in-person pop-up events were held in Hays County with a concurrent online open house available from February 14 to April 15, 2025. The purpose of this engagement was to present the SAP effort and offer the opportunity to provide input on potential projects.

### COMMUNITY ENGAGEMENT TOOLS

A variety of tools and strategies were developed to effectively engage a broad range of stakeholders and collect meaningful input. Both online and traditional print communication tools were tailored to stakeholders with different communication preferences and needs. Study materials and web content were designed to be accessible to people with disabilities. Study materials were provided in both English and Spanish and translated to additional languages as needed, and every reasonable effort was made to accommodate requests for additional translation or interpretation services.

#### Project Website

An RSAP webpage on the CAMPO website was used to share information about the planning effort. Webpage content and graphic elements adhered to the Americans with Disabilities Act (ADA) and Web Content Accessibility Guidelines. The webpage included a description of the initiative and planning process, presentations and meeting materials, maps and exhibits, information about engagement opportunities, contact information for questions and comments, as well as Public Safety Campaign information.

### Online Open House Events

CAMPO hosted online open house events during each round of engagement. Open house materials included downloadable exhibits summarizing key milestone results for each county, a fact sheet, and online input opportunities through online surveys and interactive mapping engagement tools. There were 471 virtual open house site sessions during Round 1 engagement and 450 sessions during Round 2.

### Pop-up Events in Hays County

Five in-person pop-up events were held in Bastrop, Burnet, Caldwell, Hays, and Williamson counties during Round 1 engagement, with an estimated 651 people engaging with the project team. During Round 2 engagement, ten pop-up events took place regionwide, with an estimated 450 people participating.

The Round 1 pop-up engagement event was held on October 19, 2024 in Hays County at the City of Kyle's "City Fest" event. Two pop-up events were held in Hays County for Round 2. The first occurred at the Dripping Springs Farmers Market on March 5, 2025, where 33 participants engaged with the project team. The second was held at Buda's Birthday Celebration on April 5, 2025, where 90 participants engaged with the project team. Comments received at events highlighted concerns in high-traffic areas such as FM 150 in Kyle, downtown San Marcos, and segments of I-35, particularly where high-speed traffic and merging create safety challenges.


FIGURE 19: ROUND 1 ENGAGEMENT EFFORTS AT THE CITY FEST EVENT IN THE CITY OF KYLE

FIGURE 20: ROUND 2 ENGAGEMENT POP-UP AT THE BUDA BIRTHDAY EVENT

## NOTIFICATION METHODS

To help broad participation from Hays County residents, CAMPO employed a comprehensive outreach strategy during both rounds of engagement. The planning team developed a social medial plan to promote participation for each round of engagement and to promote awareness of the safety campaign. Engaging content with strong calls to action and compelling graphics were developed and shared through CAMPO social media platforms and with Hays County partner organizations to share with their networks through their platforms, as shown in **Figure 21**. Media releases were prepared with information about community engagement opportunities and the public safety campaign. The team also leveraged community partner communication tools such as newsletters and bulletins to share project updates and promote events as depicted in **Table 3.**


FIGURE 21. EXAMPLE SOCIAL MEDIA POST

TABLE 3: LOCAL NEWS PAPER ADVERTISEMENTS

| PUBLICATION | RUN DATE |
|---|---|
| Hays Free Press | October 16, 2024 |
| Hays Free Press | February 19, 2025 |
| El Mundo Newspaper | October 17, 2024 |
| El Mundo Newspaper | February 20, 2025 |
| Community Impact (San Marcos/Kyle/Buda) | October 16, 2024 |
| Community Impact (San Marcos/Kyle/Buda) | February 25, 2025 |

The outreach team made direct phone calls and emails throughout the comment period for each round of engagement to promote and encourage the distribution of online open house materials. Push cards were distributed to local jurisdictions, schools, Meals on Wheels deliveries throughout the CAMPO region, health centers, libraries, senior centers, churches, and CARTS stations throughout the comment period. The outreach team shared a social media toolkit, including a newsletter blurb and social media content with task force members, regional public information officers, local jurisdictions, and community partners.

## WHAT WE HEARD FROM THE COMMUNITY

### Round 1 Engagement Feedback

During Round 1 of public engagement, Hays County residents provided input through an online survey, interactive mapping tool, and direct conversations during the pop-up event held at Kyle City Fest on October 19, 2024. A total of 16 online comments were submitted by Hays County participants, and 46 people engaged at the in-person event.

### Survey Feedback

During the Round 1 comment period, CAMPO received 42 survey submissions and 71 online mapped comments from across the region, including responses from Hays County residents. Of these survey submissions, 26% noted that they traveled to or lived, owned property, or worked in Hays County, as shown **Figure 22**.

In Hays County, aggressive driving, speeding, distracted driving, and a lack of safe sidewalks and school zone crosswalks were the most cited safety concerns, as shown in **Figure 23**. Several respondents also emphasized congestion on major roads and the need for more transit options and safer walking and biking conditions. As in other counties, the majority of respondents reported feeling unsafe to varying degrees while engaging in active transportation in Hays County—with many noting discomfort walking near schools or crossing busy roads without signals or marked crossings.

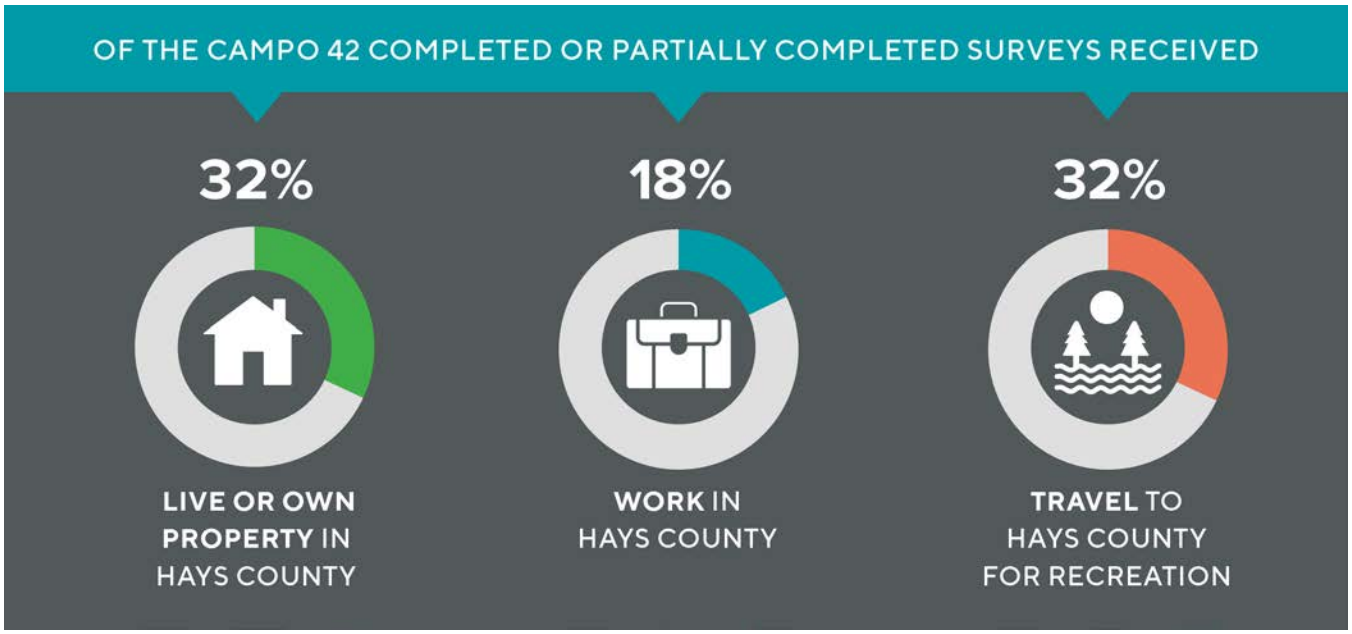



FIGURE 22. ROUND 1 SURVEY RESPONSES FOR HAYS COUNTY

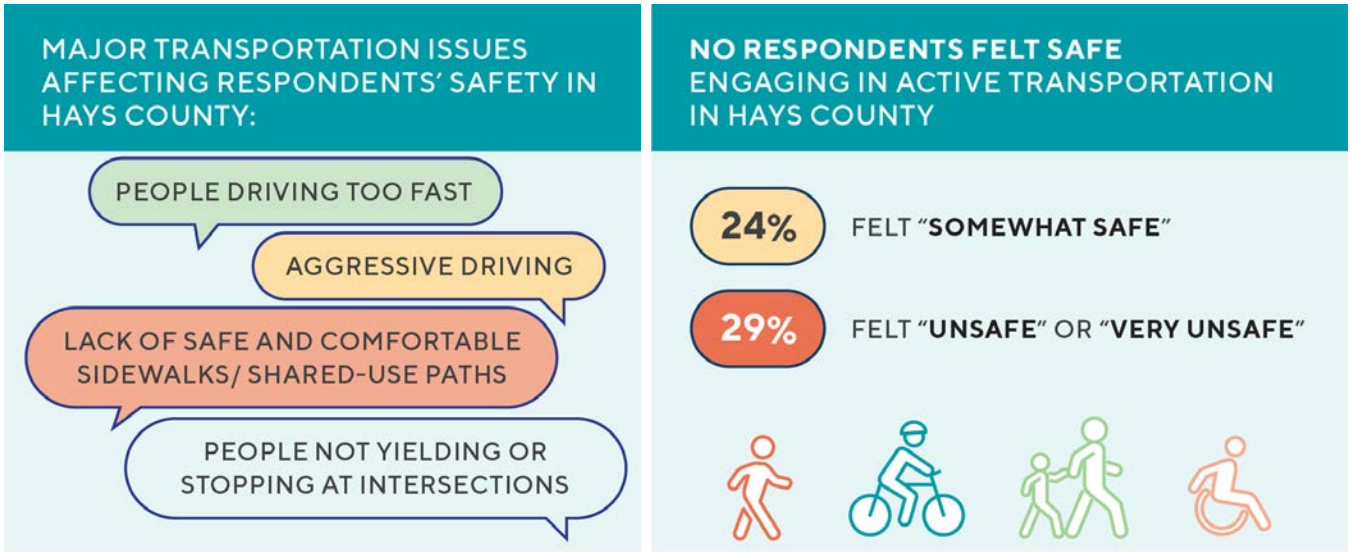



FIGURE 23. MAJOR TRANSPORTATION ISSUES IN HAYS COUNTY

Of the 71 online mapped CAMPO region comments received during Round 1 engagement, 22% were located in Hays County. The overarching themes of the Hays County comments included:

- Calls for safer roadways, particularly around Lehman High School and other school zones
- Heavy traffic and congestion on FM 1626, Kyle Crossing, and BeeBee Road, with suggestions for new turn lanes, added signals, and flow improvements
- Public interest in local trolleys, commuter buses to Austin, and more frequent local transit service
- Concerns about speeding, especially on Veterans Drive, and the need for improved driver education regarding right-of-way rules and roundabout navigation

### Round 2 Engagement Feedback

During the Round 2 outreach period, community feedback helped shape the SAP by validating proposed improvements and offering new insights. A total of 123 community members engaged with the project team at the two in-person engagement events in Hays County. Participants at these events reviewed the suggested improvement locations and safety countermeasures and provided written and verbal input on whether these addressed their local concerns.

CAMPO received 297 survey submissions. Of these, 23% noted that they traveled to or lived, owned property, or worked in Hays County, as shown in **Figure 24.**

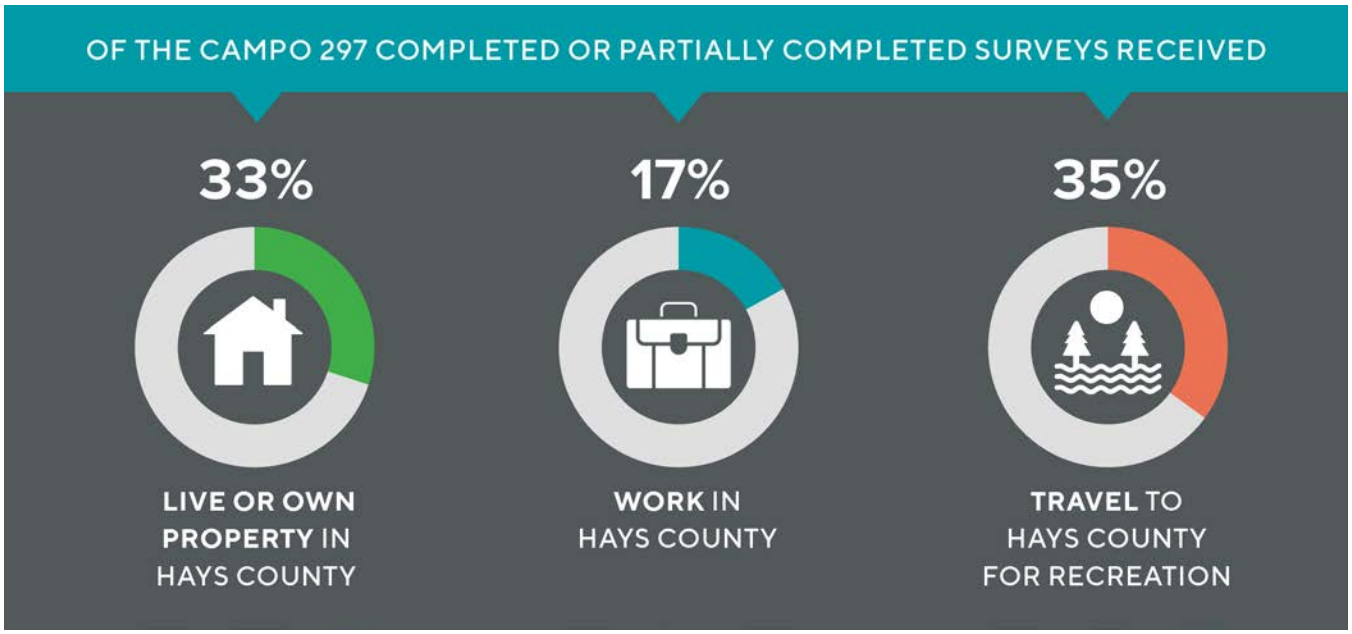



FIGURE 24: ROUND 2 SURVEY RESPONSES FOR HAYS COUNTY

Hays County survey respondents raised several critical issues related to safety and regional growth. Many pointed to worsening congestion and frequent crashes, particularly along US 290 in Dripping Springs. Key intersections—such as SH 80 and FM 142, SH 80 and FM 1984, and SH 71 and CR 401—were flagged for high crash frequencies and an urgent need for safety upgrades. Additionally, residents emphasized the importance of pedestrian infrastructure, with specific calls for dedicated pedestrian facilities on the RR 12 bridge in Wimberley.

Comments submitted through the online mapping tool echoed similar concerns. Community members highlighted areas of excessive traffic, speeding, and limited visibility. Requests were also made for additional pedestrian crossings and improved lighting in high-use areas. Several comments emphasized the need for safer routes near schools and better access for bicyclists and pedestrians.

## Collaboration

The Hays County SAP Task Force was formed to guide the development of this SAP. The Task Force was comprised of representatives from state, regional, and local agencies—including the County, municipalities, TxDOT, and regional transit providers—and met with the project team on four occasions from July 2024 through February 2025.

**Agencies Represented on the Hays County Safety Action Plan Task Force:**

- Hays County
- City of Buda
- City of Dripping Springs
- City of Kyle
- City of San Marcos
- City of Wimberley
- TxDOT - Austin District
- Texas State University
- CARTS
- CAMPO

In addition to the four formal meetings, Task Force members were engaged through ongoing communication, including email updates and one-on-one discussions. These task force meetings and one-on-one discussions with Hays County stakeholders allowed the project team to gather critical feedback on proposed strategies, validate local safety concerns, and coordinate jurisdiction-specific priorities. **Figure 25** provides details on the timeline and key milestones discussed at each Task Force meeting.

The Task Force contributed at key project milestones, reviewed draft recommendations, and supported outreach efforts during both rounds of public engagement. The Task Force is also envisioned to serve as a long-term, cross-sector body that will help monitor progress and guide implementation of the Safety Action Plan in the years ahead.

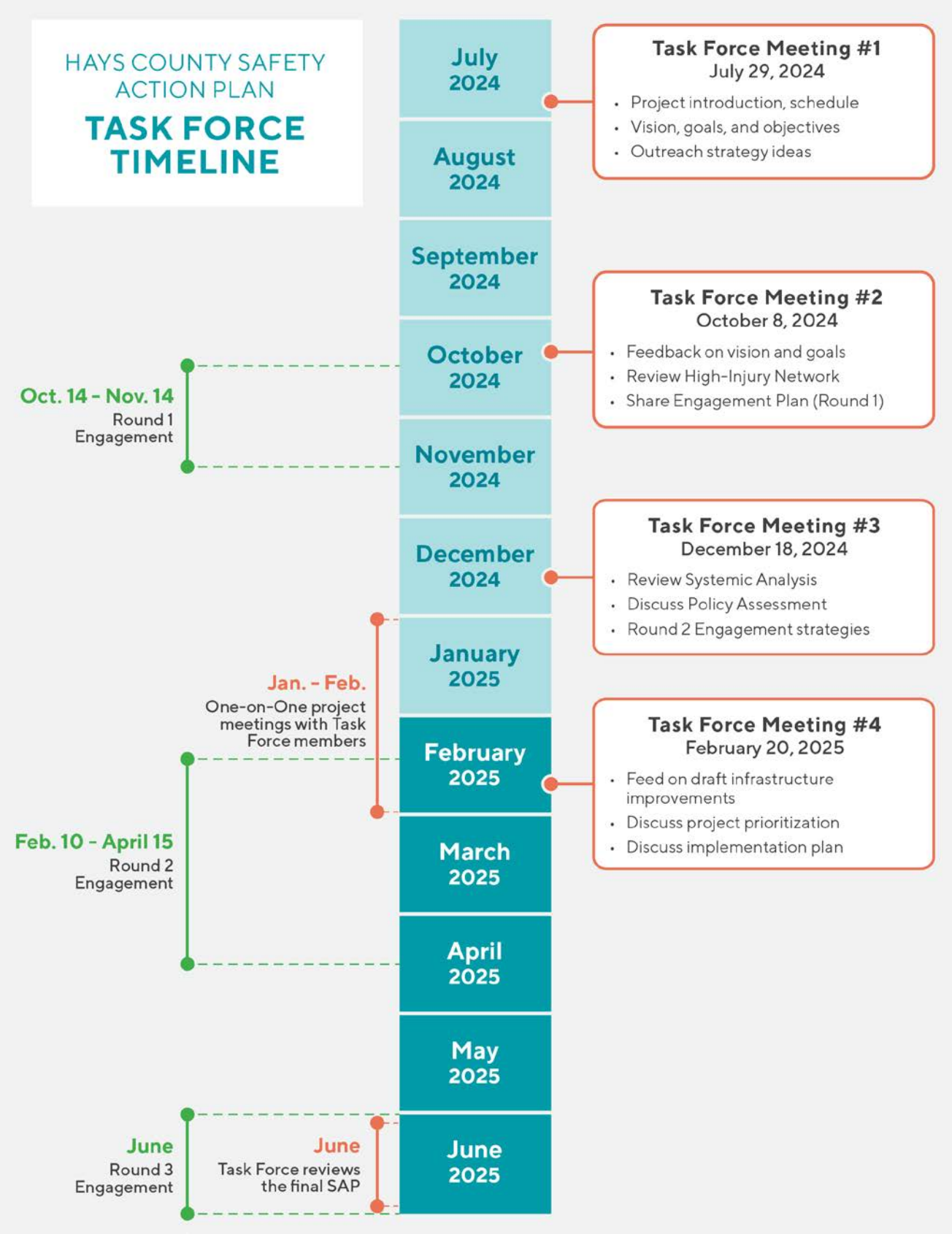



FIGURE 25. HAYS COUNTY SAP TASK FORCE MEETINGS

# Policy Recommendations

This section summarizes the review of existing plans, policies, programs, guidelines, and standards regarding transportation safety and recommends new and updated policies and programs to enhance safety levels in Hays County.

## Policy Review

As part of the development of the SAP, an assessment was conducted of existing policies, guidelines, standards, and plans related to transportation planning and the current prioritization of safety, listed in **Figure 26**. The review concentrated on key county and city documents that affect the safety of roadways, sidewalks, trails, and other transportation facilities within Hays County. This process established a baseline and identified additional opportunities and policy recommendations to enhance transportation safety for all road users, particularly the most vulnerable.

This policy focus underscores a commitment to public safety, targeting enhancements that better protect and serve the transportation network and its users.

**DOCUMENTS REVIEWED**

**Hays County**

- Hays County 2021 Transportation Plan

**City of Kyle**

- Connected Transportation Master Plan 2040
- Master Transportation Plan 2040 – 2021 Update

**City of San Marcos**

- 2018 Transportation Master Plan

**City of Dripping Springs**

- 2021 Transportation Master Plan

**City of Buda**

- 2023 Transit Development Plan
- 2021 Transportation Mobility Master Plan
- 2024-2028 Capital Improvement Plan

**City of Wimberley**

- 2022 Transportation Plan Update

FIGURE 26. SAFETY POLICY AND PLANNING REVIEW

## Policy and Program Recommendations for Hays County

The assessment of safety needs through data analysis, public and stakeholder feedback, and a policy review resulted in policy and program recommendations to improve transportation safety in Hays County and its cities. These recommendations focus on:

- Closing communication gaps
- Promoting better coordination among local agencies, schools and law enforcement
- Advancing safer roadways by design
- Reducing fatal and serious injuries
- Helping safer travel for everyone on the road

Each recommendation is aligned with both the core elements of the **Safe System Approach** and the emphasis areas of the **Texas Road to Zero** effort as described in the 2022-2027 SHSP. 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 C**. The following are the key recommendations under each of the core elements of the Safe System Approach.

### SAFETY LEADERSHIP & CULTURE

Safety leadership and culture policy recommendations within the Safe System Approach emphasize how safety is a core value in all road system investment decisions, recognizing that human mistakes are inevitable and that the transportation system should be designed to accommodate these mistakes without resulting in severe injuries or fatalities. The recommendations support Texas' Road to Zero initiative through coordination, progress tracking, education campaigns, and pursuit of funding opportunities for actions that strengthen institutional leadership and foster a public culture that prioritizes safety:

- **Road to Zero Commitment.** Encourage local elected and agency officials to adopt a public commitment to reduce the number of traffic fatalities and serious injuries by half by 2035 and eliminate all by 2050.
- **Road to Zero Task Force.** Make the Hays SAP County Task Force permanent and expand membership to help facilitate ongoing regional coordination in safety planning and management.
- **Road to Zero Coordinators.** Designate key county, city, and agency staff to lead coordinated action through the Task Force and their respective agencies.
- **Stakeholders And Progress Tracking.** Develop and maintain a stakeholder list for use in disseminating progress reports on safety progress and annual updates on regional and community-specific trends.
- **Road To Zero Awareness.** Incorporate Road to Zero messages and education campaigns into City and County communications and events.
- **Pursue Funding Opportunities.** Apply for implementation funding for projects on the High Injury Network and for systemic improvements through TxDOT and USDOT.
- **Safe Routes To School.** Create a Safe Routes to Schools program in conjunction with school districts to identify needed active transportation projects near schools and promote bicycle and pedestrian education.

### SAFER ROADWAYS

Safer roadway policy recommendations implement engineering and infrastructure-based countermeasures, such as improved signage, better lighting, safer intersections, and road designs that reduce conflict points and crash severity. Creating forgiving road environments through the Safe System Approach for safer roads reduces the change for mistakes to result in fatal or serious injuries. It is also important that these safer roadways policy recommendations do not induce unsafe travel behavior by giving the false impression of safety where risk still exists for drivers and vulnerable road users :

- **Complete Streets Policy.** Adopt City and County Complete Streets policies to provide designs for accommodating all road users in future transportation investments
- **Community Traffic Safety Team.** Develop a program to conduct collaborative, interdisciplinary Road Safety Audits of locations provided through community input, particularly involving vulnerable road users.
- **Asset Management and Maintenance Program.** Develop a systematic approach and schedule to roadway maintenance, following TxDOT's maintenance guidelines and prioritizing implementation of systemic safety treatments, such as signs, pavement markings, and rumble strips.
- **Intersection Control Evaluation Policy.** Develop a local Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements.
- **Traffic Impact Analysis.** Conduct safety assessments in conjunction with Traffic Impact Analyses for proposed developments to identify the need for systemic treatment packages as mitigation measures to reduce the risk of future crashes.
- **Community Input Webpage Development.** Implement a feedback mechanism for road users to report maintenance issues in real time.

- **Street Lighting Policy.** Develop a policy consistent with TxDOT's guidelines for roadway lighting installation focusing on systemic intersections, curves, or active transportation locations.
- **Analyze Advanced Traffic Management System Data For Safety Monitoring.** Explore the deployment of a county and city-based version of Lonestar Advanced Traffic Management System (ATMS) with real-time data to monitor and manage traffic flows compatible with existing infrastructure while adhering to TxDOT's Intelligent Transportation System (ITS) architecture.
- **Post-Implementation Evaluation.** Evaluate the efficacy of installed safety improvements through evaluation, using before and after studies (crashes, speeds) and public surveys.

### SAFER SPEEDS

Safer speeds policies focus on thoughtful roadway design, speed limit setting, targeted education, outreach campaigns, and enforcement. Designing roads that naturally encourage safe driving speeds and implementing countermeasures minimizes the risk and severity of crashes. Policy recommendations include speed limit policy, traffic calming program, school zone enhancement programs, and speed monitoring and awareness investments:

- **Speed Limit Policy.** Develop a speed limit policy and procedures process based on the Manual of Traffic Control Devices (11th Edition) that includes contextual factors and aligns with TxDOT's Speed Zone Manual.
- **Traffic Calming Program.** Collaborate on shared guidance for traffic calming on City-owned facilities that builds upon regional best practices and the FHWA ePrimer on Traffic Calming.
- **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, enhanced crossings, etc.) in designated School Zones.
- **Speed Monitoring And Awareness.** Deploy dynamic speed feedback signs on identified High Injury Network segments.

### SAFER VEHICLES

Safer vehicles involve expanding the availability of advanced driver assistance systems, such as automatic emergency braking, lane-keeping assistance, and adaptive cruise control. Policies relate to reducing conflict points between different vehicle types, such as freight and passenger vehicles, and considering investments that shore up gaps in the operating design domains for automated and connected vehicles as they enter the Hays County roadway network:

- **Truck/Freight Route Policy.** Implement local ordinances for designated truck routes by identifying areas where freight routes and active transportation facilities intersect, and include measures such as designated truck lanes or time-based restrictions to enhance safety.
- **Vehicle Advancement Program.** Evaluate TxDOT's initiatives on connected and autonomous vehicles in order to provide the necessary infrastructure and facility upgrades (striping, signing, lighting, V2X communication) and maintain awareness of new/upcoming technologies. Additionally, consider changes to the operating fleet of City and County agencies as new vehicles are purchased. Encourage use of assistance features (like automated braking, blind spot detection, lane use warning) and educate motorists on their usage and benefits.

### SAFER ROAD USERS

Safer road users, as a component of the FHWA Safe System Approach, emphasizes the importance of encouraging safe and responsible behavior . This involves promoting education and awareness campaigns to inform drivers, pedestrians, cyclists, and other road users about safe practices and the rules of the road. It also

includes enforcement countermeasures. Policies include public awareness campaigns and coordination activities around work zone activities:

- **Public Awareness Campaigns.** Leverage City, County, and civic communications to publicize TxDOT's safety campaigns to increase public awareness of traffic safety issues. Target safety campaign materials to suit needs of lower income and non-English speaking communities.
- **Educational Programs.** Partner with local organizations to pursue funding and implement educational programs in additional settings, such as schools.
- **Enforcement Programs.** Utilize the Texas Law Enforcement Liaison Program to pursue Selective Traffic Enforcement Program (STEP) grant funding and for technical assistance to implement high-visibility enforcement operations targeted at impaired or aggressive driving.
- **Work Zone Safety Enhancement Policy.** Establish comprehensive safety protocols aligned with TxDOT's work zone safety regulations, utilizing Work Zone Intelligent Transportation Systems.
- **Sponsorship of Safety Events.** Host City- and County-sponsored safety-related events and education campaigns to raise awareness and encourage safe road behavior.

### POST-CRASH CARE

Post-crash care policies help enhance timely access to emergency medical services (EMS) and trauma care which support the reduction of injury severity in crashes. It also involves training to implement robust traffic incident management practices that reduce secondary crashes. Policies recommended here include emergency response protocols, traffic signal improvement programs, and a collision database program to accelerate links between optimal post-crash care and incidents across the Hays County transportation network.

- **Emergency Response Protocols.** Develop and implement protocols that help rapid response times by emergency services in the event of a crash.
- **Traffic Signal Improvement Program.** Follow TxDOT's Traffic and Safety Analysis Procedures (TSAP) Manual guidelines for integrating adaptive signal control technologies to enhance traffic flow and emergency response times.
- **Collision Database Program.** Develop a centralized database to track collision data and response outcomes, aligning with local Central Texas emergency response protocol and data-sharing agreements.

# Safety Countermeasures

The proposed improvements and strategies include a range of safety countermeasures tailored to Hays 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 grouped into segment-related (non-intersection), intersection-related, and vulnerable road users. See **Appendix D** for guidance on the systemic safety countermeasures described in this section.

## Segment-Related

Roadway and lane departure crashes account for 42% of fatal or serious injury crashes in Hays County. **Table 4** provides a list of recommended countermeasures, including infrastructure treatments, behavioral strategies, and policy recommendations.

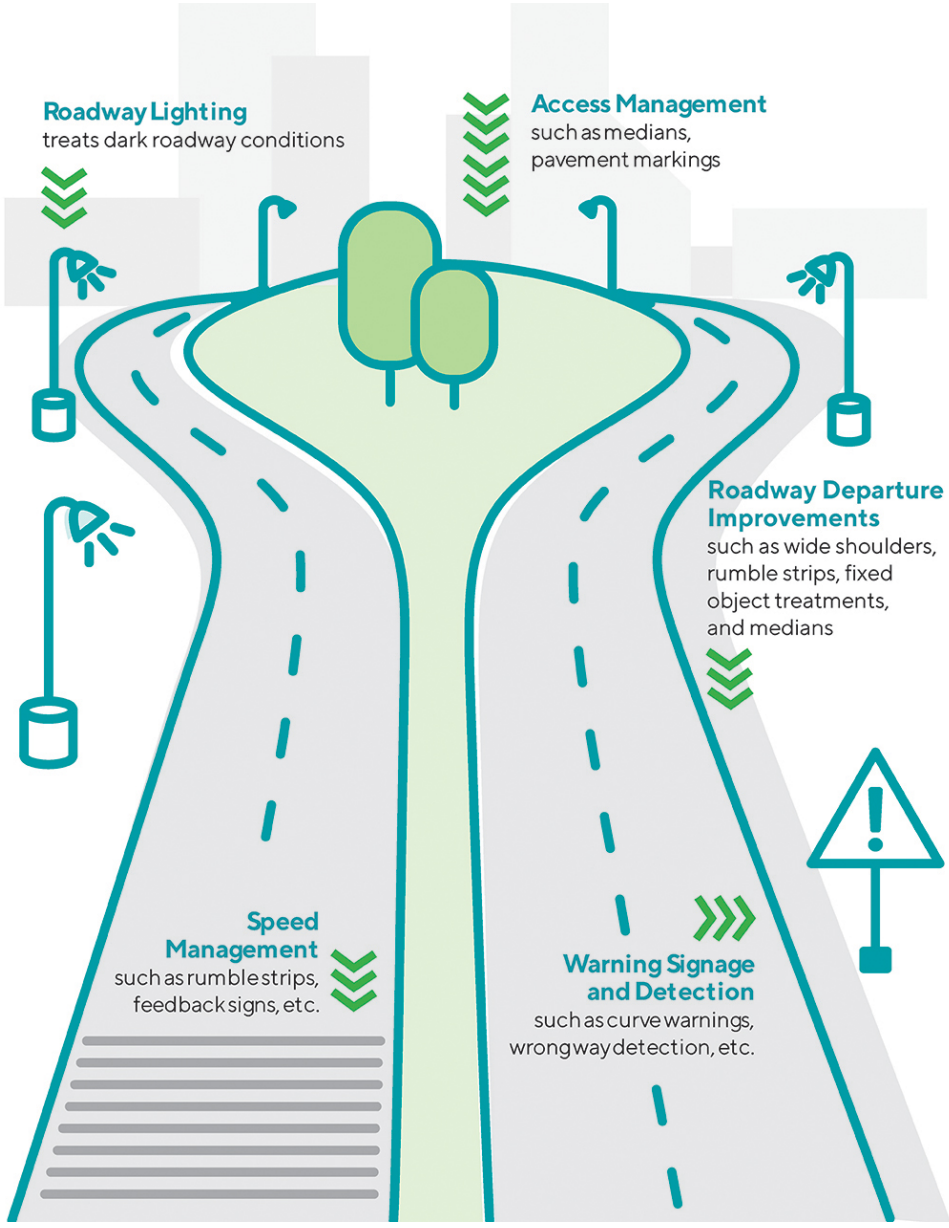


TABLE 4: SEGMENT-RELATED COUNTERMEASURES

| STRATEGY | COUNTERMEASURES |
|---|---|
| **INFRASTRUCTURE TREATMENTS**  | • Install:<br>o Centerline rumble strips.<br>o Raised medians or median barriers.<br>o Raised pavement markers or profiled center lines.<br>o Chevron signs, curve warning signs, posted speed limit reductions, and/or sequential flashing beacons in curves.<br>o High friction surface treatments .<br>o Wider, brighter, and more durable edge lines, especially on curves.<br>o 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.<br>o Roadside safety hardware such as guardrail, cable barrier, or concrete barrier.<br>• Locate and inventory fixed objects inside the clear zone to support development of programs and projects to reduce the severity of lane departure crashes.<br>• Install signal preemption at intersections.<br>• Widen shoulders.<br>• Reconfiguring vehicle lanes for turn lanes or bike lanes. |
| **BEHAVIORAL STRATEGIES**  | • Disseminate outreach materials and social media posts educating the public on the major causes of lane departure crashes (e.g., speeding).<br>• Arrange for hosting the NHTSA Speed Management Program course for local engineers, planners, and law enforcement.<br>• Utilize Dynamic Speed Feedback Signs (DSFS) on sections of roadways where speed-related crashes are of concern.<br>• 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.<br>• Utilize TxHSO Law Enforcement Liaisons (LELs) to improve participation from law enforcement in conducting high-visibility enforcement to address impaired driving. |
| **POLICY RECOMMENDATIONS**  | • Develop a policy consistent with TxDOT's guidelines for roadway lighting installation, focusing on areas identified with CRIS data analysis.<br>• Implement a feedback mechanism for road users to report maintenance issues in real time.<br>• Follow TxDOT's guidelines for high-visibility enforcement operations, public awareness campaigns targeted at aggressive driving.<br>• Partner with local organizations in Central Texas to implement interactive workshops and virtual reality simulations to demonstrate the dangers of impaired road use.<br>• Develop a program that aligns with TxDOT's "Talk. Text. Crash." campaign aimed at informing drivers of the risks of distracted driving.<br>• Incorporate data from the HIN to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized.<br>• Incorporate data from the HIN to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized.<br>• Partner with local organizations in Central Texas to implement interactive workshops and virtual reality simulations to demonstrate the dangers of impaired driving.<br>• Partner with local law enforcement to conduct high-visibility enforcement and Utilize Dynamic Speed Feedback Signs (DSFS) approaching and within work zones<br>• Develop an implementable regular maintenance schedule of existing road signs to help sign visibility and compliance. |

| STRATEGY | COUNTERMEASURES |
|---|---|
| | • Incorporate data from the HIN to determine areas where safety enhancement strategies (rumble strips, guardrail, wider edge lines, etc.) are prioritized.<br>• Develop a policy consistent with TxDOT's guidelines for roadway lighting installation, focusing on areas identified with CRIS data analysis.<br>• 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

Intersection-related crashes account for 30% of fatal or serious injury crashes in Hays County. Intersections present complex traffic interactions that contribute to higher crash frequencies. Table 5 provides a list of recommended countermeasures to reduce potential conflicts at an intersection.

TABLE 5: INTERSECTION-RELATED COUNTERMEASURES

| STRATEGY | COUNTERMEASURES |
|---|---|
| INFRASTRUCTURE TREATMENTS: SPEED REDUCTION/ MANAGEMENT  | • Install transverse rumble strips on rural stop-controlled approaches.<br>• Provide advanced dilemma zone detection (real-time warning) for high-speed approaches at rural signalized intersections.<br>• Install curb extensions at intersections. |
| INFRASTRUCTURE TREATMENTS: INTERSECTION RECONFIGURATION  | • Install or convert intersections to roundabouts.<br>• Convert permitted left turns to protected left turns at signals; provide pedestrian mobility with protected signal phasing that does not conflict with turning motorists.<br>• Install intersection conflict warning systems (real-time warning) to warn drivers on mainline or side roads of conflicting traffic at rural intersections.<br>• Increase pavement friction using high-friction surface treatments at intersection approaches.<br>• Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists.<br>• Restrict access to properties/driveways adjacent to intersections using closures or turn restrictions. |
| INFRASTRUCTURE TREATMENTS: TRAFFIC SIGNAL IMPROVEMENTS  | • Remove unwarranted signals.<br>• Modify signal phasing to implement a leading pedestrian interval; add bicycle traffic signals where bike lanes are installed.<br>• Coordinate arterial signals.<br>• Implement flashing yellow arrows at signals.<br>• Optimize traffic signal clearance intervals, including consideration for leading pedestrian intervals. |
| INFRASTRUCTURE TREATMENTS: INTERSECTION VISIBILITY IMPROVEMENTS  | • Increase sight distance (visibility) of intersections on approaches.<br>• Add retroreflective borders to signal back plates.<br>• Increase the visibility of signals and signs at intersections.<br>• Improve lighting, including pedestrian-scale lighting.<br>• Increase vegetation management to help unobstructed sightlines.<br>• Install retroreflective markings and pavement treatments to enhance nighttime. |

| STRATEGY | COUNTERMEASURES |
|---|---|
| **BEHAVIORAL STRATEGIES**  | • Support and educate the public on the safety advantages of using emerging technologies such as ITS, V2I, and connected vehicles.<br>• Utilize TxHSO LELs to improve law enforcement participation in conducting high-visibility enforcement to address red light running.<br>• Conduct focused intersection enforcement patrols with high-visibility behavioral campaigns (e.g., impaired driving, occupant protection, distracted driving).<br>• Encourage the use of coordinated high-visibility enforcement activities addressing high-risk driving behavior, particularly on weekends and evenings to address alcohol and drug-related crashes.<br>• 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.<br>• Develop a program that follows TxDOT's traffic calming guidelines and best practices. |

## Vulnerable Road Users

Vulnerable road users include pedestrians and bicyclists. Pedestrians were involved in 74 fatal or serious crashes, and bicyclists were involved in 12 fatal and serious injury crashes within Hays County from 2019 to 2023. Table 6 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 6: COUNTERMEASURES FOR VULNERABLE ROAD USERS

| STRATEGY | COUNTERMEASURES |
|---|---|
| **INFRASTRUCTURE TREATMENTS: ENHANCE PEDESTRIAN AND BICYCLE CROSSINGS**  | • Update existing or develop new pedestrian crossings with additional features such as marked crosswalks, Rapid Flashing Beacons, curb extensions, raised crosswalks, or advanced warnings.<br>• 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.<br>• Install refuge islands and raised pedestrian and bicyclist crossings and shorten crossing distances with bicycle-friendly curb extensions where these crosswalk enhancements are needed. |
| **INFRASTRUCTURE TREATMENTS: IMPROVE LIGHTING**  | • Help crosswalk lighting is illuminated with positive contrast to make it easier for a driver to see pedestrians. |
| **INFRASTRUCTURE TREATMENTS: ROADWAY RECONFIGURATION**  | • Reduce the number of travel lanes, assess posted speed limits, narrow travel lanes, and install separated bicycle and pedestrian facilities in areas with high multimodal use.<br>• Add center and/or bicycle-friendly edge line rumble strips.<br>• Construct separated pedestrian facilities (sidewalks and multi-use paths), especially in urban areas and adjacent to schools, bus stops, and school walk areas. |
| **INFRASTRUCTURE TREATMENTS: INTERSECTION IMPROVEMENTS DESIGNED FOR ACTIVE TRANSPORTATION USER SAFETY**  | • Construct left turn lanes designed and operated with explicit consideration for safety of active transportation users.<br>• Restrict or eliminate turning maneuvers at intersections that create conflicts for drivers, pedestrians, and/or bicyclists.<br>• At traffic signals, add bicycle signal heads and provide a leading signal interval. At intersections, install colored bicycle boxes. |

| STRATEGY | COUNTERMEASURES |
|---|---|
| **INFRASTRUCTURE TREATMENTS: SEPARATED PEDESTRIAN/ BICYCLE FACILITIES**  | • Remove permissive left turn signals that conflict with pedestrian/bicyclist movements and eliminate right turn on red at signals. Provide protected signal phases for pedestrian/bicyclist movements.<br>• Separate pedestrian and bicycle facilities such as sidewalks, buffered or protected bike lanes, shared use paths and regional trails.<br>• Add a delay between pedestrian walk phases and green light phases. |
| **BEHAVIORAL STRATEGIES**  | • Educate the public about the need to be self-aware and conspicuous when walking or biking. Encourage pedestrians and bicyclists to wear bright-colored clothing and carry a flashlight. Provide reflective tapes and materials to the public.<br>• Partner with local law enforcement to conduct high-visibility speed enforcement in and around school zones during peak school traffic periods.<br>• Implement DSFS in school zones during peak school traffic periods.<br>• Promote public awareness of vulnerable user safety issues and contributing circumstances, and provide education/ training for pedestrians, bicyclists, and motorists of all ages on ways to avoid crashes.<br>• Support vulnerable road user safety by coordinating with law enforcement to conduct high-visibility enforcement of bicyclists, pedestrians, and motorists who are violating traffic safety laws that may endanger them or other travelers.<br>• Disseminate outreach materials, and training, to educate the public and enforcement personnel on new traffic control devices, such as Pedestrian Hybrid Beacons (HAWK signals). |
| **POLICY RECOMMENDATIONS**  | • Increase enforcement strategies (e.g., speed feedback signs, High-Visibility Enforcement, etc.) that comply with Texas state laws regarding speeding within a school zone.<br>• Develop a policy to include crash data analysis and community input involving vulnerable road users in Central Texas to identify specific needs and concerns.<br>• Develop initiatives to improve safety for vulnerable road users and adhere to TxDOT's design standards, including promoting pedestrian countdown signals, protected bike lanes, and public engagement campaigns.<br>• Develop a Complete Streets policy to enhance the pedestrian/bicyclist environment along roadways with higher-than-normal pedestrian/bicyclist activity.<br>• Consider developing a policy based on TxDOT's methodologies for assessing pedestrian and bicyclist level of traffic stress (LTS).<br>• 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.<br>• Develop a policy in accordance with TxDOT's guidelines on truck routes, 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.<br>• Develop a program that collaborates with local schools and parent-teacher associations to identify areas for enhanced safety improvements (e.g., Rapid Flashing Beacons, speed feedback signs).<br>• Develop a program that follows TxDOT's traffic calming guidelines and best practices. |

## 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 incidents occur. By analyzing roadway design, traffic patterns, and human behavior, these packages apply 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:

- Overhead Signs
- Advanced Warning Signals (Intersection - Existing Warning Signs)
- Advanced Warning Signals and Signs (Intersection)
- Advanced Warning Signs (Intersection)
- Flashing or LED-embedded Stop Signs
- 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 proposed for Hays 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 can be combined to produce a more comprehensive safety project.

# Targeted Improvement Development and Prioritization

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

## Targeted Improvement Development

Targeted safety improvements focus on locations within the HIN where the severity and frequency of crashes are most concentrated. By prioritizing 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 Hays County HIN and other locations identified by the Task Force and the public. The location of each targeted segment improvement is shown in **Figure 27**, while proposed intersection improvement locations are shown in **Figure 28.**

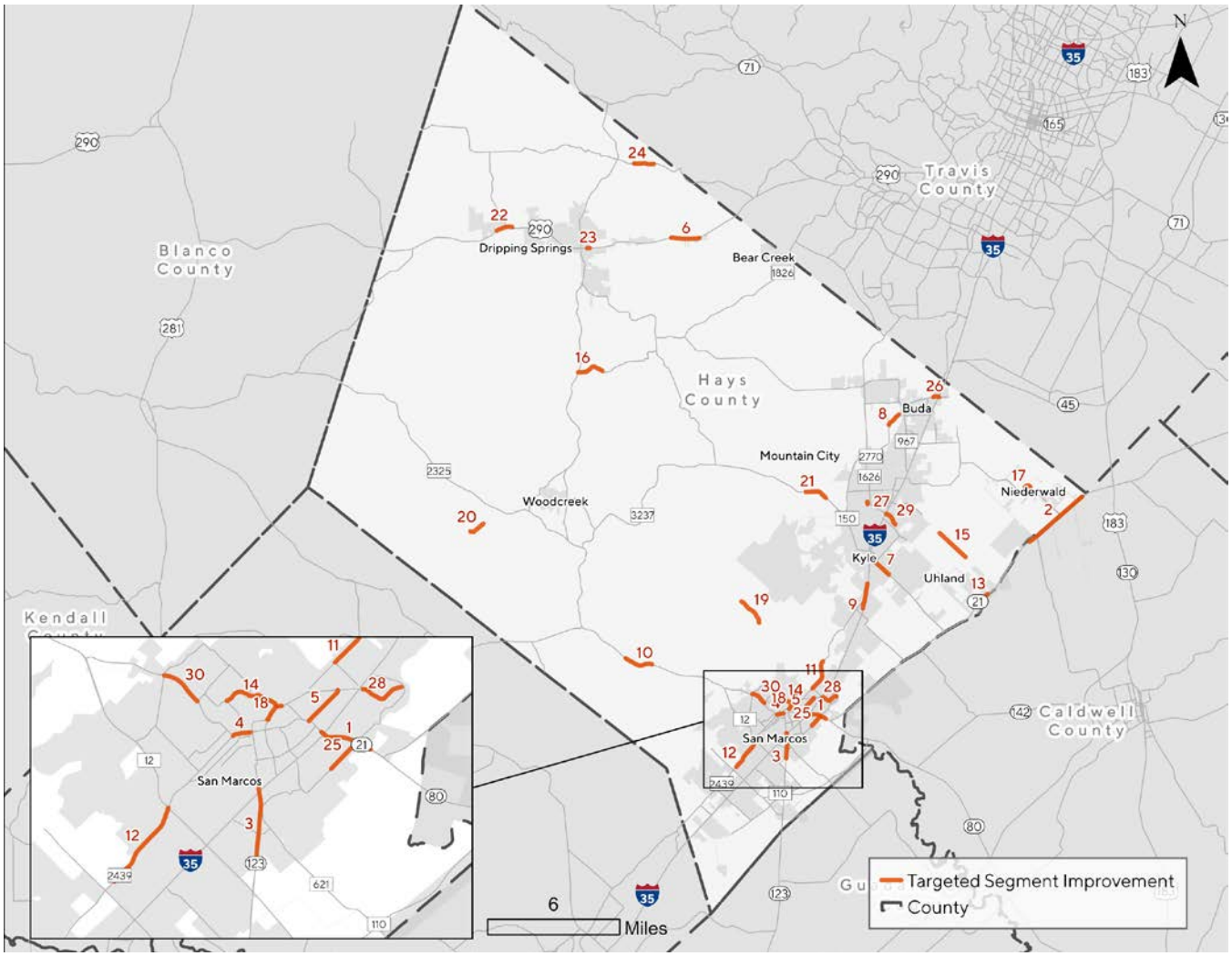



FIGURE 27: TARGETED IMPROVEMENT LOCATIONS - SEGMENTS

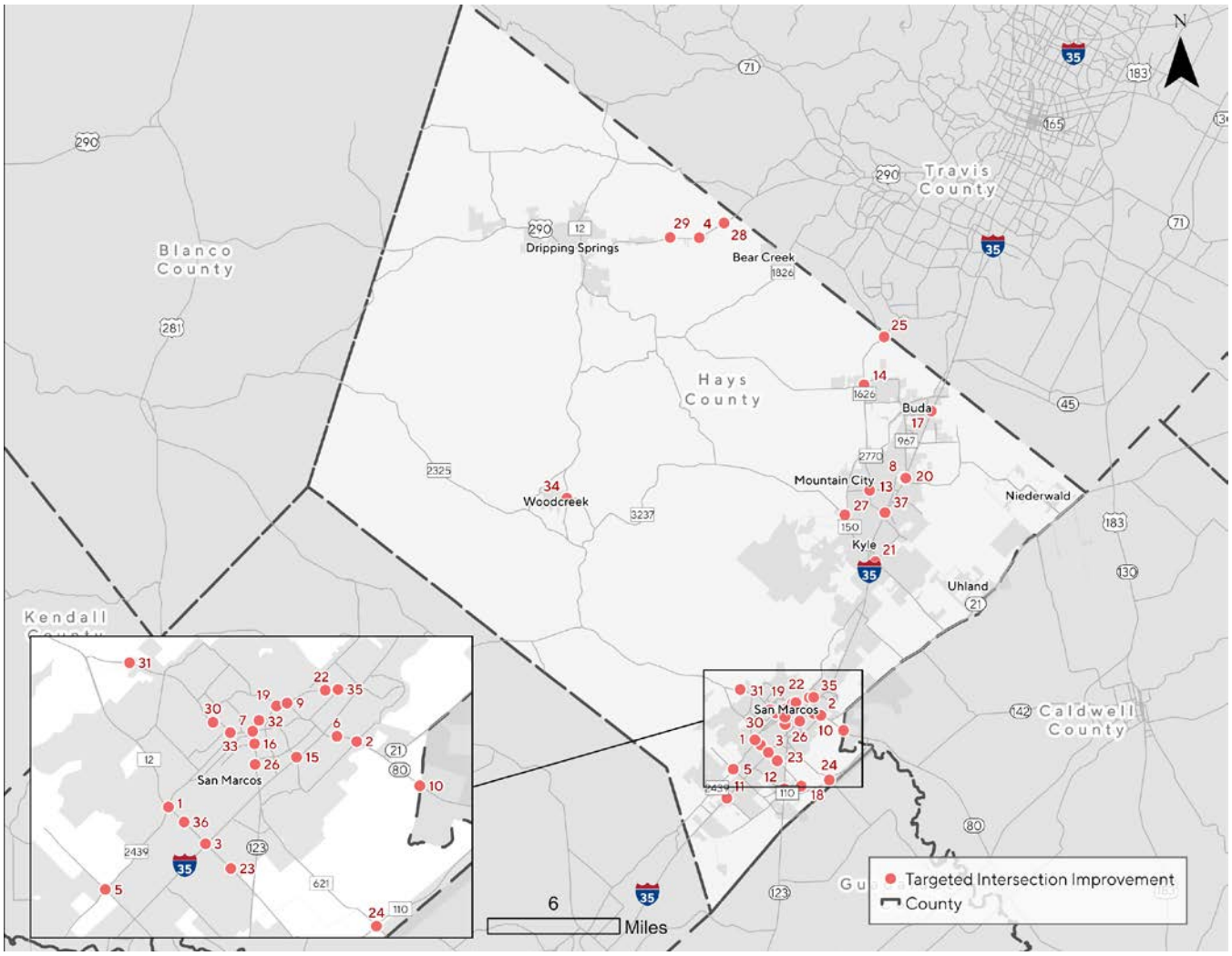



FIGURE 28: TARGETED IMPROVEMENT LOCATIONS – INTERSECTIONS

## Prioritization

This section outlines the process by which proposed safety-driven infrastructure improvements were prioritized within Hays County. The prioritization criteria were designed to identify the most effective safety projects that align with the vision of the SAP.

The criteria also served as a framework for ranking safety projects to pursue funding sources through local, regional, statewide, and national solicitations. By applying these criteria,, Hays County and its partner agencies can make data-driven decisions-making regarding the allocation of limited funds to address the most prominent safety issues and advance the goal of zero traffic fatalities and serious injuries.

Each improvement was evaluated based on the following **five criteria**:

1. **Crash Reduction Potential** estimated the potential for crash reduction, with greater weight given to projects addressing more severe and numerous crashes.
2. **Estimated Cost** categorized projects based on high-level ballpark cost estimates, providing a sense of financial investment and a proxy for constructability.

3. **Vulnerable Road User Benefits** assessed 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 Community Benefits** prioritized projects benefiting underserved or vulnerable communities.
5. **Readiness Level** evaluated the project's readiness for implementation, considering design status and funding availability.

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

Improvements are grouped into tiers, with the thresholds for each 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 utilize safety funding to reduce fatal and serious injury crashes in Hays County while maintaining flexibility in implementation. The corresponding improvement list with descriptions is included in Table 7 and Table 8.

## Project Lists

**TABLE 7: LIST OF TARGETED CORRIDOR IMPROVEMENTS**

| ID | ROADWAY NAME | LIMITS FROM | LIMITS TO | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|---|---|
| 1 | SH 21/SH 80 | IH 35 SB FRTG Rd | SH 21 at SH 80 | Install islands and/or pavement markings to control or prohibit vehicular movements; Construct paved shoulders (1-4 ft); Add safety lighting; Add shared use sidepath adjacent to roadway | Angle Crash, Opposite Direction, | TxDOT | 1 |
| 2 | SH 21 | E of Niederwald Dr | W of FM 2001 | Widen to 12 ft lanes and widen paved shoulders to greater than 5 ft | Roadway and Lane Departure, Same Direction, | TxDOT | 1 |
| 3 | SH 123 | IH 35 SB FRTG Rd | S of E de Zavala Dr | Install raised medians to control or prohibit vehicular movements; Provide paved shoulders of 1- to 4-ft width; Add safety lighting | Opposite Direction, Single Vehicle | TxDOT | 2 |
| 4 | Hopkins St | Moore St | SL 82 (Guadalupe St) | Resurface roadway, Install edge markings, Install pedestrian crosswalks, Install dedicated (protected) bicycle lanes, Add left turn lane (Commanche to Hopkins) | Same Direction, Single Vehicle | City of San Marcos | 2 |
| 5 | Thorpe Ln | SL 82 | SH 80 | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting, Add dedicated bicycle lanes (with lane reduction, Install pedestrian hybrid beacon at Springtown Way | Angle Crash, Opposite Direction, | City of San Marcos | 2 |
| 6 | US 290 | W of Whitetail Rdg | Polo Club Dr | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting | Angle Crash, Opposite Direction, | TxDOT | 3 |
| 7 | RM 150 | Hill St | Creekside Trl | Install raised medians to control or prohibit vehicular movements (Hill St to Four Seasons Dr) ; Add safety lighting; Widen paved shoulders to greater than 5 ft (Four Seasons Drive to Creekside Trl) | Roadway and Lane Departure, Angle Crash, | TxDOT | 3 |
| 8 | FM 2270/Jack C Hays Trl | Barton Crossing | .955 mi S of SL 4 | Add chevrons and curve warning/speed advisory signs; Construct paved shoulders (1-4 ft) | Roadway and Lane Departure, | City of Buda | 1 |

| ID | ROADWAY NAME | LIMITS FROM | LIMITS TO | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|---|---|
| 9 | IH 35 SB FRTG | Opal Ln | N of Yarrington Rd | Add safety lighting; Widen paved shoulders to greater than 5 ft | Roadway and Lane Departure, | TxDOT | 3 |
| 10 | RM 12 | W of Rancho Encino Dr | Hugo Road | Add chevrons and curve warning/speed advisory signs; Widen paved shoulders to greater than 5 ft | Roadway and Lane Departure, | TxDOT | 2 |
| 11 | Post Rd | N of Paintbrush St. | Uhland Rd. | Add safety lighting at intersection | Roadway and Lane Departure, Angle Crash, | Hays County, City of San Marcos | 3 |
| 12 | FM 2439 | RM 12/Wonder World Dr | E of E Mccarty Ln | Add safety lighting; Add high visibility crosswalks (at Stagecoach Trail) | Roadway and Lane Departure, | TxDOT | 2 |
| 13 | SH 21 | CR 129 (Cotton Gin Rd) | E of CR 129 (Cotton Gin Rd) | Add left turn lane; Add safety lighting (near commercial driveway) | Roadway and Lane Departure, Same Direction, | TxDOT | 1 |
| 14 | W Sessom Dr | N Comanche St | SL 82 | Add safety lighting, Add chevrons and curve ahead/speed advisory signs, Install Pavement Markings | Roadway and Lane Departure, Same Direction, | City of San Marcos | 1 |
| 15 | High Rd | Goforth Rd | N of Lonie Ln. | Construct paved shoulders (1-4 ft) | Roadway and Lane Departure, Single Vehicle | Hays County | 3 |
| 16 | Elder Hill Rd | RR 12 | E of Stoney Brook Ln. | Construct paved shoulders (1-4 ft) | Roadway and Lane Departure, Single Vehicle | Hays County | 3 |
| 17 | FM 2001 | W of Kai Vista Dr | E of Kai Vista Rd | Add safety lighting; Add chevrons and curve warning/speed advisory signs, Install pavement markings | Roadway and Lane Departure, Same Direction, | TxDOT | 1 |

| ID | ROADWAY NAME | LIMITS FROM | LIMITS TO | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|---|---|
| 18 | SL 82 | W of Charles Austin Dr | University Dr | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting, Add dedicated (protected) bicycle lanes | Roadway and Lane Departure, Same Direction, | TxDOT | 1 |
| 19 | Hilliard Rd | N of Piedras Pass | S of Telegraph Trl. | Add chevrons and curve warning/speed advisory signs, Install pavement markings, Construct paved shoulders (1-4 ft) | Roadway and Lane Departure, Same Direction, | Hays County | 2 |
| 20 | Fischer Store Rd | W of My Joy Ln. | W of Sachtleben Rd | Add chevrons and curve warning/speed advisory signs, Install pavement markings; Construct paved shoulders (1-4 ft) | Roadway and Lane Departure, Single Vehicle | Hays County | 2 |
| 21 | RM 150 | E of W Ranch Road 150 | E of Anthem Pkwy | Add chevrons and curve warning/speed advisory signs, Install pavement markings | Roadway and Lane Departure, Same Direction, | TxDOT | 2 |
| 22 | US 290 | E of Holder Ln | W of Three Sisters Ln. | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting | Roadway and Lane Departure, | TxDOT | 2 |
| 23 | US 290 | E of N Rob Shelton Blvd | E of Cannon Dr | Install islands and/or pavement markings to control or prohibit vehicular movements | Same Direction, Opposite Direction, | TxDOT | 3 |
| 24 | Fitzhugh Rd | W of Triple Creek Dr | E of Fitzhugh Pl | Add chevrons, install delineators, install curve warning/speed advisory signs | Roadway and Lane Departure, Angle Crash, | Hays County | 3 |
| 25 | River Rd | SH 80 | S of Christopher St | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting, Add dedicated (protected) bicycle lanes | Roadway and Lane Departure, Single Vehicle | City of San Marcos | 2 |

| ID | ROADWAY NAME | LIMITS FROM | LIMITS TO | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|---|---|
| 26 | Main St | W of Old San Antonio Rd | IH 35 NB FRTG Rd | Install warming/guide signs (approach of Old San Antonio Road); Install sidewalks (where gaps exist); Implement leading pedestrian interval timing | Roadway and Lane Departure, Opposite Direction, | City of Buda | 2 |
| 27 | Cromwell Dr | Dorman Ln | .5 mi S of Dorman Ln | Install islands and/or pavement markings to control or prohibit vehicular movements; Add safety lighting | Roadway and Lane Departure, | City of Kyle | 3 |
| 28 | Aquarena Springs Dr | IH 35 NB FRTG Rd | W of River Rd | Install islands and/or pavement markings to control or prohibit vehicular movements, Add Shared Use Path (sidepath) adjacent to roadway | Roadway and Lane Departure, Single Vehicle | City of San Marcos | 3 |
| 29 | Kyle Pkwy | IH 35 NB FRTG Rd | Dacy Ln | Install advanced warning signs at intersections, Add shared use sidepath adjacent to roadway | Roadway and Lane Departure, Opposite Direction | City of Kyle | 3 |
| 30 | Old RR 12 | Craddock Ave | W Holland St | Install sidewalks; Add dedicated (protected) bicycle lanes | Vulnerable Road Users | City of San Marcos | TBD |

**TABLE 8: LIST OF TARGETED INTERSECTION IMPROVEMENTS**

| ID | INTERSECTION | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|
| 1 | RM 12 at FM 2439/Hunter Rd | Signal: Prohibit turns when ped signal is activated; Prohibit right-turns on red; Consider adjusting signal timings | Head on Crashes, Rear End Crashes, | TxDOT, City of San Marcos | 1 |
| 2 | SH 80 at River Rd | Signal: Install Leading Pedestrian Interval, Prohibit turns when ped signal is activated, Prohibit right-turns on red. Other: Update worn pavement markings | Head on Crashes, Single Vehicle, | TxDOT, City of San Marcos | 2 |

| ID | INTERSECTION | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|
| 3 | IH 35 SB FRTG Rd at RM 12 | Signal: Eliminate shared left thru lanes and convert to left-turns to protected-only; Other: Update worn pavement markings, Install speed feedback signs | Rear End Crashes, | TxDOT | 2 |
| 4 | US 290 at Sawyer Ranch Rd/Polo Club Rd | Other: Install speed feedback signs; Improve lighting | Angle Crash, Head on Crashes, | TxDOT | 3 |
| 5 | FM 2439 at McCarty Ln | Signal: Install protected left-turn phase on Hunter Road, Other: Improve lighting, Update worn pavement markings, Consider posted speed reduction to 35-40 mph (due to proximity to school), Install speed feedback sign | Head on Crashes, Roadway and Lane Departure, | TxDOT, City of San Marcos | 3 |
| 6 | SH 21 at Clarewood Dr | Signal: Upgrade to audible pedestrian signal, Prohibit turns when pedestrian signal is activated | Head on Crashes, Rear End Crashes, | TxDOT | 2 |
| 7 | SL 82 (S Guadalupe St and S LBJ Drive) at SH 80 (E Hopkins St) | Ped/Bike: Upgrade to high visibility crosswalks; Signal: Install leading pedestrian interval; Other: Update worn pavement markings, Improve lighting | Rear End Crashes, Single Vehicle, | TxDOT | 1 |
| 8 | IH 35 SB FRTG Rd at Kyle Xing | Other: Improve lighting, Update worn pavement markings, Consider rumble strips; Intersection Improvement: Reduce curb radii; Install raised medians | Angle Crash, Head on Crashes, | TxDOT | 3 |
| 9 | SL 82 at Charles Austin | Signal: Install Leading pedestrian interval, Prohibit turns when ped signal is activated, Prohibit right-turns on Red; Ped/Bike: Install raised crosswalk, Install buffered bicycle lanes, Update worn pavement markings | Head on Crashes, Rear End Crashes, | TxDOT, City of San Marcos | 2 |
| 10 | SH 80 at Old Bastrop Hwy | Other: Consider posted speed reduction to 40-45 mph, Improve lighting | Angle Crash, | TxDOT, City of San Marcos | 2 |
| 11 | IH 35 NB FRTG Rd at Center Point Rd | Signal: Prohibit right-turns on red; Other: Upgrade to high visibility crosswalk, Install advanced pedestrian warning signs and yield markings, Update worn pavement markings, Improve lighting | Angle Crash, Rear End Crashes, | TxDOT | 2 |
| 12 | SH 123 at Clovis R Barker Rd | Other: Improve lighting, Consider speed feedback signs on SH 123 approaches; Signal: Consider signal control | Angle Crash, Head on Crashes, | TxDOT | 2 |

| ID | INTERSECTION | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|
| 13 | FM 1626 at Kohler's Crossing Rd | Signal: Install Leading pedestrian interval, Prohibit turns when ped signal is activated; Other: Upgrade to high visibility crosswalks, Improve lighting, Reduce curb radii, Consider lane width reduction | Angle Crash, Head on Crashes, | TxDOT, City of Kyle | 2 |
| 14 | FM 1626 at RM 967 | Study: Consider implementation of FM 1626/RM 967 Intersection Study | Head on Crashes, Rear End Crashes, | TxDOT, City of Buda | 3 |
| 15 | IH 35 SB FRTG Rd at Riverside Dr | Other: Upgrade existing "STOP" sign on Riverside Dr to LED "STOP" sign, Update worn pavement markings, Improve lighting, , Trim vegetation | Head on Crashes, Rear End Crashes, | TxDOT | 2 |
| 16 | SL 82 (S Guadalupe St and S LBJ Drive) at S Edward Gary St/E. Martin Luther King Dr. | Ped/Bike: Install buffered bicycle lanes; Install crosswalks at S Guadalupe St and S LBJ Dr, Consider installation of Rectangular Rapid Flashing Beacons; Other: Improve lighting, update worn pavement markings | Angle Crash, Single Vehicle, | TxDOT, City of San Marcos | 1 |
| 17 | IH 35 SB FRTG Rd at Cabelas Dr | Signal: Install protected left-tun phase on FM 2001 NB; Access Management: Consider revision to a access control/consolidation of driveways adjacent to this intersection; Other: Improve lighting | Angle Crash, Rear End Crashes, | TxDOT, City of Buda | 2 |
| 18 | Redwood Rd at S Old Bastrop Hwy | Other: Improve lighting, Update worn pavement markings, Upgrade to LED "STOP" signs on all approaches with red reflective strips | Angle Crash, Rear End Crashes, | City of San Marcos | 2 |
| 19 | SL 82 at E Sessom Dr | Ped/Bike: Install shared lane markings, Install raised crosswalks; Signal: Install leading pedestrian intervals; Prohibit turns when ped signal is activated; Upgrade to audible pedestrian signals | Head on Crashes, Single Vehicle, | TxDOT | 2 |
| 20 | IH 35 NB FRTG Rd at Windy Hill Rd | Other: Improve lighting, install "Signal Ahead" sign on Windy Hill Rd approach; Consider rumble strips to prevent lane departure, Intersection Improvement: Consider future realignment of Windy Hill Road approach, Reduce curb radii, Install raised median | Angle Crash, Rear End Crashes, | TxDOT | 1 |
| 21 | RM 150 at Lehman Rd | Signal: Consider coordination with signal at intersection at IH 35 NB FTRG Rd; Other: Consider posted speed reduction to 40-45 mph, Implement lighting improvements | Head on Crashes, Rear End Crashes, | TxDOT | 2 |
| 22 | SL 82 at Aquarena Springs Dr/Mill St | Ped/Bike: Install high visibility midblock crosswalk with pedestrian hybrid beacons, in-ground lighting, advanced warning signs and yield markings; Other: Update signage on minor street approaches with a right-turn only sign, Improve lighting | Head on Crashes, Rear End Crashes, | TxDOT, City of San Marcos | 2 |

| ID | INTERSECTION | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|
| 23 | RM 12 at Sadler Dr | Other: Consider posted speed reduction to 35 mph, Replace two way left-turn lane with raised median; Update worn signal markings | Angle Crash, Head on Crashes, | TxDOT | 2 |
| 24 | FM 621 at FM 110 | Intersection Improvement: Tighten intersection/reduce curb radii, Add reflective red panels and supplemental "All-Way" plaques to stop signs, Add rumble strips on all 4 approaches | Angle Crash, Rear End Crashes, | TxDOT | 3 |
| 25 | FM 1626 at SH 45 SW | Signal: Install retro-reflective back plates, Add pavement markings/shields to clarify turn-movements on ramps to SH 45 SW | Angle Crash, Roadway and Lane Departure, | TxDOT | 2 |
| 26 | SL 82 at W. Grove St | Other: Improve lighting, Update worn pavement markings and add pavement markings to clarify permitted turn movements | Angle Crash, Head on Crashes, | TxDOT | 3 |
| 27 | RM 150 at N Old Stagecoach Rd | Other: Update worn pavement markings, Restripe crosswalks to high-visibility crosswalks | Angle Crash, Head on Crashes, | TxDOT | 2 |
| 28 | US 290 at Hargraves Dr | Ped/Bike: Upgrade crosswalk markings, add pedestrian landing, Add bike lane signage and refresh pavement markings for the EB right-turn | Head on Crashes, Single Vehicle, | TxDOT | 2 |
| 29 | US 290 at Sunset Canyon Dr S. | Other: Improve lighting, Reduce speed on approach to intersection, Update worn pavement markings | Head on Crashes, Rear End Crashes, | TxDOT | 3 |
| 30 | Old Ranch Road 12/Oscar Smith St. at Blanco St. | Other: Improve lighting, update worn lane markings and add stop bar on Blanco St, Trim vegetation, Add reflective red panel to STOP sign, Add intersection warning signs to approaches on Old RR 12 | Angle Crash, Roadway and Lane Departure, | City of San Marcos | 1 |
| 31 | Old Ranch Road 12 at Country Estates Dr | Other: Improve lighting, add reflective signage to minor street approach, consider reducing speed limit on Old RR 12 | Angle Crash, Head on Crashes, | City of San Marcos | 3 |
| 32 | SL 82 at N Edward Gary St | Signal: Install leading pedestrian intervals; Prohibit turns when ped signal is activated | Head on Crashes, | TxDOT | 3 |

| ID | INTERSECTION | DESCRIPTION | SAFETY ISSUES | LEAD AGENCY | TIER |
|---|---|---|---|---|---|
| **33** | W Hutchison St at Moore St | Ped/Bike: Install shared lane markings to indicate full lane sharing for bicyclists; Signal: Install leading pedestrian intervals, Prohibit turns when ped signal is activated, Upgrade to audible pedestrian signals | Single Vehicle, | City of San Marcos | 3 |
| **34** | RM 12 at Champions Cir | Signal: Prohibit turns when ped signal is activated; Ped/Bike: Install sidewalk on north side of intersection and crosswalk, Restripe to high visibility crosswalks, Improve lighting; Other: Conduct roundabout feasibility study | Angle Crash, Head on Crashes, | TxDOT | 3 |
| **35** | SL 82 at Thorpe Ln | Signal: Install leading pedestrian interval, Prohibit turns when ped signal is activated; prohibit right-turns on red; Ped/Bike: Update worn pavement markings | Head on Crashes, Single Vehicle, | TxDOT | 2 |
| **36** | RM 12 at S Stagecoach Trl | Intersection Improvement: Consider intersection reconstruction and tightening; Signal: Prohibit permissive/un-protected left turns on RM 12 approaches; Install leading pedestrian intervals | Head on Crashes, Single Vehicle, | TxDOT | 3 |
| **37** | IH 35 SB FRTG Rd at FM 1626 | Intersection Improvement: Consider intersection reconstruction and tightening with extension of median nose into crosswalk; Signal: Install leading pedestrian intervals | Rear End Crashes, Single Vehicle, | TxDOT | 3 |

# Implementation Plan

The Hays County SAP outlines recommended improvements, safety countermeasures, and policy updates that require clear guidance and transparency for implementation. The SAP Implementation Plan provides a framework for pursuing diverse funding sources for project implementation, championing and advancing policy changes, and measuring and monitoring progress toward the County's Road to Zero goal.

## Funding Safety Improvements

To qualify for most funding sources, the proposed improvements, safety countermeasures, and policy updates must be documented in a publicly accessible plan, an objective achieved by this SAP. 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.

Funding for implementation and policy advancements may come from federal, regional, state, and local sources. State programs include, but are not limited to, HSIP 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 SS4A Grant Program.

## Championing Policy Changes

Policy changes and adoption can often face unexpected resistance, placing the burden on a few passionate advocates. Advancing roadway safety policies in Hays County will require strong leadership and cross-collaboration within agencies and departments - including planning, engineering and public works, zoning, public health , transit, schools, and elected officials.

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

- Identifying a governing body and/or official, ideally one that advocates transportation or roadway safety.
- Contacting the governing body and/or official about the SAP, informing them of policy improvements identified in the plan, and encouraging the legislation and development and adoption of the policy update(s).
- Publicly promoting policy updates with other advocates.
- Facilitating a public commitment to achieving the county's Road to Zero goal through the various policy updates.
- Considering pooling resources through coordinated planning and general engineering/planning contract (GEC) agreements, developing a formal collaboration across regional stakeholders for improved SS4A grant pursuits.

## Measuring & Monitoring Progress

CAMPO will be developing a process for monitoring to monitor the implementation of the recommended improvements, safety countermeasures, and policy updates to measure the projects' evaluate their effectiveness and desired outcomes. Member jurisdictions of Hays County can continue to work with CAMPO to measure and monitor track progress. This process will assess how well the SAP is advancing the County's Road to Zero goals and

objectives in achieving the Road to Zero goal. Key to improvements and outcomes are the performance measures and evaluation approach associated with the logic within the safety analysis, targeted improvements, and recommendations.

## PERFORMANCE MEASURES AND EVALUATION

### Project Progress: Outputs

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 crashes in Hays County. Examples include progress toward completion of:

- **Safety Projects** (infrastructure improvements such as new pedestrian crossing upgrades and installation of rumble strips)
    - Number of safety improvements completed on High Injury Network (HINs) segments and intersections
    - Number of systemic safety projects implemented (e.g., rumble strips, lighting, signage)
    - Number of bicycle and pedestrian projects completed
- **Safety Programs**
    - Number of younger drivers receiving training materials
    - Number of older drivers receiving training materials
    - Number of enforcement campaigns undertaken by law enforcement
    - Number of Hays County Task Force meetings held

For projects, evidence of progress includes securing federal or state grant funding; completing plans, specifications, and estimates; and constructing the project . For programs, progress steps include promoting statewide campaigns, supporting drivers' education programs, and increasing highway patrols during targeted law enforcement campaigns.

## PROJECT EFFECTIVENESS: OUTCOMES

Beyond tracking each action and activity, it is important to measure how effective those projects, strategies, and policy changes are at improving transportation safety in Hays County. The most common measures of traffic include the following:

- The 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 road user behaviors (e.g., speeding, impaired driving, and distracted driving) as contributing factors
- Rate of fatal crashes and serious injury crashes, normalized by county 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 the number, type, and severity of crashes occurring in Hays County and other member counties. In addition, CAMPO will consider incorporating datasets gained through the RSAP into its existing dashboards. Hays 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 respondents' self-identified behavior in a survey are considered outcomes, as these metrics can indicate the benefits of outreach and engagement.

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

# APPENDIX

## CONTENTS

# Appendix A

## SAFETY ANALYSIS TECHNICAL MEMORANDUM

# HAYS COUNTY SAFETY ANALYSIS

## Introduction

This report summarizes the safety analysis conducted for Hays County. This county-level analysis considers all roadway classes, including local roads (i.e., the analysis is not coned by the regional significance thresholds defined in the 2045 Regional Transportation Plan). Crash data from the most recent five years (2019 – 2023) is obtained for Hays County and crash patterns by severity, lighting condition, weather condition, intersections, impaired driving, and many other contributing factors are studied and presented in this report. Analyzing crash patterns by contributing factors helps identify focus areas which are areas of high potential safety risks in Hays County. The findings help identify locations that are more susceptible to fatal and serious injuries, aiding the development of the hotspot and high injury network. Hotspot and high injury network development further enables the project team to geospatially locate safety challenges associated with high risk of fatal and serious injuries, traffic stress for active transportation, excessive speeds, and transit access safety.

The Hays County safety analysis follows the Texas Strategic Highway Safety Plan (SHSP) and the Regional Safety Action Plan (RSAP) that CAMPO is conducting concurrently. 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

The analysis methodology used in this project includes three main aspects:

- Establishing a regional High Injury Network (HIN) of roadways that analyze both high injury segments, and high injury intersections as the primary focus for implementing targeted safety countermeasures, projects, and strategies.
- Reviewing countywide trends for different types of crashes and their causes to identify systemic safety issues that can be effectively addressed through broad policy and process changes.
- Using trend analysis to identify scalable, low-cost countermeasures for potential investment across the entire roadway network in the county.

The project team used the following five-step approach to quantify needs consistent with previous local best practices:

1. **Analyze Crash and Roadway Inventory Data:** The project team first obtained crash data from the Texas Crash Records Information System (CRIS) maintained by the Texas Department of Transportation (TxDOT) for all traffic crashes reported in Hays County from 2019 to 2023. 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: fatal injury (K), suspected serious injury (A), suspected minor injury (B), possible injury (C), non-injured (O), and unknown. This dataset also consists of information on different crash contributing factors, manner of collision, date and time, among other

information. This dataset is reliant 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 Hays County is downloaded from the from the TxDOT GIS Portal. The crash data is overlayed 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 (HIN) analysis, crash and roadway inventory datasets are used to conduct the analysis. The crashes are associated with the respective roadway corridors which allows the project team to understand crash patterns by different roadway characteristics such as facility type, length of the corridor, etc.

2. **Apply Crash Cost-Weighting Methodology:** To illustrate the cost burden of crashes, crashes with severity are weighted based on the Texas Highway Safety Improvement Program (HSIP) cost per crash. The cost per crash is:

    - $4,000,000 for a fatal or suspected serious injury crash and
    - $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) and suspected minor injury (B), and possible injury crashes (C) are weighted 1 point ($330,000).

3. **Conduct High-Injury Network Analysis along Intersections and Segment Basis:** Next, the project team conducted a two-part analysis using the CRIS dataset to identify the High Injury Intersections and High Injury Segments. Together, these two analysis integrates TxDOT roadway inventory data for all roads within Hays county to develop a High Injury Network with a targeted location-based safety analysis. The project team analyzed regional data as well as Hays County to ensure potential locations near the county line are considered.

4. **Integrate Findings with Texas SHSP Focus Areas:** The project team evaluated the frequency of crashes while accounting for various crash severities relating to each of the focus areas included in the Texas Strategic Highway Safety Plan.

5. **Prioritize Intersections and Segments:** From this initial analysis, the project team identified prioritized focus intersections and segments for Hays County.

The results of all safety analysis will be used to support public engagement efforts and will serve as a basis for the project recommendations and policy and process improvement recommendations that are identified as part of the Hays County Safety Action Plan.

# Existing Conditions Analysis

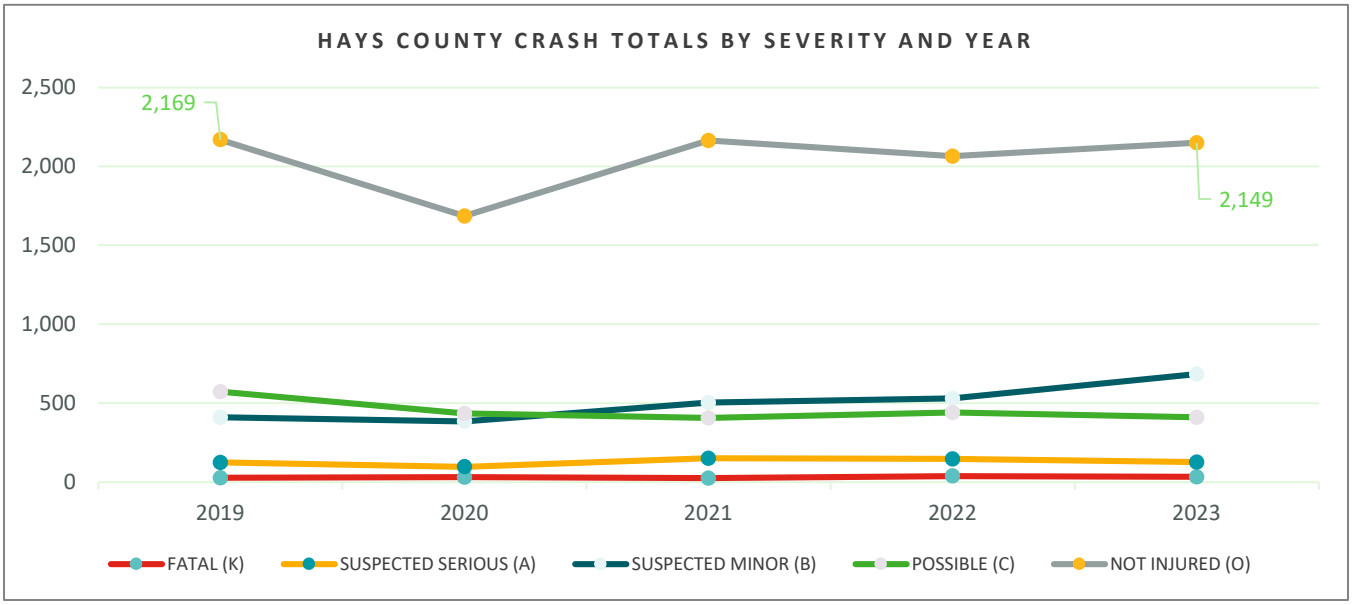
## Countywide 5-Year Crash Trends

Table 1 and Figure 1 summarize the crashes in Hays County by year and severity for all roadway types. There were 16,443 crashes from 2019 to 2023 of which 1 percent were fatal injury type and 4 percent were suspected serious injury type crashes. There were 638 (4%) crashes with 'unknown' severity type. The year 2020 observed the lowest number of crashes in five years after which the number of crashes increased every year. Since 2020, the total number of crashes increased by 28% in 2023. The region is experiencing a slight downward trend in the total number of crashes observed from 2019-2023.

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

| YEAR | FATAL (K) | SUSPECTED SERIOUS (A) | SUSPECTED MINOR INJURY (B) | POSSIBLE INJURY (C) | NOT INJURED (O) | UNKNOWN | TOTAL |
|---|---|---|---|---|---|---|---|
| **2019** | 27 | 123 | 409 | 573 | 2,169 | 144 | 3,445 |
| **2020** | 30 | 97 | 385 | 435 | 1,686 | 113 | 2,746 |
| **2021** | 25 | 151 | 504 | 406 | 2,163 | 135 | 3,384 |
| **2022** | 38 | 147 | 530 | 440 | 2,065 | 125 | 3,345 |
| **2023** | 32 | 127 | 684 | 410 | 2,149 | 121 | 3,523 |
| **TOTAL** | 152 | 645 | 2,512 | 2,264 | 10,232 | 638 | 16,443 |
| **%** | 1% | 4% | 15% | 14% | 62% | 4% | 100% |

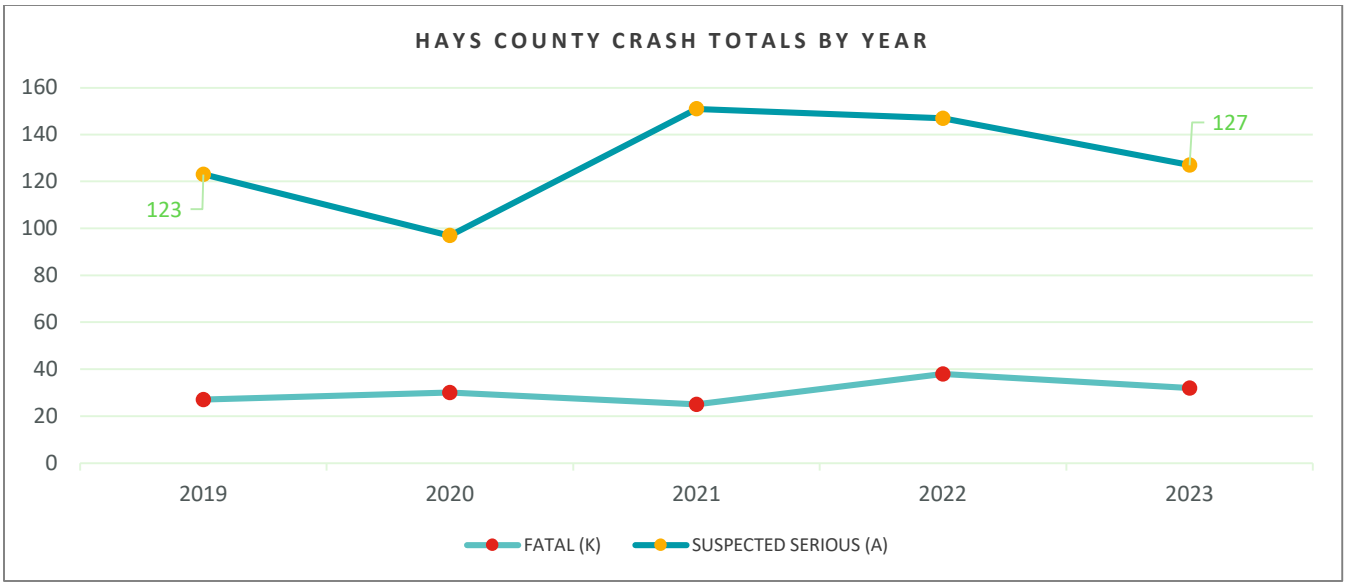
FIGURE 1: CRASHES (2019-2023) BY SEVERITY AND YEAR IN HAYS COUNTY




## FATAL AND SERIOUS INJURY CRASHES

Figure 2 presents fatal and suspected serious injury crashes in Hays County. The highest number of 38 fatal crashes were observed in 2022, and the lowest of 25 fatal crashes in 2021. The serious injury crashes show a consistent upward trendline, increasing from 123 in 2020 to 127 in 2023, with a high of 147 in 2022.

FIGURE 2: FATAL AND SERIOUS INJURY CRASHES (2019-2023) IN HAYS COUNTY




## CRASH FACTORS FOR ALL CRASHES

Figure 3 through Figure 5 present percentage distribution of crashes for lighting condition, weather condition and road surface condition. More than 66% of crashes occurred in daylight, clear sky and dry road surface condition.

FIGURE 3: LIGHTING CONDITION

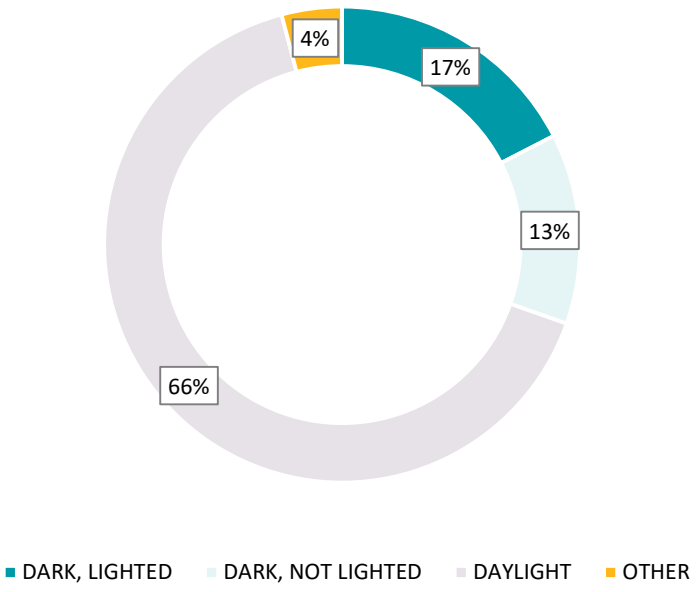



FIGURE 4: WEATHER CONDITION

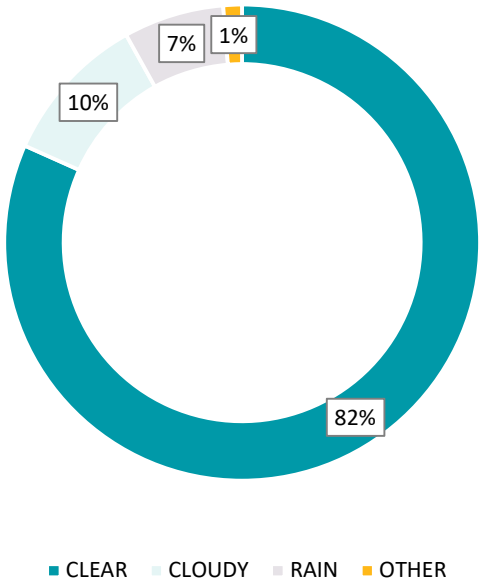
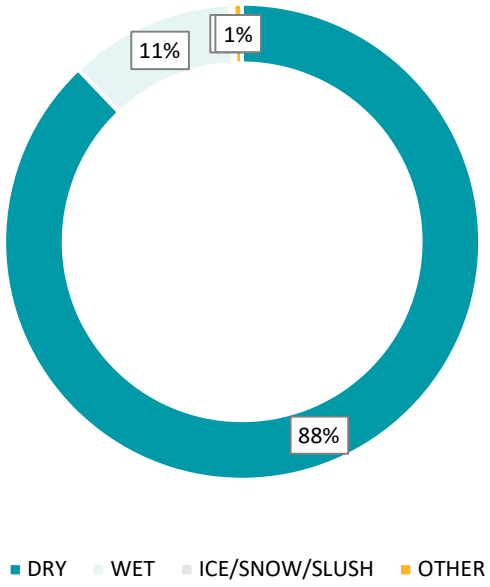


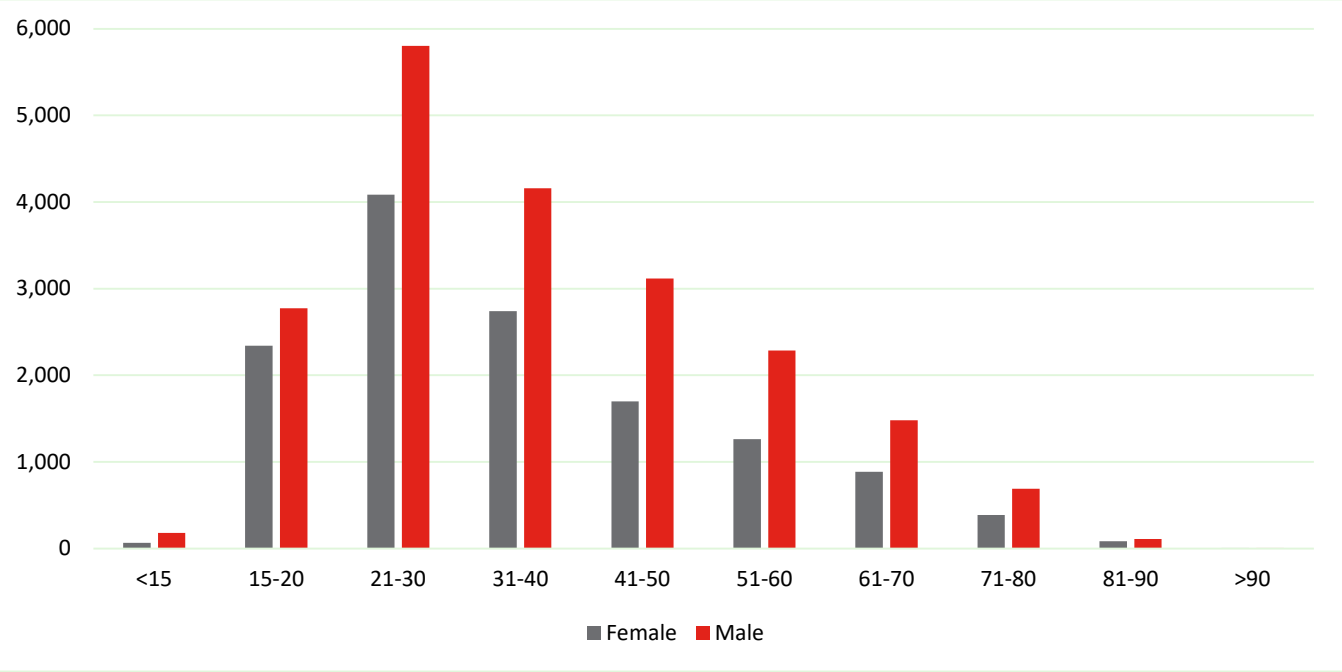

FIGURE 5: ROAD SURFACE CONDITION




## TOTAL CRASHES BY GENDER AND AGE

Figure 6 presents summary of crashes by gender and age of the driver. The crash database provides "male" and "female" type information. 60% of the drivers involved in crashes were male. 16% were young drivers (20 years or younger) and 11% were older drivers (60 years or older).

**FIGURE 6: NUMBER OF DRIVERS INVOLVED IN CRASHES (2019-2023) BY AGE (ALL SEVERITIES)**




## CRASH TYPES

Table 2 presents summary of crashes by crash types. Both the largest share of crashes and the largest percentage of high severity crashes were roadway and lane departure crashes.

**TABLE 2: SUMMARY OF CRASHES (2029-2023) BY CRASH TYPES**

| CRASH TYPE | # CRASHES | % OF ALL CRASHES | KA CRASHES | % of ALL KA CRASHES |
|---|---|---|---|---|
| **ROADWAY AND LANE DEPARTURE** | 3,791 | 23% | 338 | 42% |
| **SAME DIRECTION** | 6,343 | 39% | 153 | 19% |
| **SINGLE VEHICLE CRASH** | 1,399 | 9% | 114 | 14% |
| **ANGLE CRASH** | 3,410 | 21% | 103 | 13% |
| **OPPOSITE DIRECTION** | 1,381 | 8% | 89 | 11% |
| **OTHER** | 119 | 1% | 0 | 0% |
| **TOTAL** | 16,443 | 100% | 797 | 100% |

The crash types are further analyzed by crash contributing factors. In the crash database, there were more than 70 contributing factors. These factors are aggregated into 14 factors, presented in Table 3, and aggregated by Crash Type.

Overall, speed-related, failure to yield, or distracted driving contributed to 51% of crashes in Hays County. 50% of the same direction crashes were speed related, and 55% of the angle crashes were the result of a driver failing to yield.

**TABLE 3: SUMMARY OF CRASHES (2029-2023) BY CRASH TYPES AND CRASH CONTRIBUTING FACTORS**

| | | Crash Type | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Same Direction | Angle Crash | Roadway and Lane Departure | Opposite Direction | Single Vehicle Crash | Other | Total | |
| Contributing Factors | SPEED RELATED | 1,394 | 109 | 739 | 28 | 79 | 1 | 2,350 | 14% |
| | FAILED TO YIELD ROW | 35 | 934 | 12 | 474 | 37 | 3 | 1,495 | 9% |
| | AGGRESSIVE DRIVING | 856 | 208 | 167 | 76 | 36 | 6 | 1,349 | 8% |
| | DRIVER DISTRACTION | 693 | 258 | 340 | 67 | 162 | 9 | 1,529 | 9% |
| | OTHER | 379 | 246 | 324 | 109 | 244 | 42 | 1,344 | 8% |
| | NONE | 3,259 | 1,745 | 582 | 674 | 555 | 52 | 6,867 | 41% |
| | DISREGARD TRAFFIC SIGN | 50 | 321 | 19 | 30 | 6 | 2 | 428 | 3% |
| | FAILURE TO FOLLOW RULE | 148 | 46 | 261 | 11 | 40 | 0 | 506 | 3% |
| | IMPAIRED/DRUG/DRINKING | 100 | 28 | 220 | 9 | 66 | 1 | 424 | 3% |
| | ANIMAL | 4 | 0 | 53 | 0 | 37 | 0 | 94 | 1% |
| | FATIGUED or ASLEEP | 36 | 2 | 80 | 1 | 11 | 1 | 131 | 1% |
| | PASSING RELATED | 68 | 22 | 5 | 19 | 9 | 0 | 123 | 1% |
| | WRONG SIDE | 1 | 3 | 43 | 1 | 3 | 0 | 51 | 0% |
| | PEDESTRIAN | 1 | 2 | 1 | 0 | 31 | 0 | 35 | 0% |
| **Total** | | 7,024 | 3,924 | 2,846 | 1,499 | 1,316 | 117 | 16,726 | 100% |
| | | 42% | 23% | 17% | 9% | 8% | 1% | 100% | |

## TIME AND DAY OF CRASHES

Table 4 presents summary of all reported crashes by time of day and day of week. Friday (18%) had the highest number of crashes and Sunday (12%) had the lowest. The times of day from 3 pm to 6 pm had the highest number of crashes which coincides with the evening rush hour traffic. Overall, crashes were more frequent during the afternoon and evening rush hours, particularly on weekdays, and less frequent during early morning and late

evening hours. Table 5 presents summary of crashes by time of day and month. October (10%) had the highest number of crashes and February (7%) had the lowest.

**TABLE 4: SUMMARY OF CRASHES (2029-2023) BY TIME OF DAY AND DAY OF WEEK**

| Hour | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday | **Total** | |
|---|---|---|---|---|---|---|---|---|---|
| 12 AM | 47 | 32 | 41 | 29 | 54 | 92 | 96 | 391 | 2% |
| 1 AM | 31 | 16 | 27 | 26 | 36 | 84 | 86 | 306 | 2% |
| 2 AM | 27 | 29 | 28 | 38 | 76 | 115 | 115 | 428 | 3% |
| 3 AM | 24 | 16 | 19 | 21 | 34 | 55 | 81 | 250 | 2% |
| 4 AM | 19 | 15 | 16 | 27 | 26 | 48 | 42 | 193 | 1% |
| 5 AM | 42 | 36 | 36 | 41 | 36 | 33 | 36 | 260 | 2% |
| 6 AM | 84 | 98 | 98 | 69 | 82 | 43 | 29 | 503 | 3% |
| 7 AM | 101 | 131 | 139 | 123 | 123 | 50 | 52 | 719 | 4% |
| 8 AM | 100 | 118 | 97 | 131 | 122 | 51 | 40 | 659 | 4% |
| 9 AM | 99 | 100 | 85 | 77 | 87 | 79 | 35 | 562 | 3% |
| 10 AM | 112 | 104 | 80 | 99 | 103 | 85 | 61 | 644 | 4% |
| 11 AM | 94 | 122 | 99 | 137 | 113 | 110 | 66 | 741 | 5% |
| 12 PM | 124 | 139 | 147 | 108 | 130 | 132 | 110 | 890 | 5% |
| 1 PM | 127 | 144 | 134 | 123 | 159 | 121 | 105 | 913 | 6% |
| 2 PM | 129 | 140 | 144 | 162 | 191 | 129 | 89 | 984 | 6% |
| 3 PM | 153 | 169 | 182 | 176 | 220 | 119 | 120 | 1,139 | 7% |
| 4 PM | 174 | 185 | 186 | 190 | 273 | 140 | 131 | 1,279 | 8% |
| 5 PM | 218 | 199 | 216 | 241 | 274 | 152 | 126 | 1,426 | 9% |
| 6 PM | 176 | 174 | 164 | 176 | 205 | 148 | 140 | 1,183 | 7% |
| 7 PM | 91 | 102 | 111 | 109 | 149 | 125 | 131 | 818 | 5% |
| 8 PM | 72 | 75 | 98 | 95 | 107 | 99 | 82 | 628 | 4% |
| 9 PM | 60 | 80 | 85 | 85 | 98 | 118 | 90 | 616 | 4% |
| 10 PM | 63 | 46 | 54 | 73 | 102 | 103 | 59 | 500 | 3% |
| 11 PM | 38 | 43 | 43 | 55 | 88 | 96 | 48 | 411 | 2% |
| **Total** | 2,205 | 2,313 | 2,329 | 2,411 | 2,888 | 2,327 | 1,970 | 16,443 | |
| | 13% | 14% | 14% | 15% | 18% | 14% | 12% | | |

**TABLE 5: SUMMARY OF CRASHES (2029-2023) BY TIME OF DAY AND MONTH**

| | January | February | March | April | May | June | July | August | September | October | November | December | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 AM | 27 | 39 | 27 | 31 | 34 | 26 | 23 | 35 | 33 | 46 | 37 | 33 | 391 | 2% |
| 1 AM | 24 | 28 | 27 | 23 | 21 | 21 | 30 | 23 | 29 | 29 | 25 | 26 | 306 | 2% |
| 2 AM | 34 | 40 | 34 | 42 | 29 | 31 | 25 | 27 | 35 | 39 | 44 | 48 | 428 | 3% |
| 3 AM | 24 | 17 | 16 | 22 | 20 | 11 | 23 | 25 | 17 | 25 | 26 | 24 | 250 | 2% |
| 4 AM | 12 | 9 | 15 | 7 | 25 | 20 | 21 | 18 | 13 | 19 | 17 | 17 | 193 | 1% |
| 5 AM | 20 | 13 | 24 | 15 | 26 | 17 | 23 | 20 | 26 | 26 | 28 | 22 | 260 | 2% |
| 6 AM | 48 | 50 | 46 | 46 | 26 | 35 | 24 | 34 | 50 | 55 | 44 | 45 | 503 | 3% |
| 7 AM | 68 | 59 | 75 | 61 | 41 | 42 | 36 | 77 | 54 | 84 | 63 | 59 | 719 | 4% |
| 8 AM | 54 | 58 | 42 | 48 | 59 | 42 | 41 | 60 | 57 | 60 | 75 | 63 | 659 | 4% |
| 9 AM | 42 | 44 | 42 | 50 | 43 | 45 | 34 | 70 | 57 | 46 | 45 | 44 | 562 | 3% |
| 10 AM | 47 | 43 | 43 | 47 | 45 | 61 | 46 | 72 | 71 | 56 | 44 | 69 | 644 | 4% |
| 11 AM | 46 | 48 | 62 | 57 | 62 | 72 | 61 | 55 | 56 | 78 | 72 | 72 | 741 | 5% |
| 12 PM | 61 | 56 | 69 | 67 | 69 | 80 | 80 | 76 | 81 | 100 | 72 | 79 | 890 | 5% |
| 1 PM | 51 | 59 | 85 | 63 | 75 | 87 | 77 | 80 | 81 | 64 | 97 | 94 | 913 | 6% |
| 2 PM | 71 | 68 | 77 | 84 | 88 | 80 | 95 | 81 | 89 | 92 | 81 | 78 | 984 | 6% |
| 3 PM | 94 | 71 | 82 | 96 | 84 | 96 | 92 | 102 | 119 | 106 | 99 | 98 | 1,139 | 7% |
| 4 PM | 96 | 87 | 101 | 103 | 91 | 78 | 92 | 125 | 131 | 143 | 118 | 114 | 1,279 | 8% |
| 5 PM | 104 | 100 | 125 | 118 | 107 | 130 | 105 | 128 | 136 | 139 | 123 | 111 | 1,426 | 9% |
| 6 PM | 102 | 69 | 80 | 85 | 79 | 92 | 84 | 101 | 109 | 101 | 137 | 144 | 1,183 | 7% |
| 7 PM | 58 | 72 | 67 | 62 | 64 | 45 | 44 | 68 | 68 | 100 | 97 | 73 | 818 | 5% |
| 8 PM | 44 | 40 | 58 | 49 | 37 | 41 | 44 | 54 | 75 | 82 | 61 | 43 | 628 | 4% |
| 9 PM | 38 | 41 | 50 | 52 | 39 | 65 | 52 | 53 | 57 | 79 | 43 | 47 | 616 | 4% |
| 10 PM | 33 | 38 | 52 | 34 | 35 | 43 | 39 | 42 | 51 | 53 | 39 | 41 | 500 | 3% |
| 11 PM | 27 | 29 | 42 | 40 | 28 | 31 | 32 | 30 | 39 | 46 | 30 | 37 | 411 | 2% |
| Total | 1,225 | 1,178 | 1,341 | 1,302 | 1,227 | 1,291 | 1,223 | 1,456 | 1,534 | 1,668 | 1,517 | 1,481 | 16,443 | |
| | 7% | 7% | 8% | 8% | 7% | 8% | 7% | 9% | 9% | 10% | 9% | 9% | | |

## Emphasis Areas

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 Hays County. Trendline rates in this table present a linear trendline fitted by the crashes and year, where the higher the trendline rate relates to an increase in crashes over the years. Table 6 summarizes total crashes and combine KA crashes. The percentages are respective to countywide total crashes and total combined KA crashes respectively.

**TABLE 6: SUMMARY OF CRASHES BY YEAR (2019 – 2023) AND EMPHASIS AREAS IN HAYS COUNTY**

| EMPHASIS AREA | 2019 | 2020 | 2021 | 2022 | 2023 | TOTAL | TRENDLINE RATE OF INCREASE IN CRASHES PER YEAR |
|---|---|---|---|---|---|---|---|
| **INTERSECTION RELATED** | 1,269 | 1,002 | 1,225 | 1,274 | 1,424 | 6,194 | 39 |
| **LOW AMBIENT LIGHTING** | 1,135 | 918 | 1,168 | 1,177 | 1,229 | 5,627 | 24 |
| **SPEED RELATED** | 1,125 | 891 | 1,130 | 1,060 | 982 | 5,188 | -36 |
| **YOUNGER DRIVER INVOLVED (15-20)** | 852 | 684 | 894 | 824 | 876 | 4,130 | 6 |
| **DISTRACTED DRIVING** | 804 | 581 | 838 | 783 | 817 | 3,823 | 3 |
| **ROADWAY/LANE DEPARTURES** | 791 | 715 | 797 | 740 | 748 | 3,791 | -11 |
| **OLDER DRIVER INVOLVED (65+)** | 457 | 358 | 424 | 389 | 457 | 2,085 | 0 |
| **IMPAIRED DRIVING** | 222 | 199 | 230 | 241 | 213 | 1,105 | -2 |
| **WORK ZONE** | 125 | 149 | 231 | 236 | 222 | 963 | 24 |
| **NO SEATBELT/CHILD CAR SEAT** | 91 | 73 | 108 | 132 | 112 | 516 | 5 |
| **PEDESTRIANS** | 40 | 43 | 51 | 39 | 50 | 223 | 3 |
| **BICYCLISTS** | 14 | 17 | 13 | 20 | 20 | 84 | 2 |
| **SCHOOL ZONE** | 4 | 0 | 8 | 3 | 7 | 22 | 1 |

The four emphasis areas with the highest number of total crashes were intersection related, low ambient lighting, speed related, and younger drivers. Intersection Related and Low Ambient Lighting emphases also have the highest trendline rates.

From Table 7, low ambient lighting, roadway/lane departures, speed related, and intersection related were the emphasis areas with the highest number of combined KA crashes. Occupant protection and pedestrian crashes have a significantly higher percentage of KA crashes compared to the total crashes; these emphasis areas are more susceptible to high injury type crashes.

TABLE 7: SUMMARY OF CRASHES BY EMPHASIS AREA AND COMBINED FATAL AND SUSPECTED SERIOUS INJURY CRASHES IN HAYS COUNTY

| EMPHASIS AREA | TOTAL | KA | KA/ TOTAL | % OF HAYS KA |
|---|---|---|---|---|
| LOW AMBIENT LIGHTING | 5627 | 381 | 7% | 48% |
| ROADWAY/LANE DEPARTURES | 3791 | 338 | 9% | 42% |
| SPEED RELATED | 5188 | 312 | 6% | 39% |
| INTERSECTION RELATED | 6194 | 243 | 4% | 30% |
| YOUNGER DRIVER INVOLVED (15-20) | 4130 | 149 | 4% | 19% |
| IMPAIRED DRIVING | 1105 | 127 | 11% | 16% |
| NO SEATBELT/CHILD CAR SEAT | 516 | 124 | 24% | 16% |
| OLDER DRIVER INVOLVED (65+) | 2085 | 123 | 6% | 15% |
| DISTRACTED DRIVING | 3823 | 99 | 3% | 12% |
| PEDESTRIANS | 223 | 74 | 33% | 9% |
| WORK ZONE | 963 | 58 | 6% | 7% |
| BICYCLISTS | 84 | 12 | 14% | 2% |
| SCHOOL ZONE | 22 | 2 | 9% | 0% |

# High Injury Network Analysis

## Background

One of the key aspects of regional safety analysis is the establishment of a high injury network (HIN) that prioritizes locations with the greatest need for future safety investment. To produce a more localized and detailed analysis of the transportation safety issues in Travis County, the project team created both an intersection and a road segment HIN. By creating two networks, the project team will be able to identify and prioritize both specific intersection locations and roadway segments that require improvements to reduce the risk of all severity type collisions. This approach allows for a more targeted and effective implementation of safety measures, to enhance overall transportation safety within Travis County. Figure and Table 5-1 show the intersection HIN, and Figure and Table 5-2 show the segment HIN.

## Methodology

To develop the intersection HIN, the project team followed the steps listed below:

1. The project team obtained crash data from TxDOT CRIS for all crashes in Hays County from 2019 to 2023. The CRIS records crash relation to intersection, and the four types of relations are non-intersection, driveway access, intersection-related, and intersection.
2. We used a Roadway Inventory dataset from the TxDOT GIS Portal as a base roadway linework for the HIN, including all road types and road owners in the base linework dataset.

3. We identified High-injury intersections by analyzing both intersection and intersection-related crashes. We next assigned crashes within a 250-foot radius of an intersection an intersection ID, and then performed statistical summarizations for each intersection ID in Excel. To calculate a total score for each intersection we applied a weighted system to account for crash severity in identifying high-injury intersections that include:
    a. fatal (K) and suspected serious injury (A) crashes were given a weight of 12,
    b. suspected minor injury (B) and possible injury crashes (C) were given a weight of 1,
    c. and the non-injured or unknown crash was given a weight of 0.
4. We joined the summary table to the intersection feature class in GIS based on Intersection ID, and conducted a spatial join of fields from the base roadway dataset to the intersection to add roadway information, such as primary and intersect road names, to the intersection layer.
5. We then performed a sensitivity test to determine the number of high-injury intersections. Then we identified the top 5 percentile of intersections with the highest weighted crash score, which accounted for approximately 50 percent of the total weighted score.

The HIN segment identification deployed a sliding window approach. The window was set to 0.5 mile, and the increment was set to 0.1 mile.

1. To avoid double-counting at intersections, we identified HIN segments by considering crashes only at non-intersections and driveways. We applied the Select by Attribute tool to filter for the desired crashes for the segment analysis.
2. The base roadway linework dataset and specific roadway geometries resulted in segments shorter or longer than a mile. To create segments close to equal length, we used the Dissolve tool in GIS to merge adjacent road segments with similar attributes, such as road name, administration, and functional classification.
3. We split each segment into 0.1 miles using the Generate point Along Lines and the Split Line tools. These tools generated IDs for the original roadway segments and each 0.1-mile segment. Due to the sliding window analysis, each 0.1 segment received a unique group ID or multiple IDs, especially those in the middle of roadway segments. We used an Explode Function in GIS to duplicate the overlapping segments. Afterward, we dissolved segments by group ID to create the 0.5-mile window, and added a 50-foot flat buffer around each 0.5-mile window.
4. Similar to the HIN intersection identification we spatially joined the selected crash dataset to a 50-foot flat buffer and calculated a weighted score for each of the 0.5-mile windows. We applied a sensitivity test to identify potential HIN segments, focusing on the top 10 percentile of the 0.5-mile segments as a prioritization filter. We performed a visual check and adjustment to finalize the HIN segment, focusing on connecting adjacent segments or those separated by short gaps and expanding to include adjacent segments with fatal or severe crashes. Lastly, we dissolved adjacent 0.5-mile segments to generate the final HIN segments. We then applied a spatial join to calculate the number of crashes associated with each segment and recalculated the weighted crash score for each HIN segment. This enabled a more detailed crash attributes analysis by linking the final HIN segments with the crash dataset.

## Screening Results

### INTERSECTIONS

There were 969 intersections in Hays County where crashes of all severities were able to be spatially joined, with at least one crash happening within 250 feet of each. Among these intersections:

- The **Top 5th percentile and above of intersections**, totaling 43% of the weighted crash score, comprise the HIN.

- The identified HIN includes 49 intersections and accounts for 5% of the intersections with recorded crashed in Hays County plus a 1-mile buffer (**Figure 6-1**). A complete list of the HIN intersections is available in **Appendix A**.
- From 2019 to 2023, 5,310 intersection or intersection-related crashes happened within 250 feet of an intersection, comprising 86% of total intersection and intersection-related crashes.

### SEGMENTS

From 2019 to 2023, 9,221 non-intersection related crashes happened along the over 1,600 miles of roadway in Hays County. Among these roadway segments:

- The **Top 10th percentile and above** of the segments, excluding the IH 35 main lanes, totaling 33% weighted crash score, comprise the HIN .
- The identified HIN includes 61 centerline miles and accounts for about 4% of the roadway network in Hays County plus a 1-mile buffer (**Figure 6-2**). A complete list of the HIN segments is available in Appendix B.
- From 2019 to 2023, 1,682 crashes happened within 50 feet of the identified HIN in Hays County, accounting for 18% of total non-intersection crashes.

FIGURE 7: HIN INTERSECTIONS IN HAYS COUNTY

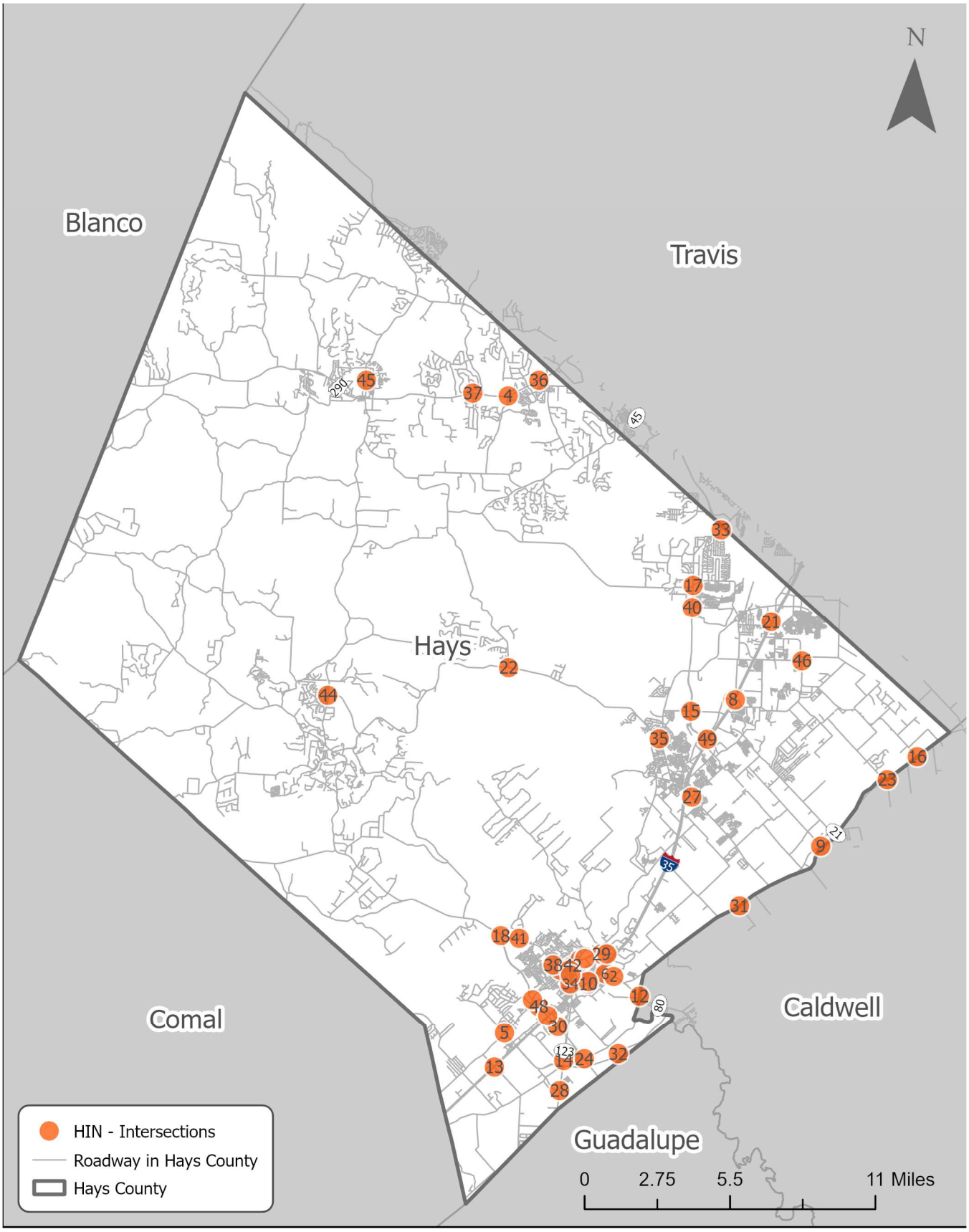
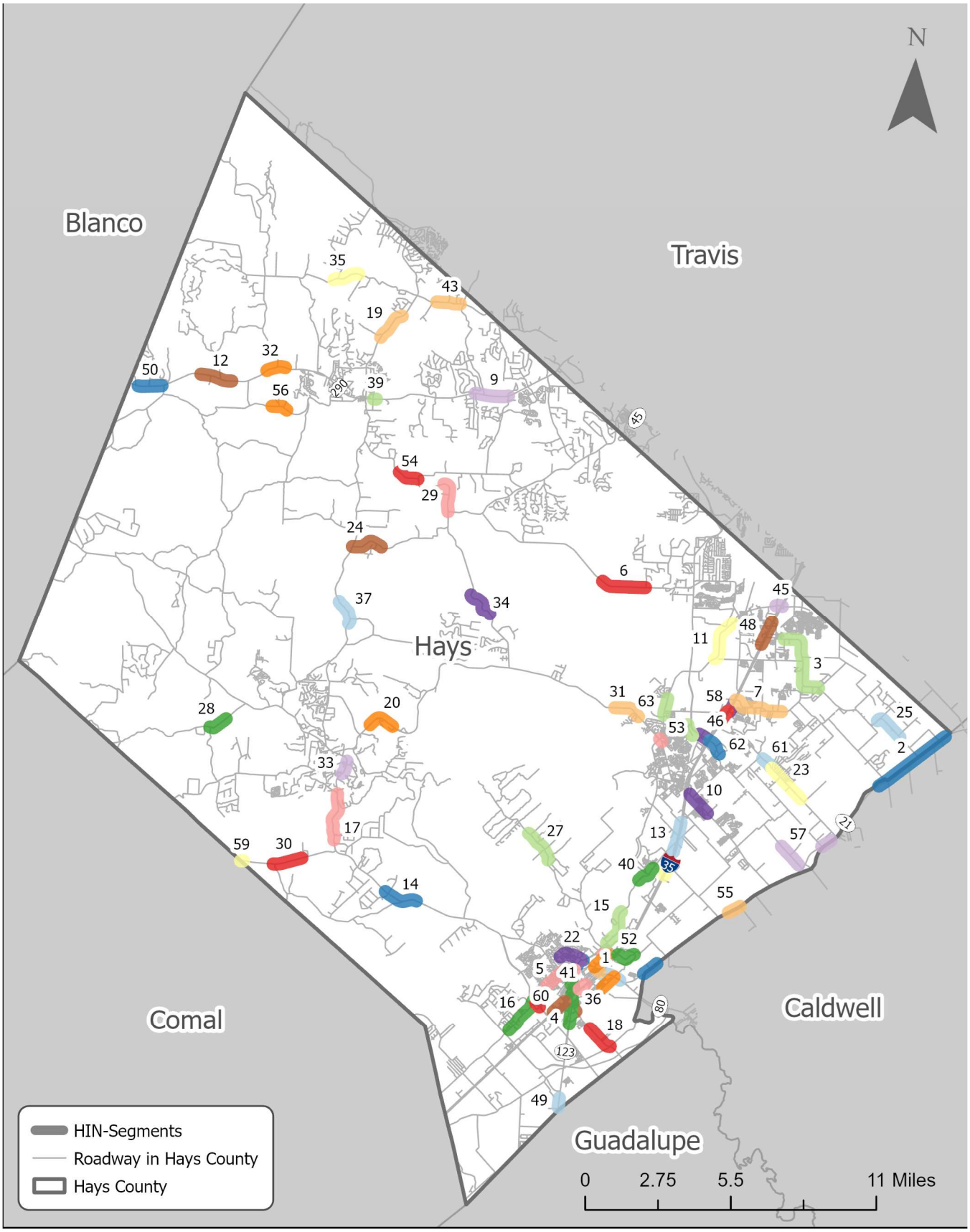


**FIGURE 8: HIN SEGMENTS IN HAYS COUNTY**



# Systemic Safety Analysis

The Systemic Screening process seeks to identify facilities based on high-risk roadway features correlated with fatal and severe injury crashes. These sites with similar identified risk factors are potential candidates for systemic countermeasures. This analysis aims to highlight how crashes interact with other factors, such as roadway characteristics (number of lanes, presence of medians, signal control, etc), urban/rural context, and speed.

Crash trees were developed using the following steps, based upon available attributes in the CRIS data. :

1. Identify focus crash types
2. Identify focus facility types
3. Identify risk factors

The results of the Systemic Screening will identify a set of prioritized focus facility types for further investigation. These have the potential to reduce fatalities and serious injuries by proactively addressing the facilities that have similar identified risk factors.

## FOCUS CRASH TYPES

Based on crash data from 2019-2023, Hays County has identified five focus crash types that are significantly associated with severe 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 8.

**TABLE 8: CRASH SEVERITY BY FOCUS CRASH TYPE IN HAYS COUNTY**

| FOCUS CRASH TYPE | KA | TOTAL CRASHES |
|---|---|---|
| **LOW AMBIENT LIGHTING** | 381 (48%) | 6,194 (34%) |
| **ROADWAY AND LANE DEPARTURE** | 338 (42%) | 3,791 (42%) |
| **SPEED RELATED** | 312 (39%) | 5,118 (15%) |
| **INTERSECTION RELEATED** | 243 (30%) | 4,130 (12%) |
| **PEDESTRIANS** | 74 (9%) | 223 (1%) |

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.

## CRASH TREE ANALYSIS

A crash tree analysis was conducted to calculate the distribution of crashes by urban/rural context, facility type and risk factors, where available. The crash tree analysis results, displayed in Figure 9 through 13, were used to identify over-represented focus facilities types. Recommended countermeasures can be targeted towards facilities with the highest concentration of over-represented crash events, ensuring interventions are directed to areas with the greatest safety improvement potential.

The areas identified as 'Urban' include 2020 Census Urbanized Area boundaries for Austin, Belterra, and San Marcos.

FIGURE 9: CRASH TREE DIAGRAM – LOW AMBIENT LIGHTING

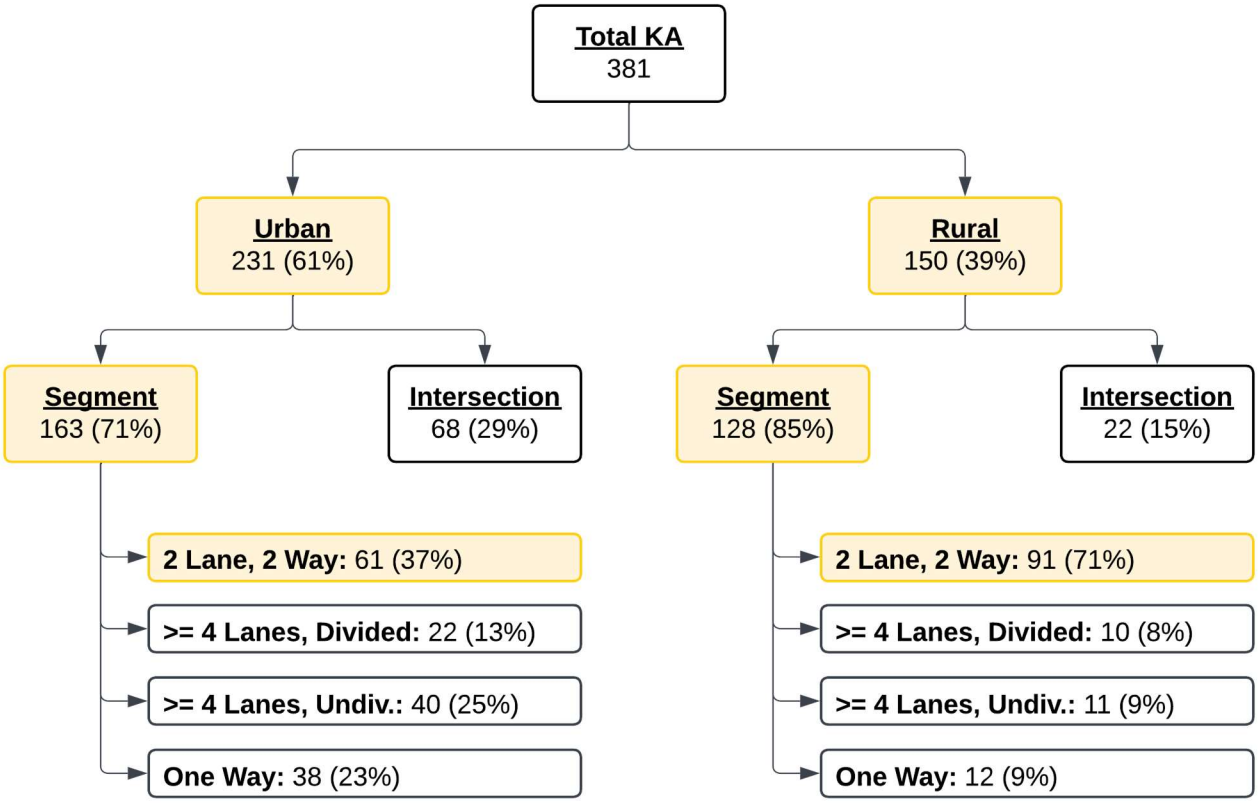


FIGURE 10: CRASH TREE DIAGRAM – ROADWAY AND LANE DEPARTURES

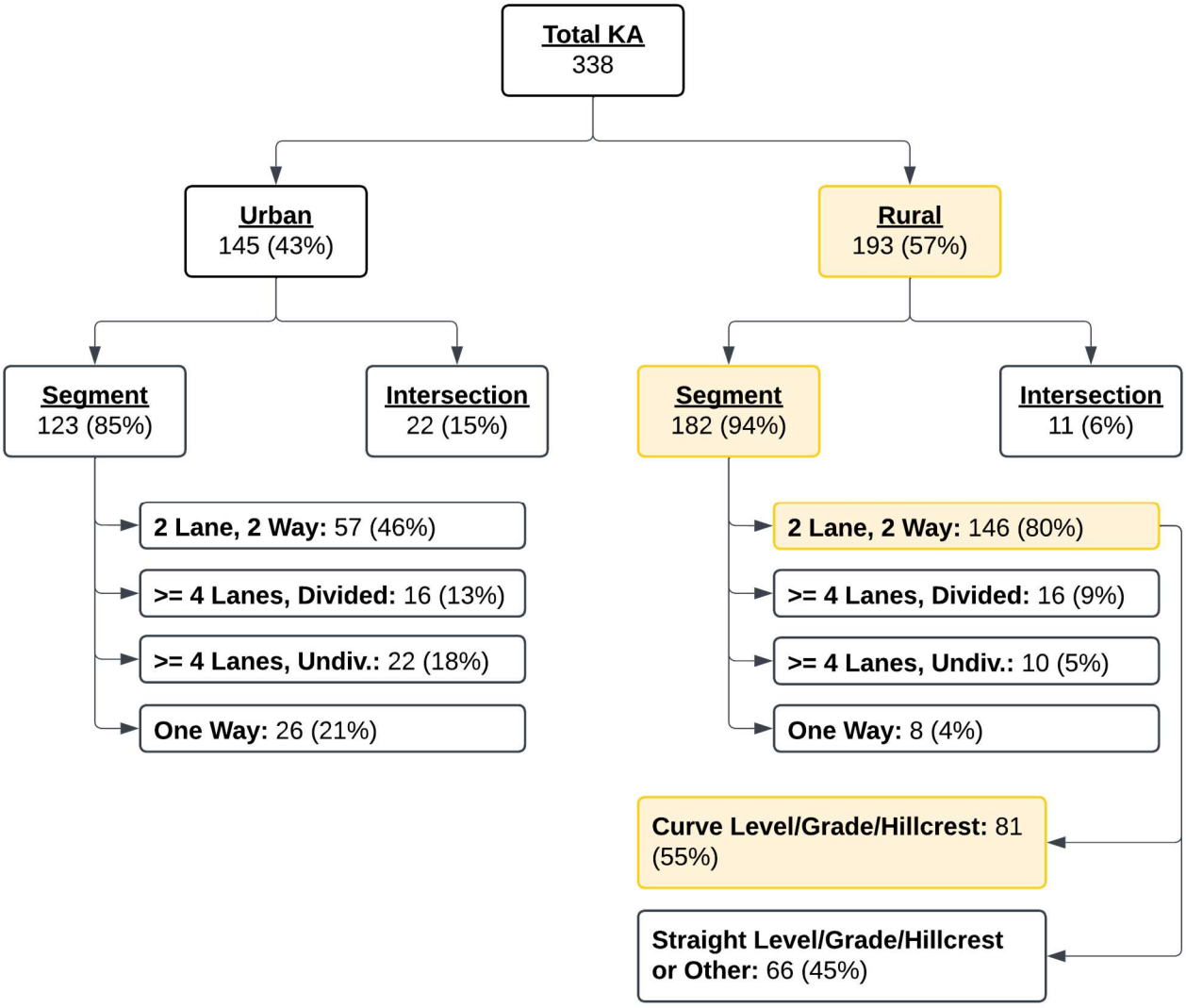


FIGURE 11: CRASH TREE DIAGRAM – SPEED-RELATED

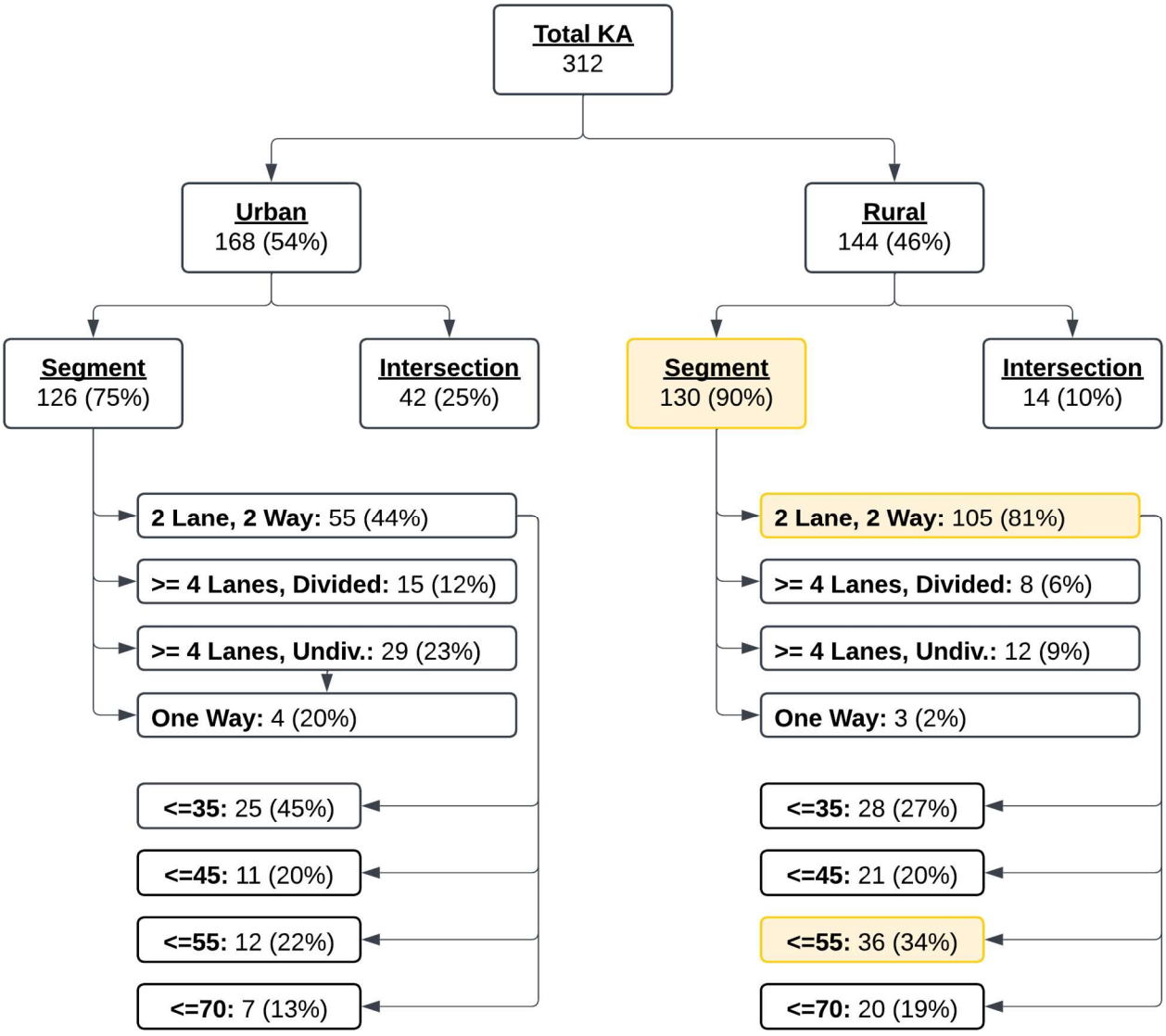


FIGURE 12: CRASH TREE DIAGRAM – INTERSECTION-RELATED

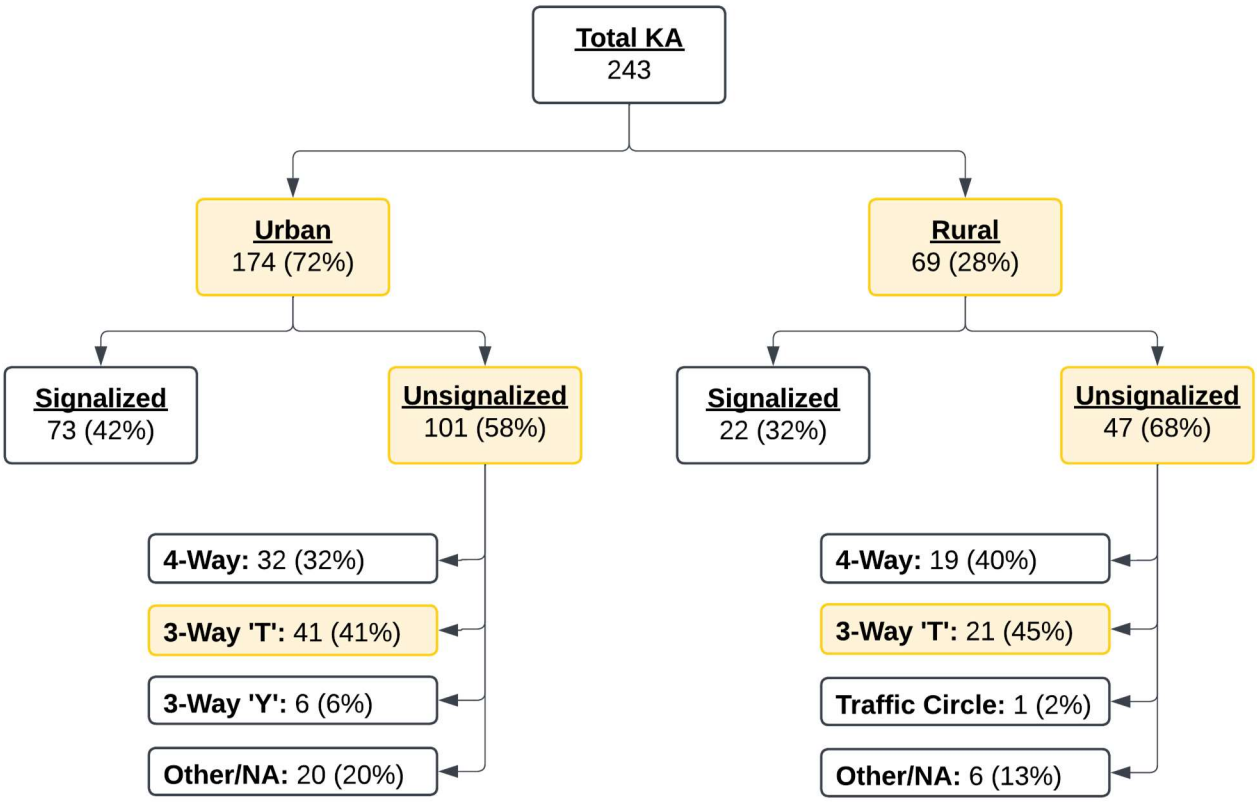
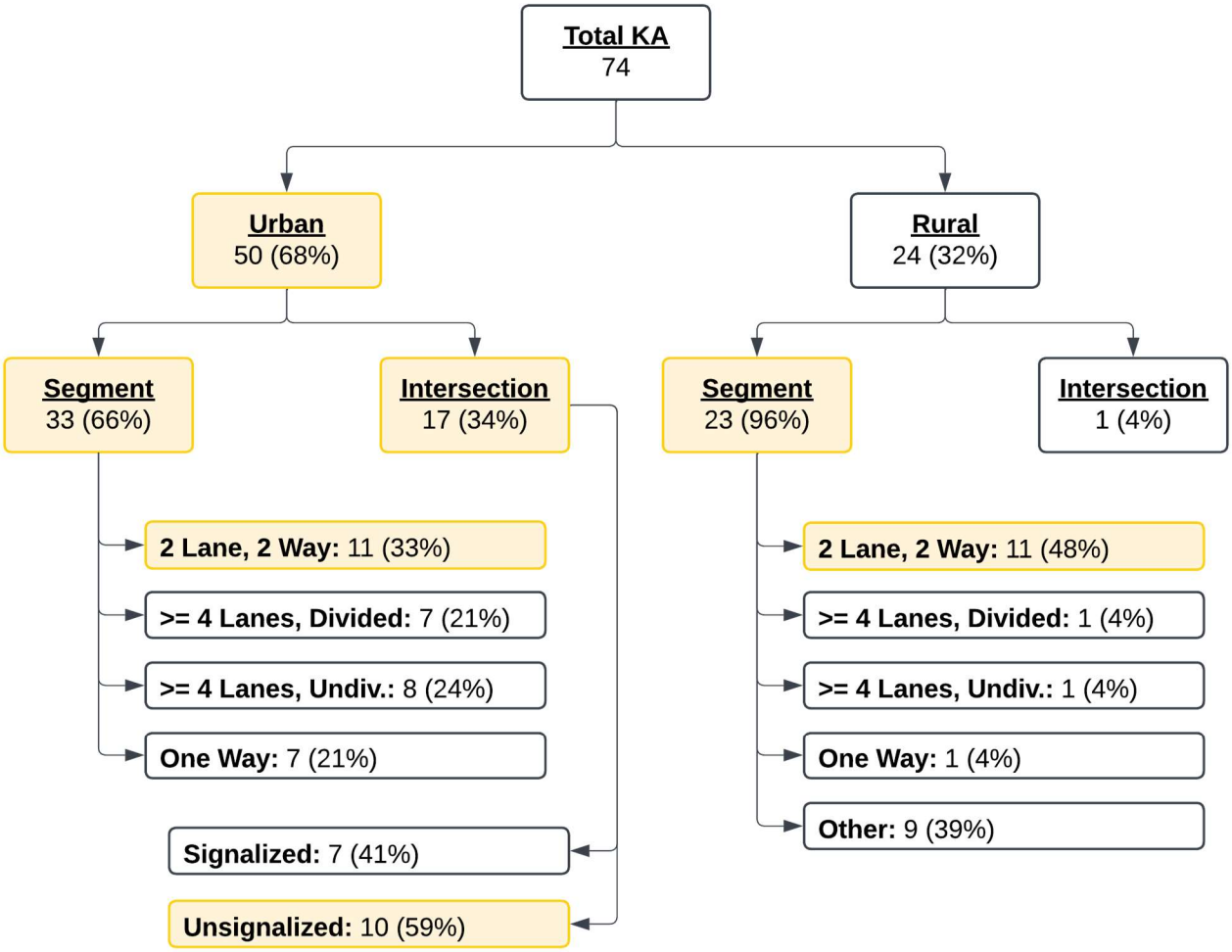


FIGURE 13: CRASH TREE DIAGRAM – PEDESTRIANS




## COUNTERMEASURE SELECTION

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

Countermeasures for Hays County's focus crash types were selected based on data-driven analysis and guidance from TxDOT's Highway Safety Improvement Program (HSIP). Systemic countermeasures align with TxDOT's HSIP guidelines, which define each safety countermeasure using specific "work codes" for streamlined planning and deployment. Table 9 provides a summary of the focus crash types and the corresponding systemic countermeasures selected for evaluation across Hays County.

TABLE 8: FOCUS CRASH TYPES AND SYSTEMIC COUNTERMEASURES

| Roadway Crash Type | Systemic Countermeasure (HSIP Work Code) | Focus Facility Type(s) |
|---|---|---|
| Low Ambient Lighting | Install Delineators (113), Safety Lighting (304) | Urban and Rural 2-Way, 2-Lane Segments |
| 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 2-Way, 2-Lane Segments at Curves |
| Speeding | Install Warning/Guide Signs(101), Install Dynamic Speed Feedback Signs (150) | Rural 2-Way, 2-Lane Segments with Posted Speeds <= 55 mph |
| Intersection Related | Install Traffic Signal (107), Signal Head Backplates (108), Install Advanced Warning Signals and Signs (124), Safety Lighting at Intersection (305), Transverse Rumble Strips (545) | Urban and Rural Unsignalized "T" Intersections |
| Pedestrians | Pedestrian Hybrid Beacon (143), Install Sidewalks (407), Install Pedestrian Refuge Islands (409) | Urban and Rural 2-Way, 2-Lane Segments; Urban Unsignalized Intersections |

## Appendix A. Emphasis Area Definitions

As defined in the Texas SHSP, crashes are categorized as one or more of the focus areas listed above when the crashes meet certain criteria as defined for each focus area below. If a single crash meets multiple focus area definitions, that crash is categorized as counting for all applicable focus areas. The Texas SHSP provides a framework that outlines the factors considered for each focus area:

**Roadway Departures:** A crash is defined this way if one of the following two situations occur:

1. A single vehicle crash where the first harmful event occurred in the median, on the shoulder or off the roadway.
2. A crash involving two vehicles both traveling straight in opposite directions, and one was going the wrong way in the lane, but not trying to pass another vehicle.

**Speed Related:** A crash is defined this way if law enforcement includes one or more of the following as a contributing crash factor:

1. Speeding (over the limit)
2. Unsafe speed
3. Failed to Control Speed

**Intersection Related:** A crash is defined this way if the intersection location field is coded as either "At Intersection" or "Intersection-Related." This field is coded this way when the crash occurs within the boundaries of

an intersection or when the first harmful event occurs on an approach to or exit from an intersection and results from an activity or behavior related to the movement of traffic units through the intersection.

**Younger Drivers:** A crash is defined this way if any driver between the ages of 15 and 20 years old was involved in the crash (regardless of whether the younger driver was at fault).

**Older Drivers:** A crash is defined this way if any driver aged 65 years old or older was involved in the crash (regardless of whether the older driver was at fault).

**Occupant Protection:** A crash is defined this way if a vehicle driver or occupant involved (where restraint usage is known and applicable) was not restrained. This crash definition applies both to lack of seatbelt use and lack of child car seat use. A crash is counted multiple times if multiple drivers or occupants involved were not restrained.

**Impaired Driving:** A crash is defined this way if the crash involves at least one driver under the influence of alcohol or some other drug that impairs driving ability. This crash definition is met through the use of one or more of the applicable contributing factor code fields:

1. Intoxicated – alcohol or drugs
2. Had been drinking
3. Taking medication

or yes/no alcohol and drug crash flag fields, or positive non-zero blood-alcohol or drug concentration counts.

**Distracted Driving:** A crash is defined this way if the crash involved at least one driver that was distracted, inattentive, or using a cell phone. A crash is defined this way if law enforcement included one or more of the following as a contributing crash factor:

1. Distraction in vehicle
2. Driver inattention
3. Cell/mobile phone use (Talking, texting, other)

**Pedestrian:** A crash is defined this way when it involves at least one pedestrian and one motor vehicle.

**Pedalcyclist:** A crash is defined this way when it involves at least one pedalcyclist and one motor vehicle. Crashes involving scooters and small electric vehicles such as go-carts, segways, or riding lawnmowers are not included in the pedestrian or pedalcyclist focus areas.

Four regional emphasis areas are analyzed in addition to the statewide emphasis areas. The following additional emphasis areas are identified:

**Work Zones:** A crash is defined this way if construction workers were present in the work zone when a crash occurred, or if law enforcement otherwise indicated that a crash occurred within a work zone.

**Low Ambient Lighting:** A crash is defined this way if the crash occurred during dark lighting without evidence of street lighting. The crash definition is met if the lighting condition field if coded as "2-Dark, Not Lighted."

**Railway Crossings :** A crash is defined this way if the crash occurred at a railway crossing, or if law enforcement otherwise indicated that a crash occurred within a railway crossing zone.

**Time of Day/Day of Week:** Time of day was analyzed using a different method than the other systemic safety focus areas. For this analysis, the project team looked at each day of the week and time by the hour of day to identify times in which most crashes were occurring.

## Appendix B: HIN Intersections

| PRIMARY STREET | INTERSECTING STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|
| **RM 12** | FM 2439/Hunter Rd | 113 | 70 | 7 |
| **SH 80** | River Rd | 66 | 47 | 4 |
| **IH 35 SB FRTG RD** | RM 12 | 64 | 123 | 2 |
| **US 290** | Sawyer Ranch Rd/Polo Club Rd | 59 | 47 | 4 |
| **FM 2439** | McCarty Ln | 58 | 30 | 4 |
| **SH 21** | Clarewood Dr | 58 | 58 | 3 |
| **SH 80** | SL82 | 54 | 51 | 3 |
| **IH 35** | Kyle Xing | 50 | 54 | 3 |
| **SH 21** | Cotton Gin Rd | 50 | 13 | 4 |
| **IH 35** | Linda Dr | 50 | 37 | 3 |
| **SL 82** | Charles Austin | 47 | 22 | 3 |
| **SH 80** | Old Bastrop Hwy | 46 | 38 | 3 |
| **IH 35** | Center Point Rd | 45 | 26 | 3 |
| **SH 123** | Clovis R Barker Rd | 44 | 14 | 3 |
| **FM 1626** | Kohler's Crossing Rd | 43 | 41 | 2 |
| **FM 2001** | SH 21 | 43 | 22 | 3 |
| **FM 1626** | RM 967 | 42 | 80 | 2 |
| **RM 12** | Old Ranch Road 12 | 40 | 10 | 3 |
| **IH 35** | Riverside Dr | 40 | 42 | 2 |
| **SL 82** | S Edward Gary St/E. Martin Luther King Dr. | 39 | 66 | 1 |
| **IH 35** | Cabelas Dr | 38 | 77 | 2 |
| **RM 150** | FM 3237 | 38 | 15 | 3 |
| **FM 2001** | SH 21/Rhode Rd | 38 | 42 | 2 |
| **REDWOOD RD** | S Old Bastrop Hwy | 37 | 10 | 3 |
| **SL 82** | E Sessom Dr | 36 | 43 | 2 |
| **IH 35** | Windy Hill Rd | 33 | 75 | 1 |
| **RM 150** | Lehman Rd | 32 | 16 | 2 |

| PRIMARY STREET | INTERSECTING STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|
| **SH 123** | Rattler Rd | 31 | 13 | 2 |
| **SL 82** | Aquarena Srpings Dr/Mill St | 31 | 20 | 2 |
| **RM 12** | Sadler Dr | 31 | 14 | 2 |
| **SH 21** | FM 1966 | 28 | 12 | 2 |
| **FM 621** | FM 110 | 28 | 11 | 2 |
| **FM 1626** | SH 45 SW | 28 | 10 | 2 |
| **SL 82** | W. Grove St | 28 | 8 | 2 |
| **RM 150** | N Old Stagecoach Rd | 28 | 16 | 2 |
| **US 290** | Hargraves Dr | 28 | 18 | 2 |
| **US 290** | Sunset Canyon Dr S. | 27 | 17 | 2 |
| **OLD RANCH ROAD 12/OSCAR SMITH ST.** | Blanco St. | 27 | 9 | 2 |
| **SL 82** | E Hutchison St. | 26 | 21 | 2 |
| **FM 1626** | Old Black Colony | 25 | 6 | 2 |
| **OLD RANCH ROAD 12** | Country Estates Dr | 25 | 4 | 2 |
| **SL 82** | N Edward Gary St | 25 | 33 | 1 |
| **W HUTCHISON ST** | Moore St | 25 | 31 | 1 |
| **RM 12** | Champions Cir | 25 | 6 | 2 |
| **RM 12** | Timberline Rd | 25 | 10 | 2 |
| **FM 2001** | Hillside Tr | 24 | 45 | 1 |
| **SL 82** | Thorpe Ln | 24 | 28 | 1 |
| **RM 12** | S Stagecoach Trl | 23 | 18 | 1 |
| **IH 35** | FM 1626 | 22 | 37 | 1 |

## Appendix C. HIN Segments

| ROAD | BEGIN STREET | END STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|---|
| **SH 21/SH 80** | N IH 35 | SH 21 at SH 80 | 192 | 201 | 9 |
| **SH 21** | E of Niederwald Dr | W of FM 2001 | 132 | 97 | 9 |

| ROAD | BEGIN STREET | END STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|---|
| **FM 2001** | Old West Trl | N of Rolling Hills Dr | 128 | 91 | 9 |
| **SH 123** | S IH 35 | S of E de Zavala Dr | 108 | 117 | 5 |
| **HOPKINS ST** | E of N. Edward Cary St. | N Bishop St. | 90 | 60 | 6 |
| **RM 967** | E of Onion Creek Lodge Rd | Oak Dorest Dr | 85 | 16 | 7 |
| **WINDY HILL RD** | IH 35 | E of Crosswinds Pkwy | 83 | 43 | 6 |
| **THORPE LN** | SL 82 | SH 80 | 78 | 54 | 6 |
| **US 290** | W of Whitetail Rdg | Polo Club Dr | 74 | 55 | 5 |
| **RM 150** | Hill St | Creekside Trl | 69 | 36 | 5 |
| **FM 2270/JACK C HAYS TRL** | S of Bluff St | S of Cement Plant Rd | 61 | 7 | 5 |
| **US 290** | W of Plum Creek Ln | E of Cow Creek Trl | 61 | 9 | 5 |
| **IH 35 SB FRTG** | Opal Ln | N of Yarrington Rd | 56 | 26 | 4 |
| **RM 12** | W of Rancho Encino Dr | N of Sink Creek | 53 | 15 | 4 |
| **POST RD** | N of Paintbrush St. | Uhland Rd. | 52 | 14 | 4 |
| **FM 2439** | RM 12/Wonder World Dr | E of E Mccarty Ln | 52 | 38 | 3 |
| **RM 12** | CR 1492 | N of Packsaddle Pass | 51 | 13 | 4 |
| **FM 621** | N of Staples Rd | N Old Bastrop Hwy | 49 | 7 | 4 |
| **RM 12** | S of Barton Creek | S of Shelton Ranch Rd | 49 | 5 | 4 |
| **RM 3237** | Inspiration Trl | N of Arrowlake Rd | 48 | 12 | 4 |
| **SH 21** | Paseo de Perez | Cotton Gin Rd | 46 | 37 | 3 |
| **W SESSOM DR** | N Comanche St | SL 82 | 45 | 75 | 2 |
| **HIGH RD** | Goforth Rd | N of Lonie Ln. | 44 | 27 | 3 |
| **ELDER HILL RD** | RR 12 | E of Stoney Brook Ln. | 43 | 23 | 3 |
| **FM 2001** | Kai Vista Dr | N of East Ridge Ln | 43 | 19 | 3 |
| **SL 82** | W of Charles Austin Dr | University Dr | 42 | 36 | 3 |
| **HILLIARD RD** | N of Piedras Pass | S of Telegeraph Trl. | 40 | 19 | 3 |
| **FISCHER STORE RD** | W of My Joy Ln. | West of Sachtleben Rd | 39 | 10 | 3 |
| **RM 150** | W of W Ranch Road 150 | FM 1826 | 39 | 17 | 3 |

| ROAD | BEGIN STREET | END STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|---|
| **RM 32** | W of Purgatory Rd | W of Rim Rock Ranch Rd | 38 | 10 | 3 |
| **RM 150** | W of W Ranch Road 150 | S of Anthem Pkwy | 38 | 8 | 3 |
| **US 290** | E of Holder Ln | W of Three Sisters Ln. | 38 | 7 | 3 |
| **RM 12** | N of Southriver | N of Wimberely Hills Dr | 37 | 11 | 3 |
| **RM 150** | W of Onion Creek | N of York Creek Ranch | 35 | 20 | 2 |
| **FITZHUGH RD** | W of S. Oak Forest Dr | W of Barton Bend Rd | 30 | 14 | 2 |
| **FM 621** | SH 123 | Broadway St | 29 | 12 | 2 |
| **RM 12** | N of Daisy Ln | Cinco Ninos | 28 | 12 | 2 |
| **SH 21** | N of Raynaldo Way | N of N Old Bastrop Hwy | 28 | 7 | 2 |
| **US 290** | E of N Rob Shelton Blvd | E of Cannon Dr | 28 | 21 | 2 |
| **POST RD** | N of S. Old Stagecoach Rd. | N of Blanco River Ranch Rd | 27 | 7 | 2 |
| **IH 35 SB FRTG** | N of San Marcos River | S of C.M. Allen Pkwy | 27 | 10 | 2 |
| **IH 35 SB FRTG** | N of Kohler's Crossing Rd | N of Bebee Rd | 27 | 10 | 2 |
| **FITZHUGH RD** | W of Triple Creek Dr | E of Fitzhugh Pl | 26 | 6 | 2 |
| **RIVER RD** | SH 80 | S of Christopher St | 26 | 13 | 2 |
| **MAIN ST** | W of Old San Antonio Rd | S IH 35 | 26 | 27 | 2 |
| **FM 1621** | W of Marketplace Ave | S IH 35 | 26 | 51 | 1 |
| **IH 35 NB FRTG** | S of Yarrington Rd | N of Technology Way | 26 | 5 | 2 |
| **IH 35 SB FRTG** | Cabelas Dr | N of Trademark St | 26 | 25 | 2 |
| **SH 123** | S of Rattler Rd | N of Lovelady Ln | 26 | 7 | 2 |
| **US 290** | E of Old Park Rd | W of RR 165 | 26 | 8 | 2 |
| **CROMWELL DR** | Dorman Ln | Cormwell Dr | 25 | 12 | 2 |
| **AQUARENA SPRINGS DR** | IH 35 | W of River Rd | 25 | 8 | 2 |
| **RM 150** | N Old Stagecoach Rd | Veterans Dr | 25 | 7 | 3 |
| **RM 150** | N of W RR 150 | Darden Hill Rd | 25 | 6 | 2 |
| **SH 21** | FM 1966 | N of Silent Meadow Run | 25 | 4 | 2 |

| ROAD | BEGIN STREET | END STREET | WEIGHTED CRASH SCORE | TOTAL CRASHES | KA CRASHES |
|---|---|---|---|---|---|
| **CREEK RD** | Safelot Ln | E of Pug Rippy | 24 | 3 | 2 |
| **GRIST MILL RD** | N of S. Plum Creek Rd | N of Camino Real | 24 | 3 | 2 |
| **IH 35 NB FRTG** | Windy Hill Rd | Amberwood S. | 24 | 34 | 1 |
| **RM 32** | Hays CL | Spanish Eyes | 24 | 2 | 2 |
| **IH 35 SB FRTG** | Ellis St | Bintu Dr | 22 | 27 | 1 |
| **GOFORTH RD** | S of Bebee Rd. | High Rd. | 21 | 13 | 1 |
| **KYLE PKWY** | IH 35 | Dacy Ln | 21 | 15 | 1 |
| **FM 2270/JACK C HAYS TRL** | S of Rioja | N of Crystal Meadows Dr | 21 | 18 | 1 |
| **SL 82** | S of E Martin Luther King Dr | E Grove St | 19 | 18 | 1 |
| **SL 82** | E of Warden Ln | West Ave | 19 | 19 | 0 |
| **RM 12** | N of Dutton Dr | S. Stagecoach Trl | 18 | 13 | 1 |
| **SH 80** | Cheatham St | S of Blanco River | 3 | 10 | 0 |

# Appendix B

## POLICY RECOMMENDATIONS TECHNICAL MEMORANDUM

# HAYS COUNTY POLICY RECOMMENDATIONS

## Introduction

The Capital Area Metropolitan Planning Organization (CAMPO) is developing a county-level safety action plan (CSAP) for Hays County, including local agencies and other partners within the county. This effort is part of the broader Regional Safety Action Plan (RSAP) that CAMPO is concurrently conducting. By aligning local safety plans with regional strategies, CAMPO seeks to enhance coordination and ensure comprehensive safety planning across jurisdictions.

This memorandum documents the consulting team's assessment of Hays County's current safety policies and processes, providing county- and city-level recommendations for integration into the CSAP. TxDOT policies and their integration into the RSAP will be addressed separately in the Task 6.2 memo on regional recommendations.

Engagement with regional stakeholders and the review of existing plans across Hays County and its municipalities indicates a shared commitment to improving transportation safety. Some common thematic goals that emerge are:

1. **Safety is a recurring theme across these documents**, reflecting a shared commitment to reducing crashes and ensuring safe mobility in their respective jurisdictions. Approaches to safety across different jurisdictions vary but primarily focus on infrastructure improvements that also address or improve safety within improvements. County and city roadway infrastructure improvements mostly include expanding capacity, redesigning intersections, and improving pedestrian and bicycling connectivity and addressing gaps in existing pedestrian and bicycling networks. Safety is integrated into these existing improvements.
2. **Integrating safety while managing rapid growth and improving network connectivity:** all plans emphasize the common need to implement roadway projects to support the rapid population and economic growth of the region and the growing mobility needs of its residents.
3. **Emphasis on improving access and offering multimodal solutions:** Improving connectivity, access, and provision of active and accessible transportation options also emerges to be an area of priority of several plans.

This review and engagement 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.

## Assessment of Existing Policies and Plans

This section provides an overview of existing transportation and safety policies and efforts across Hays County and its cities. The review findings are categorized under Safety Leadership & Culture, and the Safe System Approach Elements. This assessment followed a systematic review of transportation planning documents from Hays County and cities along with other information provided by the Task Force members:

**Hays County**

- Hays County 2021 Transportation Plan

**City of Kyle**

- Connected Transportation Master Plan 2040
- Master Transportation Plan 2040 – 2021 Update

**City of San Marcos**

- 2018 Transportation Master Plan

**City of Dripping Springs**

- 2021 Transportation Master Plan

**City of Buda**

- 2023 Transit Development Plan
- 2021 Transportation Mobility Master Plan
- 2024-2028 Capital Improvement Plan

**City of Wimberley**

- 2022 Transportation Plan Update

## SAFETY LEADERSHIP AND CULTURE

While safety is a goal (or noted as a sub-goal) in most plans, there is inconsistency in how it is approached and is translated into projects and actions. While some plans note the need to coordinate with county and state agencies for design, funding, and implementation of projects, coordination among the cities within Hays County is not considered.

Data sharing and analysis coordination/knowledge transfer could be considered as several plans note the need to collect more relevant data to monitor progress, and conduct location specific studies or assessments for targeted infrastructure investments.

Coordination on funding and partnering on strategic grants are also part of the coordination discussion since continuous availability of funds is another gap in safety. Cities can also share their emerging practices on local revenue sources such as Transportation Fees to maintain current streets and Impact Fees on new development to support mobility and safety improvements.

## SAFER STREETS

The City transportation master plans have all included recommendations for enhancing the safety and accessibility of all road users through the development of Complete Street projects.

The City of San Marcos Transportation Master Plan (2018) integrates a comprehensive traffic and safety analysis with recommendations for enhancing the safety of roadway, bicycle, pedestrian, and trail infrastructure. The project prioritization evaluation criteria assess infrastructure projects based on:

- The sidewalk maintenance program focuses on replacing deteriorated sidewalks, constructing new sidewalks, and addressing gaps to improve pedestrian safety.

The City of Kyle Connected Transportation Master Plan Update (2021) includes key safety-focused measures to improve mobility and accessibility:

- Traffic Impact Analyses (TIA): adopt an ordinance that requires Traffic Impact Analyses (TIA) for any new developments or redevelopments that meet a minimum threshold of trip generation.
- Pedestrian and Bicyclist Infrastructure: mandates additional right-of-way for new and reconstructed roads to improve non-motorized user safety.

The City of Dripping Springs Transportation Master Plan (2021) included Complete Streets recommendations for improved pedestrian and bicycle access includes sidewalks on all roads, raised cycle tracks on high-traffic routes, and shared-use paths where space is limited to enhance safety and mobility.

#### SAFER SPEEDS

The City of San Marcos Police Department Community Services Division has undertaken Data-Driven Approaches to Crime and Traffic Safety" (DDACTS) to determine the most effective methods for deploying law enforcement patrols. In 2024, they focused speed and crash-related enforcement activities on the SH 123 corridor for a total of six weeks. The corridor was selected for high visibility enforcement through analysis by the department. The department has invested in a full-time analyst for reviewing crash and other crime data to support future efforts.

#### SAFER ROAD USERS

Efforts to raise public awareness on safety or promote educational programs for safe driving behavior. TxDOT manages their highway safety campaigns at the statewide level.

The City of Buda 2023 Transit Development Plan recognized the need to create a unified strategy for sharing information about transportation and safe mobility options. These would be focused on meeting the needs of targeted population groups.

#### TAILORING EDUCATIONAL MATERIALS TO SPECIFIC AUDIENCES INCLUDING STUDENTS, HEALTHCARE PROFESSIONALS, AND LOCAL WORKFORCE. POST-CRASH CARE

Policy, strategy, and investments in improvements to emergency response are not depicted in transportation plan safety sections for most cities. For example, only the City of Buda's plan briefly notes the need to enhance existing ITS infrastructure, such as signal controllers with transit and emergency vehicle signal priority, routing systems, vehicle-to-vehicle communications, and key access corridors for emergency response routing.

## Hays County Institutional Structure

Road safety requires a coordinated effort among multiple governmental agencies, regional planning organizations, law enforcement bodies, and community stakeholders. In Hays County, the key institutional stakeholders who have been identified as the "Lead" or "Support" for the recommendations include:

#### STATE-LEVEL AGENCIES:

- Texas Department of Transportation (TxDOT) – Austin District: TxDOT oversees the highway planning, construction, and maintenance within Hays County as part of the Austin District. It manages state and federal roadway projects, implements safety programs, and collaborates with local agencies on traffic operations and crash reduction initiatives.

#### REGIONAL PLANNING BODIES:

- Capital Area Metropolitan Planning Organization (CAMPO): CAMPO oversees regional transportation planning and coordination across the five counties within its jurisdiction—Hays, Burnet, Caldwell, Williamson, and Bastrop. It is responsible for setting road safety priorities, funding allocations, and long-term mobility strategies for Hays County. CAMPO ensures that regional transportation plans align with state and federal safety goals and supports local agencies in securing funding for road safety initiatives.
- Capital Area Council of Governments (CAPCOG): CAPCOG is responsible for ensuing regional collaboration in transportation safety, emergency response, and infrastructure resilience through data-driven planning and coordination efforts.

### COUNTY GOVERNMENT AGENCIES

- Hays County Transportation Department oversees maintenance and enhancement of county roads, including road signage and county Right-Of-Way (ROW) areas, and the implementation of roadway safety improvements.
- Hays County Sherriff's Office is responsible for the following:
- Patrol Division is responsible for enforcing traffic laws, conducting DUI checkpoints, and ensuring safe road conditions on County-maintained roads
- Emergency Management Office oversees emergency response functions and disaster preparedness efforts related to roadway incidents, severe weather, and traffic related emergencies.

### CITY-LEVEL AGENCIES

    - Transportation, Engineering, and Public Works Departments:
- Each city within Hays County, – including San Marcos, Buda, Kyle, Dripping Springs, and Wimberley, -- has dedicated departments responsible for developing and maintaining roadways, managing traffic signals, and implementing safety improvements. These agencies work closely with TxDOT and the county to address local road safety concerns.
    - City Police Departments (Buda, Kyle, San Marcos):
        - Each city within Hays County has its own police department responsible for enforcing local traffic laws and promoting roadway safety
    - Emergency Response Agencies:
- Each city within Hays County also has its own Fire Departments and Emergency Medical Services.
- City Fire Departments typically provide emergency rescue operations for traffic crashes and coordinate with law enforcement to manage incident scenes.
- Emergency Medical Services (EMS) respond to road-related injuries, crashes, and medical emergencies, ensuring timely pre-hospital care.

### COMMUNITY BASED & NONPROFIT ORGANIZATIONS:

Community based organizations or nonprofit organizations serve as advocates for safer roadways by creating public awareness about pedestrians and cyclists safety needs and initiatives, and other community-driven traffic safety projects.

    - Dell Children's Medical Center (DCMC) Kids in Cars Program
        - Child passenger safety education and inspection services (in Bastrop, Caldwell, Hays, Travis, and Williamson Counties)

- Technician Certification Training and Capacity Building
- Comprehensive Underage Drinking Prevention Program (UDPP) – in coordination with the Travis County Attorney's office

To achieve Vision Zero, coordination efforts amongst the above stakeholders will reduce traffic-related injuries and fatalities and create a safer transportation network for all road users.

# Hays County Policy and Process 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. 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.

## Safety Leadership & Culture:

Safety Leadership and Culture within the safe systems approach emphasizes how safety is a core value in all road system investment decisions, recognizing that human mistakes are inevitable and that the transportation system should be designed to accommodate these mistakes without resulting in severe injuries or fatalities. By fostering a culture of safety and strong leadership, the Safe System approach aims to create a holistic and resilient transportation network that protects all road users and strives towards the vision of zero deaths. Policies cover commitment to Road to Zero, coordination, progress tracking, education campaigns, and pursuing funding opportunities for implementation that foster a strong institutional leadership and public culture of safety.

**Road to Zero Commitment**

*Encourage local elected and agency officials to adopt a public commitment to reduce the number of traffic fatalities and serious injuries by half by 2035 and eliminate all by 2050.*

- Create a local model Road to Zero resolution for cities and other public/private institutions to signal their commitment.

**Road to Zero Task Force**

*Make the Hays County Task Force permanent and expand membership to ensure regional coordination in safety planning and management*

Hays County benefits from a diverse institutional framework dedicated to road safety, with key players at the local, county, regional, and state levels. Enhanced coordination between agencies—such as through a County-wide Operations and Safety Advisory Committee—could improve alignment of safety initiatives, funding prioritization,

and infrastructure improvements. A Task Force can help coordinate efforts and ensure short- and long-term transportation improvements remain consistent with urban growth while maintaining the character of the county.

- Designate a key agency to serve as the facilitator for the Task Force.
- Continue to hold meetings at regular intervals to support coordination between agencies to highlight safety initiatives and infrastructure improvements.
- Invite members from law enforcement, emergency response, education, and other organizations

**Road to Zero Coordinators**

Designate key County, City, and agency staff for coordinated action through the Task Force and their respective agencies.

- Identify staffing and resource needs to coordinate and implement actions from the CSAP.
- Ensure there is dedicated staff to oversee projects, track progress, and engage stakeholders, with clear and defined roles and responsibilities.

**Stakeholders And Progress Tracking**

*Develop and maintain a stakeholder list for use in disseminating progress reports on safety progress and annual updates on regional and community-specific trends.*

- Conduct and annual assessment of safety programs, policies, and investments in order to monitor effectiveness, identify trends, and refine strategies to achieve safety goals.
- Review safety trends for vulnerable populations and ensure that transportation investments are promoting safety and accessibility for all road users, regardless of socio-economic status, race, or geographic location.

**Road To Zero Awareness**

*Incorporate Vision Zero messages and education campaigns into City and County communications and events.*

- Encourage community participation and awareness building towards good road behavior, fostering a shared responsibility for road safety.
- Leverage public communications and events to publicize TxDOT's safety campaigns to increase public awareness of traffic safety issues. Target safety campaign materials to suit needs of lower income and non-English speaking communities.

**Pursue Funding Opportunities**

*Apply for implementation funding for projects on the High Injury Network and for systemic improvements through TxDOT and USDOT.*

- Apply regularly for regional, state, and federal grants (e.g., Highway Safety Improvement Program (HSIP), Safe Streets and Roads for All (SS4A)) to fund safety improvement projects, with a focus on reducing fatalities and serious injuries.
- Provide updates on safety project development, progress, and funding opportunities to the Hays County Task Force.

**Safe Routes To School**

*Create a Safe Routes to Schools program in conjunction with school districts to identify needed active transportation projects near schools and promote bicycle and pedestrian education.*

- Provide coordination to support Safe Routes to School (SRTS) programs through curriculum development, train-the-trainer support, and technical support for local SRTS committees.
- Partner with local school districts and agencies to identify and plan for walking and biking improvements near schools.

## Safer Roadways

Safer roadways involve implementing engineering and infrastructure-based countermeasures, such as improved signage, better lighting, safer intersections, and road designs that reduce conflict points and crash severity. Creating forgiving road environments through the Safe System approach for safer roads ensures when mistakes occur they do not result in fatal or serious injuries, thereby enhancing overall road safety.

### Complete Streets Policy

*Adopt City and County Complete Streets policies to provide designs for accommodating all road users in future transportation investments*

- Develop a model local Complete Streets policy for cities that is applicable for local, county, and state projects.
- Develop/adopt multimodal design guidelines for use in all local projects to ensure compatibility with common land uses across Hays County. Include provisions for bicycle and pedestrian accommodations, traffic calming, and stormwater management.

### Community Traffic Safety Team

*Develop a program to conduct collaborative, interdisciplinary Road Safety Audits of locations provided through community input, particularly involving vulnerable road users.*

- Consider public requests for safety investigations with a focus on segments and intersections identified on the High-Injury Network.
- Include local jurisdictions and agency partners throughout Hays County in conducting Road Safety Audits and other engagements, incorporating their feedback into the development capital safety projects.
- Integrate input from emergency responders into roadway planning and design to ensure roads support efficient crash response, minimize delays, and improve overall public safety.

### Asset Management and Maintenance Program

*Develop a systematic approach and schedule to roadway maintenance, following TxDOT's maintenance guidelines and prioritizing implementation of systemic safety treatments, such as signs, pavement markings, and rumble strips.*

- Develop a data collection and management program that incorporates Geographic Information System (GIS) data collection of existing facility assets (roadway signs, lighting, guardrail, etc.)
- Build a close working relationship with TxDOT to ensure alignment on safety improvements, and leverage access and expertise on traffic safety data, tools, and resources that can inform decision-making and project implementation.

**Intersection Control Evaluation Policy**

*Develop a local Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements.*

- Consider adopting locally the Intersection Control Selection Matrix from the TxDOT Traffic and Safety Analysis Procedures Manual to guide potential intersection improvements.
- Utilize the TxDOT Intersection Safety Scoring Tool to evaluate potential design alternatives.
- Implement signal modifications at key intersections to prioritize the safety of pedestrians and cyclists, especially at heavy traffic intersections, by adjusting timings to provide dedicated crossing times.

**Traffic Impact Analysis**

*Conduct safety assessments in conjunction with Traffic Impact Analyses for proposed developments to identify the need for systemic treatment packages as mitigation measures to reduce the risk of future crashes.*

- Consider using the Safer by Design tool from TxDOT to explore the calculated crash performance of alternative design solutions for non-residential streets projected to have a significant increase in daily vehicular trips.
- Host training sessions on road safety principles, land use integration, and best practices for incorporating safety countermeasures into site development plans for elected officials, city and county staff, and transportation planners.

**Community Input Webpage Development**

*Implement a feedback mechanism for road users to report maintenance issues in real time.*

- Publish community feedback mechanisms that enable stakeholders and communities to report safety concerns via 3-1-1, mobile apps, and online platforms.
- Review submitted concerns with the Hays County Task Force, applicable facility owners, and elected officials.

**Street Lighting Policy**

*Develop a policy consistent with TxDOT's guidelines for roadway lighting installation focusing on systemic intersections, curves, or active transportation locations.*

- Identify clusters of nighttime crashes for prioritizing installations of Spot Safety Lighting.

**Analyze Advanced Traffic Management System Data For Safety Monitoring**

*Explore the deployment of a county- and city-based version of Lonestar Advanced Traffic Management System (ATMS) with real-time data to monitor and manage traffic flows compatible with existing infrastructure and adhering to TxDOT's Intelligent Transportation System (ITS) architecture.*[1]

[1] Southwest Research Institute. (n.d.). *Active ITS Advanced Traffic Management System | Southwest Research Institute*. Southwest Research Institute Active ITS Advanced Traffic Management System. Retrieved March 27, 2025, from https://www.swri.org/markets/automotive-transportation/automotive/intelligent-transportation-systems/activeits-advanced-traffic-management-system

- **Improving safety and emergency response:** real-time traffic, safety, and weather information enables quicker identification of crashes and reduced clearance times for incidents and enhances overall road safety by preventing secondary crashes or use of unsafe roads due to flooding or other natural hazards.
- **Investment insights on Hays County roadway network**: analyzing speeding and traffic volume data can lead to targeted systemic safety deployments and monitoring improvements in safety through unsafe speed monitoring and other potential factors contributing to unsafe conditions on roadways.

### Post-Implementation Evaluation

*Evaluate efficacy of installed safety improvement through before and after studies (crashes, speeds) and public surveys.*

- Conduct project-level evaluations of local and state-completed safety projects and share the changes in observed crashes with the Task Force, elected officials, and the public.
- Conduct before- and after-speed studies of safety and complete streets projects to document changes in operating speeds.

## Safer Speeds

Safer speeds policies focus on thoughtful roadway design, speed limit setting, targeted education, outreach campaigns, and enforcement. Designing roads that naturally encourage safe driving speeds and implementing countermeasures minimizes the risk and severity of crashes. Policy recommendations include speed limit policy, traffic calming program, school zone enhancement program, and speed monitoring and awareness investments.

### Speed Limit Policy

*Develop a speed limit policy and procedures process based on the Manual of Traffic Control Devices (11th Edition) that include contextual factors and aligns with TxDOT's Speed Zone Manual.*

- Monitor emerging guidance for setting area and corridor speed limits on city-owned facilities.
- Collect updated speed, volume, and active transportation counts on minor arterial and higher functionally classified facilities to pursue future speed limit studies.
- Inventory the age and condition of advisory speed signs at curves and conduct ball bank studies to evaluate potential changes in posted speeds.

### Traffic Calming Program

*Collaborate on shared guidance for traffic calming on City-owned facilities that builds upon regional best practices and the FHWA ePrimer on Traffic Calming.*

- Develop shared guidance for traffic calming on City-owned facilities and disseminate best practices.
- Identify school speed zones for additional safety improvements, such as enhanced crossings, flashing warning lights, updated signage.
- Establish a county-wide lending library of equipment for demonstration traffic calming installations.

### 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, enhanced crossings, etc.) in designated School Zones.*

- Promote High-Visibility Enforcement that complies with Texas state laws regarding speeding within a school zone, that are targeted through a data-driven process and align with TxDOT public awareness campaigns.
- Enhance school speed zones with additional safety improvements, such as enhanced crossings, flashing warning lights, and updated signage.

**Speed Monitoring And Awareness**

*Deploy dynamic speed feedback signs on identified High Injury Network corridors.*

- Deploy permanent and/or rotating speed feedback signs on High Injury Network corridors.
- Dynamic speed feedback signs are recommended in advance of School Zones, Work Zones, and regulatory speed zones at curves. Facility owners may also use discretion to install signs near other locations with a history of speed-related crashes or active transportation crossing activity

## Safer Vehicles

Safer vehicles involve expanding the availability of advanced driver assistance systems, such as automatic emergency braking, lane-keeping assistance, and adaptive cruise control. Policies relate to reducing conflict points between different vehicle types, such as freight and passenger vehicles, and considering investments that shore up gaps in the operating design domains for automated and connected vehicles as they enter the Hays County roadway network.

**Truck/Freight Route Policy**

*Implement local ordinances for designated truck routes by identifying areas where freight routes and active transportation facilities intersect and include measures such as designated truck lanes or time-based restrictions to enhance safety.*

- The process to implement a truck route restriction is detailed in the TxDOT Manual on Sign Guidelines, Section 8 on Restricted Truck Lanes, including the following action items:
  - Local jurisdictions (cities or counties) submit a description of the proposed restriction to the local TxDOT district.
- A traffic study evaluates the effects of the proposed restriction.
  - Public hearings are held.
  - Formal proposal is submitted with the proposed ordinance, documentation of the traffic study, transcript of public comments, and approved signatures of authorized officials.
  - TxDOT funds and installs signage to enforce the restriction.[2]

[2] TxDOT, *Sign Guidelines and Applications Manual*. (n.d.). Retrieved March 27, 2025, from https://onlinemanuals.txdot.gov/txdotonlinemanuals/txdotmanuals/smk/index.htm

- Plan truck routes to separate trucks from vulnerable road users, through truck route and parking designation. For areas with overlap with vulnerable road users, provide separation in time and/or space through time-of-day policies, separated facilities, and signal modifications.

**Vehicle Advancement Program**

*Evaluate TxDOT's initiatives on connected and autonomous vehicles in order to provide the necessary infrastructure and facility upgrades (striping, signing, lighting, V2X communication) and maintain awareness of new/upcoming technologies. Additionally, consider changes to the operating fleet of City and County agencies as new vehicles are purchased. Encourage use of assistance features (like automated braking, blind spot detection, lane use warning) and educate motorists) and educate motorists on their usage and benefits.*

- Initiate coordination meetings to discuss AV safety enhancements around pavement markings, signage, work zones, maintenance activities, and curbside policy/design.
    - Sample Discussion Topics on Pavement Markings:
        - Use 6-inch-wide longitudinal markings on freeways and interstate highways.
        - Use continuous markings at the beginning of work zones and in all tapers.
        - Eliminate the use of Botts' dots as a substitute for markings.
        - Use contrast markings on light-colored pavements.[3]
- Track national MUTCD updates and coordinate associated developments within TxDOT manuals and handbooks.

## Safer Road Users

Safer road users as a component of the FHWA Safe System Approach emphasizes the importance of encouraging safe and responsible behavior among all road users. This involves promoting education and awareness campaigns to inform drivers, pedestrians, cyclists, and other road users about safe practices and the rules of the road. It also includes enforcement countermeasures. Policies include public awareness campaigns and coordination activities around work zone activities/

**Public Awareness Campaigns**

*Leverage City, County, and civic communications to publicize TxDOT's safety campaigns to increase public awareness of traffic safety issues. Target safety campaign materials to suit needs of lower income and non-English speaking communities.*

- Promote statewide educational campaigns through county and local channels community activities, and online engagement tools with the appropriate entities (local businesses, schools, community groups, advocacy groups, etc.) in Hays County

**Educational Programs**

[3] Storey, B. (2023). *Connected and Automated Vehicle Digital and Physical Infrastructure Needs*. Texas A&M Transportation Institute. https://www.txdot.gov/content/dam/project-sites/cav-task-force/docs/2023/08/Final_Texas_CAVTF-WhitePaper_Safety_08162023_Final.pdf

*Partner with local organizations to pursue funding and implement educational programs in additional settings, such as schools.*

- Develop and maintain open and communicative relationships with school district officials in Hays County.
- Assist TxDOT in targeting messages to local vulnerable populations
- Incorporate seatbelt safety modules into local school curriculums and driver's education programs that utilize TxDOT's "Click it or Ticket" initiative materials and support.
- Develop mentorship programs supported by TxHSO or SADD to educate younger and older drivers of safe driving practices.

**Enforcement Programs**

*Utilize the Texas Law Enforcement Liaison Program to pursue STEP grant funding and for technical assistance to implement high-visibility enforcement operations targeted at impaired or aggressive driving.*

- Use traffic crash data to guide enforcement and resource allocation, focusing on the locations and behaviors (such as impaired driving, speeding, etc.) that contribute most to fatal and serious injury collisions.
- Foster relationships with local restaurants and bars to encourage safe roadway practices such as designating a driver or ride sharing.

**Work Zone Safety Enhancement Policy**

*Establish comprehensive safety protocols aligned with TxDOT's work zone safety regulations, utilizing Work Zone Intelligent Transportation Systems.*

- Cities and counties can work with TxDOT on work zone design to develop corridor-based approaches to smart work zones that may be on a road segment divided into multiple projects.
- Work with TxDOT on the work zone design and smart work zone deployment plan of smart work zone equipment to ensure optimized locations relative to local networks and HIN findings for specific crash types and risks across the work zone extent.
- Explore connections between smart work zone alert systems on city, county, and TxDOT work zones and potential heightened coordination on incidents occurring within and potential alert mechanisms.[4]

**Sponsorship of Safety Events**

*Host City- and County-sponsored safety-related events and education campaigns to raise awareness and encourage safe road behavior.*

- Partner with local organizations in Hays County to implement interactive workshops, such as virtual reality simulations to demonstrate the dangers of impaired driving
- Target events to attract younger drivers and include programming such as “Talk. Text. Crash.”

[4] Ullman, G., & Miller, M. (2024). *Improving Smart Work Zone Deployments in Texas* (Research FHWA/TX-24/0-7118-R1). Texas A&M Transportation Institute. https://library.ctr.utexas.edu/Presto/content/Detail.aspx?ctID=OWE3NjYzNTktYzJmNC00ZTAwLThmMjItYzhmNzNiYTFmNzdh&rID=MzcyODg=&qrs=RmFsc2U=&ph=VHJ1ZQ==&rrtc=VHJ1ZQ==

## Post-Crash Care

Post-crash care policies help enhance timely access to emergency medical services (EMS) and trauma care which directly impacts reduction of the severity of injuries in crashes. It also involves training to implement robust traffic incident management practices that reduce secondary crashes. Policies recommended here include emergency response protocols, traffic signal improvement programs, and a collision database program to accelerate links between optimal post-crash care and incidents across the Hays County transportation network.

**Emergency Response Protocols**

*Develop and implement protocols that ensure rapid response times by emergency services in the event of a crash.*

- Establish clear communication channels and coordination with law enforcement, emergency medical services, fire departments, tow operators, and other emergency response agencies across the county.
- Collaborate with emergency responders (e.g., fire departments, EMS, law enforcement) to streamline response efforts, reducing response times and ensuring that life-saving assistance reaches crash victims as quickly as possible.
- Hold quarterly meetings with Public Safety and Emergency Response Agencies (including law enforcement, fire departments, emergency medical services) and transportation agencies to review collision trends, assess emergency response effectiveness, and develop strategies to enhance safety interventions across the county.
- Install milepost markers along high-injury prone corridors at regular increments or on existing road signs to help emergency responders effectively locate crashes.
- Train Emergency Medical Services (EMS) personnel to specifically address the different types of crash trauma, and on providing optimal on-screen care to those injured.
- Educate the general public on how to respond effectively when crashes occur. This should include basic first aid knowledge and the importance of providing accurate information to emergency services.

**Traffic Signal Improvement Program**

*Follow TxDOT's Traffic and Safety Analysis Procedures (TSAP) Manual guidelines for integrating adaptive signal control technologies to enhance traffic flow and emergency response times.*

- Follow TxDOT's Traffic and Safety Analysis Procedures (TSAP) Manual guidelines for integrating adaptive signal control technologies to enhance traffic flow and emergency response times.

**Collision Database Program**

*Develop a centralized database to track collision data and response outcomes, aligning with local Central Texas emergency response protocol and data-sharing agreements.*

- Develop a centralized database to track collision data and response outcomes, aligning with local Central Texas emergency response protocol and data-sharing agreements.

Table 1 describes all recommended policies above alongside details associated with potential leads and primary and secondary support for deployment consideration. This is not intended to be a comprehensive list but rather serves as the potential path the Hays County Safety Task Force can carry forward after the conclusion of the Hays County Safety Action Plan effort.

TABLE 1: 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** | Adopt a public commitment to reduce the number of traffic fatalities and serious injuries by half by 2035 and eliminate all by 2050. | (Applicable to All Emphasis Areas) | Leadership | City and County Staff | Task Force | |
| **ROAD TO ZERO TASK FORCE** | Support a permanent Hays County Task Force and expand membership to ensure county-wide coordination in safety planning and management. | (Applicable to All Emphasis Areas) | Partnerships | Task Force | City and County Staff | TxDOT |
| **ROAD TO ZERO COORDINATORS** | Designate key County, City, and agency staff for coordinated action through the Task Force and their respective agencies | (Applicable to All Emphasis Areas) | Partnerships | City and County Staff | | |
| **STAKEHOLDERS AND PROGRESS TRACKING** | Identify stakeholders list and provide annual updates on overall and community-specific trends, and progress reports on safety progress. | (Applicable to All Emphasis Areas) | Stakeholder Engagement | Task Force | City and County Staff | Community Groups |
| **ROAD TO ZERO AWARENESS** | Incorporate Vision Zero messages and education campaigns into City and County communications and events. | (Applicable to All Emphasis Areas) | Public Awareness | City and County Staff | Task Force | |
| **PURSUE FUNDING OPPORTUNTIES** | Apply for implementation funding for projects on the High Injury Network and for systemic improvements through TxDOT and USDOT. | (Applicable to All Emphasis Areas) | Funding | Task Force | City and County Staff | CAMPO |
| **SAFE ROUTES TO SCHOOL** | Create a Safe Routes to Schools program in conjunction with school districts to identify needed active transportation projects near schools and promote bicycle and pedestrian education. | (Applicable to All Emphasis Areas) | Partnerships | City and County Staff | Independent School Districts | |

TABLE 2: 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 |
| **COMPLETE STREETS POLICY** | Adopt City and County Complete Streets policies to provide designs for accommodating all road users in future transportation investments | Vulnerable Road Users, Speed Related | Complete Streets | City and County Staff | Task Force | |
| **COMMUNITY TRAFFIC SAFETY TEAM** | Develop a program to conduct collaborative, interdisciplinary Road Safety Audits of locations provided through community input, particularly involving vulnerable road users. | (Applicable to All Emphasis Areas) | Partnerships | City and County Staff | Task Force | TxDOT |
| **ASSET MANAGEMENT PROGRAM** | Develop a systematic approach and schedule to roadway maintenance, following TxDOT's maintenance guidelines and prioritizing implementation of systemic safety treatments, such as signs, pavement markings, and rumble strips. | Roadway & Lane Departures, Intersection Safety, Vulnerable Road Users | Capital Investments | TxDOT | City and County Staff | Task Force |
| **TRAFFIC IMPACT ANALYSIS** | Integrate safety analysis into Traffic Impact Analysis guidelines and consideration of systemic treatment packages as mitigation measures to reduce the risk of future crashes. | Intersection Safety, Vulnerable Road Users | Complete Streets | City Staff | County Staff | TxDOT |
| **INTERSECTION CONTROL POLICY** | Develop a local Intersection Control Evaluation (ICE) policy consistent with TxDOT's ICE framework to determine appropriate intersection improvements. | Intersection Safety, Vulnerable Road Users | Capital Investments | City and County Staff | TxDOT | Task Force |
| **COMMUNITY INPUT WEBPAGE DEVELOPMENT** | Implement a feedback mechanism for road users to report maintenance issues in real time. | (Applicable to All Emphasis Areas) | Transparency | City and County Staff | Task Force | |
| **STREET LIGHTING POLICY** | Develop a policy consistent with TxDOT's guidelines for roadway lighting installation focusing on systemic intersections, curves, or active transportation locations. | Intersection Safety, Roadway & Lane Departures, | Capital Investments | Task Force | City and County Staff | TxDOT |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Vulnerable Road Users | | | | |
| **ANALYZE ADVANCED TRAFFIC MANAGEMENT SYSTEM DATA FOR SAFETY MONITORING** | Explore the creation of an Advanced Traffic Management System (ATMS) to monitor and manage traffic flow using real-time data that is compatible with existing infrastructure and adheres to TxDOT's Intelligent Transportation System (ITS) architecture. | Post-Crash Care | Operations | City and County Staff | TxDOT | Task Force |
| **POST-IMPLEMENTATION EVALUATION** | Evaluate efficacy of installed safety improvement through before and after studies (crashes, speeds) and public surveys. | (Applicable to All Emphasis Areas) | Evaluation | TxDOT | City and County Staff | Task Force |

TABLE 3: 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 |
| **SPEED LIMIT POLICY** | Develop a speed limit policy and procedures process based on the Manual of Traffic Control Devices (11th Edition) that include contextual factors and aligns with TxDOT's Speed Zone Manual. | Speed Related | Speed Limits | City and County Staff | Task Force | |
| **TRAFFIC CALMING PROGRAM** | Collaborate on shared guidance for traffic calming on City-owned facilities that builds upon regional best practices and the FHWA ePrimer on Traffic Calming | Speed Related, Vulnerable Road Users | Traffic Calming | Task Force | City and County Staff | |
| **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, enhanced crossings, etc.) in designated School Zones. | Speed Related, Vulnerable Road Users | School Zones | City and County Staff | Independent School Districts | Task Force |
| **SPEED MONITORING AND AWARENESS** | Deploy dynamic speed feedback signs on identified High Injury Network corridors. | Speed Related | Traffic Calming | City and County Staff | Task Force | |

**TABLE 4: 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** |
| **TRUCK/FREIGHT ROUTE POLICY** | Evaluate TxDOT's guidelines on truck routes and consider local ordinances for designated truck routes to identify areas where freight routes and active transportation facilities intersect and implement measures such as designated truck lanes or time-based restrictions to enhance safety. | (Applicable to All Emphasis Areas) | Commercial Vehicles | Task Force | TxDOT | City and County Staff |
| **VEHICLE ADVANCEMENT PROGRAM** | Evaluate TxDOT's initiatives on connected and autonomous vehicles in order to provide the necessary infrastructure and facility upgrades (striping, signing, lighting, V2X communication) and maintain awareness of new/upcoming technologies. | (Applicable to All Emphasis Areas) | Emerging Technologies | Task Force | TxDOT | City and County Staff |

TABLE 5: 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 |
| **PUBLIC AWARENESS CAMPAIGNS** | Leverage City, County, and civic communications to publicize TxDOT's safety campaigns to increase public awareness of traffic safety issues. Target safety campaign materials to suit needs of lower income and non-English speaking communities. | Impaired Driving, Speed Related, Vulnerable Road Users | Public Awareness | City and County Staff | TxDOT | Task Force |
| **EDUCATIONAL PROGRAMS** | Partner with local organizations to pursue funding and implement educational programs in additional settings, such as schools. | (Applicable to All Emphasis Areas) | Partnerships | Task Force | City and County Staff | TxDOT |
| **ENFORCEMENT PROGRAM** | Utilize the Texas Law Enforcement Liaison Program to pursue STEP grant funding and for technical assistance to implement high-visibility enforcement operations targeted at impaired or aggressive driving. | Speed Related, Impaired Driving | Targeted Enforcement | City and County Staff | Texas Municipal Police Association | TxDOT |
| **WORK ZONE SAFETY ENHANCEMENT POLICY** | Establish comprehensive safety protocols aligned with TxDOT's work zone safety regulations, utilizing Work Zone Intelligent Transportation Systems. | Speed Related | Work Zone Traffic Control | TxDOT | Task Force | City and County Staff |
| **SPONSORSHIP OF SAFETY EVENTS** | Host City- and County-sponsored safety-related events and education campaigns to raise awareness and encourage safe road behavior. | (Applicable to All Emphasis Areas) | Public Awareness | Task Force | City and County Staff | TxDOT |

TABLE 6: 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 |
| **EMERGENCY RESPONSE PROTOCOLS** | Develop and implement protocols that ensure rapid response times by emergency services in the event of a crash. | Post-Crash Care | Partnerships | Task Force | City and County Staff | TxDOT |
| **TRAFFIC SIGNAL IMPROVEMENT PROGRAM** | Follow TxDOT's Traffic and Safety Analysis Procedures (TSAP) Manual guidelines for integrating adaptive signal control technologies to enhance traffic flow and emergency response times. | Post-Crash Care | Operations | TxDOT | City and County Staff | Task Force |
| **COLLISION DATABASE PROGRAM** | Develop a centralized database to track collision data and response outcomes, aligning with local Central Texas emergency response protocol and data-sharing agreements. | Post-Crash Care | Evaluation | Task Force | City and County Staff | TxDOT |

## Complex Table Style

For projects where a table requires additional subcolumn headers or row grouping, the table style below can be used. **However, this table style does not meet accessibility guidelines since it has merged cells, so if there is any chance that your document will need to be accessible, please follow the style outlined in Table 1.**

**TABLE 1: COMPLEX TABLE STYLE EXAMPLE – THIS TABLE IS NOT ACCESSIBLE**

| COLUMN HEADER | COLUMN HEADER | | | COLUMN HEADER | |
|---|---|---|---|---|---|
| | SUBCOLUMN | SUBCOLUMN | SUBCOLUMN | SUBCOLUMN | SUBCOLUMN |
| ROW GROUP | | | | | |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW GROUP | | | | | |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |
| ROW NAME | Table Body | Table Body | Table Body | Table Body | Table Body |

*Source: Insert source reference information here.*

# Appendix C

## SAFETY COUNTERMEASURES TECHNICAL MEMORANDUM

# HAYS COUNTY SAFETY COUNTERMEASURES TECHNICAL MEMORANDUM

## Introduction

The proposed improvements and strategies incorporate a range of safety countermeasures tailored to Hays 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

Dark Conditions crashes account for 48% of fatal and serious injury crashes in Hays 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 30% of fatal and serious injury crashes in Hays 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 |

| STRATEGY | TIMELINE | COST | CRASH TYPES ADDRESSED |
|---|---|---|---|
| Implement flashing yellow arrows at signals. | Near-. Mid-term | $$, $$$ | Angle |
| 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 |

| STRATEGY | TIMELINE | COST | CRASH TYPES ADDRESSED |
|---|---|---|---|
| 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. Vulnerable road users accounted for 87 fatal and serious crashes within Hays 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 |

| STRATEGY | TIMELINE | COST | CRASH TYPES ADDRESSED |
|---|---|---|---|
| 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 |
| **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 |

| STRATEGY | TIMELINE | COST | CRASH TYPES ADDRESSED |
|---|---|---|---|
| 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 | $, $$ | Pedestrian/Bicyclist |
| Coordinate and support vulnerable road user safety and enforcement by law enforcement to conduct high-visibility enforcement of bicyclists, pedestrians, and motorists who are violating traffic safety laws that may endanger them or other multi-modal travelers. | Near-, Mid-term | $, $$ | 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 |

| STRATEGY | TIMELINE | COST | CRASH TYPES ADDRESSED |
|---|---|---|---|
| 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

## SYSTEMIC SAFETY PACKAGES

# Hays 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;<br>Add Left-Turn Lane;<br>Lengthen Left-Turn Lane;<br>Add Right-Turn Lane;<br>Lengthen Right-Turn Lane;<br>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;<br>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<br>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 nightime 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;<br>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;<br>Improve Traffic Signals;<br>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;<br>Install Advanced Warning Signals (Intersection - Existing Warning Signs);<br>Install Advanced Warning Signals and Signs (Intersection);<br>Install Advanced Warning Signs (Intersection);<br>Install Pavement Markings;<br>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;<br>Install Advanced Warning Signals (Intersection - Existing Warning Signs);<br>Install Advanced Warning Signals and Signs (Intersection);<br>Install Advanced Warning Signs (Intersection);<br>Flashing or LED-embedded Stop Signs;<br>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;<br>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. |

# Hays County Systemic Safety Packages

| Emphasis Area | Package Name | HSIP Work Code(s) | Countermeasures | Area Type | Location | Intersection Control | Crash Patterns and Candidate Locations Guidance |
|---|---|---|---|---|---|---|---|
| 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;<br>Install Advanced Warning Signals (Curve- Existing Warning Signs);<br>Install Advanced Warning Signals and Signs (Curve);<br>Install Advanced Warning Signs (Curve);<br>Install Chevrons (Curve);<br>Install LED Flashing Chevrons (Curve);<br>Install Surface Mounted Delineators on Centerline;<br>Install Pavement Markings;<br>Install Edge Marking;<br>Install Centerline Striping;<br>Milled Edgeline Rumble Strips;<br>Profile Edgeline Markings;<br>Raised Edgeline Rumble Strips;<br>Milled Centerline Rumble Strips;<br>Profile Centerline Markings;<br>Raised Centerline Rumble Strips | Urban, Rural | Curve | N/A | Consider in advance of or within curves, particularly on rural, two-lane undivided roadways. |
| Roadway Lane Departure | Install Median or Roadside Barriers | 201, 217 | Install Median Barrier;<br>Install Impact Attenuation System | Urban, Rural | Segment | Not Applicable (N/A) | TxDOT HSIP Guide:<br>- Existing median width must be <= 70'<br>- Cable median barriers are for use only on medians > 25' in width<br>- Concrete median barriers can be used on all median widths<br><br>Locations of projects will be prioritized in as follows:<br>1) By Functional Class (Interstate, non-Interstate freeways, other principal arterials, all others)<br>2) 0-45' median widths in urban and rural areas<br>3) Greater than 45' median widths in rural areas<br>4) Greater than 45' median widths in urban areas<br><br>AASHTO's Roadside Design Guide (RDG):<br>Recommended: High-speed fully controlled-access roadways with median is less than 30' in width and AADT is greater than 20,000<br>Optional: Median is greater than 50' and AADT is less than 20,000<br>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:<br>1) Urban Freeways<br>2) Multi-lane arterials with partial access<br>At least one of four warrants must also be met.<br><br>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);<br>Widen Paved Shoulder (to 5 ft. or less);<br>Construct Paved Shoulders (1-4 ft.);<br>Widen Paved Shoulders (to >5 ft.);<br>Construct Paved Shoulders (>= 5ft.);<br>Provide Additional Paved Surface Width;<br>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;<br>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. |

# Hays County Systemic Safety Packages

| Emphasis Area | Package Name | HSIP Work Code(s) | Countermeasures | Area Type | Location | Intersection Control | Crash Patterns and Candidate Locations Guidance |
|---|---|---|---|---|---|---|---|
| Speeding | Traffic Calming | 409, Other | Install Pedestrian Refuge Islands;<br>Install Curb Extensions;<br>Install Vertical or Horizontal Deflection | Urban | Segment | N/A | See FHWA Traffic Calming ePrimer, Module 3: Toolbox of Individual Traffic Calming Measures.<br>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;<br>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:<br>- an established crosswalk with adequate visibility, markings, and signs<br>- a posted speed limit of 40 mph or less (does not include school speed zones)<br>- 20 pedestrians or more crossing in one hour<br>- location deemed as a high risk area (e.g. schools, shopping centers)<br>- crosswalk is more than 300 ft. from an existing traffic-controlled pedestrian crossing<br><br>PHBs must also complete an engineering study per Chapter 4F of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).<br><br>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;<br>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.<br><br>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.<br><br>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;<br>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;<br>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):<br>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;<br>Install Advanced Crossing Signage;<br>Install School Zones;<br>Improve School Zone | Urban, Rural | Intersection, Segment | Stop-Controlled | 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.<br><br>Parking should be restricted a minimum of 20' from crosswalks where posted speeds are 25 mph or less and 30' where speeds are higher.<br><br>TMUTCD Section 2B.12, In-Street and Overhead Pedestrian Crossing Signs, contains additional information about in-street pedestrian crossing signs. |