



**CITY OF WEATHERFORD**

# **COMPREHENSIVE SAFETY ACTION PLAN**

**ADOPTED JANUARY 2026**



Prepared for:



Prepared by:

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# ABBREVIATIONS GLOSSARY

**A-** Severe Injuries

**B-** Minor Injuries

**Chamber-** Weatherford Chamber of Commerce

**CM-** City Manager's Office

**CMF-** Crash Modification Factors

**COMM-** Communications Department

**CP-** City Planning Department

**CRIS-** Crash Records Information System

**CSAP-** Comprehensive Safety Action Plan

**DPS-** Department of Public Safety

**DWInc-** Downtown Weatherford Incorporated

**EDD-** Economic Development Department

**FHWA-** Federal Highway Administration

**HD-** Parker Co Health Department

**HIN-** High Injury Network

**HRN-** High Risk Network

**WISD-** Weatherford Independent School District

**K-** Fatal Crashes

**KABs-** Crashes resulting in fatal, severe, and minor injuries (High Injury Crashes)

**LPI-** Leading Pedestrian Interval

**PHB-** Pedestrian Hybrid Beacon

**PS-** Public Safety

**PW-** Public Works

**RCUT-** Reduced Left-Turn Conflict Intersections

**RRFB-** Rectangular Rapid Flashing Beacon

**SHSP-** Texas Strategic Highway Safety Plan

**SAPWG-** Safety Action Plan Working Group

**TxDOT-** Texas Department of Transportation

**VMT-** Vehicle Miles Traveled

**VRU-** Vulnerable Road Users

**UW-** United Way of Parker County

**USDOT-** United States Department of Transportation



# CHAPTER 1: PURPOSE

## INTRODUCTION

The Weatherford Comprehensive Safety Action Plan (CSAP) is developed using a safety framework to help the City of Weatherford achieve the goal of eliminating traffic-related fatalities and serious injuries in the City by 2050. This chapter gives the background and foundational material needed to understand the safety framework and guiding principles; the mission statement and project timeline can also be found in this chapter.

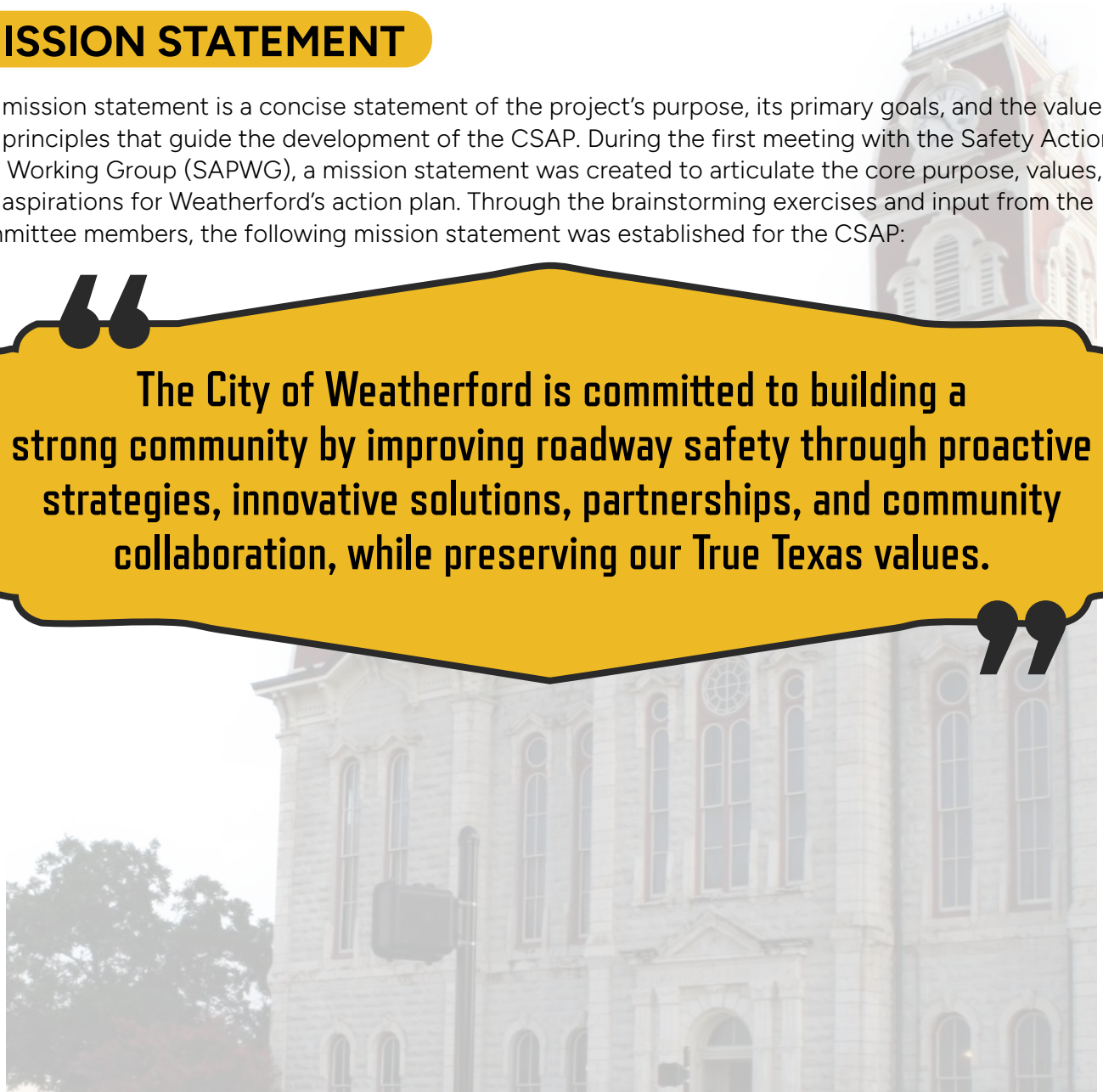




## MISSION STATEMENT

The mission statement is a concise statement of the project's purpose, its primary goals, and the values and principles that guide the development of the CSAP. During the first meeting with the Safety Action Plan Working Group (SAPWG), a mission statement was created to articulate the core purpose, values, and aspirations for Weatherford's action plan. Through the brainstorming exercises and input from the committee members, the following mission statement was established for the CSAP:

**The City of Weatherford is committed to building a strong community by improving roadway safety through proactive strategies, innovative solutions, partnerships, and community collaboration, while preserving our True Texas values.**



### SAFETY FRAMEWORK

#### SAFE SYSTEM APPROACH

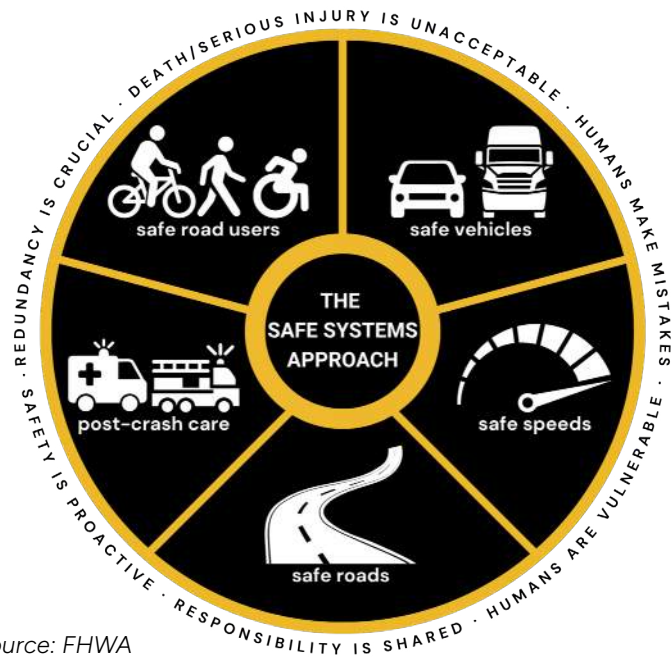
The Safe System Approach was pioneered in the 1990's by Claes Tingvall, a Swedish road safety expert. This is a framework and method in which Weatherford's CSAP can be implemented. The six key principles that can be used to implement the elements of the Safe Systems Approach are:

|                                                           |                                                    |                                                                                     |                                                                     |                                              |                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Death or serious injury is unacceptable</b>                                                                                             | <b>Humans make mistakes</b>                                                                                                         | <b>Humans are vulnerable</b>                                                                                                                                         | <b>Responsibility is shared</b>                                                                                                                        | <b>Safety is proactive</b>                                                                                                      | <b>Redundancy is crucial</b>                                                                                                                                                              |
| <i>Focusing attention on preventing fatal and severe crashes over minor crashes so residents are better protected on the City's roads.</i> | <i>Human error is inevitable and leads to crashes. Roadway systems that account for this fact can reduce the impact of crashes.</i> | <i>Human tolerance to crashes is recognized and a measurable benchmark (kinetic energy transfer can be measured) that should be incorporated into consideration.</i> | <i>No single party is responsible for crash prevention alone, but collectively all parties are responsible. All people can improve roadway safety.</i> | <i>Rather than waiting to respond to tragedy, measures should be taken beforehand to identify and mitigate potential risks.</i> | <i>Affecting change requires strengthening all Safe Systems elements. In the case that one element fails, redundancy prevents systemwide failure, ensuring that people are protected.</i> |



The Safe Systems Approach is a holistic, principle-based approach intended to eliminate serious and fatal injuries. This approach is designed to be different from other approaches because it accounts for human error (**Figure 1**). Since human error is inevitable, this approach uses traffic safety planning to implement safeguards that will offset the consequences of these mistakes. Efforts done to mitigate, or lessen, the physical impacts on the human body include roadway design, reducing speeds, physically separating automobiles from other road users, as well as technological advances in vehicles, such as lane departure assistance and autonomous emergency braking (**Figure 2**).

**FIGURE 2: SAFE SYSTEM APPROACH (FHWA)**



Source: FHWA

**FIGURE 1: TRADITIONAL VS SAFE SYSTEM APPROACH**

| TRADITIONAL                  | SAFE SYSTEM                            |
|------------------------------|----------------------------------------|
| Prevent crashes              | Prevent deaths and serious injuries    |
| Improve human behavior       | Design for human mistakes/limitation   |
| Control speeding             | Reduce system kinetic energy           |
| Individuals are responsible  | Share responsibility                   |
| React based on crash history | Proactively identify and address risks |

*Whereas traditional road safety strives to modify human behaviors and prevent all crashes, the **Safe System Approach** also focuses transportation system design and operation on anticipating human mistakes and lessening impact forces to **reduce crash severity and save lives**.*

### Crash Severity Classifications

Crashes are defined by severity based on injuries resulting from the crash, as established by the Federal Highway Administration and Department of Transportation. Police officers record this information on crash-reporting forms using the KABCO scale: K for a fatal injury, A for a suspected serious injury, B for a suspected minor injury (evident but not fatal or serious), C for a possible injury, and O for no apparent injury or bodily harm.

There are five complementary objectives outlined by the U.S. Department of Transportation (USDOT) that correspond to, and support implementation of the Safe System Approach detailed below:



### SAFE ROADS

Safe Roads are not defined by their design alone. Rather, the road design, construction, maintenance, operation, and countermeasures work collaboratively to improve safety.



### SAFE SPEEDS

Safe Speeds have direct correlation with the increased rate of survival in crashes. Reducing speeds reduces impact, improves visibility, and affords drivers' additional breaking time.



### SAFE VEHICLES

Safe Vehicles are responsible for prevention of crashes or mitigation their consequences. Active safety measures can help prevent crashes from occurring, while passive measures can lessen the implications of a crash.



### SAFE ROAD USERS

Safe Road Users have to bear the burden of responsibility for complying with rules and regulations of the roadway.



### POST-CRASH CARE

Post-Crash Care accounts for the actions of those that respond to a crash, whether it be emergency services, law enforcement, or clean up.



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## CHAPTER 2: PROCESS AND ENGAGEMENT

### INTRODUCTION

The following chapter outlines the project timeline that helps to encourage timely and effective implementation of the Plan, as well as the types of activities executed throughout the project. During this project, the Safety Action Plan Working Group (SAPWG) was established to guide the development of the CSAP. The website and pop-up events were key to collecting input from the community of Weatherford.

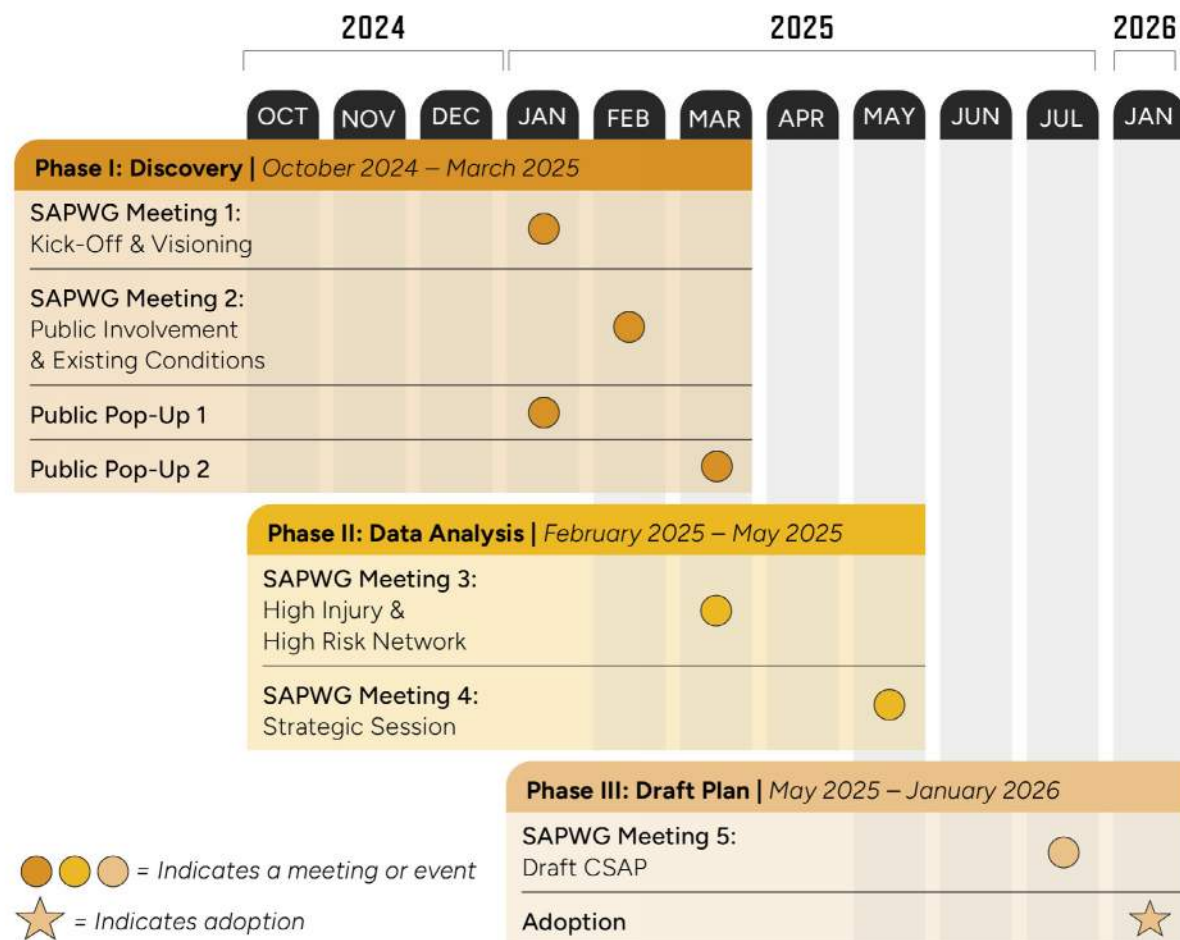




## PROJECT TIMELINE

Kicking off in October 2024, the Weatherford CSAP planning process spanned 11 months. A timeline for the Safety Action Plan Working Group (SAPWG) and public pop-ups is displayed in **Table 1** below:

**TABLE 1: PUBLIC ENGAGEMENT TIMELINE**



### SAFETY ACTION PLAN WORKING GROUP

The Safety Action Plan Working Group (SAPWG) was tasked with overseeing the CSAP's development at key touchpoints throughout the process. The SAPWG members represent a variety of professionals relevant to the commitment and improvement of roadway safety, including public and private staff such as Public Works, Police, Fire, and Planning Departments. The purpose of the SAPWG is to establish goals for the CSAP, provide comments on major components of the plan, and to review the draft CSAP documents. **Figure 3** displays a mapping activity conducted at a SAPWG meeting. In addition to attending the five planned SAPWG meetings, SAPWG members were also encouraged to attend the pop-up events and share social media posts and online engagements with their networks.

### COMMUNITY ENGAGEMENT

To make sure that Weatherford's CSAP reflects the values, priorities, and goals of the community that live and work in the area, community engagement was a top priority. Aligning with the needs and concerns of the people that use Weatherford's roads daily assist the development of safety countermeasures and action items identified in Chapters 5 and 6. These efforts included both online engagements, including surveys and a map activity, and in-person pop-up events held in the City of Weatherford.

The online engagement and in-person pop-up events provided valuable quantitative and qualitative information. This section displays the information gathered, including charts, key trends, and overall community feedback. The pop-ups provided an opportunity for meaningful face-to-face interactions, which gave residents a chance to share their safety concerns in Weatherford and provide ideas or improvements that they would like to see.

FIGURE 3: SAPWG MEETING



FIGURE 4: ONLINE SURVEY ENGAGEMENT

A screenshot of a mobile device displaying an online survey titled "Weatherford Comprehensive Safety Action Plan". The survey includes sections for "I. Information" and "II. Commute & Mode Choice". The "I. Information" section asks for relationship to the City of Weatherford and home/zip codes. The "II. Commute & Mode Choice" section asks if the place of work is located outside the home.



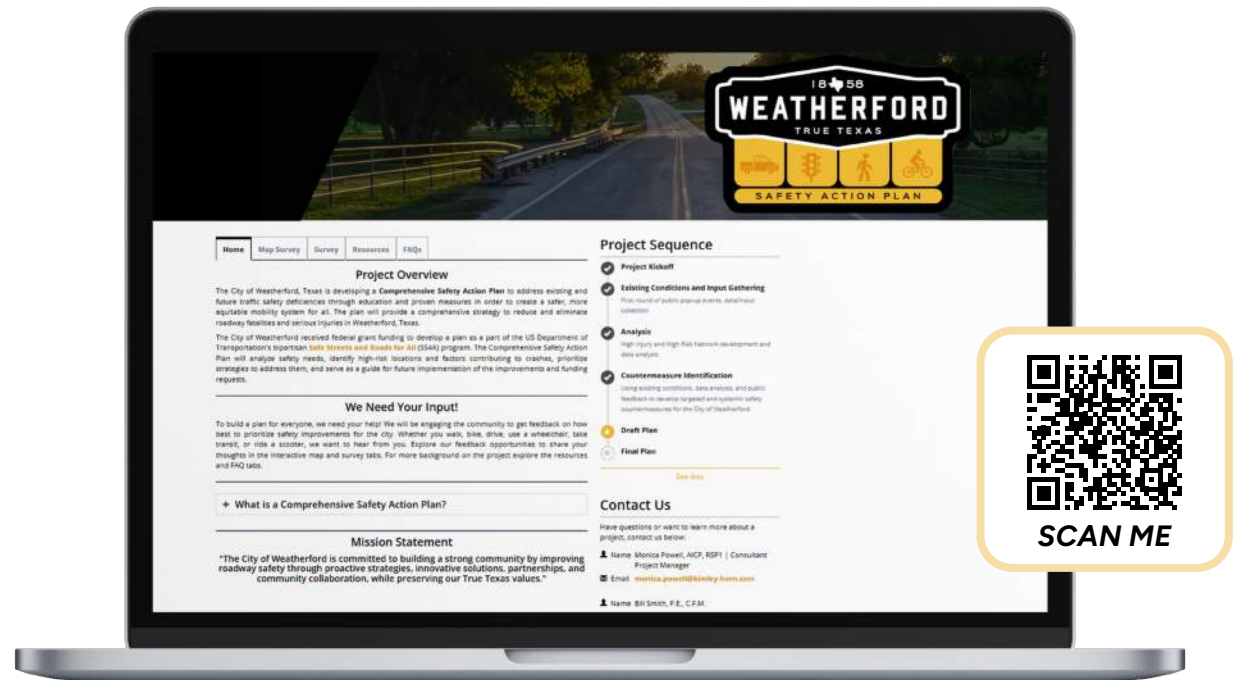
## PROJECT WEBSITE

Online engagement was a wonderful opportunity for more quantitative data and statistics. Having quantitative data is important to the Comprehensive Safety Action Plan because it provides objective data that can be measured. Quantitative data can be helpful to identify patterns and trends as well as measure the impact of different strategies over time. To begin the survey process, we wanted to know a little more about who was filling out the survey. We welcome input from all community members and want to recognize that every response holds equal value. However, to ensure that the survey captured a wide range of community members across Weatherford, the first few questions focused on learning more about who the respondents were. This

information helps us understand how well our outreach efforts reflect the broader community and ensures that the perspectives represented in Weatherford's Comprehensive Safety Action Plan come from a variety of backgrounds and experiences.

It is important to recognize that the needs of individuals who live in Weatherford may differ from those who work in the community but reside elsewhere. Based on the survey results, residents tend to focus on improvements that enhance their overall quality of life, such as neighborhood safety, access to parks, and safe routes for walking or biking, while those who commute to Weatherford for work prioritize issues related to transportation, traffic flow, and safety in and around their workplace. Understanding these different perspectives allows the CSAP to address a wider range of concerns and make sure that solutions are responsive to all community members. **Figure 5** on page 10.

FIGURE 5: PROJECT WEBSITE



From the survey conducted, 85% of respondents are not involved in action groups within the City of Weatherford. Understanding commute times can be a way to help us understand and evaluate how far the community is traveling for work (**Figure 6** below). In this case, the majority (55.1%) of people have a commute time of 20 minutes or less. Shorter commute times can suggest an opportunity for walking, biking, or short car trips, which can be important when it comes to designing roads and intersections for the safety of all road users. Based on survey results, approximately 32.4% and 32.8% of respondents stated they would walk or bike more often if these options were safer, respectively (**Figure 7**)

**FIGURE 6: COMMUTE TIME TO WORK RESULTS**

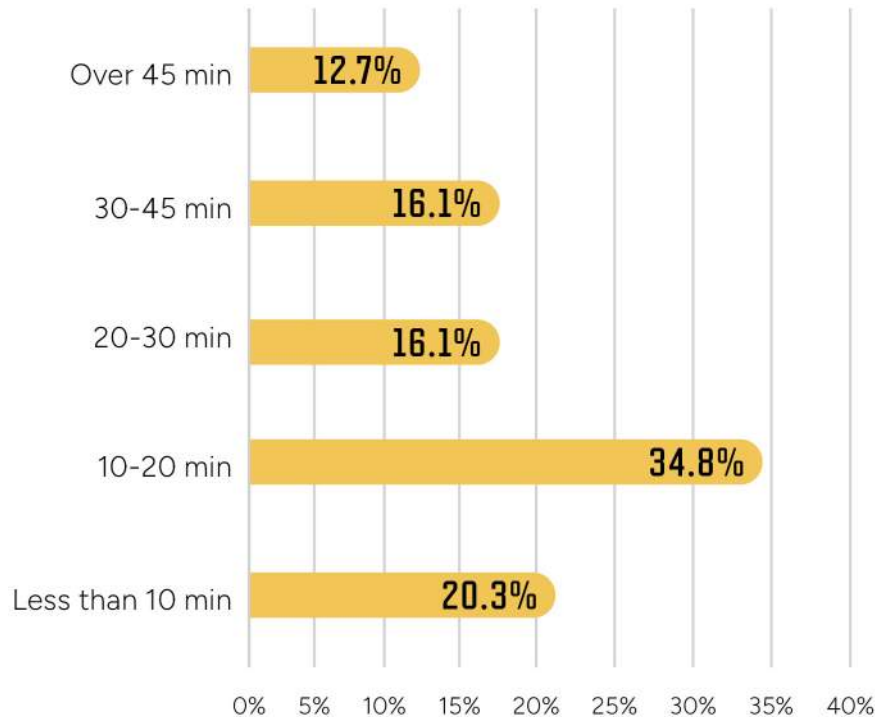
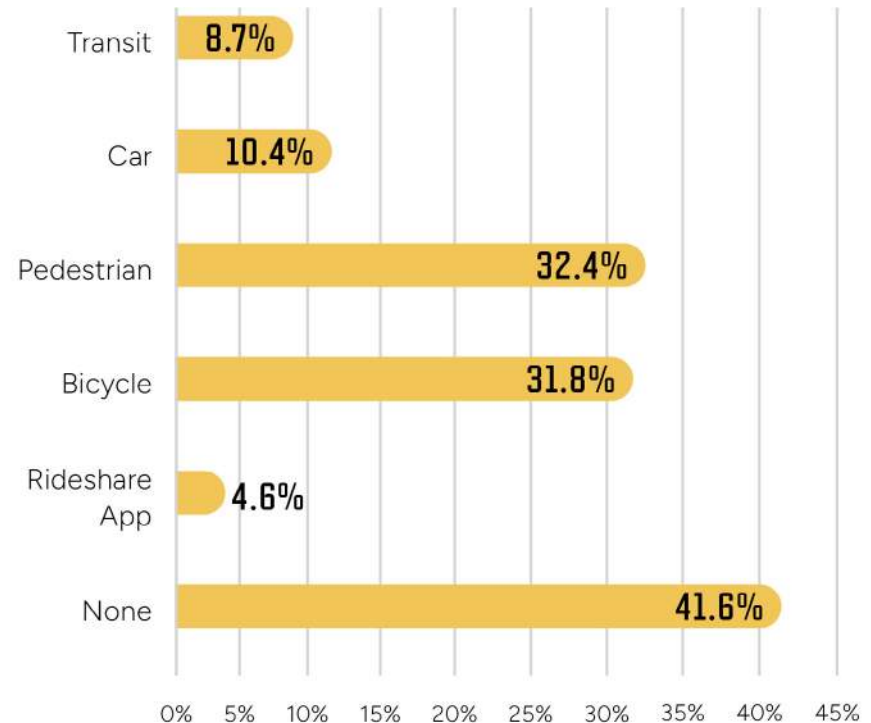


**FIGURE 7: RESPONDENTS WOULD USE THIS MODE OF TRANSPORTATION MORE OFTEN IF IT WERE SAFER RESULTS**





Additionally, about the same percentage of respondents stated they do not walk or ride a bicycle due to safety reasons (**Figure 8** below). Furthermore, **Figure 9** below shows that approximately 54% and 82% of respondents agree with the City investing in making walking and biking safer. These findings indicate the desire from Weatherford residents to be able to use alternative modes of transportation but do not due to their concerns with safety. Prioritizing infrastructure for these vulnerable road users would fill this gap felt by residents.

**FIGURE 8: RESPONDENTS DO NOT USE THIS MODE OF TRANSPORTATION DUE TO SAFETY RESULTS**

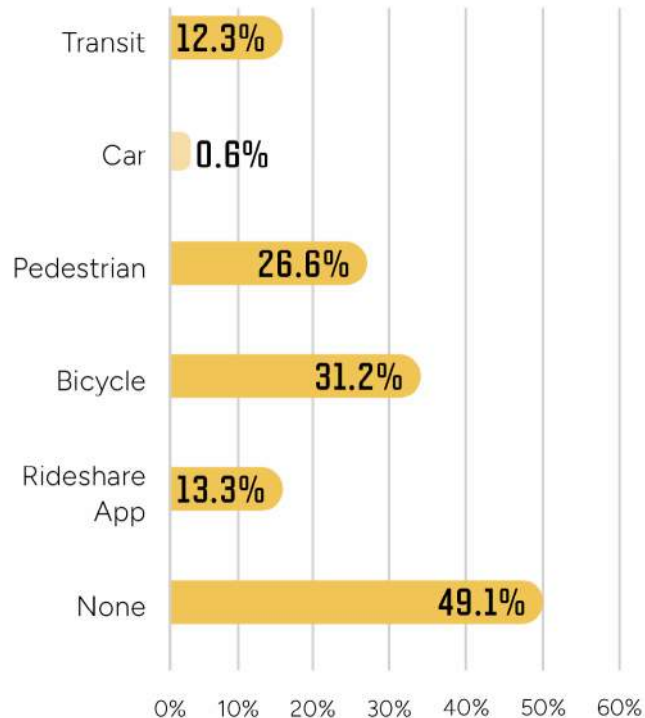
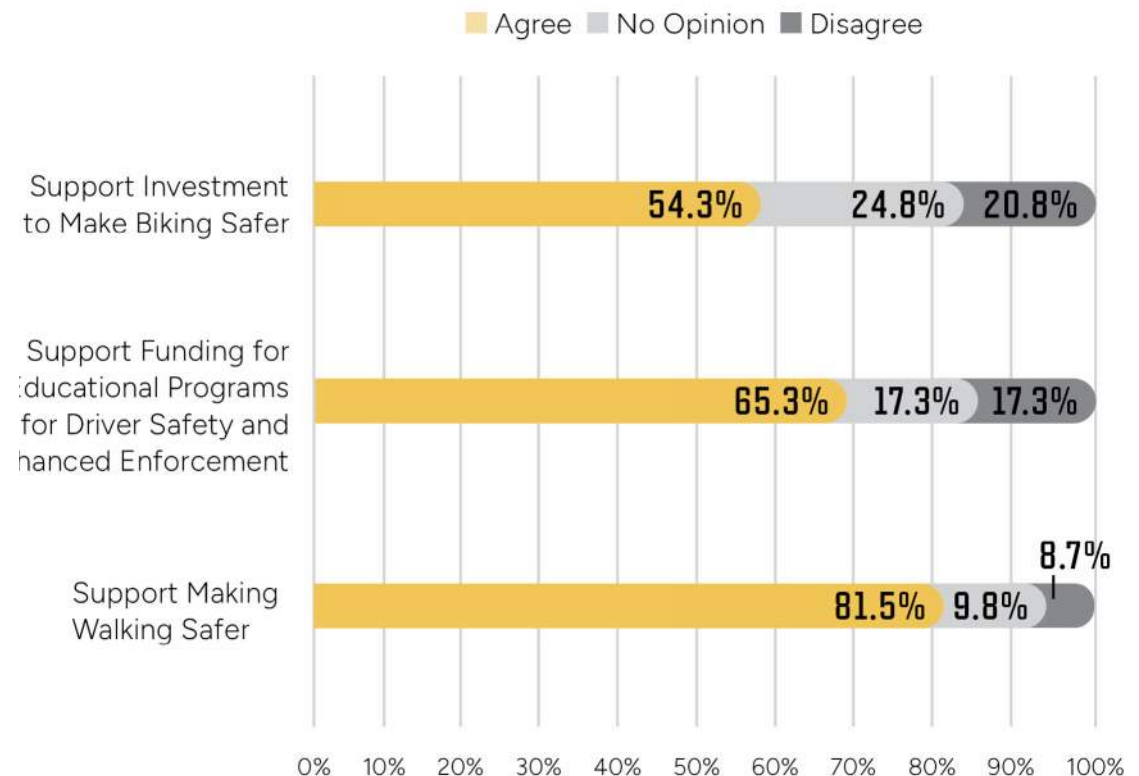
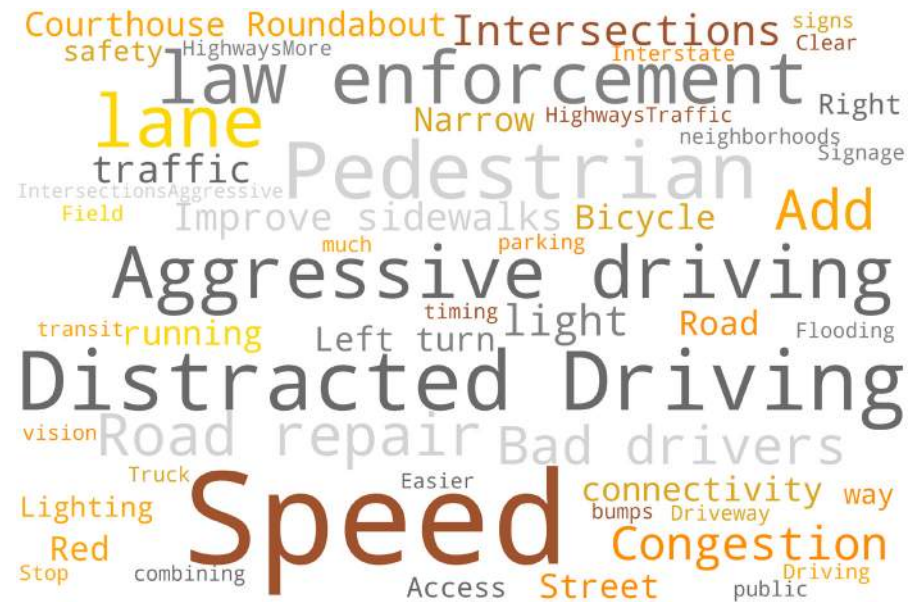


**FIGURE 9: COMMUNITY SUPPORT FOR SAFETY**



Survey participants were asked to identify the most important roadway safety concerns that need attention in the City of Weatherford. The top concerns mentioned in the responses include distracted driving, ignoring traffic laws, aggressive driving, speeding, and poorly maintained roads. **Figure 11** displays a full word cloud of responses.

**FIGURE 11: TOP SAFETY CONCERNS WORD CLOUD**



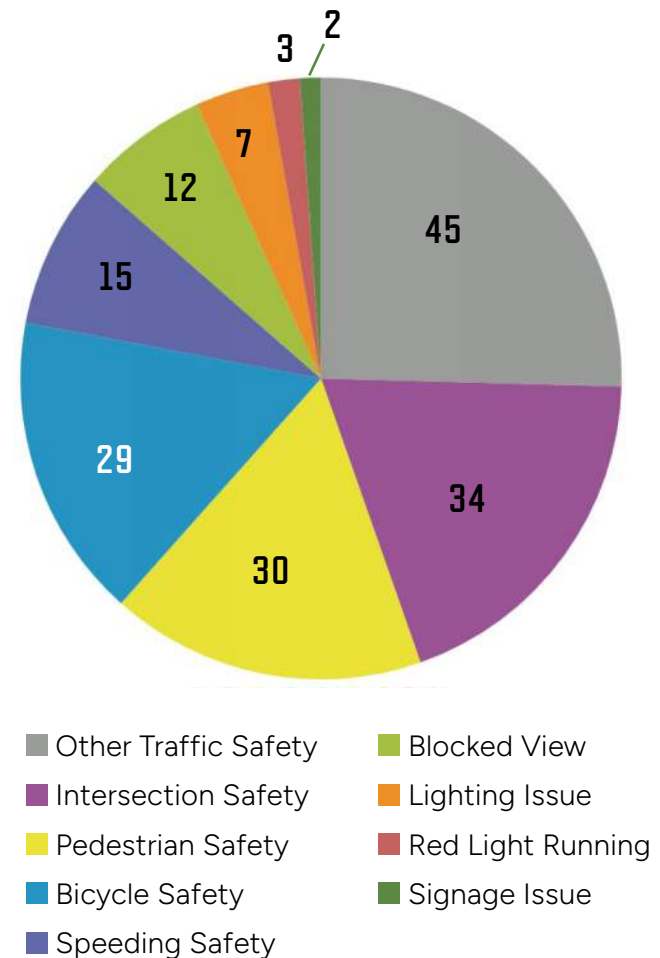


## INTERACTIVE MAP

Visitors to the online interactive map survey were able to provide feedback attached to a pin that could be dropped at specific locations. Respondents have the choice between adding their own comment or upvoting a previous respondent's contribution. These data points allowed the project team to gain a better understanding of the prioritized concerns of the traveling public. The chart seen in **Figure 12** was created to visually show a breakdown of comments received on the interactive map.

**Exhibit 1** on page 16 displays the interactive comments received from the community. It is important to note that though bicycle and pedestrian safety concerns were not a top issue in the written survey, almost 60 comments reference bicycle and pedestrians safety on the interactive map. There could be a few reasons for these discrepancies. For example, on the map, the same person could make multiple comments whereas in the survey, there was only one response per person. Another reason could be that people are more easily able to remember times when they felt unsafe or uncomfortable when they were walking or biking and more aware of their surroundings, including being able to put an exact point on the map. Since the word cloud above drew many conclusions about behavior characteristics, like aggressive driving or distracted driving, and the map focuses more on specific physical characteristics of Weatherford, the discrepancies could be drawn from these differences.

FIGURE 12: INTERACTIVE MAP COMMENTS



### POP-UP EVENTS

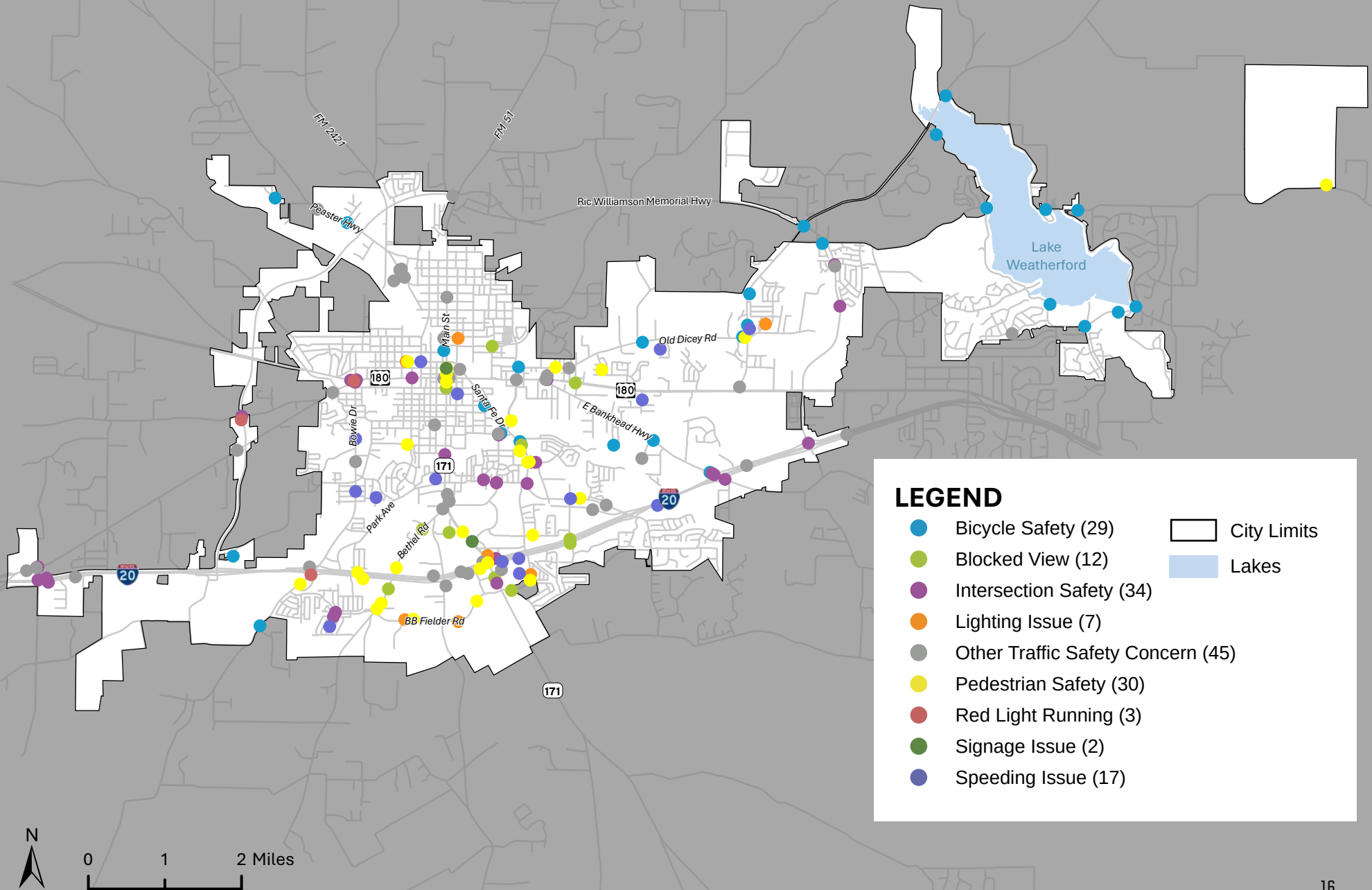
As a part of our outreach, we shared information about the CSAP at First Monday Trade Days in the months of January and March (**Figure 13**). First Monday Trade Days is one of the oldest open-air markets in Texas, located in the heart of the historical district in Weatherford that happens once a month. To engage with the public, there was a poster of Weatherford full of information on crash statistics in the City, project timeline information, and a QR code to the project website and online surveys. Other activities at these events included a jar activity for prioritization and a map activity. Overall, the pop-up events were successful in communicating to the community about the next steps of the plan and how to get involved in the CSAP.

FIGURE 13: WEATHERFORD FIRST MONDAY POP-UP EVENT





## EXHIBIT 1: INTERACTIVE MAP COMMENTS





## CHAPTER 3: CRASH HISTORY

### INTRODUCTION

This chapter examines the crash history, societal cost of crashes, and safety emphasis areas. This chapter serves as a foundation by building an understanding of crash trends to guide the plan's recommendations and create actions to reduce future crashes. Assessing the safety needs specific to Weatherford is crucial in developing a plan that addresses the roadway safety issues present in the City.





## CITYWIDE CRASH TRENDS

Crash data from 2019-2023 was collected from the TxDOT Crash Records Information System (CRIS) and analyzed to determine which roadways have experienced the most crashes in the community. Over the five-year period, there were a total of 4,930 crashes in Weatherford with 532 (10.8%) of them resulting in a fatality (K), serious injury (A), or minor injury (B). In 2021, the highest number of crashes occurred with 1,100 reported. During this time, a total of 85 fatal crashes occurred in Weatherford. **Table 2** (page 19) and **Figure 14** on page 21 display the crashes that happened within city limits from 2019-2023 by crash severity. In 2020 and 2021, less vehicles were on the road due to COVID-19, yet the fatalities were higher than any of the other years shown. This could point to increased reckless driving during those years. Although the total fatalities have decreased since 2021, there are still fatalities occurring and the total crashes have not significantly decreased. It is important that Weatherford focus on creating a road environment with zero fatalities to increase safety in Weatherford. **Exhibit 2** on page 20 gives a good indication of where these crashes occurred within the City of Weatherford. Furthermore, **Exhibit 3** on page 22 shows the locations where fatal, serious injury, and minor injury crashes in Weatherford occurred during the study period.

TABLE 2: 2019-2023 CRASHES WITHIN WEATHERFORD BY SEVERITY

| YEAR         | TOTAL CRASHES | FATALITIES<br>(% OF TOTAL) | SERIOUS INJURY<br>(% OF TOTAL) | MINOR INJURY<br>(% OF TOTAL) | NON-INJURY<br>CRASHES<br>(% OF TOTAL) |
|--------------|---------------|----------------------------|--------------------------------|------------------------------|---------------------------------------|
| 2019         | 919           | 3 (0.3%)                   | 17 (1.8%)                      | 77 (8.4%)                    | 822 (89.4%)                           |
| 2020         | 880           | 6 (0.7%)                   | 17 (1.9%)                      | 61 (6.9%)                    | 796 (90.5%)                           |
| 2021         | 1,100         | 6 (0.5%)                   | 18 (1.6%)                      | 97 (8.8%)                    | 979 (89.0%)                           |
| 2022         | 1,023         | 1 (0.1%)                   | 19 (1.9%)                      | 95 (9.3%)                    | 908 (88.8%)                           |
| 2023         | 1,008         | 2 (0.2%)                   | 14 (1.4%)                      | 99 (9.9%)                    | 893 (88.6%)                           |
| <b>Total</b> | <b>4,930</b>  | <b>18 (0.4%)</b>           | <b>85 (1.7%)</b>               | <b>429 (8.7%)</b>            | <b>4,398 (89.2%)</b>                  |



**EXHIBIT 2: WEATHERFORD CRASH HEAT MAP**

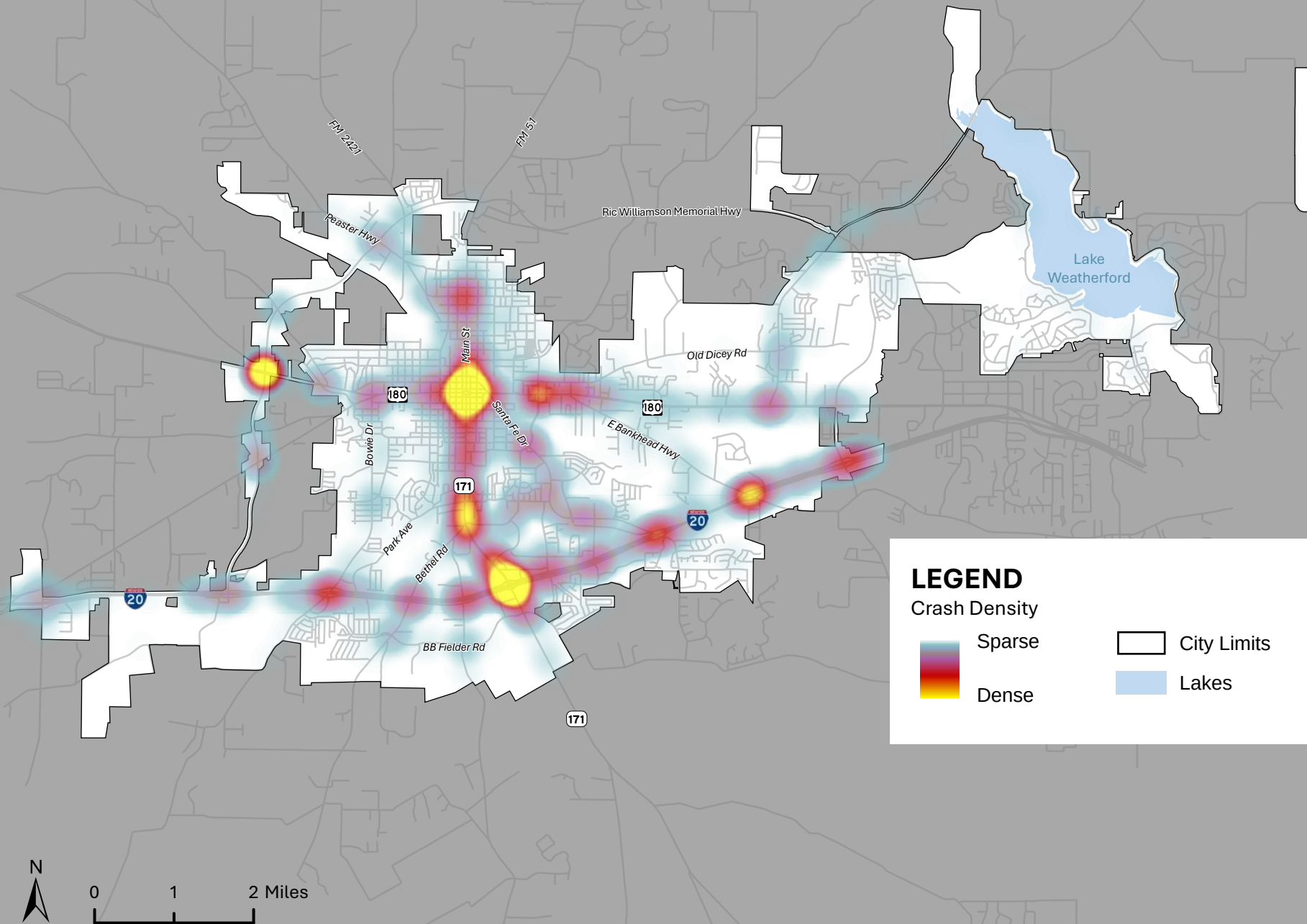
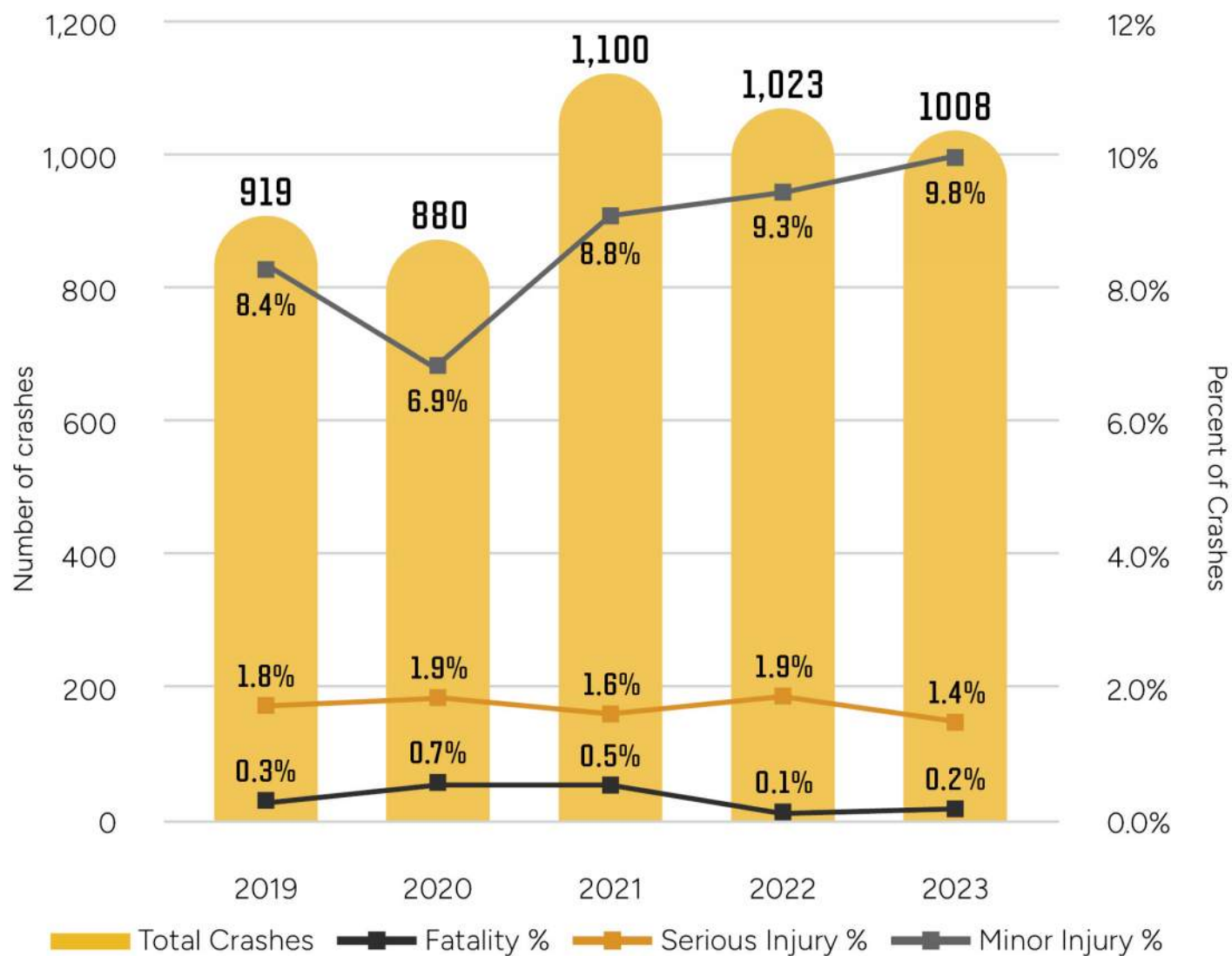
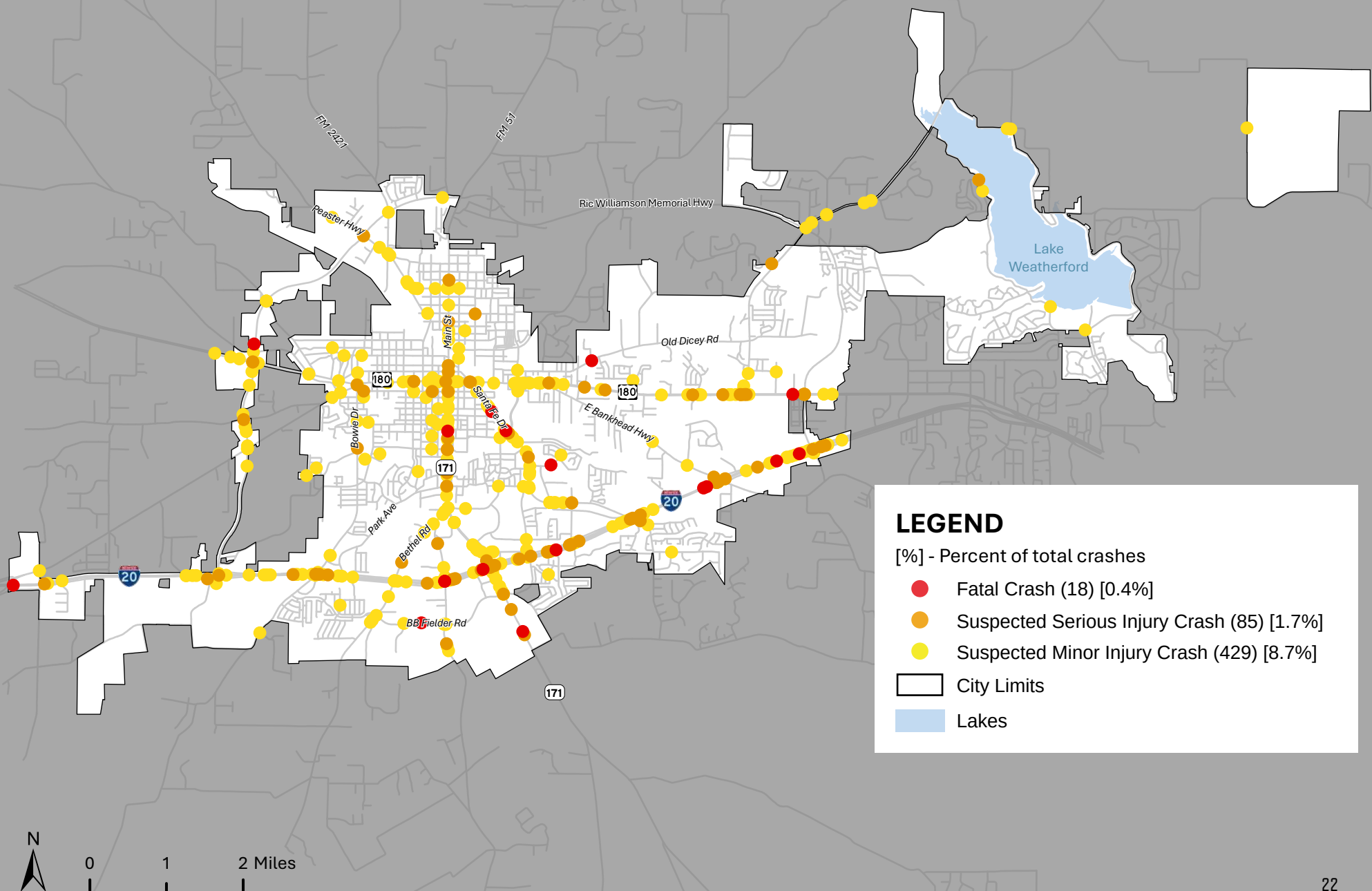


FIGURE 14: CRASHES WITHIN WEATHERFORD BY SEVERITY (2023-2025)





### EXHIBIT 3: CITYWIDE KAB CRASHES



### TEXAS STRATEGIC HIGHWAY SAFETY PLAN EMPHASIS AREAS

In 2022, the Traffic Safety Division of TxDOT and Department of Public Safety (DPS) updated the Texas Strategic Highway Safety Plan (SHSP) to coordinate the statewide efforts in reducing fatalities and injuries on state and local roadways. A part of this update focused on creating a Safe System, which puts the responsibility of severe crashes on the system, rather than solely on human failure. The SHSP analyzed Texas crash data to identify the plan's emphasis areas, which address the crash types, user behaviors, and vehicle types that produce the most frequent and severe crashes. The data gathered in this section of the plan regarding these emphasis areas comes from TxDOT SHSP (2022) (**Table 3** on page 25). TxDOT CRIS data for Weatherford has allowed for crashes concerning the following emphasis areas to be mapped:



### **Lane Departure**

crashes occurring when a vehicle departs from the dedicated lane for its direction of travel



### **Intersections**

occurs within an intersection or is related to the movement through an intersection



### **Unrestrained Persons**

an occupant of a vehicle was not using a restraint



### **Impaired Driving**

a driver involved in the crash was under the influence of drugs or alcohol, had been drinking, or had been taking medicine



### **Speed Related**

a vehicle was above the speed limit, under the speed limit but faster than safe conditions, or speed was not properly controlled



### **Distracted Driving**

the driver was distracted from their primary tasks of navigating the vehicle



### **Bicycle & Pedestrian**

crashes involve pedestrians or bicyclists



### **Post-Crash Care\***

services after a crash to reduce the potential severity of the crash and other crashes in the future

*\*There are no crashes to be mapped for the Post-Crash Care emphasis area as it is concerned with what occurs following a crash event.*

# WEATHERFORD

## SAFETY ACTION PLAN

### Weatherford vs Texas Crash Trends

As a whole, the City of Weatherford is relatively on par with Texas when it comes to crash trends by safety emphasis areas. As you can see from **Figure 15**, most emphasis areas are ranked similarly in both, with the exception of distracted driving being a higher crash statistic than lane departure in Weatherford. Where we can see the major difference between the two is in the percentage. In the top three categories, intersection safety, speed related and distracted driving, the percentages are all higher in Weatherford than the Texas average. With this trend, The City of Weatherford should prioritize these three categories, and some of the actions in **Chapter 6: Action Plan** will focus on making safety a priority in Weatherford.

The arrows in **Figure 15** indicate that in Weatherford, a higher percentage of distracted driving crashes, and a lower percentage of roadway and lane departure crashes have occurred compared to the overall state of Texas.

FIGURE 15: WEATHERFORD VS TEXAS EMPHASIS AREA STATISTICS

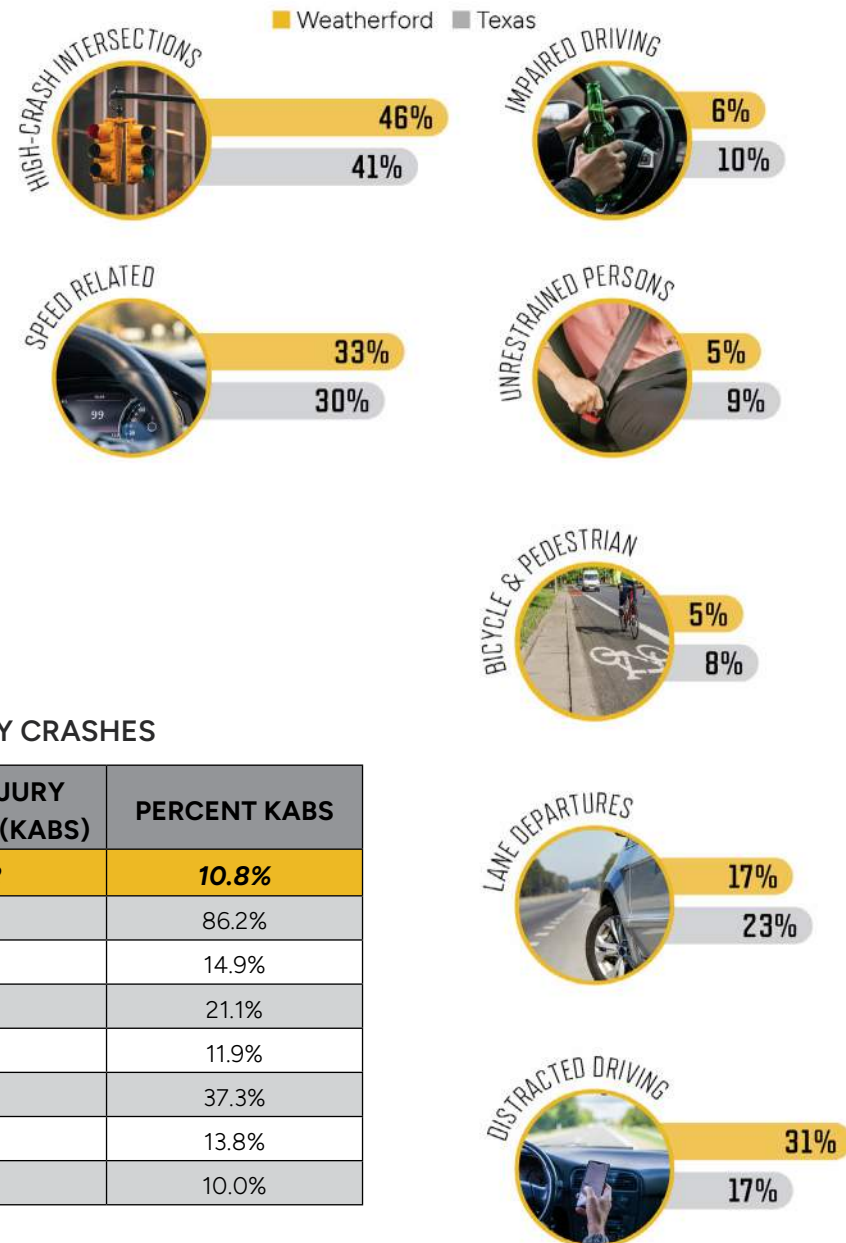


TABLE 3: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES

| CRASH TYPE               | TOTAL CRASHES | % TOTAL     | HIGH INJURY CRASHES (KABS) | PERCENT KABS |
|--------------------------|---------------|-------------|----------------------------|--------------|
| <b>All Crashes</b>       | <b>4,930</b>  | <b>100%</b> | <b>532</b>                 | <b>10.8%</b> |
| Bike & Pedestrian        | 29            | 0.6%        | 25                         | 86.2%        |
| Lane Departure           | 591           | 12.0%       | 88                         | 14.9%        |
| Impaired Driving         | 147           | 3.0%        | 31                         | 21.1%        |
| Distracted Driving       | 1382          | 28.0%       | 164                        | 11.9%        |
| Unrestrained Occupant(s) | 67            | 1.4%        | 25                         | 37.3%        |
| Speed                    | 1,281         | 26.0%       | 177                        | 13.8%        |
| Intersection             | 2,448         | 49.7%       | 246                        | 10.0%        |



### Lane Departure

A roadway/lane departure crash occurs when a vehicle travels outside of the appropriate right of way, straying into the median, into the shoulder, off the roadway, or a vehicle traveling in the opposite direction (**Figure 16**). Lane departure crashes pose a great danger for drivers because they most often happen between a vehicle and nonmoving structures. When a collision occurs between these two objects, the immovable object quickly exerts an immense force upon the vehicle, which increases the likelihood of fatality or serious injury. Crashes of this type are more likely to occur in dark conditions, as they limit the ability for the driver to see the road. The Safe System approach intends to decrease the frequency and severity of these types of crashes through infrastructure safety treatments on roads.

In Weatherford, Roadway & Land Departure contributed greatly to the presence of crashes in the City. These crashes most occurred on I-20, US 180, and Main Street From 2019-2023, Weatherford experienced 627 roadway departures, 103 of which resulted in injuries or fatalities (**Table 4**).

FIGURE 16: LANE DEPARTURES



TABLE 4: WEATHERFORD LANE DEPARTURE CRASHES COMPARED TO CITYWIDE TOTAL

|                           |                                                                                     |                        |                        |                                   |                       |
|---------------------------|-------------------------------------------------------------------------------------|------------------------|------------------------|-----------------------------------|-----------------------|
| ALL<br>CRASHES            |   | 4,930<br>total crashes | 100%<br>percent total  | 532<br>high injury crashes (KABs) | 10.8%<br>percent KABs |
| LANE DEPARTURE<br>CRASHES |  | 627<br>total crashes   | 12.7%<br>percent total | 103<br>high injury crashes (KABs) | 16.4%<br>percent KABs |

## SAFETY ACTION PLAN

**LEGEND**

- Lane Departure Fatal Crash (9)
- Lane Departure Serious Injury Crash (20)
- Lane Departure Minor Injury Crash (74)
- Lane Departure Possible & Non-Injury Crash (524)
- City Limits
- Lakes



**Intersections**

Intersection-related crashes occur within the boundaries of an intersection or in relation to the movement through an intersection or exit (**Figure 17**). Due to intersections allowing vehicles to move in a great number of directions, there are many ways that collisions can occur. The irregularity in crash types makes it difficult to determine the best focus for preventive measures. The SHSP notes that 35% of crashes occur at an angle and 28% of crashes come from left turns. Factors that may increase the likelihood of an intersection-related crash include failure to yield right of way, speed, and disregarded traffic signals. Reducing the frequency of traffic violations at and around intersections would help to diminish the frequency and severity of associated crashes.

From 2019-2023, intersections were noted as a factor in half of Weatherford’s crashes. Around half of the fatalities and injuries stem from crashes in Weatherford. A great number of these crashes in Weatherford occurred along Main Street and surrounding roads, especially near downtown and I-20. There were 2448 intersection-related crash events with 246 resulting in injury or fatality from 2019-2023 in Weatherford (**Table 5**). While a large portion of the crashes that occurred within the study period were intersection-related, **Table 6** lists the intersections in the City with the largest number of crashes. **Exhibit 5** on page 29 shows the locations of these high crash intersections.

**FIGURE 17: HIGH-CRASH INTERSECTIONS**



**TABLE 5: WEATHERFORD INTERSECTION-RELATED CRASHES COMPARED TO CITYWIDE TOTAL**

|                        |                                                                                     |                               |                               |                                          |                              |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------|------------------------------|
| <b>ALL<br/>CRASHES</b> |  | <b>4,930</b><br>total crashes | <b>100%</b><br>percent total  | <b>532</b><br>high injury crashes (KABs) | <b>10.8%</b><br>percent KABs |
| <b>INTERSECTIONS</b>   |  | <b>2,448</b><br>total crashes | <b>49.7%</b><br>percent total | <b>246</b><br>high injury crashes (KABs) | <b>10.0%</b><br>percent KABs |

# WEATHERFORD

## SAFETY ACTION PLAN

### EXHIBIT 5: INTERSECTION RELATED CRASHES

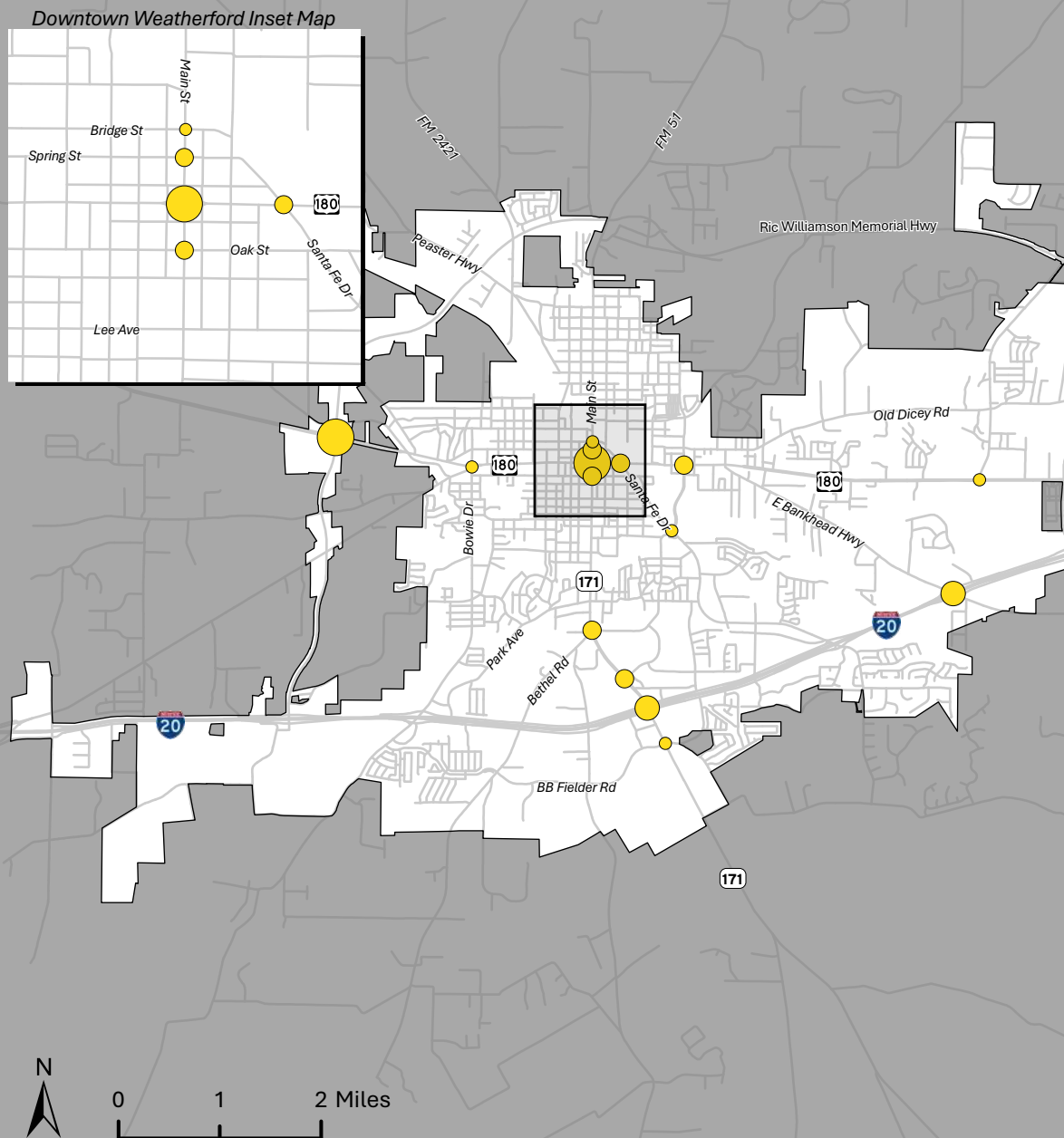


TABLE 6: HIGH CRASH INTERSECTIONS

| RANK | INTERSECTION                               | CRASH COUNT |
|------|--------------------------------------------|-------------|
| 1    | US 180 and Rick Williamson Memorial Hwy    | 180         |
| 2    | US 180 and Main St                         | 154         |
| 3    | Main St and I-20                           | 124         |
| 4    | I-20 and Bankhead Dr                       | 117         |
| 5    | Main St and Bethel Rd/College Park Dr      | 50          |
| 6    | Fort Worth Hwy and Denton St               | 47          |
| 7    | Main St and Martin Dr                      | 47          |
| 8    | Main St and Oak St                         | 40          |
| 9    | Main St and Spring St                      | 37          |
| 10   | Fort Worth Hwy and Santa Fe Dr/Spring St   | 36          |
| 11   | Denton St and Santa Fe Dr                  | 33          |
| 12   | Fort Worth Hwy and Azle Hwy                | 32          |
| 13   | Main St and B B Fielder Dr                 | 30          |
| 14   | Main St and Bridge St                      | 29          |
| 15   | Mineral Wells Hwy, Ranger Hwy and Bowie Dr | 28          |

### LEGEND

- 150 - 180 Crashes
- 50 - 150 Crashes
- 35 - 50 Crashes
- <35 Crashes
- City Limits
- Lakes



### Unrestrained Persons

Collisions involving unrestrained persons occur when there is a person who is not wearing a seatbelt or child restraint (**Figure 18**). Without wearing restraints, people involved in crashes have nothing to stop or limit the extent to which the force of the crash is transferred to their body, greatly increasing their chance of injury or fatality. In 2021, 27% of the fatalities in Texas crashes involved people who were not wearing seat belts. Wearing a restraint in a vehicle is the most effective way to save a person's life or reduce their chance of injury.

In Weatherford, unrestrained persons were involved in only 1.4% of total crashes. Despite this low number, over a third of these crashes resulted in injury or fatality, highlighting the severity of this emphasis area. Crashes involving unrestrained persons were dispersed throughout the City with a slight concentration along I-20. 67 crashes involving unrestrained persons occurred from 2019-2023 in Weatherford, 25 of which resulted in KABs (fatality, serious injury, or minor injury) (**Table 7**).

FIGURE 18: UNRESTRAINED PERSONS



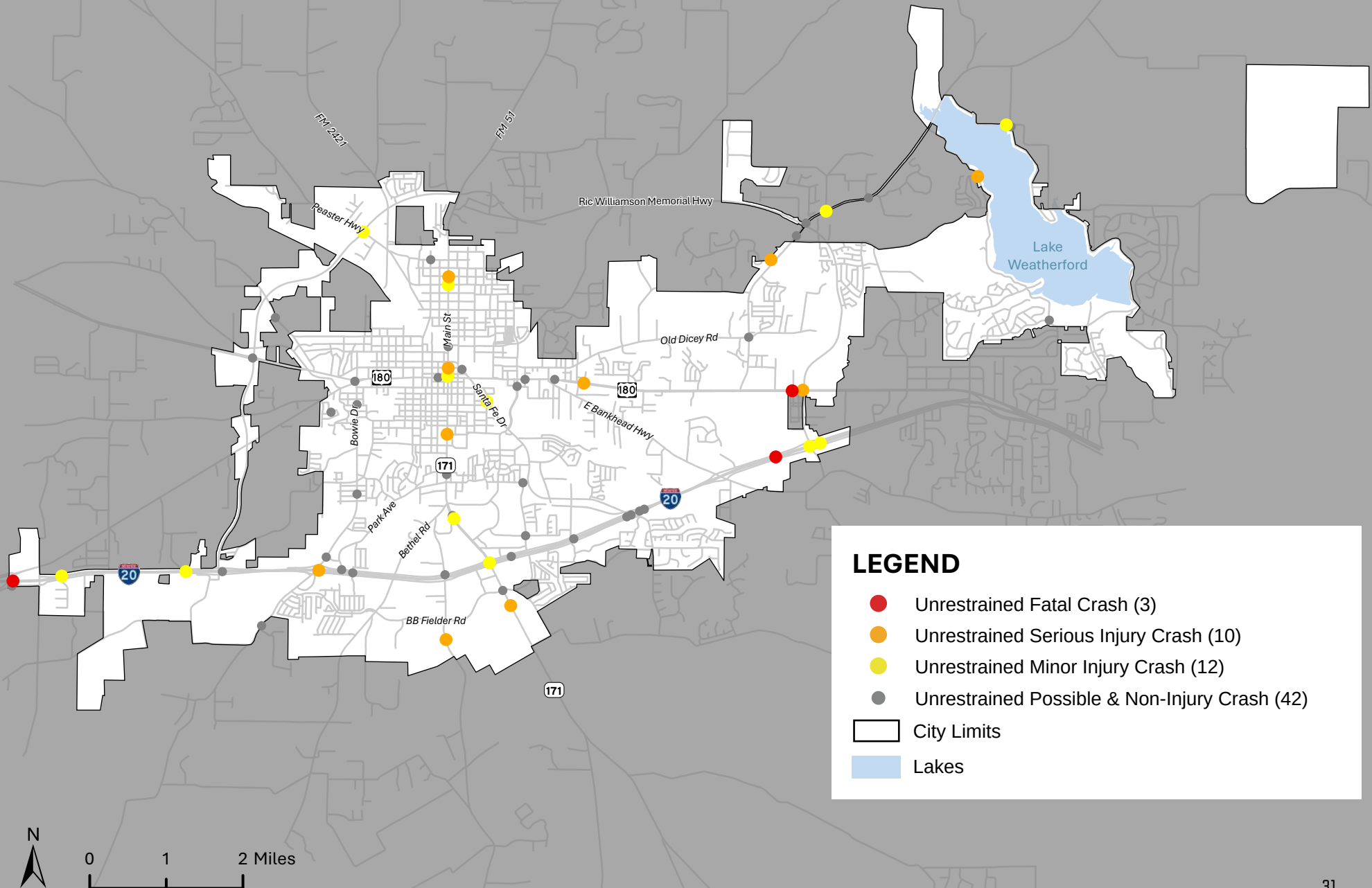
TABLE 7: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES BY UNRESTRAINED PERSONS CRASHES

|                                |                                                                                     |                        |                       |                                   |                       |
|--------------------------------|-------------------------------------------------------------------------------------|------------------------|-----------------------|-----------------------------------|-----------------------|
| ALL<br>CRASHES                 |   | 4,930<br>total crashes | 100%<br>percent total | 532<br>high injury crashes (KABs) | 10.8%<br>percent KABs |
| UNRESTRAINED<br>PERSON CRASHES |  | 67<br>total crashes    | 1.4%<br>percent total | 25<br>high injury crashes (KABs)  | 37.3%<br>percent KABs |

# WEATHERFORD

## SAFETY ACTION PLAN

### EXHIBIT 6: UNRESTRAINED PERSONS CRASHES





# Impaired Driving

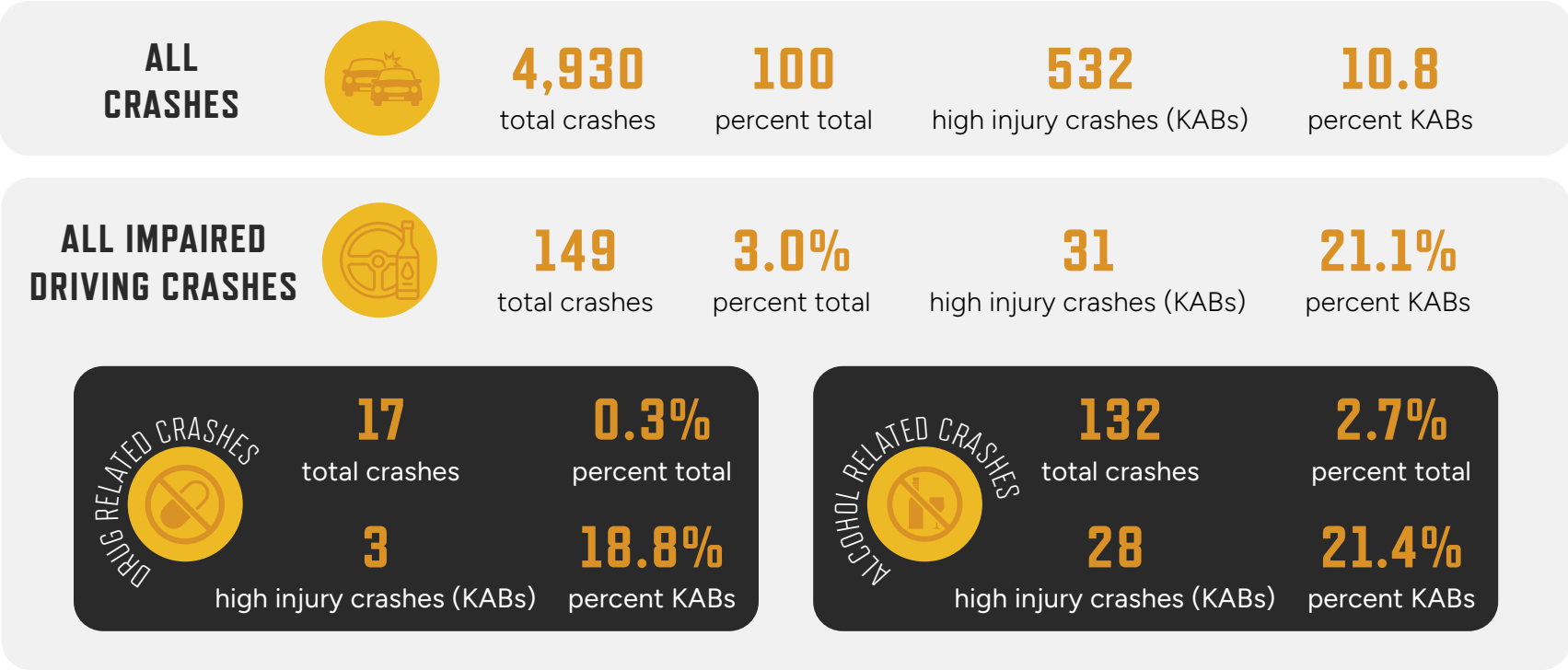
Inappropriate driver behavior has been shown to have a negative impact on the frequency and severity of crashes. Driving impaired, constitutes that the driver had been drinking, taking medicine, under the influence of alcohol, or under the influence of drugs (**Figure 19**). Impairment reduces the ability for the driver to make careful decisions. The poor judgements begin when the impaired person chooses to operate a vehicle. Crashes involving these drivers are particularly severe due to the driver's inability to control the vehicle, which puts others on the road in danger. The person that is in the most danger, however, is themselves, as most of this crash type only involves the impaired driver's vehicle. Crashes resulting in fatality or serious injury occur throughout the day but have the highest concentration from 10 pm to 2 am. Addressing these crash types require the reduction of the instances of impaired driving.

Impaired driving crashes in Weatherford make up 3.0% of the City's total crashes. Many of these crashes took place within the downtown area or along I-20. 147 impaired driver crashes took place in Weatherford from 2019-2023. 31 of these collisions resulted in fatality or injury (**Table 8**).

FIGURE 19: IMPAIRED DRIVING



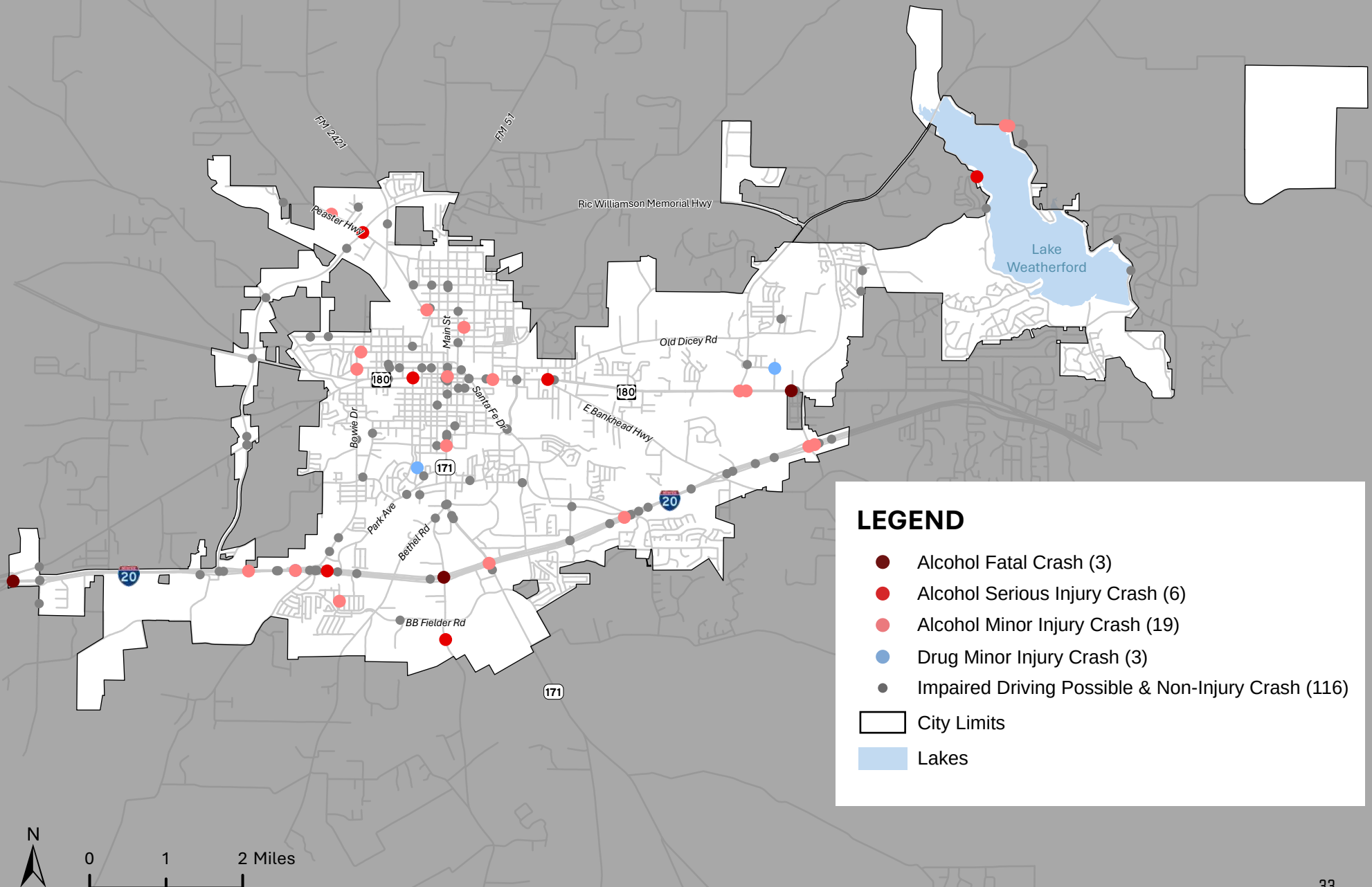
TABLE 8: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES BY IMPAIRED DRIVING CRASHES



# WEATHERFORD

## SAFETY ACTION PLAN

### EXHIBIT 7: IMPAIRED DRIVING CRASHES





## Speed-Related

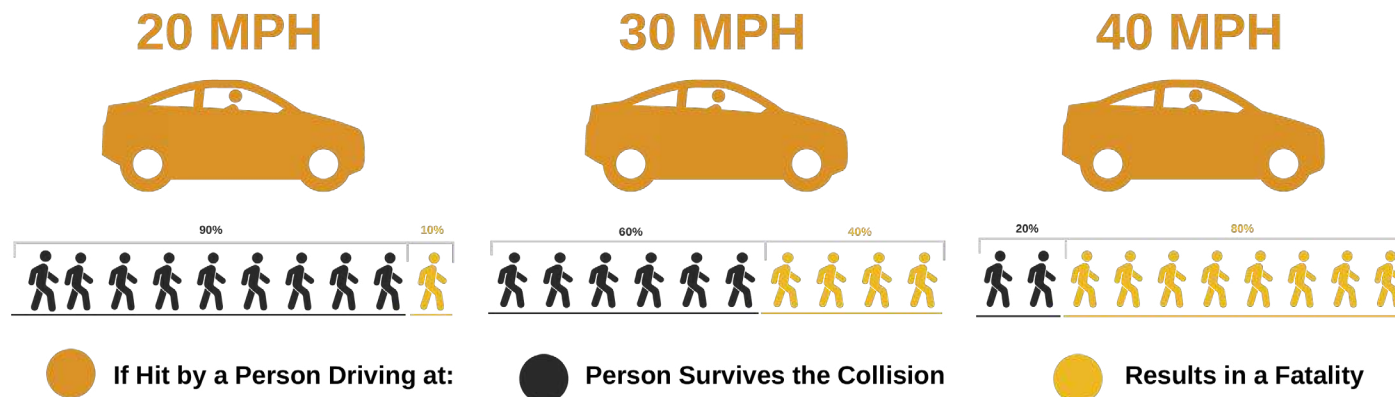
Speed related crashes occur when drivers operate their vehicle over the speed limit, at unsafe speeds (too fast for road conditions even if lower than posted speed limit), or with failure to control speed (**Figure 20**). Due to the exponential increase in energy, high speed crashes have an increased likelihood of fatalities and serious injuries. The SHSP notes that most speed related crashes occur on highways and during the daytime. TxDOT believes that identifying road segments which should become speed zones is necessary to prevent speed-related crashes.

Over a quarter of all crashes in Weatherford have been speed related. These crashes tend to occur along Main Street, I-20, and US180. From 2019-2023, 1,283 speed related crashes occurred in Weatherford; 177 of these (13.8%) brought about fatality or injury (**Table 9**).

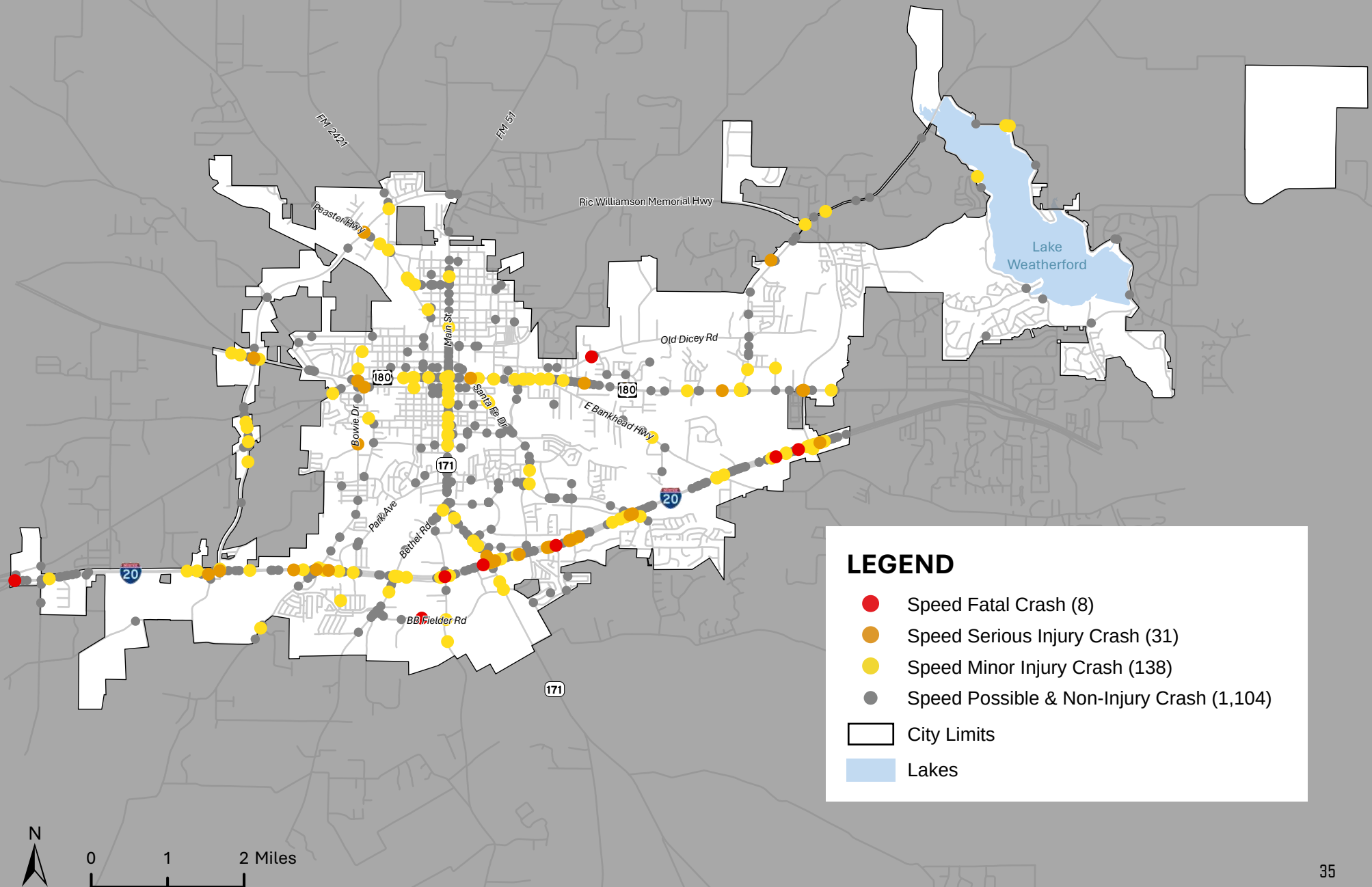
**TABLE 9: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES BY SPEED-RELATED CRASHES**

|                                  |                                                                                   |                               |                               |                                          |                              |
|----------------------------------|-----------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------|------------------------------|
| <b>ALL<br/>CRASHES</b>           |  | <b>4,930</b><br>total crashes | <b>100%</b><br>percent total  | <b>532</b><br>high injury crashes (KABs) | <b>10.8%</b><br>percent KABs |
| <b>SPEED RELATED<br/>CRASHES</b> |  | <b>1,283</b><br>total crashes | <b>26.0%</b><br>percent total | <b>177</b><br>high injury crashes (KABs) | <b>13.8%</b><br>percent KABs |

**FIGURE 20: VEHICLE SPEED COMPARISON TO CHANCE OF PEDESTRIAN FATALITY**



### EXHIBIT 8: SPEED RELATED CRASHES





**Distracted Driving**

Distracted driving occurs when there is anything that gets the attention of the driver from the primary task of navigating the vehicle (**Figure 21**). Distracted driving reduces the ability for the driver to respond to other vehicles or changing road conditions, creating a dangerous environment for themselves and others. Although research suggests distracted driving is common, it is difficult for it to be noticed and measured. When reporting distracted driving in crashes, any details about the nature of the distraction must be included in the narrative section of the report, which makes it difficult to analyze the trends of distracted driving.

Distracted driving crashes made up 28.0% of crashes in Weatherford. Crashes of this type have a great concentration around Main Street, especially near downtown and near I-20. 1,393 crashes from 2019-2023 in Weatherford took place including distracted drivers, and 164 of these led to fatality or serious injury (**Table 10**).

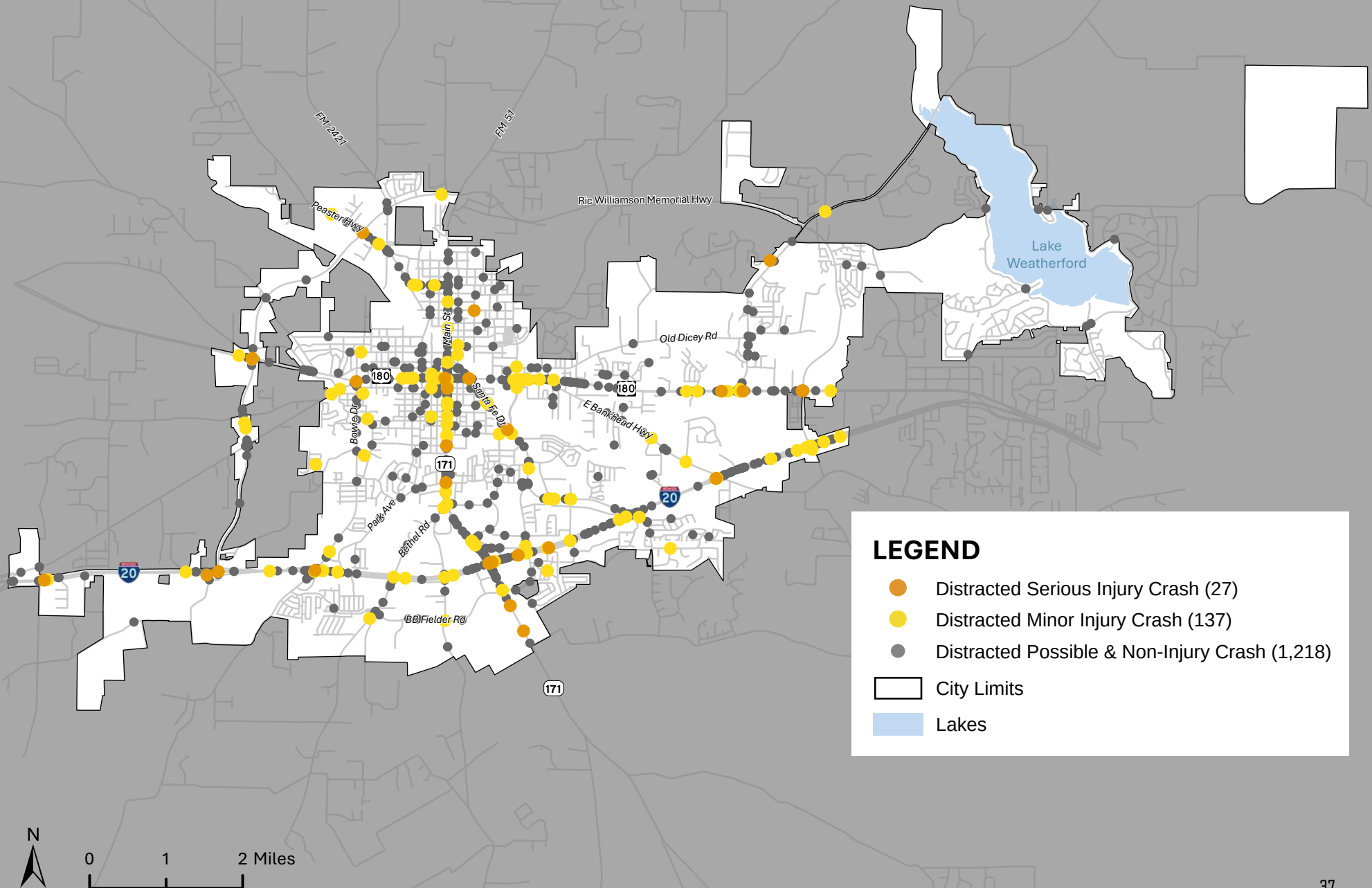
FIGURE 21: DISTRACTED DRIVING



TABLE 10: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES BY DISTRACTED DRIVING-RELATED CRASHES

|                               |                                                                                     |                        |                        |                                   |                       |
|-------------------------------|-------------------------------------------------------------------------------------|------------------------|------------------------|-----------------------------------|-----------------------|
| ALL<br>CRASHES                |   | 4,930<br>total crashes | 100%<br>percent total  | 532<br>high injury crashes (KABs) | 10.8%<br>percent KABs |
| DISTRACTED<br>DRIVING CRASHES |  | 1,393<br>total crashes | 28.0%<br>percent total | 164<br>high injury crashes (KABs) | 11.8%<br>percent KABs |

### EXHIBIT 9: DISTRACTED DRIVING CRASHES





# Bicycle & Pedestrian

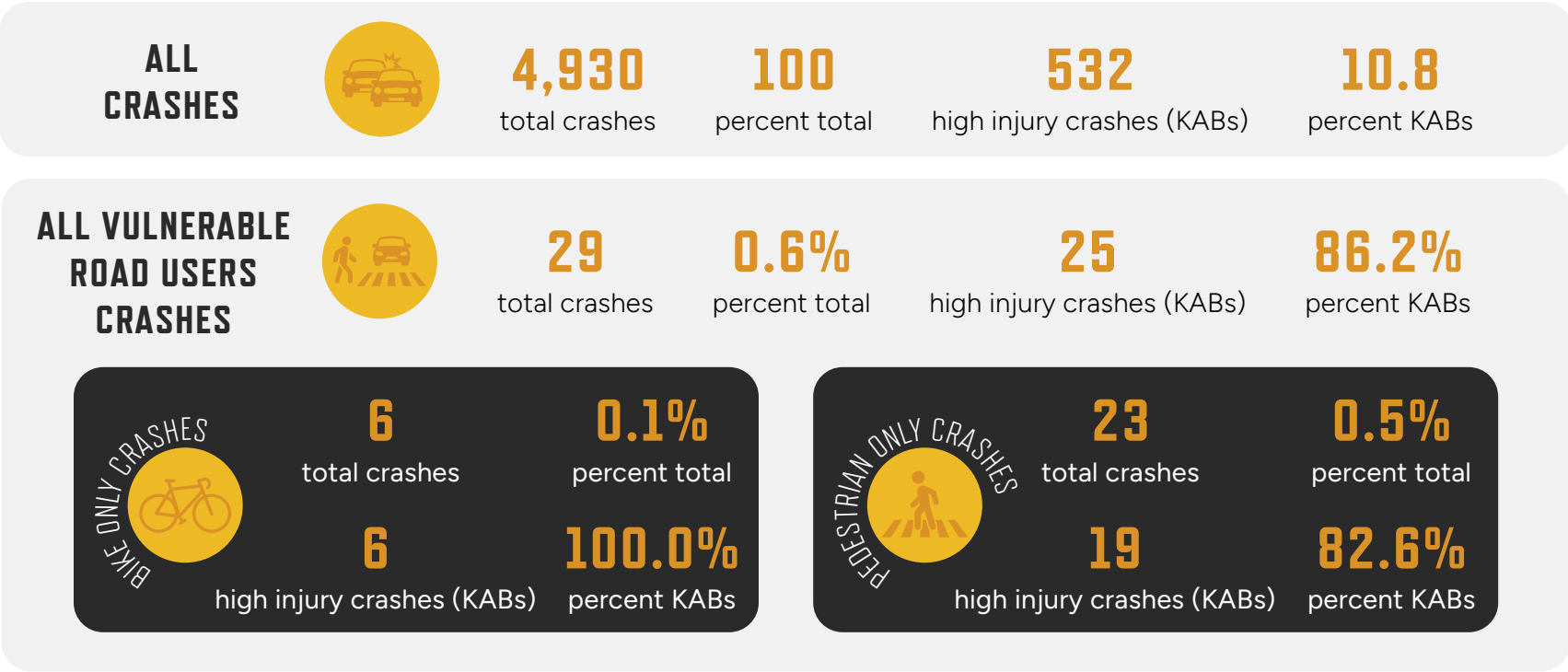
Vulnerable Road Users (VRUs) are defined as pedestrians and bicyclists, who propel themselves with their own leg power (**Figure 22**). In the State of Texas, crashes involving VRUs are more likely to end in serious injury or fatality when they occur in dark conditions. Due to their lack of protection, pedestrians and bicyclists have the highest risk of suffering from fatality or injury from a crash.

There were only a few crashes involving vulnerable road users in Weatherford. Even with this small number of crashes, nearly all (86.2%) of these resulted in fatality or injury. Collisions with VRUs were moderately clustered around downtown Weatherford. There were 29 bicycle and pedestrian crashes in 2019-2023 in Weatherford, and 25 of these were KAB crashes (**Table 11**).

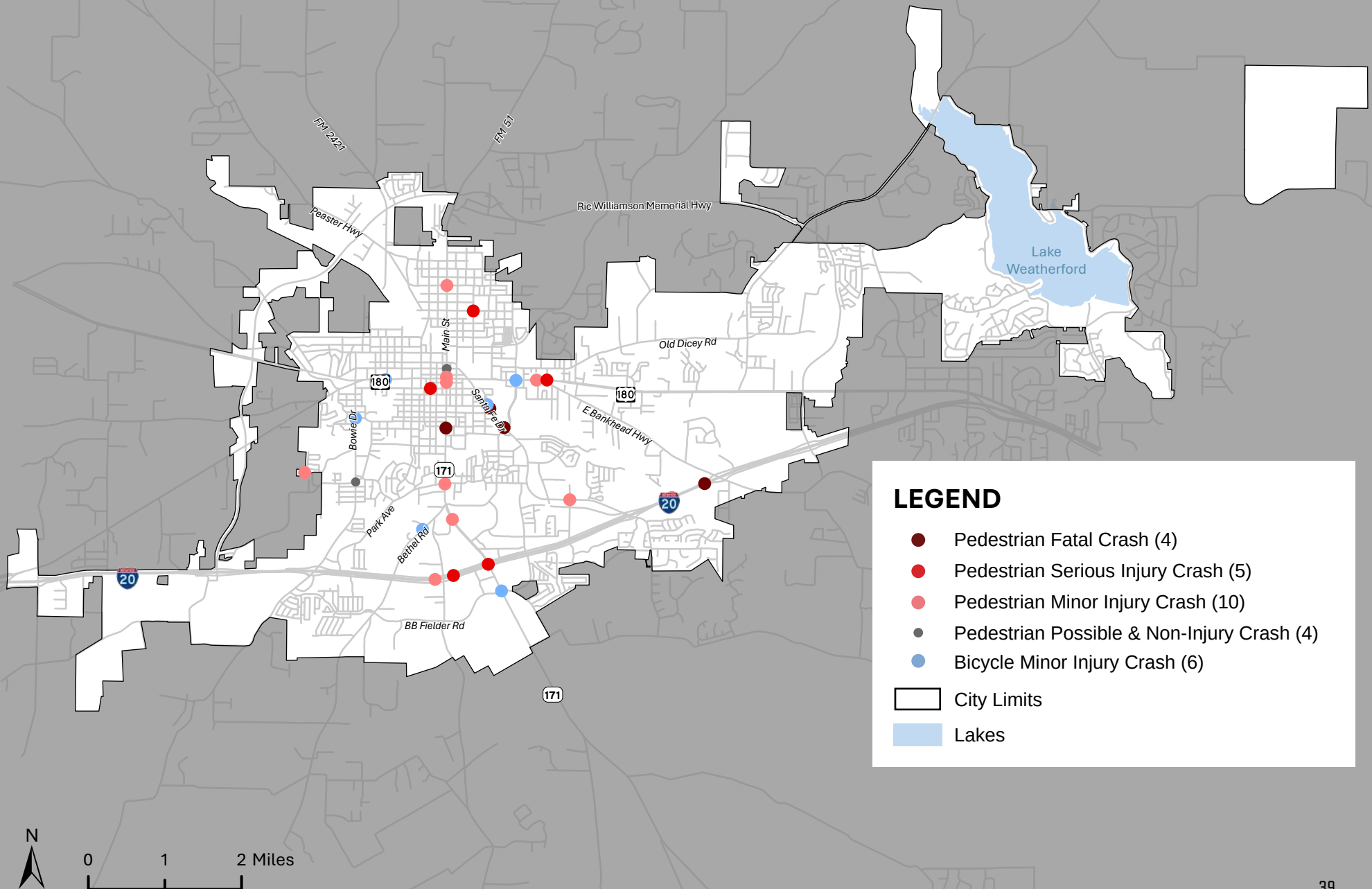
FIGURE 22: BICYCLE & PEDESTRIAN



TABLE 11: WEATHERFORD TOTAL CRASHES AND HIGH INJURY CRASHES BY VULNERABLE ROAD USER CRASHES



### EXHIBIT 10: BICYCLE AND PEDESTRIAN CRASHES





## Post-Crash Care

Post-crash care is concerned with reducing the frequency of fatalities and injuries after a crash has happened. The SHSP notes that although they are undesirable, crashes are inevitable. Thus, it is necessary to understand what resources would be needed to mitigate the occurrence of harm to people involved in the crash. Post-crash care includes: first responders, trauma and emergency medical care, crash investigation, traffic incident management, and justice. As this list shows, post-crash care is not limited to the immediate medical services provided after a crash; it also extends the changes made to the road system that will reduce the severity of future crashes (**Figure 23**).

## SOCIETAL COST OF CRASHES

A trend that highlights the impact crashes have on communities is the societal cost of crashes. Every crash, regardless of its severity, ultimately costs money. The costs span across a wide range of areas including medical costs, property damage, decrease in economic productivity, and quality of life. Societal costs are calculated by assigning a monetary value to the impact of crashes by their severity. These costs are a blend of economic costs and the monetized value of impacts. The values used in this analysis are from the Highway Safety Benefit-Cost Analysis Guide from the Federal Highway Administration (FHWA) Safety Program.

The total costs of the crashes that occurred in the study area between 2019-2023 are over \$475 million with fatal crashes making up approximately 44% of the total cost. The cost breakdown by severity is shown in the table below (**Table 12**).

**TABLE 12: SOCIETAL COST OF CRASHES IN WEATHERFORD CRASHES**

| CRASH SEVERITY                                        | SOCIETAL CRASH PER CRASH* | WEATHERFORD CRASHES | SOCIETAL COST OF CRASHES |
|-------------------------------------------------------|---------------------------|---------------------|--------------------------|
| K – Fatal Injury                                      | \$11,637,947              | 18                  | \$209,483,046            |
| A – Suspected Serious Injury                          | \$674,353                 | 85                  | \$57,320,005             |
| B – Suspected Minor Injury                            | \$204,143                 | 429                 | \$87,577,347             |
| C – Possible Injury                                   | \$129,001                 | 581                 | \$74,949,581             |
| Non-injury and Unknown                                | \$12,108                  | 3817                | \$46,216,236             |
| <b>Total Societal Cost of Crashes in Weatherford:</b> |                           |                     | <b>\$475,546,215</b>     |

\*FHWA Highway Safety Benefit–Cost Analysis Guide

**FIGURE 23: POST CRASH CARE**





## CHAPTER 4: HIGH INJURY NETWORK & HIGH RISK NETWORK

### INTRODUCTION

Chapter 4 provides decision making tools created to aid in project selection and prioritization. A key component of this plan is the identification and analysis of areas with high rates of fatalities, injuries, and risks. These locations are identified in Weatherford through the development of the High Injury Network (HIN) and the High Risk Network (HRN). This section of the CSAP provides insight into details of these networks, highlighting their significance, methodology of identification, and final results.





To assist in identifying specific locations for countermeasure identification, two data-driven analyses were conducted on the City's roads to create the HIN and HRN. Each analysis utilizes different methods to identify corridors and intersections in need of enhanced safety, and **Table 13** summarizes the key differences between both networks. The primary takeaway in comparing the two networks is that the HIN relies on crash history, while the HRN considers the design attributes of a roadway. Roadways on the HRN may not be experiencing high amounts of crashes, but the design of the road could put it at risk for having a severe crash issue.

Both reactive and proactive approaches to safety are necessary depending on the situation and project priorities. Ultimately, both networks are meant to aid in the decision-making process by providing information about which roadways should be prioritized when making transportation safety improvements.

**TABLE 13: DIFFERENCES BETWEEN HIGH INJURY NETWORK AND HIGH RISK NETWORK**

|                                 | HIGH INJURY NETWORK                                          | HIGH RISK NETWORK                                                                             |
|---------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Safety Planning Approach</b> | Reactive – only roads where crashes have previously occurred | Proactive – roads that have similar characteristics with high crash roadways                  |
| <b>Methodology Source</b>       | Highway Safety Manual – Critical Crash Rate Method           | Utilizes the Federal Highway Administration's system-wide safety planning process             |
| <b>Data Inputs</b>              | Crashes, road classification, traffic volumes                | Crash data, roadway design characteristics (such as lane width, number of lanes, median type) |

## HIGH INJURY NETWORK

The HIN is a network of road segments and intersections in Weatherford that experience a higher-than-average rate of crashes resulting in fatal, severe, and minor injuries (KABs). This network is meant to assist the City in prioritizing future transportation projects and investments. Identifying road segments with the most severe and frequent crashes is the first step in developing countermeasures and policy recommendations to improve safety for all.

### CRITICAL CRASH RATE METHOD

Calculating critical crash rates involves comparing roadway segments with similar functional classes and contexts, normalized by vehicle miles traveled (VMT). If the observed crash rate on a segment exceeds the expected crash rate, it is flagged to potentially be added to the HIN. These steps are further detailed in **Chapter 4** of the Highway Safety Manual (pages 4-41 – 4-45; Section 4.4.2.5).

Since the critical crash rate method requires several intermediate calculations to arrive at the final crash rate, an ArcGIS Pro model was created to complete these calculations for each segment on the City's network.

The critical crash rate was calculated for each segment in the region's network using the following three steps (**Figure 24**):

#### 1. Assigning Data to Road Segments

Calculating the critical crash rate requires four data inputs: roadway functional classification, context, daily traffic volumes, and weighted crash counts. Crashes were assigned weights of 12 for fatal crashes, 3 for severe injury crashes, and 1 for minor injury crashes. This assignment ensured that areas with high injury crashes were prioritized in the development of the HIN. Similarly, traffic volume and functional classifications were also assigned to the roadways during this step.

#### 2. Calculate Variables of Critical Crash Rate

The variables of the critical crash rate were calculated using the equations specified in the FHWA Highway Safety Manual. The critical crash rate is calculated by comparing the difference between the observed crash rate and the expected crash rate. The observed crash rate is determined by using the existing crashes at each segment per 100 million VMT. The expected average crash rate per 100 million VMT normalizes the daily volumes for each functional class. After both values are calculated for a segment, the equation highlights segments that experience a higher crash rate than what is expected for a segment of its functional classification, traffic volume, and weighted crash counts.

#### 3. Calculate Critical Crash Rate Ratio

Once all variables are input, a ratio is calculated to identify segments experiencing higher-than-average rates of fatal, serious, and minor injury crashes. If the ratio is greater than 1.0, or the observed critical crash rate is higher than the critical crash rate, then the segment's crash history was higher than other road segments of similar function classification and context. Segments and intersections with a ratio of 1.0 or more were considered to be added to the HIN.

The critical crash rate is important to be able to differentiate between whether a street should be considered in the HIN. By adding the critical crash rate to our analysis, we can ensure that streets with a high frequency of severe crashes are identified. This approach aids in prioritizing corridors and maximizing the impact on reducing injuries and fatalities. The results of the initial critical crash rate model is displayed in **Exhibit 11** on page 44.

FIGURE 24: HIN DATA INPUTS

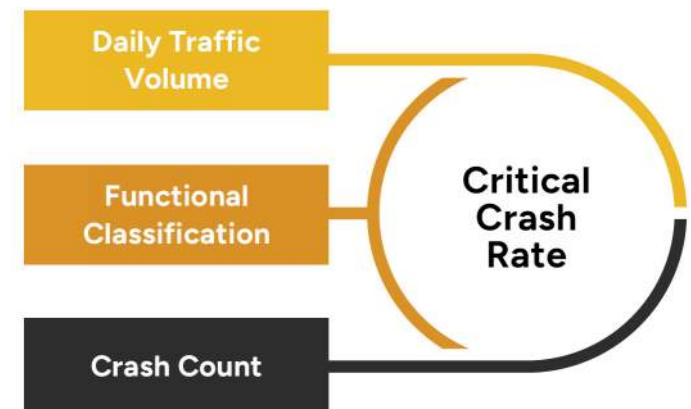
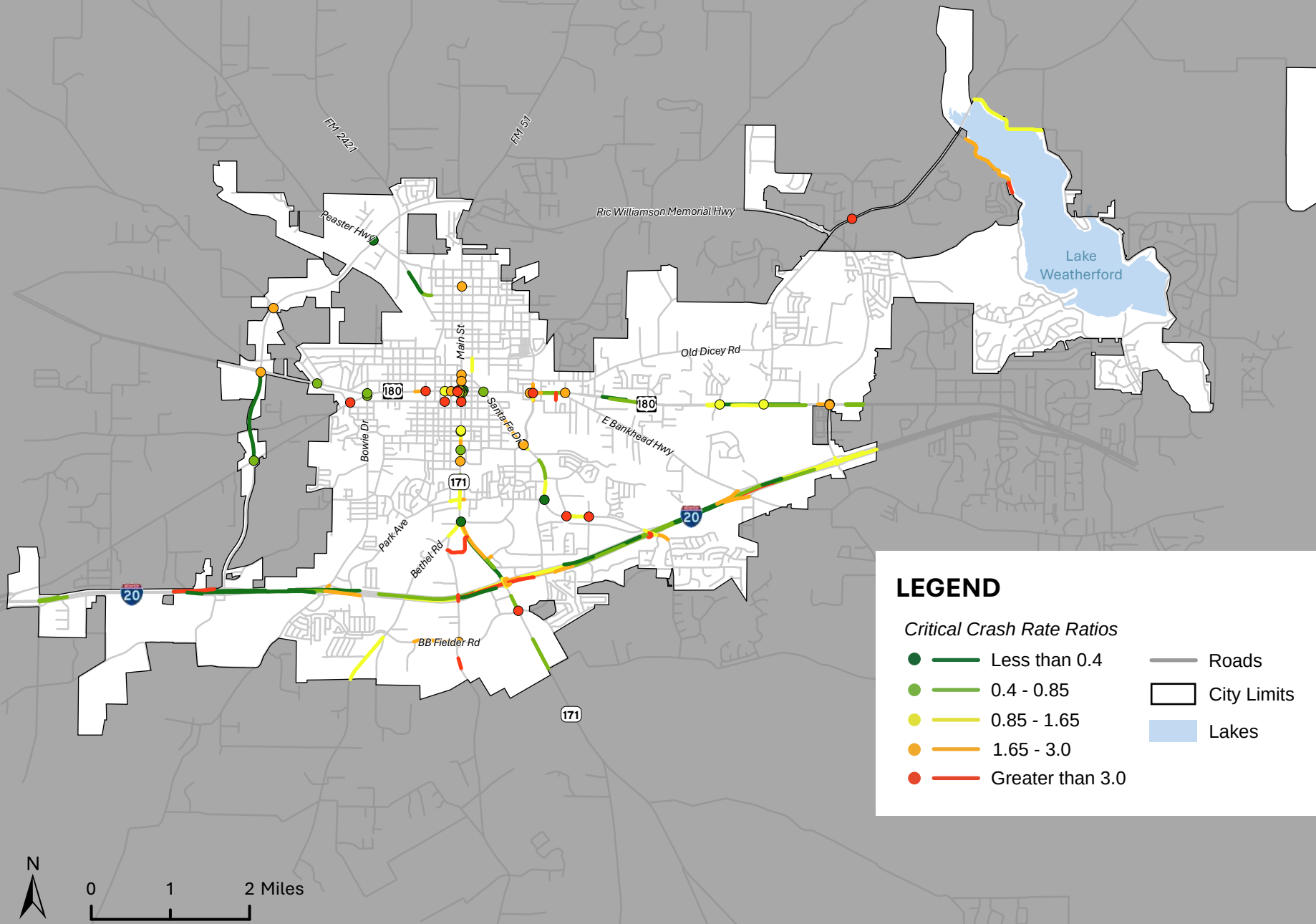




**EXHIBIT 11: CRITICAL CRASH RATE RESULTS**



### High Injury Network Results

Creating the HIN requires both a qualitative and quantitative approach. While the critical crash rate method produces results that identify locations with higher-than-average crash rates, finalizing the network requires post processing. This process involves a qualitative approach to the work by asking the following questions:

- What segments and intersections can be identified from the results?
- What gaps between segments can be closed?
- How can the amount of road network mileage be minimized?
- How can the number of fatal, severe injury, and minor injury crashes be maximized?

Ultimately, the goal of the HIN selection process is to maximize the total fatal, severe, and minor injury crashes on the least mileage of roads on the network. The final HIN for the City of Weatherford comprises of only 7.0% of the total road network while capturing 72.2% of all fatal crashes, 50.2% of KABs, and 56.0% of bicycle and pedestrian KAB crashes. Additionally, a total of 20 intersections were identified as a part of the HIN. The finalized HIN is shown in **Exhibit 12** on page 46.

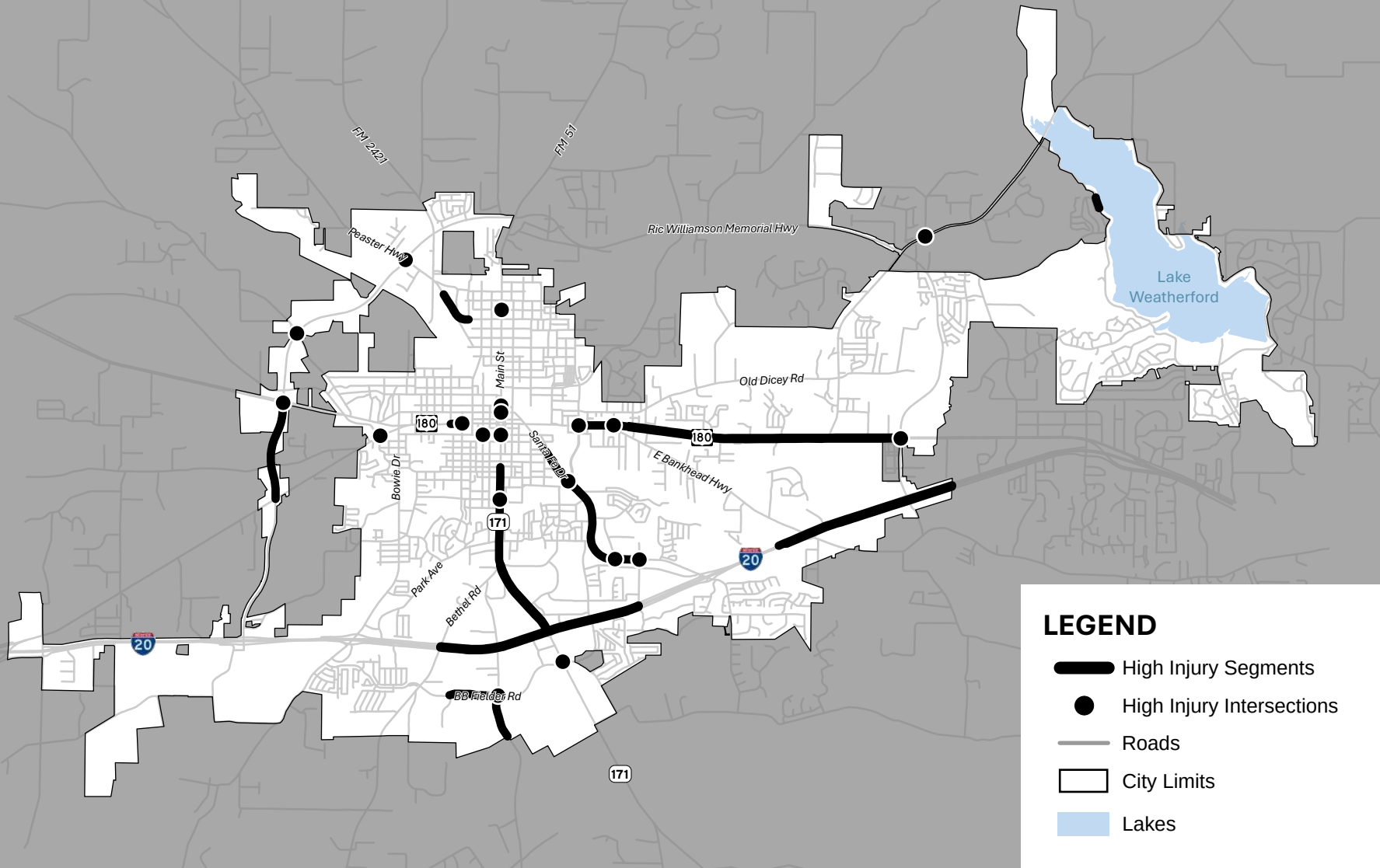
**TABLE 14: HIGH INJURY NETWORK SEGMENTS AND INTERSECTIONS**

| ROAD NAME                   | FROM                       | TO                                |
|-----------------------------|----------------------------|-----------------------------------|
| Peaster Hwy                 | 880' SW of W 7th St        | Oliver St                         |
| Ric Williamson Memorial Hwy | SH 180                     | Ranger Hwy                        |
| SH 180                      | Bryan St                   | Lamar St                          |
| SH 180                      | Denton St                  | Ric Williamson Memorial Hwy       |
| W Lake Dr                   | Lakeview Ter               | 585' S of Lakeview Ter            |
| W B B Fielder Rd            | Patriot Ave                | Tin Top Rd                        |
| Tin Top Rd                  | W B B Fielder Rd           | 250' SE of Threemile Branch Creek |
| SH 171                      | Simmons St                 | I-20                              |
| I-20                        | Bethel Rd                  | Holland Lake Dr                   |
| Santa Fe Dr                 | E Baylor St                | Holland Lake Dr                   |
| I-20                        | 1,500' SW of E Bankhead Dr | 2,350' NE of Center Point Rd      |

| HIN INTERSECTIONS                             |
|-----------------------------------------------|
| W Oak St & SH 171                             |
| W Oak St & S Alamo St                         |
| SH 180 & N Bankhead Rd                        |
| Ric Williamson Memorial Hwy & SH 180          |
| Santa Fe Dr & Foster Ln                       |
| SH 180 & S Denton St                          |
| SH 180 & N Lamar St                           |
| SH 171 & W Bridge St                          |
| SH 180 & Center Point Rd                      |
| SH 171 & E Spring St                          |
| W B B Fielder Rd & Tin Top Rd                 |
| SH 171 & W Russell St                         |
| Santa Fe Dr & Holland Lake Dr                 |
| Santa Fe Dr & Clear Lake Rd                   |
| Ric Williamson Memorial Hwy & Garner Adell Rd |
| W B B Fielder Rd & SH 171                     |
| Azle Hwy & Trailwood Dr                       |
| Ranger Hwy & W Bankhead Dr                    |
| SH 171 & E 5th St                             |
| Ric Williamson Memorial Hwy & Peaster Hwy     |



## EXHIBIT 12: HIGH INJURY NETWORK RESULTS



### HIGH RISK NETWORK

In addition to the HIN, the High Risk Network (HRN) was developed to serve as another tool in the decision-making process for selecting study locations in Weatherford. The HRN consists of roadways that share design attributes associated with a specific crash type. Since this network is dependent on similarities to high crash roadways, the HRN acts as a proactive prioritization and decision-making tool regarding future transportation projects and investments. The HRN identifies roadways that could experience high numbers of crashes based on shared characteristics with high injury roadways.

#### PROCESS

The creation of the HRN is a measurable process outlined by the Federal Highway Administration's (FHWA) System-Wide Safety Planning Process Methodology. The following five steps were taken to achieve the finalized HRN:

- 1 IDENTIFYING TOP SAFETY EMPHASIS AREAS
- 2 IDENTIFYING FOCUS FACILITIES
- 3 EVALUATING POTENTIAL RISK FACTORS
- 4 SCORING THE NETWORK
- 5 SELECTING THE HIGH RISK NETWORK SEGMENTS

#### *Step 1: Identifying the Top Safety Emphasis Area*



Intersection-  
Related Crashes

The final focus crash type chosen for the Weatherford HRN analysis was intersection crashes. Between 2019 and 2023, 49.7% of all crashes and 46.2% of KAB crashes occurred at intersections in the City.

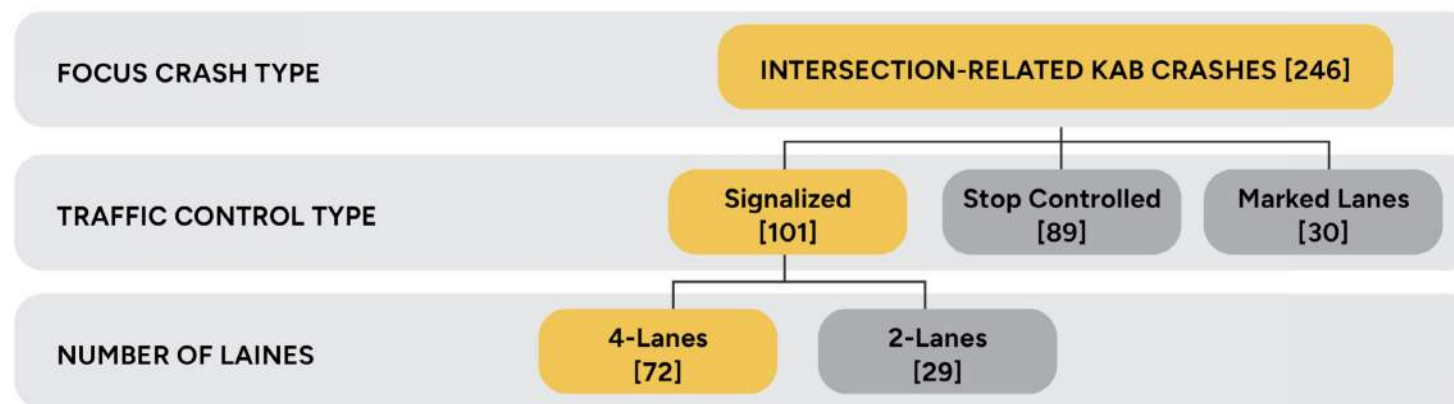
- Distracted Driving
- Impaired Driving
- Intersection Safety
- Occupant Protection
- Roadway & Lane Departures
- Speed Related
- Vulnerable Road Users



## Step 2: Identifying Focus Facilities

After identifying intersection-related crashes as the focus crash type, focus facilities were to be identified. Focus facilities refer to roadways in which more than 50% of intersection-related crashes in the City occurred on. To identify focus facilities, a crash tree diagram was created with intersection-related KAB crashes at the highest level and each subsequent level separated the crashes by facility type. The crash tree included separation based on traffic control type number of lanes intersection crashes. Based on this analysis, the focus facilities that pose the greatest risk for the City of Weatherford are four-lane roadways with signalized intersections (**Figure 25**).

FIGURE 25: CRASH TREE CRASH TREE FOR INTERSECTION-RELATED KAB CRASHES



## Step 3: Identifying and Evaluating Potential Risk Factors

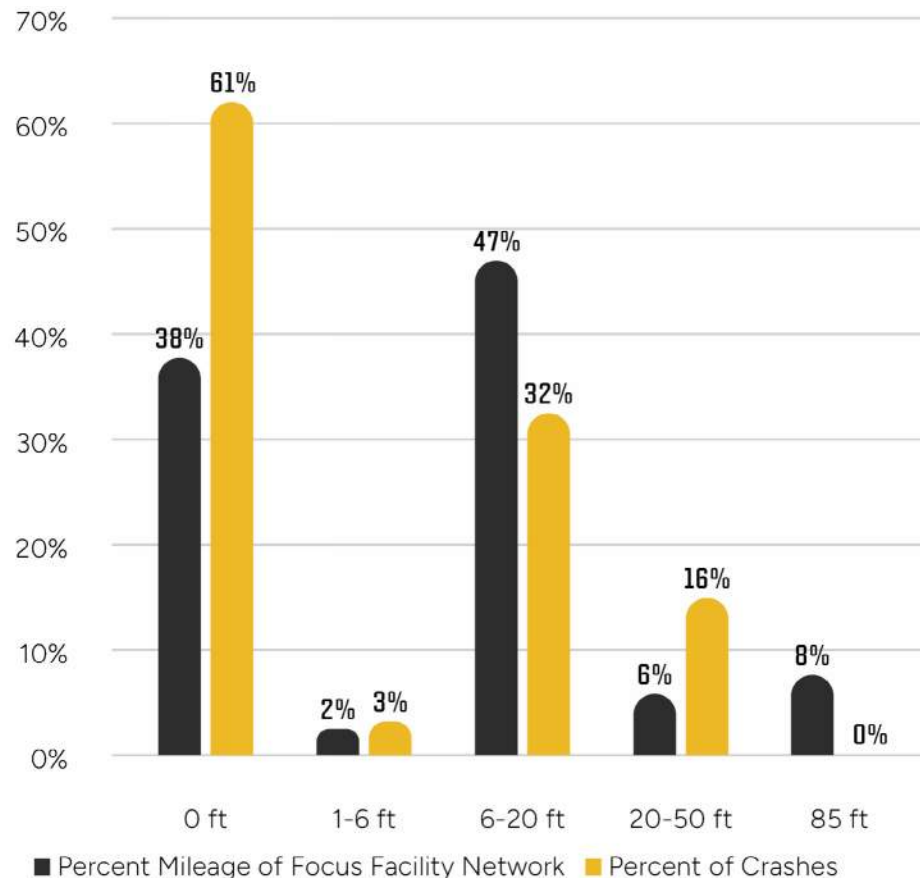
This portion of the HRN analysis identifies if focus facility crashes were overrepresented on focus facilities with specific design attributes. Design features were chosen to be included in this analysis based on their association with the chosen focus crashes. The design features used in the analysis were:

- Median Type
- Median Width
- Shoulder Type
- Roadway Alignment
- Volume (AADT)
- Lane Width
- Truck % AADT
- Shoulder Width

To assess whether a potential risk factor was overrepresented, the percentage of focus facilities' mileage possessing that attribute was compared to the percentage of focus crashes occurring at those locations. **Figure 26** on page 49 shows an example of this comparison for lane width in Weatherford. By graphing these values, the overrepresentation of focus crash types on specific roadway types was easily identifiable.

As shown in **Figure 26**, The chart shows a clear relationship between median width and crash occurrence. Road segments with no median (0 feet) account for 38% of the focus network's mileage but are associated with over 60% of crashes, highlighting a significant safety concern. In contrast, segments with a narrow median of 1–6 feet show both low mileage and low crash percentages, indicating relatively safer performance. The 6–20 feet category, which represents the highest share of mileage in the network, also shows an elevated crash percentage, though not as severe as the 0 feet category. Wider medians represent a smaller portion of the network but still show a noticeable share of crashes, particularly in the 20–50 feet range. These findings suggest that roads with no physical separation or those with medians wide enough to accommodate turn movements, between 20 to 50 feet, may present higher safety risks, emphasizing the importance of thoughtful median design in reducing crash frequency.

**FIGURE 26: POTENTIAL RISK FACTOR OF MEDIAN WIDTH FOR CRASHES**





### Step 4: Scoring the Network

All roadway segments were scored using one of the following scoring table for roadway characteristics that present the high risk for intersection crashes in Weatherford. Factors that have a high correlation risk factor for crashes received 1 point and medium correlation risk factors received 0.5 points. The highest point total that a roadway segment could receive is 7 points. **Table 15** below displays the breakdown of points assigned to all roadways in Weatherford based on characteristics.

**TABLE 15: INTERSECTION RISK FACTORS AND POINT ALLOCATION**

| ROADWAY CHARACTERISTICS                   | HIGH CORRELATION RISK FACTORS (1 PT) | MEDIUM CORRELATION RISK FACTOR (0.5 PTS) |
|-------------------------------------------|--------------------------------------|------------------------------------------|
| Median Type                               | No Median                            | Unprotected                              |
| Median width                              | 0 ft                                 | 20–50 ft                                 |
| Shoulder Type                             | –                                    | None                                     |
| Shoulder Width                            | 0–6 ft                               | 6–12 ft                                  |
| Volume                                    | 12,500–25,000                        | 2,500–5,000                              |
| Truck % AADT                              | 5–10%                                | 0–5%, 10–15%                             |
| Lane Width                                | 12 ft                                | 14–15 ft, 17–18 ft                       |
| <b>Total Possible Risk Factor Points:</b> |                                      | <b>7 points</b>                          |

### Step 5: Selecting the High Risk Network Segments

After the appropriate scoring table was selected for grading, risk points were allocated to a roadway segment based on its design attributes. A segment's final risk score was calculated using the equation below:

$$\text{RISK SCORE (\%)} = \left( \frac{\text{TOTAL NUMBER OF ASSIGNED RISK FACTOR POINTS}}{\text{MAXIMUM POSSIBLE NUMBER OF RISK FACTOR POINTS}} \right) \times 100$$

Segments were added into the HRN if their risk score met one or both conditions listed below:

- Risk score was greater than or equal to 50%
- Risk score was greater than or equal to the City average risk score

### High Risk Network Results

**Exhibit 13** shows the final HRN for the City of Weatherford. Additionally, **Exhibit 14** on page 53 demonstrates how the HRN compares to the HIN. It is common for the HRN to act as an extension of the HIN segments, due to the HIN roadways sharing similar attributes to roadways with severe crash histories which are also attributes held by roadways on the HIN. The final HRN is only 10.1% of the total roadway network but encompasses 70% of the HIN intersections.

### HIN and HRN Statistics

The HIN and HRN are vital tools for cities aiming to enhance road safety. Utilizing predictive metrics such as, road characteristics and historical crash data, the City of Weatherford can pinpoint high-risk locations and implement measures prevent crashes before they occur. Regular analysis of these locations help address issues before they result in serious injuries to create safer a environment for all road users. The city should prioritize safety improvements in the most dangerous and potential dangerous areas by implementing safety countermeasures on the HIN and HRN. The HIN and HRN make up 16.2% of the City's roadway network, while consisting of 76.2% of all crashes, 78.3% of KABs, and 77.8% of fatalities.

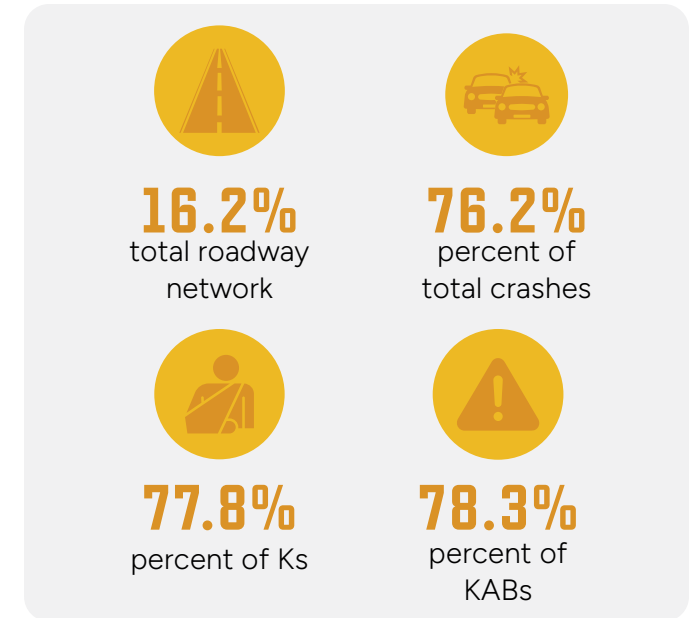


TABLE 16: HIGH RISK NETWORK SEGMENTS

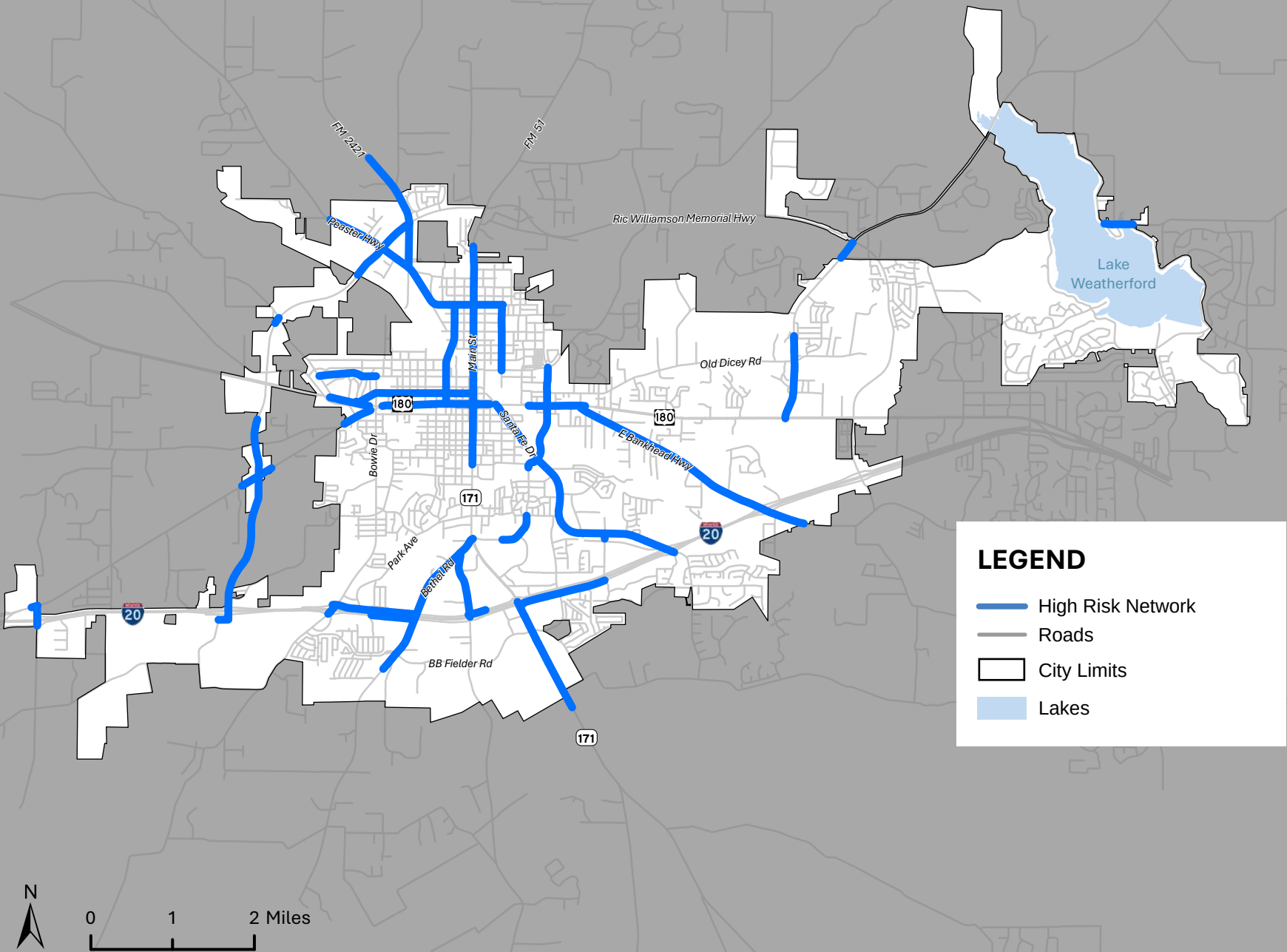
| ROAD NAME                       | FROM                          | TO                                     |
|---------------------------------|-------------------------------|----------------------------------------|
| Zion Hill Rd                    | 1,850' NW of Red Bird Ln      | Peaster Hwy                            |
| Peaster Hwy/4th St              | 265' SE of Cartwright Park Rd | N Rusk St                              |
| Ric Williamson Memorial Hwy     | Zion Hill Rd                  | 825' NE of Town Creek                  |
| Ric Williamson Memorial Hwy     | Garner Adell Rd               | 415' SW of Garner Adell Rd             |
| Ric Williamson Memorial Highway | 1,600' N of Greenwood Rd      | Old Brock Rd                           |
| Ranger Hwy                      | 200' NE of W Ranch Ln         | 800' NE of Ric Williamson Memorial Hwy |
| Ranger Hwy                      | 315' W of Dennis Rd           | Dennis Rd                              |
| Ranger Hwy                      | US 180                        | 265' SW of Merritt Ln                  |
| W Water St                      | Garner Rd                     | N Bowie Dr                             |
| US 180                          | S Bowie Dr                    | Garner Rd                              |



**TABLE 18: HIGH RISK NETWORK SEGMENTS (CONTINUED)**

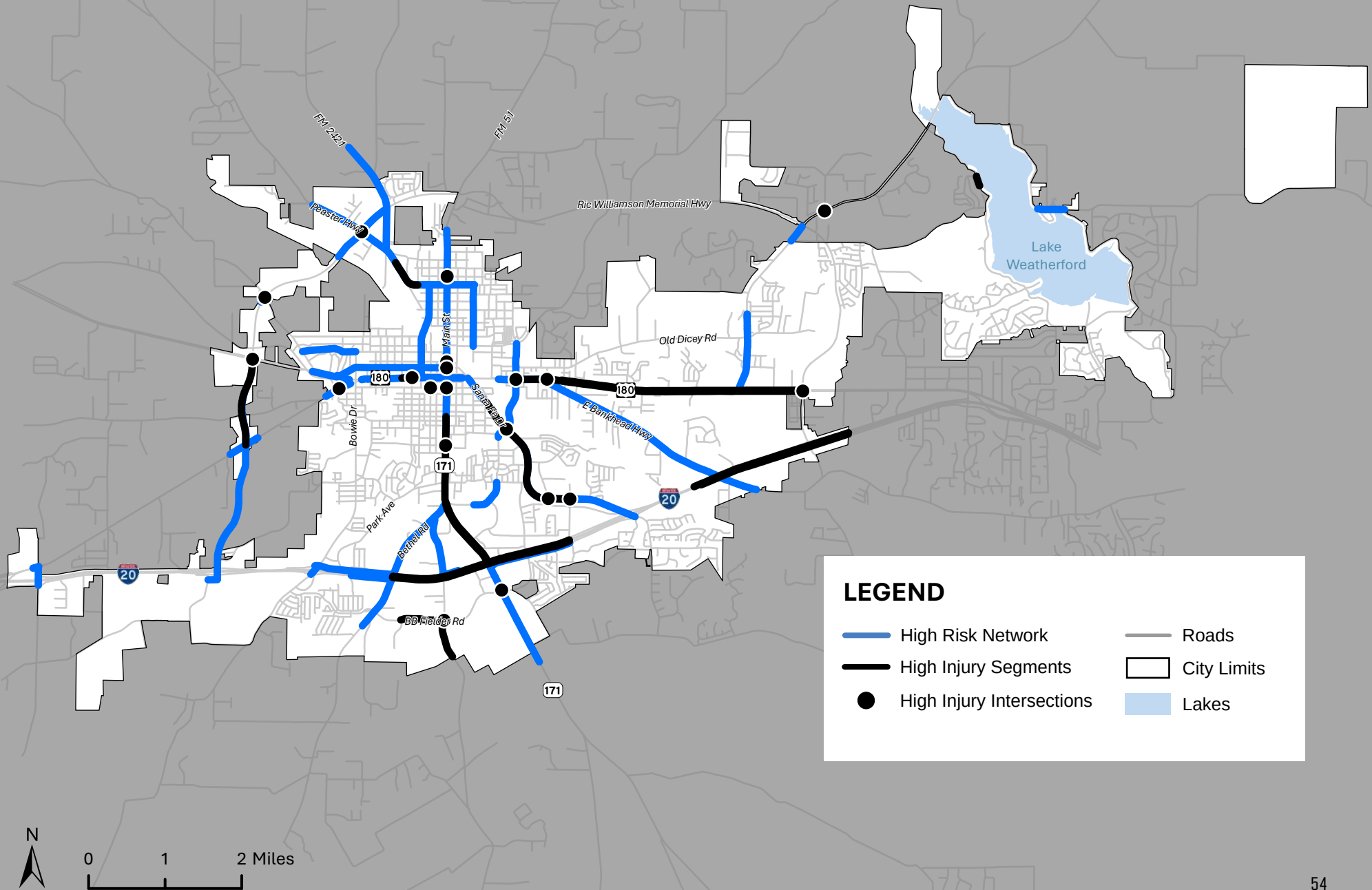
| ROAD NAME           | FROM                        | TO                           |
|---------------------|-----------------------------|------------------------------|
| Zion Hill Rd        | 1,850' NW of Red Bird Ln    | Peaster Hwy                  |
| US 180              | Bowie Dr                    | S Walnut St                  |
| W Spring St         | Harmon St                   | N Main St                    |
| SH 171              | City Limits                 | Eureka St                    |
| Franklin St         | W 4th St                    | Palo Pinto St                |
| N Rusk St           | W 4th St                    | Front St                     |
| N Denton St         | Front St                    | 190' S of Eureka St          |
| Santa Fe Dr         | US 180                      | 870' S of E Lee Ave          |
| Santa Fe Dr         | Foster Ln                   | I-20                         |
| Holland Lake Dr     | Santa Fe Dr                 | 350' S of Santa Fe Dr        |
| US 180              | Hogle St                    | 300' E of Bankhead Dr        |
| E Bankhead Dr       | US 180                      | 1,500' E of Banks Dr         |
| E Bankhead Dr       | US 180                      | 1,500' E of Banks Dr         |
| Azle Hwy            | Ric Williamson Memorial Hwy | White Settlement Rd          |
| White Settlement Rd | E Lake Dr                   | E Lake Dr                    |
| College Park Dr     | E Park Ave                  | 910' W of Martin Dr          |
| Bethel Rd           | SH 171                      | 1,100 SW of W B B Fielder Rd |
| SH 171              | I-20                        | City Limits                  |
| Tin Top Rd          | Bethel Rd                   | W I-20 Frontage Rd           |
| Dennis Rd           | Ranger Hwy                  | W I-20 S Frontage Rd         |
| Old Brock Rd        | Old Brock Rd                | Ric Williamson Memorial Hwy  |
| Old Dennis Rd       | W I-20 Frontage Rd          | E I-20 Frontage Rd           |
| W I-20 Frontage Rd  | 220' W of W Park Ave        | Bethel Rd                    |
| E I-20 Frontage Rd  | Kaitlyn Dr                  | Bethel Rd                    |
| W I-20 Frontage Rd  | Tin Top Rd                  | Home Depot Driveway          |
| E I-20 Frontage Rd  | SH 171                      | Fossil Hill Rd               |

## EXHIBIT 13: HIGH RISK NETWORK RESULTS





## EXHIBIT 14: HIGH INJURY & HIGH RISK NETWORK RESULTS





## CHAPTER 5: COUNTERMEASURES

### INTRODUCTION

This chapter focuses on the strategic countermeasures essential to improving community safety. This chapter introduces the Safety Countermeasure Toolbox, a resource that serves as a comprehensive tool that has critical safety emphasis areas and the Crash Modification Factors (CMF). The end of this chapter provides targeted recommendations specifically tailored to address specific safety challenges within the community. By leveraging these countermeasures, Weatherford aims to provide practical guidance and effective solutions for the risks and safety of our residents.





## SAFETY COUNTERMEASURE TOOLBOX

This section of the CSAP details specific countermeasures (**Table 17** on pages 56 and 57) that can be implemented in Weatherford that can improve safety. Countermeasures are physical interventions that Weatherford can use to make the roads safer. To interpret a CMF, if the CMF is lower than 1, we can expect a reduction in crashes. If the CMF is higher than 1, we can expect an increase in crashes. If the CMF is 1, we expect no change in crashes. Countermeasures in the toolbox can be applied to any roadway in the City, but roads that are on the high injury or high risk networks should be prioritized. Additionally, all countermeasures in the toolbox are also recommended in the FHWA's Proven Safety Countermeasures list.

TABLE 17: SAFETY COUNTERMEASURE TOOLBOX

| COUNTERMEASURE                            | LANE DEPARTURES | INTERSECTION-RELATED | UNRESTRAINED PERSONS | IMPAIRED DRIVING | SPEED RELATED | DISTRACTED DRIVING | BICYCLE & PEDESTRIAN |
|-------------------------------------------|-----------------|----------------------|----------------------|------------------|---------------|--------------------|----------------------|
| Appropriate Speed Limits                  |                 |                      | ●                    |                  | ●             |                    | ●                    |
| Bike Lanes                                |                 |                      | ●                    | ●                | ●             | ●                  | ●                    |
| Crosswalk Visibility Enhancements         |                 | ●                    |                      |                  |               | ●                  | ●                    |
| Leading Pedestrian Interval               |                 | ●                    |                      |                  |               |                    | ●                    |
| Medians and Pedestrian Refuge Islands     |                 |                      | ●                    | ●                | ●             |                    | ●                    |
| Pedestrian Hybrid Beacons                 |                 |                      |                      |                  | ●             | ●                  | ●                    |
| Rectangular Rapid Flashing Beacons (RRFB) |                 | ●                    |                      |                  |               |                    | ●                    |
| Roadway Reconfiguration                   | ●               | ●                    | ●                    |                  | ●             |                    | ●                    |

TABLE 17: SAFETY COUNTERMEASURE TOOLBOX (CONTINUED)

| COUNTERMEASURE                                                                    | LANE DEPARTURES | HIGH-CRASH INTERSECTION | UNRESTRAINED PERSONS | IMPAIRED DRIVING | SPEED RELATED | DISTRACTED DRIVING | BICYCLE & PEDESTRIAN |
|-----------------------------------------------------------------------------------|-----------------|-------------------------|----------------------|------------------|---------------|--------------------|----------------------|
| Sidewalks                                                                         |                 |                         |                      |                  |               |                    | ●                    |
| Enhanced Delineation for Horizontal Curves                                        | ●               |                         |                      |                  | ●             | ●                  |                      |
| Longitudinal Rumble Strips and Stripes on Two-Lane Roads                          | ●               |                         | ●                    | ●                | ●             | ●                  | ●                    |
| Median Barriers                                                                   | ●               |                         | ●                    | ●                | ●             |                    | ●                    |
| Wider Edge Lines                                                                  | ●               |                         |                      | ●                |               |                    |                      |
| Retroreflective Backplates                                                        |                 | ●                       |                      | ●                |               |                    |                      |
| Corridor Access Management                                                        |                 | ●                       |                      |                  |               |                    |                      |
| Dedicated Left- and Right-Turn Lanes at Intersections                             |                 | ●                       |                      |                  |               |                    |                      |
| Reduced Left-Turn Conflict Intersections                                          |                 | ●                       |                      |                  |               |                    |                      |
| Roundabouts                                                                       |                 | ●                       |                      |                  | ●             |                    |                      |
| Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections |                 | ●                       | ●                    |                  | ●             | ●                  |                      |
| Yellow Change Intervals                                                           |                 | ●                       |                      |                  | ●             |                    |                      |
| Lighting                                                                          | ●               | ●                       |                      |                  |               |                    | ●                    |

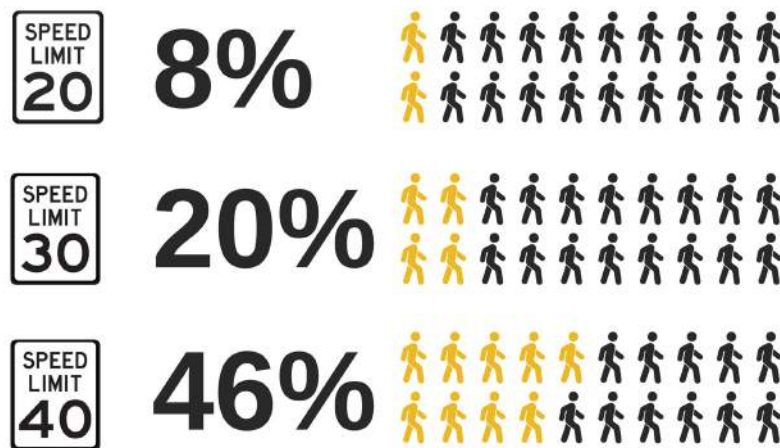


## Appropriate Speed Limits

Agencies that have the authority to set speed limits can designate reduced speed zones and set speeds based on several roadway factors. Roadway safety experts agree that speed control is one of the most important methods for reducing fatal and serious injury crashes.

A driver traveling at 30 miles per hour who hits a pedestrian has a 20% chance of killing or seriously injuring them. By reducing the speed limit by just 10 miles, at 20 miles per hour, that percentage drops to 8% (**Figure 27**).

FIGURE 27: SPEED COMPARED TO PEDESTRIANS SURVIVAL PROBABILITY



Source: City of Boulder, CO



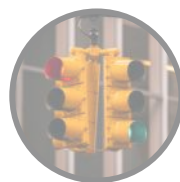
**CMF: 0.856 (ID: 11288) Crash Type: All**  
**Safety Emphasis Areas:** Unrestrained Persons, Speed Related, Bicycle & Pedestrian



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)

### Bike Lanes

A bike lane is a designated area of the roadway that is reserved for bicycles, typically marked with pavement markings and signage (**Figure 28**). Bike lanes offer a designated space for bicyclists, enhancing safety by minimizing interactions with vehicles and encouraging more people to choose bicycling as their mode of transportation. There are various types of bike lanes that can be installed. The FHWA's Bikeway Selection Guide and the Incorporating On-Road Bicycle Network into Resurfacing Projects documents help agencies determine the most beneficial facility based on roadway and land use context. In urban settings, bike lanes can reduce crashes by up to 49% for total crashes on 4-lane undivided collectors and local roads or 30% for total crashes on 2-lane undivided collectors and local roads (FHWA).

**FIGURE 28: BIKE LANES**



Source: Adobe Stock



**CMF: 0.435 (ID: 10737) Crash Type: All**

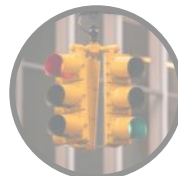
**Safety Emphasis Areas:** Distracted Driving, Impaired Driving, Unrestrained Persons, Speed Related, Bicycle & Pedestrian



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)



## Crosswalk Visibility Enhancements

Crosswalk visibility enhancements can encompass multiple strategies that can be used alone or in combination (**Figure 29**). High-visibility crosswalks use inlay or thermoplastic tape patterns that are visible to the driver and pedestrians from far away. Improved lighting illuminates with a positive contrast that makes the pedestrian more visible by placing luminaires in forward locations. Enhanced signage and pavement markings alert the driver in advance that a pedestrian crosswalk is approaching, using either signage or pavement markings. High-visibility crosswalks can reduce pedestrian injury crashes by up to 40%.

FIGURE 29: CROSSWALK VISIBILITY ENHANCEMENTS



Source: Adobe Stock



**CMF: 0.930 (ID: 4123) Crash Type: All**  
**Safety Emphasis Areas:** Distracted Driving, High-Crash Intersection, Bicycle & Pedestrian



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)

### Leading Pedestrian Interval

A leading pedestrian interval (LPI) allows pedestrians a head start of three to seven seconds to cross the street before the vehicles receive a green light (**Figure 30**). LPI increases pedestrian visibility, aiming to reduce the conflict between vehicles and pedestrians. LPI also helps pedestrians who may require more time to cross the street. Installing a LPI can lead to a 10% reduction in pedestrian-vehicle crashes at intersections.

FIGURE 30: LEADING PEDESTRIAN INTERVAL



Source: Adobe Stock



**CMF: 0.900 (ID: 9901) Crash Type: All**  
**Safety Emphasis Areas:** High-Crash Intersection,  
 Bicycle & Pedestrian



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)



## Medians and Pedestrian Refuge Islands

Medians in urban and suburban areas can be defined by pavement markings, raised areas, or islands to separate motorized and non-motorized road users (**Figure 31**). Medians also may serve as a refuge for pedestrians. A median with marked crosswalks can lead to 46% reduction in pedestrian crashes, according to FHWA. Pedestrian refuge islands, which are incorporated within medians, give pedestrians a safe place to pause when crossing busy roads. These combined features result in improved overall safety and accessibility for pedestrians.

**FIGURE 31: MEDIAN AND PEDESTRIAN REFUGE ISLANDS**



Source: Kimley-Horn



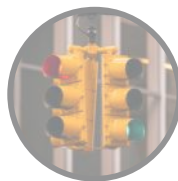
**CMF: 0.290 (ID: 2219) Crash Type: All**  
**Safety Emphasis Areas:** Impaired Driving, Unrestrained Persons,  
 Speed Related, Bicycle & Pedestrian



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)

### Pedestrian Hybrid Beacons

A pedestrian hybrid beacon (PHB) is a traffic control device designed to help pedestrians safely cross higher-speed roadways at midblock crossings and uncontrolled intersections (**Figure 32**). PHBs are typically effective at locations where three or more lanes need to be crossed, or in areas with high traffic volume. If PHBs are not familiar to a community, agencies and other governmental departments may need to provide education campaigns to ensure proper utilization. According to FHWA, PHBs can lead to a 55% reduction in pedestrian crashes.

FIGURE 32: PEDESTRIAN HYBRID BEACONS



Source: Adobe Stock



**CMF:** 0.883 (ID: 10585) **Crash Type:** All

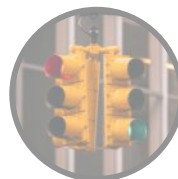
**Safety Emphasis Areas:** Distracted Driving, Speed Related, Bicycle & Pedestrian



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)



## **Rectangular Rapid Flashing Beacons (RRFB)**

A rectangular rapid flashing beacon (RRFB) is a pedestrian-activated traffic control device that is installed at crosswalks to better enhance visibility and alert drivers to the presence of pedestrians (**Figure 33**). When activated, the RRFB emits a rapid, alternating pattern of flashing lights to alert oncoming drivers to yield to pedestrians crossing the street. According to FHWA, RRFBs can result in motorist yielding rates as high as 98% at marked crosswalks with varied speed limits, crossing distances, and number of travel lanes.

**FIGURE 33: RECTANGULAR RAPID FLASHING BEACONS (RRFB)**



*Source: Kimley-Horn*



**CMF: 0.310 (ID: 11158) Crash Type: Vehicle/pedestrian**  
**Safety Emphasis Areas: High-Crash Intersection,  
 Bicycle & Pedestrian**



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)

### Roadway Reconfiguration

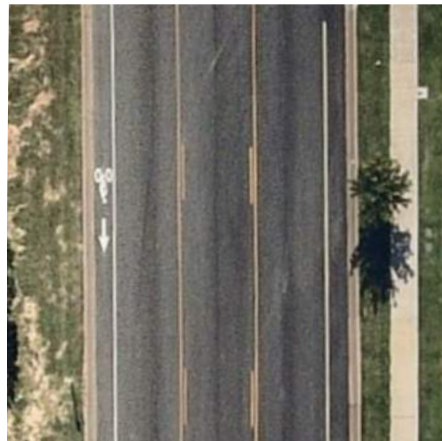
A roadway reconfiguration, sometimes called road diets, usually involves converting an existing four-lane roadway into a three-lane roadway (**Figure 34**). Implementing roadway reconfiguration can improve safety, calm traffic, provide better mobility and access for all users, and enhance the quality of life in a community. Roadway reconfigurations can make a roadway more complete by adding bike lanes or areas for pedestrians. In the context of a four-lane to three-lane reconfiguration, a road segment can experience up to a 47% reduction in total crashes.

**FIGURE 34: ROADWAY RECONFIGURATION**

Before



After



Source: Kimley-Horn



**CMF: 0.530 (ID: 2841) Crash Type: All**

**Safety Emphasis Areas:** High-Crash Intersection, Unrestrained Persons, Lane Departures, Speed Related, Bicycle & Pedestrian



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)



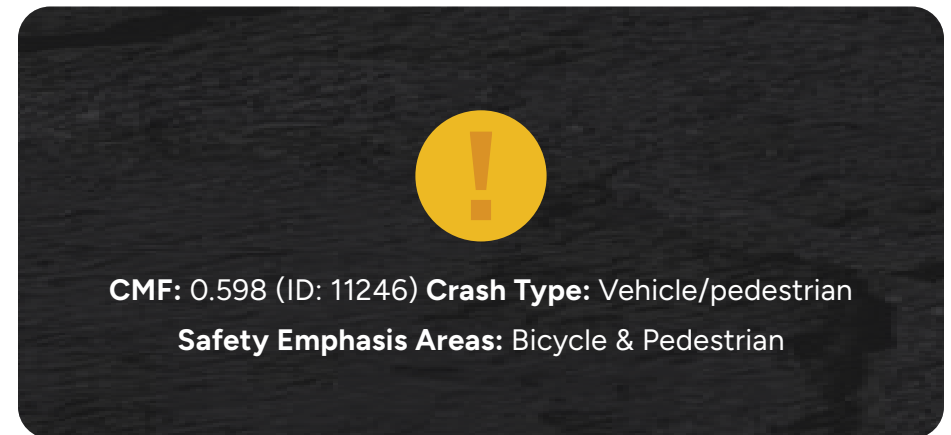
## Sidewalks

Sidewalks are designated pathways alongside the road or street intended for pedestrian use (**Figure 35**). It provides a safe and separate space for pedestrians to walk that is separated from vehicle traffic. Sidewalks enhance pedestrian safety by reducing the risk of collisions with vehicles, promoting walking as a form of transportation, and providing accessible routes for people of all ages and abilities. Sidewalks can contribute up to a 40% reduction in crashes involving pedestrians walking along active roadways.

FIGURE 35: SIDEWALKS



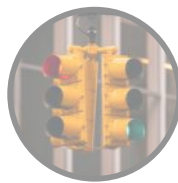
Source: Kimley-Horn



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)

### Enhanced Delineation for Horizontal Curves

Enhanced delineation for horizontal curves involves various strategies both before and within the curves to enhance road safety (**Figure 36**). Pavement markings, such as center and edge lines, help drivers maintain their lane position, while in-lane curve warning pavement markings, which are solid center lines on two-lane roads, signal an approaching curve. Retroreflective strips installed on signposts reflect light back to drivers, increasing night visibility. Delineators, which are retroreflective devices on posts or roadside barriers, assist drivers in aligning themselves with the road, and chevron signs placed on the outside of curves indicate the road's direction. Enhanced visibility can be achieved by upgrading to larger, retroreflective signs, and dynamic curve warnings to detect vehicle speeds, alerting drivers if they exceed the safe speed limit for a curve. Additionally, sequential dynamic chevrons, a type of advanced delineation, have been shown to reduce fatal and injury crashes by up to 60%, according to FHWA. These strategies collectively improve driver awareness and response, particularly in low visibility conditions or during inclement weather.

**FIGURE 36: ENHANCED DELINEATION FOR HORIZONTAL CURVES**



Source: Adobe Stock



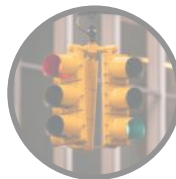
**CMF:** 0.750 – 0.820 (ID: 2439, 2431, 2432) **Crash Type:** All  
**Safety Emphasis Areas:** Distracted Driving, Lane Departures, Speed Related



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)



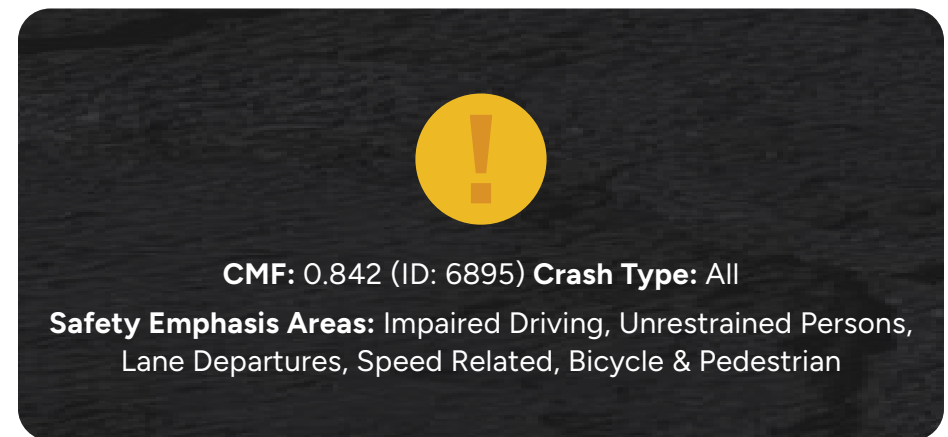
## **Longitudinal Rumble Strips and Stripes on Two-Lane Roads**

Longitudinal rumble strips are milled installations on the ground that alert a driver through vibration and sound (**Figure 37**). A longitudinal rumble strip is on the shoulder, edge or near or at the centerline of an undivided roadway. These are intended to warn drivers whose vehicles are crossing centerlines through the creation of noise and vibration of the vehicle. Longitudinal rumble strips can result in a 17% reduction in crashes.

**FIGURE 37: LONGITUDINAL RUMBLE STRIPS AND STRIPS ON TWO-LANE ROADS**



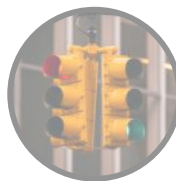
Source: Adobe Stock



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)

### Median Barriers

Median barriers are longitudinal barriers that separate opposing traffic on a divided highway and are designed to redirect traffic and vehicles striking either side of the road barriers (**Figure 38**). These barriers can take the form of cable barriers, concrete barriers, or metal-beam guardrails. These barriers significantly reduce head-on crashes and fatalities by physically separating the two different sides of the road. Median barriers Installed on Rural Four-Lane Freeways lead to a 97% reduction in cross-median crashes.

**FIGURE 38: MEDIAN BARRIERS**



Source: Adobe Stock



**CMF: 0.29 (ID: 2219) Crash Type: All**

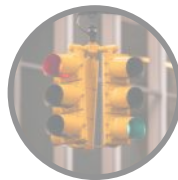
**Safety Emphasis Areas:** Impaired Driving, Unrestrained Persons, Lane Departures, Speed Related, Bicycle & Pedestrian



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)



## Wider Edge Lines

Edge lines are the pavement markings at the edge of the travel lanes and are designed to help drivers clearly identify the road alignment ahead (**Figure 39**). To improve safety, designers increase edge lines from the minimum normal line width of four inches to the maximum normal width of six inches. Wider edge lines enhance the visibility of travel lane boundaries compared to traditional edge lines. Wider edge lines can reduce crashes by up to 22% for fatal and injury crashes or rural freeways.

**FIGURE 39: WIDER EDGE LINES**



*Source: Adobe Stock*



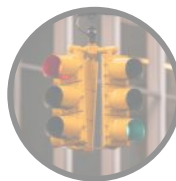
**CMF: 0.635 (ID: 4737) Crash Type: All**  
**Safety Emphasis Areas:** Impaired Driving, Lane Departures



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)

### Retroreflective Backplates

A retroreflective backplate is a backplate made by framing traffic signals with a 1-to-3-inch yellow retroreflective border around the traffic signal (**Figure 40**). They improve the visibility of the signal by creating an illuminated border to provide greater contrast from the area around the signal. The backplates lead to improvements in both daytime and nighttime conditions. Safety benefits for retroreflective backplates include a 15% reduction in total crashes.

FIGURE 40: RETROREFLECTIVE BACKPLATES



Source: Adobe Stock



**CMF: 0.850 (ID: 1410) Crash Type: All**

**Safety Emphasis Areas: Impaired Driving, High-Crash Intersection**



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



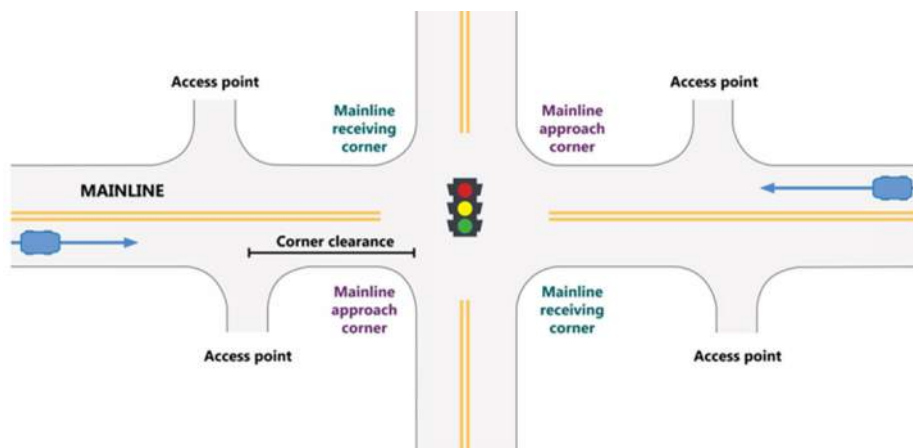
Post Crash Care  
(no crash data)



## Corridor Access Management

Access management refers to the design, application, and control of entry and exit points along a roadway (**Figure 41**). This includes intersections with other roads and driveways that serve adjacent properties. Strategies can include the intentional spacing of intersections, utilizing protected turn lanes, and generally minimizing conflict points on a corridor. Since the presence of driveways too close to an intersection affects the number of intersection crashes, closing, relocating, or condensing driveways can reduce fatal and injury crashes along arterials by 25-31%.

**FIGURE 41: CORRIDOR ACCESS MANAGEMENT**



Source: FHWA



**CMF: 0.930 (ID: 442) Crash Type: All**  
**Safety Emphasis Areas: High-Crash Intersection**



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian

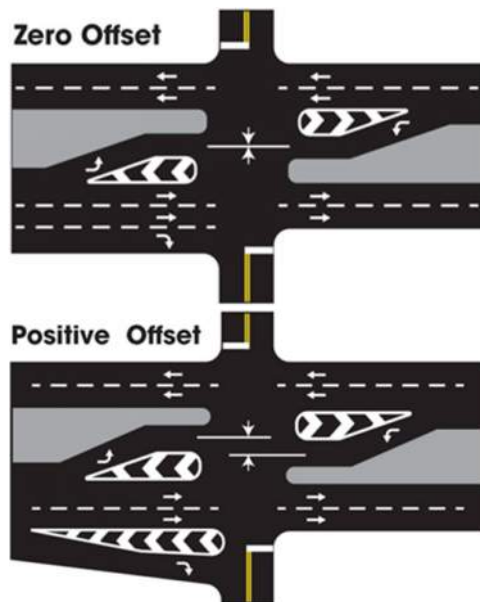


Post Crash Care (no crash data)

### Dedicated Left- and Right-Turn Lanes at Intersections

Auxiliary turn lanes- either for left or right turns provides physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections (**Figure 42**). Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn. Installing dedicated right-turn lanes can reduce crashes by 14-26% while installing dedicated left-turn lanes can have an even greater impact, reducing crashes 28-48% (FHWA). Along with dedicated turning lanes, having an offset at the left- and right- turn lanes can increase safety benefits. Offsets increase sight distance for approaching vehicles that conflict with the turning movement.

FIGURE 42: DEDICATED LEFT- AND RIGHT-TURN LANES AT INTERSECTIONS



#### DEDICATED TURN LANES

**CMF:** 0.520 - 0.880 (ID : 260, 289,  
285) **CMF:** 0.520 - 0.740  
(ID: 268, 289)

**Crash Type:** All

**Safety Emphasis Areas:** High-Crash  
Intersection



#### OFFSETS

**CMF:** 0.644 (ID: 6096)

**Crash Type:** All Severe Crashes (Fatal,  
Serious Injury, Minor Injury)

**Safety Emphasis Areas:** High-Crash  
Intersection



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



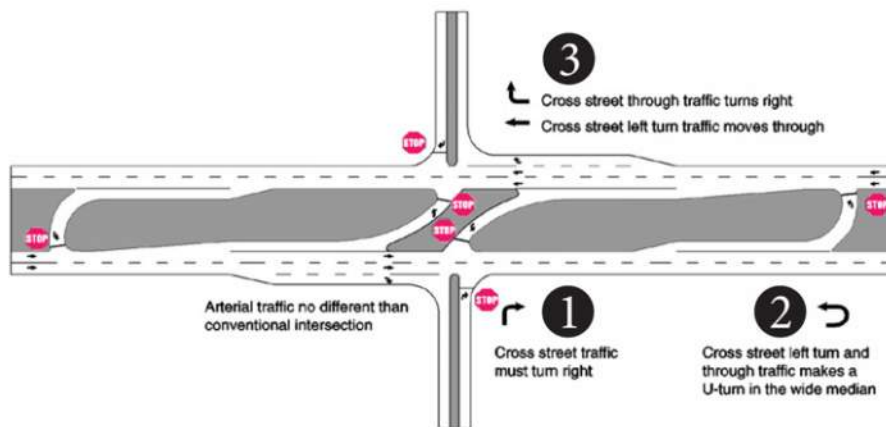
Post Crash Care  
(no crash data)



## Reduced Left-Turn Conflict Intersections

Reduced left-turn conflict intersections (RCUT) are geometric designs that alter left-turn movements (**Figure 43**). These intersections can simplify drivers' decision-making and minimize the potential for higher-severity crash types, such as head-on and angle. Variations on the U-Turn are typical of these intersections. One type of these intersections, the RCUT intersection, has been shown to lead to a 54% reduction in fatal and injury crashes.

FIGURE 43: REDUCED LEFT-TURN CONFLICT INTERSECTIONS



Source: FHWA



**CMF: 0.80 (ID: 10383) Crash Type: All**  
**Safety Emphasis Areas: High-Crash Intersection**



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)

### Roundabouts

A roundabout is a circular type of intersection where traffic flows continuously around a central island (**Figure 44**). Vehicles entering a roundabout must yield to traffic already circulating within the circle, promoting a smooth, efficient, and safe flow of traffic with reduced conflict points compared to traditional intersections. Roundabouts are designed to improve safety, reduce congestion, and enhance traffic flow with vehicles on the road. When a signalized intersection is converted to a roundabout, there is a 78% reduction in fatal and injury crashes.

**FIGURE 44: ROUNDABOUTS**



Source: City of Weatherford



**CMF: 0.613 (ID: 10083) Crash Type: All**  
**Safety Emphasis Areas: High-Crash Intersection, Speed Related**



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care  
(no crash data)



## **Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections**

This approach to stop-controlled intersection safety involves deploying a package of multiple low-cost countermeasures, including enhanced signing and pavement markings at intersections (**Figure 45**). These different types of countermeasures increase driver awareness and recognition of intersections and potential conflicts. Applying low-cost countermeasures at stop-controlled intersections can reduce fatal and injury crashes by 10% when looking at all locations, types, and areas.

**FIGURE 45: APPLICATION OF MULTIPLE LOW-COST COUNTERMEASURES AT STOP-CONTROLLED INTERSECTIONS**



*Source: Adobe Stock*



**CMF: 0.853 (ID:8870) Crash Type: All**

**Safety Emphasis Areas:** Distracted Driving, High-Crash Intersection, Unrestrained Persons, Speed Related



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)

### Yellow Change Intervals

The yellow clearance interval is the time the yellow indication signal is displayed following a green light indication signal (**Figure 46**). Red light running is a leading cause of crashes and fatalities at intersections, so timing the signal allows drivers to both stop safely without inviting acceleration through a yellow to red light transition. A well-timed yellow clearance interval helps reduce crashes, indicating green has passed and the following is red. This leads to appropriate speed management at signalized intersections. Safety benefits include a 36-50% reduction in red light running when timed appropriately.

**FIGURE 46: YELLOW CHANGE INTERVALS**



Source: Adobe Stock



**CMF: 0.92 (ID: 380) Crash Type: All**

**Safety Emphasis Areas: High-Crash Intersection, Speed Related**



Distracted  
Driving



Impaired  
Driving



High-Crash  
Intersection



Unrestrained  
Persons



Lane Departures



Speed  
Related



Bicycle &  
Pedestrian



Post Crash Care  
(no crash data)



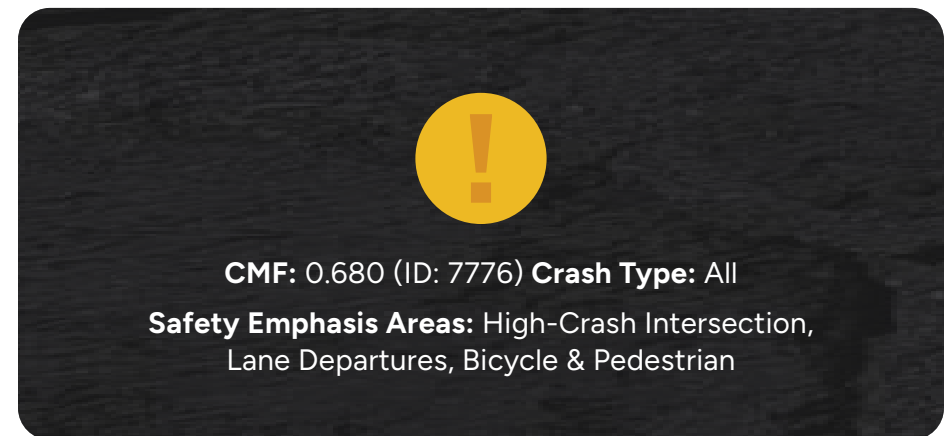
## Lighting

The number of fatal crashes in daylight is similar to those that occur in darkness, despite only 25% of total vehicle miles traveled (VMT) happening at night. Adequate lighting is essential to enhance roadway safety for all users. Lighting not only improves safety but also provides personal security benefits for non-vehicle users traveling along and across roadways. Increased lighting can be implemented at intersections or along corridors. Lighting fixtures can take many forms from LED lights seen on interstates to more decorative ones as shown in **Figure 47**. When lighting is increased, up to 28% of nighttime injury crashes on rural and urban highways can be reduced.

FIGURE 47: LIGHTING



Source: Adobe Stock



Distracted Driving



Impaired Driving



High-Crash Intersection



Unrestrained Persons



Lane Departures



Speed Related



Bicycle & Pedestrian



Post Crash Care (no crash data)

### TARGETED RECOMMENDATIONS

Countermeasures and recommendations that would enhance safety were chosen after conducting in-field observations to ensure a wholistic understanding of the existing conditions and crash history at those locations. A memorandum summarizing the in-field observations, field photos, and preliminary recommendations can be found in the Appendix. The following section summarizes the existing conditions, crash history, corridor recommendations, and intersection recommendations for each of the study locations. The study locations were selected based on the following criteria (**Table 18**):

**TABLE 18: STUDY LOCATION SELECTION CRITERIA**

| COMMUNITY NEED | ENGAGEMENT                                                                                                         | FEASIBILITY                                     | PRIORITY CORRIDOR                        |
|----------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------|
| Census Data    | Interactive Map Comments   SAPWG Comments (from Meeting 2)  <br>SAPWG Priority Corridor Selection (from Meeting 3) | Current Roadway Projects<br>TxDOT On/Off System | Located on the HIN<br>Located on the HRN |

### Study Locations

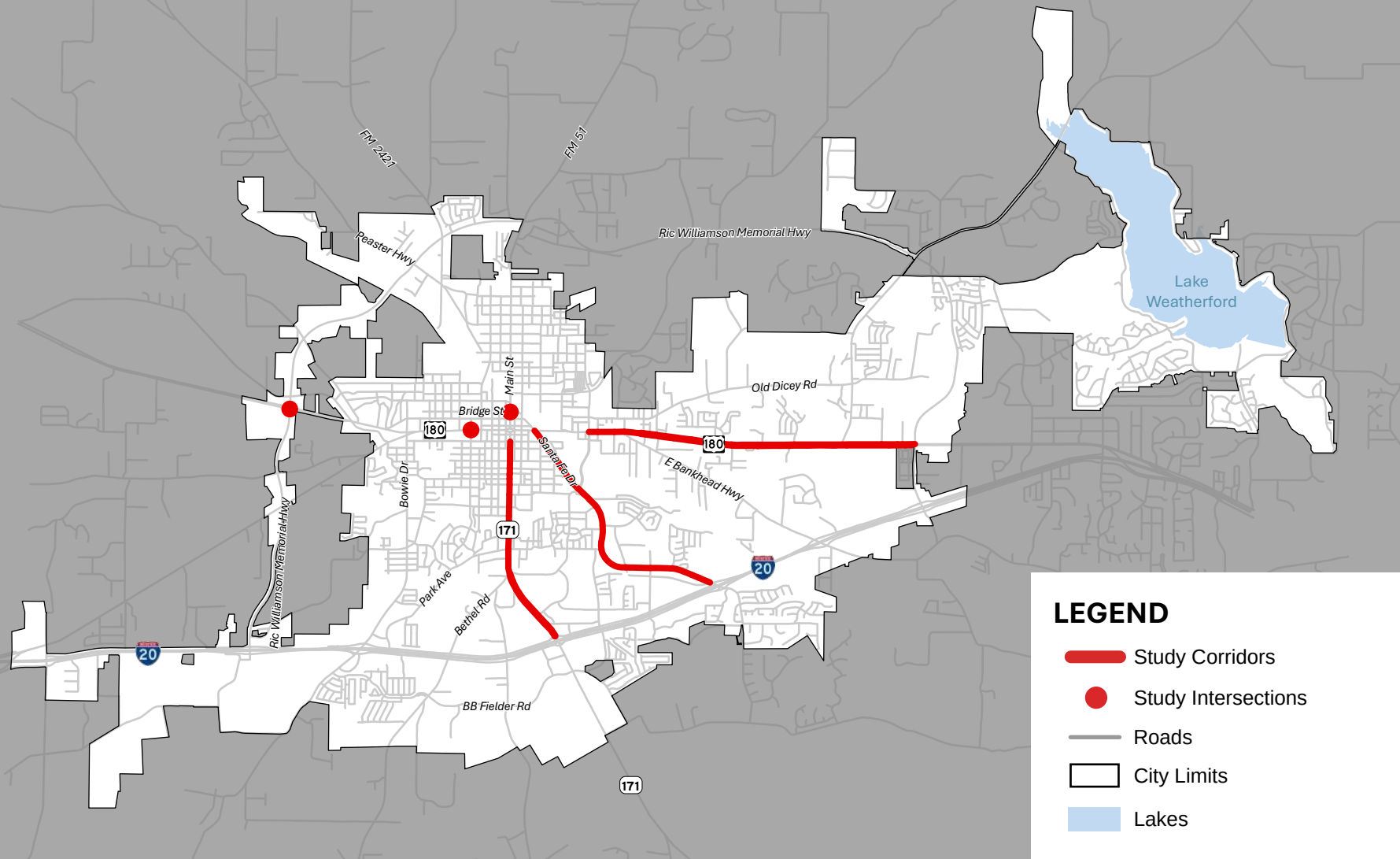
Six roadway segments and intersections were selected from the HIN and HRN to be priority locations. The chosen corridors and intersections received targeted recommendations that will improve safety on some of the most unsafe roads in Weatherford. **Table 19** below lists the six study locations and general information about each one. **Exhibit 15** on page 80 shows the location of each study location in the City.

**TABLE 19: STUDY LOCATIONS**

| CORRIDOR NAME                                                   | SPEED LIMIT | VOLUME                                                            | FUNCTION CLASS         | CROSS SECTION | TOTAL CRASHES | CRASH SEVERITY |    |    |
|-----------------------------------------------------------------|-------------|-------------------------------------------------------------------|------------------------|---------------|---------------|----------------|----|----|
|                                                                 |             |                                                                   |                        |               |               | K              | A  | B  |
| Study Corridor 1: US-180                                        | 30-50       | 14,700                                                            | Arterial               | 4D            | 345           | 1              | 13 | 42 |
| Study Corridor 2: Santa Fe Dr                                   | 45          | 9,900                                                             | Arterial               | 4D            | 242           | 2              | 6  | 34 |
| Study Corridor 3: SH-171                                        | 30-35       | 14,100                                                            | Arterial               | 4D            | 529           | 1              | 7  | 41 |
| Intersection 1: Mineral Wells HWY & Ric Williamson Memorial HWY | 50-65       | 11,700 (Mineral Wells HWY)<br>9,900 (Ric Williamson Memorial HWY) | Arterial -<br>Arterial | 4D/2U         | 180           | 0              | 2  | 9  |
| Intersection 2: N. Main Street & Bridge St.                     | 30-35       | 3,100 (Bridge St.)<br>19,000 (N Main Street)                      | Arterial -<br>Local    | 6D/4D         | 29            | 0              | 1  | 4  |
| Intersection 3: Lamar and US-180<br>(Palo Pinto Street)         | 30-45       | 1,300 (Lamar)<br>7,000 (US-180 (Palo Pinto Street))               | Arterial-<br>Collector | 2U/4D         | 23            | 0              | 1  | 5  |



**EXHIBIT 15: STUDY LOCATIONS**



### Corridor 1: Santa Fe Drive from Fort Worth Highway to I-20

#### Context

The section of Santa Fe Drive between Fort Worth Highway and Interstate 20 spans 2.53 miles. Located in the southeastern portion of the city, this corridor is primarily surrounded by commercial development, with some residential areas, including Medical City Weatherford and two preschools. Santa Fe Drive is a four-lane divided arterial with a posted speed limit of 45 mph and carries an average of 9,900 vehicles per day.

#### Crash History

There were a total of 242 crashes on this study corridor of Santa Fe Drive from the study period of 2019-2023. Of these crashes there were 34 B's, 6 A's, and 2 K's. Additionally, 4 crashes involved a pedestrian or bicyclist. Along the study corridor of Santa Fe Drive, there were:

**165**

Intersection-Related Crashes

**47**

Opposite Direction – One Straight- One Left Turn

**75**

Driver Inattention

#### Corridor Recommendations

To enhance traffic flow and improve safety, it is recommended to increase corridor lighting, upgrade traffic signals to include flashing yellow arrows and implement signage and visibility enhancements at signalized intersections. Additional recommendations include access management through driveway consolidation from Holland Lake Drive to Briarhaven Boulevard and the installation of a raised median between Fort Worth Highway and Jack Borden Way.

**TABLE 20: CORRIDOR 1 INTERSECTION RECOMMENDATIONS**

| INTERSECTIONS                   | RECOMMENDATIONS                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------|
| Santa Fe and Fort Worth Highway | Signal signage, Refresh striping - dual right                                             |
| Santa Fe and Oak Street         | Traffic signal                                                                            |
| Santa Fe and E. Lee Avenue      | Driveway consolidation southeast of the intersection                                      |
| Santa Fe and Foster Lane        | Install bollards at paved to unpaved section north of the intersection, Trail connection  |
| Santa Fe and Hilltop Drive      | Driveway consolidation northwest of the intersection in front of Parker County Courthouse |
| Santa Fe and E. Park Avenue     | Turn lane reconfiguration                                                                 |
| Santa Fe and Clear Lake Road    | Driveway reconfiguration at the southwest portion of the intersection, Traffic signal     |

A summary of existing conditions and crash statistics for the study location are in **Exhibit 16** on page 82. All corridor and intersection-specific recommendations are shown in **Exhibit 17** on page 82-83.



## EXHIBIT 16: SANTA FE DRIVE SUMMARY SHEET

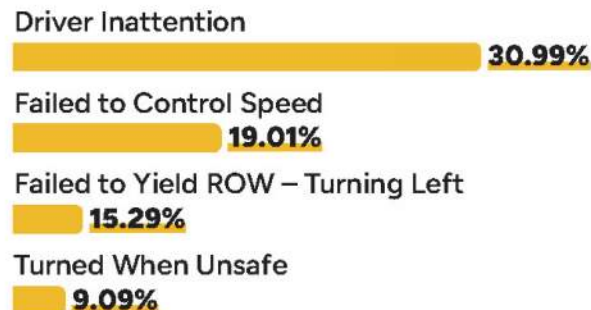
### SANTA FE DRIVE

From Fort Worth Highway to Interstate 20

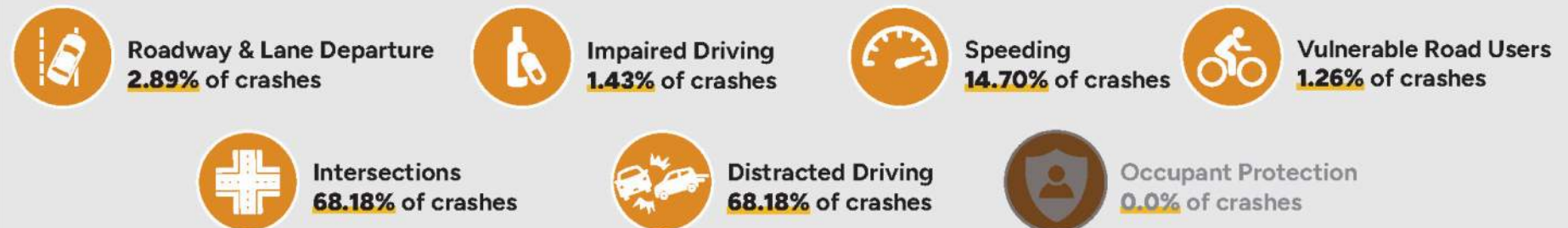
#### EXISTING CONDITIONS

- Arterial
- 4 lane divided
- Total Volume: 9,900
- 45 mph

#### CONTRIBUTING FACTORS



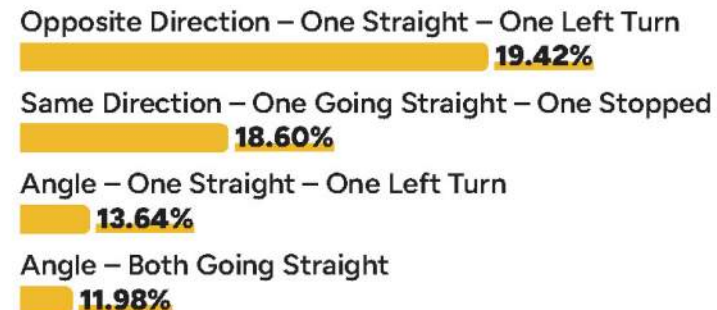
#### SAFETY EMPHASIS AREAS



#### CRASH SUMMARY

**242** Total Crashes  
**2** Fatal Crashes  
**6** Suspected Serious Injury Crashes  
**34** Suspected Minor Injury Crashes  
**4** Pedestrian & Bicyclist Crashes  
**165** Intersection Related Crashes

#### MANNERS OF COLLISION



CORRIDOR WIDE RECOMMENDATIONS



Lighting



Sidewalks



Implement Systemic Signage and Visibility Improvements at Signalized Intersections



Driveway Access Management



Flashing Yellow Arrow

KEY MAP

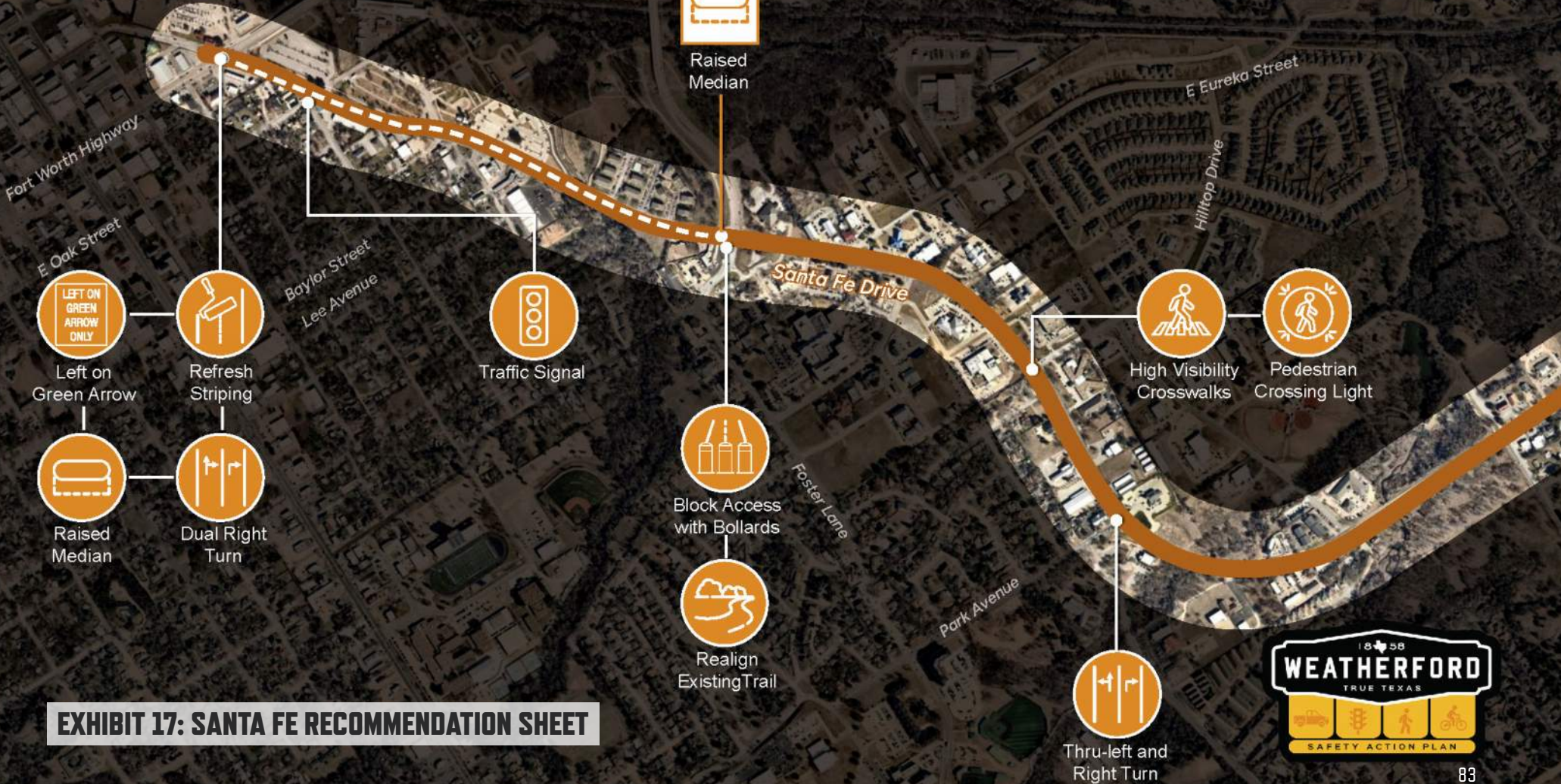


EXHIBIT 17: SANTA FE RECOMMENDATION SHEET



## CORRIDOR WIDE RECOMMENDATIONS



Lighting



Sidewalks



Implement  
Systemic Signing  
and Visibility  
Improvements  
at Signalized  
Intersections



Driveway Access  
Management



Flashing Yellow  
Arrow

## KEY MAP



Traffic Signal



Driveway  
Consolidation



Retroreflective  
Backplates



Flashing Yellow  
Arrow

EXHIBIT 17: SANTA FE RECOMMENDATION SHEET (CONTINUED)



Corridor 2: State Highway 171 from Oak Street to I-20

Context

The SH-171 segment from Oak Street and Interstate 20 spans approximately 2.78. Located in the southern portion of the city, the corridor is primarily commercial, with some residential uses. This segment has a posted speed limit ranging from 30 to 35 mph and carries an average of 14,100 vehicles per day. SH-171 is a four-lane divided arterial roadway.

Crash History

There was a total of 529 crashes on this study corridor of SH-171 from the study period of 2019-2023. Of these crashes there were 41 B's, 7 A's, and 1 K. Additionally, 3 crashes involved a pedestrian or bicyclist. Along the study corridor of Santa Fe Drive, there were:



Corridor Recommendations

Corridor wide recommendations for the SH-171 corridor include implementing signing and visibility improvements are signalized intersections, extending the raise median from E. Oak Street to E. Owens Street, addressing pedestrian gaps, and installing sidewalks where needed from E. Oak Street to Bethel Road. Additionally, it is recommended to install Flashing Yellow Arrows at signalized intersections from Cleburne Avenue to Interstate-20.

TABLE 21: CORRIDOR 2 INTERSECTION RECOMMENDATIONS

| INTERSECTIONS            | RECOMMENDATIONS                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| SH-171 and Park Avenue   | Close driveways at eastern portion of the intersection, ADA compliance, Eliminate island |
| SH-171 and Eureka Street | Close excessive driveways                                                                |
| SH-171 and Bethel Road   | Close excessive driveways                                                                |
| SH-171 and Martin Drive  | Left turn pavement markings                                                              |
| SH-171 and Adams Drive   | Vertical delineators at the southernmost exit of Walmart turning onto Adams Drive        |
| SH-171 and I-20          | Lane reconfigurations, Eliminate pedestrian crossing                                     |

A summary of existing conditions and crash statistics for the study location are in **Exhibit 18** on page 86. All corridor and intersection-specific recommendations are shown in **Exhibit 19** on page 87.



# EXHIBIT 18: STATE HIGHWAY 171 SUMMARY SHEET

## STATE HIGHWAY 171

From Oak Street to Interstate 20

### EXISTING CONDITIONS

- Arterial
- 4 lane divided
- Total Volume: 14,100
- 30-35 mph

### CONTRIBUTING FACTORS

- Driver Inattention  
 **31.57%**
- Failed to Control Speed  
 **24.01%**
- Followed Too Closely  
 **11.53%**
- Failed to Yield ROW – Turning Left  
 **8.32%**

### CRASH SUMMARY

- 529** Total Crashes
- 1** Fatal Crashes
- 7** Suspected Serious Injury Crashes
- 41** Suspected Minor Injury Crashes
- 3** Pedestrian & Bicyclist Crashes
- 298** Intersection Related Crashes

### MANNERS OF COLLISION

- Same Direction – One Straight – One Stopped  
 **31.00%**
- Same Direction – Both Going Straight – Rear End  
 **12.85%**
- Angle – Both Going Straight  
 **12.29%**
- Opposite Direction – One Straight – One Left Turn  
 **9.45%**

### SAFETY EMPHASIS AREAS

- 

Roadway & Lane Departure  
**4.54%** of crashes
- 

Impaired Driving  
**0.39%** of crashes
- 

Speeding  
**19.72%** of crashes
- 

Vulnerable Road Users  
**0.57%** of crashes
- 

Intersections  
**56.33%** of crashes
- 

Distracted Driving  
**26.71%** of crashes
- 

Occupant Protection  
**0.0%** of crashes

# CORRIDOR WIDE RECOMMENDATIONS



Implement Systemic Signing and Visibility Improvements at Signalized Intersections



Driveway Access Management



Sidewalks



Address Pedestrian Gaps



Leading Pedestrian Interval



Flashing Yellow Arrow



Eliminate Island



Flashing Yellow Arrow



Pavement Markings



Install Vertical Delineators



Right Turn Lane



Eliminate Pedestrian Crossing



Sidewalks



Add 2nd Left Turn Lane



Extend Raised Median

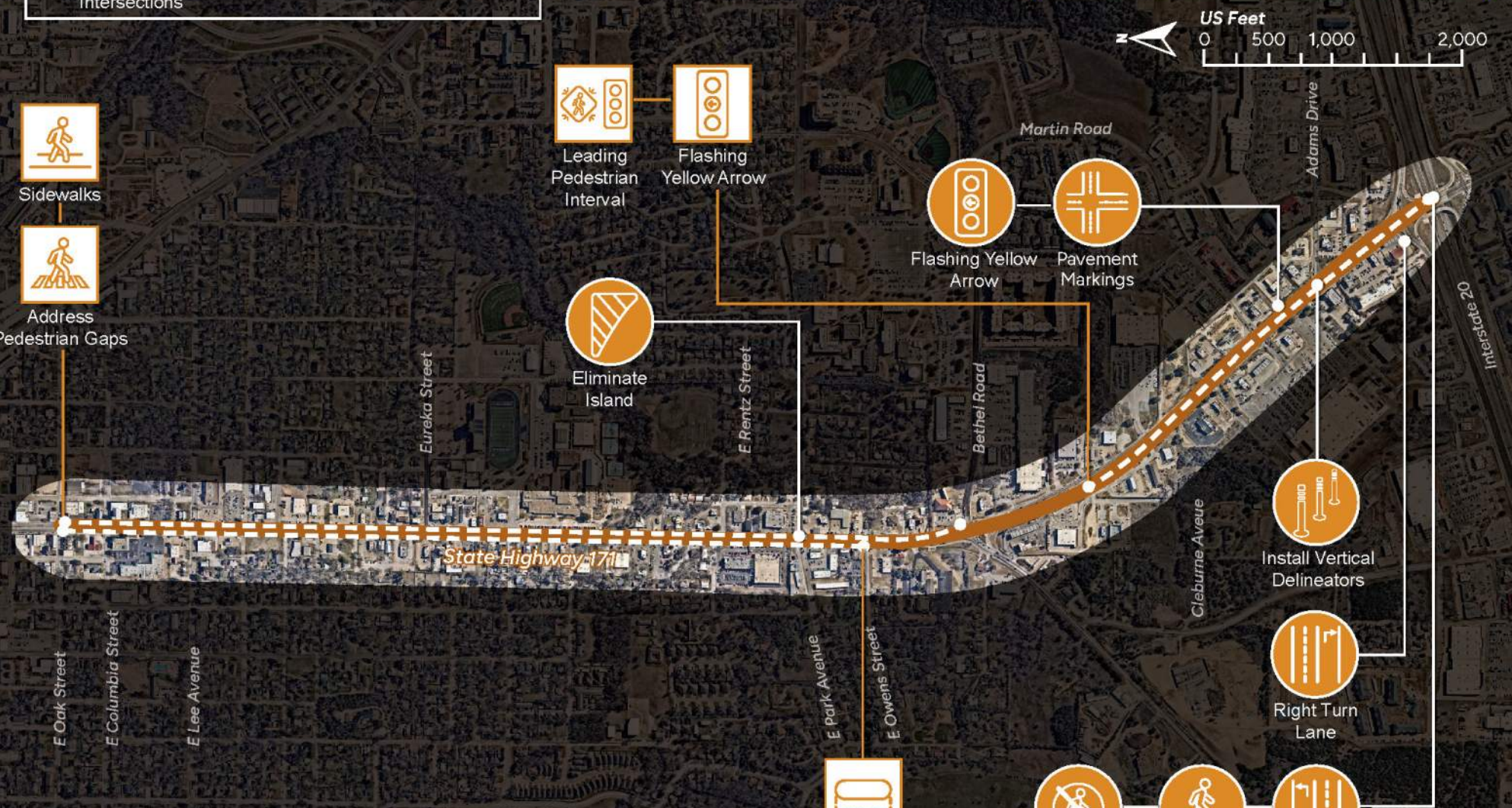


EXHIBIT 19: STATE HIGHWAY 171 RECOMMENDATION SHEET



### **Corridor 3: US Highway 180 from Jack Borden Way to Ric Williamson Memorial Highway**

#### **Context**

The section of US-180 between Jack Borden Way and Ric Williamson Memorial Highway spans 5.80 miles. Located in the eastern portion of the city, the corridor is primarily commercial with some residential areas. This segment has a posted speed limit ranging from 30 to 50 mph and carries an average of 14,700 vehicles per day. US-180 is a four-lane divided arterial roadway.

#### **Crash History**

There was a total of 345 crashes on this study corridor of US-180 from the study period of 2019-2023. Of these crashes there were 41 B's, 7 A's, and 1 K. Additionally, 3 crashes involved a pedestrian or bicyclist. Along the study corridor of US-180, there were:

**165**

Intersection-Related Crashes

**164**

Same Direction – One Straight – One Stopped

**71**

Same Direction – One Straight – One Stopped

#### **Corridor Recommendations**

Corridor wide recommendations for the US-180 corridor include implementing signing and visibility improvements are signalized intersections, adding corridor lighting, and implementing positive left-turn offset. Additionally, it is recommended to restripe the corridor from Jack Borden Way to Willow Creek Drive and extend the raised median over the currently painted median west of the intersection with Azle Highway.

**TABLE 22: CORRIDOR 3 INTERSECTION RECOMMENDATIONS**

| INTERSECTIONS                                      | RECOMMENDATIONS                                                                                                                                                                                                                                           |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US-180 and Willow Creek Drive                      | Install traffic signal                                                                                                                                                                                                                                    |
| US-180 and Pine Street                             | Extend left-turn lane                                                                                                                                                                                                                                     |
| US-180 and Mimosa Street   US-180 and Allen Street | Close Median Openings                                                                                                                                                                                                                                     |
| U-180 and Sweetwater Drive                         | Install traffic signal, Remove hooded left-turn                                                                                                                                                                                                           |
| SH-171 and Adams Drive                             | Vertical delineators at the southernmost exit of Walmart turning onto Adams Drive                                                                                                                                                                         |
| U-180 and Azle Highway                             | Extend storage in westbound left-turn lane, Deceleration lane southbound along Azle Highway, Acceleration lane eastbound on US-180, Restripe, Raised pavement markers, Curb ramps, Wildlife crossing sign west of the intersection, Hooded left-turn lane |

A summary of existing conditions and crash statistics for the study location are in **Exhibit 20** on page 89. All corridor and intersection-specific recommendations are shown in **Exhibit 21** on page 90.

### EXHIBIT 20: US HIGHWAY 180 SUMMARY SHEET

## US HIGHWAY 180

From Jack Borden Way to Ric Williamson Memorial Highway

#### EXISTING CONDITIONS

- Arterial
- 4 lane divided
- Total Volume: 14,700
- 30-45-50 mph

#### CONTRIBUTING FACTORS

Driver Inattention

**27.83%**

Failed to Control Speed

**26.09%**

Failed to Yield ROW – Turning Left

**11.59%**

Changed Lane When Unsafe

**9.56%**

#### CRASH SUMMARY

**345** Total Crashes

**1** Fatal Crashes

**13** Suspected Serious Injury Crashes

**42** Suspected Minor Injury Crashes

**3** Pedestrian & Bicyclist Crashes

**165** Intersection Related Crashes

#### MANNERS OF COLLISION

Same Direction – One Straight – One Stopped

**20.58%**

Same Direction – Both Going Straight – Rear End

**16.81%**

Opposite Direction – One Straight – One Left Turn

**14.20%**

Same Direction – Both Going Straight - Sideswipe

**9.27%**

#### SAFETY EMPHASIS AREAS



Roadway & Lane Departure  
**6.96%** of crashes



Impaired Driving  
**1.73%** of crashes



Speeding  
**20.15%** of crashes



Vulnerable Road Users  
**0.59%** of crashes



Intersections  
**47.83%** of crashes



Distracted Driving  
**22.54%** of crashes



Occupant Protection  
**0.0%** of crashes

## CORRIDOR WIDE RECOMMENDATIONS



Implement Systemic Signing and Visibility Improvements at Signalized Intersections

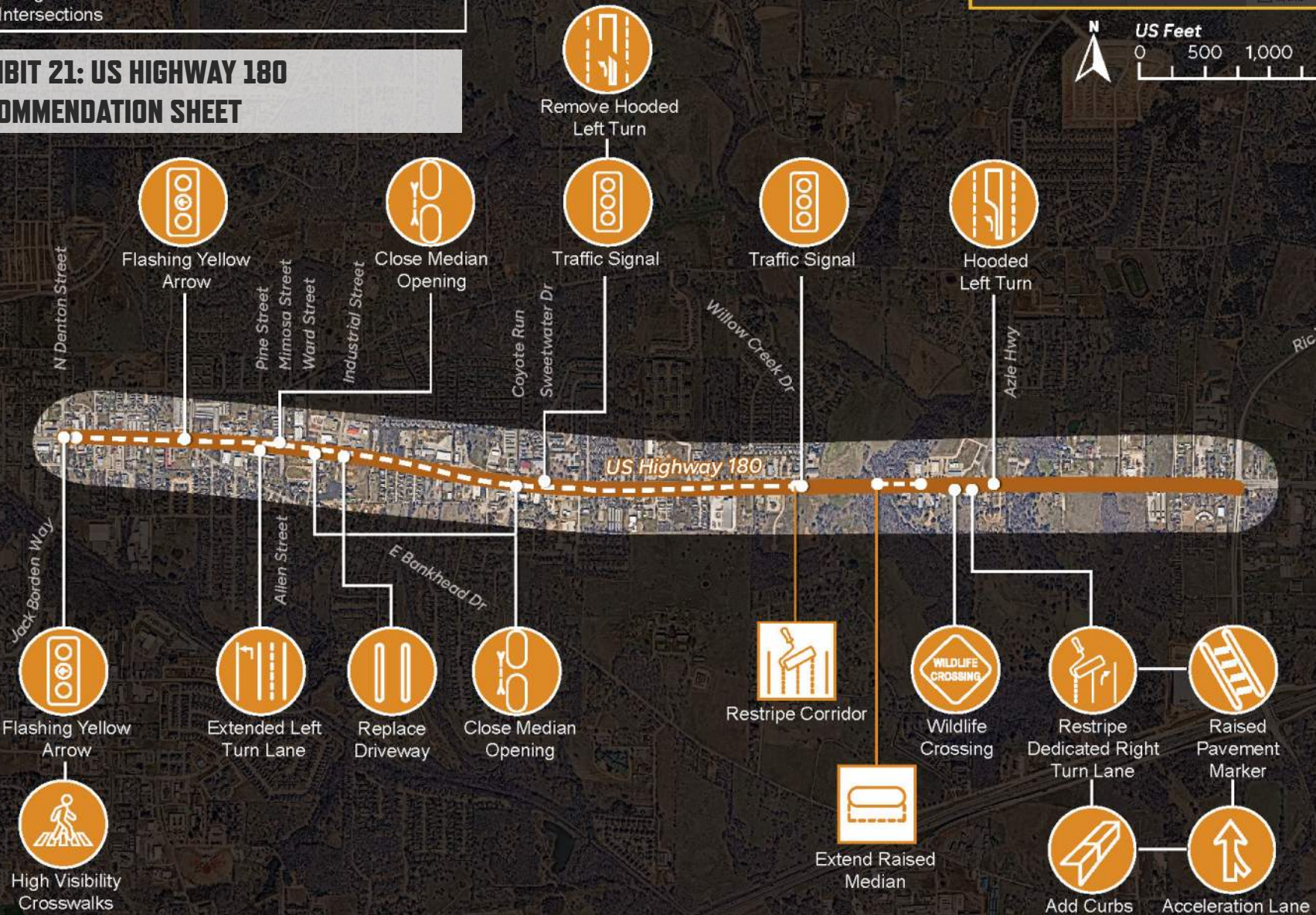


Lighting



Positive Left-turn Offset

## EXHIBIT 21: US HIGHWAY 180 RECOMMENDATION SHEET



### ***Intersection 1: Mineral Wells Highway and Ric Williamson Memorial Highway***

#### **Context**

The intersection of Mineral Wells Highway and Ric Williamson Memorial Highway is located in western Weatherford (**Exhibit 18**). The adjacent areas are majority vacant with a gas station/restaurant located at the northwestern corner of the intersection. The intersecting roads have a posted speed limits of 50-65 mph and an average volume of 11,700 vehicles per day for Mineral Wells Highway and 9,900 vehicles per day for Ric Williamson Memorial Highway. The intersecting streets are a four-lane divided road, and a two-lane divided road.

#### **Crash History**

There was a total of 180 crashes at this study intersection from the study period of 2019-2023. Of these crashes there were 9 B's, 2 A's, and 0 K's. There were no crashes at this intersection that involved a pedestrian or bicyclist. On the study intersection, there were:

**180**

Intersection-Related Crashes, Which  
Included 1 KA Crash

**96**

Failed To Disregard Of Turn  
Marks At The Intersection

**55**

Driver Inattention

#### **Recommendations**

Recommendations for the Mineral Wells Highway and Ric Williamson Memorial Highway intersection include refresh striping and adding left turn pavement markings, retroreflective backplates, lane assignment signage, and grade separation (long-term goal). A summary of existing conditions and crash statistics for the study location are in **Exhibit 22** on page 92. All corridor and intersection-specific recommendations are shown in **Exhibit 23** on page 93.



## EXHIBIT 22: MINERAL WELLS HIGHWAY AND RIC WILLIAMSON MEMORIAL HIGHWAY INTERSECTION SUMMARY SHEET

### BRIDGE STREET & N MAIN STREET INTERSECTION

#### EXISTING CONDITIONS

- Arterial and local
- Total volumes:
  - » 3,100 (Bridge Street)
  - » 19,000 (N Main Street)
- 6 lane divided and 4 lane divided
- 30-35 mph

#### CONTRIBUTING FACTORS

Failed to Yield ROW or Stop Sign



Driver Inattention



Failed to Yield ROW – Open Intersection



Failed to Yield ROW – Turning Left



#### SAFETY EMPHASIS AREAS



Roadway & Lane Departure  
**0.0%** of crashes



Impaired Driving  
**0.0%** of crashes



Speeding  
**8.74%** of crashes



Vulnerable Road Users  
**0.0%** of crashes



Intersections  
**100%** of crashes



Distracted Driving  
**20.93%** of crashes



Occupant Protection  
**0.0%** of crashes

#### CRASH SUMMARY

**29** Total Crashes

**0** Fatal Crashes

**1** Suspected Serious Injury Crash

**4** Suspected Minor Injury Crashes

**0** Pedestrian & Bicyclist Crashes

**29** Intersection Related Crashes

#### MANNERS OF COLLISION

Angle – Both Going Straight



Opposite Direction – One Straight – One Left Turn



Same Direction – One Straight – One Right Turn



Angle – One Straight – One Right Turn



## RECOMMENDATIONS



Dual Hooded Left  
with S-median



Pedestrian  
Ramps

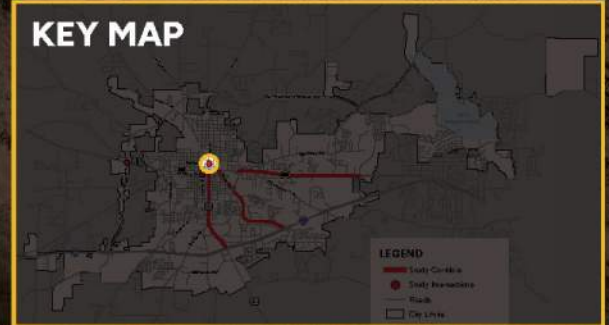


Lighting



High Visibility  
Crosswalks

## KEY MAP



US Feet

0 500 1,000 2,000

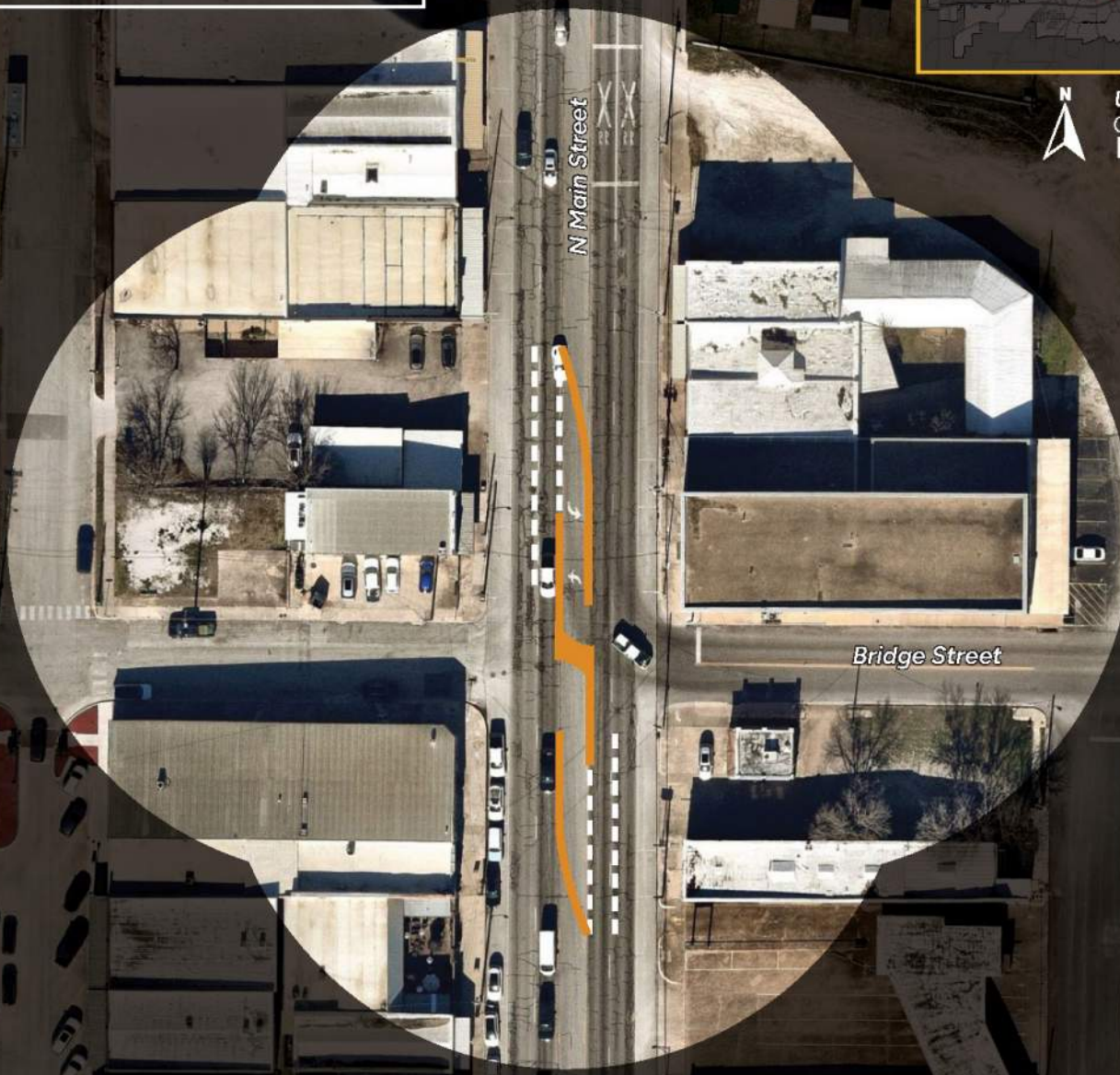


**EXHIBIT 23: MINERAL WELLS HIGHWAY AND RIC WILLIAMSON MEMORIAL HIGHWAY INTERSECTION RECOMMENDATIONS SHEET**



## ***Intersection 2: Bridge Street and N Main Street***

### **Context**

The Bridge Street and N. Main Street intersection are located near the center portion of Weatherford (**Exhibit 20**). The adjacent areas are majority commercial businesses. The intersecting roads have a posted speed limit of 30-35 mph and an average volume of 3,100 vehicles per day for Bridge Street, and 19,000 vehicles per day for N. Main Street. The intersecting streets are a four-lane divided road, and a six-lane divided road.

### **Crash History**

There was a total of 29 crashes at this study intersection from the study period of 2019-2023. Of these crashes there were 4 B's, 1 A, and 0 K's. There were no crashes at this intersection that involved a pedestrian or bicyclist. On the study intersection, there were:

**29**

Intersection-Related Crashes, Which  
Included 1 KA Crash

**12**

Failed To Yield Right-Of-Way – Stop Sign

**9**

Driver Inattention

### **Recommendations**

Recommendations for the Bridge Street and N. Main Street intersection include dual hooded left with S-median, pedestrian ramps, increased lighting, and high visibility crosswalks. A summary of existing conditions and crash statistics for the study location are in **Exhibit 24** on page 95. All corridor and intersection-specific recommendations are shown in **Exhibit 25** on page 96.

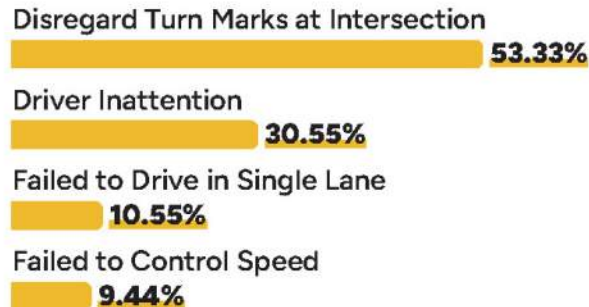
### EXHIBIT 24: BRIDGE STREET AND N MAIN STREET INTERSECTION SUMMARY SHEET

## MINERAL WELLS HIGHWAY & RIC WILLIAMSON MEMORIAL HIGHWAY INTERSECTION

#### EXISTING CONDITIONS

- Arterial and local
- Total volumes:
  - » 11,700 (Mineral Wells Highway)
  - » 9,900 (Ric Williamson Memorial Highway)
- 4 lane divided and 2 lane divided
- 50-65 mph

#### CONTRIBUTING FACTORS



#### CRASH SUMMARY

**180** Total Crashes

**0** Fatal Crashes

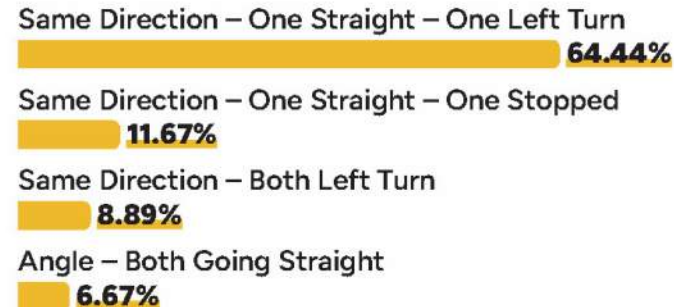
**2** Suspected Serious Injury Crash

**9** Suspected Minor Injury Crashes

**0** Pedestrian & Bicyclist Crashes

**180** Intersection Related Crashes

#### MANNERS OF COLLISION



#### SAFETY EMPHASIS AREAS



Roadway & Lane Departure  
**1.11%** of crashes



Impaired Driving  
**0.39%** of crashes



Speeding  
**9.65%** of crashes



Vulnerable Road Users  
**0.0%** of crashes



Intersections  
**100%** of crashes



Distracted Driving  
**24.03%** of crashes



Occupant Protection  
**0.0%** of crashes

## RECOMMENDATIONS



Refresh Striping  
and Add Left  
Turn Pavement  
Markings



Retroreflective  
Backplates



Grade  
Separated  
(Long Term)



Lane Assignment  
Signage

## KEY MAP



US Feet

0 500 1,000 2,000

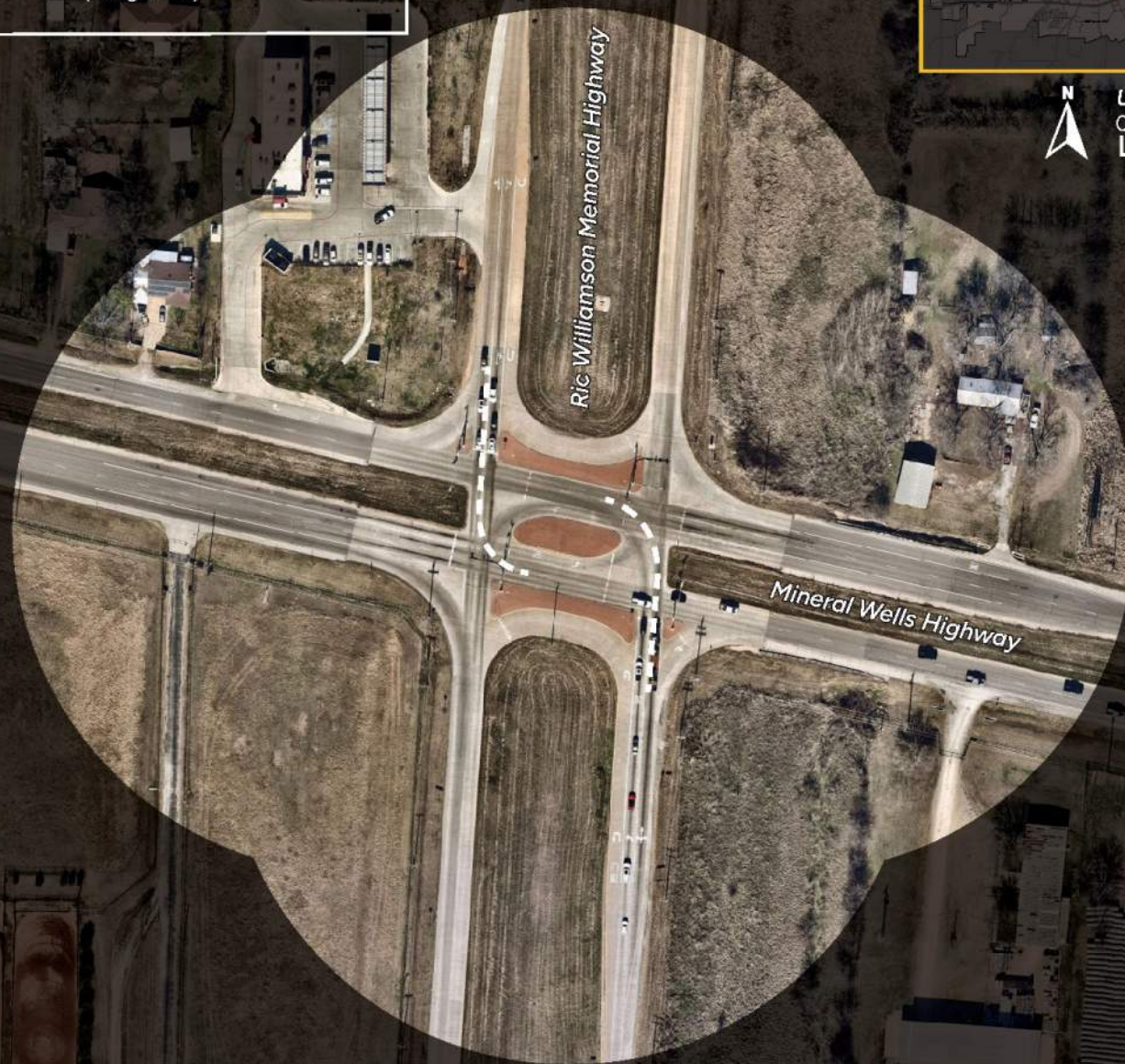


**EXHIBIT 25: BRIDGE STREET AND N MAIN STREET INTERSECTION RECOMMENDATIONS SHEET**

### ***Intersection 3: S. Lamar Street and US-180 (Palo Pinto Street)***

#### **Context**

The S. Lamar Street and US-180 (Palo Pinto Street) intersection are located near the center portion of Weatherford. The adjacent areas are majority commercial businesses. The intersecting roads have a posted speed limit of 30-45 mph and a volume of 1,300 vehicles per day for Lamar Street and 7,000 vehicles per day for US-180 (Palo Pinto Street). The intersecting streets are a four-lane divided road, and a two-lane undivided road.

#### **Crash History**

There was a total of 23 crashes at this study intersection from the study period of 2019-2023. Of these crashes there were 5 B's, 1 A, and 0 K's. There were no crashes at this intersection that involved a pedestrian or bicyclist. On the study intersection, there were:

**23**

Intersection-Related Crashes, Which  
Included 1 Ka Crash

**14**

Angle- Both Going Straight

**11**

Driver Inattention

#### **Recommendations**

Recommendations for the S. Lamar Street and US-180 intersection include adding flashing yellow arrows, ensuring ADA compliance, adding a luminaire to the southwest corner of the intersection, high contrast lane markings, and closing driveway within 100' of the intersection. A summary of existing conditions and crash statistics for the study location are in **Exhibit 26** on page 98. All corridor and intersection-specific recommendations are shown in **Exhibit 27** on page 99.



# EXHIBIT 26: S. LAMAR STREET AND US-180 INTERSECTION SUMMARY SHEET

## US-180 (PALO PINTO STREET) & S LAMAR STREET INTERSECTION

**EXISTING CONDITIONS**

- Arterial and Collector
- Total Volumes:
  - » 1,300 (S. Lamar Street)
  - » 7,000 (US-180 (Palo Pinto Street))
- 2 lane undivided and 4 lane divided
- 30-45 mph

**CRASH SUMMARY**

**23** Total Crashes

**0** Fatal Crashes

**1** Suspected Serious Injury Crash

**5** Suspected Minor Injury Crashes

**0** Pedestrian & Bicyclist Crashes

**23** Intersection Related Crashes

**CONTRIBUTING FACTORS**

Driver Inattention  
**39.13%**

Failed to Control Speed  
**34.78%**

Disregard Stop and Go Signal  
**30.43%**

Failed to Stop at Proper Place  
**8.69%**

**MANNERS OF COLLISION**

Angle – Both Going Straight  
**60.87%**

Same Direction – One Straight – One Stopped  
**21.74%**

Opposite Direction – One Straight – One Left Turn  
**8.69%**

Angle – One Straight – One Left Turn  
**4.35%**

**SAFETY EMPHASIS AREAS**

Roadway & Lane Departure  
**0.0%** of crashes

Impaired Driving  
**0.0%** of crashes

Speeding  
**34.78%** of crashes

Vulnerable Road Users  
**0.0%** of crashes

Intersections  
**100%** of crashes

Distracted Driving  
**47.83%** of crashes

Occupant Protection  
**0.0%** of crashes

RECOMMENDATIONS



Flashing Yellow Arrow



ADA Compliance



High Contrast Lane Markings



Driveway Consolidation



Lighting



KEY MAP



EXHIBIT 27: BRIDGE STREET AND N MAIN STREET INTERSECTION RECOMMENDATIONS SHEET



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## CHAPTER 6: ACTION PLAN

### INTRODUCTION

The improvement of transportation safety requires a multi-pronged approach. The previous chapters highlight portions of Weatherford's road network where engineering countermeasures can be implemented to reduce crashes. In addition to these efforts, an action plan is needed to identify and recommend policies that, when implemented, can lead to further reduction in crashes, fatalities, and injuries. The Action Plan provides policy recommendations which offer clear guidance for prioritizing and executing the safety initiatives discussed in this plan. Additionally, this chapter addresses plan administration, ensuring that there is a reliable framework for overseeing the implementation of this plan.





## IMPLEMENTATION PROGRAM

The Action Plan outlines recommended policies and programs that will assist in achieving the Mission Statement set out by the SAPWG. The policies and programs recommended are meant to enhance the safety of Weatherford's transportation system. To create a clear path toward Weatherford's Comprehensive Safety Action Plan goals, each of the policies has actions that should be completed as part of the implementation effort.

### POLICY RECOMMENDATIONS AND ACTION MATRIX

The City of Weatherford Safety Action Plan is summarized in the Action Matrix, presented in **Table 25** on pages 103-104. The Action Matrix is categorized based on the Safety Emphasis Areas discussed in **Chapter 1**. For each recommended policy, the following additional details are provided:

#### Timeframe

For every policy, an estimated timeframe for implementation is provided. The estimated timeframe for implementation allows for better informed decision-making and allocation of resources, funds, and time to complete the action plan strategies and actions promptly. Timeframes are broken out into the following:



**Short (< 2 years):** This action is a top priority and can be a "quick win" for Weatherford's CSAP.



**Medium (2–5 years):** This action may take longer but can be accomplished before the next CSAP update.



**Long (> 5 years):** This action will require many years but will have a significant impact on Weatherford when it is completed.

### Partners

For many instances, collaboration with partner organizations, entities or stakeholders is crucial to gathering more expertise to successfully implement recommended actions. These partners play a vital role by contributing resources, experience, and support to achieve Weatherford's goals. The list of partners below identifies internal and external agencies that could be helpful in the implementation process, although it is not an exhaustive list.

- City Manager's Office (CM)
- City Planning Department (CP)
- Public Works (PW)
- Public Safety (PS)
- Texas Department of Transportation (TxDOT)
- Communications Department (COMM)
- Weatherford Chamber of Commerce (Chamber)
- Downtown Weatherford Incorporated (D-Winc)
- Economic Development Department (EDD)
- Weatherford Independent School District (WISD)
- United Way of Parker County (UW)
- Parker Co Health Department (HD)
- Parker County Sheriff's Office

### Funding

Potential funding sources are essential to implementing the action plan. The action matrix provides guidance on how three distinct funding sources can be utilized to accomplish each individual action. Three potential sources of funding are as follows:

- Existing Funds
- Reallocation of Funds
- Grant Acquisition

TABLE 23: ACTION MATRIX

| ID | ACTION ITEM                                                                                                                                    | EMPHASIS AREA         | POTENTIAL PARTNERS                     | TIME FRAME | POTENTIAL FUNDING |
|----|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------|------------|-------------------|
| 1  | <b>Increase demand for rideshare services by partnering with major local event organizers to sponsor discount codes with Uber and/or Lyft.</b> | Impaired Driving      | Chamber, D-Winc., Economic Development | Short      | Reallocate        |
| 2  | <b>Partner with local subject experts to increase awareness of car seat safety programs.</b>                                                   | Occupant Protection   | PD, ISD, Hospitals, Fire               | Short      | Existing          |
| 3  | <b>Evaluate currently active crash clearance trainings and utilize local resources to expand availability and frequency.</b>                   | Post Crash Care       | PD, Fire                               | Short      | Existing          |
| 4  | <b>Conduct a citywide Active Transportation Plan to inventory and plan a more connected sidewalk and trails network.</b>                       | Vulnerable Road Users | CM, PD                                 | Medium     | Reallocate        |



TABLE 25: ACTION MATRIX (CONTINUED)

| ID | ACTION ITEM                                                                                                                                                                                                                     | EMPHASIS AREA                        | POTENTIAL PARTNERS                           | TIME FRAME | POTENTIAL FUNDING |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------|------------|-------------------|
| 5  | Install emergency preemption devices and battery backups when traffic signals are built or upgraded.                                                                                                                            | Post Crash Care, Intersections       | PW, PD, FD                                   | Long       | Reallocate        |
| 6  | Research the procurement of work zone traffic devices that have the ability to preemptively alert drivers of work zones.                                                                                                        | Speed Related, Vulnerable Road Users | CM, PS                                       | Short      | Reallocate        |
| 7  | Work with Weatherford Police Department to establish an enforcement program for unsafe driving , obtaining grant funding to support overtime resources if needed.                                                               | Impaired Driving; Speed Related      | PD                                           | Medium     | Grant             |
| 8  | Partner with the Communications Department and Police Department to develop public communications campaigns that highlights targeted unsafe driving programs referencing data from the City's Comprehensive Safety Action Plan. | Speed Related                        | PD, COMM                                     | Short      | Existing          |
| 9  | Discourage distracted driving through social media outreach to raise driver awareness and reduce crashes.                                                                                                                       | Impaired Driving                     | United Way, Parker Co Health District , COMM | Short      | Grant             |
| 10 | Develop a screening process to deploy rumble strips, raised buttons, and/or refreshed striping as part of the City's existing pavement maintenance program.                                                                     | Roadway & Lane Departures            | PW, TxDOT                                    | Medium     | Reallocate        |
| 11 | Encourage City employees to enable driving/focus mode on cell phone when operating city-owned vehicles                                                                                                                          | Distracted Driving                   | PS, CM                                       | Short      | Existing          |
| 12 | Deploy speed monitoring trailers along corridors where speed-related crashes occur the most frequently as a short-term solution.                                                                                                | Speed Related                        | PW, PS, PD, TxDOT                            | Short      | Reallocate        |
| 13 | Complete the changes to the Engineering Design Criteria Manual, Subdivision Ordinance, and Complete Streets Policy specified in Appendix X.                                                                                     | All                                  | CM, PD, COMM                                 | Medium     | Existing          |

Additional information on each recommended action or strategy is provided on the following pages

### 1 INCREASE DEMAND FOR RIDESHARE SERVICES

This strategy directly addresses the issue of improving roadway safety by reducing the number of distracted, aggressive, and impaired drivers. Offering discounted rideshare options encourages individuals to opt for safe, reliable transportation instead of driving themselves, particularly after attending community events where alcohol consumption may occur (**Figure 48**). This not only helps to lower the risk of crashes caused by drunk driving but also mitigates the incidence of distracted and aggressive driving behaviors, as professional (Uber / Lyft) drivers are generally more focused and trained to handle diverse traffic conditions. Leveraging popular events to promote ride sharing can shift public behavior towards a more safety-conscious mindset, by giving the community another option to get around, other than driving themselves.

FIGURE 48: RIDESHARE FOR MAJOR EVENTS



### 2 INCREASE AWARENESS OF CAR SEAT SAFETY PROGRAMS

Car seat safety programs play a key role in ensuring that children are properly secured in vehicles, significantly reducing the risk of injury or fatality in the event of a crash. Proper use of car seats has been shown to reduce the risk of death dramatically for infants and toddlers in passenger vehicles (**Figure 50**). Despite this knowledge, many caregivers are either unaware of the correct car seat usage or make errors during the installation process. By raising awareness and providing education through trusted institutions, we can ensure that parents and guardians are well-informed about the importance of car seat safety. This collaborative effort can lead to a measurable decrease in crash-related fatalities and injuries among children, contributing to overall safer travel within the Weatherford community.

FIGURE 49: CAR SEAT SAFETY PROGRAMS





### 3 EVALUATE CRASH CLEARANCE TRAINING

Timely and efficient crash clearance is essential in mitigating the risks of secondary crashes, reducing traffic congestion, and ensuring that affected individuals receive prompt medical attention (**Figure 51**). By continually assessing and refining training programs related to crash clearance, we ensure that our first responders are equipped with the most current techniques and best practices in crash management and clearance. This not only enhances their ability to safely and quickly secure crash scenes, but also minimizes the exposure of emergency personnel and the public to potential hazards caused by crashes. Well-trained first responders can more effectively manage traffic incidents, thereby reducing the likelihood of further collisions and improving the overall flow of traffic.

FIGURE 50: CRASH CLEARANCE TRAINING



### 4 CREATE AN ACTIVE TRANSPORTATION PLAN

An Active Transportation Plan is critical for identifying gaps in our current infrastructure, allowing the City of Weatherford to strategically develop a comprehensive network of sidewalks and trails. A connected city encourages more residents to engage in walking, biking, and other forms of active transportation, reducing the reliance on motor vehicles and mitigating traffic congestion. This can also lead to improved public health outcomes by promoting regular physical activity and reducing pollution levels. Ensuring that our sidewalks and trails are well-integrated and accessible to all residents, including those with disabilities, enhances mobility and provides safe routes for children to walk or bike to school. A connected network of pedestrian and cycling paths boosts the local economy by making it easier for residents to access businesses and services. **Figure 52** shows an example of a bicycle trail.

FIGURE 51: ACTIVE TRANSPORTATION PLAN  
TRAIL NETWORK



### 5 EMERGENCY PRE-EMPTION DEVICES AND BATTERY BACKUPS

Emergency preemption devices are specialized systems that allow emergency vehicles, such as fire trucks, ambulances, and police cars, to control traffic signals, ensuring they receive a green light as they approach intersections. This technology significantly reduces response times during emergencies, ensuring that first responders can reach incidents and crashes more quickly and safely, which can be critical in life-threatening situations. Additionally, incorporating battery backups ensures that traffic signals remain operational during power outages, preventing traffic chaos and potential crashes. Upgrading traffic signals with these different technologies improves overall traffic flow, reduces the risk of secondary crashes, and enhances public safety by providing prioritized pathways for emergency vehicles (Figure 52).

FIGURE 52: UPGRADED TRAFFIC SIGNALS



### 6 RESEARCH WORK ZONE TRAFFIC DEVICES

These advanced traffic devices are designed to provide real-time warnings to drivers approaching work zones, which can significantly reduce the likelihood of crashes and ensure the safety of both motorists and construction workers. By alerting drivers in advance, these devices help them to adjust their speed, change lanes, or take alternate routes, which can prevent sudden braking, stopping, or dangerous driving maneuvers near work zones (Figure 54). This proactive measure is particularly important during road construction or maintenance activities, where unexpected changes in traffic patterns can lead to confusion and collisions. Investing in such technology not only saves lives but also helps to maintain smooth traffic flow and reduces the overall disruption caused by work zones.

FIGURE 53: WORK ZONE





## 7 ESTABLISH AN ENFORCEMENT PROGRAM FOR IMPAIRED DRIVING AND SPEEDING

Impaired driving and speeding are among the leading causes of serious crashes and fatalities on our roads. By implementing a dedicated enforcement program, we can significantly deter these dangerous behaviors, ensuring that our roads are safer for all users. Increased enforcement, supported by grant funding for overtime resources, enables our police department to maintain a visible presence in high-risk areas and during peak times when violations are more likely to occur. This not only acts as a powerful deterrent but also facilitates the prompt identification and removal of impaired and speeding drivers from the roads (**Figure 55**). Enhanced enforcement efforts, coupled with public awareness campaigns, underscore our commitment to protecting the lives and well-being of Weatherford residents, promoting a culture of safe and responsible driving.

FIGURE 54: ENFORCEMENT OF IMPAIRED DRIVING AND SPEEDING



## 8 SPEED ENFORCEMENT COMMUNICATION CAMPAIGN

Effective communication is key to ensuring that residents are informed about the reasons behind the implementation and the benefits of enforcement initiatives. By publicizing the targeted speed enforcement program, Weatherford can raise awareness about the dangers of speeding and the critical importance of adhering to speed limits. This campaign will educate drivers on how enforcement measures are designed to protect them and their loved ones, reduce crashes, and foster safer road conditions. Additionally, transparency of effort within the Police Department can also help to build trust within the community, showing that these actions are part of a comprehensive strategy to improve public safety. Through a well-crafted communications campaign, Weatherford can also encourage community members to support and participate in safety initiatives, reinforcing a collective commitment to responsible driving habits. An informed and engaged community is more likely to comply with speed regulations and contributes to a significant reduction in traffic violations and crashes. An example speed campaign poster is shown in **Figure 56**.

FIGURE 55: SPEED CAMPAIGN SIGN



### 9 DISCOURAGE DISTRACTED DRIVING

Distracted driving remains one of the leading causes of preventable road crashes, often resulting in serious injuries or fatalities. By leveraging the wide reach and influence of social media platforms, we can effectively disseminate impactful messages that highlight the real-life consequences of distracted driving. Utilizing crash statistics in these posts grounds our messages in concrete data, making the dangers more relatable and urgent for the public. This targeted approach not only raises awareness but also educates drivers on the importance of staying focused while behind the wheel. Additionally, regular and engaging social media content can help keep the issue top-of-mind for residents, fostering a community-wide culture of safe driving. By actively discouraging distracted driving (**Figure 57**) through compelling, data-driven posts, we can significantly reduce the occurrence of these dangerous behaviors and create a safer roadway environment for everyone in Weatherford.

FIGURE 56: DISCOURAGE DISTRACTED DRIVING



### 10 EXPAND THE CITY'S EXISTING PAVEMENT MAINTENANCE PROGRAM

Weatherford currently has a pavement maintenance program in place which includes refreshed striping. The expansion of this program could include additional measures such as rumble strips, raised buttons, and other means which provide tactile and auditory feedback. Rumble strips and raised buttons provide tactile and auditory feedback to drivers, effectively alerting them when they are veering off the road or approaching hazardous areas, thus preventing potential crashes. Refreshed striping ensures that lane markings and other road demarcations are clearly visible, particularly in adverse weather conditions or at night, greatly improving driver navigation and reducing confusion. By incorporating these features into the City's regular pavement maintenance program, we can identify and address areas in need of these safety enhancements (**Figure 58**). This proactive approach not only extends the longevity and functionality of our roadways but also creates a safer driving environment by encouraging proper lane usage and adherence to traffic regulations.

FIGURE 57: PAVEMENT MAINTENANCE





## 11 ENCOURAGE DRIVING/FOCUS MODE

Distracted driving is a big concern in Weatherford, and enabling driving or focus mode on cell phones is an effective measure to minimize distractions and ensure that drivers remain focused on the road. City employees, as representatives of Weatherford, have a unique opportunity to lead by example, demonstrating responsible driving behaviors that prioritize safety. By encouraging City employees to use driving/focus mode on their phones, we can show our commitment to protecting not only our employees but also all motorists, pedestrians and bicyclists who share the road. City vehicles (**Figure 59**) should embody the highest standards of safety and accountability, serving as visible reminders of our dedication to reducing distracted driving incidents.

## 12 DEPLOY SPEED MONITORING TRAILERS

Speed monitoring trailers, as shown in **Figure 60**, serve two purposes: 1) reminding drivers to observe the speed limits, and 2) they help to collect valuable data on traffic patterns and speeds. These trailers provide a visible warning to drivers, which helps to encourage them to slow down, which can significantly reduce the likelihood of speed-related crashes. By placing these trailers in specific locations with a history of frequent speed-related crashes, Weatherford can target and alleviate speed-related crashes. Additionally, the data gathered from these trailers can inform future management strategies surrounding traffic and different enforcement efforts, allowing for more effective allocation of resources and development of long-term safety measures.

FIGURE 58: CITY-OWNED VEHICLE



FIGURE 59: SPEED MONITOR TRAILER SIGN



### 13 COMPLETE STRATEGIC CHANGES TO THE CITY DESIGN MANUALS AND POLICIES

Updating these foundational documents, such as the “Engineering Design and Construction Manual” (**Figure 62**), is essential for creating a cohesive and consistent framework that supports the principles of safe, sustainable, and inclusive infrastructure development. These changes will integrate the latest safety standards, innovative design practices, and policies into the city’s planning and engineering processes, thereby enhancing road safety for all users, including pedestrians, cyclists, and motorists. Aligning these documents with the Comprehensive Safety Action Plan also ensures that new developments and existing infrastructure upgrades are performed with a clear emphasis on safety, accessibility, and long-term sustainability. Additional information on recommended manual and policy updates is specified in **Appendix X**.

FIGURE 60: ENGINEERING DESIGN AND CONSTRUCTION MANUAL





## **PLAN ADMINISTRATION**

The City of Weatherford and the SAPWG are responsible for administering this Plan. City staff will oversee the Plan's day-to-day implementation, monitoring, amendments, and evaluation. This section details the administrative activities.

### **City Departments**

Through the safe system approach, all City of Weatherford departments will be involved in supporting this Plan. The Planning, Public Works, and Public Safety departments will primarily oversee the administration and provide annual updates to the City Council.

### **City Council**

The City Council will play a vital role by providing continuous guidance and direction to staff and other boards and commissions and making decisions on budgets, resources and regulatory modifications as specified in the Implementation Program.

### **Other Boards, Committees, & Commissions**

City boards, committees and commissions are designed to review and guide specific initiatives. They will play a crucial role in implementing the recommendations in the Implementation Program that align with their focus areas.

### **SAPWG and Other Partners**

The SAPWG plays a crucial role in the implementation of this Plan by overseeing the plan's actions and initiatives to ensure goals are met both efficiently and effectively. The committee provides continuous feedback and guidance, supporting implementing agencies, monitoring progress, and adjusting for major challenges. Additionally, the SAPWG allows for fostering collaborative processes among stakeholders, including residents, regional entities, and external departments. The SAPWG helps to facilitate communication and promote community engagement to maintain momentum and accountability. The SAPWG will create annual report memos detailing progress in accordance with the CSAP.

### **Monitoring Progress**

Extensive efforts were dedicated throughout the planning process to engage a broad spectrum of external stakeholders and community members to ensure the Plan aligns with the overarching community vision. To sustain community engagement and enthusiasm, transparency about the progress in implementation is a vital part of the next steps. The Weatherford Public Works department will capture the CSAP monitoring and reporting progress.



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