WACO METROPOLITAN PLANNING ORGANIZATION

COMPREHENSIVE SAFETY ACTION PLAN

APRIL 2024

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Waco Metropolitan Planning Organization

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Waco Metropolitan Planning Organization

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2024 COMPREHENSIVE SAFETY ACTION PLAN

Undertaken by Waco Metropolitan Planning Organization in collaboration with McLennan County and 20 municipalities in the County

APRIL, 2024

Prepared By:

REGISTERED PROFESSIONAL ENGINEER
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Professional Civil Engineer and Project Manager,
T J K M Inc.

Signed for Approval:

Mukesh Kumar, Ph.D.
Director,
Waco Metropolitan Planning Organization

LEADERSHIP COMMITMENT

Dear Members of the Community,

I am writing to express my support for the Vision Zero goal adopted by the Policy Board of the Waco Metropolitan Planning Organization (MPO) to achieve zero traffic deaths and serious injuries by the year 2050. This ambitious objective represents a significant stride towards creating safer, more livable communities, and it is an endeavor that deserves our utmost dedication and commitment.

Taking action in pursuit of this goal will improve the safety of our roadways and prevent traffic deaths. Between 2014 and 2023, there have been 54,625 crashes in the Waco MPO's planning area of McLennan County, Texas - 331 of which resulted in tragic fatalities, and 1,630 of which resulted in serious injuries. These types of tragedies occur across the County, affecting people from all walks of life. By identifying high-risk areas, implementing targeted interventions, and continuously monitoring outcomes, communities can create safer roadways that protect all road users, from pedestrians and cyclists to motorists and users of public transit.

While traffic deaths and severe injuries are often regarded as inevitable, these tragedies are preventable if we take a proactive, preventative approach that considers traffic safety to be a public health issue. It is our collective responsibility to save every life we can. Beyond the human toll, these incidents have profound social and economic ramifications, impacting our healthcare systems, productivity, and overall quality of life. By setting a goal to eliminate traffic fatalities and serious injuries, the Waco MPO is not only prioritizing public safety but also demonstrating a profound commitment to the well-being of its residents.

Vision Zero aligns closely with the federal mandates outlined by transportation legislation such as the Fixing America's Surface Transportation (FAST) Act. As part of the federal transportation planning process, MPOs are required to address safety concerns and develop strategies to reduce traffic-related fatalities and injuries. By embracing Vision Zero principles, the Waco MPO not only fulfills its statutory obligations but also sets a precedent for other MPOs to follow suit in pursuit of safer, more sustainable transportation systems.

As Chairman of the Waco MPO Policy Board, I am proud to convey our commitment to Vision Zero as a guiding principle of our transportation planning. Through collaboration with stakeholders, investment in FHWA Proven Safety Countermeasures, and steadfast commitment to zero fatalities and serious injuries by 2050, the Waco MPO can help create a future where every journey is safe, and every life is valued.

Sincerely,

Josh Borderud
Chairman
Waco MPO Policy Board

Dear Members of the Community,

I am writing to communicate my enthusiasm for the recent resolution adopted by the Waco Metropolitan Planning Organization (MPO) Policy Board, affirming its commitment to the Vision Zero goal of achieving zero roadway deaths and serious injuries by 2050. The adoption of this ambitious objective marks a pivotal moment in our region's efforts to prioritize safety and enhance quality of life for all of its residents.

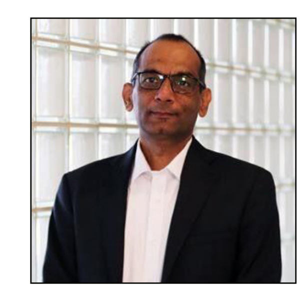
As the Director of the Waco MPO, I am proud to say that the MPO staff is fully dedicated to the realization of a McLennan County free of roadway deaths and serious injuries. I recognize the profound significance of our role in facilitating the necessary actions and strategies to achieve this critical milestone. Furthermore, it is important to note that this commitment is not only rooted in our community's needs and aspirations but also aligns with federal mandates for safety planning and goals set forth for Metropolitan Planning Organizations (MPOs) across the country.

MPOs are tasked by federal mandate to prioritize safety as a fundamental component of transportation planning. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have emphasized the importance of adopting proactive measures to reduce traffic-related fatalities and injuries, aligning with the overarching objectives of Vision Zero. By embracing this initiative, we not only fulfill our obligations as stewards of federal funding, but also demonstrate our unwavering commitment to promoting a safer, more resilient transportation system for our region.

The MPO Policy Board's commitment to Vision Zero underscores its dedication to human-centered design principles, data-driven decision-making, and collaborative partnerships. By setting clear and ambitious targets for safety, we lay the groundwork for transformative change that will benefit our community for generations to come.

I extend my sincere gratitude to the Policy Board for their dedication to advancing this crucial initiative. With determination and collaboration, I am confident that we will realize the Vision Zero goal and leave a lasting legacy of safety and resilience for generations to come.

Sincerely,



Mukesh Kumar
Director
Waco Metropolitan Planning Organization

Waco Metropolitan Planning Organization

RESOLUTION 2024-6

WHEREAS the Waco Metropolitan Planning Organization (MPO) was established to identify and support the implementation of regionally significant transportation projects to address future mobility needs of the Waco Region;

WHEREAS the Waco MPO Policy Board is composed of representatives appointed by the elected City Councils and Counties located within the jurisdiction of the MPO as well as the Texas Department of Transportation;

WHEREAS Section 134, Title 23, USC requires a comprehensive and continuing transportation planning process must be carried out cooperatively to ensure funds for transportation projects are effectively allocated to the Waco Metropolitan Area;

WHEREAS the Waco MPO has the authority and responsibility for transportation policy-making that leads to the efficient and safe movement of people and goods in its planning area of McLennan County, Texas;

WHEREAS motor vehicle crashes that result in death or serious injury are not inevitable but largely preventable and stem in part from human inattention and designs that are ineffective in accommodating multimodal uses;

WHEREAS the State of Texas leads the nation in total number of traffic deaths, and people dying and suffering serious injuries on our streets is a serious public health problem which necessitates public action;

WHEREAS crashes in the Waco MPO planning area necessitate a comprehensive and specific approach to street planning, design, policy, enforcement, legal processes, education, and communication to provide the most powerful solution to solve the problem;

WHEREAS a commitment to zero traffic deaths is a commitment to life and equitable opportunity for residents of McLennan County; and

WHEREAS implementing a commitment to zero traffic deaths requires the continued support of residents, business owners, and visitors to the Waco MPO planning area to improve the safety, comfort, and usability of streets in McLennan County for all roadway users;

P.O. Box 2570, Waco, TX 76702-2570
(254) 750-5651
www.waco-texas.com/cms-mpo
mpo@wacotx.gov

Now, therefore, be it ***RESOLVED***, that the Waco MPO Policy Board

1. hereby commits to a goal of zero deaths and serious injuries that are a result of crashes on streets within its planning area by 2050;
2. hereby acknowledges that achieving this goal requires significant effort and resources which will necessitate dedicated safety planning activities;
3. hereby officially found and determined that the meeting at which this resolution is passed is open to the public and that public notice of the time, place and purpose of said meeting was given as required by law;
4. hereby certifies this action complies with all applicable policies, procedures, and requirements identified within 23 CFR, Section 450, and Chapter 16 of Title 43 of the Texas Administrative Code.

PASSED AND APPROVED this the 29th day of April, 2024.

Josh Borderud
Council Member – City of Waco
Chair – Waco MPO Policy Board

ATTEST:

Mukesh Kumar
Director

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mpo@wacotx.gov

Waco Metropolitan Planning Organization

RESOLUTION 2024-7

WHEREAS the Waco Metropolitan Planning Organization (MPO) was established to identify and support the implementation of regionally significant transportation projects to address future mobility needs of the Waco Region;

WHEREAS the Waco MPO Policy Board is composed of representatives appointed by the elected City Councils and Counties located within the jurisdiction of the MPO as well as the Texas Department of Transportation;

WHEREAS Section 134, Title 23, USC requires a comprehensive and continuing transportation planning process must be carried out cooperatively to ensure funds for transportation projects are effectively allocated to the Waco Metropolitan Area;

WHEREAS the Waco MPO recognizes that human inattention and ineffective designs are the primary factors behind fatalities and serious injuries on our roadways;

WHEREAS the Policy Board of the Waco MPO has resolved to commit to a goal of zero deaths and serious injuries that are a result of crashes on streets within its planning area by 2050;

WHEREAS the Policy Board of the Waco MPO has acknowledged that achieving this goal will require significant effort and resources and necessitate dedicated safety planning activities;

WHEREAS the Waco MPO is dedicated to utilizing a data-driven approach to reaching its Vision Zero goal which measures the progress, challenges, and successes of its progress and produces tangible, reportable metrics; and

WHEREAS the Waco MPO Policy Board has previously resolved to support the pursuit of developing a "Comprehensive Safety Action Plan" for the planning area of the MPO;

Now, therefore, be it ***RESOLVED***, that the Waco MPO Policy Board

1. hereby adopts the 2024 Waco MPO Comprehensive Safety Action Plan;

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2. hereby officially found and determined that the meeting at which this resolution is passed is open to the public and that public notice of the time, place and purpose of said meeting was given as required by law;

3. hereby officially found and determined that all public participation requirements identified within the Waco MPO Public Participation Plan related to this action by the Policy Board were met and completed; and,

4. hereby certifies this action complies with all applicable policies, procedures, and requirements identified within 23 CFR, Section 450, and Chapter 16 of Title 43 of the Texas Administrative Code.

PASSED AND APPROVED this the 29th day of April, 2024.

Josh Borderud
Council Member – City of Waco
Chair – Waco MPO Policy Board

ATTEST:

Mukesh Kumar
Director

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ACKNOWLEDGMENTS

The Waco Metropolitan Planning Organization (MPO), in collaboration with member government agencies within McLennan County, has developed this Comprehensive Safety Action Plan (CSAP). The Plan was funded through a Safe Streets and Roads for All (SS4A) grant awarded by the Federal Highway Administration (FHWA).

This CSAP builds upon the foundation laid out in the region's existing transportation planning efforts, such as the Waco MPO's Connections 2045 Transportation Plan and the Active Transportation Plan. Additionally, it incorporates the overarching goals of Vision Zero - a national movement dedicated to eliminating all traffic fatalities and serious injuries (KSI).

The Waco MPO would like to acknowledge the valuable contributions of its member jurisdictions, including the incorporated cities, Independent School Districts, and McLennan County. Their active participation and input throughout the planning process were essential in shaping this comprehensive safety strategy for the region.

Furthermore, the MPO extends its gratitude to the stakeholders, community organizations, and members of the public who provided feedback and insights during the development of this plan. Their perspectives helped to ensure that the CSAP addresses the unique safety needs and priorities of all residents of McLennan County, regardless of their chosen mode of transportation.

The Waco MPO is committed to implementing the strategies outlined in this CSAP and collaborating with its partners to achieve the goal of zero traffic fatalities and serious injuries within the region.

PROJECT PARTNERS

City of Bruceville-Eddy

City of McGregor

City of Hewitt

City of Robinson

City of Woodway

City of Lacy Lakeview

City of Gholson

City of McLennan County

City of Bellmead

City of Waco

City of Golinda

City of West

City of Lorena

City of Mart

City of Beverly Hills

City of Moody

City of Riesel

Waco ISD

Midway ISD

Connally ISD

La Vega ISD

TxDOT

Waco Transit System

Other Agencies:
City of Crawford
City of Hallsburg
City of Leroy
City of Ross

WACO MPO SAFETY ACTION TASK FORCE

The Safety Action Task Force is a collaborative initiative proposed by the Waco MPO as part of its CSAP. This task force brings together stakeholders from various sectors to address transportation safety concerns within the region.

The formation of the Safety Action Task Force was driven by the recognition that improving traffic safety requires a coordinated effort involving multiple agencies and organizations. By bringing together representatives from the MPO, member governments, the Texas Department of Transportation (TxDOT), and Independent School Districts (ISDs), the task force aims to leverage collective expertise and resources to identify and implement effective strategies for enhancing road safety.

During the preparation of the CSAP, the Safety Action Task Force played a crucial role in providing guidance and input. Members contributed their unique perspectives, shared data and insights, and collaborated to develop a comprehensive understanding of the region's safety challenges. The task force's diverse representation ensured that the action plan addressed a wide range of concerns, from infrastructure improvements to educational campaigns and enforcement measures.

REPRESENTATIVE	AGENCY
Yost Zakary	City of Bellmead
Greg Snydal	City of Bellmead
Jim Devlin	City of Hewitt
John McGrath	City of Hewitt
Jeron Barnett	City of Lacy Lakeview
Andy Moore	City of Lacy Lakeview
Bryan LeMeilluer	City of McGregor
Chad Savlors	City of McGregor
Craig Lemin	City of Robinson
David Harrell	City of Robinson
Amy Burlarley - Hyland	City of Waco
Christine Miller	City of Waco
Mitch Davidson	City of Woodway
Shanna Sanders	Connally ISD
Kerry Blakemore	La Vega ISD
Sharon Shields	La Vega ISD
Zane Dunnam	McLennan County
Jeff Foley	Midway ISD
Aaron Pena	Midway ISD
Jacob Chau	TxDOT
Colton Smith	TxDOT
Lashonda Malrey-Horne	Waco McLennan Health District
Ricky Edison	Waco ISD
Gloria Barrera	Waco ISD
Sgt. Chad Ashworth	Waco PD

WACO MPO STAFF

Waco Metropolitan Planning Organization

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Daniela Gallegos

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50th Anniversary TJKM

Ruta Jariwala (Project Manager)

Utsav Domadia

Chaithra Navada

Andrew Dickinson

Talha Majeed

EXECUTIVE SUMMARY

The Waco MPO, in partnership with member agencies in McLennan County, has developed this CSAP. This plan aims to create a safer transportation system for all users in McLennan County by systematically analyzing crash data, identifying high-risk areas, and developing countermeasures.

The primary objectives of the CSAP are to:

- Conduct a proactive safety analysis of McLennan County's transportation network.
- Identify high-risk locations and recurring collision patterns.
- Develop a prioritized list of safety countermeasures, including both short-term and long-term solutions.
- Create a roadmap to secure funding and implement these safety improvements.

The CSAP aligns with Vision Zero, a national movement to eliminate traffic fatalities and serious injuries. By proactively addressing safety concerns, the Waco MPO aims to significantly reduce crashes and move closer to this goal. The plan considered safety data and developed actions for eight jurisdictions within the MPO: the Cities of Bellmead, Hewitt, Lacy Lakeview, McGregor, Robinson, Waco, Woodway, and the remainder of McLennan County.

The SS4A grants enable a data-driven approach to safety planning. The CSAP development involves:

- Building a comprehensive crash database.
- Analyzing collision data to identify trends and patterns.
- Identifying high collision corridors and intersections.
- Collaborating with partner agencies, stakeholders, and public to seek feedback on ongoing traffic safety concerns.
- Considering historical transportation disadvantages faced by communities.
- Developing safety projects that include a list of countermeasures to address these safety concerns.
- Prioritizing projects based on collision history, systemic benefits, benefit to vulnerable users, equity, ease of implementation, and other factors.

The Waco MPO CSAP represents a collaborative effort to create a datadriven safety plan for McLennan County. By implementing the recommendations outlined in this plan, Waco MPO strives to reduce traffic fatalities and serious injuries, ultimately achieving a safer transportation system for all.

SS4A ACTION PLAN COMPONENTS

The SS4A grant program defines nine action plan components that are integral to any safety action plan and must be satisfied to meet its requirements. The table below describes sections of the CSAP that satisfy these components.

Action Plan Components	Section
Leadership Commitment and Goal Setting	Chapter 1
Planning Structure	Chapter 1, 4 and 8
Safety Analysis	Chapter 2, 6.1 to 6.8
Engagement and Collaboration	Chapter 4
Equity Considerations	Chapter 8
Policy and Process Changes	Chapter 6, 6.1 to 6.8
Strategy and Project Selections	Chapter 6, 6.1 to 6.8
Progress and Transparency	Project Website: WacoMPOSafeStreets.com
Action Plan Adoption Date	April 29th 2024

GLOSSARY

ADT – Abbreviation for average daily traffic: Refers to vehicle traffic volumes.

ATP – Abbreviation for Active Transportation Plan.

CMAQ Grant – Congestion Mitigation and Air Quality (CMAQ) Improvement Program: This program provides funding for State and local governments for projects that reduce congestion and improve air quality as per the Clean Air Act.

Collision Severity – Defined as the intensity of collisions typically in the following categories: fatal, severe injury, minor injury and possible injury, and non–injured or property damage only (PDO).

CRF – Abbreviation for crash reduction factor: The percentage of expected effect of a countermeasure or safety project to decrease collisions.

CRIS – Abbreviation for Crash Records Information System. A database maintained by TxDOT that contains reportable motor vehicle traffic crash data.

CSAP – Abbreviation for Comprehensive Safety Action Plan.

Disadvantaged Communities – Census tracts facing transportation disadvantage as identified by US DOT's ETC Explorer. The ETC Explorer ranks them at the 65th percentile or higher.

EMS – Abbreviation Emergency Medical Services.

ETC Explorer – Abbreviation for US DOT's Equitable Transportation Community Explorer Screening Tool.

FHWA – Abbreviation for Federal Highway Administration: The federal agency responsible managing the nation's highway system, including bridges and tunnels.

FIRST – Abbreviation for Fatality and Injury Reporting System Tool: A query tool from the national Highway Traffic Safety Administration providing data on traffic fatalities.

First Harmful Event – First event that resulted in injury, fatality, or property damage during a traffic collision.

HSIP – Abbreviation for Highway Safety Improvement Program: A roadway safety funding program managed by TxDOT, Texas State Department of Transportation.

ISD – Abbreviation for Independent School District.

KSI – Abbreviation for fatal and severe injury collisions.

Manner of Collision – Describes how the vehicles involved in a collision collided with each other or with other objects. a.k.a Type of Collision (e.g. Broadside, rear end).

MOE – Abbreviation for Measure of Effectiveness.

MPO – Abbreviation for Metropolitan Planning Organization.

MTP – Abbreviation for Metropolitan Transportation Plan.

Primary Contributing Factor – Defined as a primary contributing cause of collisions.

PROTECT – Abbreviation for Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation Program: It funds projects that ensure the resilience of surface transportation to natural hazards.

RAISE Grant – Abbreviation for Rebuilding American Infrastructure with Sustainability and Equity (RAISE) discretionary grant program: It funds state and local government projects that have a significant regional or local impact.

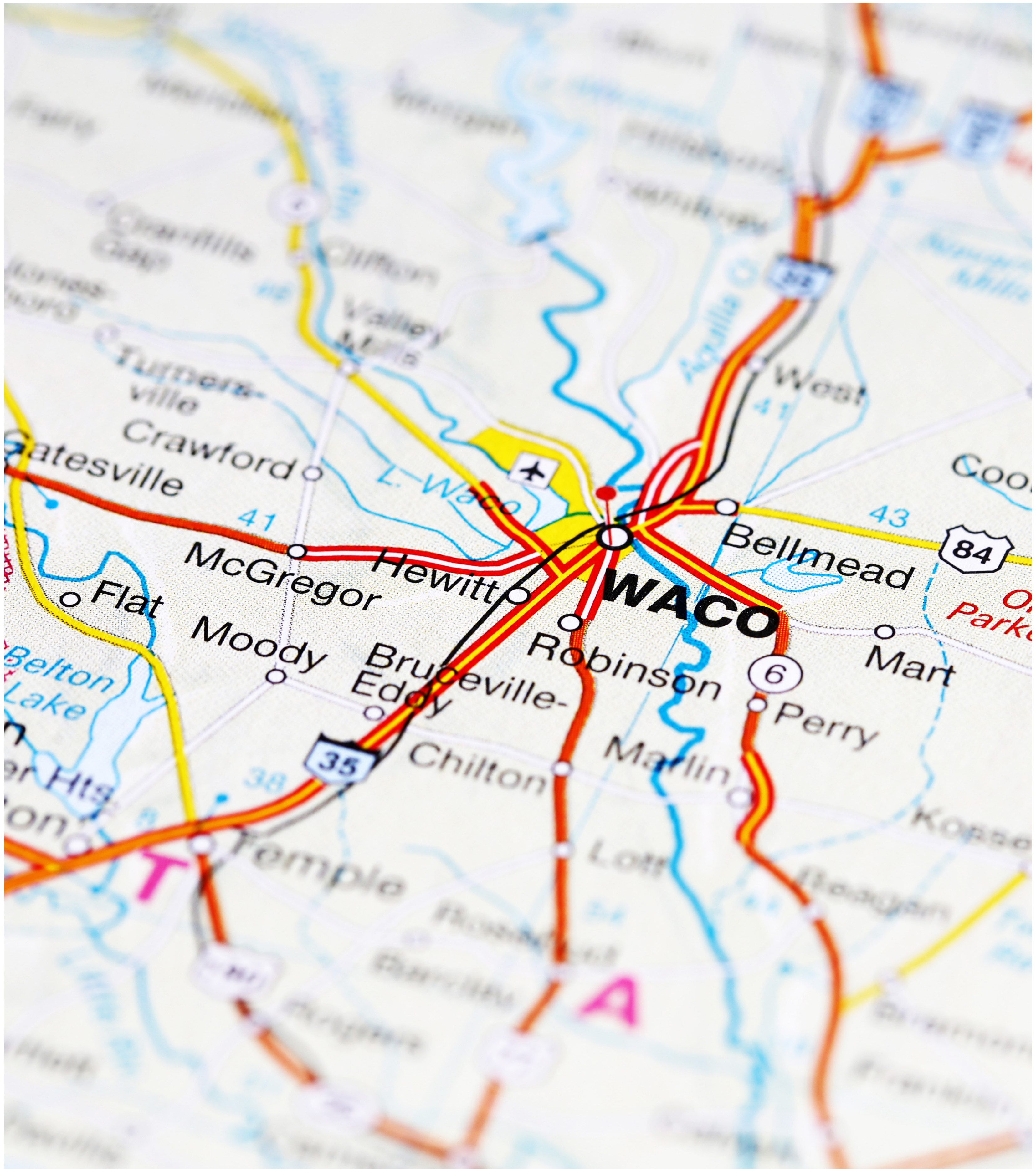
SS4A – Abbreviation for Safe Streets and Roads for All. A federal funding program that provides $5 billion nationwide over five years (2022–2026) to help reduce roadway fatalities.

TDM – Abbreviation for Transportation Demand Management.

TIP – Abbreviation for Transportation Improvement Program.

TxDOT – Abbreviation for Texas Department of Transportation.

UTP – Abbreviation for Unified Transportation Program.



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CHAPTER 1: INTRODUCTION

The Waco MPO is the federally-mandated transportation policy-making organization for the Waco metropolitan area. The Waco MPO's planning area is coincident with the boundary of McLennan County. The County population as per the 2020 US Census is 260,579. The Waco MPO's primary roles and responsibilities include conducting comprehensive transportation planning studies and analyses to support decision-making processes; facilitating collaboration and coordination among various stakeholders, including local governments, state agencies, transit providers, and the public; and ensuring compliance with federal and state regulations related to transportation planning, air quality, and environmental justice.

The Waco MPO operates under the guidance of a Policy Board, which serves as the decision-making body for the organization. The Policy Board is comprised of elected officials and representatives from TxDOT and local governments within the MPO's planning area. By fulfilling its roles and responsibilities, the Waco MPO plays a crucial role in shaping the region's transportation system, promoting economic development, and enhancing the overall quality of life for residents and visitors alike.

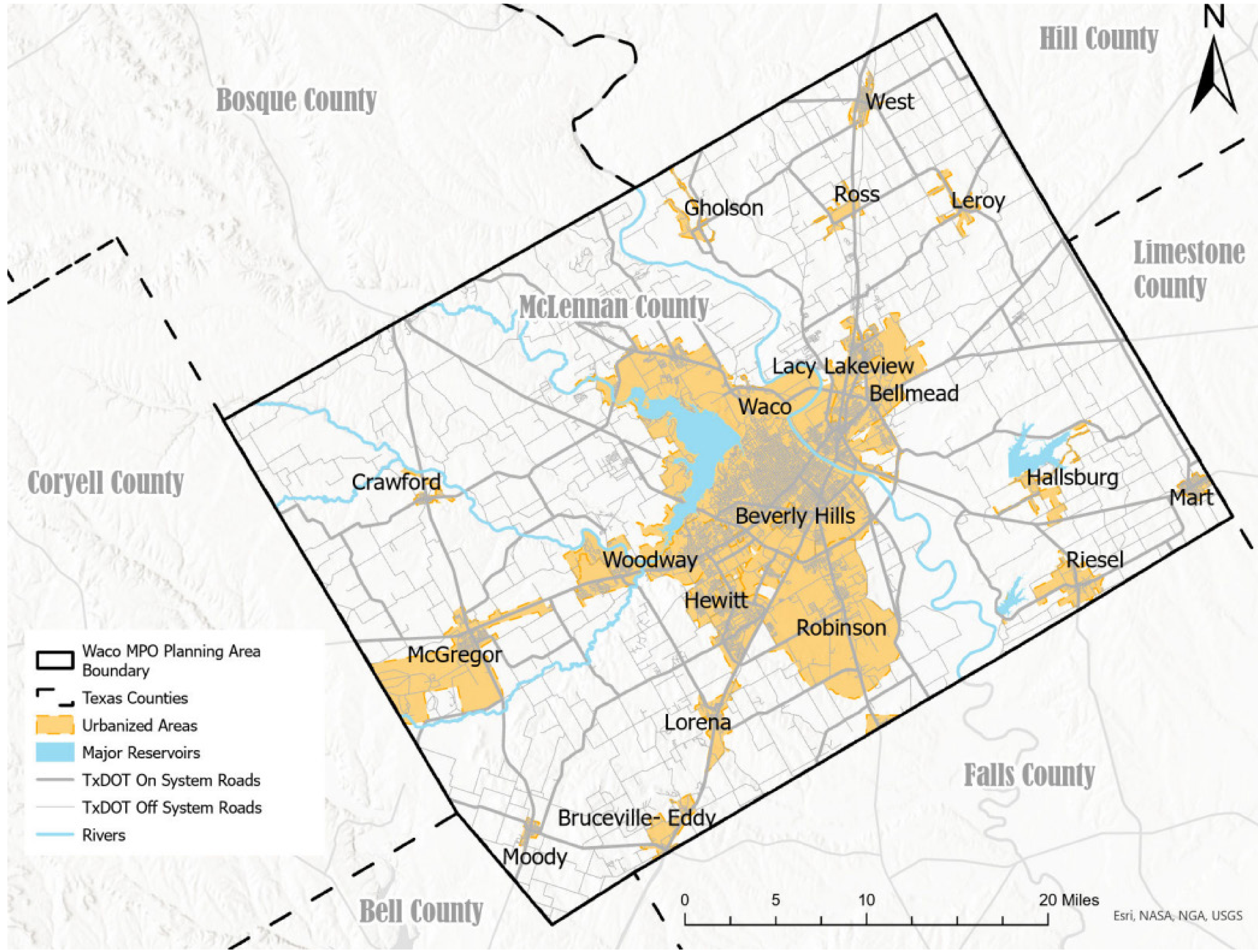
IMPORTANCE OF TRANSPORTATION SAFETY

Ensuring the safety and security of transportation systems is a paramount concern for communities across the nation. Despite ongoing efforts and improvements, traffic-related incidents continue to impose a significant burden on society, resulting in tremendous human suffering, economic losses, and environmental consequences.

Moreover, the consequences of inadequate transportation safety disproportionately affect vulnerable road users- such as pedestrians, cyclists, and individuals with disabilities-, exacerbating issues of equity and accessibility within transportation systems.

Addressing transportation safety is not only a moral imperative but also a practical necessity for fostering livable, sustainable, and equitable communities. By prioritizing safety measures and implementing effective strategies, communities can reduce the incidence of traffic-related incidents, minimize their associated costs, and promote a transportation environment that instills confidence and encourages active modes of travel.

The Waco MPO recognizes the critical importance of transportation safety and is committed to developing and implementing a CSAP that will enhance the safety of the region's transportation network for all users.



LEADERSHIP COMMITMENT & GOAL SETTING: EVENTUAL TARGET OF ZERO FATALITIES

The Waco MPO is firmly committed to improving safety across its transportation network and aligning with the statewide goals set forth by the TxDOT. Recognizing the urgent need to address traffic fatalities and serious injuries, the Waco MPO has embraced the vision of eliminating all transportation-related fatalities by 2050.

The Waco MPO Policy Board adopted a Vision Zero Resolution at their special meeting on April 29th, 2024, committing to the goal of eliminating KSI collisions. This Vision Zero Resolution, along with a resolution adopting the CSAP itself, can be found in **Appendix A.**

This commitment to reaching zero fatalities stems from the MPO's core values of prioritizing the safety and wellbeing of all McLennan County residents, regardless of how they choose to travel. By adopting TxDOT's ambitious statewide targets, the Waco MPO signals its resolve to be a leader in improving roadway safety. Specifically, the MPO aims to cut the number of fatal collisions in half by 2035, marking a critical step towards the ultimate goal of zero fatalities.

To achieve these targets, the Waco MPO committed to implement a comprehensive, data-driven approach that addresses the multifaceted factors contributing to traffic collisions. This includes engineering solutions to improve infrastructure, education campaigns to modify road user behaviors, and robust enforcement efforts to uphold traffic laws. By taking a holistic, collaborative approach, the MPO is confident it can make significant strides in eliminating fatalities and serious injuries on region's roads.

The MPO's leadership team is fully committed to this vision, and has allocated the necessary resources and political will to drive meaningful progress. Regular progress monitoring, data analysis, and stakeholder engagement will ensure the Waco region remains on track to meet its safety goals. Through this unwavering dedication, the Waco MPO aims to set a powerful example for other communities across Texas in the pursuit of zero traffic fatalities.

ORGANIZATION OF PLAN

CHAPTER 1: INTRODUCTION

This chapter sets the leadership goals and visions for the CSAP in the Waco Metropolitan Area. It describes the plan area and summarizes the approach taken in the plan.

CHAPTER 2: COUNTYWIDE COLLISION TRENDS

Chapter 2 describes the collision data and methodology of the analysis followed in the report. It summarizes the key findings, and compares McLennan County trends to Texas state trends. This chapter discusses countywide key collision profiles identified from the collision data analysis.

CHAPTER 3: EXISTING PLANNING EFFORTS

Chapter 3 provides an overview of the Waco MPO and its partner agencies' previous transportation planning initiatives that have laid the foundation for the development of the CSAP. It highlights the key plans, programs, projects, and partnerships that have contributed to the region's safety priorities and strategies.

CHAPTER 4: ENGAGEMENT & COLLABORATIONS

The CSAP was guided by a robust and inclusive stakeholder engagement process. Chapter 4 outlines the collaborative efforts undertaken to gather input from a diverse range of community members and partners. A key included element is a summary of the map-based public survey. Additionally, the MPO convened a series of stakeholder meetings and focus group discussions with representatives from local governments, law enforcement, advocacy groups, and other relevant organizations. This collaborative approach ensured the CSAP's recommendations reflect the unique needs and perspectives of all transportation users within the McLennan County.

CHAPTER 5: SAFE STREET TOOLKIT

This chapter presents the comprehensive "Safe Streets Toolkit" developed as part of the Waco MPO CSAP. This toolkit outlines a diverse range of engineering, education, and enforcement countermeasures that can be applied to address the specific safety challenges identified across the transportation network. The toolkit will serve as a valuable resource to guide the implementation of targeted interventions and assist in the selection of appropriate safety improvements.

CHAPTER 6: INDIVIDUAL JURISDICTION CHAPTERS & RECOMMENDED SAFETY PROJECTS

Chapter 6 consists of an overview, which discusses safety project categories, project prioritization criteria, and general policy and strategy recommendations. It also includes seven sub-chapters, one each for the seven cities (namely Bellmead, Hewitt, Lacy Lakeview, McGregor, Robinson, Waco, and Woodway) and unincorporated McLennan County. The sub-chapters present the municipal portfolio, including the results of historic collision data analysis, a network of corridors and intersections with a high risk for future KSI collisions, and prioritized safety projects recommending specific countermeasures for high-risk locations.

CHAPTER 7: EQUITY CONSIDERATION

A key focus of the CSAP is ensuring an equitable approach to transportation safety. Chapter 7 describes the disproportionate impacts experienced by communities and populations that experience transportation disadvantages from historic investment decisions, including in the form of increased share of traffic collisions and safety issues. The proposed safety countermeasures and implementation strategies have been designed to direct resources and investments towards disadvantaged areas, providing the greatest safety benefits to the populations most in need. The equity results have been considered during the planning process and project prioritization. The chapter also identifies the proportion of cost of improvements that directly serve disadvantaged and under-served communities.

CHAPTER 8: IMPLEMENTATION, MONITORING, & FUNDING OPPORTUNITIES

Chapter 8 outlines the comprehensive strategy for implementing the safety improvements and recommendations outlined in the CSAP. It establishes a framework for monitoring the CSAP's progress and evaluating the effectiveness of implemented countermeasures. The chapter also explores various grant programs and funding sources, such as the Highway Safety Improvement Program (HSIP) and SS4A that Waco MPO and its member jurisdictions can leverage to support the timely delivery of safety projects.

CHAPTER 2

COUNTYWIDE COLLISION TRENDS

CHAPTER 2: COUNTYWIDE COLLISION TRENDS

INTRODUCTION

This section presents a description of the safety approach for the Waco MPO CSAP. This safety action plan evaluates conditions on all roadway types in McLennan County, at the countywide level and for local jurisdictions, except for private roads and parking lots.

The collision-based safety assessment is based on 10 years of collision data obtained from the Crash Records Information System (CRIS) database maintained by the TxDOT. The CRIS database includes collisions on TxDOT facilities as well as local police or sheriff reported collisions that occurred between 2014 and 2023.

Before commencing the analysis, collision records that took place on private roads, parking lots, or lacked either geo-coordinates or collision severity information were eliminated from the database. These excluded collisions accounted for approximately 11 percent of the total collisions. The CRIS dataset utilizes multiple categories to classify collision manner and primary contributing factors. To streamline the analysis, common categories were consolidated into broader groupings. The comprehensive list of original CRIS categories and their respective new grouped categories is provided in **Appendix L.** The collision data was then analyzed and plotted using ArcMap Geographic Information Systems (GIS) software to identify high-risk intersections and roadway segments across McLennan County.

The data-driven process included:

- Examination of Collision Trends: Review of collision statistics to evaluate when, where, and why collisions occur and what modes are involved.
- Development of Collision Profiles: Combination of collision factors to identify prevalent collision types.
- Development of a Countermeasure Toolbox: Identification of effective, nationally proven countermeasures applicable to different collisions.
- Identification of Priority Safety Project Locations: Identification of priority project locations based on collision density and community, stakeholder and community verification.

The analysis began with a comparative evaluation of total injury collisions throughout the county. Factors examined included: collisions within various timeframes, collision type, primary contributing factor, vehicle type, harmful event during collision, collision distribution by posted speed limit, and lighting conditions. This was followed by a comprehensive analysis of all injury collisions to identify collision profiles. Later in the safety plan, the evaluation of injury collisions also identified High Injury Network locations, consisting of intersections and corridors with more frequent injury collisions.

COUNTYWIDE COLLISION DATA ANALYSIS FINDINGS

The countywide findings summarize the collision trends in overall McLennan County from 2014 to 2023. This analysis aims to identify key patterns, risk factors, and emphasis areas to inform the development of targeted countermeasures and safety improvements.

A series of graphs and charts illustrating trends across various factors are included on the following pages. These visualizations provide an overview of collision characteristics and contributing factors. Key findings are summarized below:

- Overall, from 2014-2023, there were a total of 54,400 countywide collisions of which 36,356 (67 percent) were non injury or property damage collisions and 18,044 (33 percent) were injury collisions. Of the total collisions, 1,945 (approximately 4 percent) resulted in KSI collisions.
- A total of 18,044 injury collisions resulted in 27,302 people being injured. Of those injured, 15,452 suffered possible injuries, 9,528 had minor injuries, 1,962 sustained severe injuries, and 360 resulted into fatalities.
- The highest number of collisions occurred in 2021.
- Month of July had the highest KSI collisions over the 10 year period (10 percent of all KSI collisions).
- Collisions peak during typical evening commute hours, 4 p.m. to 6 p.m. In particular, 8.5 percent of total collision occurred during 5 p.m. to 6 p.m. Pedestrian collisions rise sharply between 8 p.m. and 9 p.m., while bicycle collisions peak from 5 p.m. to 6 p.m.
- In McLennan County, broadside collisions (42 percent) account for the highest number of injury collisions followed by hit object (28 percent) and rear end (24 percent) collisions.
- The top factors that contribute to these injury collisions are unsafe speed (23 percent), automobile right-of-way violations (22 percent) and traffic signal and sign violations (12 percent).
- Roadways with a posted speed limit of 30 mph have the highest percentage of injury collisions at 28 percent. This is followed by roadways with a 55 mph speed limit at 19 percent, and roadways with a 60 mph speed limit at 14 percent.
- Out of all injury collisions, 30 percent of all injury collisions occurred during low light conditions at dusk, dawn, and in the night. 11 percent of all injury collisions took place at night on streets without lighting.

Additional detailed collision statistics are summarized in the following pages.

McLENNAN COUNTY COMPARISON TO STATEWIDE COLLISION TRENDS

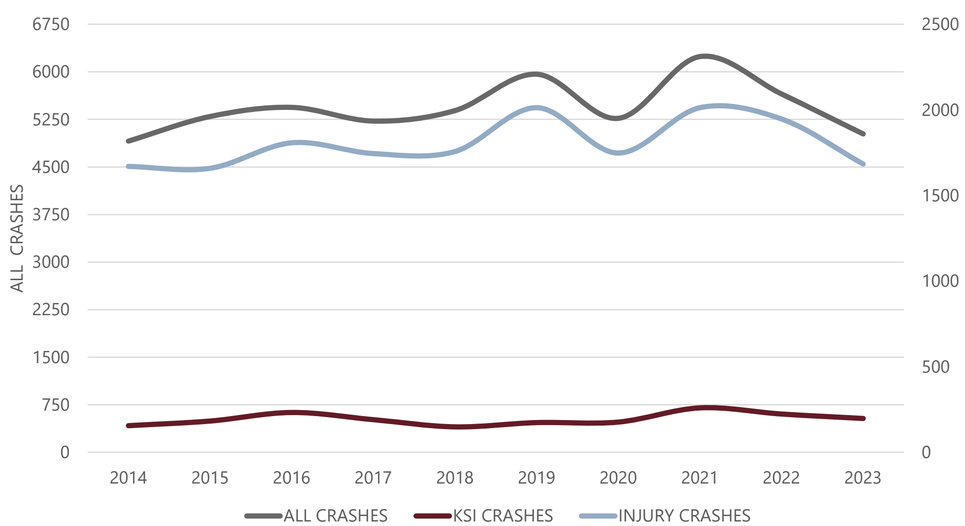
While McLennan County experienced fluctuations in the number of KSI collisions over the 10-year period, the State of Texas as a whole saw an increase in KSI collisions during this time. The share of KSI collisions (3.5 percent) and all injury collisions (33 percent) out of the total collisions appeared to be approximately the same for both the statewide and McLennan County data.

Similar to the statewide trend, McLennan County also saw its peak number of collisions in 2021. Analyzing the monthly distribution of collisions over the ten year period, October recorded the highest number of collisions statewide, while for McLennan County, July had the most prominent number of injury collisions.

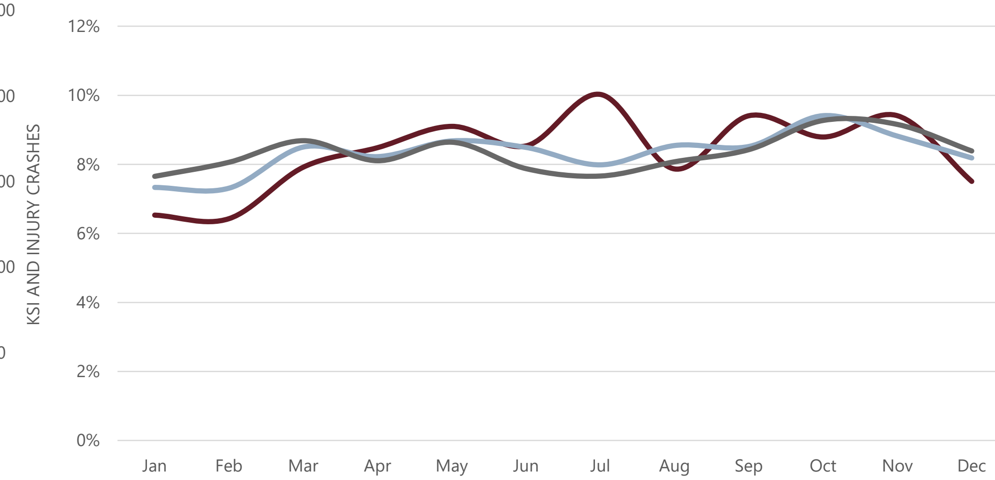
The evening commute hour from 5 p.m. to 6 p.m. was identified as a peak period for injury collisions in both the statewide and McLennan County data. In contrast, the peak hour for pedestrian and bicycle injury collisions differed, with the statewide data showing the highest occurrence from 9 p.m. to 10 p.m., while for McLennan County, it was from 8 p.m. to 9 p.m. Unsafe speed was a common top contributing factor for injury collisions, both at the statewide and countywide levels.

These shared findings highlight the need for the Waco MPO to closely align its safety strategies and interventions with broader statewide efforts to address the persistent transportation safety issues impacting the region.

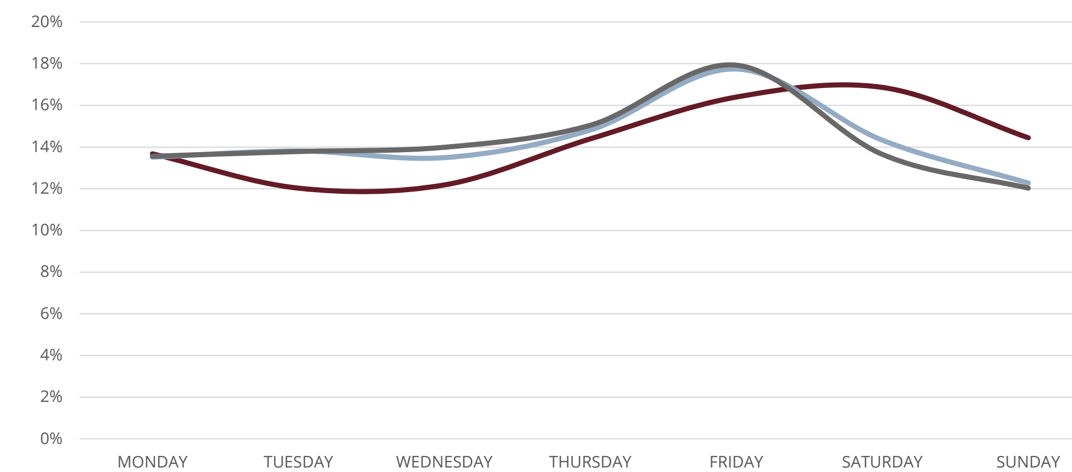
YEARLY TRENDS



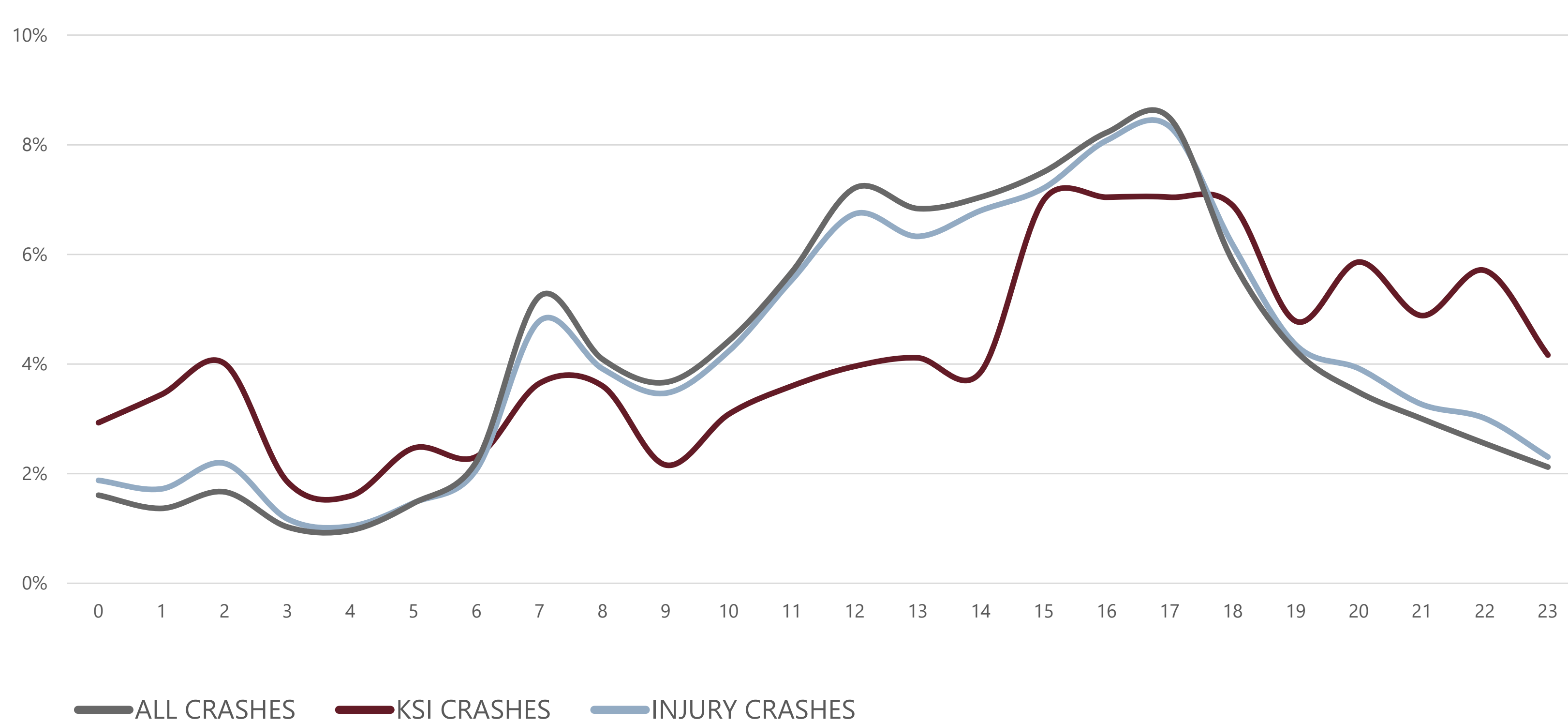
MONTHLY TRENDS



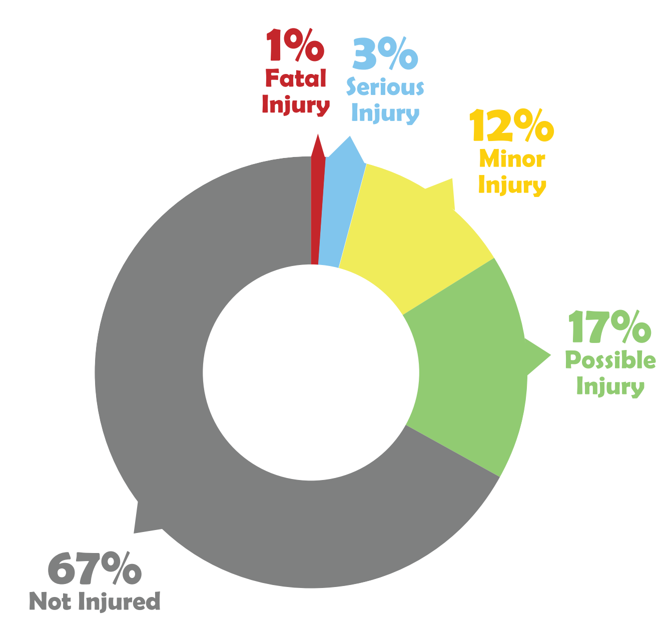
DAILY TRENDS



HOURLY TRENDS



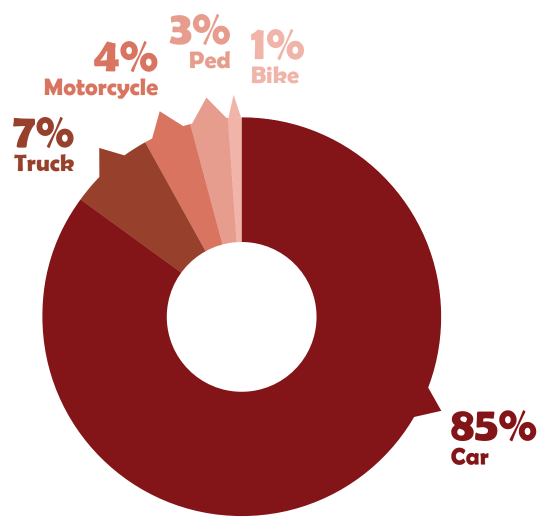
COLLISIONS BY SEVERITY



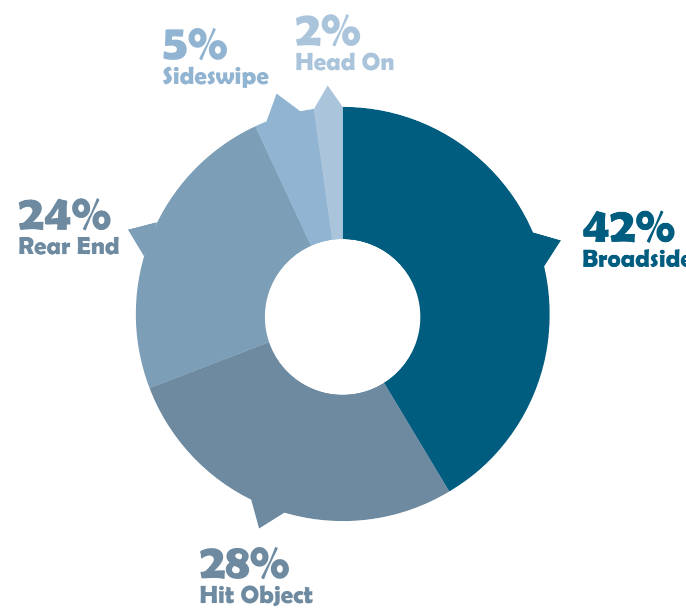
COLLISIONS BY SEVERITY

	COLLISIONS	
FATAL INJURY	330	1%
SERIOUS INJURY	1,615	3%
MINOR INJURY	6,769	12%
POSSIBLE INJURY	9,330	17%
NOT INJURED	36,356	67%
TOTAL	54,400	100%

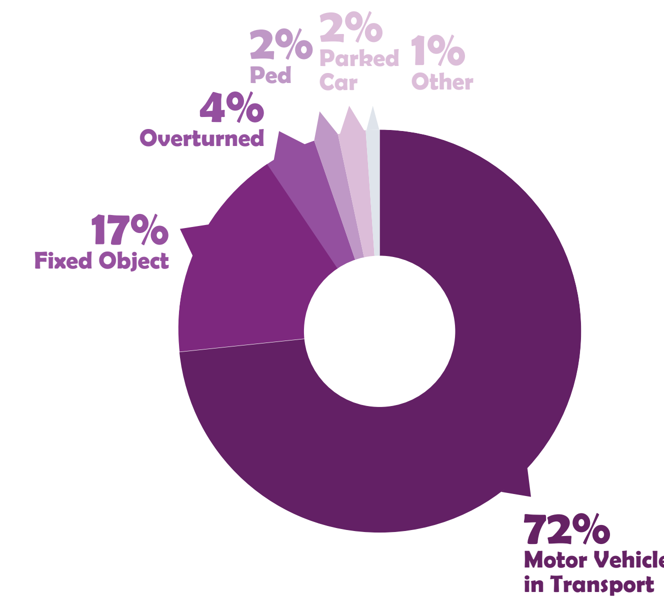
MODE



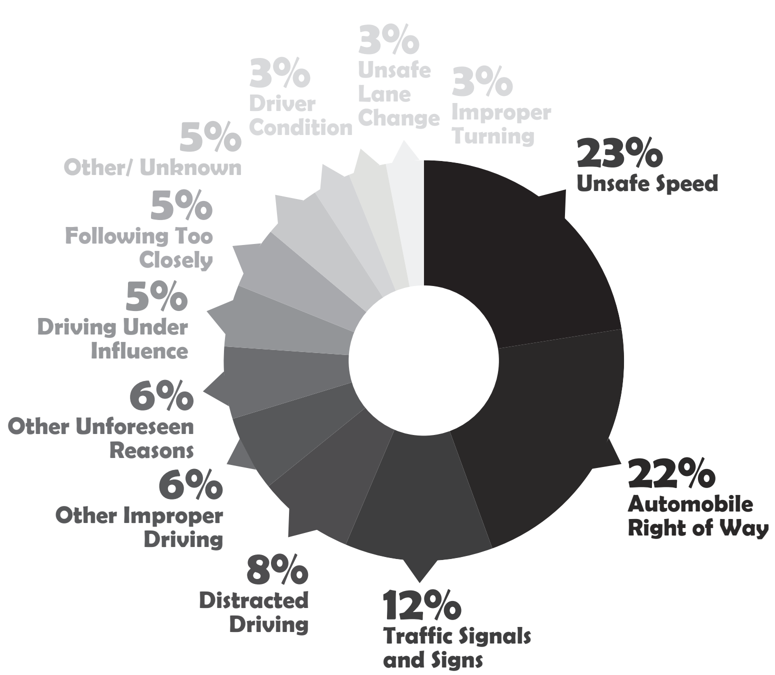
MANNER OF COLLISION



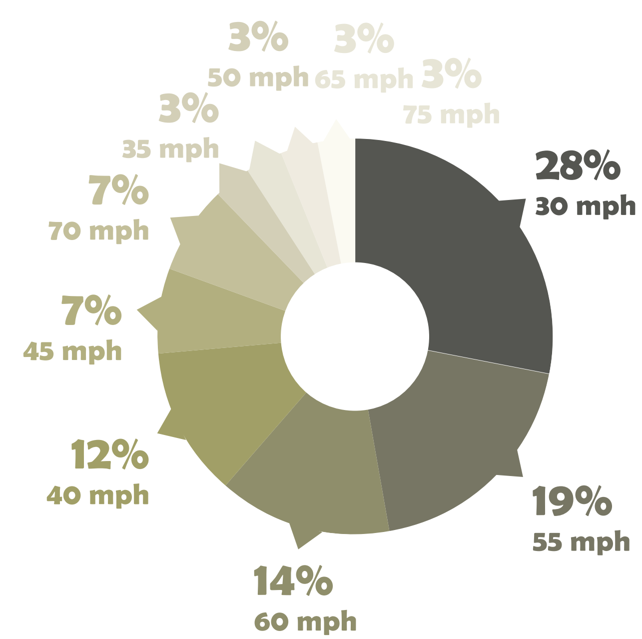
FIRST HARMFUL EVENT



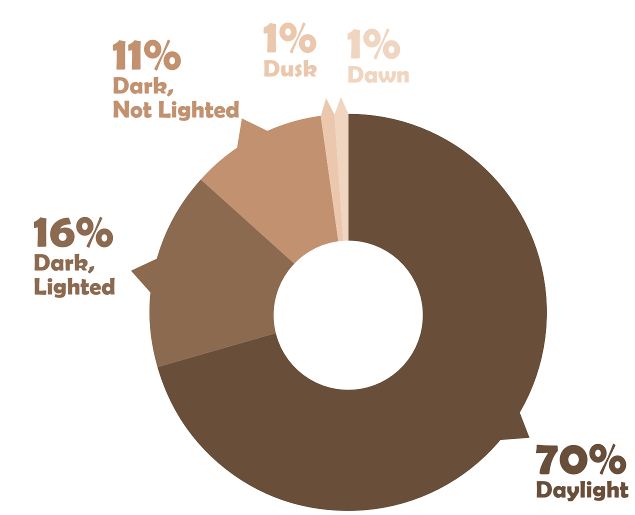
VIOLATION CATEGORY



SPEED



LIGHTING CONDITION



FINDINGS BY JURISDICTION

The following is a summary of the key findings in the evaluation of collision data for individual McLennan County jurisdictions:

- The City of Waco experienced the highest concentration of KSI collisions when compared to other areas of the county, accounting for 38 percent of fatal collisions and 48 percent of KSI collisions countywide.
- Unincorporated areas outside of city limits also saw a substantial share of the collisions, comprising 36 percent of fatal collisions and 30 percent of KSI collisions. This indicates the rural/unincorporated parts of the county were also hotspots for collisions.
- Following the City of Waco and unincorporated areas, The City of Bellmead experienced the third highest number of these types of collisions, making up eight percent of fatal collisions and five percent of KSI collisions.

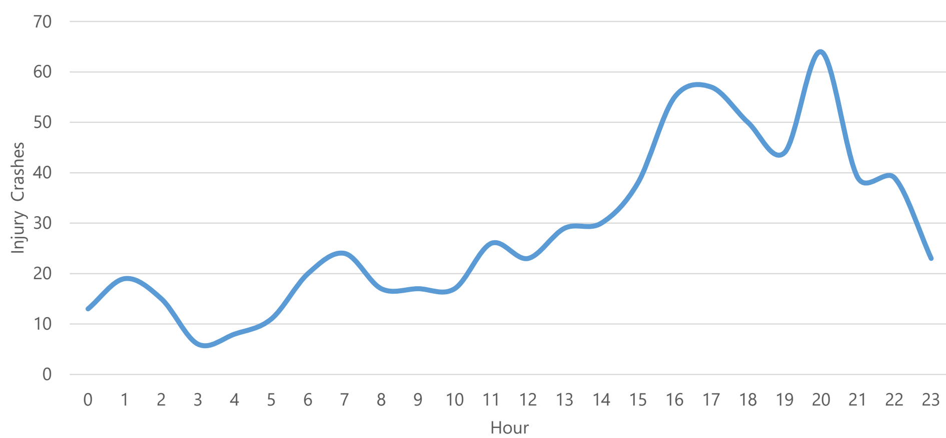
Other cities like Lacy Lakeview and Robinson, also had relatively elevated crash numbers comparison to smaller jurisdictions. Other examined smaller cities and towns experienced much lower incidences of KSI collisions overall.

INJURY COLLISIONS BY JURISDICTION

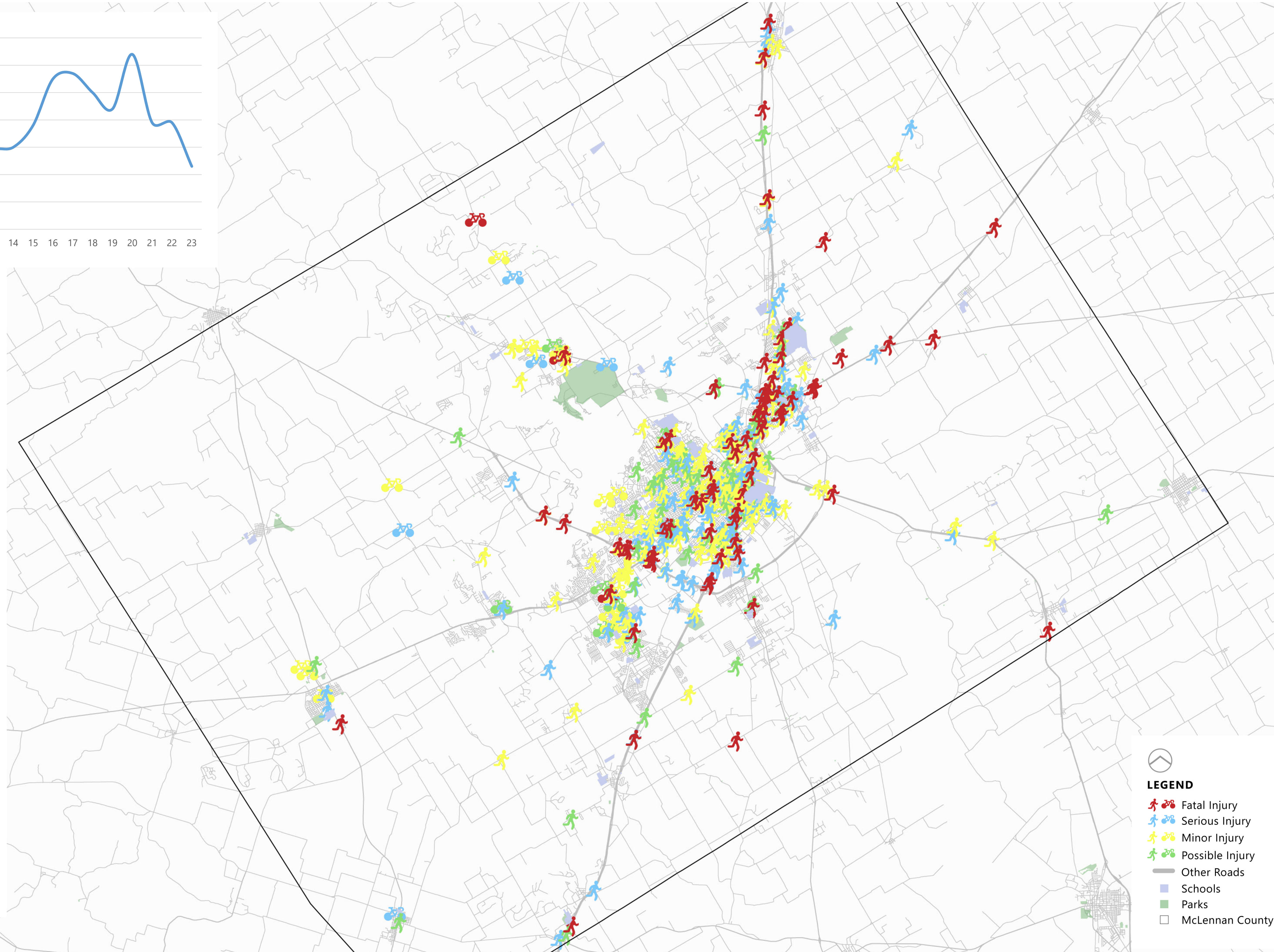
JURISDICTION	TOTAL INJURY COLLISIONS BY JURISDICTION						TOTAL INJURY COLLISIONS BY JURISDICTION - BY MODE				
	FATAL INJURY COLLISIONS		KSI		ALL INJURY COLLISIONS		PEDESTRIAN	BIKE	MOTORCYCLE	CAR	TRUCK
	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT					
BELLMEAD	28	8%	100	5%	971	5%	43	13	46	748	121
BEVERLY HILLS	1	0%	7	0%	106	1%	4	2	1	94	5
BRUCEVILLE-EDDY	5	2%	18	1%	145	1%	4	0	4	101	36
CRAWFORD	0	0%	2	0%	7	0%	0	0	1	6	0
GHOLSON	0	0%	1	0%	17	0%	0	0	2	14	1
GOLINDA	0	0%	1	0%	4	0%	0	0	0	4	0
HALLSBURG	0	0%	1	0%	8	0%	1	0	0	6	1
HEWITT	6	2%	35	2%	384	2%	16	5	16	324	23
LACY LAKEVIEW	10	3%	82	4%	458	3%	18	4	22	355	59
LEROY	0	0%	6	0%	21	0%	1	0	2	16	2
LORENA	5	2%	22	1%	151	1%	2	0	4	116	29
MART	0	0%	0	0%	9	0%	0	0	0	9	0
MCGREGOR	5	2%	33	2%	190	1%	4	3	7	164	12
MOODY	0	0%	1	0%	33	0%	1	1	1	28	2
OUTSIDE CITY LIMITS	120	36%	581	30%	2,521	14%	36	7	116	2,080	282
RIESEL	3	1%	3	0%	48	0%	1	0	5	35	7
ROBINSON	11	3%	74	4%	519	3%	7	1	25	417	69
ROSS	3	1%	7	0%	30	0%	0	0	1	22	7
VALLEY MILLS	2	1%	4	0%	10	0%	0	0	0	8	2
WACO	126	38%	935	48%	12,154	67%	328	173	406	10,617	630
WEST	1	0%	7	0%	49	0%	3	0	1	38	7
WOODWAY	4	1%	25	1%	209	1%	5	1	9	181	13
TOTAL	330	100%	1,945	100%	18,044	100%	474	210	669	15,383	1,308

Note: KSI - Fatal and Severe Injury Collsions

PEDESTRIAN & BICYCLE INJURY COLLISIONS



The McLennan Countywide Pedestrian and Bicycle Collision Map shows clusters of collisions, particularly along major roadways and intersections. From 2014 to 2023, 684 injury collisions were reported involving pedestrians, bicyclists, or both. Of those, 82 collisions resulted in fatalities, and 170 collisions resulted in serious injuries. Approximately nine percent of pedestrian and bicycle collisions occurred from 8 p.m. to 9 p.m., which is the highest for any one-hour period. The common factors for these pedestrian and bicycle collisions generally include high vehicle speeds, lack of dedicated pedestrian and bicycle infrastructure, and poor visibility or lighting. Potential countermeasures to address these issues could include reducing speed limits, installing pedestrian signals and crosswalks, adding bike lanes or shared-use paths, improving street lighting, and launching public education campaigns to promote visibility and safe sharing of the roads between vehicles, pedestrians, and cyclists. Implementing a combination of engineering, enforcement, and education strategies tailored to the specific collision patterns in McLennan County could help improve safety for vulnerable road users.

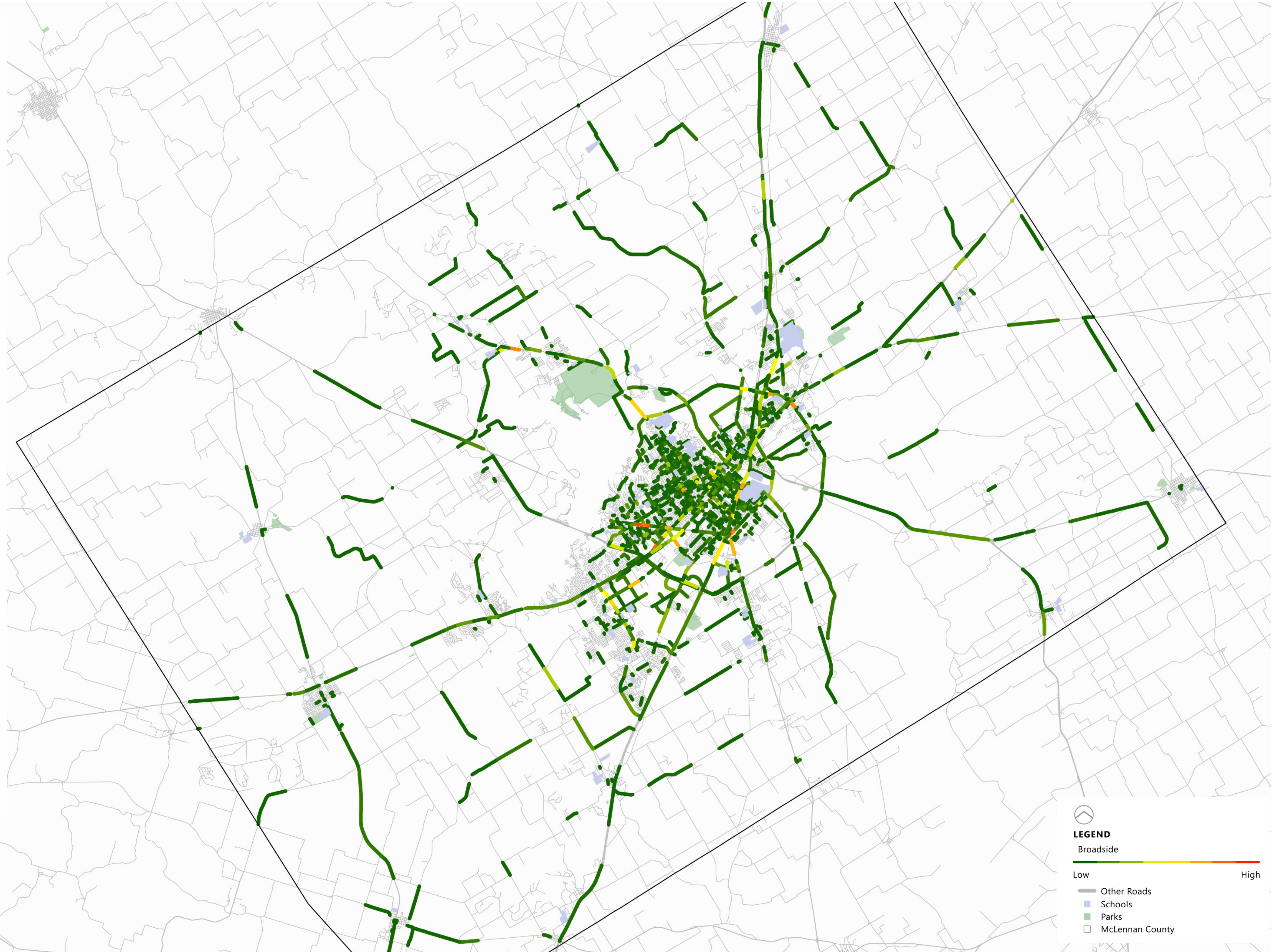


PROFILE 1: BROADSIDE COLLISIONS

Broadside collisions are the most common type of collision in McLennan County. These collision account for 42 percent of countywide injury collisions. Broadside collisions, also known as T-bone or angle collisions, occur when the front of one vehicle strikes the side of another. These types of collisions can be hazardous due to the lack of structural protection on the sides of vehicles, often resulting in serious injuries or fatalities.

The high frequency of broadside collisions in McLennan County is a concerning trend that deserves focused attention and mitigation efforts. Factors contributing to the elevated rates of these collisions could include driver inattention, failure to yield the right-of-way, running red lights or stop signs, and unsafe speeds. Distracted driving, such as using a cell phone, can also be a significant contributor to broadside collisions, as the driver's attention is diverted from the task of safe driving.

A multi-faceted approach involving education, enforcement, and infrastructure improvements may be warranted to address this issue. Public awareness campaigns highlighting the dangers of broadside collisions and the importance of attentive, cautious driving could help change driver behavior. Increased traffic enforcement at high-risk intersections and strict penalties for violations can also serve as a deterrent. Additionally, engineering solutions such as improved signage, traffic signals, and intersection design could enhance safety and reduce the likelihood of broadside collisions.

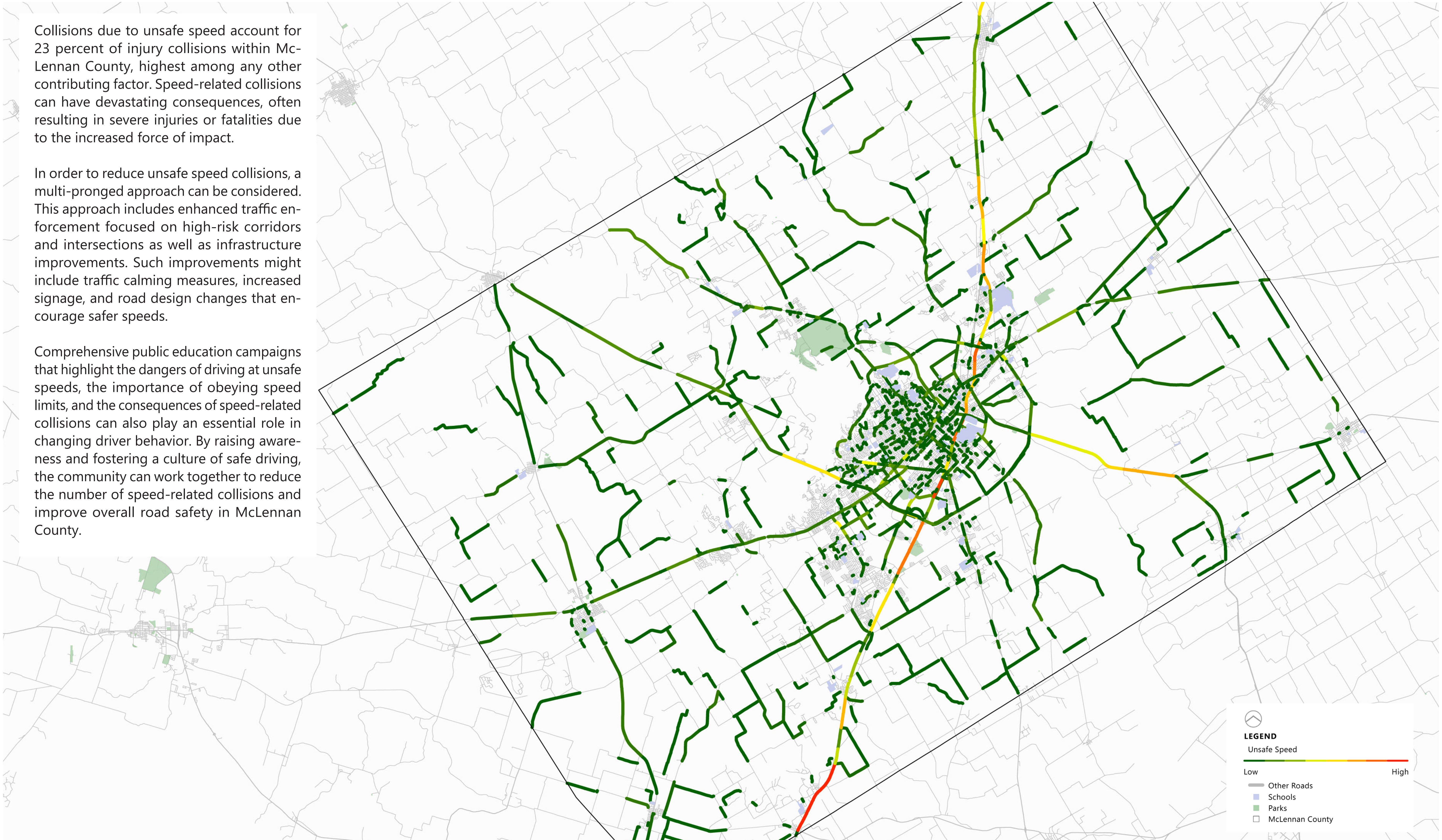


PROFILE 2: UNSAFE SPEED COLLISIONS

Collisions due to unsafe speed account for 23 percent of injury collisions within McLennan County, highest among any other contributing factor. Speed-related collisions can have devastating consequences, often resulting in severe injuries or fatalities due to the increased force of impact.

In order to reduce unsafe speed collisions, a multi-pronged approach can be considered. This approach includes enhanced traffic enforcement focused on high-risk corridors and intersections as well as infrastructure improvements. Such improvements might include traffic calming measures, increased signage, and road design changes that encourage safer speeds.

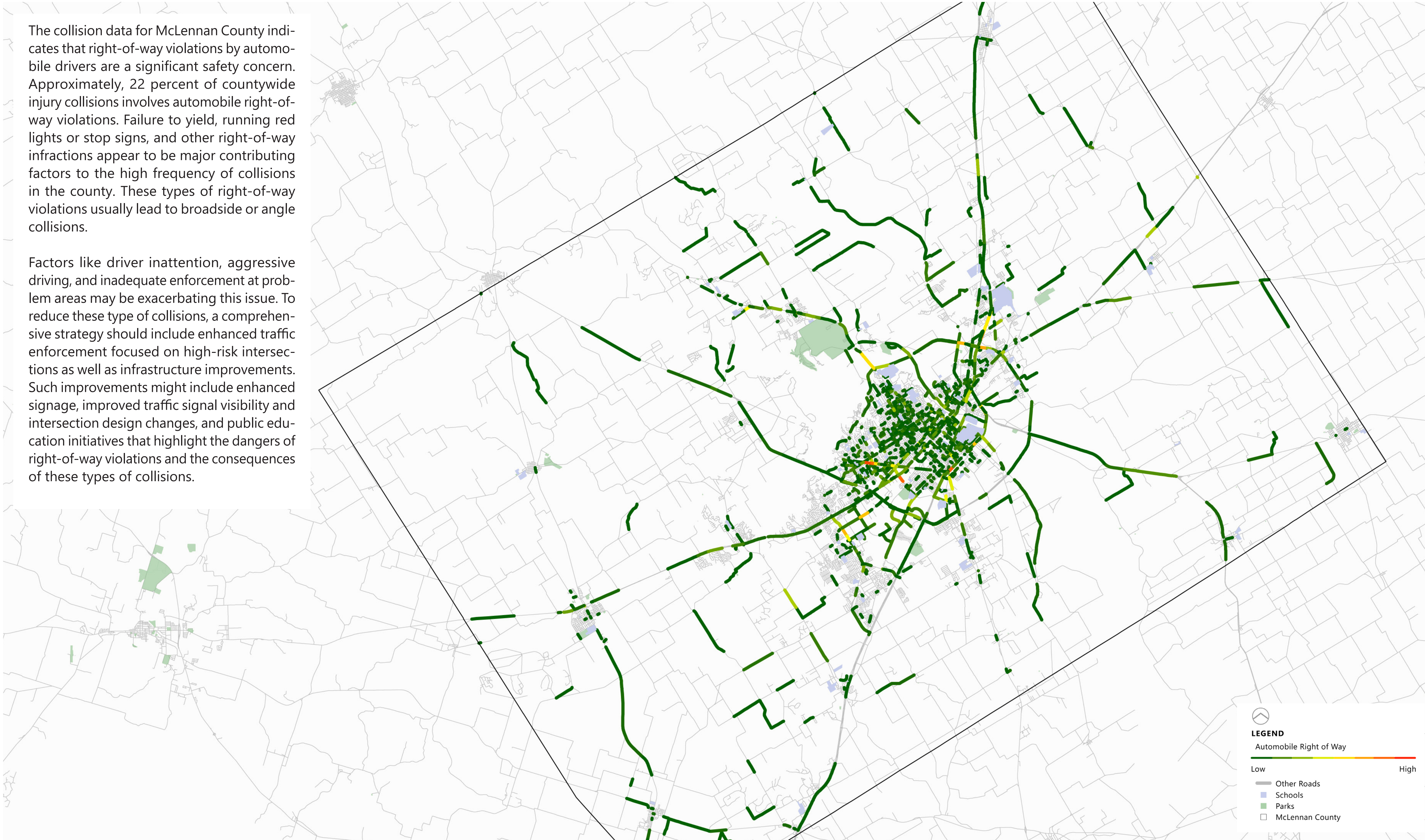
Comprehensive public education campaigns that highlight the dangers of driving at unsafe speeds, the importance of obeying speed limits, and the consequences of speed-related collisions can also play an essential role in changing driver behavior. By raising awareness and fostering a culture of safe driving, the community can work together to reduce the number of speed-related collisions and improve overall road safety in McLennan County.



PROFILE 3: AUTOMOBILE RIGHT-OF-WAY COLLISIONS

The collision data for McLennan County indicates that right-of-way violations by automobile drivers are a significant safety concern. Approximately, 22 percent of countywide injury collisions involves automobile right-of-way violations. Failure to yield, running red lights or stop signs, and other right-of-way infractions appear to be major contributing factors to the high frequency of collisions in the county. These types of right-of-way violations usually lead to broadside or angle collisions.

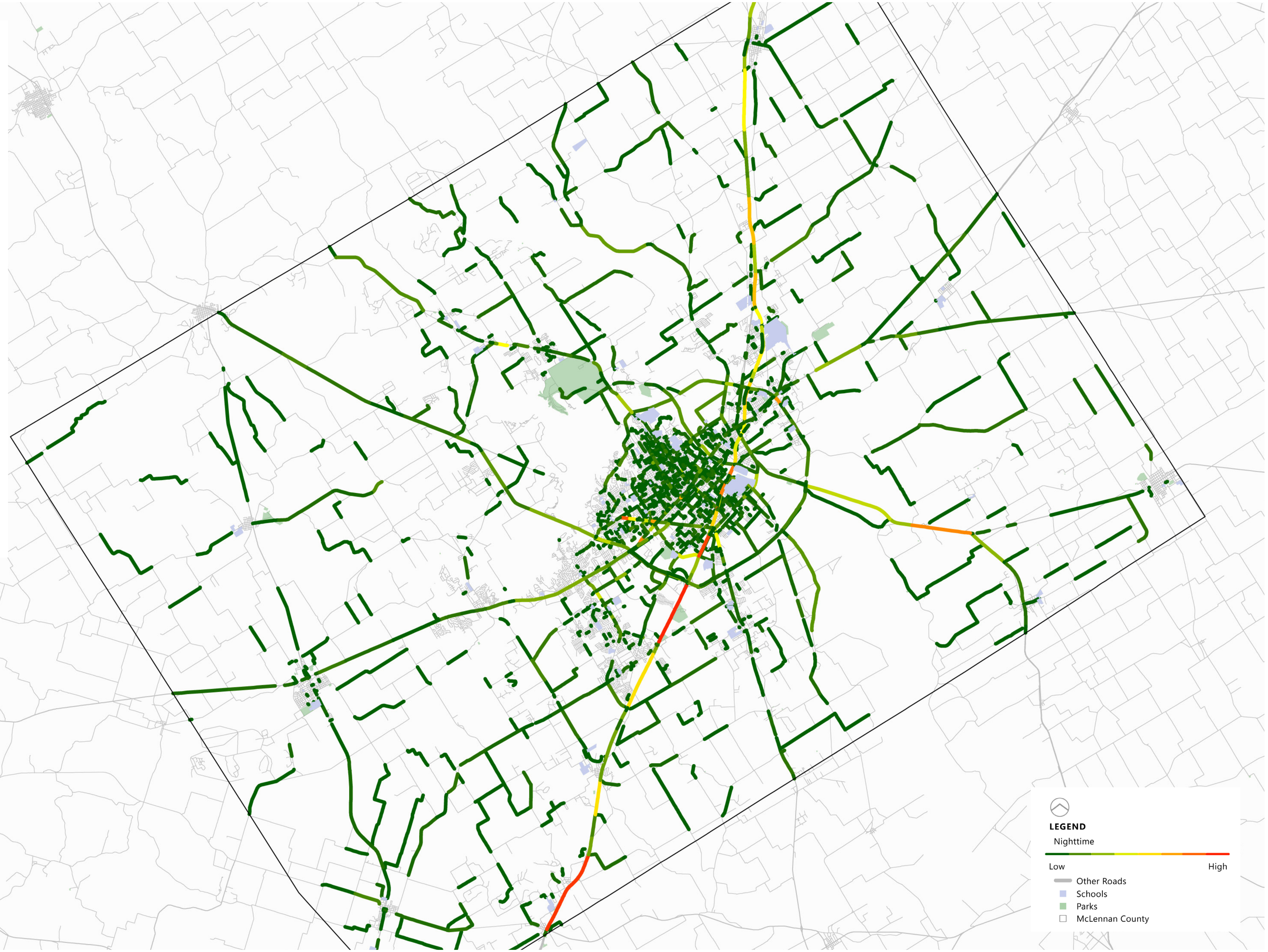
Factors like driver inattention, aggressive driving, and inadequate enforcement at problem areas may be exacerbating this issue. To reduce these type of collisions, a comprehensive strategy should include enhanced traffic enforcement focused on high-risk intersections as well as infrastructure improvements. Such improvements might include enhanced signage, improved traffic signal visibility and intersection design changes, and public education initiatives that highlight the dangers of right-of-way violations and the consequences of these types of collisions.



PROFILE 4: NIGHTTIME COLLISIONS

Nighttime collisions are also a significant safety concern, accounting for 30 percent of all injury collisions countywide. Collisions occurred during low light conditions at dusk, dawn, and in the night (with or without street-lights) are considered nighttime collisions. Driving in dark conditions presents additional challenges and hazards for motorists, including reduced visibility, driver fatigue, and the potential for impaired driving.

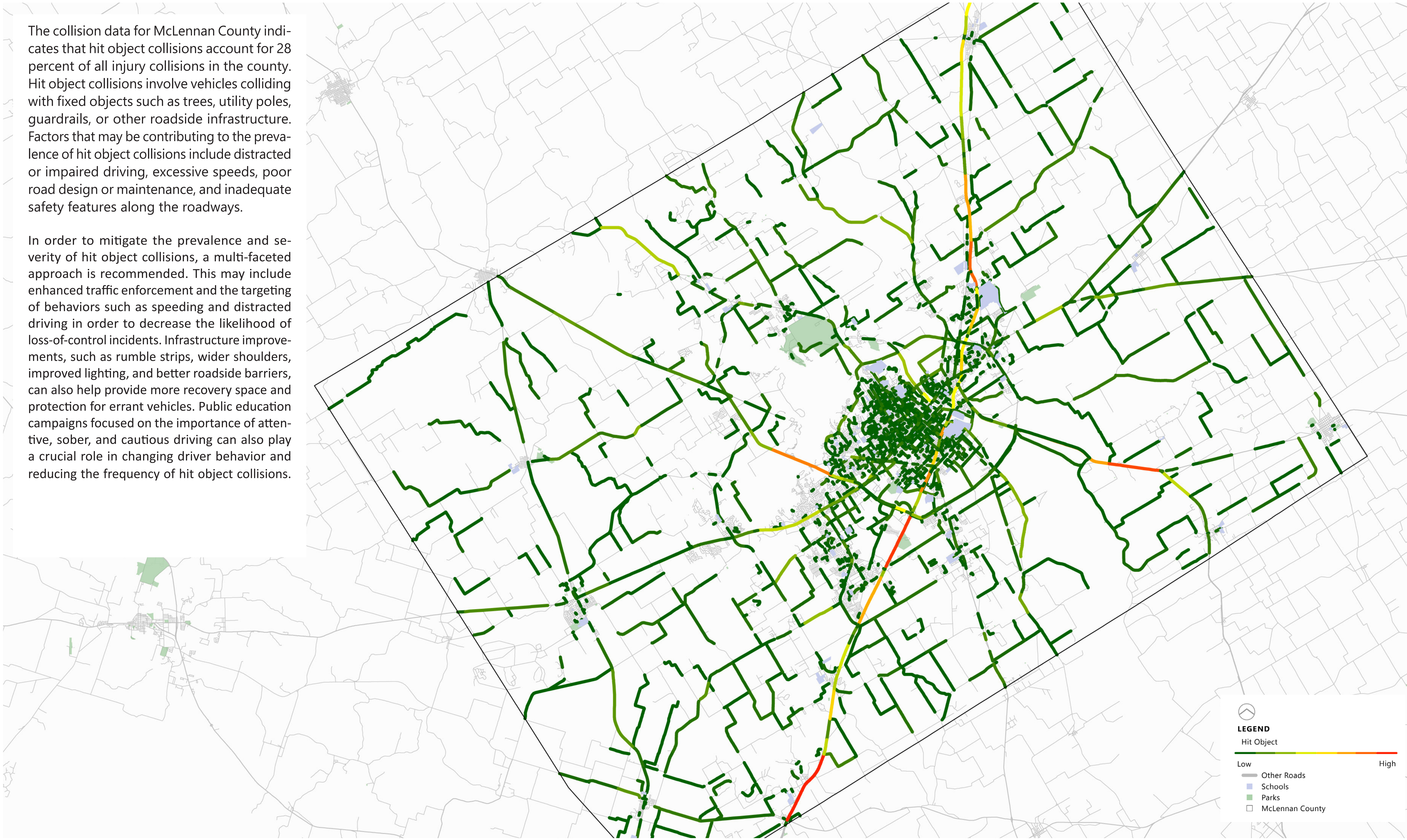
Enhanced nighttime traffic enforcement focuses on identifying and deterring dangerous driving behaviors like impaired or fatigued driving to reduce nighttime collisions. Improved roadway lighting, particularly at intersections and other high-risk areas, can enhance visibility and help drivers navigate roads more safely after dark. Public education campaigns emphasizing the importance of maintaining vigilance, slowing down, and avoiding distractions when driving at night can help change driver behavior and foster a safe nighttime driving culture.



PROFILE 5: HIT OBJECT COLLISIONS

The collision data for McLennan County indicates that hit object collisions account for 28 percent of all injury collisions in the county. Hit object collisions involve vehicles colliding with fixed objects such as trees, utility poles, guardrails, or other roadside infrastructure. Factors that may be contributing to the prevalence of hit object collisions include distracted or impaired driving, excessive speeds, poor road design or maintenance, and inadequate safety features along the roadways.

In order to mitigate the prevalence and severity of hit object collisions, a multi-faceted approach is recommended. This may include enhanced traffic enforcement and the targeting of behaviors such as speeding and distracted driving in order to decrease the likelihood of loss-of-control incidents. Infrastructure improvements, such as rumble strips, wider shoulders, improved lighting, and better roadside barriers, can also help provide more recovery space and protection for errant vehicles. Public education campaigns focused on the importance of attentive, sober, and cautious driving can also play a crucial role in changing driver behavior and reducing the frequency of hit object collisions.



CHAPTER 3

EXISTING PLANNING EFFORTS

CHAPTER 3: EXISTING PLANNING EFFORTS

LITERATURE REVIEW

This chapter condenses key information from various planning documents, projects, and studies relevant to the Waco MPO CSAP. This review aims to align the CSAP's goals, analysis, and recommendations with past and ongoing transportation and non-infrastructure plans within the Waco metropolitan area. The review focuses on relevant efforts from the MPO, McLennan County, member cities, and state policymakers. Plans, documents, and studies reviewed in this chapter are as follows:

Waco Metropolitan Planning Organization

- Connections 2045: The Waco Metropolitan Transportation Plan (2020)
- The Transportation Improvement Program FY-2023-26 (2022)
- Waco Metropolitan Area Active Transportation Plan (2019)
- US Business 77 Corridor Study (2016)
- Waco MPO Corridors Study: Valley Mills Drive and Hewitt Drive (2013)
- Waco Area Master Thoroughfare Plan and Design Guidelines (2012)
- Future Land Use Study for McLennan County (2007)
- Roadway Safety Performance Targets

McLennan County

- Parks Recreation and Open Space Master Plan 2011-2021 (2010)

City of Bellmead

- Comprehensive Plan (2023)

City of Bruceville-Eddy

- Comprehensive Plan (2011)

City of Hewitt

- Comprehensive Plan 2022 (2003)
- We are Hewitt: Strategic Plan 2022-2027 (2022)

City of Lorena

- Comprehensive Plan (2020)
- Lorena Parks, Recreation, and Open Space Master Plan (2019-2028)
- Lorena Strategic Plan (2021-2022)

City of McGregor

- Vision 2030 (2018)

City of Robinson:

- Comprehensive Plan: Community Visions 2034 (2014)

City of Waco

- The City Plan: Waco Comprehensive Plan 2040 (2016)
- Capital Improvement Projects FY 2023-2024
- Downtown Implementation Plan (2023)
- Waco City-Wide Trails Master Plan (2023)
- Park Projects (2022-24)
- 25th Street Corridor Project (2023)
- Americans with Disability Act Transition Plan (2019)
- 17th/18th/19th Streets Corridor Study (2017)
- Imagine Waco: A Plan For Greater Downtown (2010)

City of Woodway

- Comprehensive Plan (2004)

TxDOT

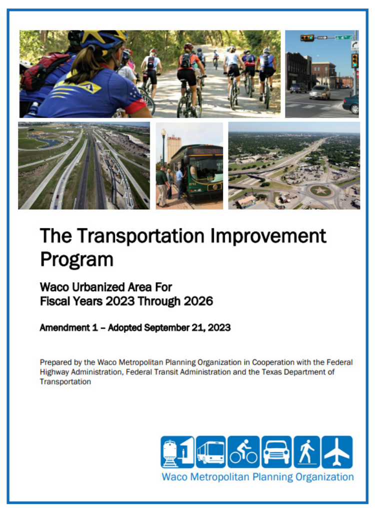
- Unified Transportation Program 2024 (2023)
- Texas Transportation Plan 2050

This review guides the identification of needs and adequacy with respect to roadway and intersection safety improvements. All safety projects identified in the CSAP are consistent with local and regional goals and standards. **Appendix B** and **Appendix C** list and summarize relevant goals, policies, objectives, and roadway safety projects from the documents reviewed. The CSAP has also been influenced by ideas and thought processes in safety plans from jurisdictions across the country including the Marin County Travel Safety Plan (2018), City of Livermore Local Roadway Safety Plan (2023), and the City of Cupertino Vision Zero Action Plan and Policy (2024).

WACO METROPOLITAN PLANNING ORGANIZATION

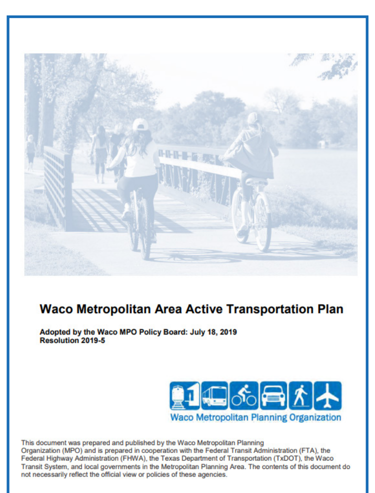
Connections 2045: The Waco Metropolitan Transportation Plan (2020)

The Metropolitan Transportation Plan (MTP) assesses and outlines the future transportation needs and priority projects for the Waco metropolitan through the year 2045. The plan focuses on regional priorities including maintaining existing transportation facilities and maximizing their use, safety, and security; preserving regional air quality and environmental standards; supporting regional freight movement and economic development efforts; and improving access to economic opportunity and essential services. The MTP includes a detailed analysis of the County's transportation network including the modal inventory, and infrastructure, and a needs and gap analysis including a highway crash analysis that identifies locations with the highest crash rates. The MTP finalizes a priority project list after evaluating projects on a 22-element selection criteria. The MTP is fiscally constrained to only include those projects that can be realistically funded by the year 2045. Projects with crash reduction possibilities and projects at locations with higher numbers of bicycle and pedestrian crashes get priority under the safety and security criteria. The CSAP process will be informed by the safety and security priority and will consider the safety-related projects listed in the MTP.



The Transportation Improvement Program | FY-2023-26 (2022)

The Transportation Improvement Program (TIP) lists regionally significant financially constrained projects that will be implemented in the cycle 2023-2026. Projects included in the TIP are selected through the MTP, based on corridors identified in the Metropolitan Thoroughfare Plan. Projects listed in the MTP are included in TIPs after completion of necessary studies, acquisition of right of way, and commitment of funds. The TIP includes detailed list of highway and transit projects. Smaller projects, including pedestrian and bicycle improvements, that are relevant for the CSAP, are included as grouped projects in the TIP. The CSAP will consider safety projects prioritized into the TIP in finalizing the recommended project list.

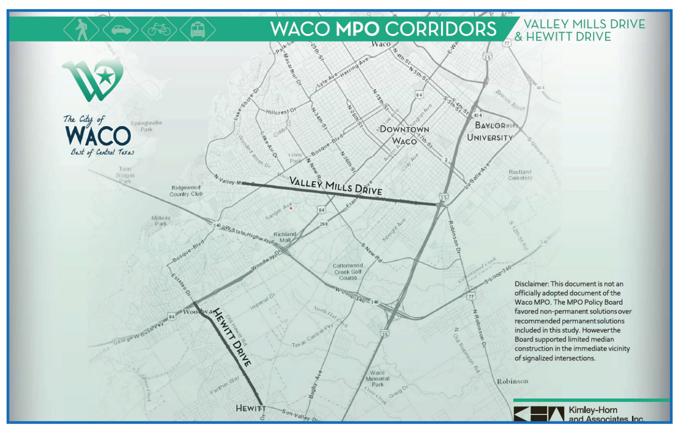


Waco Metropolitan Area Transportation Plan (2019)

The 2019 Active Transportation Plan (ATP) established the comprehensive framework for multimodal and active mobility for McLennan County. It assesses the status of the bicycle and pedestrian network in the region, including regional connectivity, and safety. The plan includes engineering, education, encouragement, enforcement, evaluation, and planning and equity-driven recommendations. The plan proposes several new bikeway and pavement improvement projects that directly contribute to safety. The non-engineering methods recommended in the plan include education and outreach programs, celebrating national bike month and pedestrian events, community rides, walks, bicycle and pedestrian audits, shared mobility, and micro-mobility programs. There are several overlaps with the focus of this plan and the CSAP, especially in terms of engineering and non-engineering projects to improve safety.

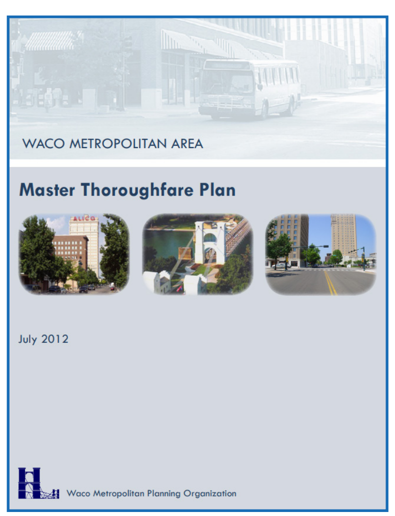
US Business 77 Corridor Study (2016)

US Business 77 is an ageing corridor running through the County. The study sought to consider the possibility of converting parts of the freeway from I-35 and Elm Mott interchanrge to avvnd Brazos River into a moderate speed arterial. The stakeholder-involved planning process identified key corridor features that needed to be addressed, including boulevard design, need for access control, special use parallel roads for specific local access, bicycle and pedestrian accommodations, roadway network enhancements, and special intersection treatments. Intersection improvements and access management control were among the safety recommendations from the study. The safety improvements identified in the study will inform the current planning efforts.



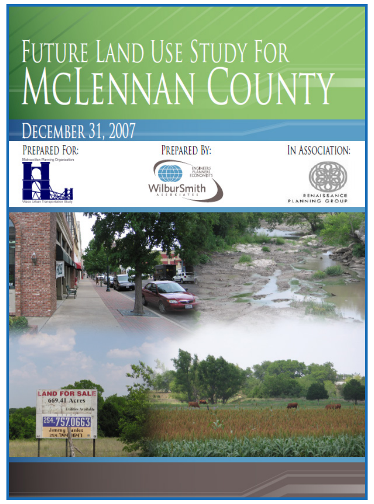
Waco MPO Corridors Study: Valley Mills Drive and Hewitt Drive (2013)

The 2013 study evaluates safety and conditions along the two regional corridors in Waco – Valley Mills Drive between Waco Drive and I-35, and Hewitt Drive between US-84 and Sun Valley Boulevard. The study looked into safety, traffic conditions and delays, and also examined ways to improve multimodal features of the two corridors. The study found that the crash rates for Valley Mills Drive and some parts of Hewitt Drive were higher than the average for Texas. The study recommends improving safety on both the roads through access management, raised medians, driveway consolidation, and cross access provision. Operational improvements were also recommended in the study including creating turn lanes, improving signal timings, and creating pedestrian, bicycle and transit facilities. Many of the challenges identified in this study continue to date, and the CSAP draws from it to provide recommendations for the two corridors.



Waco Area Master Thoroughfare Plan and Roadway Design Guidelines (2012)

The Waco Master Thoroughfare Plan and Roadway Design Guidelines provide guidelines for developing a county-wide roadway network for local, regional, and state transportation planning entities in response to anticipated growth. The guidelines ensure that roadway design is integrated with land use and improves safety and travel experience, enabling coordinated roadway network development. The plan's emphasis goes beyond traditional roadway goals to elements such as multimodal transportation network and urban vitality. The plan defines roadway characteristics for the County and identifies project locations to implement context-sensitive solutions. The Roadway Design Guidelines that are a part of the plan provide an engineering toolkit containing interventions that can be implemented on the county roadways to improve safety. The CSAP will be guided by the context-sensitive project opportunities and design recommendations in this plan.



Future Land Use Study for McLennan County (2007)

This 2007 study is an active effort by the Waco MPO to bring a synergy between land use trends and mobility needs in the County away from existing sprawl-like patterns towards more efficient growth trends. Current and historic trends and land uses were analyzed to identify 21 existing land use patterns. The scenario planning exercise, which involved the community, compared the trend scenario of low density and sprawl in rural and suburban areas to two preferred growth patterns which improves mobility without significant roadway expansion. The study considers two scenarios – a suburban center scenario and an urban center scenario – both of which support a multimodal development patterns. The CSAP will follow the implementation recommendations from the study that promotes roadway safety for all users and in school areas.

Roadway Safety Performance Targets

The Roadway Safety Performance Targets have been set to meet the Fixing America's Surface Transportation (FAST) Act requirement to include a performance-based decision-making process in the MTP. The Waco MPO adopted TxDOT's 5-year average target for 2023 and committed to a goal of zero roadway fatalities by 2050. The CSAP will play a foundational role in ensuring that these targets are met.

McCLENNAN COUNTY

Parks, Recreation, and Open Space Space Master Plan 2011-2021 (2010)

The 2010 Plan lays a 10-year vision for developing parks, recreational facilities, and open spaces in McLennan County and its cities, with the exception of Waco. The Plan aims to promote fitness, wellness, and safety in developing quality recreational settings within the County. Developed through a community-involved process, the Plan defines and compiles the park, recreational facility, and open space inventory for the County. The priority needs identified in the Plan were planned for implementation between 2011 and 2023. The CSAP supports the Plan in ensuring safety in the multimodal linkages between parks and open spaces.

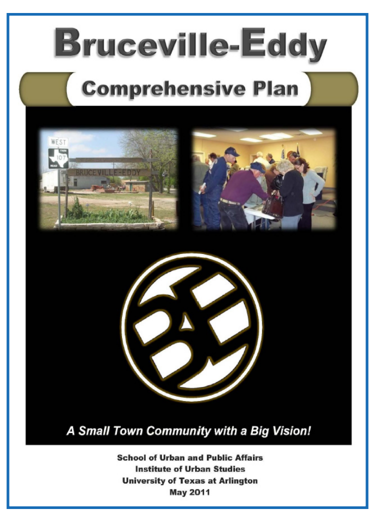
CITY OF BELLMEAD

Comprehensive Plan (2023)

The Bellmead Comprehensive Plan provides a report on the present conditions and future vision for the City based upon the needs and desires of the community. The 2033 vision of the city has the four characteristics, a family-oriented and pedestrian-friendly feel, a local economy that allows residents to meet many of their needs in Bellmead, improved street conditions supported by a well-maintained storm drainage system, and parks and recreation facilities that provide a variety of activities for residents of all ages and abilities. The Plan includes a detailed study of four elements: Storm Drainage System, Thoroughfares, Central Business District, and Recreation and Open Space Study, as well as proposed goals and objectives for each element. The thoroughfare study provides an inventory of current routes and local street networks. It identifies limited connectivity areas, provides street functional classification and speed limits, and information on traffic control devices in use in the city. The pedestrian and bicycle network is also mapped in the Plan. The Plan identifies three challenges facing the City's thoroughfare: gaps in bike and pedestrian networks between activity centers, heavy truck and freight movement along corridors connecting activity centers, development regulations, and standards intended to improve connectivity.

The Plan also provides guidance on context-sensitive design standards and includes recommendations for improvements that considers safety element, including adopting transportation alternatives with safety features like speed bumps, designated truck routes, speed limit signs, and flashing lights. The CSAP will consider the goals and guidelines provided by this Plan to ensure continuity.

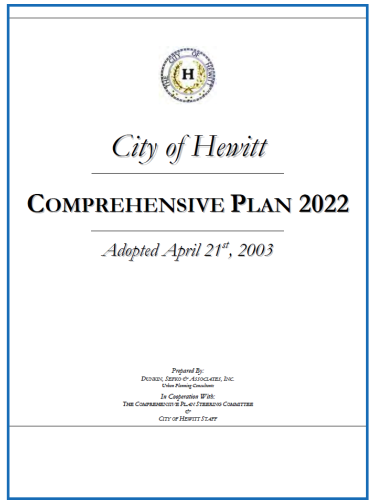
CITY OF BRUCEVILLE-EDDY



Comprehensive Plan (2011)

The Bruceville-Eddy Comprehensive Plan considers the future growth and vision of the community, driven by the expansion of I-35 upon which it is located. It includes goals and policies for changes and improvements to land use, transportation, economic development, housing, and open space to support its growth. Among the important projects envisaged in the Plan are an expansion of the road network, downtown revitalization, setting up a farmers market, a new park, and improvements to the senior center. The transportation element within the Plan describes the local roadway network and discusses the future expansion for improved connectivity. Relocations and changes prompted by the expansion of I-35 form an important consideration within the Plan. The CSAP will develop priorities that align with the goals and policies in this Plan.

CITY OF HEWITT


City of Hewitt
COMPREHENSIVE PLAN 2022
Adopted April 21st, 2003

Comprehensive Plan 2022 (2003)

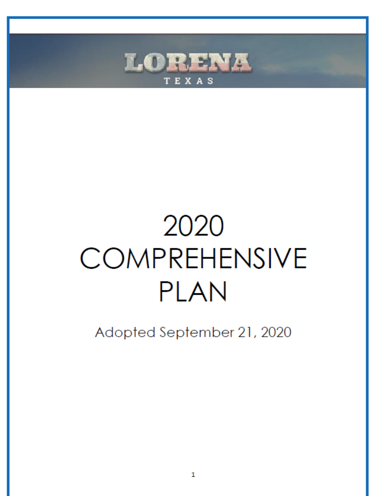
The Comprehensive Plan of the City of Hewitt aims to coordinate long-range planning and establish generalized patterns for development. It provides a baseline analysis of physical, demographic, socio-economic characteristics, and existing land use and housing patterns in the City. The City aims to develop a safe, friendly, and family-oriented community, with affordable housing and a vital economy. The Plan identifies multiple safety challenges on the roadway, including a need for signalization at intersections, establishing shared driveways for developments along major roads, increasing traffic and a need for roadway standards. The thoroughfare plan within the document contains the functional classification system and standards for the City. The CSAP priorities and recommendations take into account the anticipated growth patterns in the city and challenges identified on the roadway network.


2022-2027
Strategic Plan
WE ARE HEWITT
PERSEVERANCE
SERVICE
UNITY
HEWITT
TEXAS

We Are Hewitt: Strategic Plan 2022-2027 (2022)

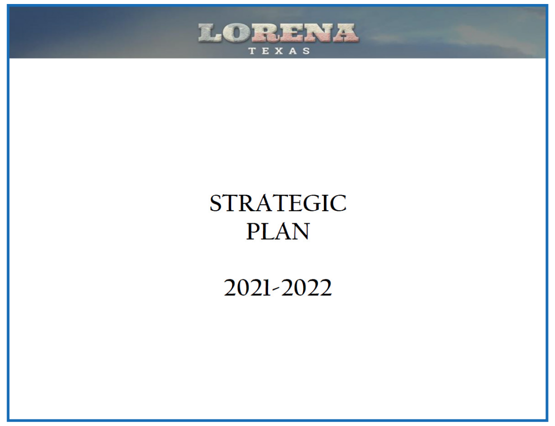
The Strategic Plan is a 5-year plan that combines planning on capital improvement, staffing, service, and funding sources for the City. It includes plans from various city departments with their capital improvement projects and staffing needs listed. The streets department has multiple roadways identified for reclamation and reconstruction. The CSAP will identify opportunities for safety upgrades on these roadways that can be implemented to improve overall road safety in the City.

CITY OF LORENA


LORENA
TEXAS
2020
COMPREHENSIVE
PLAN
Adopted September 21, 2020

Comprehensive Plan (2020)

The City of Lorena Comprehensive Plan was adopted in 2020. The citizen-included planning process identified the City's hometown feel, the Old Town historic area, proximity to Waco, its unique location on the I-35 corridor, and excellent schools as key features of the community. The city adopted goals and objectives for eight areas, namely: growth management; existing and future land use; transportation; historic preservation; economic development; housing; parks, recreation and natural resources; and government infrastructure, services, and facilities. The transportation element of the Plan prioritizes mobility, access, safety, and rapid travel. The City envisions adequate roads, bike lanes, and sidewalks. The Plan provides for the functional classification of the roadway network with design guidelines. The Plan emphasizes a context-sensitive approach that considers community objectives, functional classification, thoroughfare type, and adjacent land use in designing its thoroughfare. Street and sidewalk connectivity are among the priorities for the City. The Plan also includes maps of proposed roads and sidewalks. The proposed improvements and guidelines in the plan will inform the CSAP.



Lorena Strategic Plan (2021-2022)

The City of Lorena Strategic Plan outlines the short-term (three-to-five years) development path for coordinating and streamlining operations as per the Comprehensive Plan. The Plan identifies a vision for a thriving Lorena, with a unique 'hometown' feel supported by infrastructure including utilities, roads, bike lanes, and sidewalks. It identifies inclusiveness, livability, excellence, sustainability, and preservation as core values for the Plan period, while adopting specific strategic goals to achieve the City's vision. The City also identifies long-term issues, including the need for enhanced beautification and image through improved lighting, signage, landscaping, and welcome signs. The CSAP will contribute to improving livability and infrastructure quality in Lorena through its focus on safety for all users, including pedestrians, bicyclists, and motorists.

Lorena Parks, Recreation, and Open Space Master Plan (2019-2028)

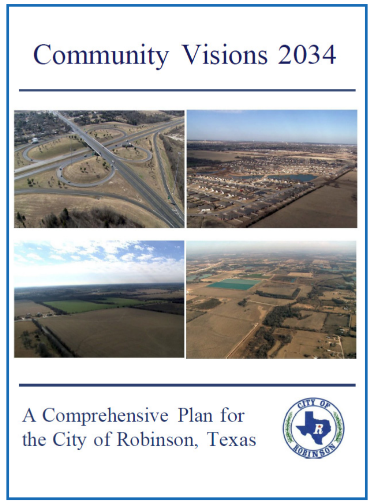
The City of Lorena Parks, Recreation, and Open Space Master Plan provides guidelines for the development and planning of its park and recreation system for a 10-year period. The 2019-2028 Plan describes the current inventories of areas and facilities, conducts a community-based need assessment, and prioritization for future parks. The Master Plan's goals of providing connectivity to the facilities through trails, bike lanes, and pedestrian ways align with the intent of the CSAP.

CITY OF McGREGOR

Vision 2030 (2018)

Vision 2030 identifies action items and projects in seven areas for the City of McGregor. The action areas include Economic Development and Main Street, a Sense of Community and Quality of life, and as well as essential services including Education, Infrastructure, Public Safety and Code Enforcement, Housing, and Wellness and Recreation. The projects along Main Street offer opportunities to improve safety. The CSAP considers these in developing priorities and countermeasures.

CITY OF ROBINSON



Comprehensive Plan: Community Visions 2034 (2014)

The Community Visions 2034 is the comprehensive plan for the City of Robinson, adopted in 2014. It contains a detailed plan, including maps and masterplans to direct the future growth of the City developed in consultation with stakeholders. The City's visions and goals for nine plan categories- namely, Leadership and Administration, Community Development, Natural Resources, Infrastructure, Historic and Cultural Preservation, Agricultural and Rural Preservation, Business and Economic Development, Transportation, and Emergency Management- were developed through a participatory planning process. The Plan also includes a transportation system plan that provides long-range guidance for the location of arterial, collector, and local streets. It lays basic street classification and design guidelines. The land use plan also provides urban design considerations and recommendations for streetscape design. The future land use plan update of 2018 identifies corridors of future growth in Robinson. Single-family residential developments are anticipated in south, southwest, and south east parts of the City. Higher density housing is anticipated along I-35 on the north side. I-35 and SL-340/SR-6 would see new commercial, industrial, and office developments. The CSAP will develop priorities that align with the goals and policies in this Plan.

CITY OF WACO

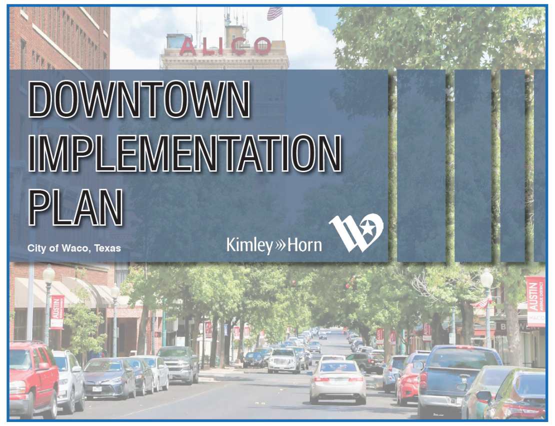
The City Plan: Waco Comprehensive Plan 2040 (2016)

The Waco Comprehensive Plan 2040 is the fifth comprehensive plan developed for the City of Waco, and includes a focus on promoting sustainable development through strategic development of the physical, economic, and cultural environments in the City. The Plan promotes sustainable development through downtown revitalization and the management of the dispersed rural growth projected for the City. Transportation policies in the Plan promote the sustainable and safe management of the growing travel needs of the City through multimodal expansion, improvements to local street design, and connectivity promoting active mobility. The Plan also seeks to reduce vehicle miles traveled (VMT) though thoughtful land use planning, higher density development, and carpooling. The Plan also recognizes the safety risk facing county and city road systems, which can primarily be attributed to driver behavior. The CSAP will align with the sustainable development and safety-focused vision put forth in the Plan.

CITY OF WACO
Capital Improvement Projects
(FY 2023-2024)

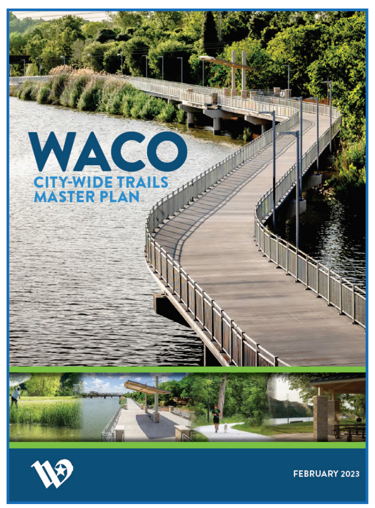
Capital Improvement Projects (FY 2023-2024)

The City has 189 capital improvement projects including projects related to facilities, parks and recreation, engineering, streets, traffic, and utilities. These include safety-related projects that are in construction or earlier phases of planning. The CSAP will consider the projects already scheduled to be implemented while drafting its list of recommendation.



Downtown Implementation Plan (2023)

The Downtown Implementation Plan was adopted in early 2023, providing an action-oriented strategy to revitalize downtown Waco. The Plan provides a framework for improvements in parking, pedestrian mobility, and streetscape, along with a toolbox of improvements that can be utilized in the downtown area. It also analyzes the street network and creates a new street classification for the downtown with associated design guidance. These are Arterial/Gateway Streets, Entertainment Streets, Circulation Streets, Green Boulevards, Activated Streets, Pedestrian Only Streets, and Shared Streets. The toolkit in this plan contains action items that enhance safety and hence can be considered for the CSAP.



Waco City-Wide Trails Master Plan (2023)

The Trail Master Plan was developed by the City of Waco Parks and Recreation Department as a comprehensive manual to guide the maintenance and improvement of the interconnected trail network for recreational and transportation uses in the City. It seeks to develop hiking, biking, and paddling trails that can accommodate all users including walkers, runners, equestrians, in-line skaters and skateboarders, motorized users, paddlers, and people/persons with disabilities. Despite being a City Plan, it also plans for adjacent jurisdictions to ensure connectivity. The Plan defines trail typology and discusses the current condition of trails including features and opportunities for enhancement, needs of trail users and concerns, and planned trail systems. The Master Plan also summarizes design development principles and standards. With respect to the CSAP, the Plan includes safety design elements and guidelines applicable to the trail network.

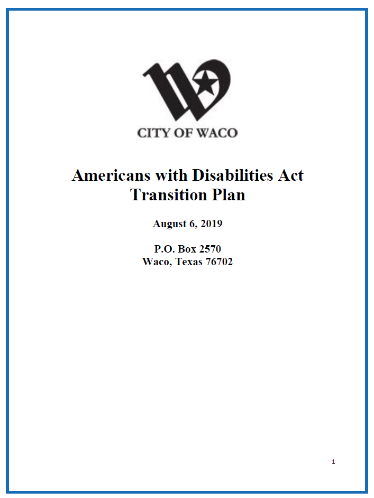
Park Projects (2022-2024)

The City of Waco is currently undertaking a series of park improvement and revitalization projects. These projects look to improve access and connectivity to the parks while developing the infrastructure and resources within the park. The following are the projects underway that are of consequence to the CSAP in their focus on improving safety through better sidewalks and connectivity.

- Floyd Casey Development Project (ongoing)
- Lions Park Revitalization Project (2023)
- China Spring Park Project (ongoing)
- Cotton Palace Park Master Plan (2022)

25th Street Corridor Project (2023)

The Plan outlines proposed projects which seeks to revitalize 1.5 miles of 25th Street between Franklin Avenue and Maple Avenue to promote the Hispanic heritage of the neighborhood. The project would outline an action-oriented implementation strategy for the corridor. Specific project actions could include walkability improvements through improvements to sidewalks, street lighting, street parking, and traffic calming. The strategy will be developed through October 2023 and April 2024. This project considers several safety-enhancing improvements that are relevant to the CSAP.


CITY OF WACO

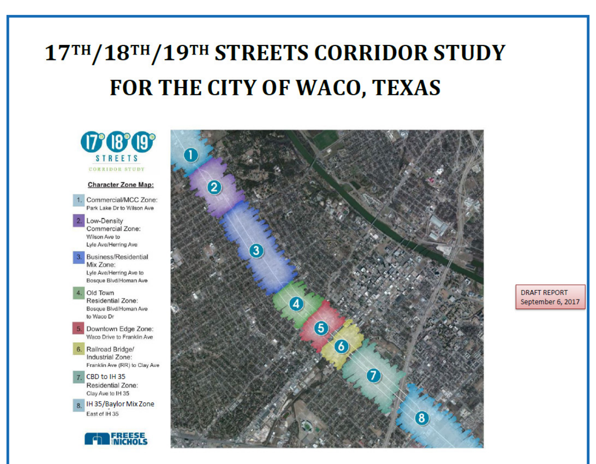
Americans with Disabilities Act
Transition Plan

August 6, 2019

P.O. Box 2570
Waco, Texas 76702

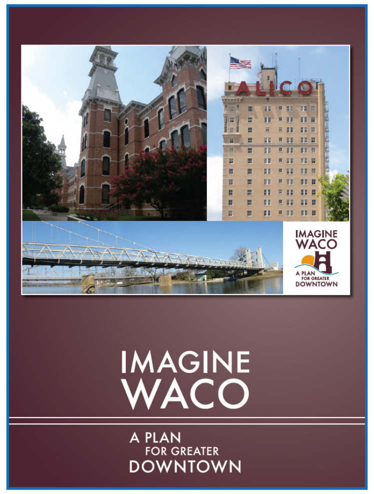
Americans with Disability Act Transition Plan (2019)

The City of Waco Adopted the Americans with Disability Act (ADA) Transition Plan in 2019. It guides the upgrade of city infrastructure to meet the requirements in ADA Title II. Between 2019 and 2021, street improvements including construction of sidewalks and ramps where followed.



17th/18th/19th Streets Corridor Study (2017)

The study examined the combined five-mile corridor surrounding 17th, 18th, and 19th Streets in the City of Waco, from Lake Shore Drive in the northwest to Primrose Drive in the southeast. It identified roadway geometry, maintenance, safety and other issues in consultation residents and business owners along the corridor. Safety concerns were identified along the corridor due to high intersection volume, complexity of the corridor geometry, and unsafe speed. The community-led steering committee identified a five-phase improvement implementation plan that focused on safety and operational improvements, pavement markings upgrade, sidewalk and curb line roadway upgrades, and pedestrian crossing and signal upgrades. The improvements recommended in the study are supportive of the goals of this CSAP. The CSAP will analyze these corridors with respect to safety with updates data and draw from the community-supported changes proposed to improve safety.



Imagine Waco: A Plan for Greater Downtown (2010)

The 2010 revitalization plan aims to arrest the residential and commercial decline in Waco downtown. The Plan envisages a vibrant downtown development that supports diverse activities throughout the day for residents and businesses, supported by improvements to accessibility, connectivity, walkability, and a multimodal transportation network. The Plan hopes to create a vibrant city center by the river and to ensure connectivity between the east and west sides. The Plan's emphasis on walkability creates an opportunity for improving safety for all users on the road, an objective of the CSAP. As this is a relatively older plan, the CSAP will take into consideration the strategies and project list in the more recent 2023 Implementation Plan.

CITY OF WOODWAY

Comprehensive Plan (2004)

The City of Woodway Comprehensive Plan is the City's long-range plan that outlines its community development vision. The 1997 Plan lists the functional classification of major thoroughfares in the City, identifies traffic generators, and contains street section guidelines. It identifies deficiencies and recommends changes to the roadway network. The 2004 update to the Plan updates some of these recommendations. The CSAP follows the general direction of the Comprehensive Plan.

TxDOT

Unified Transportation Program 2024 (2023)

The Unified Transportation Program (UTP) guides the 10-year transportation programming that is annually updated. It bridges the long-range transportation planning goals, performance measures, and targets to project level outcomes. The UTP categorizes transportation projects and authorizes the distribution of funding across 12 categories. The UTP actively promotes safety of the transportation network in support of TxDOT's three strategic goals: promoting safety, preserving assets, and optimizing system performance. The CSAP works to reduce crashes and fatalities on local roadways and directly contributes to attaining the goals of the UTP.

Texas Transportation Plan 2050 (2020)

The Texas Transportation Plan 2050 presents the long-range transportation vision for a 30-year period. Developed with considerable stakeholder input and analysis, the Plan is informed through considerations of high safety risks on roadways, population growth, economic expansion, increasing freight demands, technological advancements, and systemic risks affecting the transportation system. Promoting safety is a central goal of the long-range plan, which will be measured through a reduction in fatalities and severe injuries consistent with national goals and performance measures. The plan promotes a five "E's" – Evaluation, Engineering, Encouragement, Education, and Enforcement – based approach to safety promotion. TxDOT has also adopted a Vision Zero goal to reach zero traffic KSI by 2050.

CHAPTER 4

ENGAGEMENT & COLLABORATION

CHAPTER 4: ENGAGEMENT & COLLABORATION

The development of the Waco MPO CSAP involved extensive community engagement and collaboration with key stakeholders across the region. Safety is a shared responsibility, and input from the public, local agencies, and safety partners was critical to identifying priority concerns and building support for recommended strategies.

The planning process included regular updates and discussions at Waco MPO's Policy Board, Technical Advisory Committee, and workgroup meetings beginning November 2023; these meetings were open to the public.

Additionally, a 30-day public participation period for the CSAP was held from March 31 to April 29, 2024. The plan was developed collaboratively with input from the County, Cities, TxDOT, and other key stakeholders in the region, including representatives from area Independent School Districts (ISDs). The table on the right provides a summary of various outreach conducted for the CSAP. Engagement and collaboration activities with respect to the project schedule are shown on the following page.

SUMMARY OF ENGAGEMENT & COLLABORATION ACTIVITIES

ACTIVITY	DESCRIPTION
Project Website	Dedicated project website (https://www.wacomposafestreets.com/) containing overview of the project, project area and map of collisions between 2014 and 2023. A project website on the Waco MPO's official website: https://www.waco-texas.com/Departments/Metropolitan-Planning-Organization/Planning-Programs#section-7
Public Map Input Platform	As part of the project website, an online mapping platform for public and stakeholders to report locations or roadways with known or potential safety issues was created. Responses were accepted until March 24, 2024 to be included in the Comprehensive Safety Action Plan.
Stakeholder Meetings	Stakeholder engagement meetings and activities continued from January through April 2024. Two rounds of virtual meetings and discussions were held; first, to gain an understanding of the existing conditions, and second, to finalize safety projects. Two meetings each were organized with the Cities of Bellmead, Hewitt, Lacy Lakeview, McGregor, Robinson, Waco, Woodway, and McLennan County. One meeting with was held with Waco, Midway, Connelly, and La Vega Independent School Districts. Baylor University staff were invited and participated during the meeting with the City of Waco. The meeting agendas and minutes are available as **Appendix D**.
Safety Action Task Force Meetings	Safety Action Task Force Meetings were held in-person and virtually on the second Monday of each month starting in December. These meetings were attended by the task force members and the MPO. The task force will continue to meet after the adoption of the plan to monitor its implementation. The exact dates of the meetings are given below. • Safety Task Force Meeting #1 – December 11, 2023 • Safety Task Force Meeting #2 – January 8, 2024 • Safety Task Force Meeting #3 – February 12, 2024 • Safety Task Force Meeting #4 – March 11, 2024
Public Comment Form	Waco MPO Community Engagement page on the City of Waco website was available during the public comment period March 31, 2024 to April 29, 2024.
Public Information Meetings	Public Information Meeting #1 – April 9, 2024 – 12:00 p.m. (in-person and online) Public Information Meeting #2 – April 9, 2024 – 5:30 p.m. (in-person and online)

ENGAGEMENT & OUTREACH TIMELINE

PLAN INITIATION	EXISTING CONDITIONS ASSESSMENT			SAFETY PROJECT PRIORITIZATION	PLAN ADOPTION
NOV 2023	DEC 2023	JAN 2024	FEB 2024	MAR 2024	APR 2024

STAKEHOLDER ENGAGEMENT

PUBLIC OUTREACH & MAP INPUT PLATFORM

PUBLIC COMMENT PERIOD

SAFETY ACTION TASK FORCE MEETING #1
DEC 11

SAFETY ACTION TASK FORCE MEETING #2
JAN 8

SAFETY ACTION TASK FORCE MEETING #3
FEB 12

SAFETY ACTION TASK FORCE MEETING #4
MAR 11

SAFETY ACTION TASK FORCE MEETING #5
APR 15

STAKEHOLDER ENGAGMENT #1

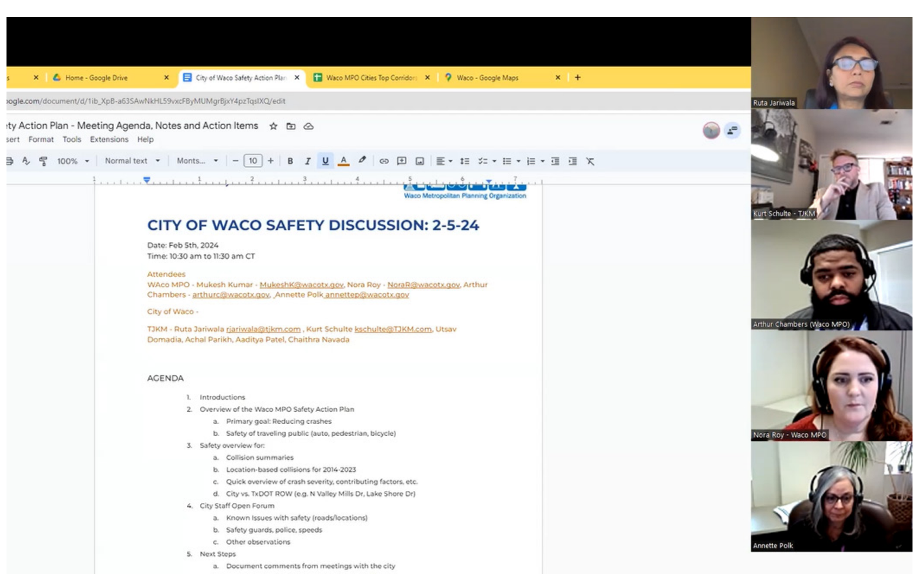
- Waco ISD - Jan 29, 1:00 pm
- Midway ISD - Jan 29, 10:30 am
- Connelly ISD - Jan 29, 2:30 pm
- La Vega ISD - Jan 29, 9:00 am
- City of Bellmead - Feb 5, 1:00 pm
- City of Hewitt - Feb 6, 10:30 am
- City of Lacy Lakeview - Feb 5, 2:30 pm
- City of McGregor - Feb 6, 2:30 pm
- City of Robinson - Feb 6, 9:00 am
- City of Waco - Feb 5, 10:30 am
- City of Woodway - Feb 6, 1:00 pm
- McLennan County - Feb 5, 9:00 am

STAKEHOLDER ENGAGMENT #2

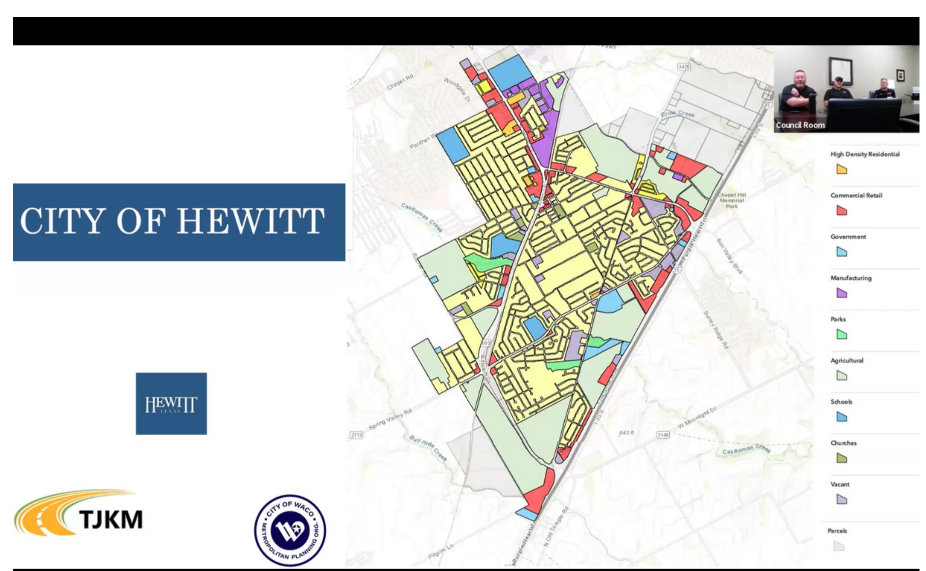
- City of Bellmead - Mar 20, 4:00 pm
- City of Hewitt - Mar 28, 3:00 pm
- City of Lacy Lakeview - Apr 1, 3:00 pm
- City of McGregor - Mar 19, 3:00 pm
- City of Robinson - Mar 20, 1:00 pm
- City of Waco - Mar 28, 4:00 pm
- City of Woodway - Mar 27, 2:00 pm
- McLennan County - Apr 1, 1:00 pm

PUBLIC INFORMATION MEETINGS
APR 9, 12:00 PM & 5:30 PM

STAKEHOLDER ENGAGEMENT #1 - WACO



STAKEHOLDER ENGAGEMENT #2 - HEWITT



INTER-AGENCY & INTRA-AGENCY COLLABORATION

Coordination between the many agencies and safety stakeholders in the Waco MPO and McLennan County was essential to developing a comprehensive and collaborative Safety Action Plan. An inter-agency Safety Action Task Force was formed at the outset, comprised of representatives from following agencies:

- Waco MPO
- City of Bellmead
- City of Hewitt
- City of McGregor
- City of Robinson
- City of Lacy Lakeview
- City of Waco
- City of Woodway
- McLennan County
- Waco Police Department
- Independent School Districts (within McLennan County)
- TxDOT Waco District

The Safety Action Task Force held monthly meetings throughout the planning process to provide technical guidance, feedback on analysis findings, identification and prioritization of potential safety projects, and strategies. Task Force members also facilitated broader engagement within their respective agencies. The Safety Action Task Force meeting agendas and minutes are available as **Appendix D**.

In addition to the regional partners above, the planning process involved intra-agency collaboration between departments within the City of Waco, including Public Works, Traffic Engineering, Police, Fire, and Planning. This helped ensure the plan's consistency with related City policies, identify opportunities to advance safety through processes like development review, and facilitate intergovernmental implementation.

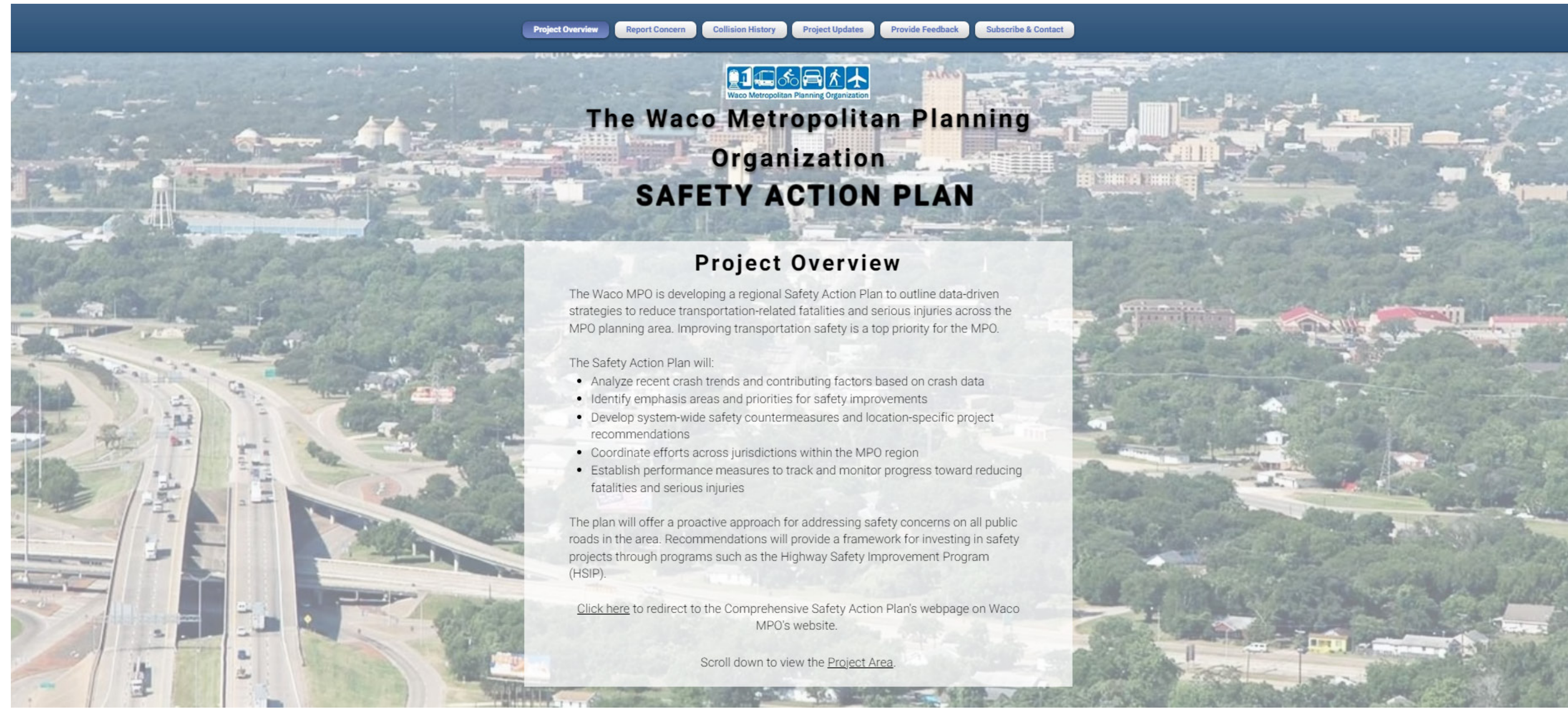
The engagement process and stakeholder collaborations were instrumental in building understanding of key safety issues in McLennan County. More importantly, it established a foundation of regional partnership and shared commitment to the strategies and priority projects outlined in the CSAP. Continued engagement and collaboration will be vital as the plan moves into implementation over the coming years.

PROJECT WEBSITE & PUBLIC MAP INPUT PLATFORM

Public engagement for the CSAP took place online through a dedicated project website (WacoMPOSafeStreets.com) which included a map-based questionnaire platform. The website gave a brief overview of the project, project area, and map of collisions between 2014 and 2023. The public was invited to report areas of concern through the map-input platform with directions on how to use the collision history map and map-input platform provided in the website. The website and platform were shared with the residents, city staff, school districts, and other stakeholders on the Waco MPO and the City of Waco websites. The image to the right displays the landing page of the website.

A total of 176 public comments were collected until March 24, 2024 through the interactive map platform. The map on the right displays the locations identified by the comments on the platform. Safety issues mentioned in these comments were classified into 10 categories: bicycle-related, lighting, pedestrian safety, roadway related, school safety, sign and signal related, traffic, unsafe speed, and unsafe turns. The Cities of Bellmead, Waco, and Hewitt received the most comments. The table below summarizes the number of comments received by jurisdiction. Top commented streets are US-84, Hewitt Drive, and Concord Road, while the top commented intersections are US-84 at SL-340/Airbase Road, and Bagby Avenue at S 4th Street. All comments are included in **Appendix E.**

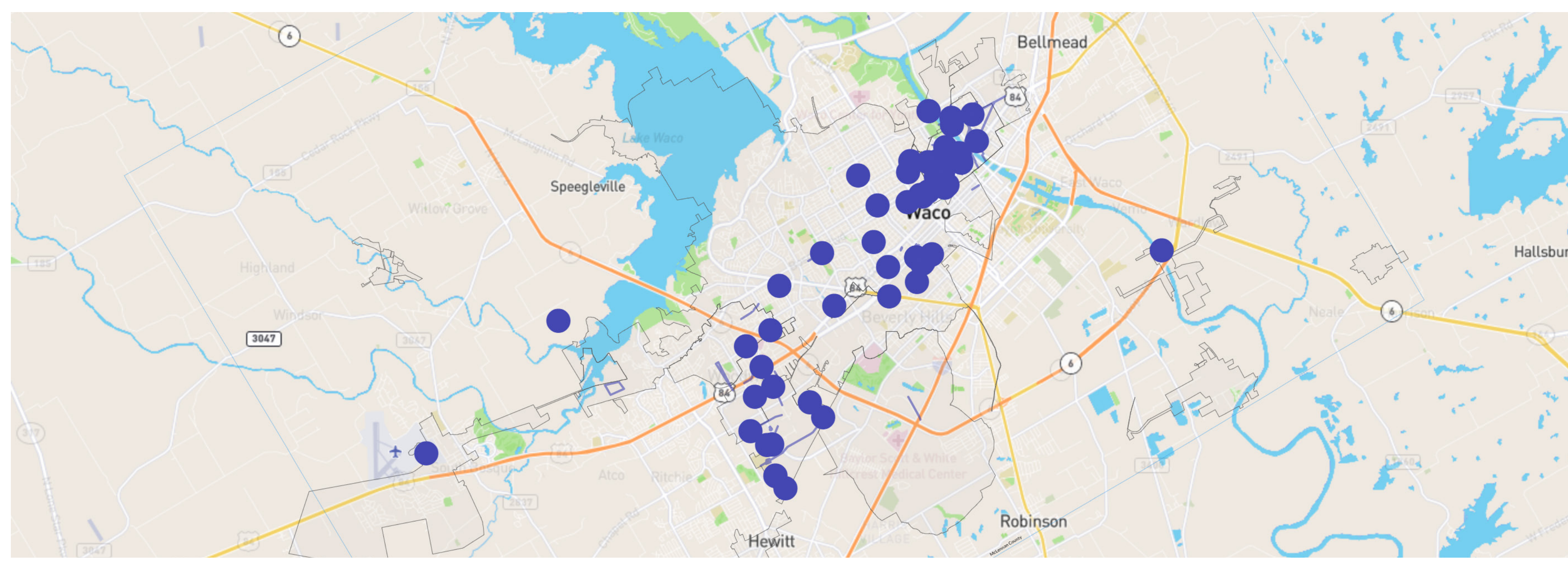
WACO METROPOLITAN PLANNING ORGANIZATION COMPREHENSIVE SAFETY ACTION PLAN PROJECT WEBPAGE



NUMBER OF COMMENTS RECEIVED BY CITY

CITY	# MENTIONS
Bellmead	93
Waco	46
Hewitt	28
Lacy Lakeview	2
Woodway	2
Hallsburg	1
Lorena (Unincorporated)	1
McGregor	1
Robinson	1
Unincorporated McLennan County	1
TOTAL	**176**

INTERACTIVE MAP COMMENT RESPONSES

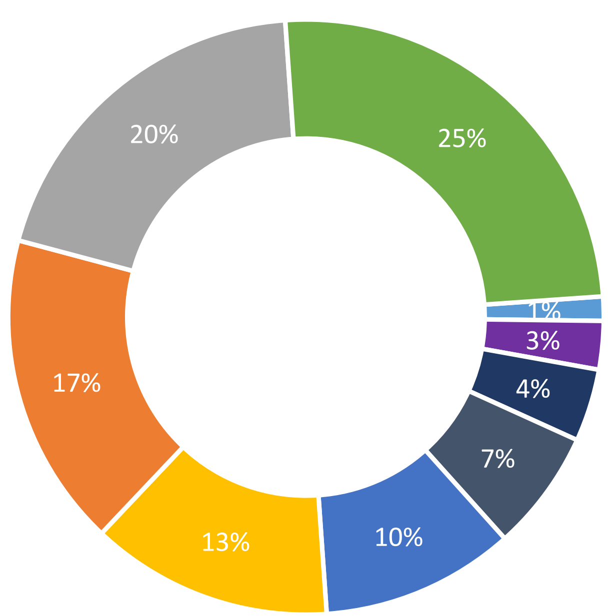


TOP CORRIDORS

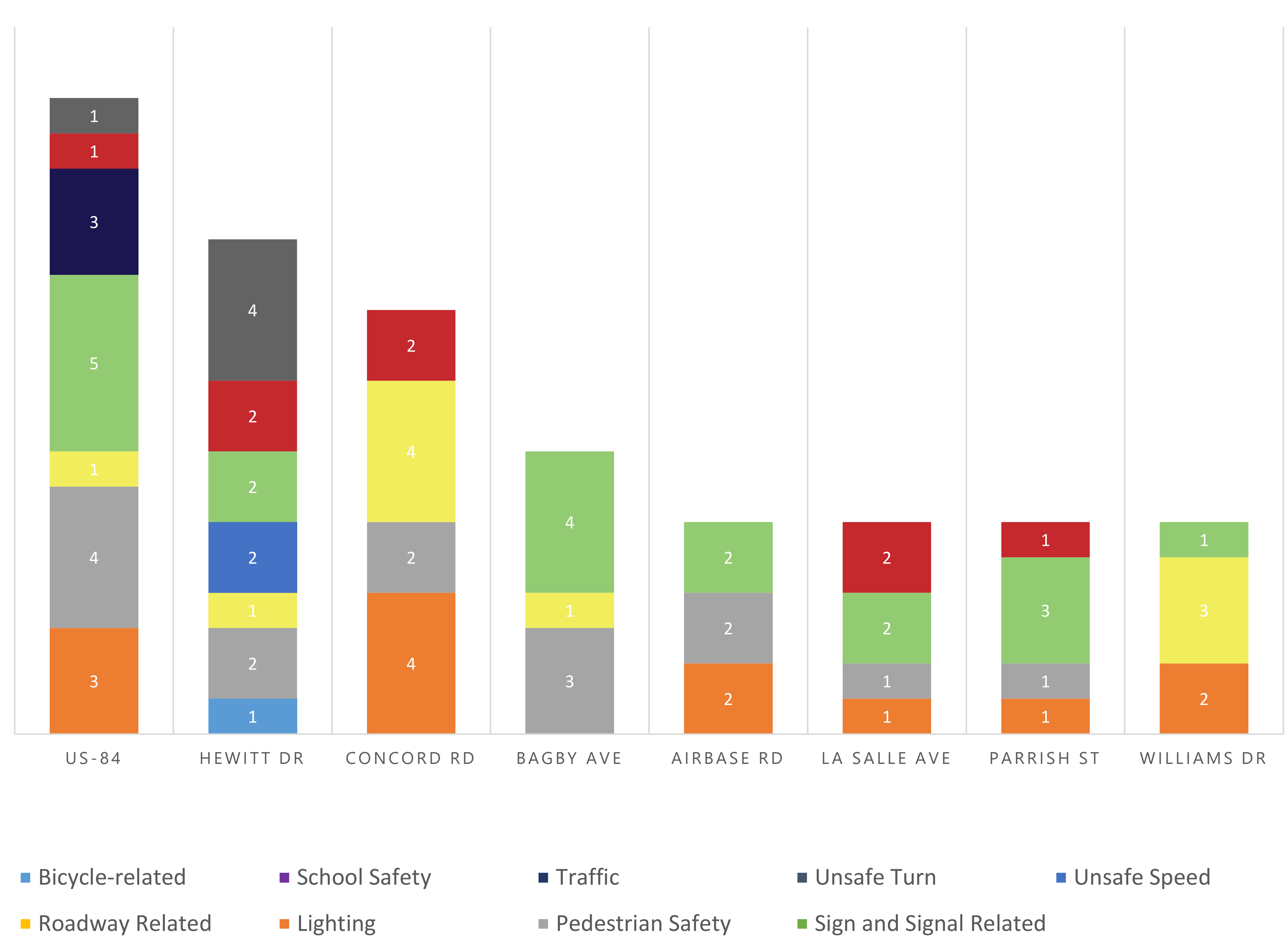
This section includes an analysis of the comments received regarding the eight corridors that received the highest level of public input. These corridors are US-84 in the Cities of Bellmead and McGregor; Hewitt Drive in the Cities of Hewitt and Waco; Concord Road, Airbase Road, Parrish Street and Williams Drive in the City of Bellmead; and Bagby Avenue and La Salle Avenue in the City of Waco. The comments highlighted safety several safety issues. Primary issues are: sign and signal-related concerns such as requests for sign upgrades and new signals; pedestrian safety issues such as crosswalks, sidewalks, and pedestrian-involved collisions; and a lack of adequate street lighting.

Roadway-related concerns reported by the public include narrow lanes, pavement and shoulder rehabilitation, striping, and drainage. The bar chart to the right summarizes safety issues identified through public input for each of the eight corridors. 63 percent of the comments across the eight corridors were related to motor vehicles, 36 percent pertained to issues faced by pedestrians, and one percent pertained to issues faced by bicyclists. Among these, Bagby Avenue, Airbase Road, and La Salle Avenue the highest number of reported pedestrian safety issues. Bicycle safety issues were reported for Hewitt Drive.

PUBLIC COMMENTS ON TRAFFIC SAFETY BY ISSUE



PUBLIC COMMENTS ON TRAFFIC SAFETY BY LOCATION AND CONCERNS



Note: Both graphs cover the safety-related issues highlighted for the top 8 corridors. Comments relating to an intersection are assigned to the major road for the purpose of analysis.

CHAPTER 5

SAFE STREET TOOLKIT

CHAPTER 5: SAFE STREET TOOLKIT

INTRODUCTION

This Safe Street Toolkit summarizes the safety improvement countermeasures to be considered for the Waco metropolitan area. The countermeasures are drawn from proven strategies identified by FHWA. The list of FHWA's proven safety countermeasures is included in the **Appendix F.**

The Safe Street Toolkit provides information on each countermeasure's applicability to different crash types, expected crash reduction factors (CRF), expected service life, and the opportunity for systemic implementation across the region. The countermeasure information was derived from the research compiled in the FHWA's Crash Modification Factor Clearinghouse as well as guidance in the FHWA's Roadway Departure Safety, Intersection Safety, and Roadway Safety Information Analysis publications.

NAVIGATING THE TOOLKIT

The countermeasures are grouped into the following categories:

- Signalized Intersections: This category includes countermeasures that can be applied at intersections controlled by traffic signals, such as signal timing adjustments, improved signage/markings, or geometric improvements.
- Unsignalized Intersections: These are countermeasures for intersections that do not have a traffic signal, such as stop-controlled or uncontrolled intersections. Examples include installing signals, roundabouts, improved signing/striping, etc.
- Roadway Segments: Countermeasures in this group are focused on improving safety along roadway sections between intersections. This includes treatments like rumble strips, lighting, guardrails, curve realignments, etc.
- Other Countermeasures: This category lists potential safety strategies such as educational campaigns or enforcement programs.

For each countermeasure, the toolkit provides:

- Crash Types Addressed: Indicates what crash types the countermeasure is intended to mitigate, such as all crashes, pedestrian/bicycle crashes, nighttime crashes, etc.
- Crash Reduction Factor (CRF): The expected percentage reduction in crashes that can be achieved by implementing this countermeasure, based on research studies.
- Expected Service Life: The anticipated number of years the countermeasure will be effective before requiring major rehabilitation or replacement, typically 10 or 20 years.
- Systemic Implementation Opportunity: The potential for proactively implementing this countermeasure across the region using a systemic risk-based approach, rather than just at individual high crash locations. This has been ranked as Very High, High, Medium or Low opportunity.

COMPREHENSIVE APPROACH

While this toolkit focuses primarily on engineering countermeasures, additional strategies are included to encourage a comprehensive approach, incorporating Engineering, Enforcement, Education, and Emergency Services. Reducing severe crashes often requires a balanced approach beyond just infrastructure improvements.

Common violation types like speeding, impaired driving, distracted driving, and failure to yield may warrant supplementing engineering treatments with targeted enforcement or educational campaigns. Coordination with law enforcement and community partners is recommended when applying countermeasures to address these violation types.

The following toolkit entries provide information on the recommended countermeasures and guidance on their applicability within the Waco metropolitan area.

SIGNALIZED INTERSECTION COUNTERMEASURES

Add intersection lighting

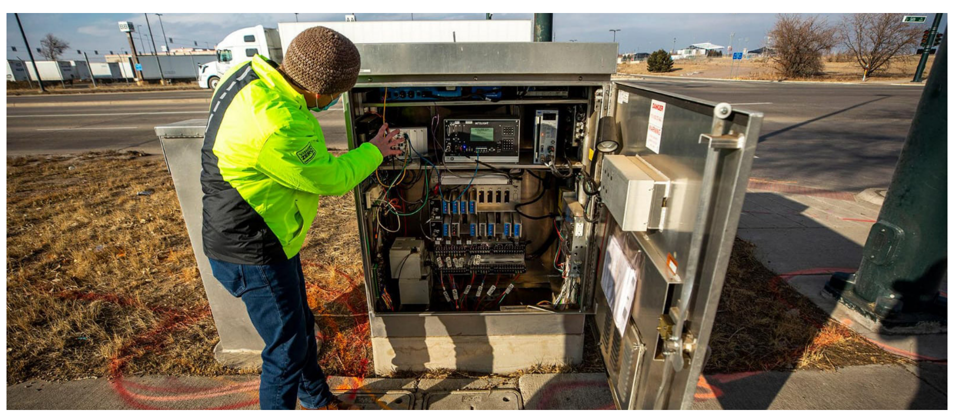
Provision of lighting at intersection.

Crash Type	Night
CRF	40%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number

Includes new LED lighting, signal back plates, retro-reflective tape outlining the back plates, or visors to increase signal visibility, larger signal heads, relocation of the signal heads, or additional signal heads.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High



Improve signal timing (coordination, phases, red, yellow, or operation)

Includes adding phases, lengthening clearance intervals, eliminating or restricting higher-risk movements, and coordinating signals at multiple locations.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

Install emergency vehicle pre-emption systems

Corridors that have a history of crashes involving emergency response vehicles. The target of this strategy is signalized intersections where normal traffic operations impede emergency vehicles and where traffic conditions create a potential for conflicts between emergency and nonemergency vehicles. These conflicts could lead to almost any type of crash, due to the potential for erratic maneuvers of vehicles moving out of the paths of emergency vehicles.

Crash Type	Emergency Vehicle
CRF	70%
Expected Life (Years)	10
Systemic Approach Opportunity	High

SIGNALIZED INTERSECTION COUNTERMEASURES

Install left-turn lane and add turn phase (signal has no left-turn lane or phase before)

Intersections that do not currently have a left-turn lane or a related left-turn phase that are experiencing a large number of crashes. Many intersection safety problems can be traced to difficulties in accommodating left-turning vehicles, in particular where there is currently no accommodation for left turning traffic. A key strategy for minimizing collisions related to left-turning vehicles (angle, rear-end, sideswipe) is to provide exclusive left-turn lanes and the appropriate signal phasing, particularly on high-volume, and high-speed major-road approaches.

Crash Type	All
CRF	55%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Provide protected left turn phase (left turn lane already exists)

Left-turns are widely recognized as the highest-risk movements at signalized intersections. Providing Protected left-turn phases for signalized intersections with existing left-turn pockets significantly improve the safety for left-turn maneuvers by removing the need for the drivers to navigate through gaps in oncoming/opposing through vehicles.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	High

Convert signal to mast arm (from pedestal-mounted)

Providing better visibility of intersection signs and signals aids the drivers' advance perception of the upcoming intersection. Visibility and clarity of the signal should be improved without creating additional confusion or distraction for drivers.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install raised pavement markers and striping

Adding clear pavement markings can guide motorists through complex intersections. When drivers approach and traverse through complex intersections, drivers may be required to perform unusual or unexpected maneuvers.

Crash Type	All
CRF	10%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

SIGNALIZED INTERSECTION COUNTERMEASURES

Install flashing beacons as advance warning

Increased driver awareness of an approaching signalized intersection and an increase in the driver's time to react.

Crash Type	All
CRF	30%
Expected Life (Years)	10
Systemic Approach Opportunity	Medium

Improve pavement friction (High Friction Surface Treatments)

Improving the skid resistance at locations with high frequencies of wet road crashes and/or failure to stop crashes.

Crash Type	All
CRF	55%
Expected Life (Years)	10
Systemic Approach Opportunity	Medium

Install raised median on approaches

Raised medians next to left-turn lanes at intersections offer a cost effective means for reducing crashes and improving operations at higher volume intersections.

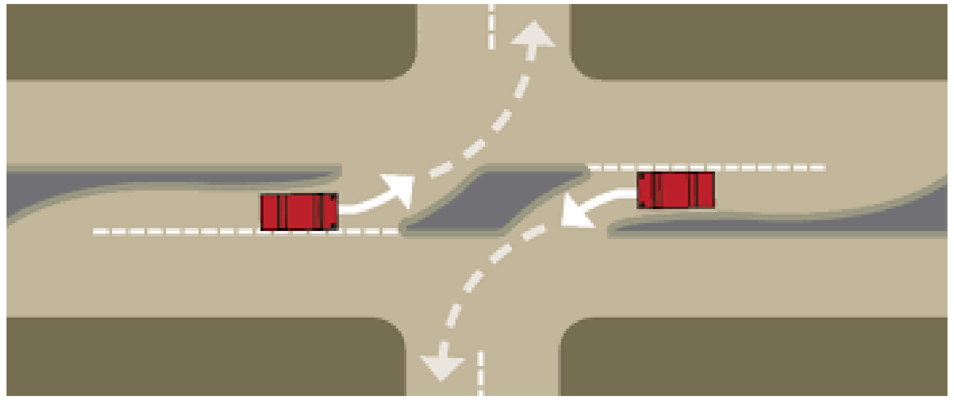
Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install pedestrian median fencing on approaches

Signalized Intersections with high pedestrian-generators nearby (e.g. transit stops) may experience a high volumes of pedestrians J-walking across the travel lanes at mid-block locations instead of walking to the intersection and waiting to cross during the walk-phase.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

SIGNALIZED INTERSECTION COUNTERMEASURES



Create directional median openings to allow (and restrict) left-turns and U-turns

Crashes related to turning maneuvers include angle, rear-end, pedestrian, and sideswipe (involving opposing left turns) type crashes. If any of these crash types are an issue at an intersection, restriction or elimination of the turning maneuver may be the best way to improve the safety of the intersection.

Crash Type	All
CRF	50%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Reduced left-turn conflict intersections

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur in order to simplify decisions and minimize the potential for related crashes. Two highly effective designs that rely on U-turns to complete certain left-turn movements are known as the restricted crossing U-turn (RCUT) and the median U-turn (MUT).

Crash Type	All
CRF	50%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Convert intersection to roundabout (from signal)

Signalized intersections that have a significant crash problem and the only alternative is to change the nature of the intersection itself. Roundabouts can also be very effective at intersections with complex geometry and intersections with frequent left-turn movements.

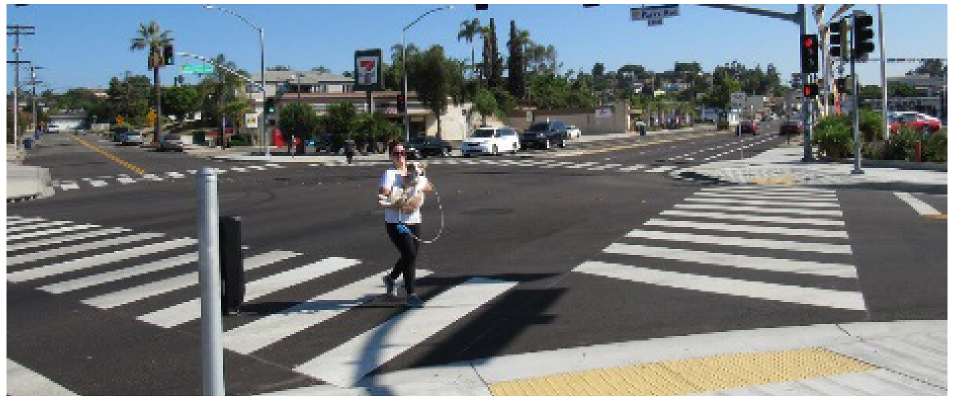
Crash Type	All
CRF	Varies
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Install pedestrian countdown signal heads

Signals that have signalized pedestrian crossing with walk/don't walk indicators and where there have been pedestrian vs. vehicle crashes.

Crash Type	P & B
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Very High

SIGNALIZED INTERSECTION COUNTERMEASURES



Install pedestrian crossing

Signalized Intersections with no marked crossing and pedestrian signal heads, where pedestrians are known to be crossing intersections that involve significant turning movements. They are especially important at intersections with (1) multiphase traffic signals, such as left-turn arrows and split phases, (2) school crossings, and (3) double-right or double-left-turns. At signalized intersections, pedestrian crossings aroften safer when the left-turns have protected phases that do not overlap the pedestrian walk phase.

Crash Type	P & B
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	High

Pedestrian scramble

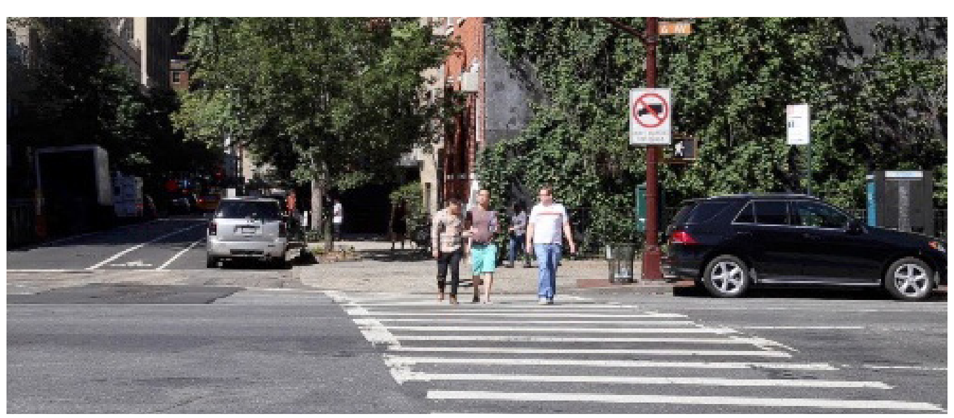
Pedestrian Scramble is a form of pedestrian "WALK" phase at a signalized intersection in which all vehicular traffic is required to stop, allowing pedestrians/bicyclists to safely cross through the intersection in any direction, including diagonally. Pedestrian Scramble may be considered at signalized intersections with very high pedestrian/bicycle volumes, e.g. in an urban business district.

Crash Type	P & B
CRF	40%
Expected Life (Years)	20
Systemic Approach Opportunity	High

Install advance stop bar before crosswalk (Bicycle Box)

Signalized Intersections with a marked crossing, where significant bicycle and/or pedestrians volumes are known to occur.

Crash Type	P & B
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High



Modify signal phasing to implement a Leading Pedestrian Interval (LPI)

Addition of LPI gives pedestrians the opportunity to enter an intersection three to seven seconds before vehicles are given a green indication; only minor signal timing alteration is required.

Crash Type	P & B
CRF	60%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

NON SIGNALIZED INTERSECTION COUNTERMEASURES

Add intersection lighting

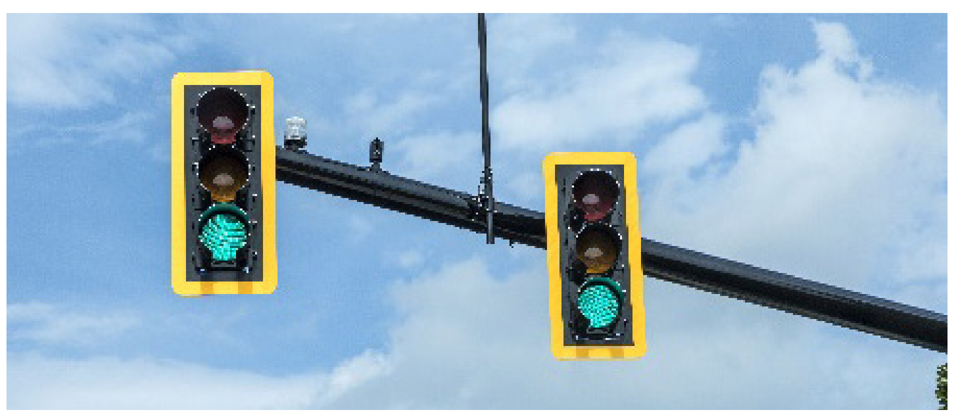
Provision of lighting at intersection.

Crash Type	Night
CRF	40%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Convert to all-way STOP control (from 2-way or Yield control)

Unsignalized intersection locations that have a crash history and have no controls on the major roadway approaches. However, all-way stop control is suitable only at intersections with moderate,and relatively balanced volume levels on the intersection approaches. Under other conditions, the use of all-way stop control may create unnecessary delays and aggressive driver behavior.

Crash Type	All
CRF	50%
Expected Life (Years)	10
Systemic Approach Opportunity	High



Install signals

Installation of traffic signals

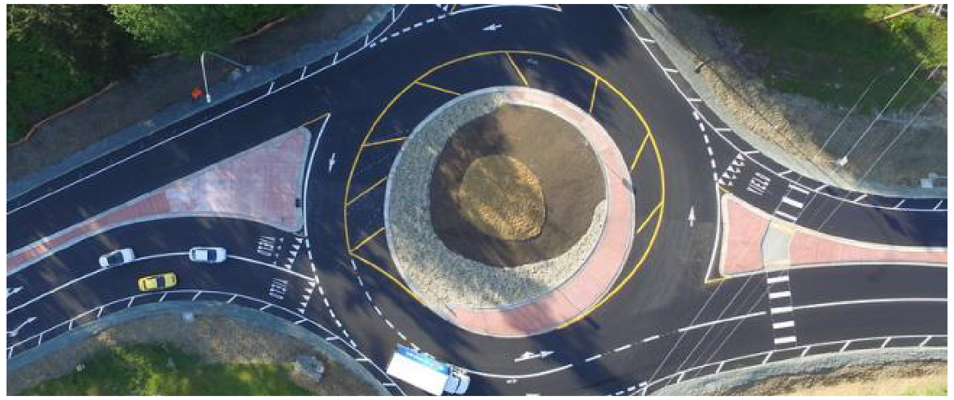
Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Convert intersection to roundabout (from all way stop)

Intersections that have a high frequency of right-angle and left-turn type crashes. Whether such intersections have existing crash patterns or not, a roundabout provides an alternative to signalization. The primary target locations for roundabouts should be moderate-volume unsignalized intersections.

Crash Type	All
CRF	Varies
Expected Life (Years)	20
Systemic Approach Opportunity	Low

NON SIGNALIZED INTERSECTION COUNTERMEASURES



Convert intersection to roundabout (from stop or yield control on minor road)

Intersections that have a high frequency of right-angle and left-turn type crashes. Whether such intersections have existing crash patterns or not, a roundabout provides an alternative to signalization. The primary target locations for roundabouts should be moderate-volume unsignalized intersections.

Crash Type	All
CRF	Varies
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Convert intersection to mini-roundabout

Mini-roundabouts are characterized by a small diameter (45-90 feet) and traversable islands (central island and splitter islands).

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs

Additional regulatory and warning signs at or prior to intersections will help enhance the ability of approaching drivers to percieve them.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

Upgrade intersection pavement markings

Typical improvements include “Stop Ahead” markings and the addition of centerlines and stop bars.

Crash Type	All
CRF	25%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

NON SIGNALIZED INTERSECTION COUNTERMEASURES

Install Flashing Beacons at Stop-Controlled Intersections

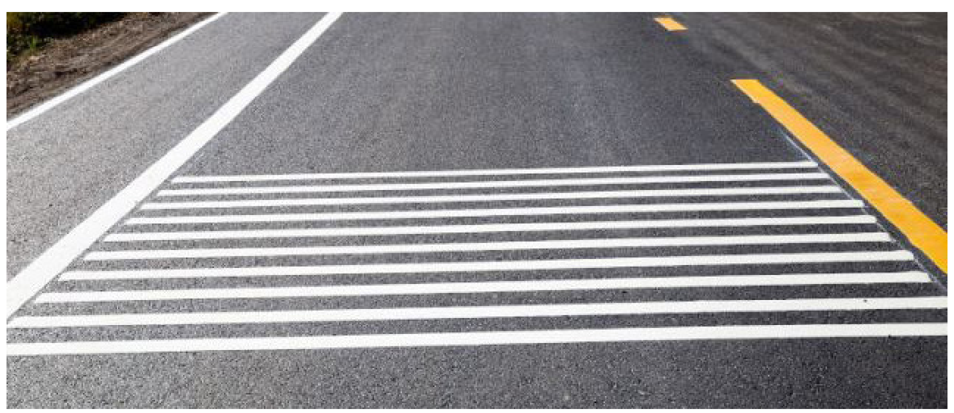
Flashing beacons can reinforce driver awareness of the Non-Signalized intersection control and can help mitigate patterns of right-angle crashes related to stop sign violations. Post-mounted advanced flashing beacons or overhead flashing beacons can be used at stop-controlled intersections to supplement and call driver attention to stop signs.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install flashing beacons as advance warning

Installation of advance flashing beacons to call drivers attention to intersection control signs.

Crash Type	All
CRF	30%
Expected Life (Years)	10
Systemic Approach Opportunity	High



Install transverse rumble strips on approaches

Transverse rumble strips are installed in the travel lane for the purposes of providing an auditory and tactile sensation for each motorist approaching the intersection.

Crash Type	All
CRF	20%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Improve sight distance to intersection (clear sight triangles)

Unsignalized intersections with restricted sight distance and patterns of crashes related to lack of sight distance where sight distance can be improved by clearing roadside obstructions without major reconstruction of the roadway.

Crash Type	All
CRF	55%
Expected Life (Years)	10
Systemic Approach Opportunity	Medium

NON SIGNALIZED INTERSECTION COUNTERMEASURES

Improve pavement friction (High Friction Surface Treatments)

Non-signalized Intersections noted as having crashes on wet pavements or under dry conditions when the pavement friction available is significantly less than needed for the actual roadway approach speeds. This treatment is intended to target locations where skidding and failure to stop is determined to be a problem in wet or dry conditions and the target vehicle is unable to stop due to insufficient skid resistance.

Crash Type	All
CRF	55%
Expected Life (Years)	10
Systemic Approach Opportunity	Medium

Install splitter-islands on the minor road approaches

The installation of a splitter island allows for the addition of a stop sign in the median to make the intersection more conspicuous.

Crash Type	All
CRF	40%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install raised median on approaches

Effective access management is key to improving safety at, and adjacent to, intersections. The number of intersection access points coupled with the speed differential between vehicles traveling along the roadway often contributes to crashes. Any access points within 250 feet upstream and downstream of an intersection are generally undesirable.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Create directional median openings to allow (and restrict) left-turns and u-turns

Crashes related to turning maneuvers include angle, rear-end, pedestrian, and sideswipe (involving opposing left turns) type crashes. If any of these crash types are an issue at an intersection, restriction or elimination of the turning maneuver may be the best way to improve the safety of the intersection.

Crash Type	All
CRF	50%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

NON SIGNALIZED INTERSECTION COUNTERMEASURES

Reduced left-turn conflict intersections

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur in order to simplify decisions and minimize the potential for related crashes.

Crash Type	All
CRF	50%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install right-turn lane

Many collisions at unsignalized intersections are related to right-turn maneuvers. A key strategy for minimizing such collisions is to provide exclusive right-turn lanes, particularly on high-volume and high-speed major-road approaches. When considering new right-turn lanes, potential impacts to non-motorized users should be considered and mitigated as appropriate.

Crash Type	All
CRF	20%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Install left-turn lane (where no left-turn lane exists)

Many collisions at unsignalized intersections are related to left-turn maneuvers. A key strategy for minimizing such collisions is to provide exclusive left-turn lanes, particularly on high-volume and high-speed major-road approaches. When considering new left-turn lanes, potential impacts to non-motorized users should be considered and mitigated as appropriate.

Crash Type	All
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Install raised medians/refuge islands

Intersections that have a long pedestrian crossing distance, a higher number of pedestrians, or a crash history. Raised medians decrease the level of exposure for pedestrians and allow pedestrians to concentrate on (or cross) only one direction of traffic at a time.

Crash Type	P & B
CRF	45%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

NON SIGNALIZED INTERSECTION COUNTERMEASURES

Install pedestrian crossing at uncontrolled locations (new signs and markings only)

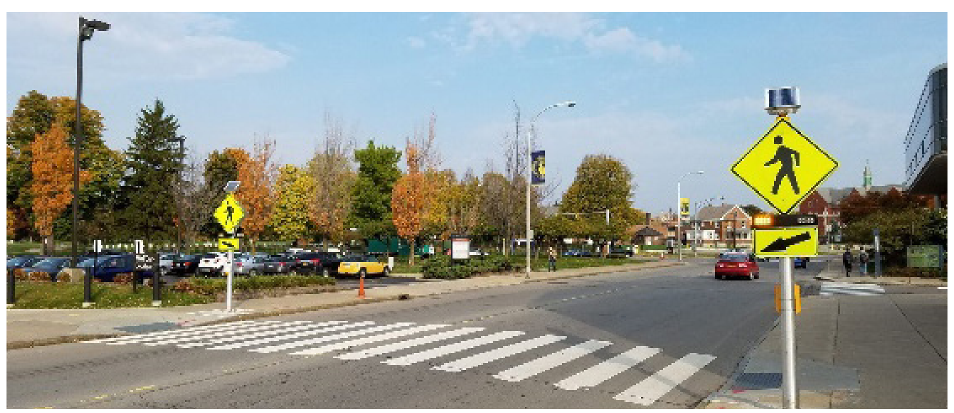
Non-signalized intersections without a marked crossing, where pedestrians are known to be crossing intersections that involve significant vehicular traffic. They are especially important at school crossings and intersections with right and/or left turns pockets.

Crash Type	P & B
CRF	25%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)

Non-signalized intersections where pedestrians are known to be crossing intersections that involve significant vehicular traffic. They are especially important at school crossings and intersections with turn pockets, flashing beacons, curb extensions, advanced “stop” or “yield” markings, and other safety features should be added to complement the standard crossing elements.

Crash Type	P & B
CRF	60%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High



Install Rectangular Rapid Flashing Beacon (RRFB)

The RRFB includes pedestrian-activated flashing lights and additional signage that enhance the visibility of marked crosswalks and alert motorists to pedestrian crossings. It uses an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs are installed at unsignalized intersections and mid-block pedestrian crossings.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install pedestrian signal (including Pedestrian Hybrid Beacon (PHB))

Intersections noted as having a history of pedestrian vs. vehicle crashes and in areas where the likelihood of the pedestrian presence is high. Corridors should also be assessed to determine if there are adequate safe opportunities for non-motorists to cross and if a pedestrian signal, or a Pedestrian Hybrid Beacon (PHB) (also called High-Intensity Activated crossWalK beacon (HAWK)) are needed to provide an active warning to motorists when a pedestrian is in the crosswalk.

Crash Type	P & B
CRF	55%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

ROADWAY SEGMENT COUNTERMEASURES

Add intersection lighting

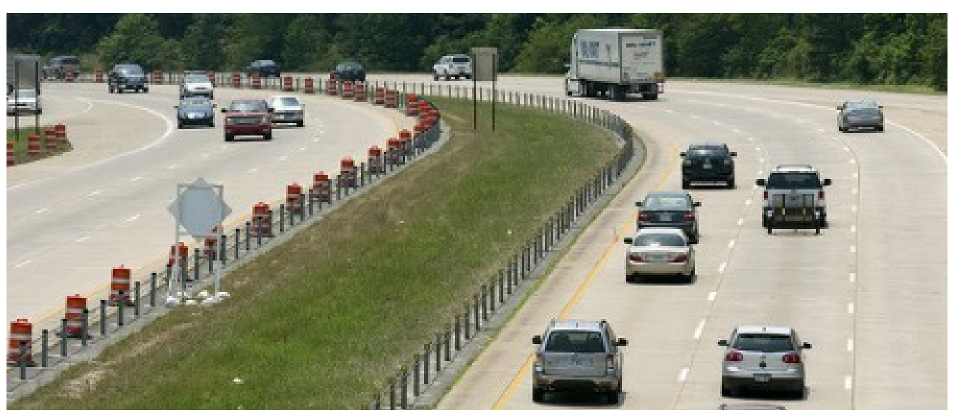
Provision of lighting along roadways.

Crash Type	Night
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Remove or relocate fixed objects outside of clear recovery zone

Known locations or roadway segments prone to collisions with fixed objects such as utility poles, drainage structures, trees, and other fixed objects, such as the outside of a curve, end of lane drops, and in traffic islands. A clear recovery zone should be developed on every roadway, as space is available. In situations where public right-of-way is limited, steps should be taken to request assistance from property owners, as appropriate.

Crash Type	All
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	High



Install median barrier

Areas where crash history indicates drivers are unintentionally crossing the median and the cross-overs are resulting in high severity crashes. The installation of median barriers can increase the number of PDO and non-severe injuries. The net result in safety from this countermeasure is connected more to reducing the severity of crashes not the number of crashes.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install guardrail

Guardrail is installed to reduce the severity of lane departure crashes. However, guardrail can reduce crash severity only for those conditions where striking the guardrail is less severe than going down an embankment or striking a fixed object. Guardrail should only be installed where it is clear that crash severity will be reduced, or there is a history of run-off-the-road crashes at a given location that have resulted in severe crashes.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	High

ROADWAY SEGMENT COUNTERMEASURES

Install impact attenuators

Impact attenuators are typically used to shield rigid roadside objects such as concrete barrier ends, steel guardrail ends and bridge pillars from oncoming automobiles. Attenuators should only be installed where it is impractical for the objects to be removed.

Crash Type	All
CRF	25%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Flatten side slopes

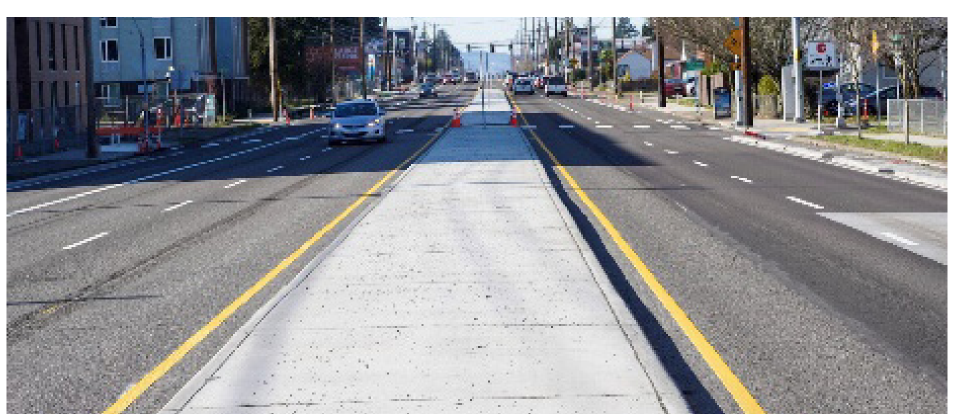
Roadways experiencing frequent lane departure crashes that result in roll-over type crashes as a result of the roadway slope being so severe as to not accommodate a reasonable degree of driver correction. When there is a need to reduce the severity of lane departure crashes without installing a barrier system that could result in increased numbers of crashes.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Flatten side slopes and remove guardrail

Locations where high number of crashes originate as a lane departure and result in collision with guardrail or a fixed object located on the side slope shielded by guardrail. The guardrail may or may not meet current standards. Even though guardrails are generally installed to reduce the severity of departure crashes, they still can result in severe crashes in some locations.

Crash Type	All
CRF	40%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium



Install raised median

Areas experiencing head-on collisions that may be affected by both the number of vehicles that cross the centerline and by the speed of oncoming vehicles. Installing a raised median is a more restrictive approach in that it represents a more rigid barrier between opposing traffic.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

ROADWAY SEGMENT COUNTERMEASURES

Install median (flush)

Areas experiencing head-on collisions that may be affected by both the number of vehicles that cross the centerline and by the speed of oncoming vehicles. Roadways with oversized lanes offer an opportunity to restripe the roadway to reduce the lanes to standard widths and use the extra width for the median.

Crash Type	All
CRF	15%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install pedestrian median fencing on approaches

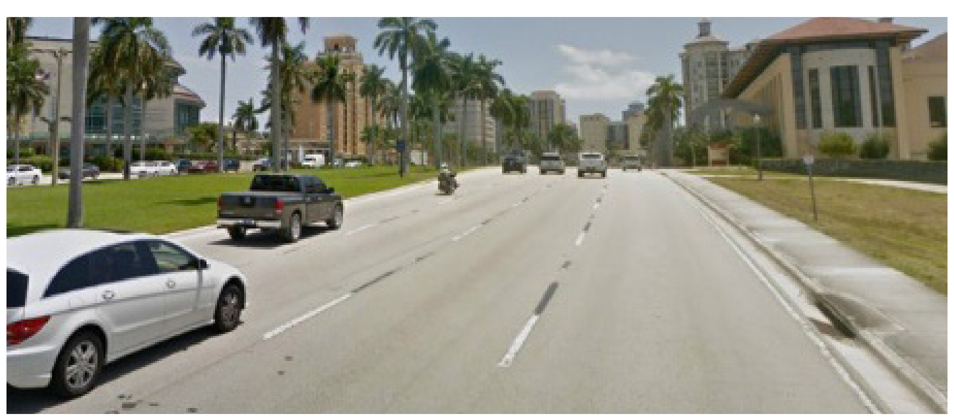
Roadway segments with high pedestrian-generators and pedestrian-destinations nearby (e.g. transit stops) may experience a high volume of pedestrians J-walking across the travel lanes at mid-block locations instead of walking to the nearest intersection or designated mid-block crossing. When this safety issue cannot be mitigated with shoulder, sidewalk and/or crossing treatments, then installing a continuous pedestrian barrier in the median may be a viable solution.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Install acceleration/deceleration lanes

Areas proven to have crashes that are the result of drivers not being able to turn onto a high speed roadway to accelerate until the desired roadway speed is reached and areas that do not provide the opportunity to safety decelerate to negotiate a turning movement.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Low



Widen lane (initially less than 10 feet)

Horizontal curves or tangents and low speed or high speed roadways identified as having lane departure crashes, sideswipe or head-on crashes that can be attributed to an existing pavement width less than 10 feet.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

ROADWAY SEGMENT COUNTERMEASURES

Add two-way left-turn lane

Roadways having a high frequency of drivers being rear-ended while attempting to make a left turn across oncoming traffic. Also can be effective for drivers crossing the centerline of an undivided multilane roadway inadvertently.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Road Diet (reduce travel lanes and add a two way left-turn and bike lanes)

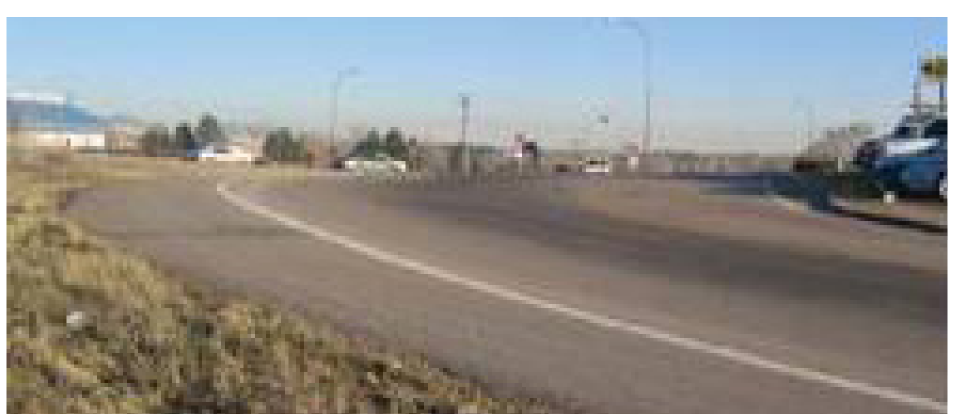
Areas noted as having a higher frequency of head-on, left-turn, and rear-end crashes with traffic volumes that can be handled by only two free flowing lanes. Using this strategy in locations with traffic volumes that are too high could result in diversion of traffic to routes less safe than the original four-lane design.

Crash Type	All
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Widen shoulder

Roadways that have a frequent incidence of vehicles leaving the travel lane resulting in an unsuccessful attempt to reenter the roadway. The probability of a safe recovery is increased if an errant vehicle is provided with an increased paved area in which to initiate such a recovery.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium



Curve shoulder widening (outside only)

Roadway curves noted as having frequent lane departure crashes due to inadequate or no shoulders, resulting in an unsuccessful attempt to reenter the roadway.

Crash Type	All
CRF	45%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

ROADWAY SEGMENT COUNTERMEASURES

Improve horizontal alignment (flatten curves)

Roadways with horizontal curves that have experienced lane departure crashes as a result of a roadway segment having compound curves or a severe radius. This strategy should generally be considered only when less expensive strategies involving clearing of specific sight obstructions or modifying traffic control devices have been tried and have failed to ameliorate the crash patterns.

Crash Type	All
CRF	50%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Flatten crest vertical curve

The target for this strategy is usually unsignalized intersections with restricted sight distance due to vertical geometry and with patterns of crashes related to that lack of sight distance that cannot be ameliorated by less expensive methods. This strategy should generally be considered only when less expensive strategies involving clearing of specific sight obstructions or modifying traffic control devices have been tried and have failed to ameliorate the crash patterns.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Systemic Approach Opportunity	Low

Improve curve super elevation

Roadways noted as having frequent lane departure crashes and inadequate or no super elevation. Safety can be enhanced when the super elevation is improved or restored along curves where the actual super elevation is less than the optimal.

Crash Type	All
CRF	45%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Convert from two-way to one-way traffic

One-way streets can offer improved signal timing and accommodate odd-spaced signals. One-way streets can simplify crossings for pedestrians, who must look for traffic in only one direction. While studies have shown that conversion of two-way streets to one-way generally reduces pedestrian crashes and the number of conflict points, one-way streets tend to have higher speeds which creates new problems.

Crash Type	All
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

ROADWAY SEGMENT COUNTERMEASURES

Improve pavement friction (high friction surface treatments)

Improving the skid resistance at locations with high frequencies of wet road crashes and/or failure to stop crashes.

Crash Type	All
CRF	55%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install/upgrade signs with new fluorescent sheeting (regulatory or warning)

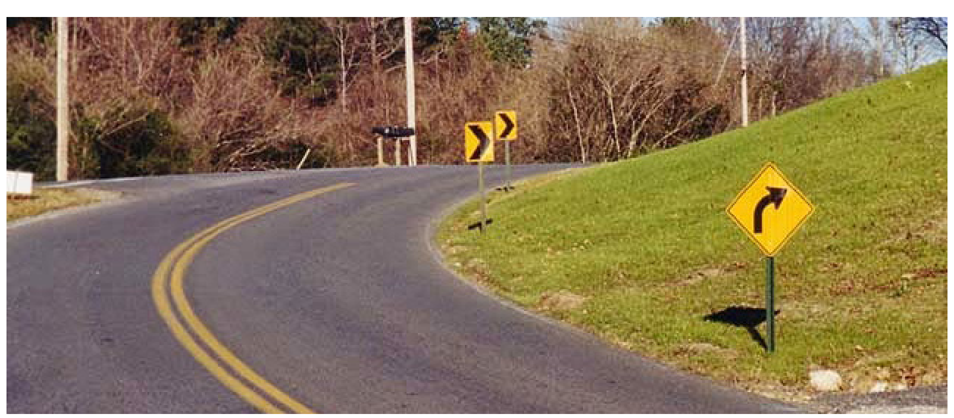
Additional or new signage can address crashes caused by lack of driver awareness or compliance of roadway signing.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

Install chevron signs on horizontal curves

Roadways that have an unacceptable level of crashes on relatively sharp curves during periods of light and darkness.

Crash Type	All
CRF	40%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High



Install curve advance warning signs

Addition of advance curve warning signs; may also include horizontal alignment and/or advisory speed warning signs.

Crash Type	All
CRF	25%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

ROADWAY SEGMENT COUNTERMEASURES

Install curve advance warning signs (flashing beacon)

Roadways that have an unacceptable level of crashes on relatively sharp curves. Flashing beacons in conjunction with warning signs should only be used on horizontal curves that have an established severe crash history to help maintain their effectiveness.

Crash Type	All
CRF	30%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install dynamic/variable speed warning signs

Includes the addition of dynamic speed warning signs (also known as Radar Speed Feedback Signs). Curvilinear roadways that have an unacceptable level of crashes due to excessive speeds on relatively sharp curves.

Crash Type	All
CRF	30%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install delineators, reflectors, and/or object markers

Installation of delineators, reflectors, and/or object markers are intended to warn drivers of an approaching curve or fixed object that cannot easily be removed.

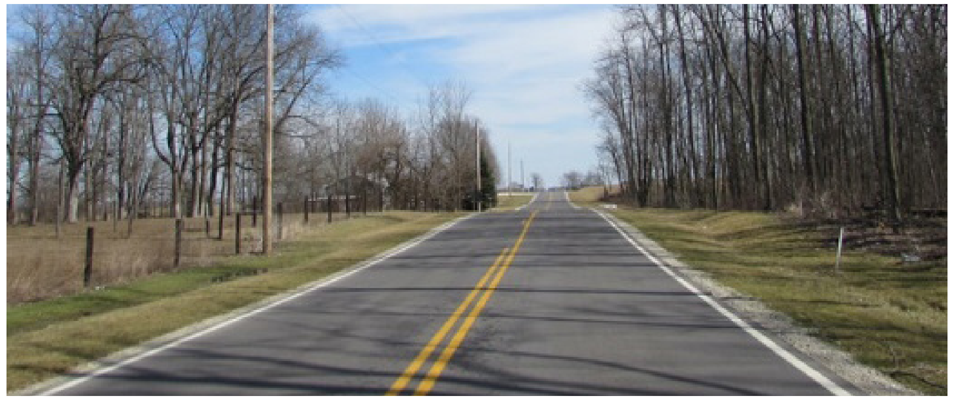
Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

Install edge-lines and centerlines

Any road with a history of run-off-road right, head-on, opposite-direction-side-swipe, or run-off-road-left crashes is a candidate for this treatment -install where the existing lane delineation is not sufficient to assist the motorist in understanding the existing limits of the roadway. Depending on the width of the roadway, various combinations of edge line, and/or center line pavement markings may be the most appropriate.

Crash Type	All
CRF	25%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

ROADWAY SEGMENT COUNTERMEASURES



Install no-passing line

Roadways that have a high percentage of head-on crashes suggesting that many head-on crashes may relate to failed passing maneuvers. No-passing lines should be installed where drivers "passing sight distance" is not available due to horizontal or vertical obstructions.

Crash Type	All
CRF	45%
Expected Life (Years)	10
Systemic Approach Opportunity	Very High

Install centerline rumble strips/stripes

Center Line rumble strips/stripes can be used on virtually any roadway especially those with a history of head-on crashes.

Crash Type	All
CRF	20%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install edge line rumble strips/stripes

Shoulder and edge line milled rumble strips/stripes should be used on roads with a history of roadway departure crashes.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Systemic Approach Opportunity	High

Install bike lanes

Roadway segments noted as having crashes between bicycles and vehicles or crashes that may be preventable with a buffer/shoulder.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	High

ROADWAY SEGMENT COUNTERMEASURES

Install separated bike lanes

Separated bike ways are most appropriate on streets with high volumes of bike traffic and/or high bike-vehicle collisions, presumably in an urban or suburban area. Separation types range from simple, painted buffers and flexible delineators, to more substantial separation measures including raised curbs, grade separation, bollards, planters, and parking lanes.

Crash Type	P & B
CRF	45%
Expected Life (Years)	20
Systemic Approach Opportunity	High

Install sidewalk/pathway (to avoid walking along road-way)

Areas noted as not having adequate or no sidewalks and a history of walking along roadway pedestrian crashes. In rural areas asphalt curbs and/or separated walkways may be appropriate.

Crash Type	P & B
CRF	80%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install/upgrade pedestrian crossing (with enhanced safety features)

Roadway segments with no controlled crossing for a significant distance in high-use midblock crossing areas and/or multilane roads locations. Flashing beacons, curb extensions, medians and pedestrian crossing islands, and/or other safety features should be added to complement the standard crossing elements.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install raised pedestrian crossing

On lower-speed roadways, where pedestrians are known to be crossing roadways that involve significant vehicular traffic.

Crash Type	P & B
CRF	35%
Expected Life (Years)	120
Systemic Approach Opportunity	Medium

ROADWAY SEGMENT COUNTERMEASURES

Install Rectangular Rapid Flashing Beacon (RRFB)

The RRFB includes pedestrian-activated flashing lights and additional signage that enhance the visibility of marked crosswalks and alert motorists to pedestrian crossings. It uses an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs are installed at unsignalized intersections and mid-block pedestrian crossings.

Crash Type	P & B
CRF	35%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

Install animal fencing

At locations with high number of vehicular/animal crashes (reactive) or where there is a known high number of animals crossing due to migratory patterns (proactive).

Crash Type	Animal
CRF	80%
Expected Life (Years)	20
Systemic Approach Opportunity	Medium

ADDITIONAL COUNTERMEASURES

Crosswalk visibility enhancements

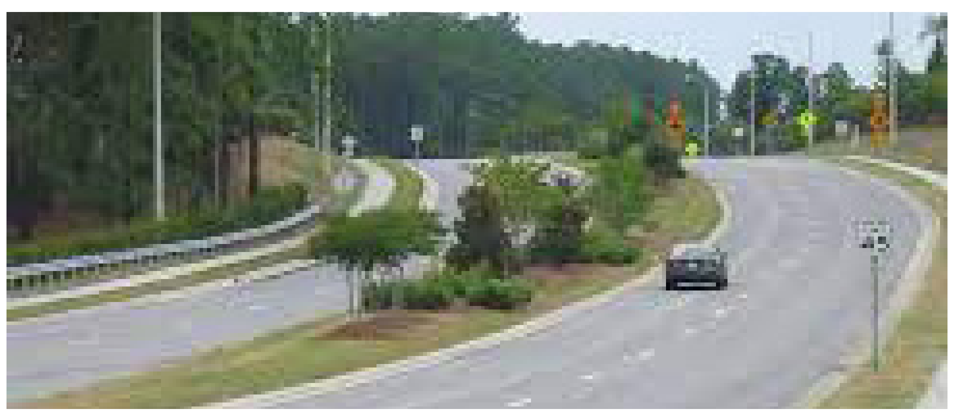
Poor lighting conditions, obstructions such as parked cars, and horizontal or vertical roadway curvature can reduce visibility at crosswalks.

Crash Type	All
CRF	N/A
Expected Life (Years)	N/A
Systemic Approach Opportunity	N/A

Variable Speed Limits

Speed limits are established with an engineering study based on inputs like traffic volumes, operating speeds, roadway characteristics, and crash history. However, conditions on the roadway are susceptible to change in a short amount of time (e.g., congestion, crashes, weather).

Crash Type	All
CRF	N/A
Expected Life (Years)	N/A
Systemic Approach Opportunity	N/A



Corridor access management

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties.

Crash Type	All
CRF	N/A
Expected Life (Years)	N/A
Systemic Approach Opportunity	N/A

SafetyEdge^{SM}

The SafetyEdge^{SM} technology shapes the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process. This safety practice eliminates the potential for vertical drop-off at the pavement edge, has minimal effect on project cost, and can improve pavement durability by reducing edge raveling of asphalt.

Crash Type	All
CRF	N/A
Expected Life (Years)	N/A
Systemic Approach Opportunity	N/A

ADDITIONAL COUNTERMEASURES

Appropriate speed limits for all road users

There is broad consensus among global roadway safety experts that speed control is one of the most important methods for reducing KSI. Speed is an especially important factor on non-limited access roadways where vehicles and vulnerable road users mix.

Crash Type	All
CRF	N/A
Expected Life (Years)	N/A
Systemic Approach Opportunity	N/A

CHAPTER 6

INDIVIDUAL JURISDICTION CHAPTERS & RECOMMENDED SAFETY PROJECTS

CHAPTER 6: INDIVIDUAL JURISDICTION CHAPTERS & RECOMMENDED SAFETY PROJECTS

This chapter provides an overview of individual agency portfolios and their recommended safety planning and design projects. The chapter also includes the necessary background to understand the planning, systemic, and design projects identified for each jurisdiction, and the methodology used to prioritize projects. The Policy and Strategy Recommendation section provides recommendations for additional planning projects for each jurisdiction.

Individual Jurisdiction Chapters (Chapters 6.1 to 6.8) form the core of the CSAP, containing jurisdiction-wide safety analysis and recommendations. Each chapter begins with a brief overview of the jurisdiction, including its population, location, and transportation network. This is followed by an analysis of the total number of collisions, persons injured, and the proportion of collisions by mode of transportation, age, and gender for both city-maintained roads and state-maintained roads (TxDOT facilities) within the city limits. The chapters also compare citywide collision statistics to countywide collision statistics. In-depth examination of the predominant collision types, contributing factors, and other key characteristics observed on city streets and TxDOT facilities are presented as collision profiles, highlighting the most prevalent trends and patterns unique to that jurisdiction. A visual representation of the locations with the highest injury severity, as determined by a collision severity index calculation, is provided in the form of a collision severity heat map to identify the most high-risk areas requiring safety improvements. The chapters then list the roadway segments and intersections with the highest collision severity scores, whose proposed infrastructure enhancements and other mitigation measures are prioritized.

In addition to identifying locations with a history of collisions, this plan also evaluated the systemic nature of crashes in the study area, focusing on trying to understand where crashes are likely to occur in the future rather than where they have occurred in the past. Blending the historic crash network with the systemic crash network, the CSAP identified safety projects for each of the individual jurisdiction chapters and identified them as systemic safety projects, planning safety projects, and design safety projects.

Details on specific safety improvement initiatives or plans the jurisdiction should pursue—such as Active Transportation Plans, Safe Routes to School programs, and neighborhood traffic calming projects—are included. Descriptions of citywide safety programs targeting common collision factors, such as sign and pavement marking upgrades or enhanced street lighting, are presented to address systematic safety issues across the jurisdiction. This consistent format and set of analyses for each city enables cross-jurisdictional comparisons and the identification of regional safety trends and needs, supporting the development of coordinated, data-driven strategies to improve roadway safety throughout the McLennan County.

SAFETY PROJECTS

All the steps undertaken as part of the CSAP have culminated in the identification of safety projects. The CSAP presents three categories of projects, namely planning projects, systemic projects, and design projects.
Collision trends along roadways are the primary factor in the selection of safety improvements. The safety projects have been further refined after careful consideration of characteristics of local roadways, safety risks, needs of communities, and the priorities of City, County, and MPO decision makers.

All safety projects listed in this CSAP indicate a priority need for the jurisdiction to improve roadway safety, regardless of their order of listing. The project selection done as part of the CSAP followed a 2-step process – 1) an initial list of projects was developed based on the safety benefits, benefit to vulnerable road users, school safety impact, equity impact, public inputs, and ease of implementation, and 2) the final list was developed after community input and extensive discussion and deliberations among staff from the respective cities, TJKM, and the Waco MPO. These deliberations included the status of multimodal infrastructure, future plans currently under consideration, and the availability of funding sources.

Planning Projects

Planning projects are projects that require further planning and feasibility studies. While the CSAP relies on historic collision data to identify safety risks and engagement with stakeholders to understand their needs, certain changes require detailed assessments of existing conditions, collaborative engagement with stakeholder groups, and technical plans before they can be implemented. The planning process undertaken in the CSAP is comprehensive in its focus on safety but comes with limitations when parallel criteria need extensive inclusion. For instance, an Active Transportation Plan would require a detailed analysis of existing pedestrian and bicycle connectivity infrastructure, and a neighborhood traffic calming program needs community engagement to identify calming tools that enable all stakeholders, including residents and businesses, to meet their needs for safe mobility.
Planning projects identified within the individual agency chapters were developed with consideration of the analysis and stakeholder engagement undertaken in the CSAP. The Policy and Strategy Recommendation section within this chapter provides high level recommendations for changes which will supplement these projects.

Systemic Projects

Systemic projects are improvements implemented across an entire city or county that focus on a single category of enhancements. These holistic initiatives aim to provide widespread safety benefits when implemented comprehensively.
Two common systemic projects that have been recommended for many jurisdictions as part of the CSAP are:

- **Streetlight Inventory:** This involves reviewing the existing street lighting within the jurisdiction, identifying the need for upgrades or new lighting, and implementation.
- **Sign Inventory:** This project entails reviewing the current signage to ensure compliance with the latest standards, and then determining if additional signs are required or if existing ones need to be upgraded.

These systemic safety projects have been prioritized over design projects for all jurisdictions.

Design Projects

Design projects are location-specific safety initiatives that focus on enhancing the safety of specific corridors and/or intersections. These projects utilize countermeasures identified in Chapter 5 "Safe Streets Toolkit" and are selected to address the unique safety risks of each location, based on collision trends and stakeholder input. The design projects incorporate the recommendations from the FHWA Proven Safety Countermeasures, making them suitable for implementation on all types of roads.

The design project listings in Chapters 6.1 to 6.8 include the following information:

- 10-year collision history by severity, illustrated on a map
- Top collision trends
- Existing conditions photos (for illustration purposes)
- Types of recommended improvements
- Estimated costs of the improvements

While all projects identified in this CSAP address critical safety improvements for the Waco Metropolitan Area, the following prioritization criteria guides the implementation of the location-specific design projects to best meet the safety and related goals outlined in the CSAP.

The CSAP considers six key criteria to score and prioritize the design projects. These are:

- Safety Benefits
- Benefit to Vulnerable Road Users
- School Safety Impact
- Equity Impact
- Public Engagement
- Ease of Implementation

The weighted scores from these six criteria are used to prioritize projects. In cases where projects have the same weighted score, the normalized severity index is used to prioritize them further. The same priority is assigned for corridors with multiple sub-projects, with each sub-project identified using a suffix (A, B, etc.). For projects which include improvements which can be implemented in a staged manner, improvements that will be part of the initial stages and have better ease of implementation are considered. For example, for a street which has striping, sign upgrades, and complete street improvements in its recommendations, complete streets is considered to be a later stage project due to the level-of-effort will entails. The design project prioritization methodology is outlined in the section table that follows.

Appendix G contains the prioritized list of design projects along with a prioritization worksheet for each jurisdiction. The project listing does not impose limitations on any individual agency with respect to the order in which they implement the projects. Jurisdictions have the flexibility to implement projects based on their preferences, as informed by cost, funding availability, and other factors they determine to be critical. Jurisdictions also have the flexibility to implement selected improvements from a project that they deem feasible at a given time. The costs outlined in the CSAP are high-level engineering estimates based on 2024 rates. These costs may vary with time or the unique circumstances of a jurisdiction. **Appendix H** includes detailed cost estimates for each project.

Prioritization Matrix

CRITETRIA	DESCRIPTION	WEIGHT (100%)
Safety Benefits	This evaluates the collision severity risk associated with the project location based on 10-year collision history. To calculate the safety benefit score, a severity index is first determined by weighting each collision - KSI collisions are assigned 3 points, minor injury collisions 2 points, and possible injury collisions 1 point. The severity index is then normalized by dividing it by the length of the project location corridor (intersections are assigned a length of 1). Projects are then grouped into three equal-range buckets based on the normalized severity indexes - the highest bucket receives a safety score of 10, the middle bucket receives a score of 5, and the lowest bucket receives a score of 2.	30%
Benefit to Vulnerable Road Users	Projects that include improvements benefiting pedestrians, bicyclists, transit users, or persons with disabilities receive a score of 10, while projects without such features receive a score of 0.	15%
School Safety Impact	Projects that improve safety on roadways and intersections within 0.25 mile of an existing school receive a score of 10. Projects without such proximity to schools receive a score of 0.	15%
Equity Impact	Projects located fully or partially in, or adjacent to, transportation-disadvantaged census tracts receive a score of 10. All other projects receive a score of 0 for this criteria.	10%
Public Engagement	Projects that have garnered community support through prior planning efforts or the CSAP outreach process receive a score of 10. Projects without documented public engagement receive a score of 0.	10%
Ease of Implementation	Projects are scored based on the complexity of their countermeasures - a score of 10 is given for high-ease improvements like signs, lights, striping, and crosswalks; a score of 5 is given for medium-ease improvements like sidewalks, medians, and new signals; and a score of 2 is given for low-ease improvements requiring lane/geometry changes, right-of-way acquisition, or utility or drainage work. For projects with multiple countermeasures, the lowest category score is applied.	20%

POLICY & PROCESS RECOMMENDATIONS

This section provides high-level policy and process recommendations to update existing policies and processes within each jurisdiction, complementing the design projects to ensure comprehensive safety. These recommendations consider the current efforts detailed in Chapter 3. Each recommendation includes a brief description, followed by a matrix indicating the jurisdictions to which it applies. The City-specific sections provide justifications for the recommended policies.

Corridor Planning

A collaborative process that looks at existing land use and transportation conditions along a roadway corridor and explores opportunities for improvements to meet long-term needs. The process includes discussions of existing and projected travel patterns and social, environmental, and economic issues within the corridor. It requires analysis of potential infrastructure improvements as well as land use and system-management actions. A corridor plan defines a comprehensive package of recommendations for managing and improving the transportation facilities and services within and along a specific corridor, typically based on a medium- to long-term planning horizon. Recommendations may include a mix of strategies and improvements and may relate to multiple travel modes.

Uniform School Speed Limit

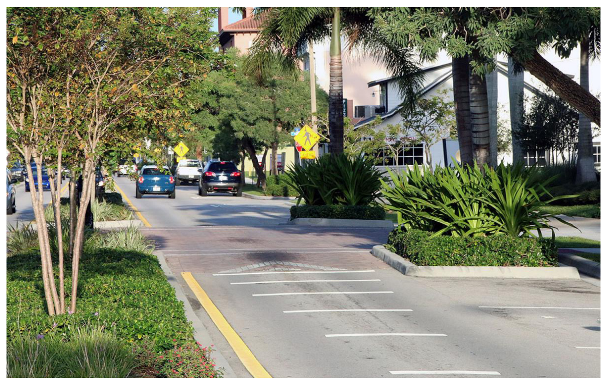
A school zone speed limit puts in place a lower speed limit on a street near a school to ensure the safety of children, who lack the capacity to adequately judge speeds and distances of fast-moving automobiles. This limit is operational during specific hours of the day, or when children are present. However, a higher school zone speed limit, such as 30 mph, or variability in school zone speed limits within a metropolitan area poses a safety risk. Adequately determined and uniform school zone speed limit within a metropolitan area brings uniformity and consistency in the expectations of drivers and thereby improves safety.

Transit-Oriented Development

Transit-Oriented Development (TOD) promotes sustainable development that has the potential to reduce vehicle miles traveled by providing safe multimodal mobility access. Local jurisdictions, transit agencies, and MPOs lead planning processes and develop design guidelines focusing on existing or planned transit station areas. These processes often involve education and outreach on TOD principles, detailed or conceptual station area planning, market assessment, development and adoption of overlay districts or other zoning changes to facilitate transit-supportive development, and application of other tools and incentives.

Access Management

State and local agencies can improve traffic flow and safety by controlling access to properties along major roadways. Access management principles include restricting uncontrolled driveway access onto major arterials, restricting left turns, providing internal connectivity among properties, and providing adequate length on connecting streets to avoid traffic conflicts. Different levels of access management can be applied based on street classifications and/or area land use designations, to ensure that the principles applied are both consistent with the function of the transportation facility and respect the character of the land uses and neighborhood served.



Complete Street and Context Sensitive Street Design

Complete Streets is an approach to transportation planning and design that considers all transportation users (bicyclists, pedestrians, transit vehicles, motor vehicles, etc.) in every stage of project development. Rather than a design prescription, Complete Streets policies change practice. They direct planners and engineers to consider all anticipated users of the right-of-way during everyday decision-making. To date, more than 25 states (and Puerto Rico and the District of Columbia) and over 600 regional and local jurisdictions have adopted Complete Streets policies. In many cases, public health organizations and departments support these policies, which can improve the health and safety of a community by encouraging active transportation, reducing emissions from automobile traffic, and reducing injuries and fatalities from collisions.

Transportation Demand Management

Transportation Demand Management (TDM) is a term that encompasses a broad set of strategies intended to reduce or diffuse travel demand among modes, time, or routes within a regional or local transportation system. By providing choices and incentives for travelers to diversify their travel mode or behavior, TDM strategies relieve disproportionate pressures on segments of a transportation system. Land use patterns can serve as either a source of or a solution to transportation demand. Land use is often incorporated into TDM strategies through the consideration of infrastructure planning, management, and development. TDM strategies that influence land use decisions - such as development incentives, zoning regulations, and alternative transportation programs ranging from carpooling to transit access - are most effective when used in concert with other TDM strategies.

Multimodal Street Planning

State Departments of Transportation (DOT) and MPOs provide technical assistance to county and city governments to develop and implement pedestrian and bicycle facility improvement plans. This assistance can include guidelines, strategies, or primers on land use and site design to support pedestrian, bicycle, and transit access, especially in denser urban environments. In 2010, the USDOT signed a Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations, which notes that all transportation agencies have the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems.

POLICY & STRATEGIES RECOMMENDATION MATRIX

POLICY	WACO MPO	BELLMEAD	HEWITT	LACY LAKEVIEW	MCGREGOR	ROBINSON	WACO	WOODWAY	MCLENNAN COUNTY
Corridor Planning	●		●			●			
Uniform School Speed Limit	●	●	●	●	●	●	●	●	●
Transit-Oriented Development	●						●		
Access Management Policy	●	●	●			●			
Complete Streets Policy	●	●		●	●				
Transportation Demand Management	●								
Multimodal Street Planning		●		●	●	●		●	●

JURISDICTION SPECIFIC POLICIES & STRATEGIES

Bellmead

Existing policies and plans in Bellmead, including the 2023 Comprehensive Plan, designate a high preference for a strong multimodal network that empowers pedestrians and bicyclists to access schools, parks, and businesses. The safety projects listed in the Bellmead chapter follow the direction of these plans and propose multimodal improvements within the central business district and around schools. In addition to undertaking these standalone projects, the City can put forward a commitment to implement these changes on neighboring streets with similar characteristics to maintain uniformity. The City should consider adopting context sensitive thoroughfare design standards that support multimodal uses which are also recommended in its comprehensive plan. A Complete Streets policy would support this action. Bellmead should systematically approach access management along major thoroughfares, including Bellmead Drive/US-84, through both safety projects identified in this CSAP and by adopting appropriate processes during project planning approval.

Hewitt

The City of Hewitt should adopt policies that will support a safe multimodal transportation network and expand the community's vision for roadways beyond the existing auto-centric thoroughfare goals in the Hewitt Comprehensive Plan. The planning projects identified in this CSAP provide options for the City to consider a multimodal network as an integral part of its roadways. The City can also consider policies to identify characteristics and goals for segments of Hewitt Drive that better serve the needs and demands of businesses, residents and roadway users. Currently classified as a major or minor arterial, there is potential for Hewitt Drive to serve as a business and pedestrian-friendly street, especially along the northern part of the corridor. The City would benefit from policies for shared driveway access onto Hewitt Drive with appropriate controls to ensure safety along the corridor. The CSAP presents the potential for Complete Streets along this corridor. The City should also consider a development management and urban design plan along the corridor to achieve these goals.

Lacy Lakeview

The City of Lacy Lakeview has yet to define policies and guidelines that support the development of a well-connected, high-quality multimodal streetway network. The City must strongly consider thoroughfare planning to define roadway classifications and supporting characteristics that support the present and future needs of its residents. Such a plan would provide the scope to define and develop multimodal infrastructure including sidewalks and bike lanes, which is lacking at present. In particular, the City can consider adoption of a complete streets policy along the US Business 77/New Dallas Road to ensure that the needs of all users of this roadway segment are met.

McGregor

The CSAP identifies specific planning and policy recommendations that can improve overall safety in the City of McGregor. The City's current framework of Vision 2030, while comprehensive in its recommendation to improve sections of local roadways to meet the City's anticipated needs, has limitations regarding the upgrading of its street network to ensure safety for all users. The current lack of multimodal facilities requires that the City undertake systematic and focused planning efforts. The four planning projects listed in Chapter 6.4 would expand the City's capacity to meet these needs by providing a conducive policy framework. A Complete Streets policy can provide a framework to improve and support safety throughout the City.

Robinson

Planning projects listed for the City of Robinson in this CSAP identify programs and policies that improve roadway safety. The City should consider policies to acquire right-of-way along Old Robinson Road, a key corridor connecting schools, and an access management standard that governs new developments along arterial roads such as Robinson Drive/US-77. Safety enhancing strategies such as shared driveways and driveway spacing work alongside projects identified in this CSAP to create safe roadways in Robinson. The City can consider strategies to encourage the development of a safe multimodal network after studying the potential for a pedestrian and bicycle network.

Waco

The City of Waco undertakes regular planning and corridor studies to identify improvement opportunities along major corridors and destinations. These studies, including the Downtown Implementation Plan, have been reviewed in Chapter 3. The City can enhance its roadway safety commitments by exploring policies, including those for TOD, with safe multimodal connectivity and a uniform school speed limit in coordination with the larger metropolitan region.

Woodway

The City of Woodway can improve safety on its roadways through planning centered on safety within neighborhoods for all users. This provides a chance for the City to review its thoroughfare plan with respect to the latest standards in roadway design, including context sensitive street design. Woodway should consider policies that improve internal connectivity on its residential roadways to promote modal shift to sustainable modes such as walking and biking.

Unincorporated McLennan County

McLennan County should consider adopting policies related to school zone speed limits in conjunction with the Waco MPO. This process can be supplemented by a Safe Routes to School program. The County should consider a multimodal policy that recommends adequate pedestrian infrastructure and connectivity within unincorporated towns and areas.

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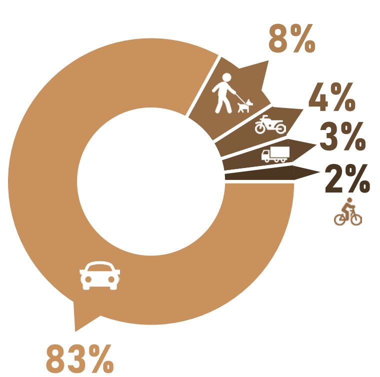
CHAPTER 6.1: CITY OF BELLMEAD

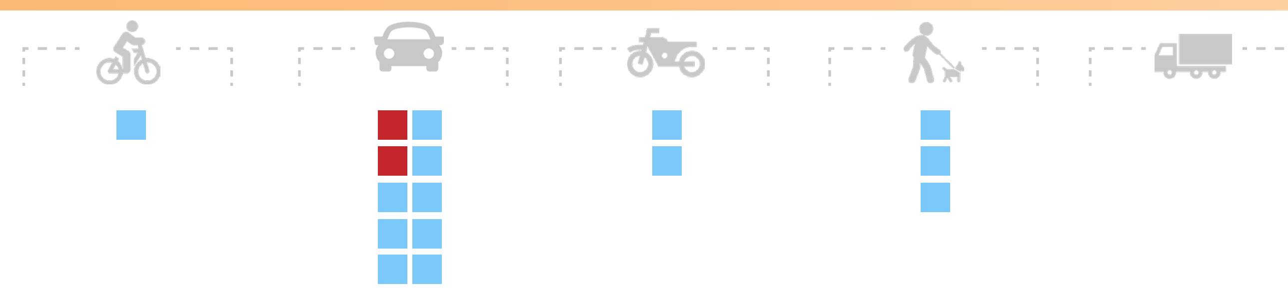
INTRODUCTION

The City of Bellmead is on SH-31, two miles northeast of Waco in east central McLennan County. The city has an estimated population of 10,494 according to the 2020 census. This chapter provides information on the City of Bellmead's collision statistics from 2014 to 2023. A total of 160 collisions occurred on Bellmead streets in the last 10 years, including two fatalities and 14 serious injuries. TxDOT roadways within Bellmead city limits observed 811 collisions during the same period, with 26 fatal injuries and 58 serious injuries. The majority of injury collisions in both City and TxDOT rights-of-way resulted into possible injuries, with 50 percent in City right-of-way and approximately 58 percent in TxDOT right-of-way.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**160**	**100 %**	**811**	**100 %**
Fatal Injury	2	1.25 %	26	3.21 %
Serious Injury	14	8.75 %	58	7.15 %
Minor Injury	64	40.00 %	253	31.20 %
Possible Injury	80	50.00 %	474	58.45 %
Total Persons Involved	**216**	**100 %**	**1175**	**100 %**
Fatal Injury	2	0.93 %	27	2.30 %
Serious Injury	16	7.41 %	66	5.62 %
Minor Injury	80	37.04 %	367	31.23 %
Possible Injury	118	54.63 %	715	60.85 %

COLLISIONS BY MODE - CITY

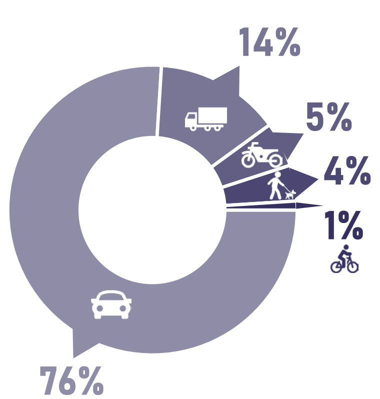


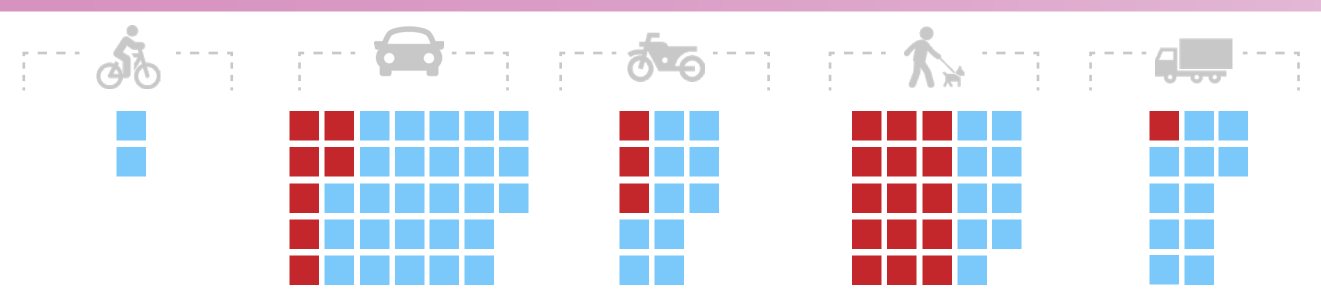


Note : Each box represents one fatal or severe injury collision.

0 %	2 %	0 %	0 %	0 %	Fatal Injury
25 %	6 %	33 %	25 %	0 %	Serious Injury
50 %	38 %	67 %	58 %	20 %	Minor Injury
25 %	55 %	0 %	17 %	80 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

0 %	1 %	8 %	48 %	1 %	Fatal Injury
22 %	4 %	25 %	29 %	9 %	Serious Injury
44 %	32 %	43 %	10 %	28 %	Minor Injury
33 %	63 %	25 %	13 %	61 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on Bellmead's city streets, TxDOT facilities, and McLennan County across various categories.

On Bellmead city streets, there were a total of 160 collisions, resulting in 216 persons injured. In comparison, TxDOT reported a total of 811 collisions, resulting in 1,175 persons injured within Bellmead city limits.

This section also identifies several major collision trends on Bellmead city streets, including hit object collisions, broadside collisions due to distracted driving, and right-of-way violations by automobiles. On TxDOT roadways, the prominent trends were rear end collisions, broadside collisions, unsafe speed violations, and collisions due to distracted driving. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. The charts indicate that roads with a 40 mph speed limit accounted for the highest proportion of KSI collisions out of the speed limits examined.

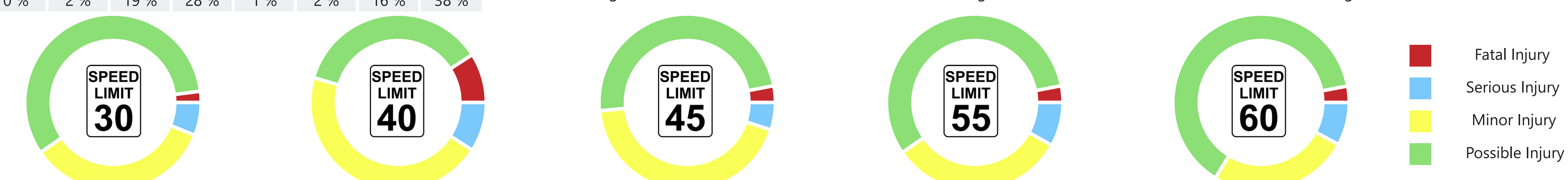
CITY	TxDOT
160	811
TOTAL COLLISIONS	TOTAL COLLISIONS
216	1175
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED								
	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	1 %	0 %	0 %	0 %	0 %	0 %
Car	1 %	5 %	30 %	52 %	1 %	4 %	28 %	57 %
Motorcycle	0 %	1 %	2 %	0 %	0 %	1 %	1 %	1 %
Pedestrian	0 %	1 %	3 %	1 %	1 %	1 %	0 %	0 %
Truck	0 %	0 %	1 %	0 %	0 %	0 %	1 %	2 %
AGE								
Below 15	0 %	0 %	4 %	2 %	0 %	0 %	2 %	6 %
15 - 65	1 %	6 %	28 %	44 %	2 %	5 %	26 %	48 %
Above 65	0 %	1 %	5 %	8 %	1 %	1 %	3 %	6 %
GENDER								
Male	0 %	6 %	19 %	26 %	2 %	4 %	15 %	23 %
Female	0 %	2 %	19 %	28 %	1 %	2 %	16 %	38 %

CITY OF BELLMEAD VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

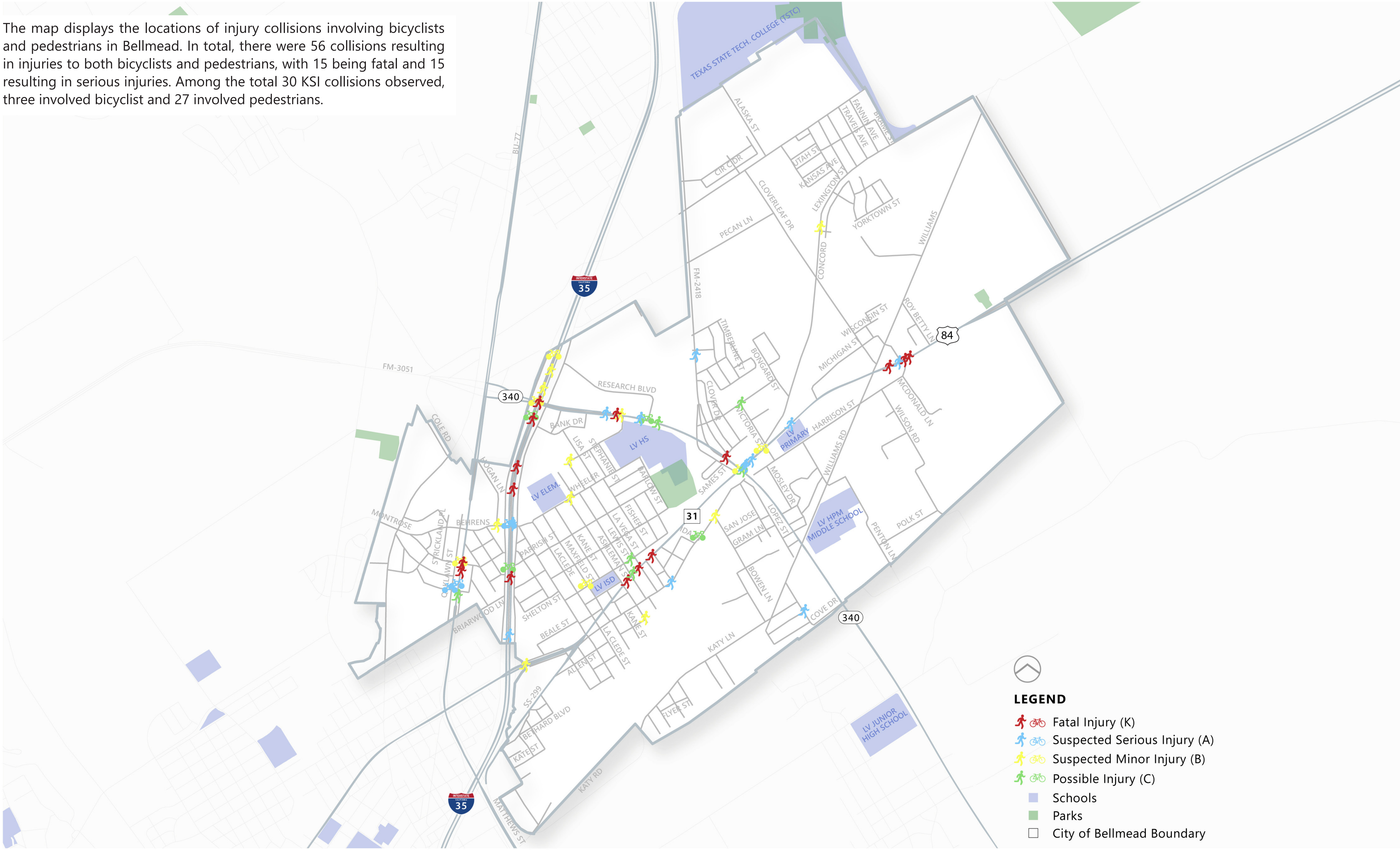
CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	3 %	Bicycle	1 %	Bicycle	1 %
Car	83 %	Car	76 %	Car	85 %
Motorcycle	4 %	Motorcycle	5 %	Motorcycle	4 %
Pedestrian	8 %	Pedestrian	4 %	Pedestrian	3 %
Truck	3 %	Truck	14 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	55 %	Motor Vehicle in Transport	85 %	Motor Vehicle in Transport	72 %
Fixed Object	28 %	Fixed Object	7 %	Fixed Object	17 %
Pedestrian	8 %	Pedestrian	4 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	45 %	Rear End	41 %	Broadside	42 %
Broadside	42 %	Broadside	35 %	Hit Object	28 %
Rear End	6 %	Hit Object	15 %	Rear End	24 %
Head-On	5 %	Sideswipe	7 %	Sideswipe	5 %
VIOLATION CATEGORY					
Distracted Driving	20 %	Unsafe Speed	25 %	Unsafe Speed	23 %
Automobile Right-of-Way	19 %	Distracted Driving	19 %	Automobile Right-of-Way	22 %
Unsafe Speed	11 %	Automobile Right-of-Way	15 %	Traffic Signals and Signs	12 %
Traffic Signals and Signs	11 %	Traffic Signals and Signs	10 %	Distracted Driving	8 %
Other Unforeseen Reasons	10 %	Following Too Closely	6 %	Other Improper Driving	6 %
Driving/ Bicycling under Influence	6 %	Other Unforeseen Reasons	5 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	58 %	Intersection	57 %	Intersection	59 %
Roadway	43 %	Roadway	43 %	Roadway	41 %
LIGHTING					
Daylight	72 %	Daylight	75 %	Daylight	70 %
Dark, Lighted	13 %	Dark, Lighted	14 %	Dark, Lighted	16 %
Dark, Not Lighted	12 %	Dark, Not Lighted	8 %	Dark, Not Lighted	11 %

SPEED LIMIT



BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

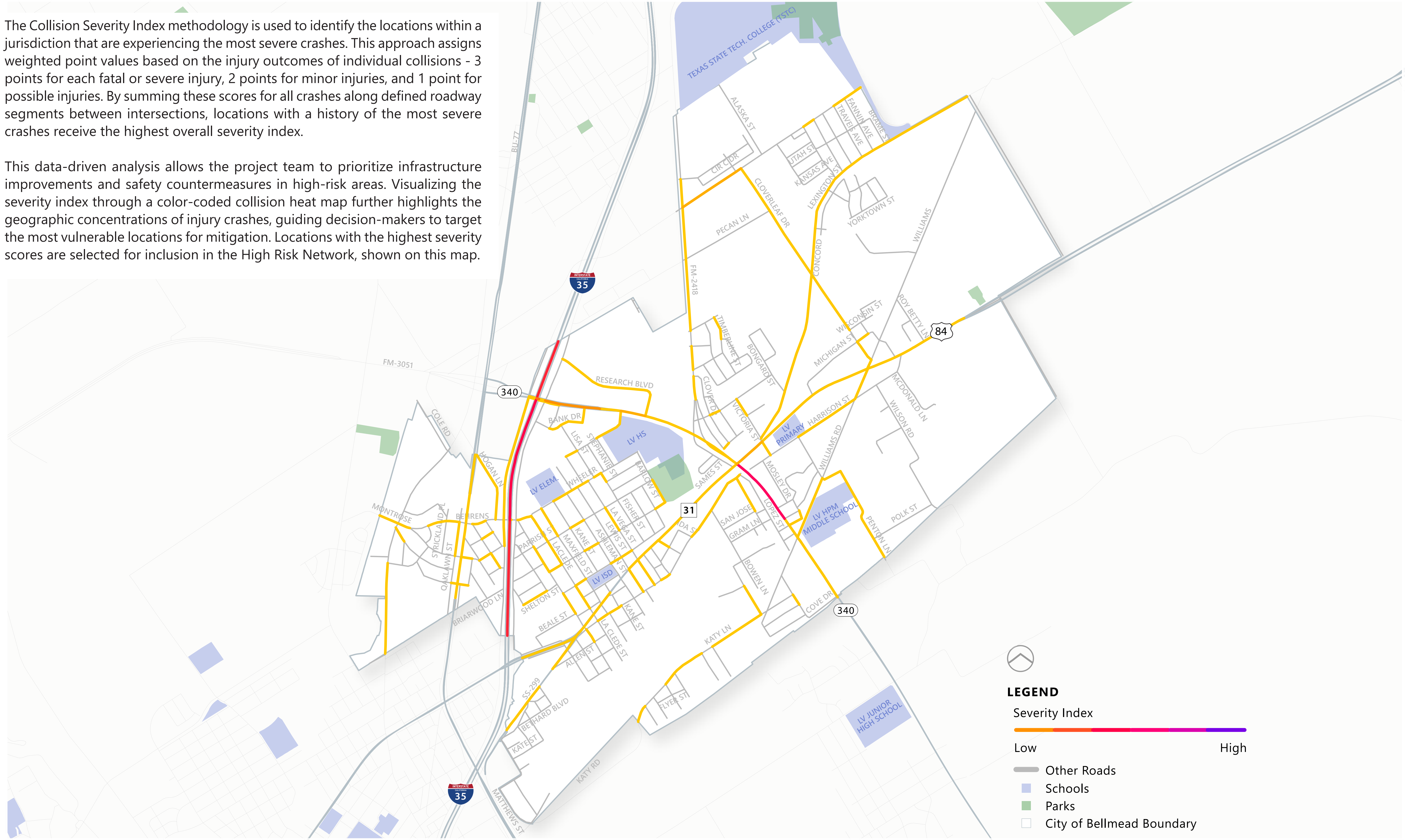
The map displays the locations of injury collisions involving bicyclists and pedestrians in Bellmead. In total, there were 56 collisions resulting in injuries to both bicyclists and pedestrians, with 15 being fatal and 15 resulting in serious injuries. Among the total 30 KSI collisions observed, three involved bicyclist and 27 involved pedestrians.



SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

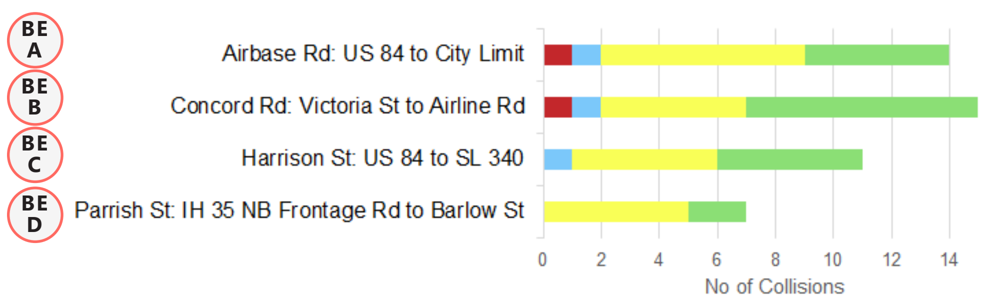
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



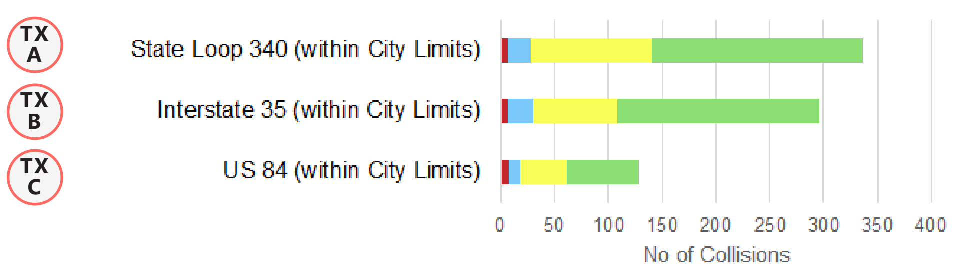
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within Bellmead city limits. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

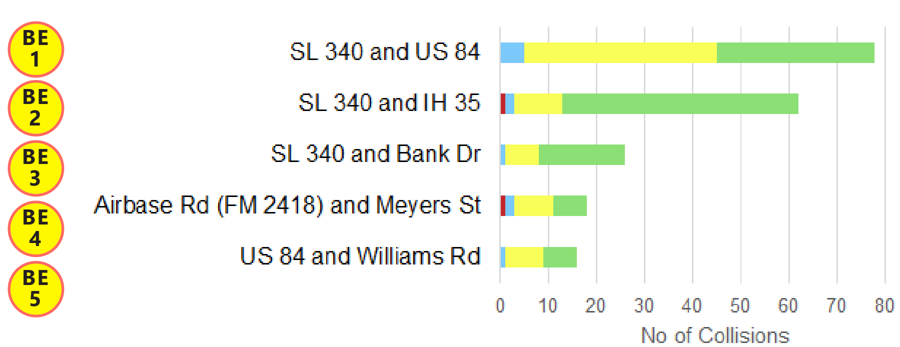
ROADWAYS



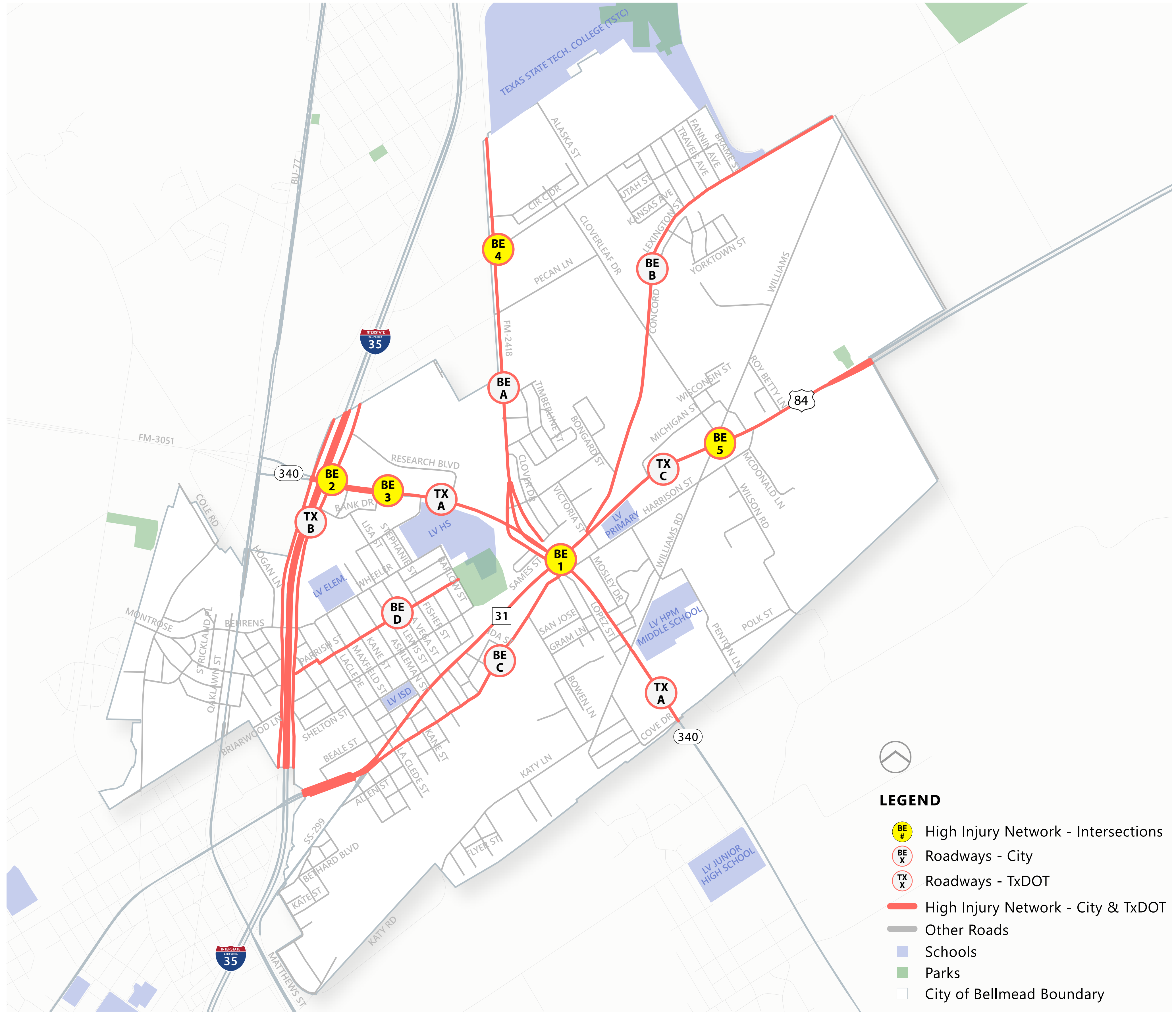
TxDOT ROADWAYS



INTERSECTIONS

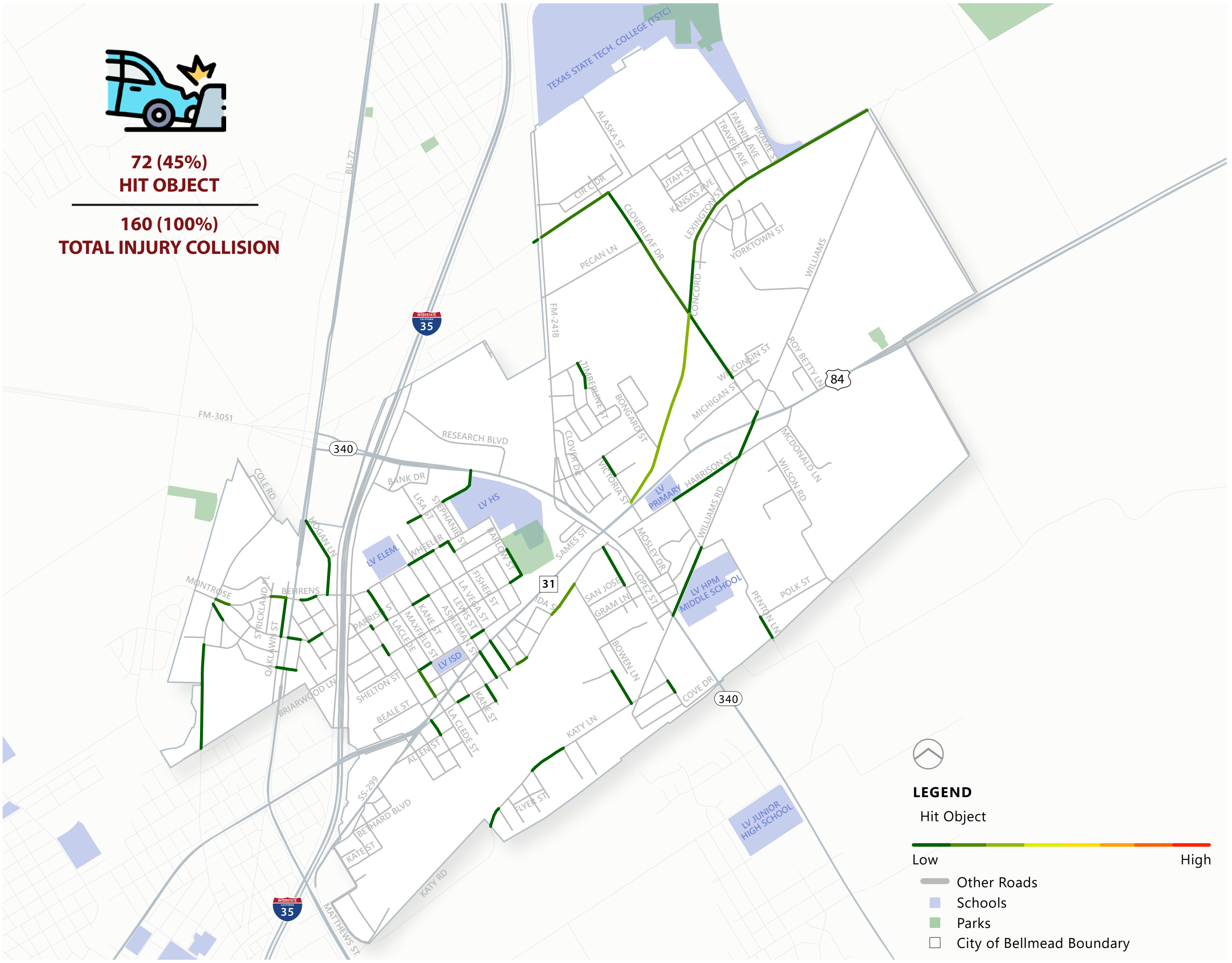


FATAL INJURY SERIOUS INJURY MINOR INJURY POSSIBLE INJURY



PROFILES - CITY

PROFILE 1 - HIT OBJECT



SEVERITY

3 %
13 %
41 %
43 %

LOCATION

28 %
72 %

LIGHTING

60 %
7 %
15 %
18 %

72 COLLISIONS

BY MODE

69 % CAR
17 % PEDESTRIAN

CONTRIBUTING FACTOR

22 % DISTRACTED DRIVING
21 % UNSAFE SPEED
15 % OTHER UNFORESEEN REASONS
10 % DRIVING UNDER INFLUENCE
8 % OTHER IMPROPER DRIVING

HARMFUL EVENT

61 % FIXED OBJECT
17 % PEDESTRIAN

0 % 25 % 50 % 75 % 100 %

PROFILE 2 - BROADSIDE

SEVERITY

0 %
6 %
40 %
54 %

LOCATION

97 %
3 %

LIGHTING

88 %
1 %
9 %
2 %

67 COLLISIONS

BY MODE

94 % CAR

CONTRIBUTING FACTOR

42 % AUTOMOBILE RIGHT-OF-WAY
25 % TRAFFIC SIGNALS AND SIGNS
15 % DISTRACTED DRIVING

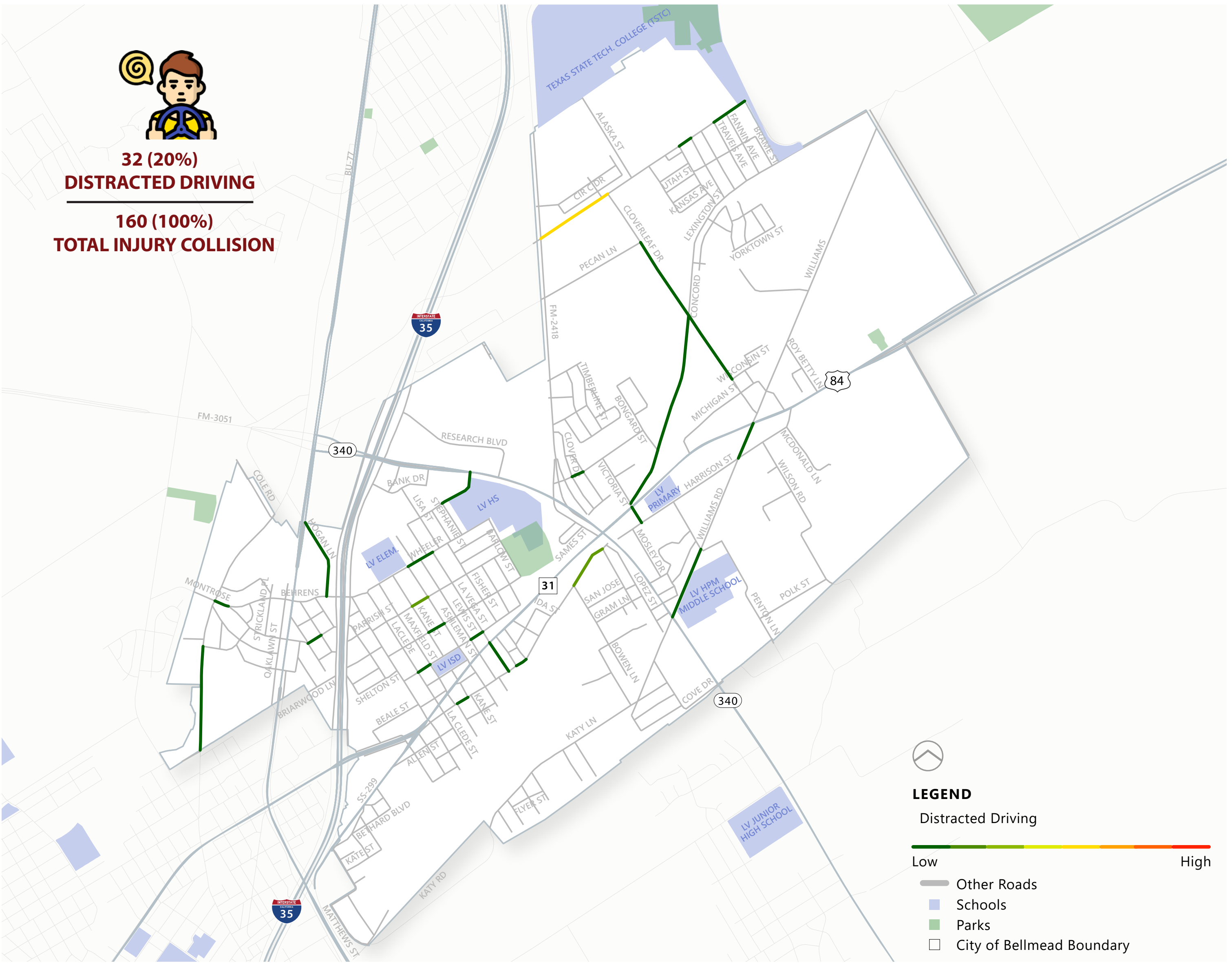
HARMFUL EVENT

100 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILES - CITY

PROFILE 3 - DISTRACTED DRIVING



SEVERITY

0 % | 0 %

44 % | 56 %

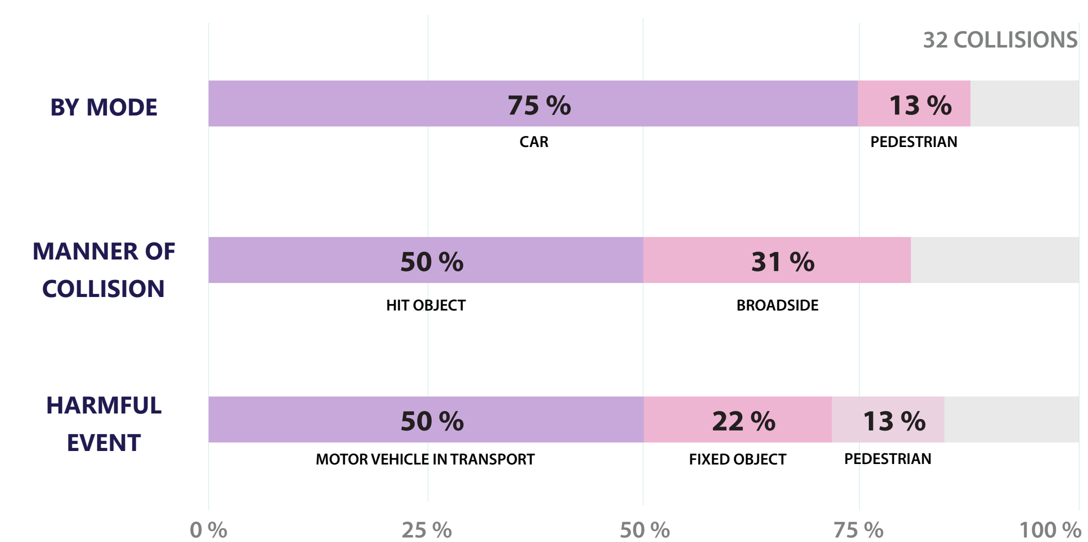
LOCATION

50 % | 50 %

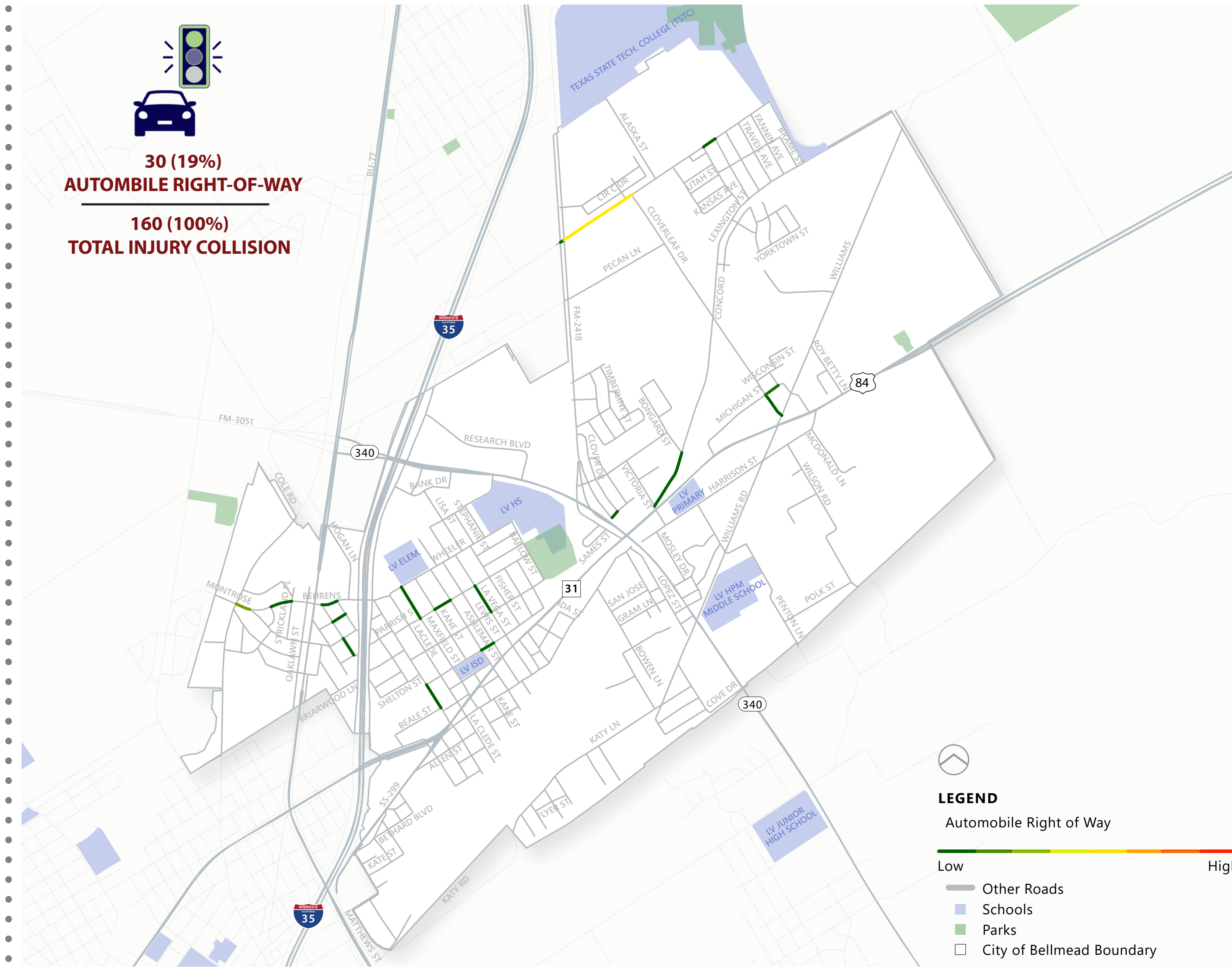
LIGHTING

88 % | 0 %

6 % | 6 %



PROFILE 4 - AUTOMOBILE RIGHT-OF-WAY



SEVERITY

0 % | 10 %

47 % | 43 %

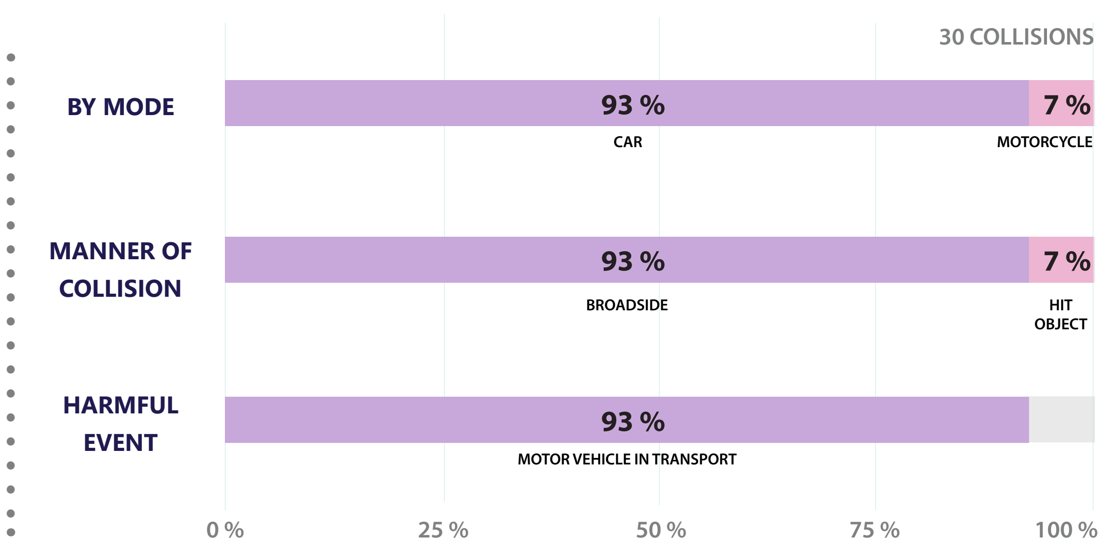
LOCATION

100 % | 0 %

LIGHTING

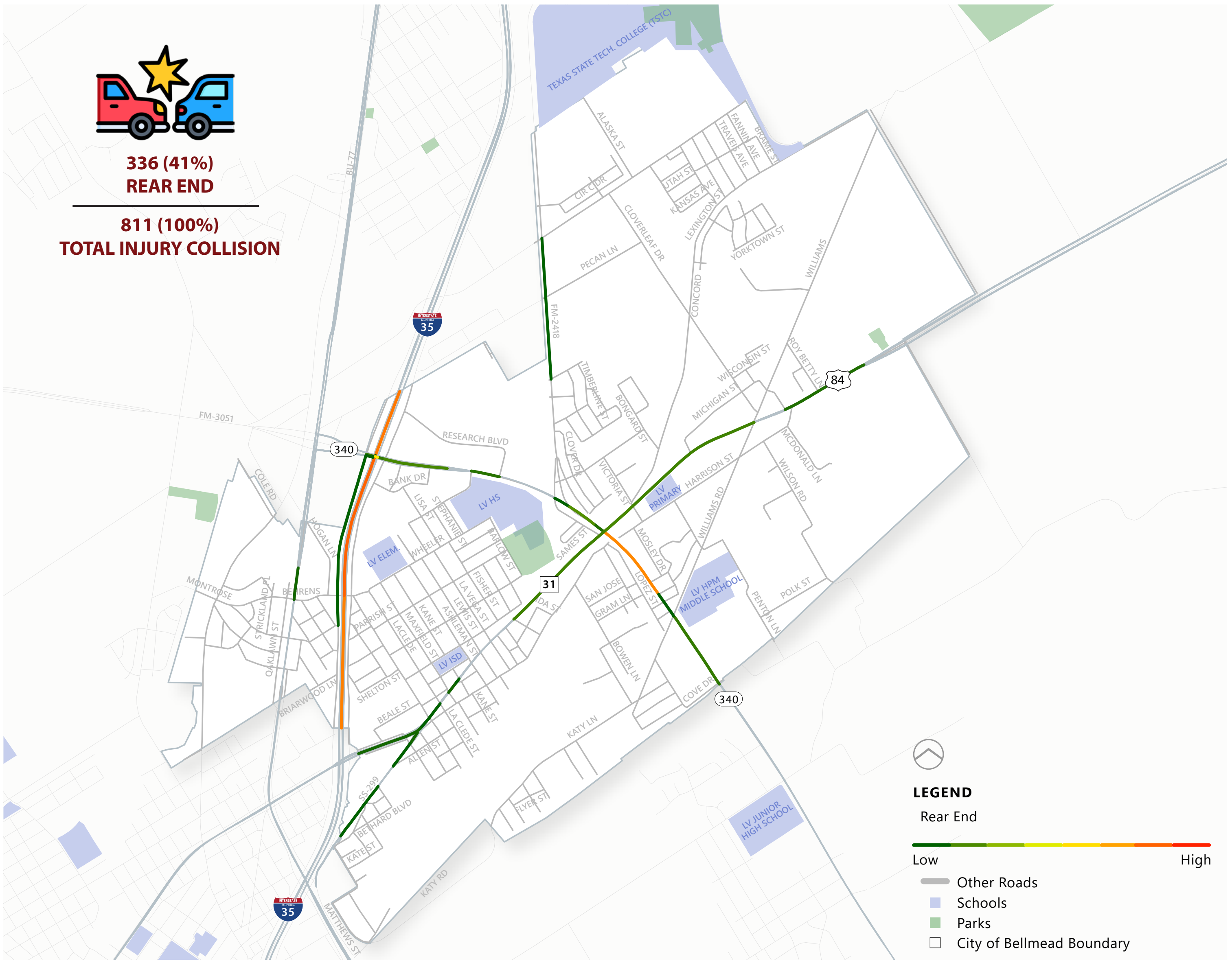
93 % | 4 %

3 % | 0 %



PROFILES - TXDOT

PROFILE 1 - REAR END



SEVERITY

- 1 %
- 5 %
- 28 %
- 66 %

LOCATION

- 43 %
- 57 %

LIGHTING

- 81 %
- 2 %
- 12 %
- 5 %

336 COLLISIONS

BY MODE	82 % CAR		
CONTRIBUTING FACTOR	48 % UNSAFE SPEED	30 % DISTRACTED DRIVING	
HARMFUL EVENT	100 % MOTOR VEHICLE IN TRANSPORT		

0 % 25 % 50 % 75 % 100 %

PROFILE 2 - BROADSIDE

SEVERITY

- 1 %
- 5 %
- 36 %
- 58 %

LOCATION

- 95 %
- 5 %

LIGHTING

- 77 %
- 3 %
- 14 %
- 6 %

284 COLLISIONS

BY MODE	82 % CAR		
CONTRIBUTING FACTOR	40 % AUTOMOBILE RIGHT-OF-WAY	28 % TRAFFIC SIGNALS AND SIGNS	15 % DISTRACTED DRIVING
HARMFUL EVENT	100 % MOTOR VEHICLE IN TRANSPORT		

0 % 25 % 50 % 75 % 100 %

PROFILES - TXDOT

PROFILE 3 - UNSAFE SPEED

SEVERITY

2 % | 5 %

32 % | 61 %

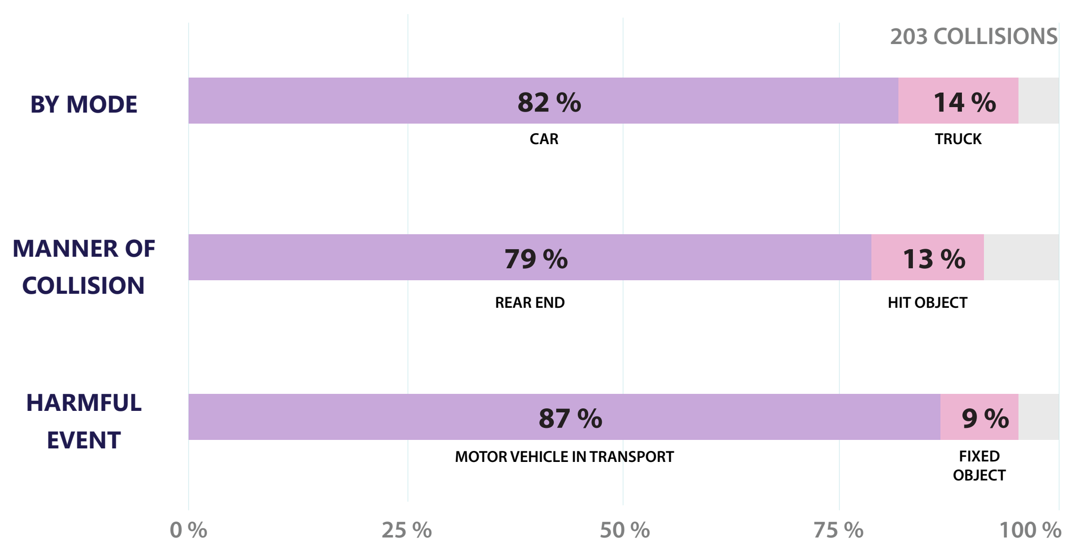
LOCATION

27 % | 73 %

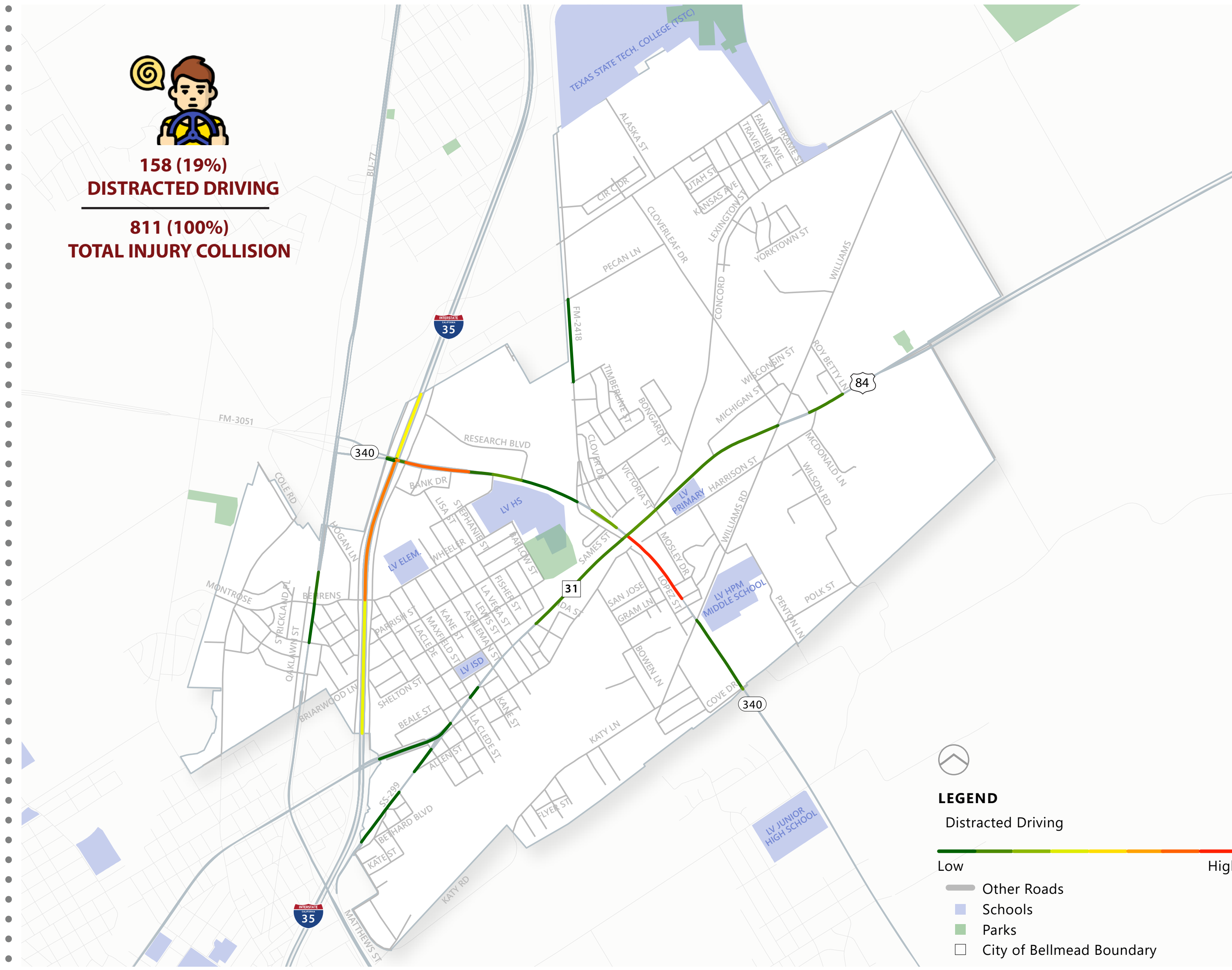
LIGHTING

81 % | 5 %

9 % | 5 %



PROFILE 4 - DISTRACTED DRIVING



SEVERITY

0 % | 6 %

24 % | 70 %

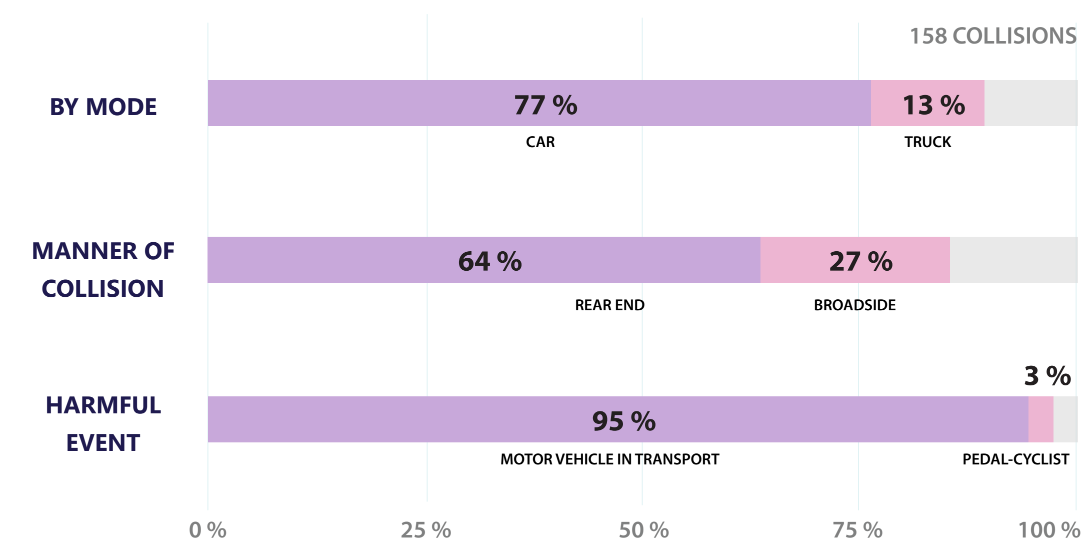
LOCATION

77 % | 23 %

LIGHTING

78 % | 1 %

15 % | 6 %

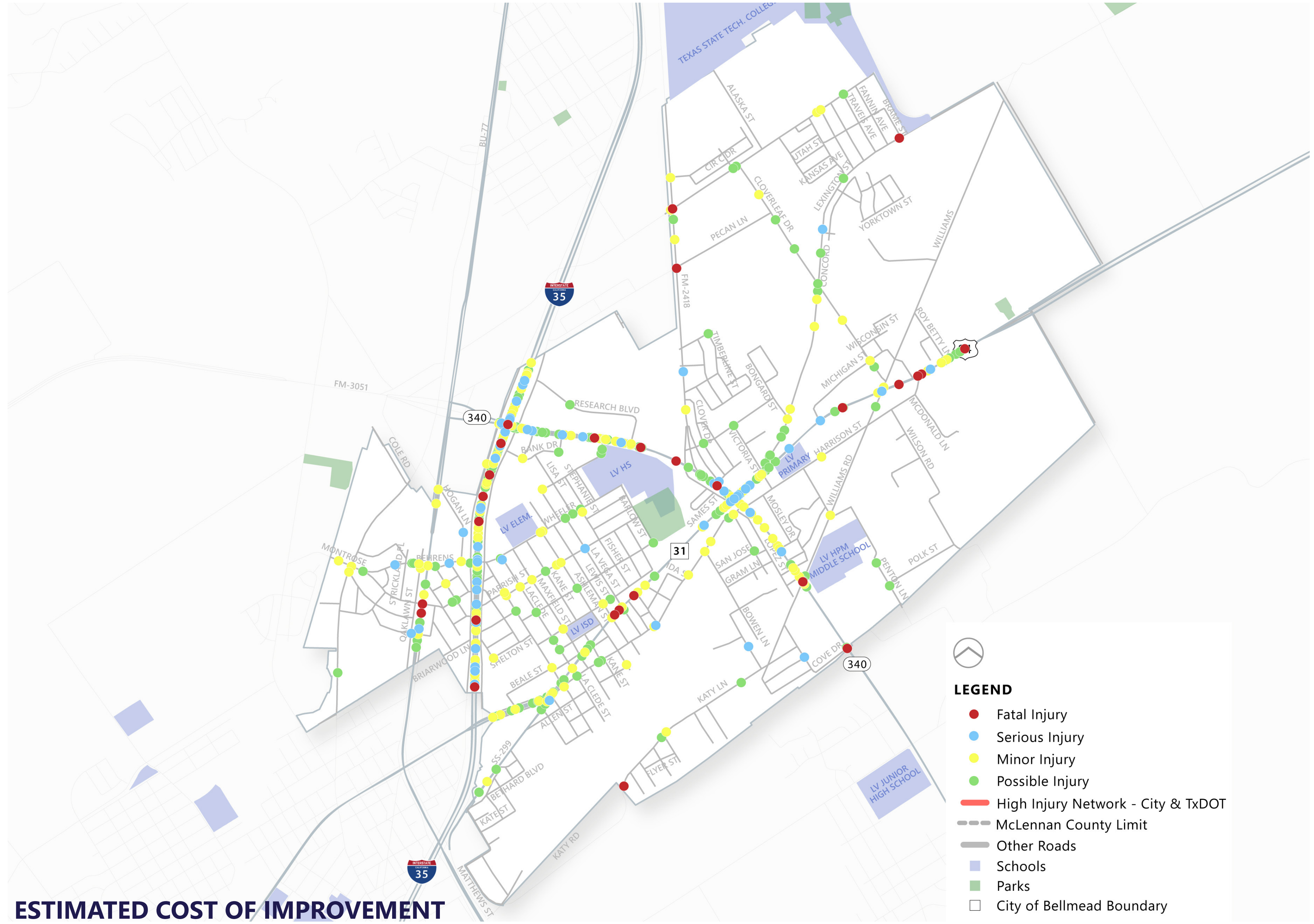


BASIC THOROUGHFARE PLANNING

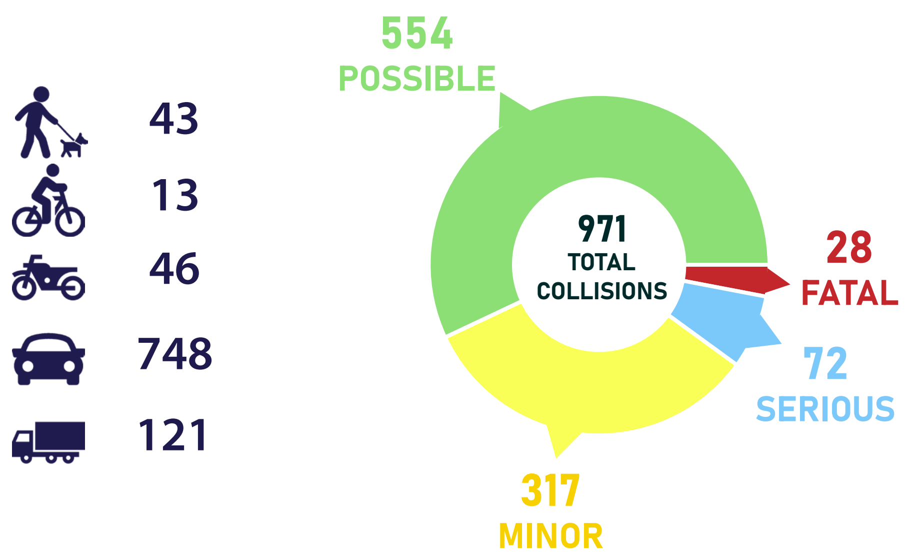
The City of Bellmead should consider undertaking a Basic Thoroughfare Planning process to comprehensively evaluate its existing transportation network and identify strategic improvements. With Bellmead's growing population and economic activity, a thorough assessment of the city's major roads, intersections, and mobility patterns is crucial for addressing current challenges and planning for future needs. The thoroughfare planning effort could involve analyzing traffic volumes, crash data, multimodal access, pavement conditions, and other key metrics to develop a data-driven plan for optimizing the efficiency, safety, and connectivity of Bellmead's thoroughfare system. This planning initiative could provide the roadmap for targeted projects to upgrade major corridors, enhance intersection operations, expand bicycle/pedestrian facilities, and ensure the transportation network keeps pace with the community's development. Investing in this comprehensive transportation planning would position Bellmead to proactively manage its growing mobility demands and foster a safe, accessible, and sustainable thoroughfare network.

PROJECT 1: CITYWIDE SIGN INVENTORY & PAVEMENT DELINEATION

The City of Bellmead is proposing a Citywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the city.



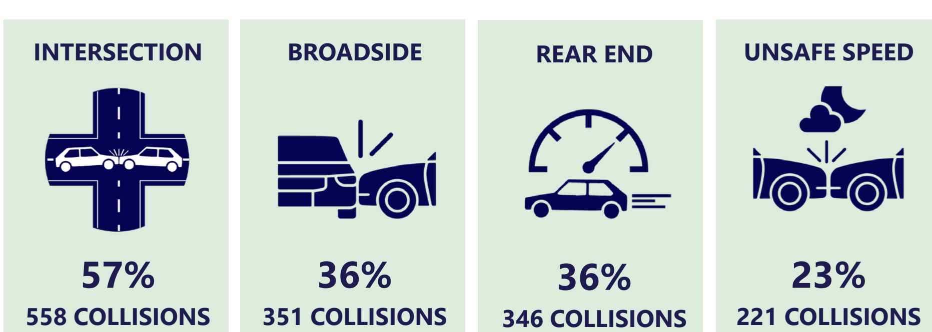
INJURY COLLISION STATISTICS



ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Citywide Sign Inventory, Replacement & Installation	Citywide	$782,200
	Citywide Pavement Delineation	Citywide	$2,777,800
		CONTINGENCY COST	$712,000
		ENGINEERING COST	$1,068,000
		TOTAL COST	**$5,340,000**

TRENDS



PROJECT 2: CITYWIDE STREET LIGHT INVENTORY

The City of Bellmead is proposing a Citywide Streetlight Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the city to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating Bellmead's streets during the nighttime hours.

Note : Nighttime Injury Collisions

NIGHTTIME INJURY COLLISION STATISTICS

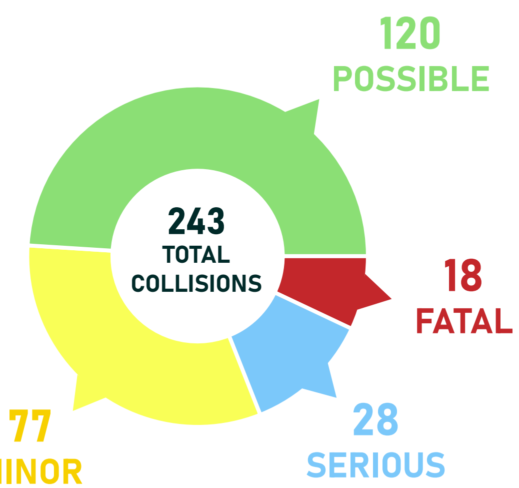
26

4

12

174

27



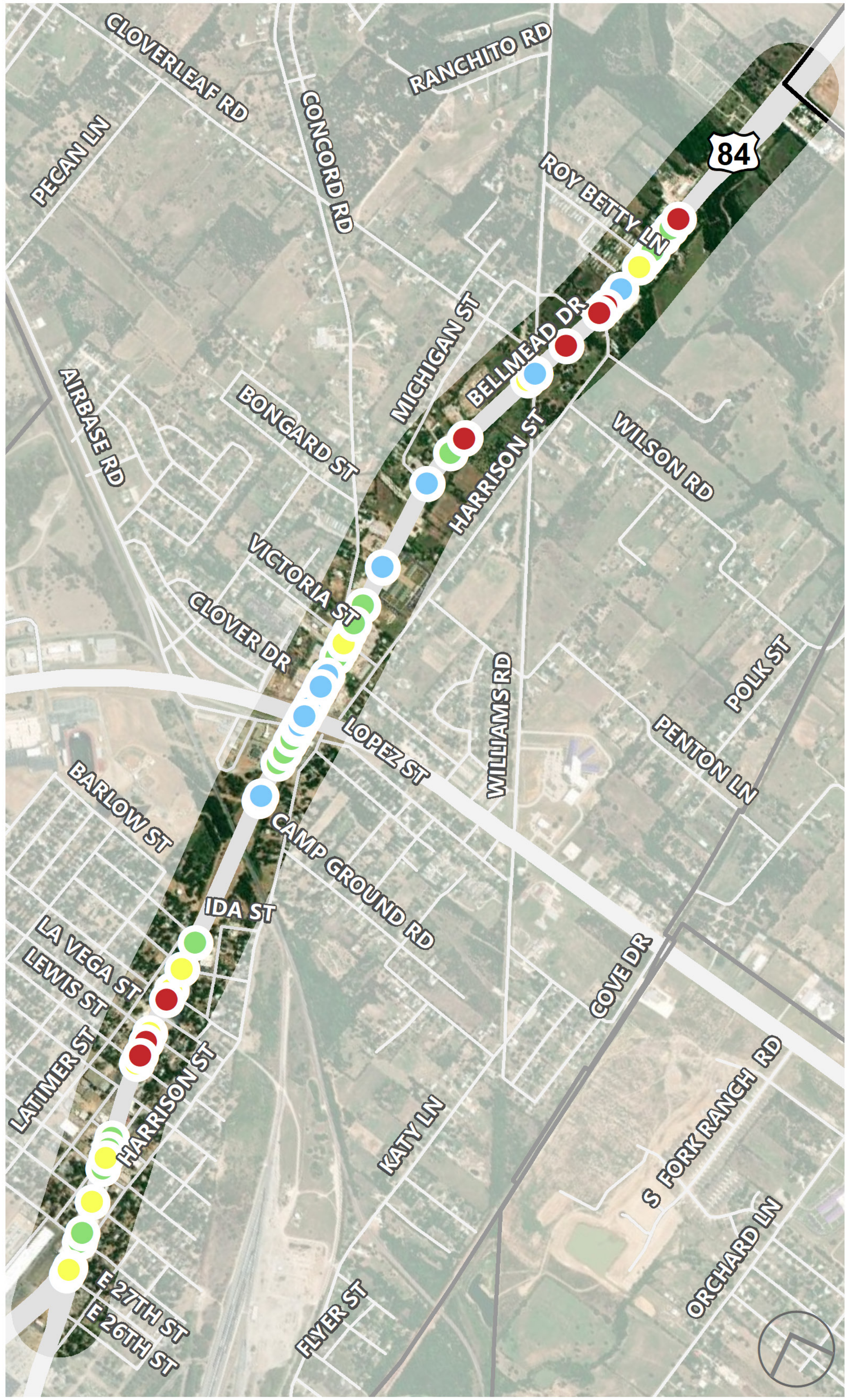
TRENDS

INTERSECTION	HIT OBJECT	BROADSIDE	REAR END
51% 125 COLLISIONS	33% 80 COLLISIONS	30% 72 COLLISIONS	27% 66 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Install/ Replace Street Lights	Citywide	$5,232,500
		CONTINGENCY COST	$1,046,500
		ENGINEERING COST	$2,197,700
		TOTAL COST	$8,476,700

PROJECT 3: US-84 (BELLMEAD DRIVE)- CORRIDOR SAFETY IMPROVEMENTS

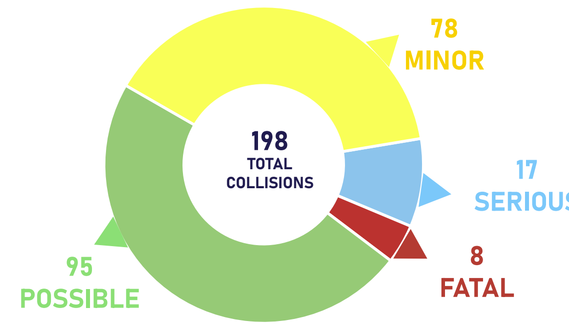


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Bellmead Drive serves as a primary east-west arterial within the City of Bellmead. This segment of the corridor is a two lane roadway with a center two-way left turn lane, and the speed limits vary, it ranges from 30 mph to 55 mph. The comprehensive plan (2023) identifies a need for sidewalks, biking infrastructure, landscaping and curb packing along this corridor. This road also provides access to La Vega Primary School.

INJURY COLLISION STATISTICS

Pedestrian	12
Bicycle	2
Motorcycle	5
Car	155
Truck	24



TRENDS

INTERSECTION	BROADSIDE	REAR END	NIGHTTIME
81%	48%	35%	28%
161 COLLISIONS	96 COLLISIONS	70 COLLISIONS	55 COLLISIONS

EXISTING CONDITIONS

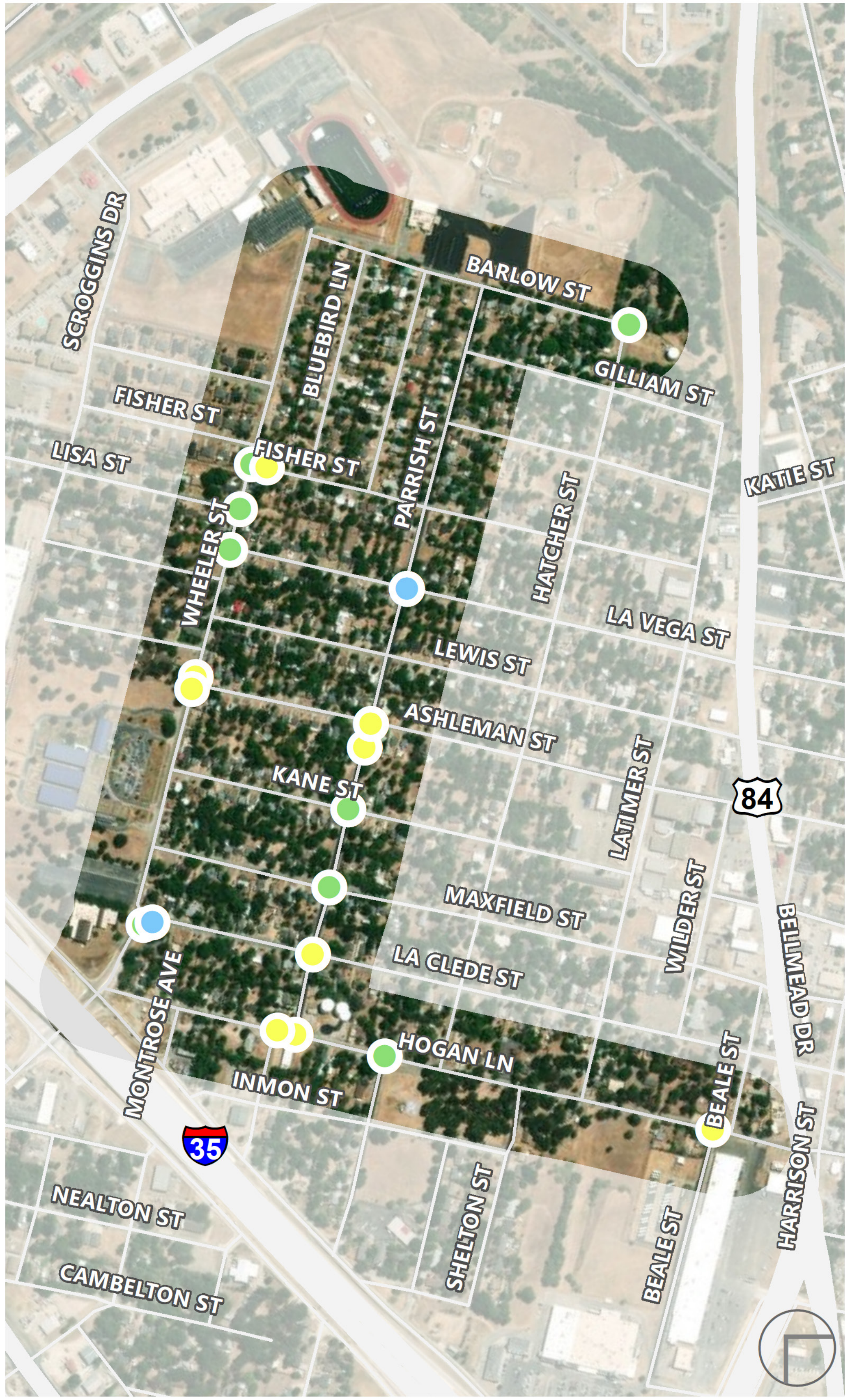
Existing Condition:
Bellmead Dr at E 27th St facing east

Existing Condition:
Bellmead Dr between Lewis St and La Vega Dr facing east

ESTIMATED COST OF IMPROVEMENT

3: US-84 (BELLMEAD DR)- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Median and Access Management	From E 26th St to East City Limits	$4,275,300
	Pedestrain Connectivity Improvements		$7,009,300
	Install Street Lighting		$994,800
	Install Speed Feedback Sign		$69,000
	Pull-out Bus Stop		$25,900
	Install Roundabout	US-84 & E 27th St	$862,500
		CONTINGENCY COST	$2,647,400
		ENGINEERING COST	$5,559,500
		TOTAL COST	**$21,443,700**

PROJECT 4: PEDESTRIAN SAFETY IN SCHOOL ZONE



Fatal Injury　Serious Injury　Minor Injury　Possible Injury

Wheeler Street, a two-lane undivided major collector, provides access to La Vega Elementary School, residential neighborhoods, and Bellmead Civic Center. Parrish Street, a two-lane undivided local street runs parallel to Wheeler Street and provides access to residential neighborhoods. Both roadways have a posted speed limit of 30 mph. Hogan Lane and Barlow Street complete the network. The comprehensive plan (2023) recommends bike infrastructure, and sidewalks on Hogan Lane and Wheeler Street. This project is within a 0.25 mile of La Vega Elementary and High Schools and the Bellmead Civic Center.

INJURY COLLISION STATISTICS

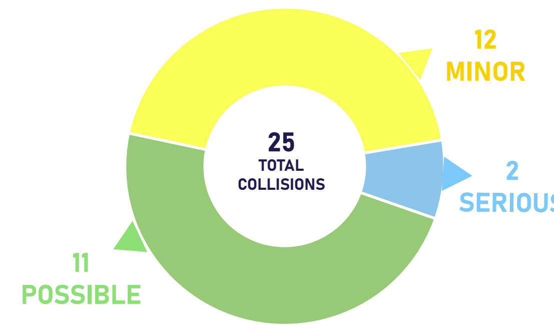
1

0

0

22

2



TRENDS

INTERSECTION	BROADSIDE	DISREGARD OF SIGNS & SIGNALS	NIGHTTIME
88%	64%	36%	28%
22 COLLISIONS	16 COLLISIONS	9 COLLISIONS	7 COLLISIONS

EXISTING CONDITIONS

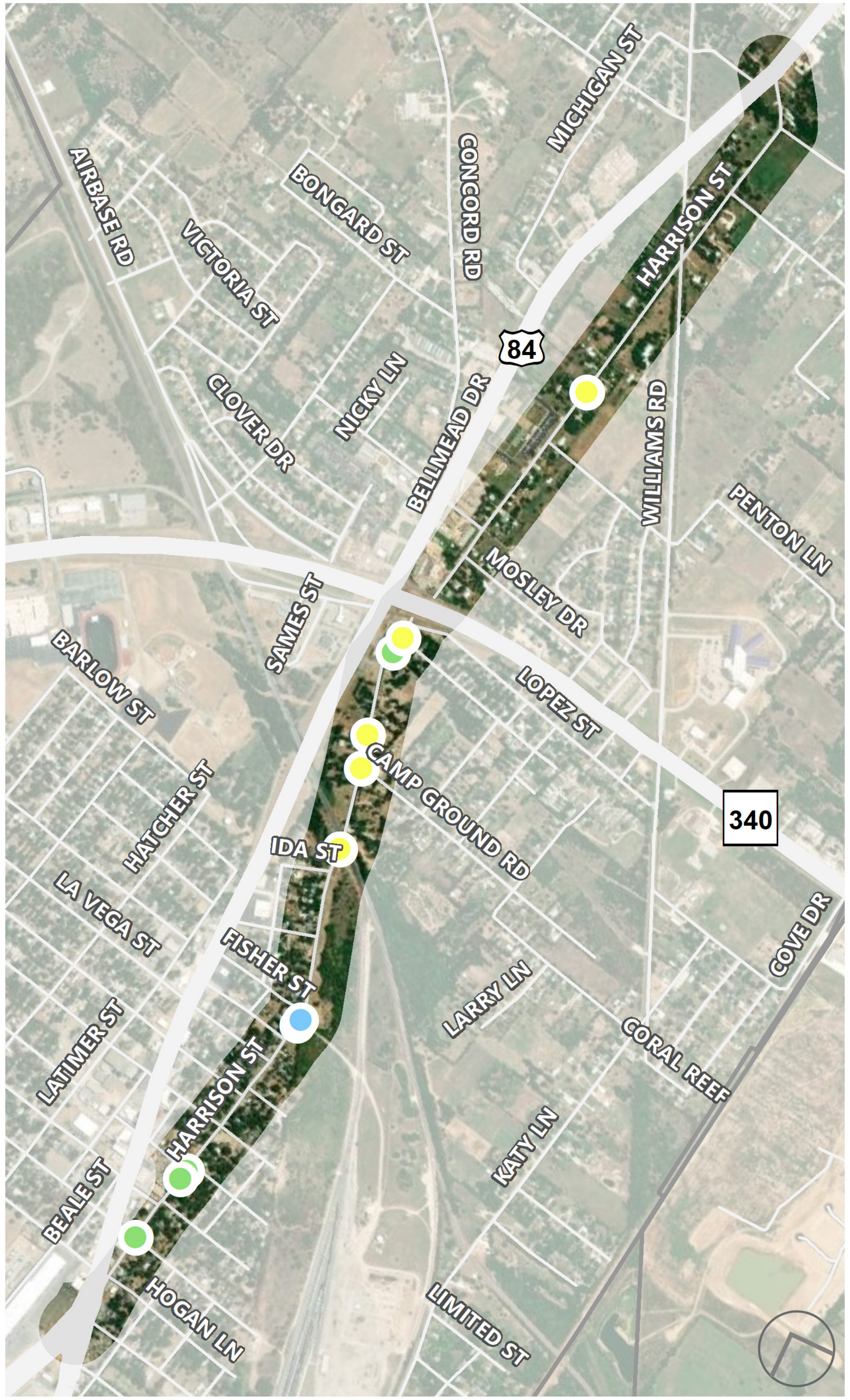
Existing Condition:
Wheeler St at Maxfield St facing east

Existing Condition:
Parrish St at Lewis St facing east

ESTIMATED COST OF IMPROVEMENT

4: PEDESTRIAN SAFETY IMPROVEMENTS IN SCHOOL ZONE			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Pedestrian Connectivity Improvements (Sidewalks & Crosswalks)	Wheeler St	$996,200
		Parrish St	$1,988,800
		Barlow St	$439,300
		Hogan Ln	$854,100
		CONTINGENCY COST	$855,700
		ENGINEERING COST	$1,797,000
		TOTAL COST	**$6,931,100**

PROJECT 5: HARRISON STREET- MULTIMODAL CORRIDOR SAFETY IMPROVEMENTS

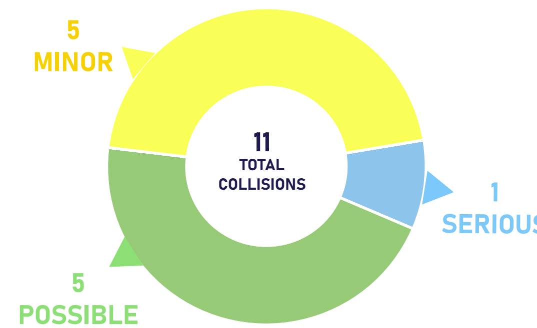


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Harrison Street is an east-west local roadway that runs between Bellmead Drive and State Loop 340. This segment of Harrison Street is a two-lane undivided roadway with a posted speed limit of 30 mph. This road provides access to East La Vega Primary School. The comprehensive plan (2023) also recommends multimodal improvements along this corridor.

INJURY COLLISION STATISTICS

- 2
- 1
- 0
- 8
- 0



TRENDS

HIT OBJECT	DISTRACTED DRIVING	INTERSECTION	PED-BIKE COLLISIONS
55%	36%	27%	27%
6 COLLISIONS	4 COLLISIONS	3 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Harrison St at Penton Ln facing north

Existing Condition:
Harrison St at Williams Rd facing west

ESTIMATED COST OF IMPROVEMENT

5: HARRISON STREET- MULTIMODAL CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Centerline and Edgeline Striping	Harrison St from Hogan Ln to US-84 (East of SL 340)	$153,000
	Minor Street Improvements		$18,100
	Improve Sight Distance		$19,600
	Install Shared Use Path		$4,876,400
	Install Street Lighting		$492,200
		CONTINGENCY COST	$1,111,900
		ENGINEERING COST	$2,335,000
		TOTAL COST	**$9,006,200**

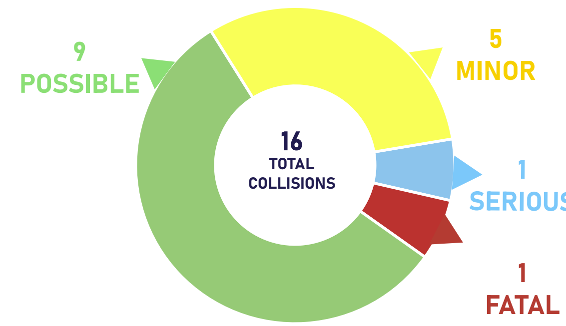
PROJECT 6: CONCORD ROAD- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Concord Road serves as a significant east-west collector street, spanning from US-84 (Bellmead Drive) to Aviation Parkway within the City of Bellmead. This particular segment of Concord Road is a two-lane undivided roadway with a posted speed limit of 30 mph. Concord Road provides connectivity to La Vega Primary School. The comprehensive plan (2023) identifies drainage issues along this corridor.

INJURY COLLISION STATISTICS

1
0
0
15
0



TRENDS

HIT OBJECT	NIGHTTIME	DUI	UNSAFE SPEED
81%	44%	25%	25%
13 COLLISIONS	7 COLLISIONS	4 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

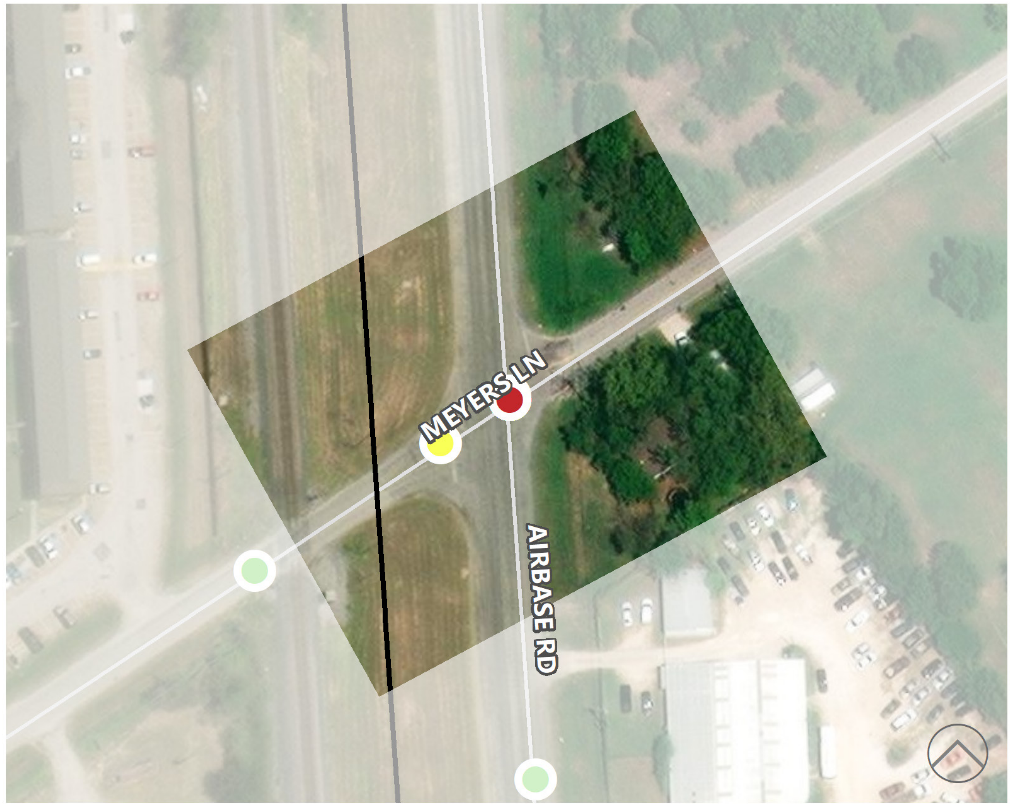
Existing Condition:
Concord Rd at Bongard St facing south

Existing Condition:
Concord Rd at Cloverleaf Rd facing south

ESTIMATED COST OF IMPROVEMENT

6: CONCORD RD- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
	Install Striping and Pavement Marking Upgrade	US-84 (Bellmead Dr) to Aviation Pkwy	$130,400
	Install Street Lighting		$648,600
	Install Speed Feedback Sign		$34,500
	Pedestrian Connectivity Improvements	US-84 (Bellmead Dr) to Bowie St	$3,062,400
		CONTINGENCY COST	$775,200
		ENGINEERING COST	$1,627,900
		TOTAL COST	**$6,279,000**

PROJECT 7: AIRBASE ROAD- INTERSECTION SAFETY IMPROVEMENTS



Airbase Rd & Meyers Ln

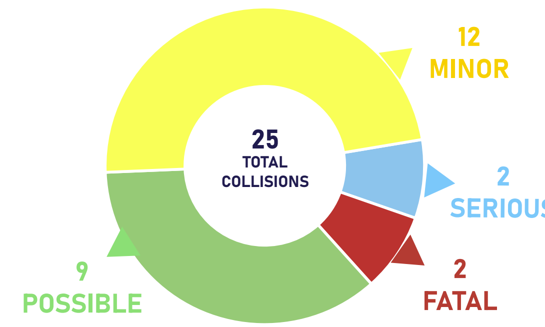
Airbase Rd & Pecan Ln

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Airbase Road is classified as a minor arterial roadway within the City of Bellmead. The intersections at Airbase Road/Meyers Lane, and Airbase Road/Pecan Lane are two-way stop-controlled intersections. The posted speed limit on Airbase Road is 55 mph, while it is 30 mph on Meyers Lane and Pecan Lane. Airbase Road provides primary access to Texas State Technical College.

INJURY COLLISION STATISTICS

- Pedestrian: 0
- Bicycle: 0
- Motorcycle: 2
- Automobile: 21
- Truck: 2



TRENDS

BROADSIDE	AUTOMOBILE ROW	DISTRACTED DRIVING	NIGHTTIME
92%	68%	16%	12%
23 COLLISIONS	17 COLLISIONS	4 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Airbase Rd at Meyers Ln facing south

Existing Condition:
Airbase Rd at Pecan Ln facing north

ESTIMATED COST OF IMPROVEMENT

7: AIRBASE RD- INTERSECTION SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Roundabout	Airbase Rd and Meyers Ln	$918,900
	Install Roundabout	Airbase Rd and Pecan Ln	$918,900
		CONTINGENCY COST	$367,600
		ENGINEERING COST	$771,900
		TOTAL COST	**$2,977,300**

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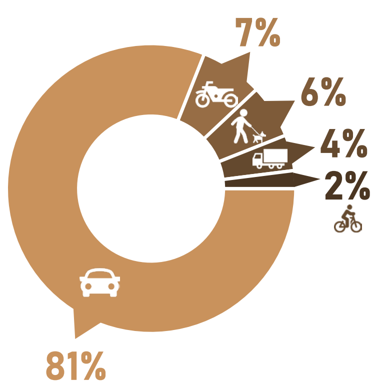
CHAPTER 6.2: CITY OF HEWITT

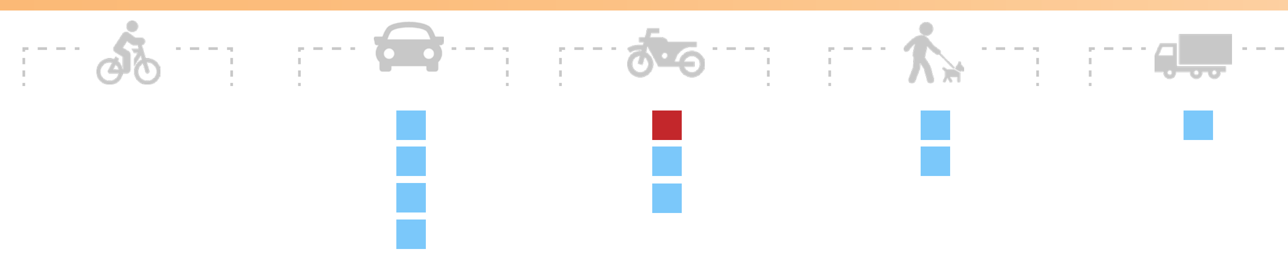
INTRODUCTION

City of Hewitt is on IH 35, south of Waco in McLennan County. The city has an estimated population of 16,026 according to the 2020 census, making it the second largest city in the county. This chapter provides information on the City of Hewitt's collision statistics from 2014 to 2023. A total of 68 collisions occurred on Hewitt streets in the last 10 years, including one fatality and nine serious injuries. TxDOT roadways within Hewitt city limits had 316 collisions during the same period, with five fatal injuries and 20 serious injuries. On city-maintained roads, minor injuries accounted for the 47 percent of injury collisions whereas, on roads maintained by TxDOT, possible injury accounted for 55 percent of injury collisions.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**68**	**100 %**	**316**	**100 %**
Fatal Injury	1	1.47 %	5	1.58 %
Serious Injury	9	13.24 %	20	6.33 %
Minor Injury	32	47.06 %	119	37.66 %
Possible Injury	26	38.24 %	172	54.43 %
Total Persons Involved	**86**	**100 %**	**463**	**100 %**
Fatal Injury	1	1.16 %	5	1.08 %
Serious Injury	11	12.79 %	22	4.75 %
Minor Injury	40	46.51 %	160	34.56 %
Possible Injury	34	39.53 %	276	59.61 %

COLLISIONS BY MODE - CITY

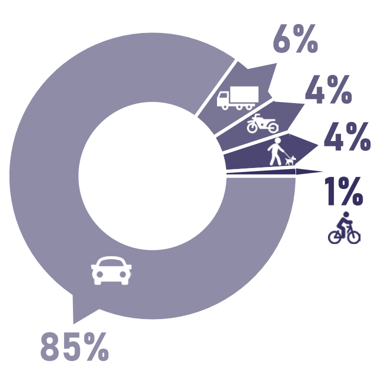


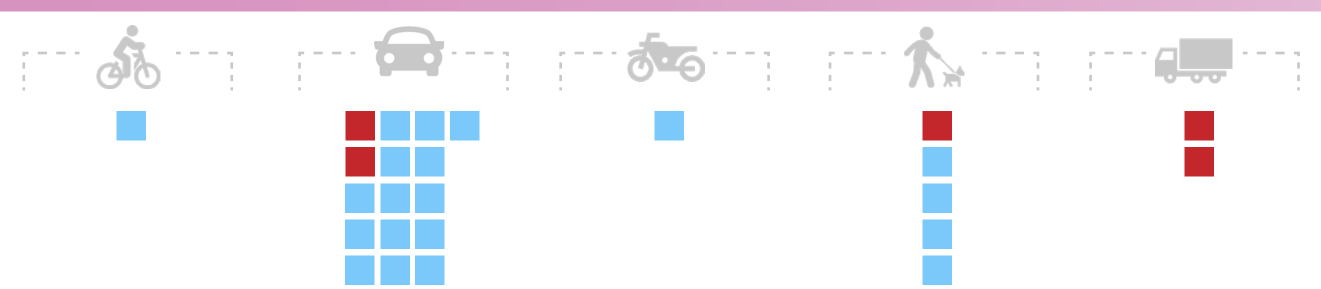


Note : Each box represents one fatal or severe injury collision.

0 %	0 %	20 %	0 %	0 %	Fatal Injury
0 %	7 %	40 %	50 %	33 %	Serious Injury
100 %	49 %	40 %	25 %	33 %	Minor Injury
0 %	44 %	0 %	25 %	33 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

0 %	1 %	0 %	8 %	10 %	Fatal Injury
25 %	5 %	9 %	33 %	0 %	Serious Injury
50 %	36 %	55 %	42 %	50 %	Minor Injury
25 %	58 %	36 %	17 %	40 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on Hewitt's city streets, TxDOT facilities and McLennan County across various categories.

On Hewitt city streets, there were a total of 68 collisions, resulting in 86 persons injured. In comparison, TxDOT reported a total of 316 collisions resulting in 463 persons injured within Hewitt city limits.

This section also identifies several major collision trends on Hewitt city streets, including hit object collisions, broadside collisions, distracted driving, and nighttime collisions. On TxDOT roadways, the prominent trends were broadside collisions, rear end collisions, distracted driving, and nighttime collisions. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. The charts indicate that roads with a 60 mph speed limit accounted for the highest proportion of KSI collisions out of the speed limits examined.

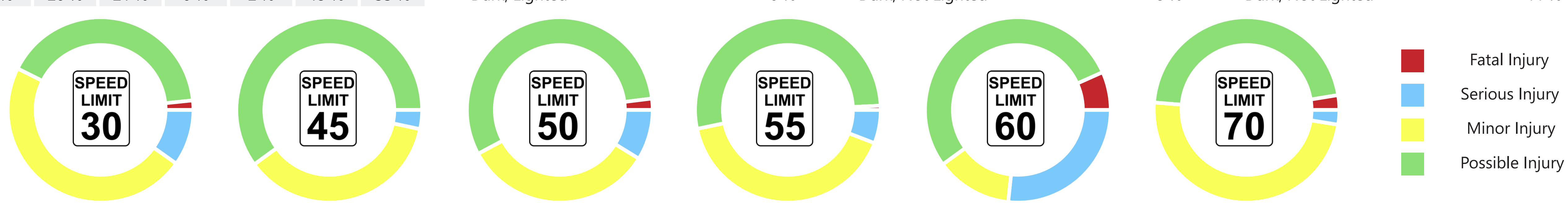
CITY	TxDOT
68	316
TOTAL COLLISIONS	TOTAL COLLISIONS
86	463
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED								
	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	1 %	0 %	0 %	0 %	0 %	0 %
Car	0 %	7 %	41 %	38 %	1 %	3 %	31 %	57 %
Motorcycle	1 %	2 %	2 %	0 %	0 %	0 %	1 %	1 %
Pedestrian	0 %	2 %	1 %	1 %	0 %	1 %	1 %	0 %
Truck	0 %	1 %	1 %	0 %	0 %	0 %	1 %	1 %
AGE								
Below 15	0 %	2 %	1 %	3 %	0 %	1 %	2 %	6 %
15 - 65	1 %	10 %	41 %	29 %	1 %	4 %	27 %	48 %
Above 65	0 %	0 %	5 %	7 %	0 %	0 %	6 %	5 %
GENDER								
Male	1 %	8 %	27 %	19 %	1 %	2 %	15 %	25 %
Female	0 %	5 %	20 %	21 %	0 %	2 %	19 %	35 %

CITY OF HEWITT VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	1 %	Bicycle	1 %	Bicycle	1 %
Car	81 %	Car	85 %	Car	85 %
Motorcycle	7 %	Motorcycle	3 %	Motorcycle	4 %
Pedestrian	6 %	Pedestrian	4 %	Pedestrian	3 %
Truck	4 %	Truck	6 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	44 %	Motor Vehicle in Transport	81 %	Motor Vehicle in Transport	72 %
Fixed Object	26 %	Fixed Object	9 %	Fixed Object	17 %
Parked Car	15 %	Pedestrian	4 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	56 %	Broadside	52 %	Broadside	42 %
Broadside	34 %	Rear End	23 %	Hit Object	28 %
Rear End	9 %	Hit Object	19 %	Rear End	24 %
Head-On	1 %	Sideswipe	3 %	Sideswipe	5 %
VIOLATION CATEGORY					
Distracted Driving	25 %	Distracted Driving	28 %	Unsafe Speed	23 %
Unsafe Speed	13 %	Automobile Right-of-Way	18 %	Automobile Right-of-Way	22 %
Automobile Right-of-Way	13 %	Traffic Signals and Signs	12 %	Traffic Signals and Signs	12 %
Other Unforeseen Reasons	9 %	Unsafe Speed	9 %	Distracted Driving	8 %
Other Improper Driving	7 %	Driving under Influence	5 %	Other Improper Driving	6 %
Driver Condition	7 %	Improper Turning	5 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	50 %	Intersection	74 %	Intersection	59 %
Roadway	50 %	Roadway	26 %	Roadway	41 %
LIGHTING					
Daylight	69 %	Daylight	70 %	Daylight	70 %
Dark, Not Lighted	19 %	Dark, Lighted	17 %	Dark, Lighted	16 %
Dark, Lighted	6 %	Dark, Not Lighted	8 %	Dark, Not Lighted	11 %

SPEED LIMIT



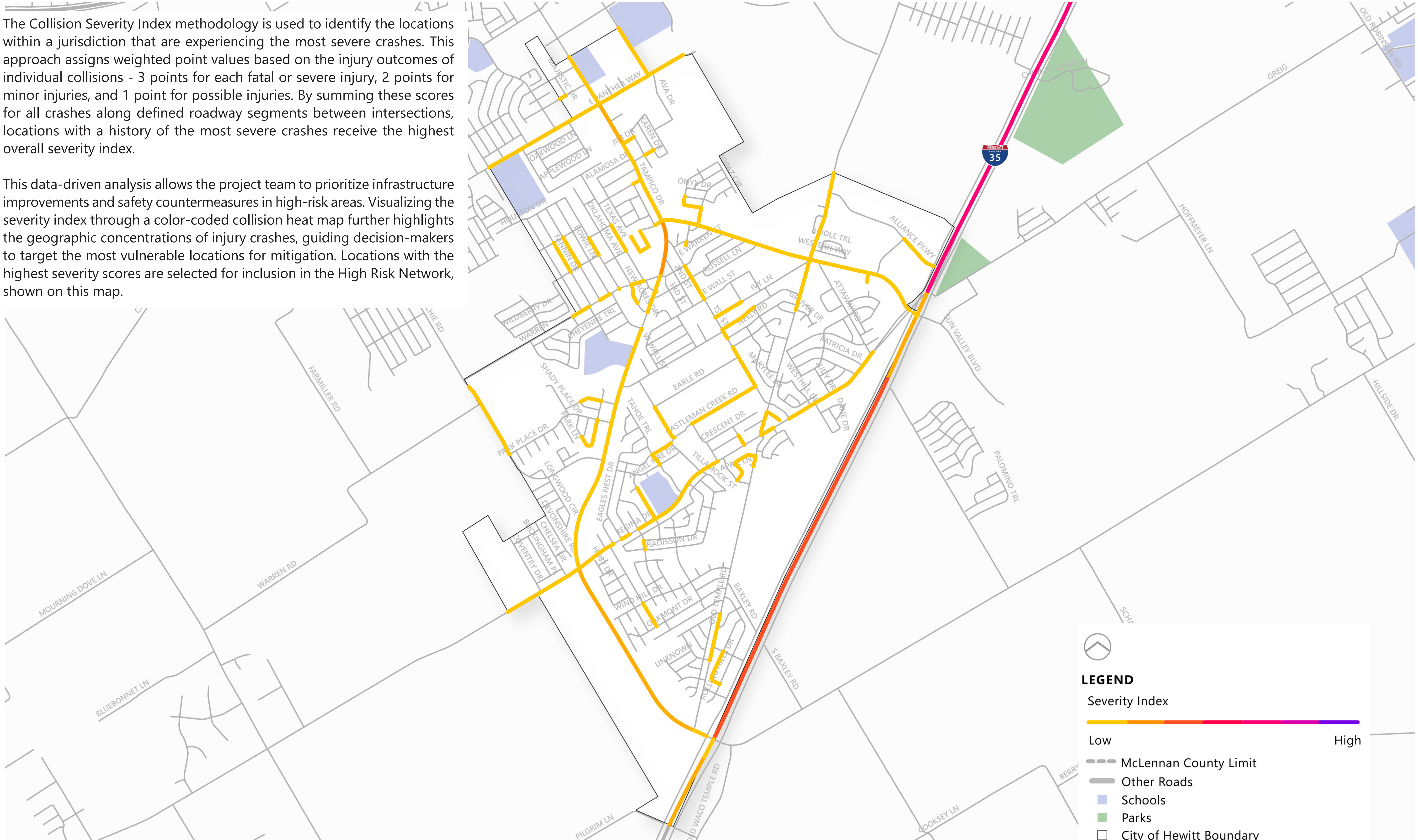
BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

The map displays the location of injury collisions involving bicyclists and pedestrians in Hewitt. In total there were 21 bicycle and pedestrian injury collisions which resulted to one pedestrian fatality and seven serious injury collisions (six pedestrian and one bicycle).

SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

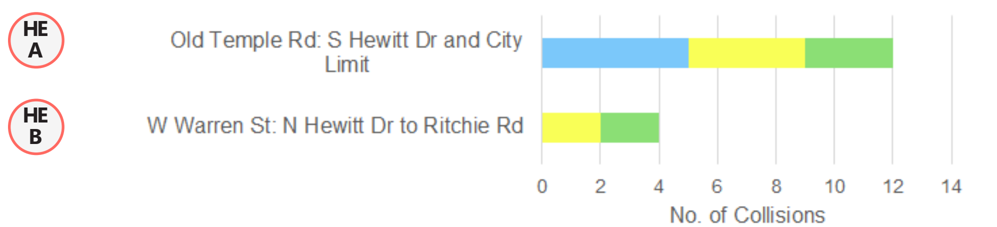
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



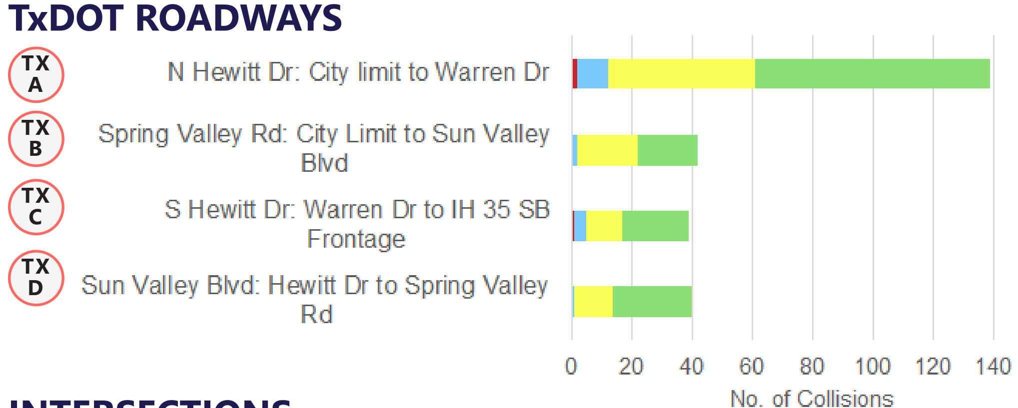
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within Hewitt city limit. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

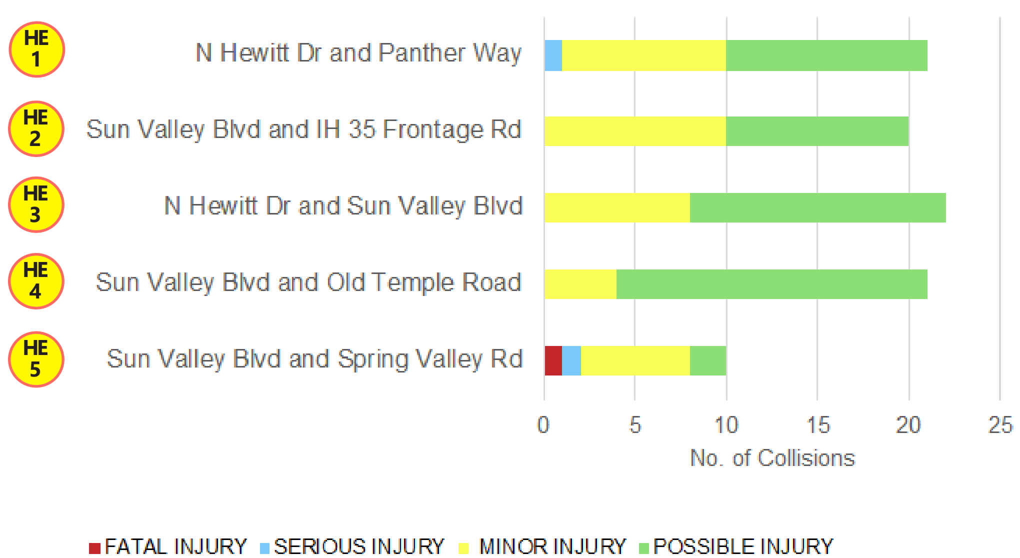
ROADWAYS

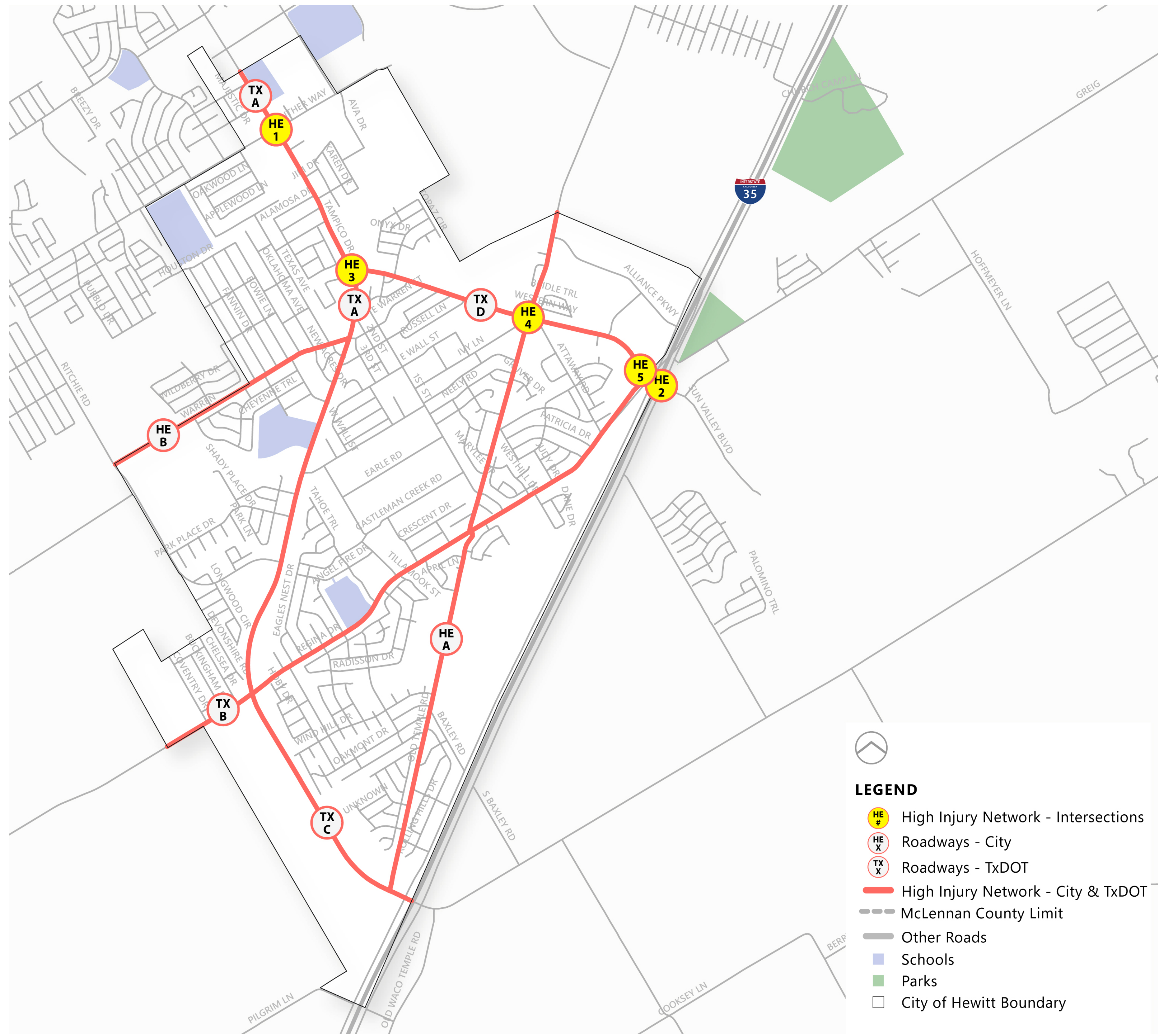


TxDOT ROADWAYS



INTERSECTIONS





PROFILES - CITY

PROFILE 1 - HIT OBJECT

38 COLLISIONS

SEVERITY

3 % | 16 % | 45 % | 36 %

LOCATION

24 % | 76 %

LIGHTING

63 % | 5 % | 3 % | 29 %

BY MODE

76 % CAR

CONTRIBUTING FACTOR

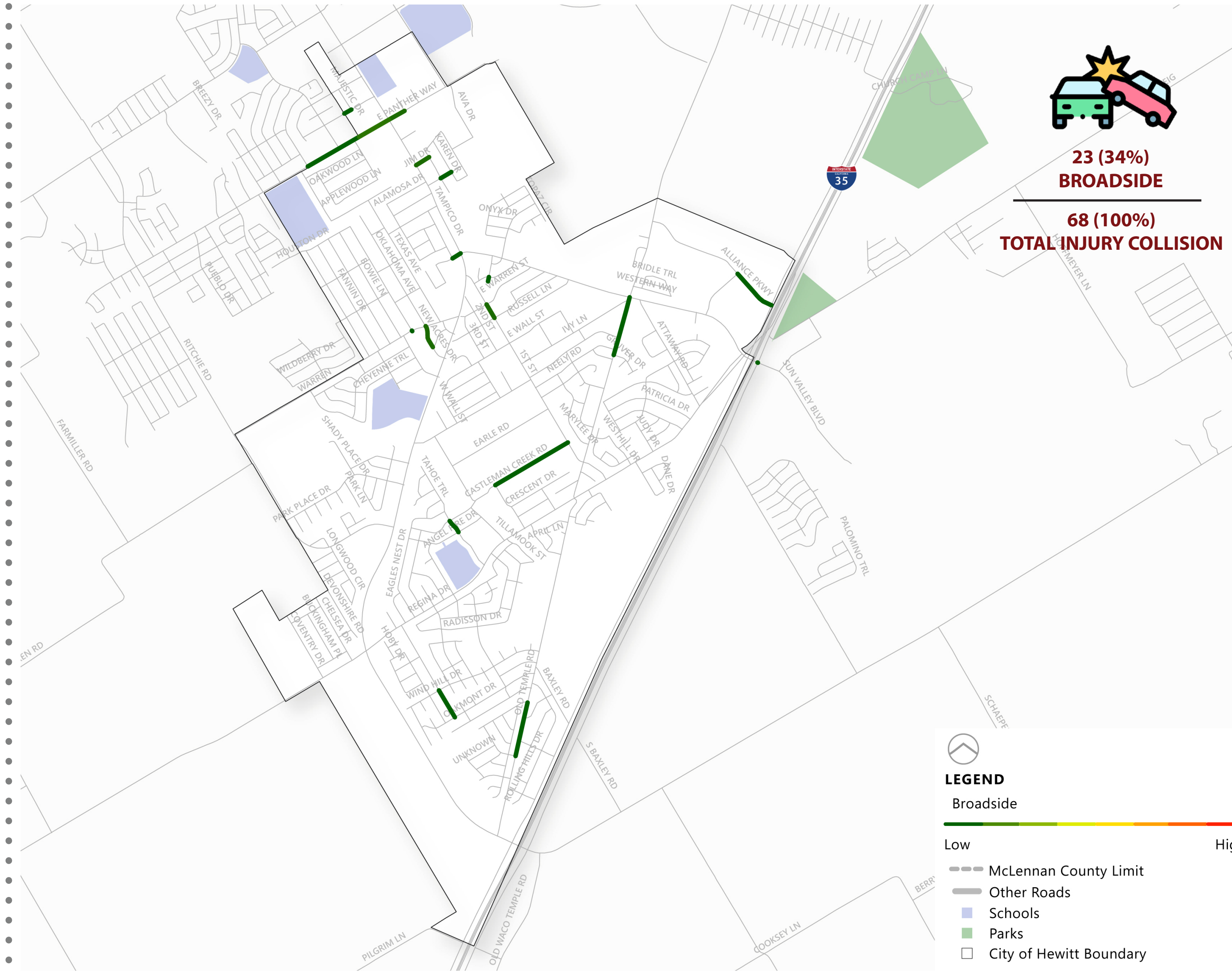
24 %	16 %	13 %	13 %	13 %
DISTRACTED DRIVING	OTHER UNFORESEEN REASONS	DRIVER CONDITION	OTHER IMPROPER DRIVING	UNSAFE SPEED

HARMFUL EVENT

47 %	26 %	11 %
FIXED OBJECT	PARKED CAR	PEDESTRIAN

0 % 25 % 50 % 75 % 100 %

PROFILE 2 - BROADSIDE



23 COLLISIONS

SEVERITY

0 % | 4 % | 57 % | 39 %

LOCATION

96 % | 4 %

LIGHTING

78 % | 4 % | 9 % | 9 %

BY MODE

87 % CAR

CONTRIBUTING FACTOR

39 %	22 %	17 %
AUTOMOBILE RIGHT-OF-WAY	DISTRACTED DRIVING	TRAFFIC SIGNALS AND SIGNS

HARMFUL EVENT

100 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILES - CITY

PROFILE 3 - DISTRACTED DRIVING

SEVERITY

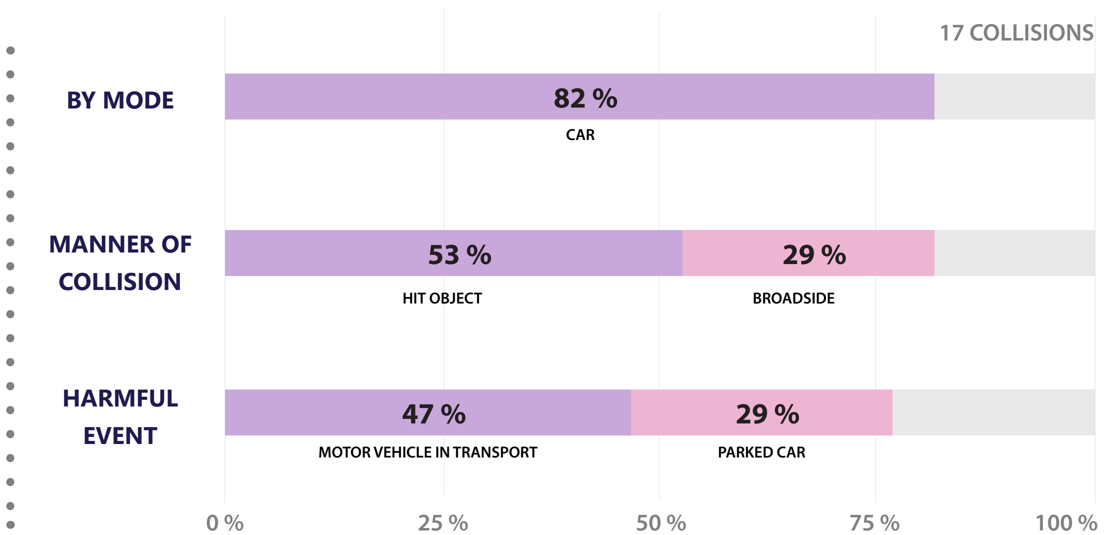
6 % | 12 %
24 % | 58 %

LOCATION

41 % | 59 %

LIGHTING

65 % | 6 %
12 % | 18 %



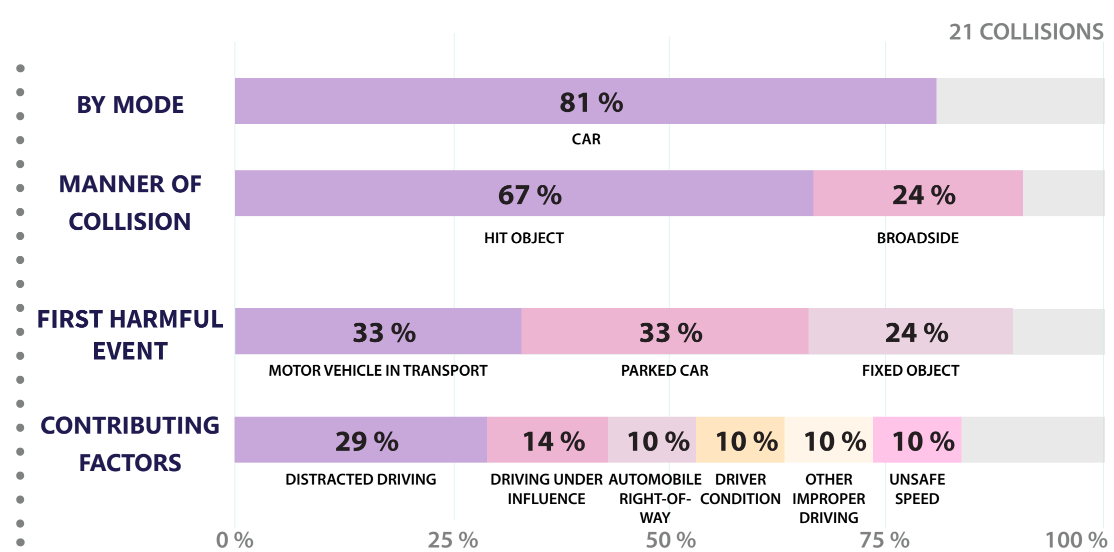
PROFILE 4 - NIGHTTIME

SEVERITY

0 % | 19 %
52 % | 29 %

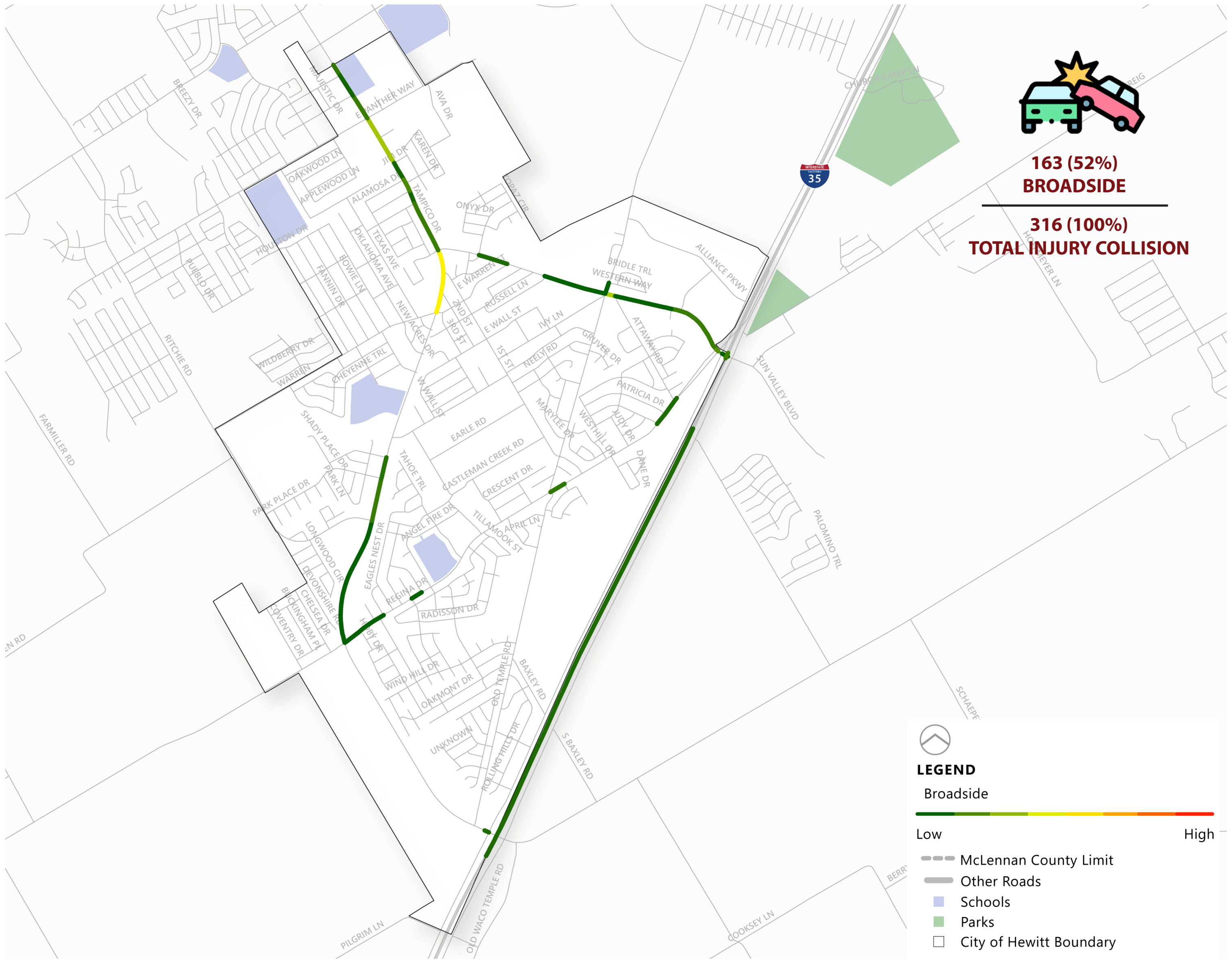
LOCATION

33 % | 67 %



PROFILES - TXDOT

PROFILE 1 - BROADSIDE



SEVERITY

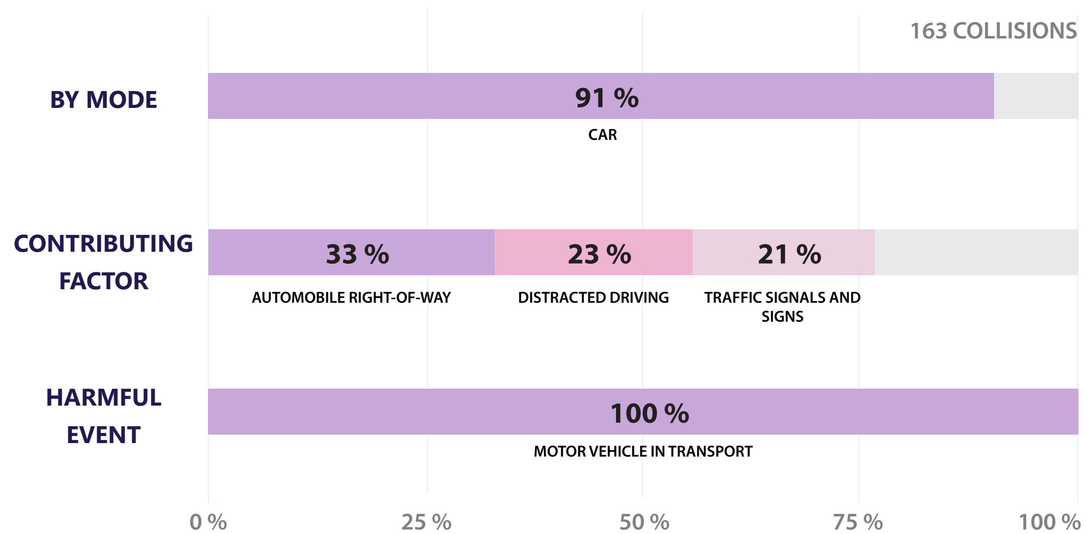
2 % | 4 % | 37 % | 57 %

LOCATION

97 % | 3 %

LIGHTING

80 % | 3 % | 15 % | 2 %



PROFILE 2 - REAR END

SEVERITY

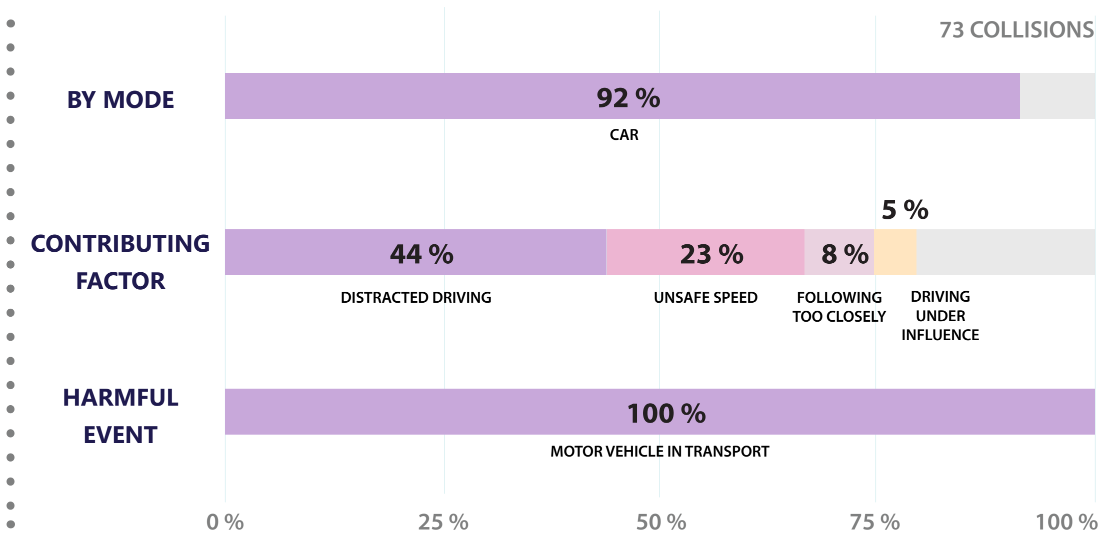
1 % | 2 % | 33 % | 64 %

LOCATION

58 % | 42 %

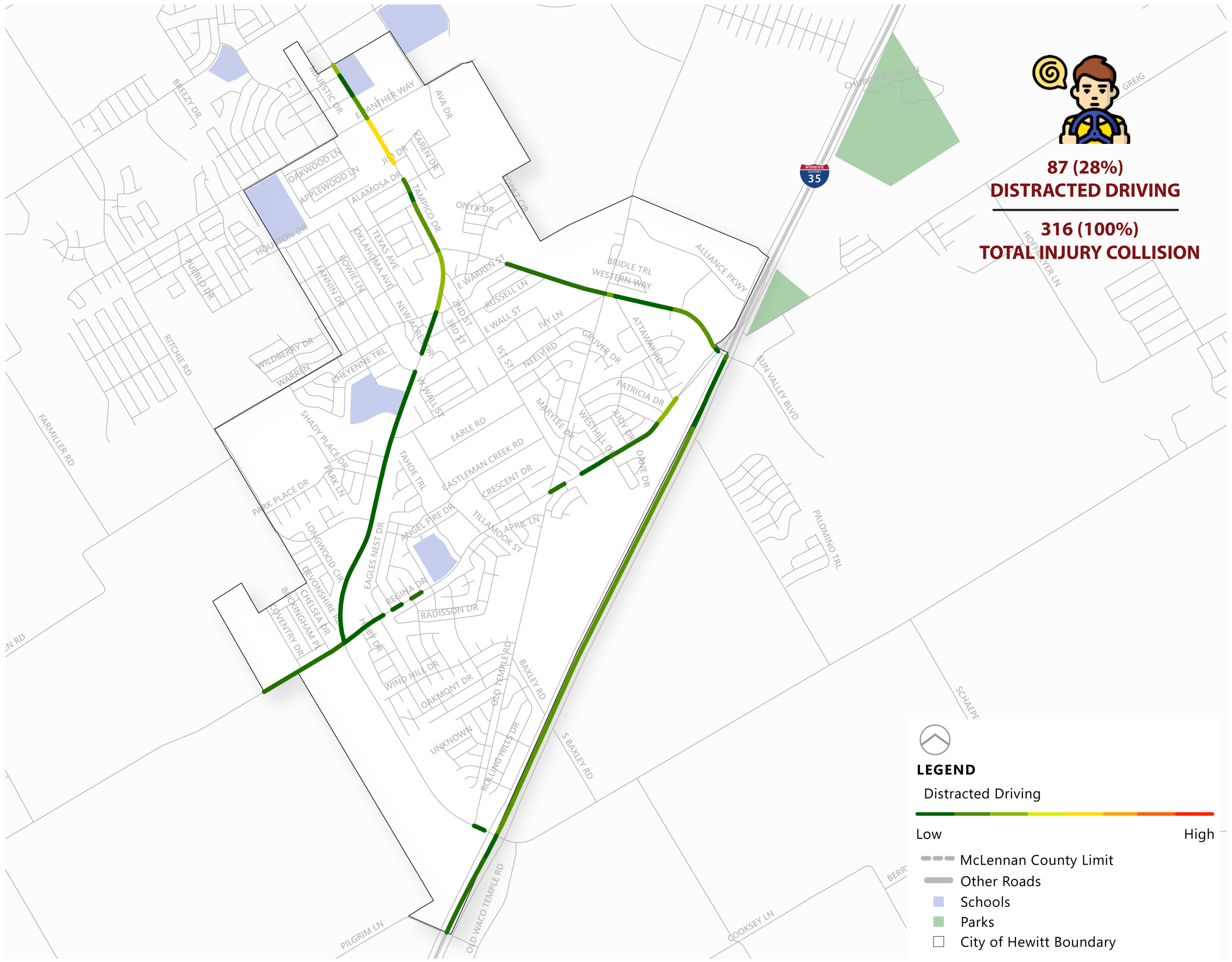
LIGHTING

74 % | 3 % | 16 % | 7 %



PROFILES - TXDOT

PROFILE 3 - DISTRACTED DRIVING



SEVERITY

1 % | 3 %

29 % | 67 %

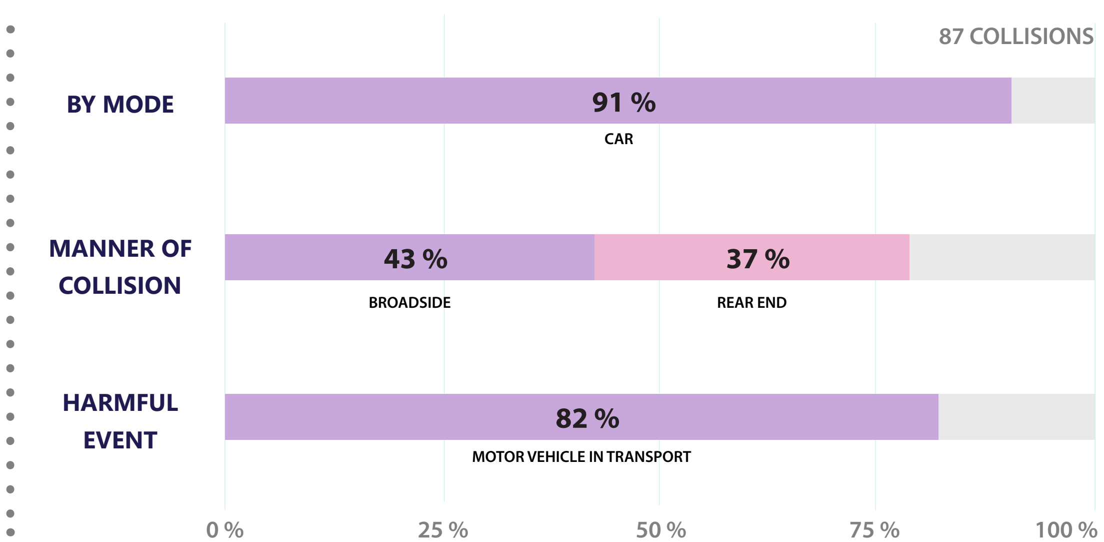
LOCATION

77 % | 23 %

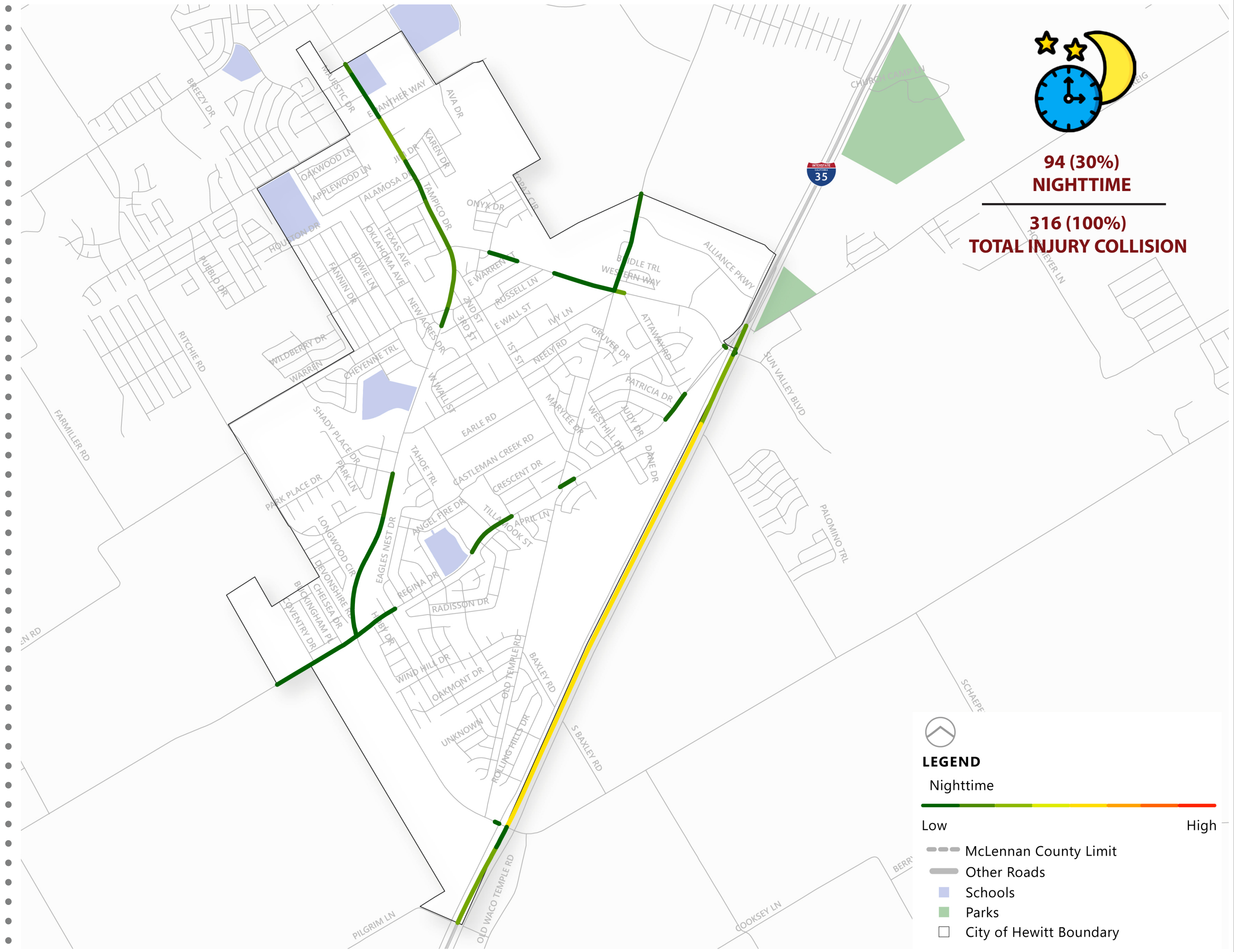
LIGHTING

82 % | 4 %

8 % | 6 %



PROFILE 4 - NIGHTTIME



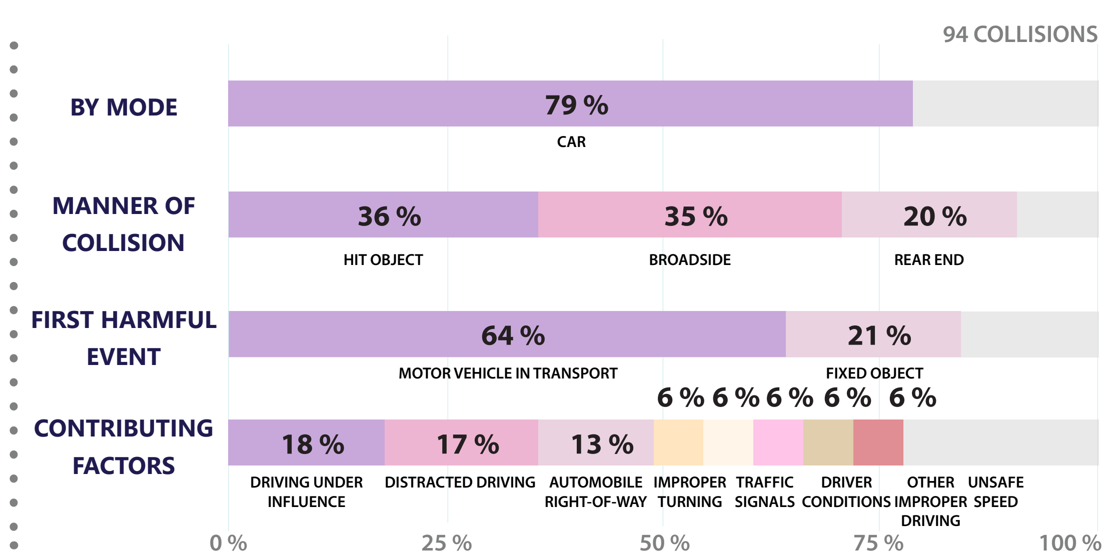
SEVERITY

3 % | 12 %

43 % | 42 %

LOCATION

63 % | 37 %



NEIGHBORHOOD TRAFFIC CALMING PROGRAM

The residential streets in the City of Hewitt need a Neighborhood Traffic Calming Project due to cut-through traffic and speeding issues. A neighborhood traffic calming program typically involves initiatives aimed at reducing traffic speed and improving safety on residential streets. These programs often include measures such as speed humps, traffic circles, chicanes, curb extensions, and signage to encourage drivers to slow down and be more cautious in residential areas. The program also involves community engagement and input to identify specific traffic issues and develop appropriate solutions tailored to the neighborhood's needs. Overall, the goal of a neighborhood traffic calming program is to create safer and more livable streets for residents and pedestrians.

TRAFFIC SIGNAL WARRANT STUDY

Traffic Signal Warrant Study at the following two intersections:
FM-1695 (S Hewitt Drive) and Agile Street
FM-1695 (S Hewitt Drive) and Old Temple Road

The intersections of FM-1695 (S Hewitt Drive) and Agile Street, as well as FM-1695 (S Hewitt Drive) and Old Temple Road, have seen an increase in traffic volume and safety concerns over the past few years. A Traffic Signal Warrant Study is necessary to evaluate if traffic signals are warranted at these locations based on criteria outlined in the Texas Manual on Uniform Traffic Control Devices (TMUTCD). The study will involve collecting data on traffic volumes, vehicle delays, pedestrian crossings, and crash history. This data will be analyzed to determine if one or more signal warrant criterias are met, which would justify the installation of traffic signals to improve safety and operational efficiency at these busy intersections. The findings of the Traffic Signal Warrant Study will provide the city with the necessary information to make an informed decision about potential signal installations.

ACTIVE TRANSPORTATION PLAN

The City of Hewitt is in need of implementing an Active Transportation Plan (ATP) to promote increased walking, biking, and the use of other non-motorized transportation modes. This comprehensive plan will delineate strategies, policies, and infrastructure enhancements aimed at fostering safer and more accessible environments for pedestrians and cyclists within the city.

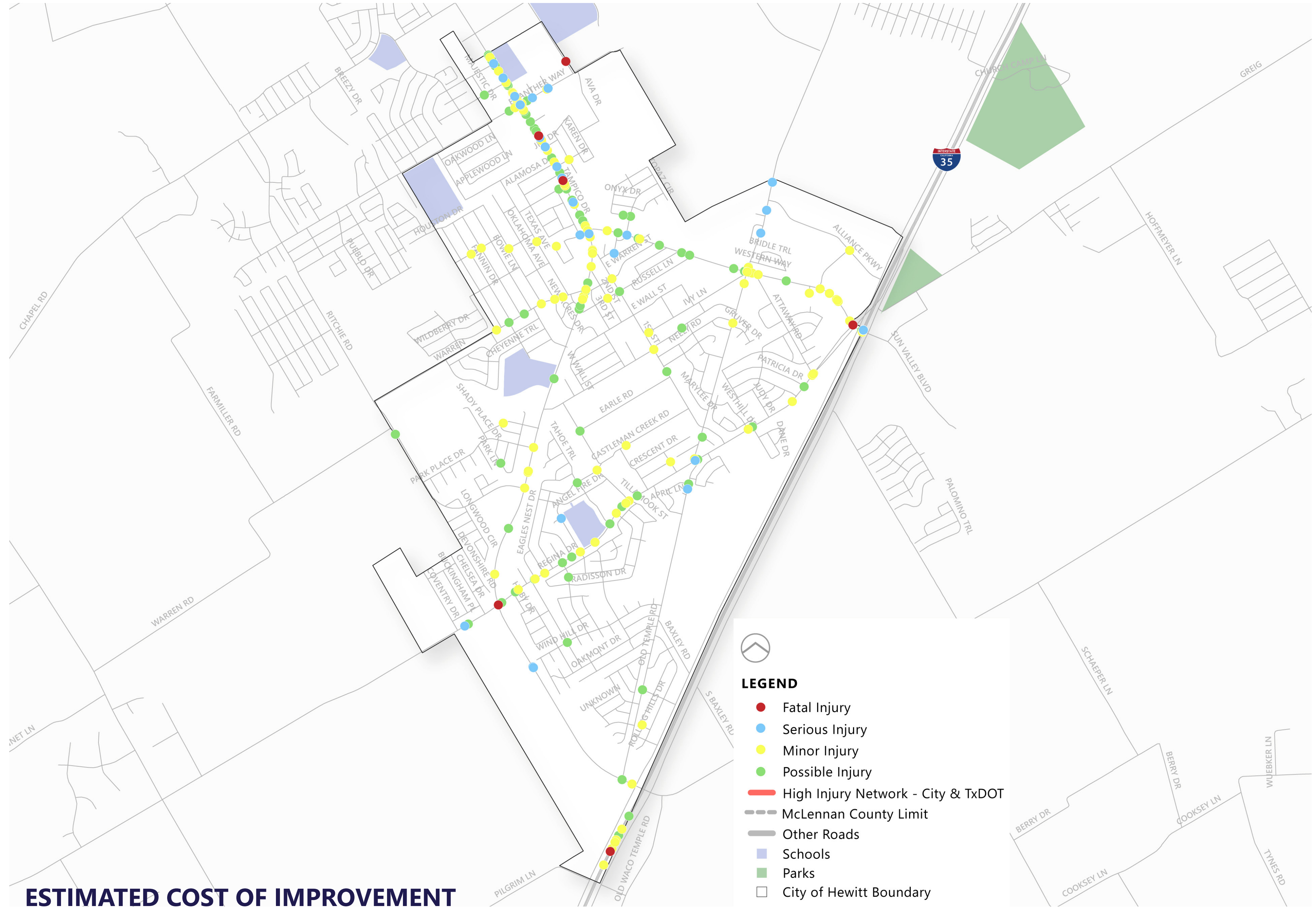
The ATP will entail an evaluation of existing multi-modal infrastructure improvements and safety measures, while also identifying gaps and deficiencies in infrastructure such as sidewalks and bike lanes. Additionally, the plan will focus on raising awareness about the benefits of walking and cycling, as well as educating the community about road safety and the importance of sharing the road with other users.

Furthermore, the ATP will involve the implementation of policies and regulations to support active transportation, including the adoption of Complete Streets policies, zoning regulations prioritizing pedestrian and cyclist safety, and incentives for developers to incorporate active transportation infrastructure into new developments.

Moreover, the ATP will provide an opportunity to integrate with public transit systems by ensuring seamless connectivity between walking, cycling, and public transit networks. By fostering a more pedestrian and cyclist-friendly environment, the ATP aims to promote healthier lifestyles, reduce traffic congestion, and create more vibrant and livable communities in Hewitt.

PROJECT 1: CITYWIDE SIGN INVENTORY & PAVEMENT DELINEATION

The City of Hewitt is proposing a Citywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the city.



INJURY COLLISION STATISTICS

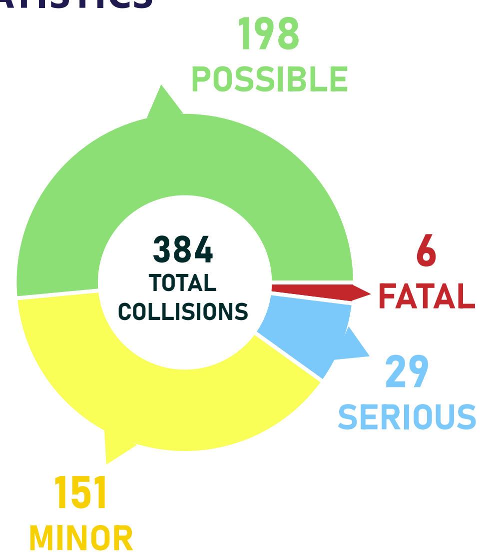
16

5

16

324

23



ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Sign Inventory, Replacement & Installation	Citywide	$569,000
	Citywide Pavement Delineation	Citywide	$3,079,800
		CONTINGENCY COST	$729,800
		ENGINEERING COST	$1,094,700
		TOTAL COST	**$5,473,300**

TRENDS

INTERSECTION	BROADSIDE	DISTRACTED DRIVING	HIT OBJECT
70%	48%	27%	25%
269 COLLISIONS	186 COLLISIONS	104 COLLISIONS	97 COLLISIONS

PROJECT 2: CITYWIDE STREET LIGHT INVENTORY

The City of Hewitt is proposing a Citywide Streetlight Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the city to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating Hewitt's streets during the nighttime hours.

NIGHTTIME INJURY COLLISION STATISTICS

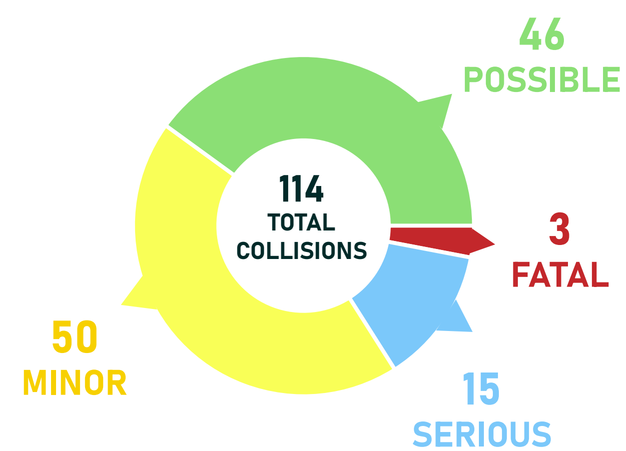
8

0

5

90

11



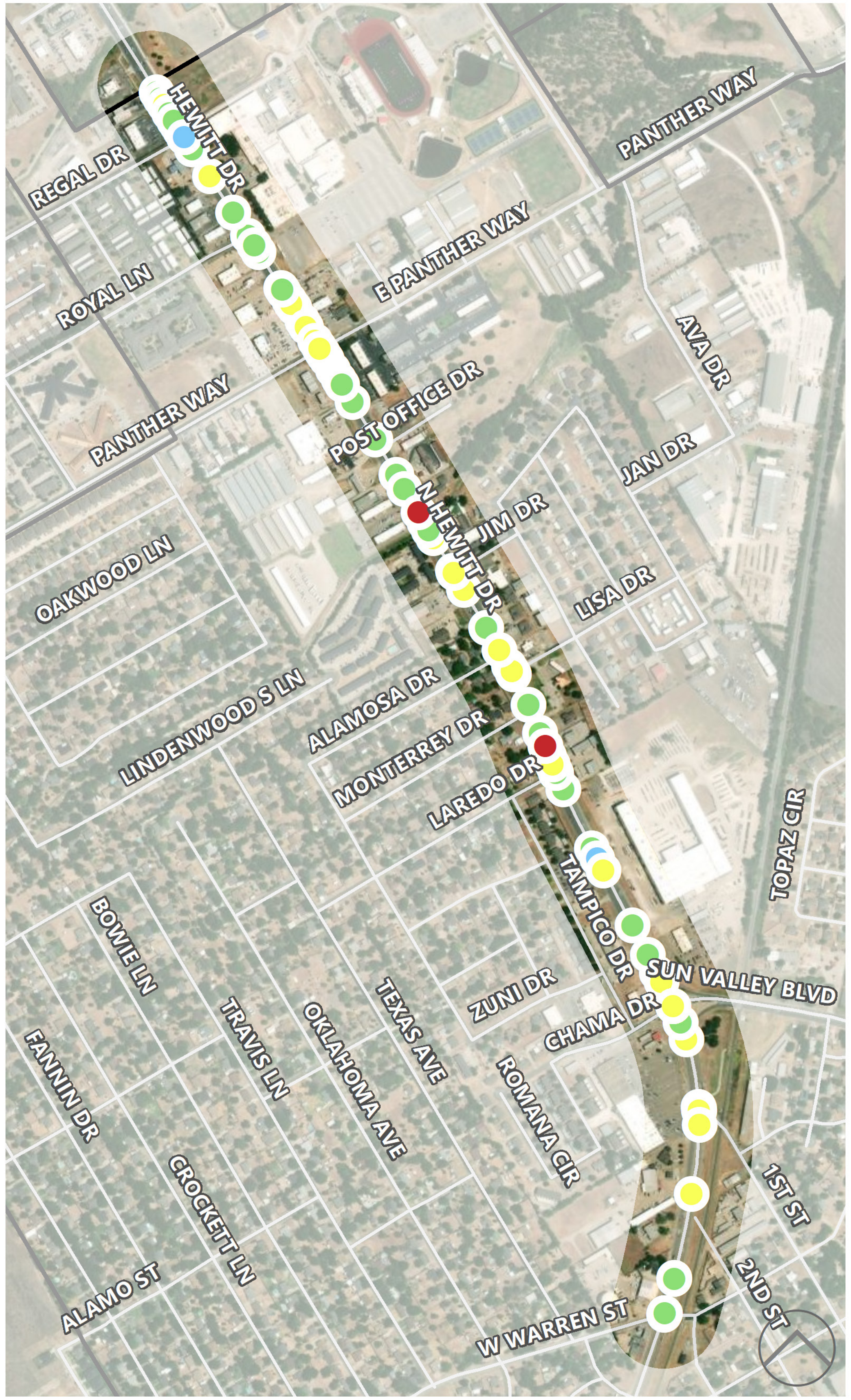
TRENDS

INTERSECTION	HIT OBJECT	DISTRACTED DRIVING	DUI
57%	42%	19%	18%
65 COLLISIONS	48 COLLISIONS	22 COLLISIONS	20 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Citywide **Street Light Inventory**	Citywide	$10,861,800
		CONTINGENCY COST	$2,172,360
		ENGINEERING COST	$4,562,000
		TOTAL COST	**$17,596,160**

PROJECT 3-A: FM-1695 (N HEWITT DRIVE)- CORRIDOR SAFETY IMPROVEMENTS

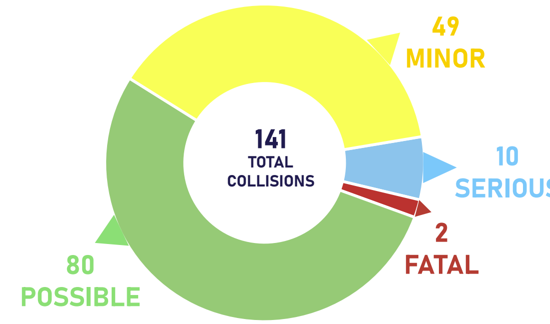


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

N Hewitt Drive is a four-lane minor arterial with a center two-way left turn lane, that provides access to commercial developments and residential neighborhoods. The speed limit varies throughout the corridor, from 45 mph to 55 mph. This segment of Hewitt Drive provides access to Midway Middle School.

INJURY COLLISION STATISTICS

- 11
- 4
- 6
- 118
- 2



TRENDS

INTERSECTION	BROADSIDE	NIGHTTIME	DISTRACTED DRIVING
77%	55%	26%	27%
108 COLLISIONS	77 COLLISIONS	36 COLLISIONS	38 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
FM-1695 (N Hewitt Dr) at Laredo Dr facing north

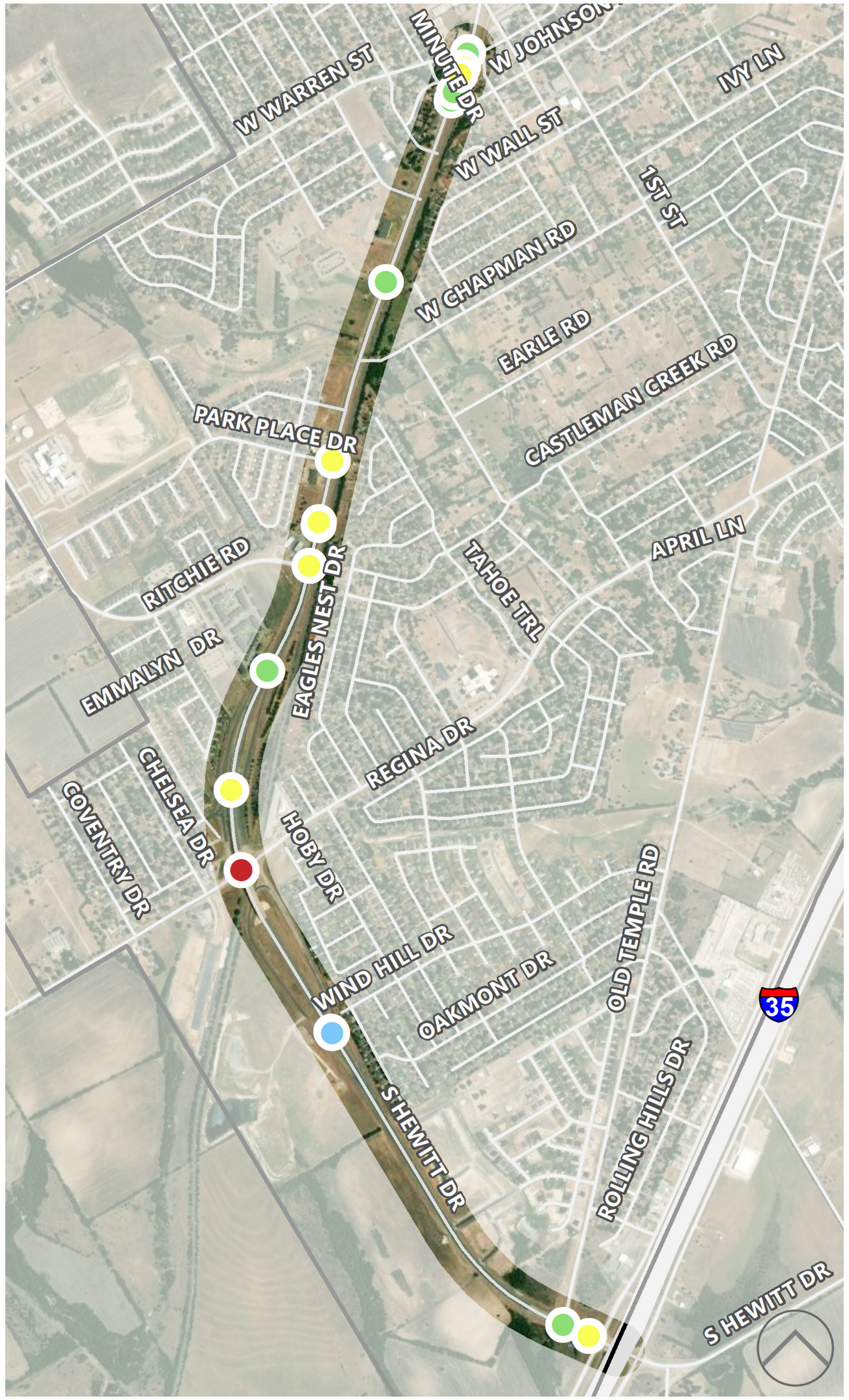
Existing Condition:
FM-1695 (N Hewitt Dr) south of Panther Way facing south

ESTIMATED COST OF IMPROVEMENT

3-A: FM-1695 (N HEWITT DR)- CORRIDOR SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Median & Access Management	Phase 1- From North of City Limits to W Warren St	$3,336,000
	Street Lighting		$374,900
	School Zone Speed Limit Reduction		$1,400
	Pedestrian Connectivity Improvement (Sidewalk & Crosswalk)		$3,796,000
	Install Speed Feedback Signs		$69,000
	Pedestrian Hybrid Beacon	Phase 1- At Jim Dr & Laredo Dr	$462,300
	Signalized Intersections Improvements (Protected Left, Yellow Border, & Signal Timing)	Phase 1- Panther Way, FM-2063 (Sun Valley Blvd)	$35,200
	Complete Streets with Multimodal Access	Phase 2- From North of City Limits to W Warren St	$8,625,000
		CONTINGENCY COST	$3,340,000
		ENGINEERING COST	$7,014,000
		TOTAL COST	**$27,053,800**

PROJECT 3-B: FM-1695 (S HEWITT DRIVE)- CORRIDOR SAFETY IMPROVEMENTS

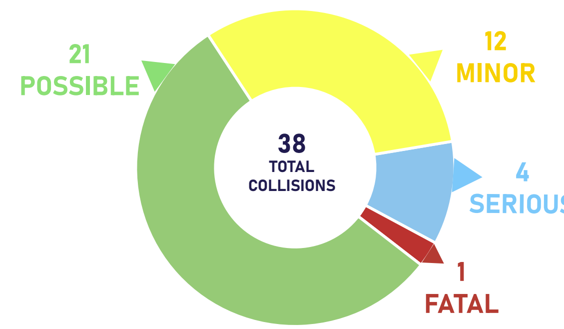


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

S Hewitt Drive is a four-lane minor arterial with a center two-way left turn lane, that provides access to elementary school and residential neighborhoods. Speed limits vary, set at 55 mph between W Warren Street and Spring Valley Road, and 60 mph between Spring Valley Road and I-35. S Hewitt Drive fronts the Castleman Creek Elementary School, and Hewitt Park.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Automobile	35
Truck	2



TRENDS

INTERSECTION	BROADSIDE	NIGHTTIME	AUTOMOBLE ROW
71%	66%	34%	32%
27 COLLISIONS	25 COLLISIONS	13 COLLISIONS	12 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
FM-1695 (S Hewitt Dr) at Minute Dr facing south

Existing Condition:
FM-1695 (S Hewitt Dr) at Park Place Dr facing north

ESTIMATED COST OF IMPROVEMENT

3-B: FM-1695 (S HEWITT DR)- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
	Install Median	Phase 1: From W Warren St to I-35	$6,952,200
	Install Street Lighting		$179,400
	Sign Upgrade		$5,200
	Speed Limit Reduction		$3,500
	Install Speed Feedback Sign		$34,500
	Complete Streets with Multimodal Access	Phase 2: From W Warren St to Ritchie Rd	$6,555,000
		CONTINGENCY COST	$2,746,000
		ENGINEERING COST	$5,766,600
		TOTAL COST	**$22,242,400**

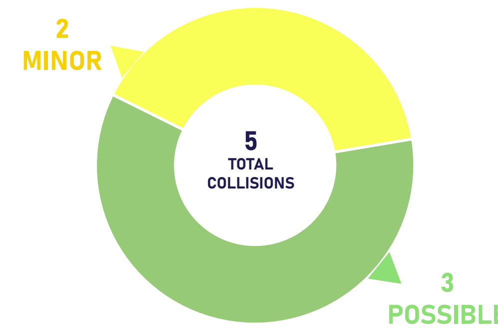
PROJECT 3-C: FM-1695 (S HEWITT DRIVE)- INTERSECTION SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

The intersection of S Hewitt Drive and Ritchie Road is a one way stop controlled T- intersection with a stop sign at Ritchie Road approach. Ritchie Road provides access to residential neighborhood and Park Hill Elementary School. The speed limit for approaching this intersection is 55 mph on S Hewitt Drive and 30 mph on Ritchie Road. This is a key intersection connecting to Hewitt City Hall, Public Library and the Fire Department.

INJURY COLLISION STATISTICS

- Pedestrian: 0
- Bicycle: 0
- Motorcycle: 0
- Automobile: 5
- Truck: 0



TRENDS

BROADSIDE	AUTOMOBILE ROW	NIGHTTIME	DUI
100%	60%	40%	20%
5 COLLISIONS	3 COLLISIONS	2 COLLISIONS	1 COLLISION

EXISTING CONDITIONS

Existing Condition:
FM-1695 (S Hewitt Dr) at Ritchie Rd facing west

Existing Condition:
FM-1695 (S Hewitt Dr) at Ritchie Rd facing east

ESTIMATED COST OF IMPROVEMENT

3-C: FM-1695 (S HEWITT DR)- INTERSECTION SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Signal	FM 1695 (S Hewitt Dr) and Ritchie Rd	$862,500
	Upgrade Striping and Revise Lane Geometry		$34,500
	Install Approach Median		$145,200
	Install Intersection Lighting		$193,500
	Pedestrian Connectivity Improvements		$151,800
		CONTINGENCY COST	$277,500
		ENGINEERING COST	$582,800
		TOTAL COST	**$2,247,800**

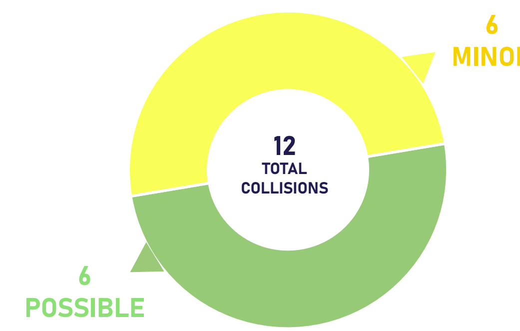
PROJECT 4: SCHOOL SAFETY IMPROVEMENTS

Fatal Injury　Serious Injury　Minor Injury　Possible Injury

S Hewitt Drive is a four-lane minor arterial with a center two-way left turn lane with a posted speed limit of 55 mph. Ritchie Road, is a two-lane major collector with a speed limit of 30 mph and Park Place Drive is a two-lane local neighborhood street with a 30 mph speed limit. This project will provide multimodal connectivity to Castleman Creek Elementary School, and Park Hill Elementary School.

INJURY COLLISION STATISTICS

0
0
1
11
0



TRENDS

BROADSIDE	AUTOMOBILE ROW	NIGHTTIME	DISTRACTED DRIVING
83%	58%	25%	25%
10 COLLISIONS	7 COLLISIONS	3 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Ritchie Rd at Ellis Farm Rd facing west

Existing Condition:
Park Place Rd at Vanessa Dr facing east

ESTIMATED COST OF IMPROVEMENT

4: SCHOOL SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Pedestrian Connectivity Improvements: Sidewalks and Crosswalks	S Hewitt Dr (From Kiowa Trail to Ritchie Rd)	$344,600
		Ritchie Rd (From Hewitt Dr to Park Place Dr)	$1,104,900
		Park Place Dr	$2,116,600
		CONTINGENCY COST	$713,300
		ENGINEERING COST	$1,497,800
		TOTAL COST	**$5,777,200**

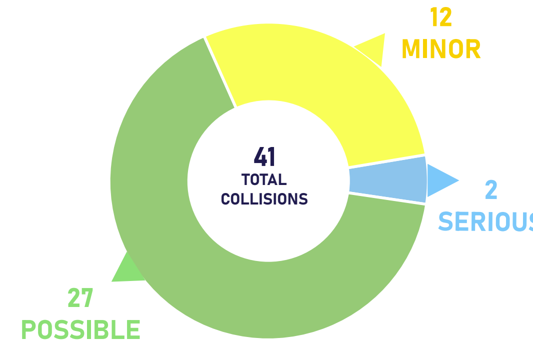
PROJECT 5: OLD TEMPLE ROAD- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Old Temple Road, a two-lane major collector, provides access to residential neighborhoods. The speed limit is set at 30 mph.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	2
Car	37
Truck	2



TRENDS

INTERSECTION	BROADSIDE	NIGHTTIME	DISTRACTED DRIVING
85%	66%	34%	22%
35 COLLISIONS	27 COLLISIONS	14 COLLISIONS	9 COLLISIONS

EXISTING CONDITIONS

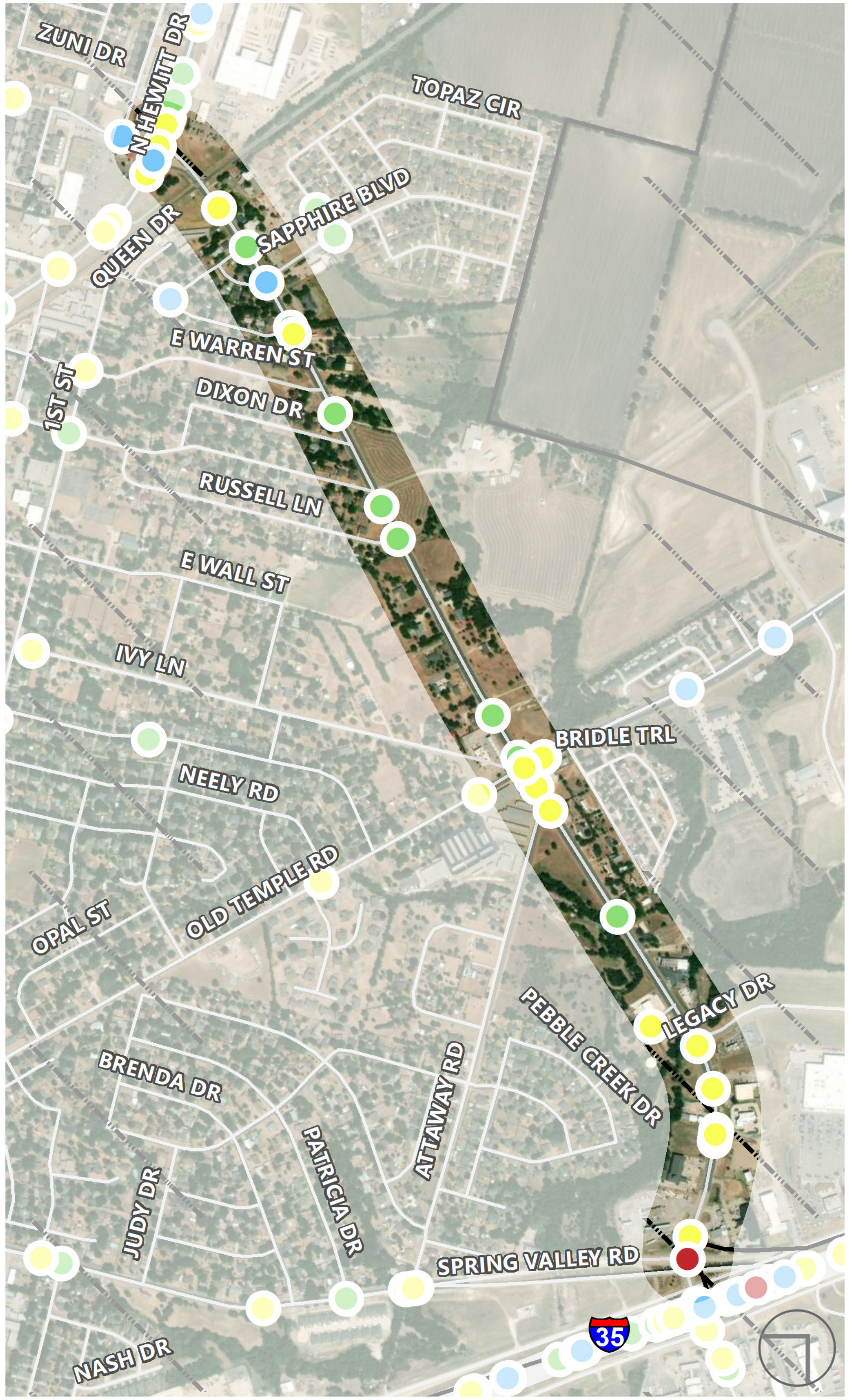
Existing Condition:
Old Temple Rd at Glenleigh Dr facing north

Existing Condition:
Old Temple Rd at Ruth Dr facing south

ESTIMATED COST OF IMPROVEMENT

5: OLD TEMPLE RD- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping	From FM-1695 (S Hewitt Dr) to FM-2063 (Sun Valley Blvd)	$148,500
	Install Street Lighting		$523,300
	Minor Street Improvements		$21,500
	Install Speed Feedback Sign		$69,000
		CONTINGENCY COST	$152,500
		ENGINEERING COST	$320,200
		TOTAL COST	**$1,235,000**

PROJECT 6: FM- 2063 (SUN VALLEY BOULEVARD)- CORRIDOR SAFETY IMPROVEMENTS

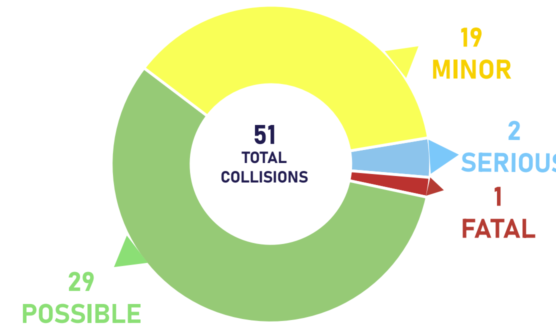


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Sun Valley Boulevard, a four-lane minor arterial with a center two-way left turn lane provides access to commercial developments and residential neighborhoods. The speed limit is set at 55 mph throughout the corridor.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Automobile	47
Truck	3



TRENDS

INTERSECTION	BROADSIDE	DISTRACTED DRIVING	AUTOMOBILE ROW
90%	75%	29%	27%
46 COLLISIONS	38 COLLISIONS	15 COLLISIONS	14 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
FM-2063 (Sun Valley Blvd) at Attaway Rd facing east

Existing Condition:
FM-2063 (Sun Valley Blvd) at Dixon Dr facing west

ESTIMATED COST OF IMPROVEMENT

6: FM-2063 (SUN VALLEY BOULEVARD)- CORRIDOR SAFETY IMPROVEMENTS

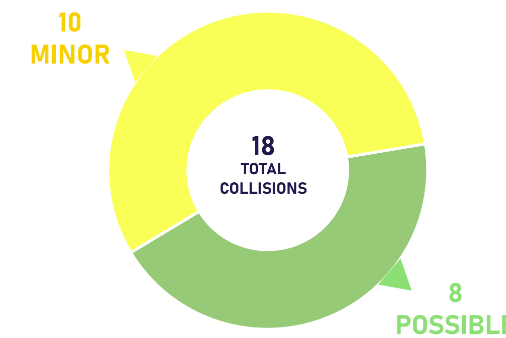
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Install Median	From FM-1695 (N Hewitt Dr) to FM-2113 (Spring Valley Rd)	$1,472,900
Upgrade Striping		$119,600
Install Speed Feedback Sign		$34,500
Install Street Lighting		$472,700
Minor Street Striping and Sign Improvements		$8,600
Upgrade Signal Hardware		$29,900
Pedestrian Connectivity Improvements		$2,264,100
Protected Left Turn Improvements		$22,100
	CONTINGENCY COST	$884,900
	ENGINEERING COST	$1,858,300
	TOTAL COST	**$7,167,600**

PROJECT 7: WARREN STREET – CORRIDOR SAFETY IMPROVEMENTS

W Warren Street, between S Hewitt Drive and Ritchie Road is a two lane major collector while the rest of the corridor is a local residential street. The posted speed limit is set at 30 mph throughout the corridor. W Warren Street transverses into E Warren Street upon intersecting with 1st Street, a minor residential road that stretches all the way to Sun Valley Boulevard. E Warren Street terminates at Sun Valley Boulevard.

INJURY COLLISION STATISTICS

- 1
- 0
- 1
- 16
- 0



TRENDS

INTERSECTION	BROADSIDE	DISREGARD OF SIGNS & SIGNALS	AUTOMOBILE ROW
89%	61%	22%	22%
16 COLLISIONS	11 COLLISIONS	4 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
W Warren St at Bonham Dr facing east

Existing Condition:
W Warren St at Texas Ave facing west

ESTIMATED COST OF IMPROVEMENT

7: WARREN ST- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping		$71,800
	Install Street Lighting	From FM 2063 (Sun Valley Blvd) to Ritchie Rd	$296,700
	Minor Street Improvements		$9,300
		CONTINGENCY COST	$75,600
		ENGINEERING COST	$158,700
		TOTAL COST	**$612,100**

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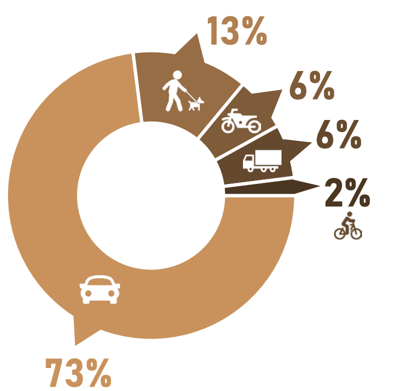
CHAPTER 6.3: CITY OF LACY LAKEVIEW

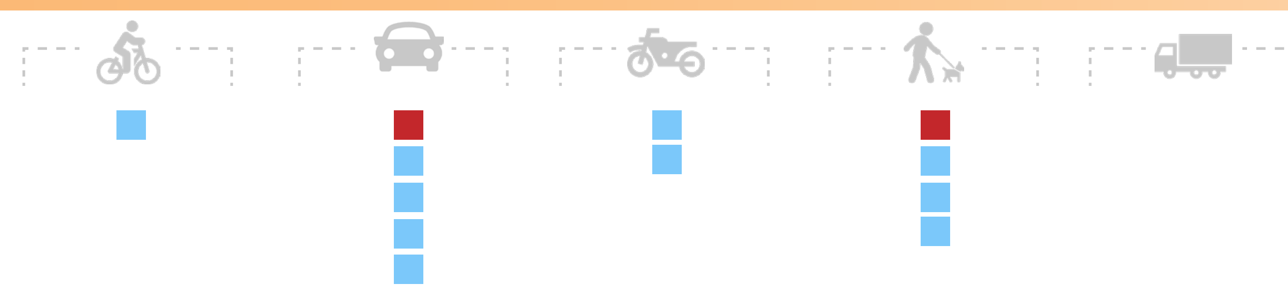
INTRODUCTION

Lacy Lakeview, located north of Waco, is a city in central McLennan County. Both I-35 and US-84 run through Lacy Lakeview. The city has an estimated population of 6,988 according to the 2020 census. This chapter provides information on the City of Lacy Lakeview's collision statistics from 2014 to 2023. A total of 62 collisions occurred on Lacy Lakeview streets in the last 10 years, including two fatalities and 10 serious injuries. TxDOT roadways within Lacy Lakeview city limits had 396 collisions during the same period, with eight fatal injuries and 62 serious injuries. On city-maintained roads, minor injuries accounted for approximately 44 percent of injury collisions on city-maintained roads, whereas possible injuries were the most commonly reported (43 percent) on roads maintained by TxDOT.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**62**	**100 %**	**396**	**100 %**
Fatal Injury	2	3.23 %	8	2.02 %
Serious Injury	10	16.13 %	62	15.66 %
Minor Injury	27	43.55 %	155	39.14 %
Possible Injury	23	37.10 %	171	43.18 %
Total Persons Involved	**82**	**100 %**	**577**	**100 %**
Fatal Injury	2	2.44 %	8	1.39 %
Serious Injury	13	15.85 %	70	12.13 %
Minor Injury	36	43.90 %	232	40.21 %
Possible Injury	31	37.80 %	267	46.27 %

COLLISIONS BY MODE - CITY

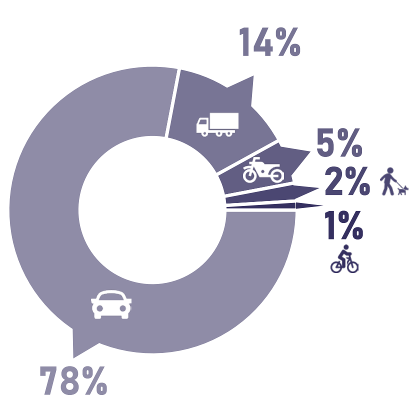


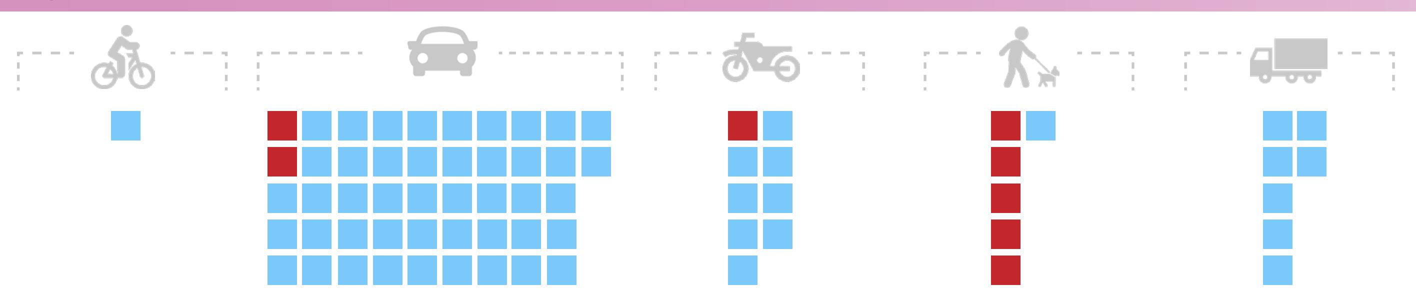


Note : Each box represents one fatal or severe injury collision.

0 %	2 %	0 %	13 %	0 %	Fatal Injury
100 %	9 %	50 %	38 %	0 %	Serious Injury
0 %	44 %	50 %	50 %	25 %	Minor Injury
0 %	44 %	0 %	0 %	75 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

0 %	1 %	6 %	50 %	0 %	Fatal Injury
33 %	15 %	44 %	10 %	13 %	Serious Injury
67 %	39 %	39 %	20 %	44 %	Minor Injury
0 %	46 %	11 %	20 %	44 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

CITY OF LACY LAKEVIEW

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisions between collisions on Lacy Lakeview city streets, TxDOT facilities, and McLennan County across various categories. On Lacy Lakeview city streets, there were a total of 62 collisions, resulting in 82 persons injured. In comparison, TxDOT reported a total of 396 collisions resulting in 577 persons injured within Lacy Lakeview city limits.

This section also identifies several major collision trends on Lacy Lakeview city streets, including hit object collisions, broadside collisions, distracted driving, and nighttime collisions. On TxDOT roadways, the prominent trends were broadside collisions, rear end collisions, right-of-way violations by automobiles, and unsafe speed violations. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. Of the speed limits examined, the charts indicate that roads with a 45 mph speed limit accounted for the highest proportion of severe injury collisions and roads with a 70 mph speed limit accounted for the highest proportion of fatal collisions.

CITY	TxDOT
62 TOTAL COLLISIONS	396 TOTAL COLLISIONS
82 TOTAL PERSONS INJURED	577 TOTAL PERSONS INJURED

PERSONS INVOLVED

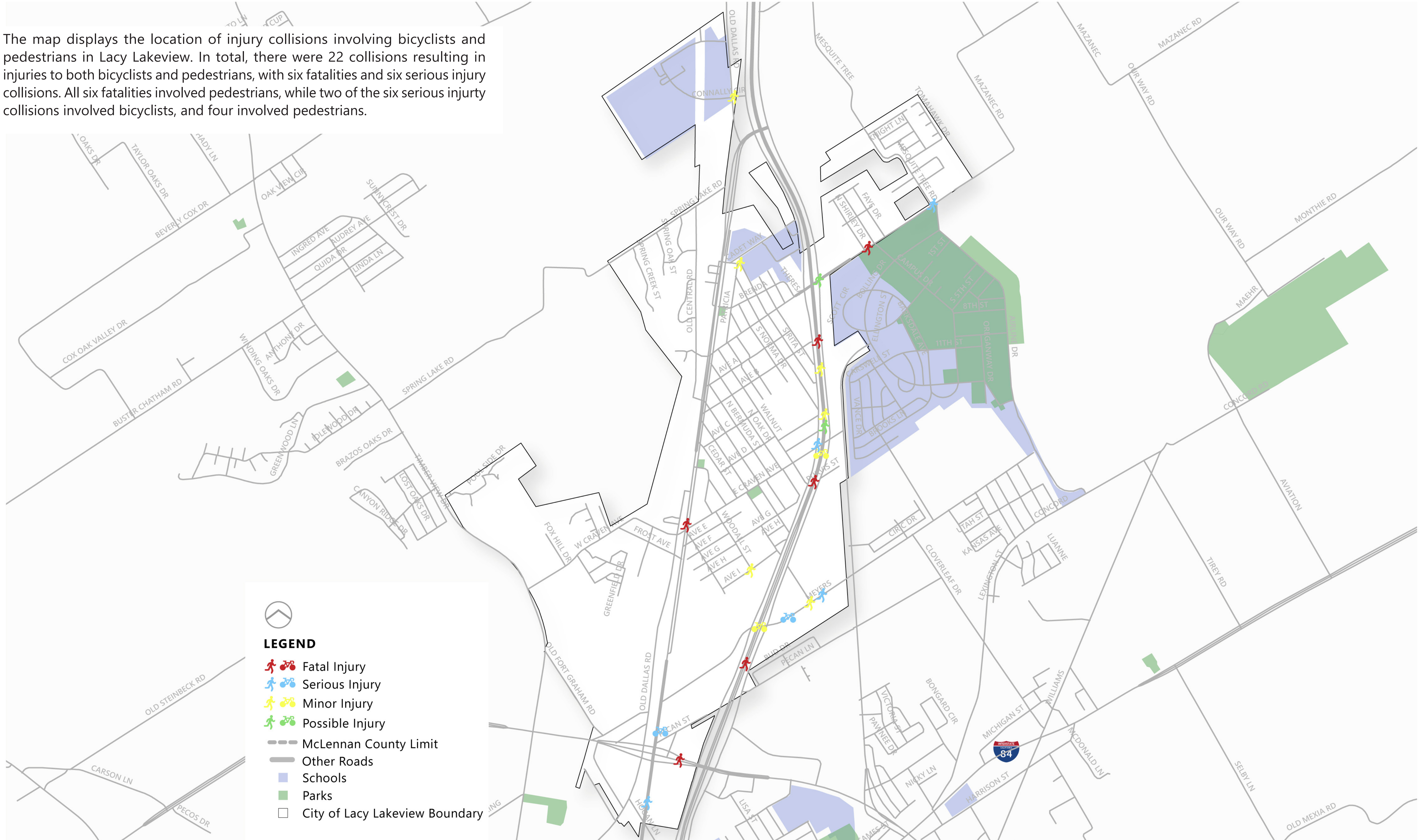
	CITY				TxDOT			
MODE								
Bicycle	0 %	2 %	0 %	0 %	0 %	0 %	0 %	0 %
Car	1 %	7 %	35 %	38 %	0 %	10 %	38 %	45 %
Motorcycle	0 %	2 %	2 %	0 %	0 %	2 %	2 %	0 %
Pedestrian	1 %	4 %	5 %	0 %	1 %	0 %	0 %	0 %
Truck	0 %	0 %	1 %	0 %	0 %	1 %	1 %	1 %
AGE								
Below 15	0 %	1 %	12 %	1 %	0 %	1 %	3 %	5 %
15 - 65	2 %	14 %	27 %	32 %	1 %	10 %	33 %	37 %
Above 65	0 %	0 %	5 %	5 %	0 %	1 %	5 %	4 %
GENDER								
Male	0 %	13 %	22 %	11 %	1 %	6 %	19 %	16 %
Female	2 %	2 %	22 %	27 %	1 %	6 %	21 %	30 %

CITY OF LACY LAKEVIEW VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	2 %	Bicycle	1 %	Bicycle	1 %
Car	73 %	Car	78 %	Car	85 %
Motorcycle	6 %	Motorcycle	5 %	Motorcycle	4 %
Pedestrian	13 %	Pedestrian	3 %	Pedestrian	3 %
Truck	6 %	Truck	14 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	44 %	Motor Vehicle in Transport	79 %	Motor Vehicle in Transport	72 %
Fixed Object	31 %	Fixed Object	13 %	Fixed Object	17 %
Pedestrian	13 %	Overturned	4 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	56 %	Broadside	44 %	Broadside	42 %
Broadside	34 %	Rear End	24 %	Hit Object	28 %
Rear End	6 %	Hit Object	21 %	Rear End	24 %
Sideswipe	2 %	Sideswipe	9 %	Sideswipe	5 %
VIOLATION CATEGORY					
Automobile Right-of-way	19 %	Automobile Right-of-way	28 %	Unsafe Speed	23 %
Distracted Driving	13 %	Unsafe Speed	21 %	Automobile Right-of-way	22 %
Driving/ Bicycling under Influence	11 %	Traffic Signals and Signs	9 %	Traffic Signals and Signs	12 %
Other Unforeseen Reasons	11 %	Distracted Driving	7 %	Distracted Driving	8 %
Unsafe Speed	10 %	Other Unforeseen Reasons	7 %	Other Improper Driving	6 %
Other Improper Driving	8 %	Unsafe Lane Change	6 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	50 %	Intersection	56 %	Intersection	59 %
Roadway	50 %	Roadway	44 %	Roadway	41 %
LIGHTING					
Daylight	65 %	Daylight	74 %	Daylight	70 %
Dark, Not Lighted	24 %	Dark, Lighted	15 %	Dark, Lighted	16 %
Dark, Lighted	10 %	Dark, Not Lighted	9 %	Dark, Not Lighted	11 %

BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

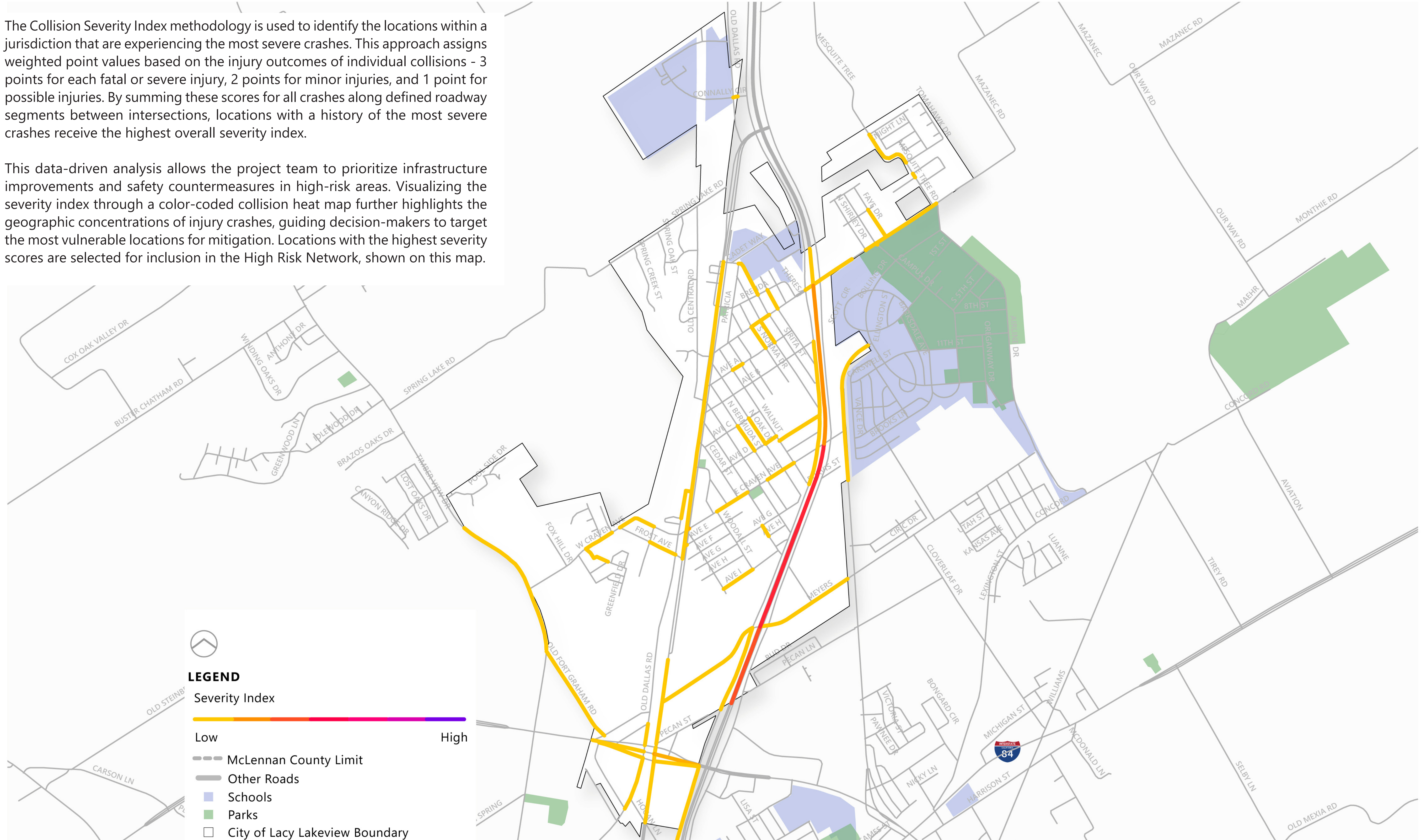
The map displays the location of injury collisions involving bicyclists and pedestrians in Lacy Lakeview. In total, there were 22 collisions resulting in injuries to both bicyclists and pedestrians, with six fatalities and six serious injury collisions. All six fatalities involved pedestrians, while two of the six serious injurty collisions involved bicyclists, and four involved pedestrians.



SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

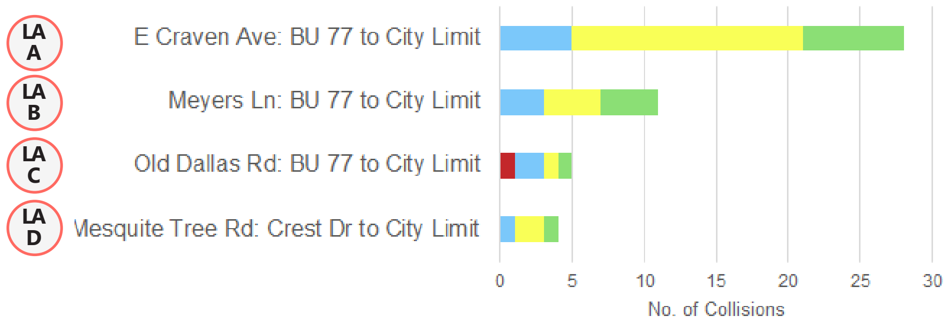
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



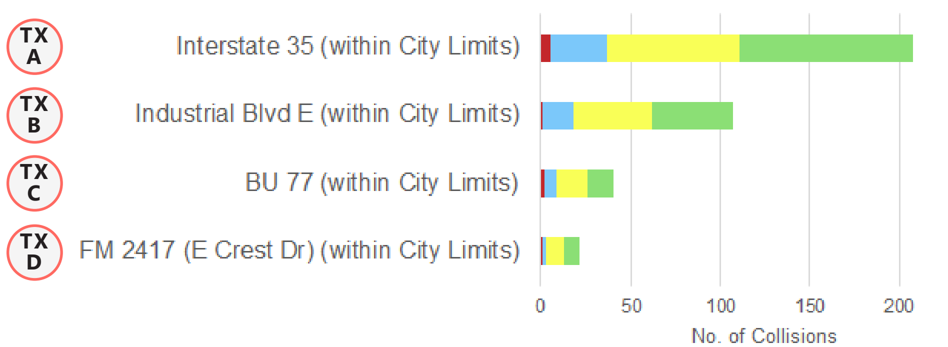
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within Lacy Lakeview city limits. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

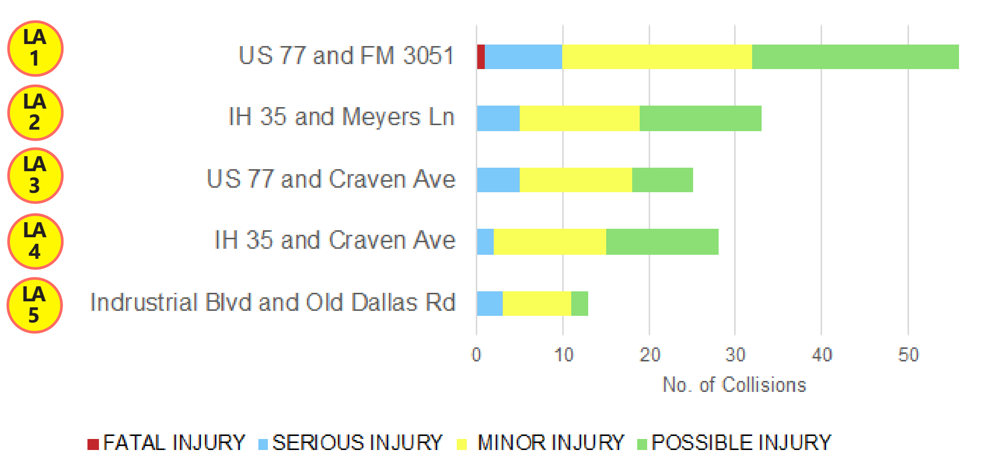
ROADWAYS

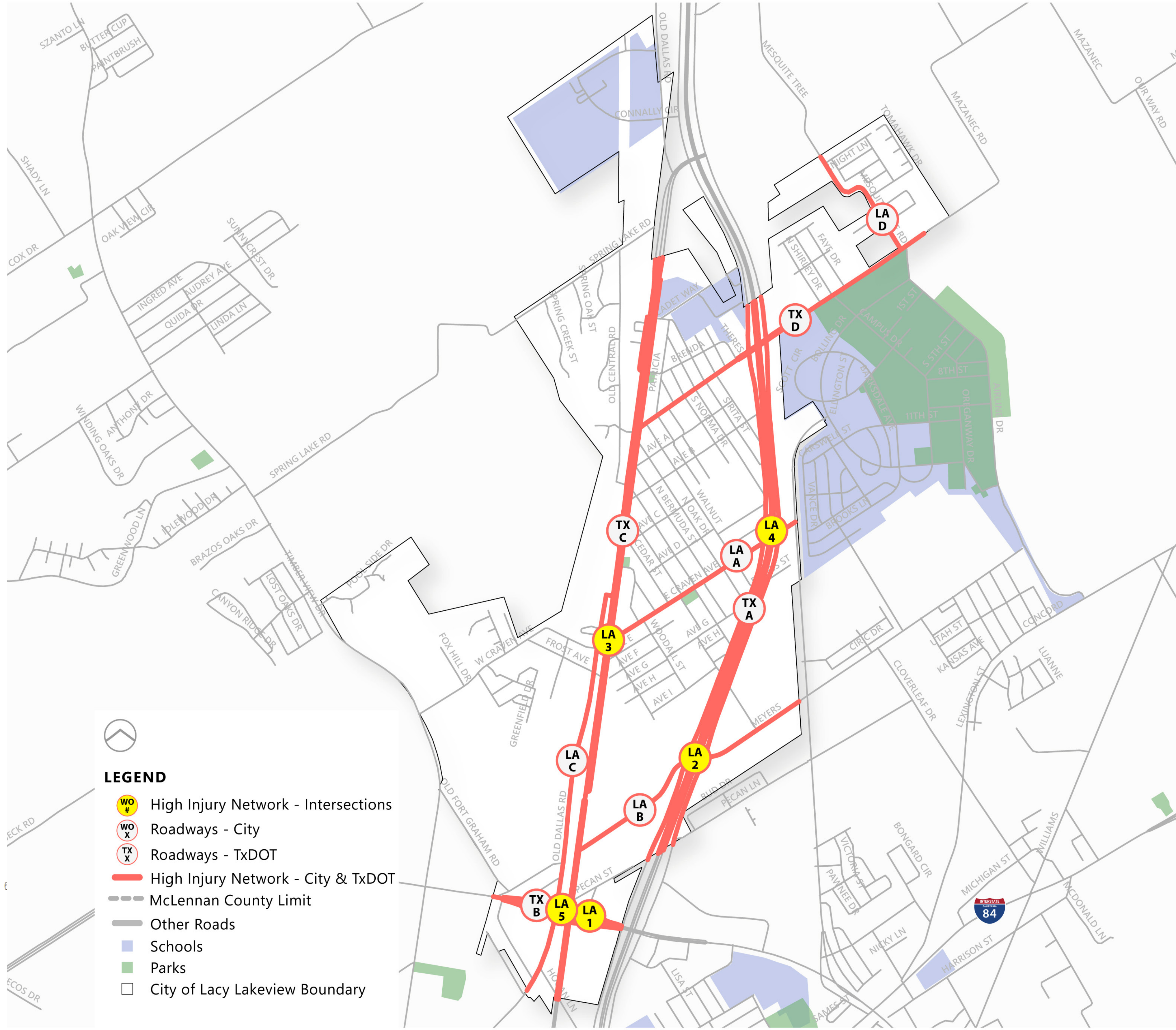


TxDOT ROADWAYS



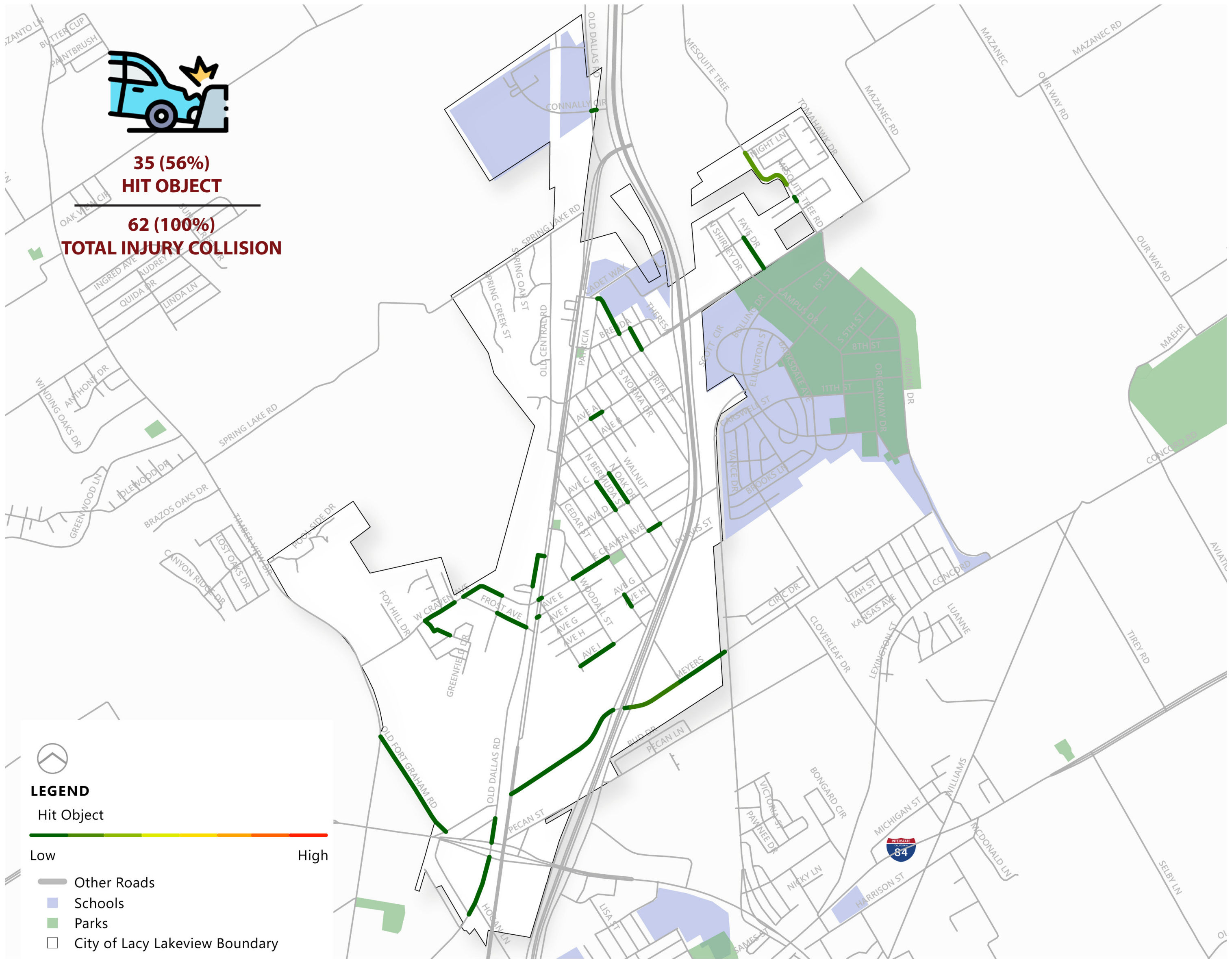
INTERSECTIONS





PROFILES - CITY

PROFILE 1 - HIT OBJECT



SEVERITY

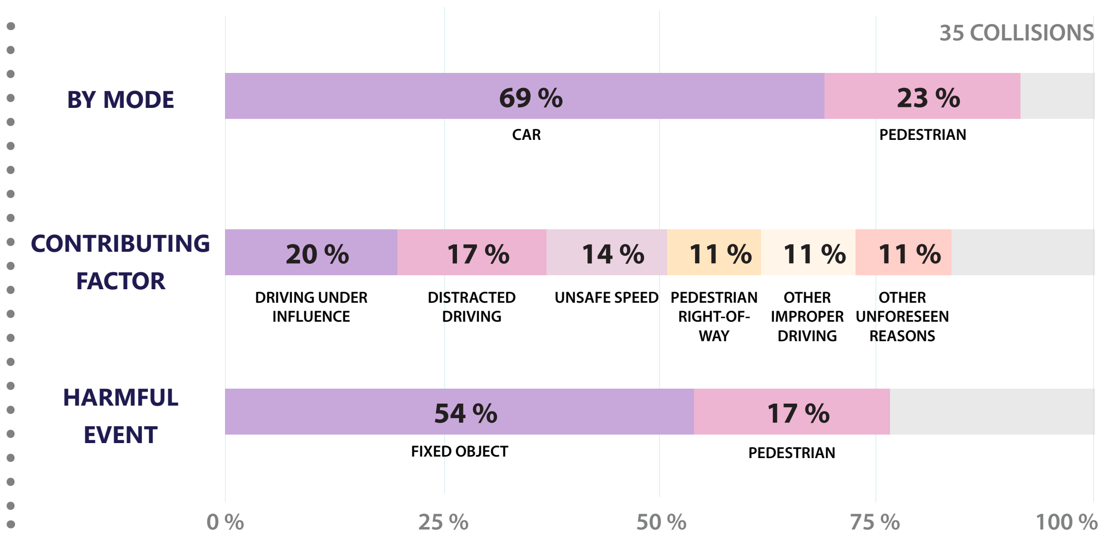
6 %
23 %
43 %
28 %

LOCATION

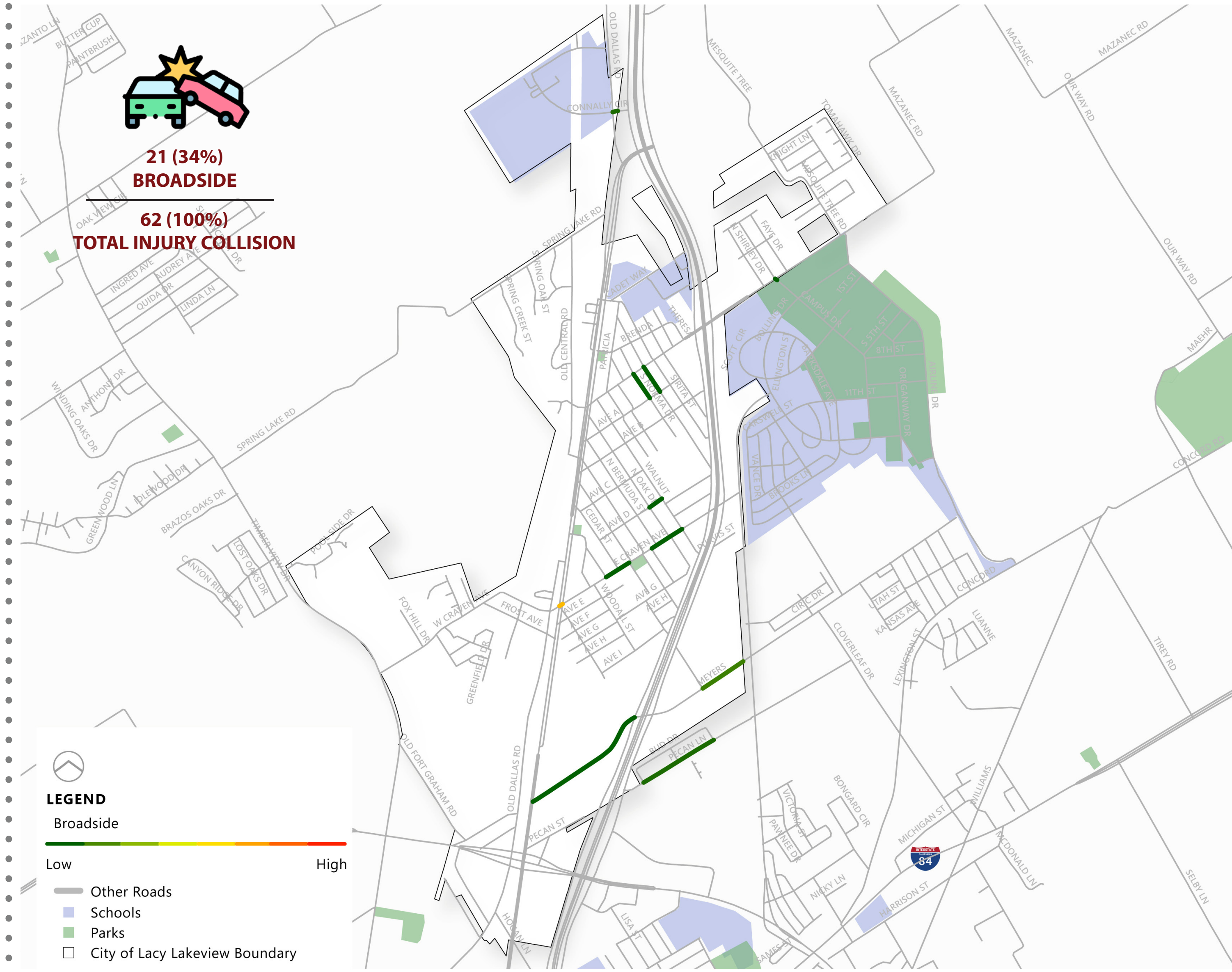
17 %
83 %

LIGHTING

51 %
3 %
11 %
34 %



PROFILE 2 - BROADSIDE



SEVERITY

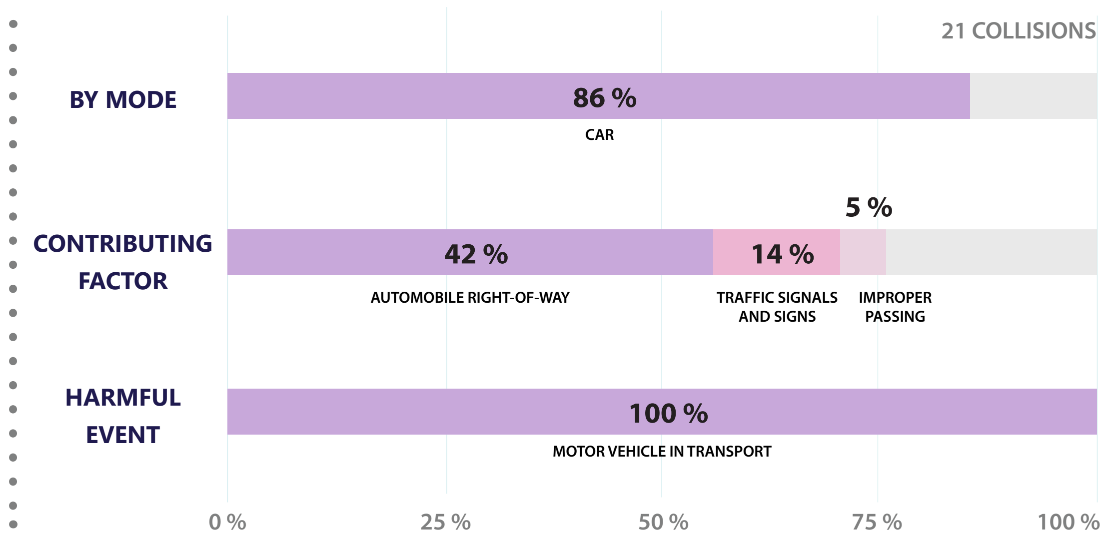
0 %
0 %
52 %
48 %

LOCATION

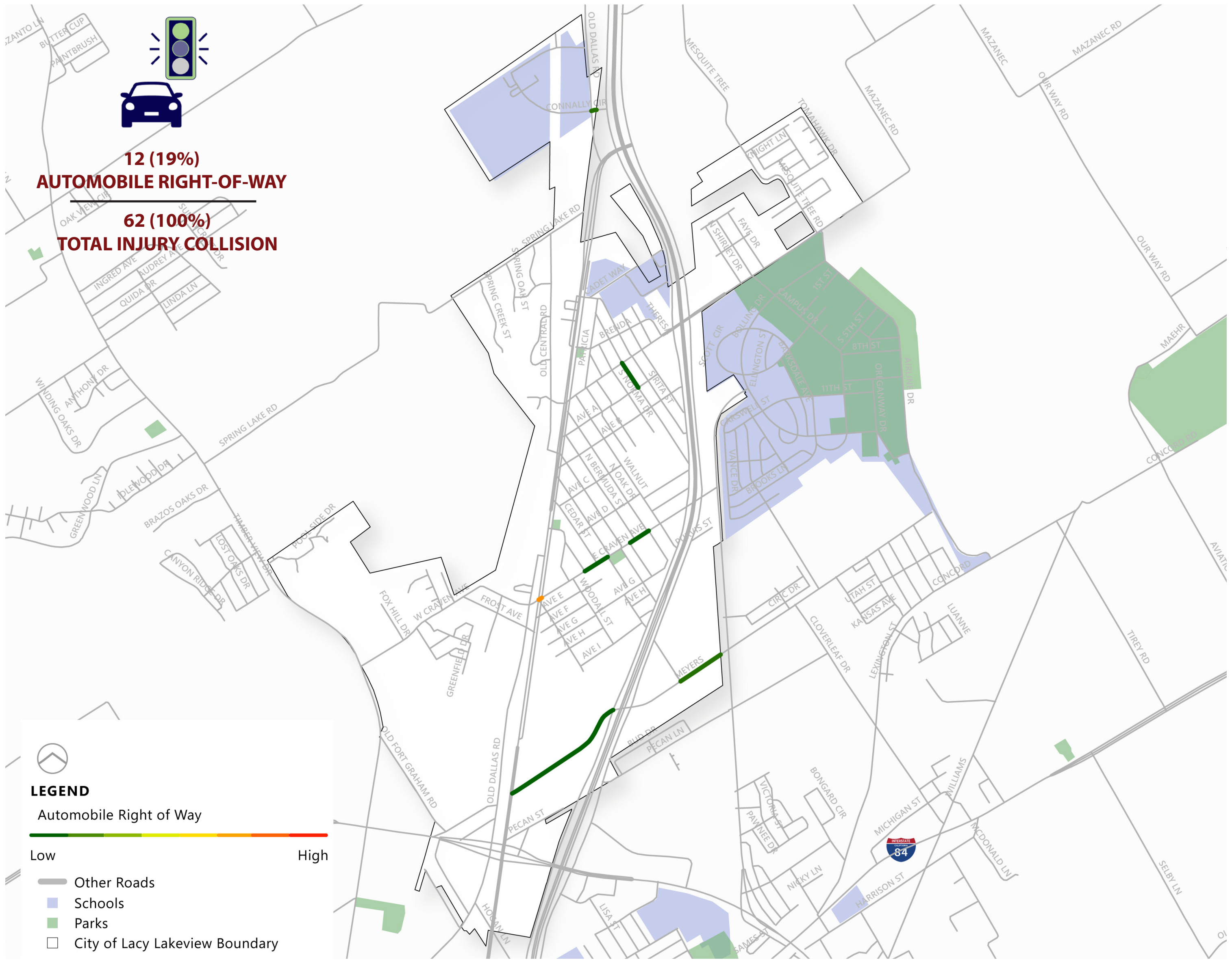
95 %
5 %

LIGHTING

90 %
0 %
5 %
5 %



PROFILE 3 - AUTOMOBILE RIGHT-OF-WAY



SEVERITY

0 % | 0 % | 42 % | 58 %

LOCATION

92 % | 8 %

LIGHTING

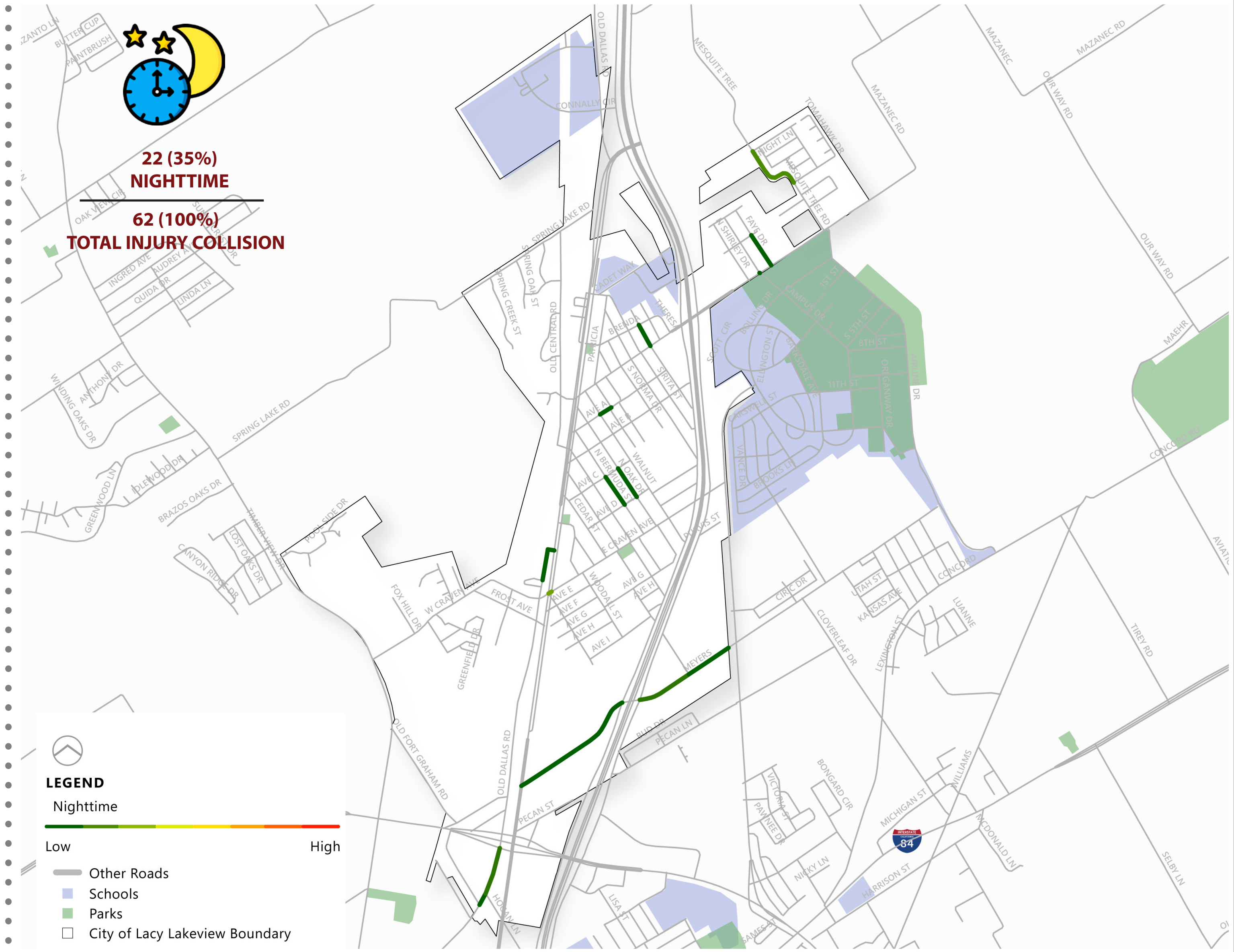
92 % | 0 % | 8 % | 0 %

12 COLLISIONS

BY MODE	75 % CAR
MANNER OF COLLISION	100 % BROADSIDE
HARMFUL EVENT	100 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILE 4 - NIGHTTIME



SEVERITY

9 % | 32 % | 27 % | 32 %

LOCATION

23 % | 77 %

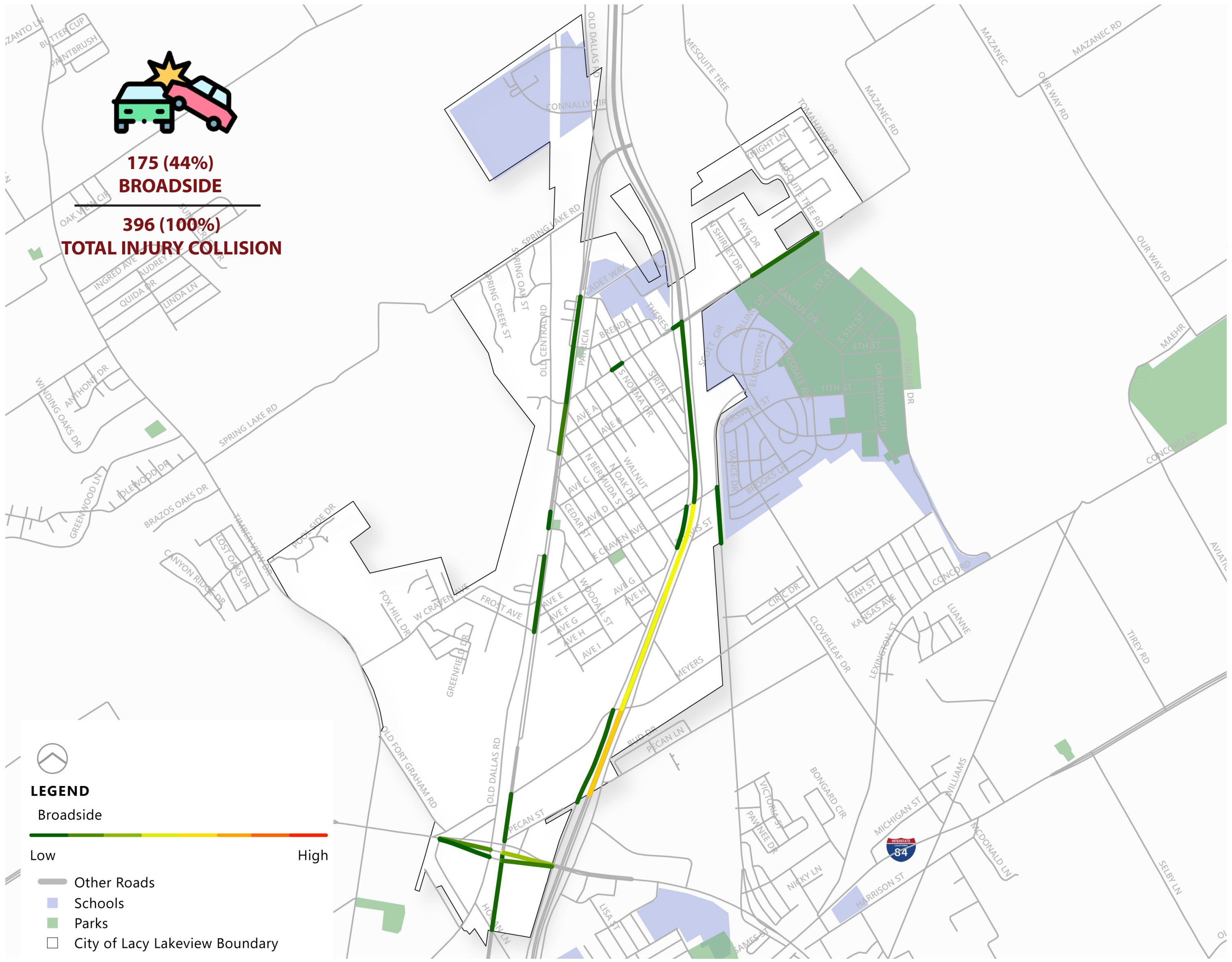
22 COLLISIONS

BY MODE	68 % CAR; 23 % PEDESTRIAN
MANNER OF COLLISION	77 % HIT OBJECT; 9 % BROADSIDE
FIRST HARMFUL EVENT	32 % FIXED OBJECT; 23 % MOTOR VEHICLE IN TRANSPORT; 23 % PEDESTRIAN
CONTRIBUTING FACTORS	23 % DRIVING UNDER INFLUENCE; 18 % OTHER UNFORESEEN REASONS; 9 % PEDESTRIAN RIGHT-OF-WAY; 9 % UNKNOWN; 9 % DISTRACTED DRIVING; 9 % UNSAFE SPEED

0 % 25 % 50 % 75 % 100 %

PROFILES - TXDOT

PROFILE 1 - BROADSIDE



SEVERITY

1 % | 15 %

42 % | 42 %

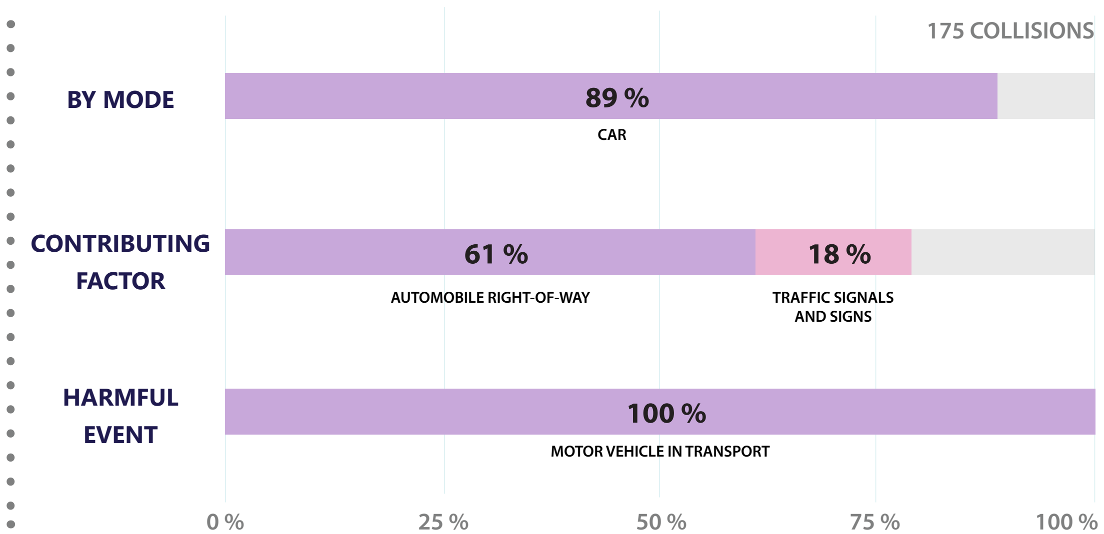
LOCATION

96 % | 4 %

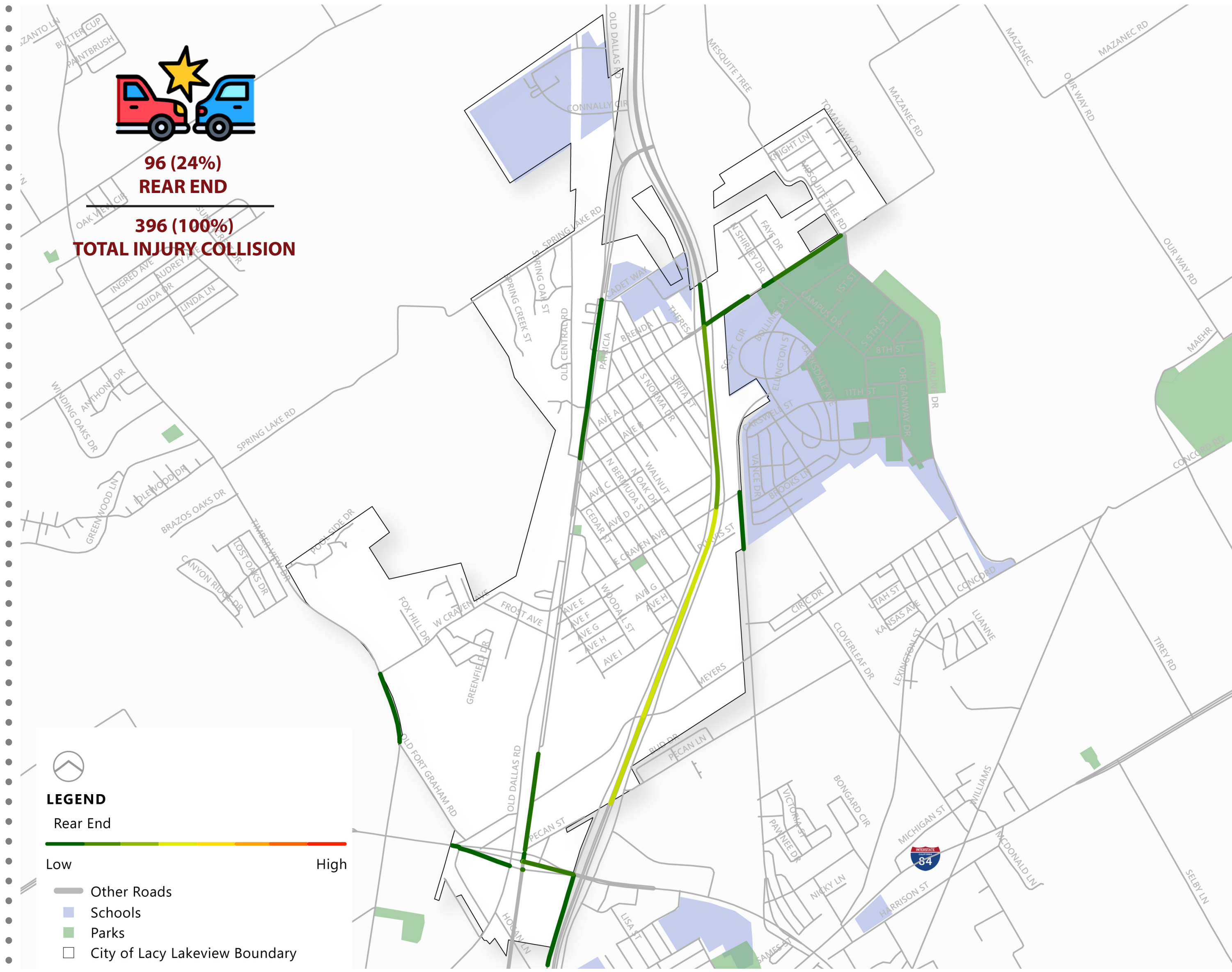
LIGHTING

83 % | 2 %

11 % | 4 %



PROFILE 2 - REAR END



SEVERITY

1 % | 8 %

45 % | 46 %

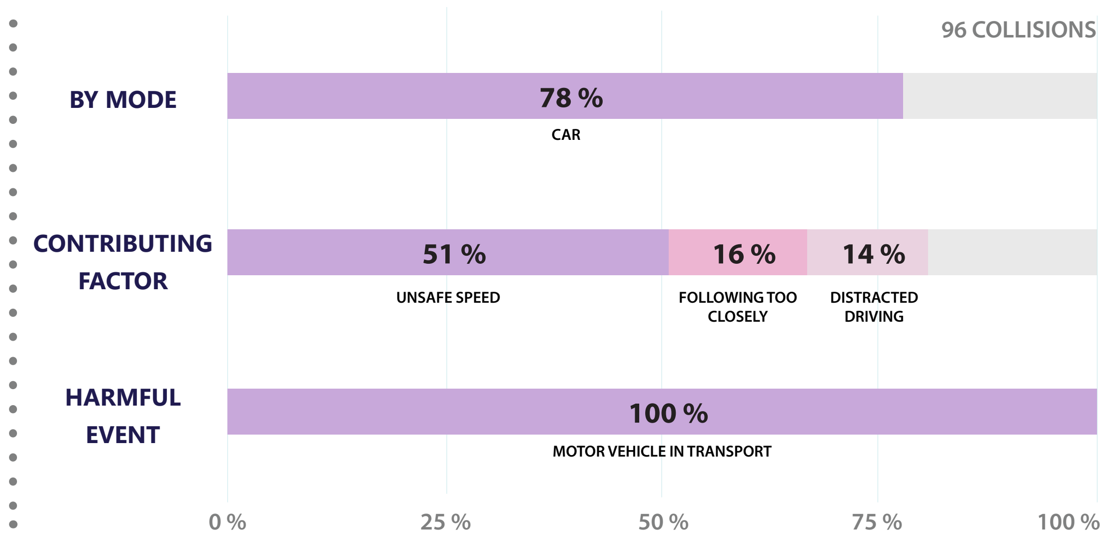
LOCATION

34 % | 66 %

LIGHTING

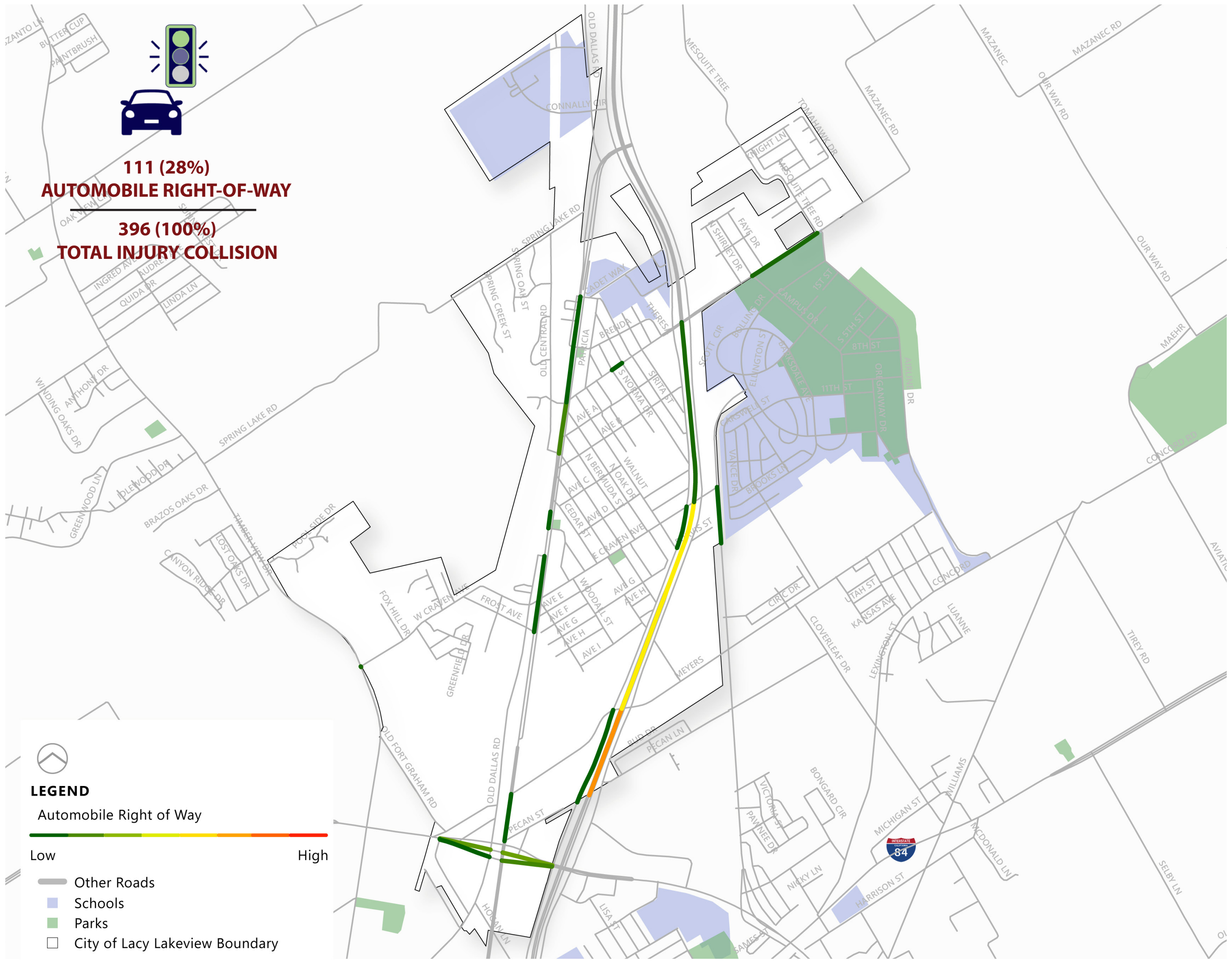
79 % | 2 %

14 % | 5 %



PROFILES - TXDOT

PROFILE 3 - AUTOMOBILE RIGHT-OF-WAY



SEVERITY

0 % | 15 %

41 % | 44 %

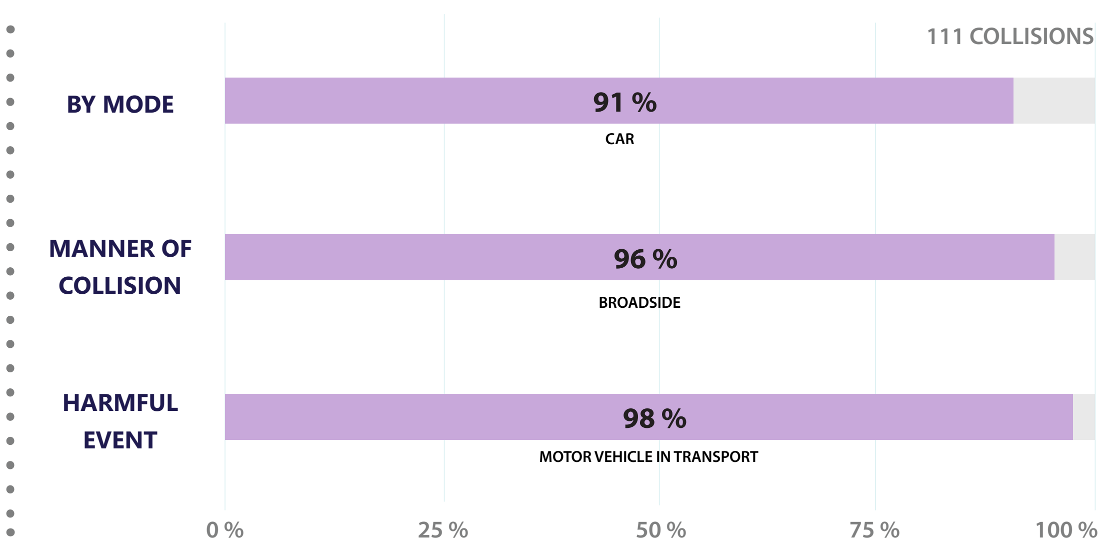
LOCATION

97 % | 3 %

LIGHTING

86 % | 1 %

6 % | 7 %



PROFILE 4 - UNSAFE SPEED

SEVERITY

1 % | 11 %

43 % | 45 %

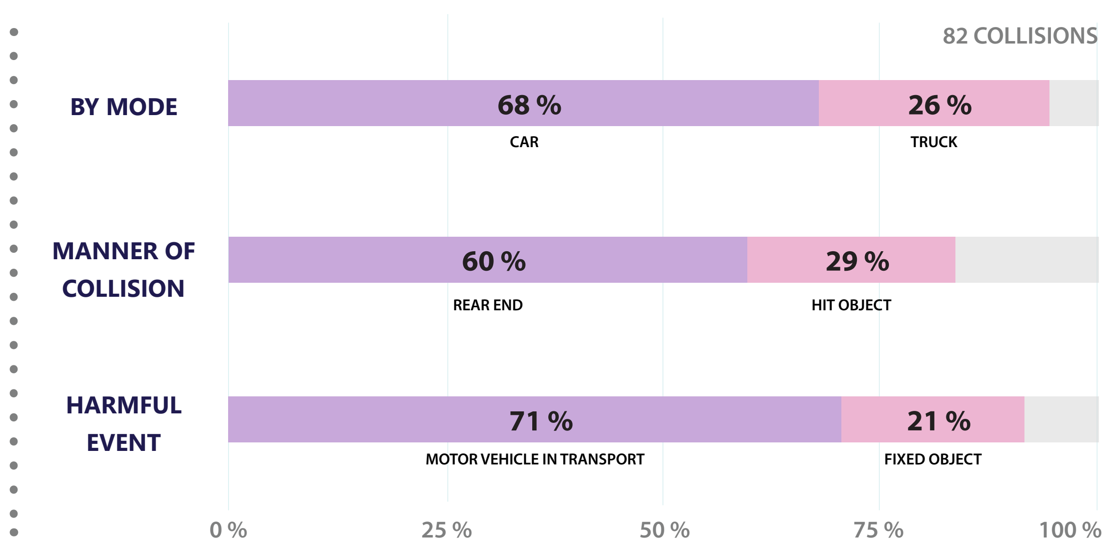
LOCATION

21 % | 79 %

LIGHTING

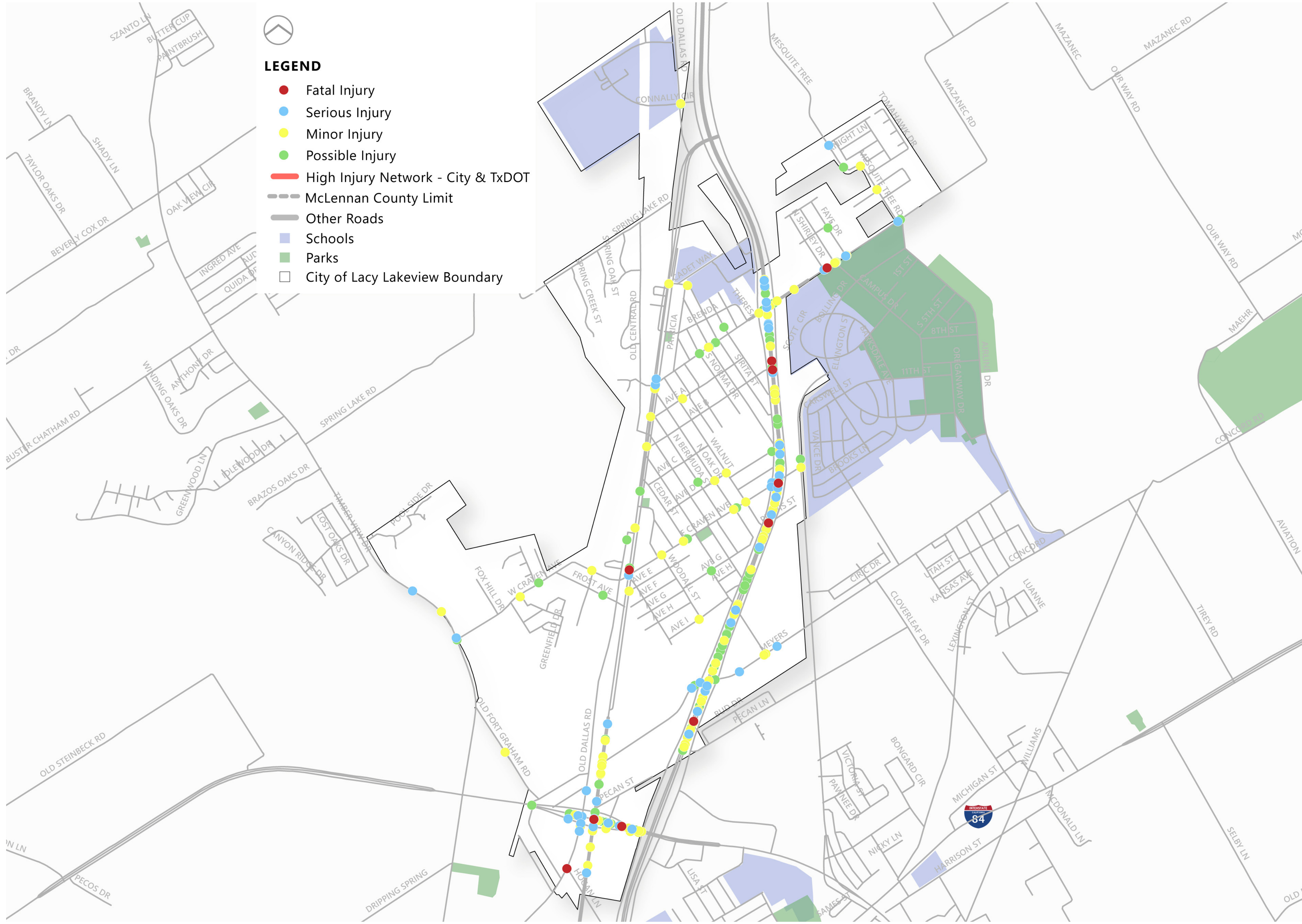
68 % | 2 %

23 % | 6 %



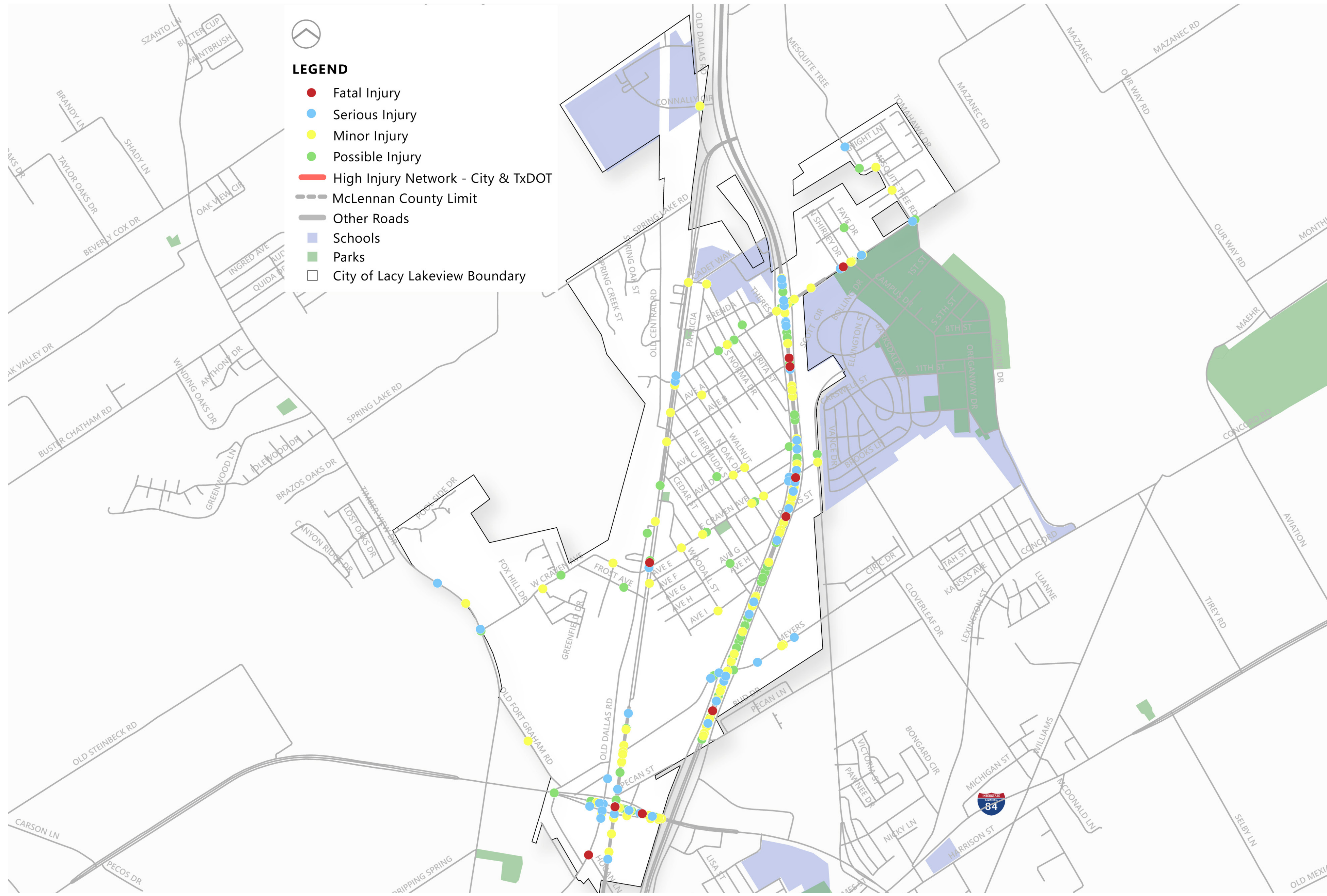
SAFE ROUTES TO SCHOOL

The City of Lacy lakeview recognizes the importance of providing safe and accessible transportation options for students traveling to and from local schools. Currently, many neighborhoods lack sufficient pedestrian and bicycle infrastructure to allow children to safely walk or bike to school. This poses safety risks and discourages active transportation, leading to increased vehicle congestion and emissions around school zones. To address these concerns, the city is proposing to conduct a Supplemental Planning Study to evaluate the feasibility of implementing a comprehensive Safe Routes to School program. The study would involve assessing existing conditions, identifying key routes and infrastructure needs, and engaging with the community - including school districts, parents, and students - to develop a strategic plan for improving sidewalks, crosswalks, signage, and other safety enhancements around Lacy Lakeview schools. By investing in this planning effort, the city aims to remove barriers, promote healthy and sustainable transportation choices, and ensure the safety of its youngest residents as they commute to and from their places of learning.



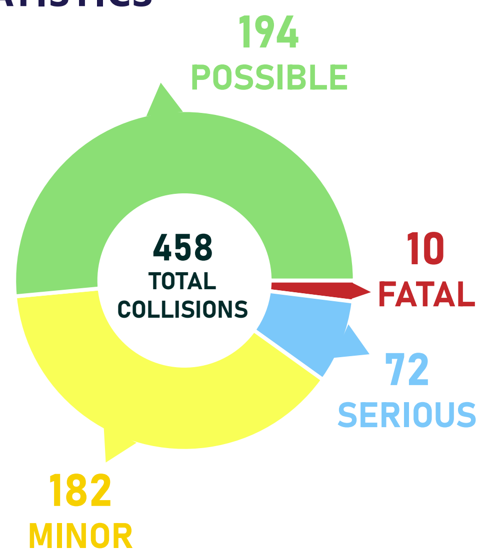
PROJECT 1: CITYWIDE SIGN INVENTORY & PAVEMENT DELINEATION

The City of Lacy Lakeview is proposing a Citywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the city.



INJURY COLLISION STATISTICS

- 18
- 4
- 22
- 355
- 59



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE RIGHT-OF-WAY	HIT OBJECT
55%	43%	27%	26%
253 COLLISIONS	196 COLLISIONS	123 COLLISIONS	120 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Sign Inventory, Replacement & Installation	Citywide	$407,100
	Citywide Pavement Delineation	Citywide	$2,211,800
		CONTINGENCY COST	$523,800
		ENGINEERING COST	$785,700
		TOTAL COST	**$3,928,400**

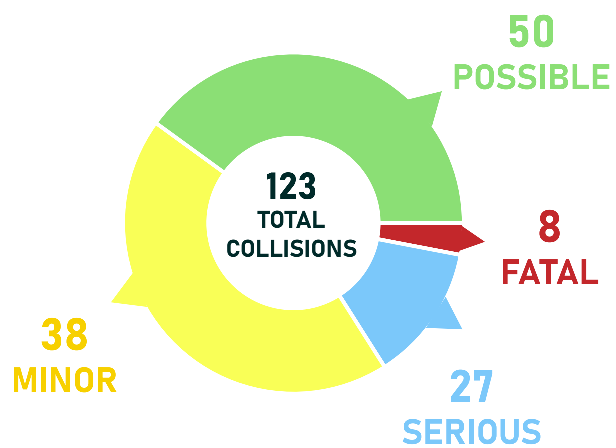
PROJECT 2: CITYWIDE STREET LIGHT INVENTORY

The City of Lacy Lakeview is proposing a Citywide Streetlight Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the city to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating Lacy Lakeview's streets during the nighttime hours.

Note : Nighttime Injury Collisions

NIGHTTIME INJURY COLLISION STATISTICS

13
2
7
83
18



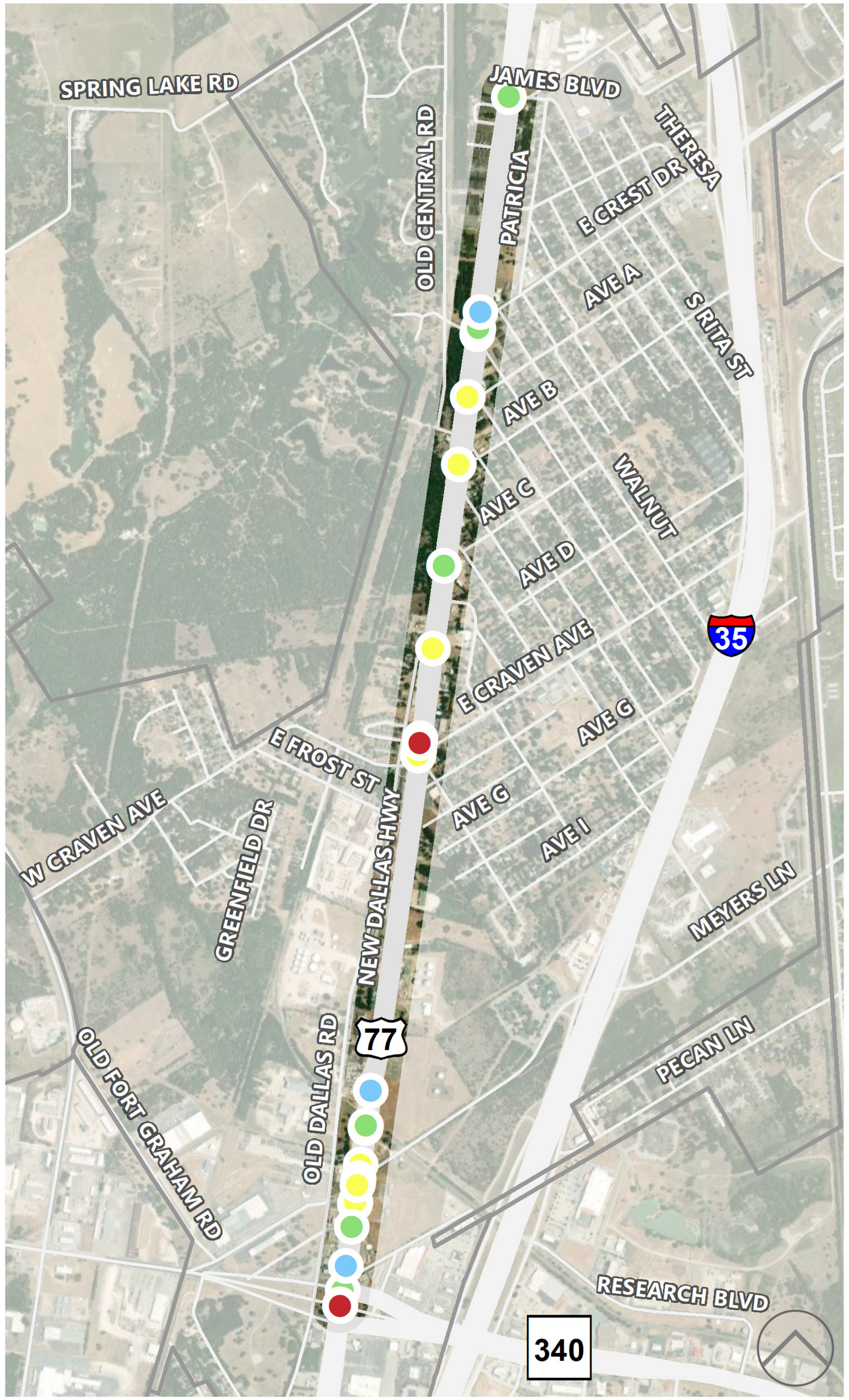
TRENDS

HIT OBJECT	INTERSECTION	BROADSIDE	UNSAFE SPEED
46%	37%	25%	23%
57 COLLISIONS	45 COLLISIONS	31 COLLISIONS	28 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Citywide Street Light Inventory	Citywide	$4,025,000
		CONTINGENCY COST	$805,000
		ENGINEERING COST	$1,690,500
		TOTAL COST	**$6,520,500**

PROJECT 3-A: BU-77 (NEW DALLAS HIGHWAY) CORRIDOR SAFETY IMPROVEMENTS

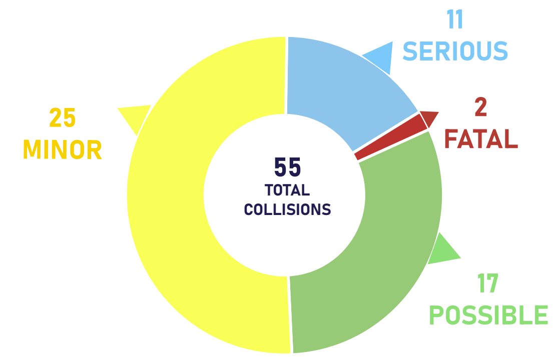


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

New Dallas Highway, also referred to as US Business 77, is a four-lane divided minor arterial traverses through Lacy Lakeview, running parallel to I-35. The posted speed limit is 45 mph on this section of New Dallas Highway. US Business 77 provides access to Connally High School, and Connally Elementary School. The project for the corridor of US Business 77 (New Dallas Highway) is presented in two phases (Phase A and B). Project 3-A entails the installation of medians, street Lighting, and sidewalks throughout the corridor, while Project 3-B proposes complete street improvements including the full reconstruction of the corridor.

INJURY COLLISION STATISTICS

- Pedestrian: 1
- Bicycle: 1
- Motorcycle: 3
- Car: 44
- Truck: 6



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	NIGHTTIME
78%	58%	45%	25%
43 COLLISIONS	32 COLLISIONS	25 COLLISIONS	14 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
BU-77 (New Dallas Hwy) at E Frost St facing north

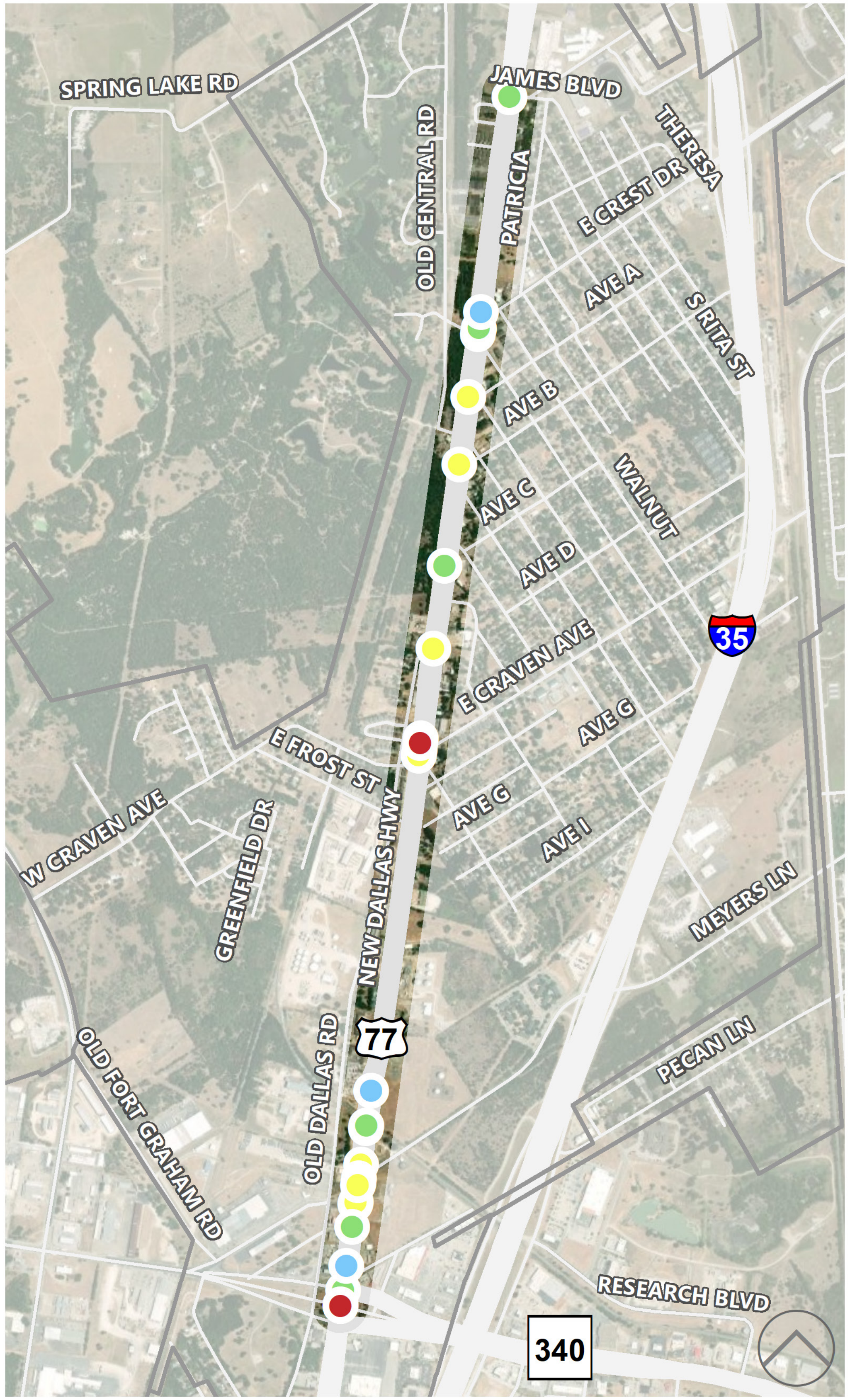
Existing Condition:
BU-77 (New Dallas Hwy) at Ave B facing south

ESTIMATED COST OF IMPROVEMENT

3-A: BU-77 (NEW DALLAS HIGHWAY) CORRIDOR SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Sidewalk	From James Blvd to Ave C	$1,642,700
	Install Street Lighting		$554,300
	Install Sidewalk	From Ave C to Meyers Ln	$3,297,300
	Install Street Lighting		$601,500
	Install Median		$2,474,600
	Install Sidewalk	From Meyers Ln to SL-340 (Industrial Blvd)	$670,300
	Install Street Lighting		$128,800
		CONTINGENCY COST	$1,873,900
		ENGINEERING COST	$3,935,200
		TOTAL COST	**$15,178,600**

PROJECT 3-B: BU-77 (NEW DALLAS HIGHWAY) CORRIDOR SAFETY IMPROVEMENTS

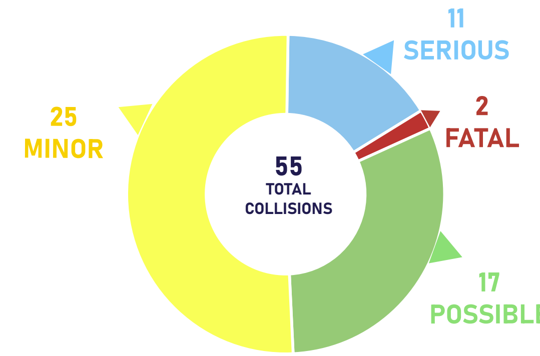


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Given that Project 3-B involves roadway reconstruction, the improvements implemented as part of Project 3-A may require removal to meet the new roadway geometry. Because of this, both projects are presented as standalone projects with separate costs.

INJURY COLLISION STATISTICS

Pedestrian	1
Bicycle	1
Motorcycle	3
Car	44
Truck	6



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	NIGHTTIME
78%	58%	45%	25%
43 COLLISIONS	32 COLLISIONS	25 COLLISIONS	14 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
BU-77 (New Dallas Hwy) at E Frost St facing north

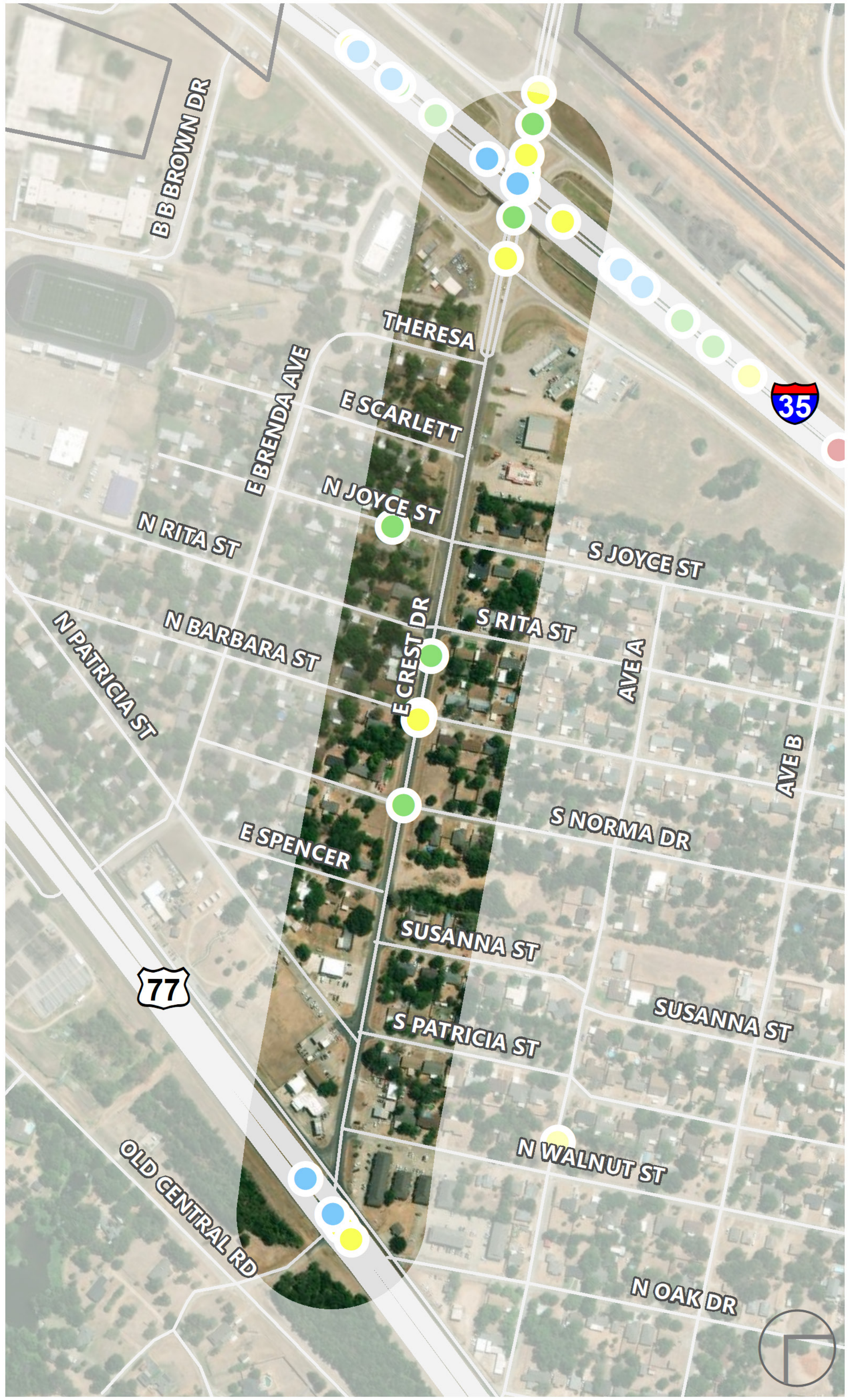
Existing Condition:
BU-77 (New Dallas Hwy) at Ave B facing south

ESTIMATED COST OF IMPROVEMENT

3-B: BU-77 (NEW DALLAS HIGHWAY) CORRIDOR SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Complete Streets Project	From James Blvd to Ave C	$6,900,000
	Complete Streets Project	From Ave C to Meyers Ln	$8,832,000
	Complete Streets Project	From Meyers Ln to SL-340 (Industrial Blvd)	$1,265,000
	Install Roundabout	BU-77 and E Crest Dr	$1,150,000
	Install Roundabout	BU-77 and E Craven Ave	$1,150,000
		CONTINGENCY COST	$3,859,400
		ENGINEERING COST	$8,104,800
		TOTAL COST	**$31,261,200**

PROJECT 4: FM-2417 (E CREST DRIVE)- CORRIDOR SAFETY IMPROVEMENTS

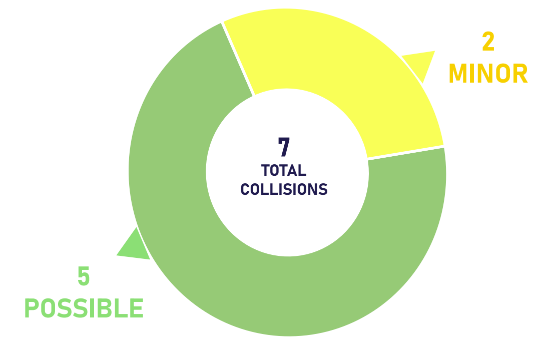


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

E Crest Drive, a two-lane undivided minor arterial, provides access to surrounding residential neighborhoods. The posted speed limit is 30 mph. E Crest Drive connects Connally High School, Connally Elementary School, and the Texas State Technical College.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	0
Automobile	7
Truck	0



TRENDS

BROADSIDE	INTERSECTION	AUTOMOBILE ROW	DISTRACTED DRIVING
57%	57%	29%	14%
4 COLLISIONS	4 COLLISIONS	2 COLLISIONS	1 COLLISION

EXISTING CONDITIONS

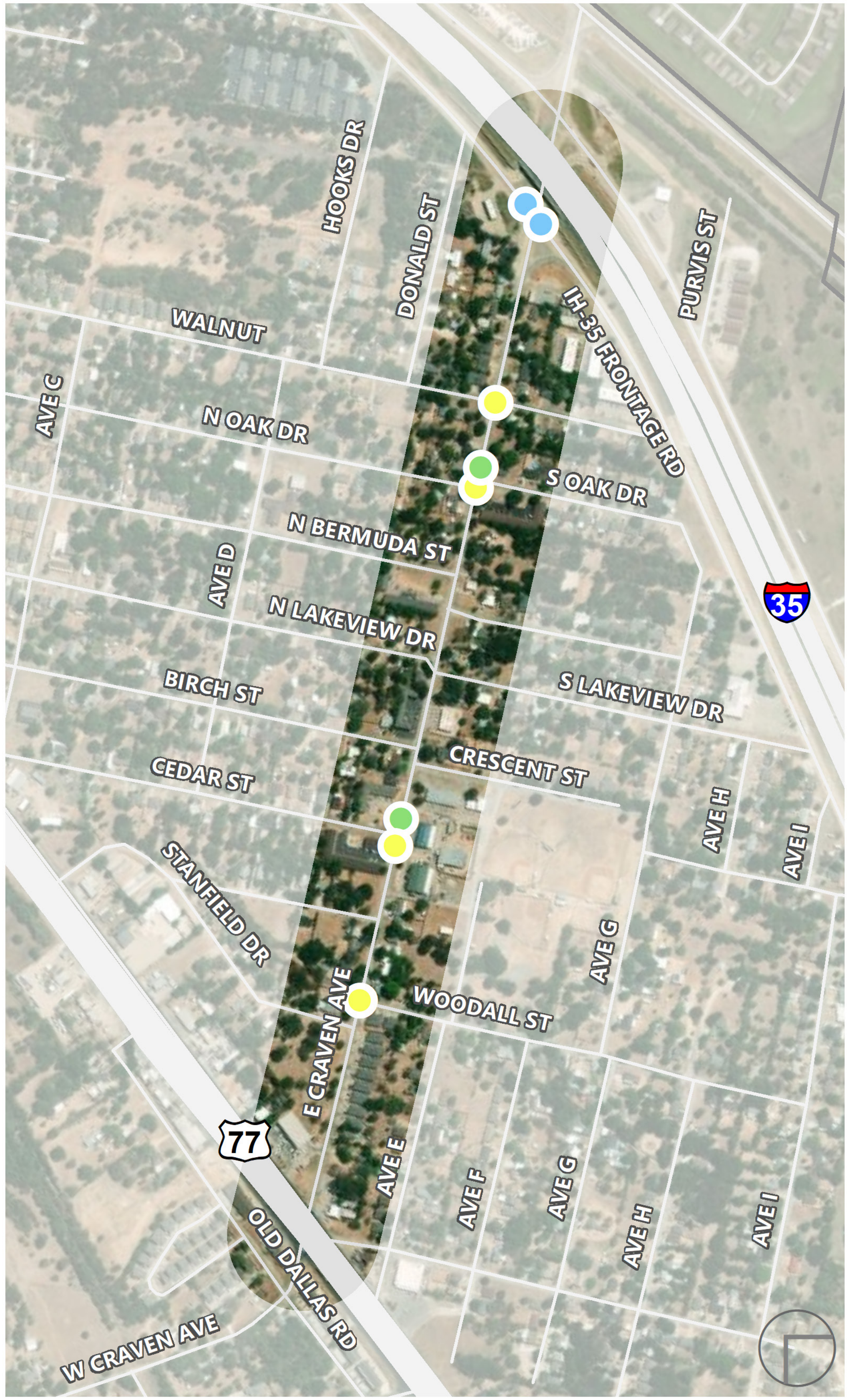
Existing Condition:
FM-2417 (E Crest Dr) at N/ S Patricia St facing east

Existing Condition:
FM-2417 (E Crest Dr) at N/ S Rita St facing east

ESTIMATED COST OF IMPROVEMENT

4: FM-2417 (E CREST DR)- CORRIDOR SAFETY IMPROVEMENTS		
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Install Speed Feedback Sign	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$34,500
Install Street Lighting	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$246,100
Sign Upgrades	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$10,100
Clear Sight Triangles	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$3,500
Install Sidewalks	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$1,840,500
Crosswalk Installation with Enhancements	N Rita St	$24,200
	CONTINGENCY COST	$431,800
	ENGINEERING COST	$906,800
	TOTAL COST	**$3,497,500**

PROJECT 5: E CRAVEN AVENUE- CORRIDOR SAFETY IMPROVEMENTS

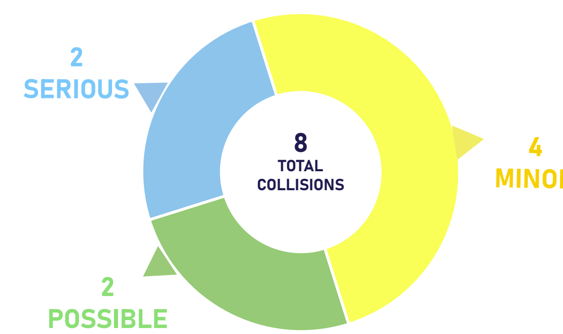


Fatal Injury · Serious Injury · Minor Injury · Possible Injury

E Craven Avenue, a two-lane undivided major collector, provides access to residential neighborhoods and Lacy Lakeview City Hall. The posted speed limit is 30 mph.

INJURY COLLISION STATISTICS

Pedestrian	1
Bicycle	0
Motorcycle	1
Car	5
Truck	1



TRENDS

INTERSECTION	HIT OBJECT	BROADSIDE	AUTOMOBILE ROW
88%	50%	50%	38%
7 COLLISIONS	4 COLLISIONS	4 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

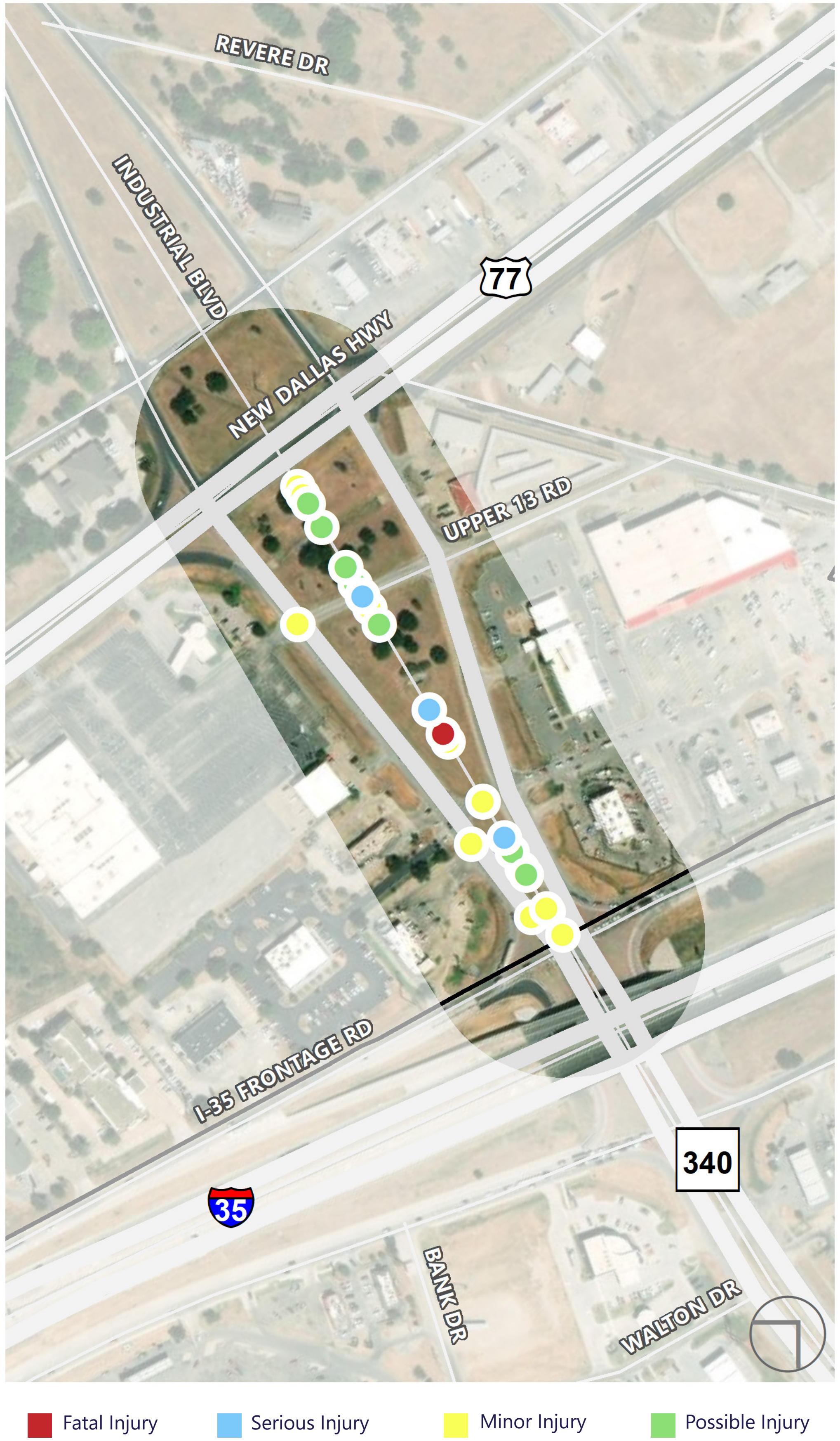
Existing Condition:
E Craven Ave at Woodall St facing east

Existing Condition:
E Craven Ave at N/S Oak Dr facing west

ESTIMATED COST OF IMPROVEMENT

5: E CRAVEN AVE- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Pedestrian Connectivity Improvements (Sidewalk, Crosswalks)	From BU-77 (New Dallas Hwy) to I-35 Frontage Rd	$2,707,000
	Install Striping		$53,000
	Install Street Lighting		$296,700
	Minor Street Striping and Sign Upgrades		$11,300
	Install Speed Feedback Sign		$34,500
		CONTINGENCY COST	$620,500
		ENGINEERING COST	$1,303,100
		TOTAL COST	**$5,026,100**

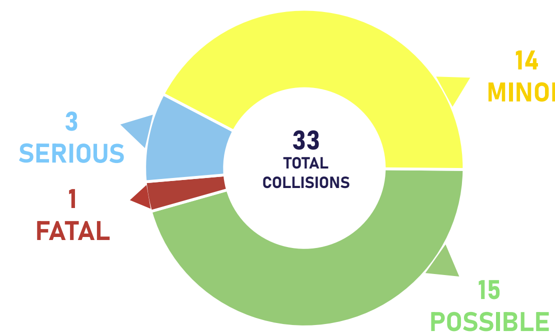
PROJECT 6: SL-340 (INDUSTRIAL BOULEVARD)- CORRIDOR SAFETY IMPROVEMENTS



Industrial Boulevard, a four-lane divided principal arterial, provides connection between US Business 77 and IH-35. The posted speed limit is 40 mph.

INJURY COLLISION STATISTICS

Pedestrian	1
Bicycle	0
Motorcycle	1
Car	28
Truck	3



TRENDS

BROADSIDE	INTERSECTION	AUTOMOBILE ROW	UNSAFE LANE CHANGES
67%	58%	39%	18%
22 COLLISIONS	19 COLLISIONS	13 COLLISIONS	6 COLLISIONS

Existing Condition:
SL-340 (Industrial Blvd) at Upper 13 Rd facing east

Existing Condition:
SL-340 (Industrial Blvd) at I-35 Frontage Rd facing west

ESTIMATED COST OF IMPROVEMENT

6: SL-340 (INDUSTRIAL BLVD)- CORRIDOR SAFETY IMPROVEMENTS		
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Pedestrian Connectivity Improvements (Sidewalk & Crosswalk)	From BU-77 (New Dallas Hwy) to I-35	$725,900
Install Street Lighting		$136,900
Dedicated Left Turn Lanes		$81,000
Sign Upgrades		$7,200
Revise Lane Configuration	I-35 Frontage Rd Exit Ramp	$7,400
Pedestrian Connectivity Improvements (Sidewalk & Crosswalk)	BU-77 (New Dallas Hwy)	$435,900
Signal Hardware Upgrades		$24,200
	CONTINGENCY COST	$283,700
	ENGINEERING COST	$595,800
	TOTAL COST	**$2,298,000**

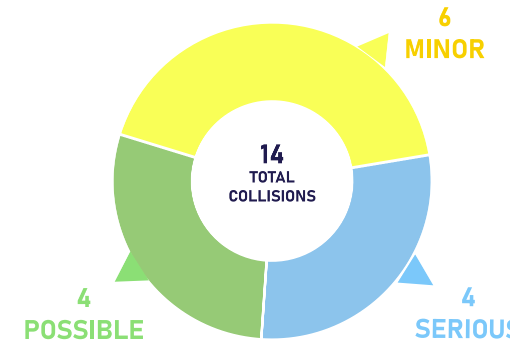
PROJECT 7: MEYERS LANE- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Meyers Lane, a two-lane undivided major collector street, provides access to I-35. The posted speed limit is 30 mph.

INJURY COLLISION STATISTICS

Pedestrian	2
Bicycle	1
Motorcycle	0
Automobile	9
Truck	2



TRENDS

BROADSIDE	INTERSECTION	HIT OBJECT	AUTOMOBILE ROW
64%	57%	36%	36%
9 COLLISIONS	8 COLLISIONS	5 COLLISIONS	5 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Meyers Ln at Crescent St facing east

Existing Condition:
Meyers Ln at I-35 n Frontage Rd facing west

ESTIMATED COST OF IMPROVEMENT

7: MEYERS LANE- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping	From BU-77 (New Dallas Hwy) to Airbase Rd	$49,700
	Install Street Lighting		$335,800
	Install Safety Edge		$87,400
	Sign Upgrades		$9,000
	Advance Warning Flashing Beacon	Advance of I-35 Frontage Rd Intersection	$17,300
		CONTINGENCY COST	$99,900
		ENGINEERING COST	$209,700
		TOTAL COST	**$808,800**

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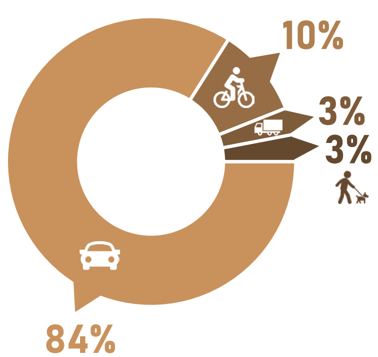
CHAPTER 6.4: CITY OF McGREGOR

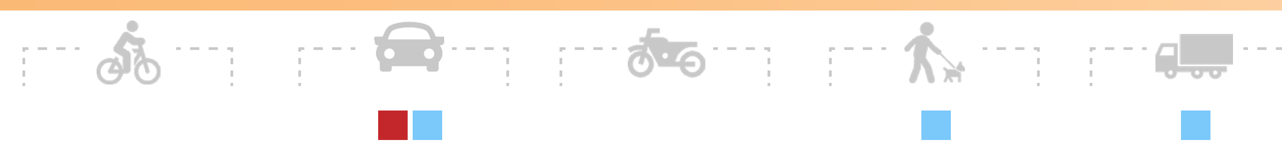
INTRODUCTION

The City of McGregor is located sixteen miles southwest of Waco on US-84 in western McLennan County. The city has an estimated population of 5,338 according to the 2020 census. This chapter provides information on the City of McGregor's collision statistics from 2014 to 2023. A total of 32 collisions occurred on McGregor city streets in the last 10 years, including one fatal and three serious injuries collisions TxDOT roadways within McGregor city limits had 158 collisions during the same period, with four fatal injuries and 25 serious injuries. The majority of injury collisions in both City and TxDOT rights-of-way resulted in minor injuries, with 50 percent in City right-of-way and approximately 42 percent in TxDOT right-of-way.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**32**	**100 %**	**158**	**100 %**
Fatal Injury	1	3.13 %	4	2.53 %
Serious Injury	3	9.38 %	25	15.82 %
Minor Injury	16	50.00 %	66	41.77 %
Possible Injury	12	37.50 %	63	39.87 %
Total Persons Involved	**32**	**100 %**	**229**	**100 %**
Fatal Injury	1	3.13 %	4	1.75 %
Serious Injury	3	9.38 %	27	11.79 %
Minor Injury	16	50.00 %	96	41.92 %
Possible Injury	12	37.50 %	102	44.54 %

COLLISIONS BY MODE - CITY

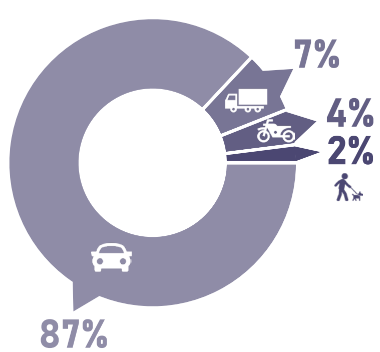


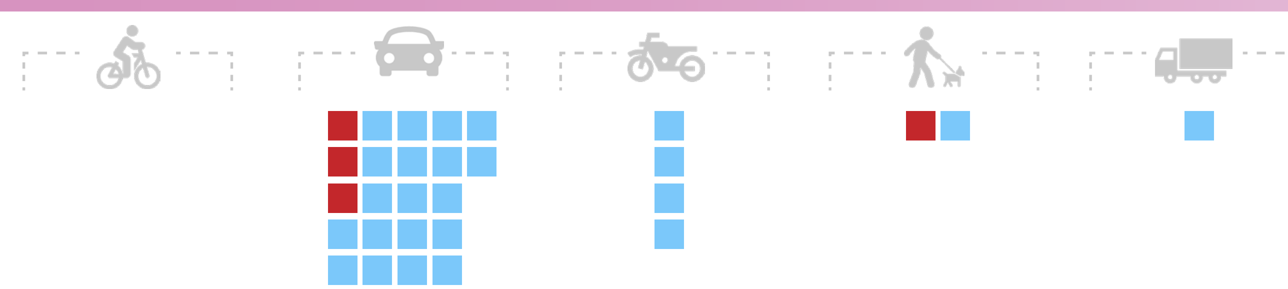


Note : Each box represents one fatal or severe injury collision.

0 %	4 %	0 %	0 %	0 %	Fatal Injury
0 %	4 %	0 %	100 %	100 %	Serious Injury
100 %	48 %	0 %	0 %	0 %	Minor Injury
0 %	44 %	0 %	0 %	0 %	Possible Injury
100 %	100 %	0 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

0 %	2 %	0 %	33 %	0 %	Fatal Injury
0 %	14 %	57 %	33 %	9 %	Serious Injury
0 %	43 %	29 %	0 %	45 %	Minor Injury
0 %	41 %	14 %	33 %	45 %	Possible Injury
0 %	100 %	100 %	100 %	100 %	

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on McGregors's city streets, TxDOT facilities and McLennan County across various categories.

On the city streets of McGregor, there were a total of 32 collisions, resulting in 32 persons injured. In comparison, TxDOT reported a total of 158 collisions resulting in 229 persons injured within McGregor city limits.

This section also identifies several major collision trends on McGregor city streets, including hit object collisions, collisions involving unsafe speeds, right-of-way violations by automobiles, and nighttime collisions. On TxDOT roadways, the prominent trends were broadside collisions, unsafe speed violations, right-of-way violations by automobiles and nighttime collisions. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. The charts indicate that roads with a 50 mph speed limit accounted for the highest proportion of KSI collisions out of the speed limits examined.

CITY	TxDOT
32	158
TOTAL COLLISIONS	TOTAL COLLISIONS
32	229
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

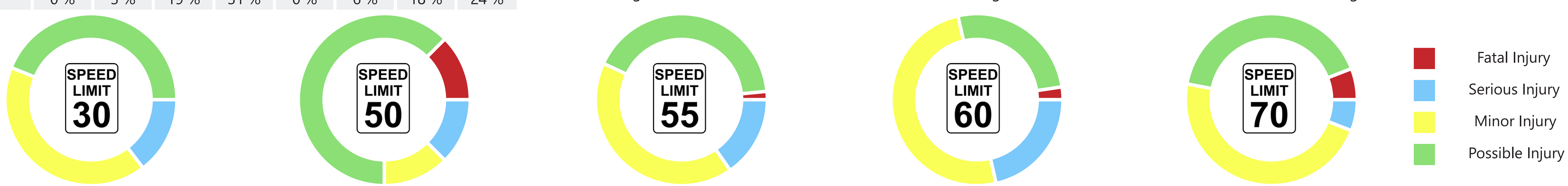
PERSONS INVOLVED

	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	9 %	0 %	0 %	0 %	0 %	0 %
Car	3 %	3 %	41 %	38 %	1 %	10 %	41 %	43 %
Motorcycle	0 %	0 %	0 %	0 %	0 %	2 %	1 %	0 %
Pedestrian	0 %	3 %	0 %	0 %	0 %	0 %	0 %	0 %
Truck	0 %	3 %	0 %	0 %	0 %	0 %	0 %	1 %
AGE								
Below 15	0 %	0 %	9 %	3 %	0 %	0 %	3 %	6 %
15 - 65	3 %	9 %	41 %	28 %	1 %	11 %	34 %	33 %
Above 65	0 %	0 %	0 %	6 %	0 %	1 %	5 %	5 %
GENDER								
Male	3 %	6 %	31 %	6 %	1 %	6 %	24 %	21 %
Female	0 %	3 %	19 %	31 %	0 %	6 %	18 %	24 %

CITY OF McGREGOR VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	9 %	Bicycle	0 %	Bicycle	1 %
Car	84 %	Car	87 %	Car	85 %
Motorcycle	0 %	Motorcycle	4 %	Motorcycle	4 %
Pedestrian	3 %	Pedestrian	2 %	Pedestrian	3 %
Truck	3 %	Truck	7 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	47 %	Motor Vehicle in Transport	75 %	Motor Vehicle in Transport	72 %
Fixed Object	19 %	Fixed Object	15 %	Fixed Object	17 %
Overturned	9 %	Overturned	3 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	53 %	Broadside	38 %	Broadside	42 %
Broadside	25 %	Rear End	32 %	Hit Object	28 %
Rear End	19 %	Hit Object	25 %	Rear End	24 %
Head-On	3 %	Sideswipe	4 %	Sideswipe	5 %
VIOLATION CATEGORY					
Unsafe Speed	28 %	Unsafe Speed	37 %	Unsafe Speed	23 %
Automobile Right-of-way	28 %	Automobile Right-of-way	29 %	Automobile Right-of-way	22 %
Driver Condition	9 %	Other Unforeseen Reasons	7 %	Traffic Signals and Signs	12 %
Traffic Signals and Signs	6 %	Distracted Driving	6 %	Distracted Driving	8 %
Distracted Driving	6 %	Unsafe Lane Change	4 %	Other Improper Driving	6 %
Other Improper Driving	6 %	Driver Condition	4 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	59 %	Intersection	51 %	Intersection	59 %
Roadway	41 %	Roadway	49 %	Roadway	41 %
LIGHTING					
Daylight	69 %	Daylight	66 %	Daylight	70 %
Dark, Lighted	16 %	Dark, Lighted	8 %	Dark, Lighted	16 %
Dark, Not Lighted	16 %	Dark, Not Lighted	25 %	Dark, Not Lighted	11 %

SPEED LIMIT



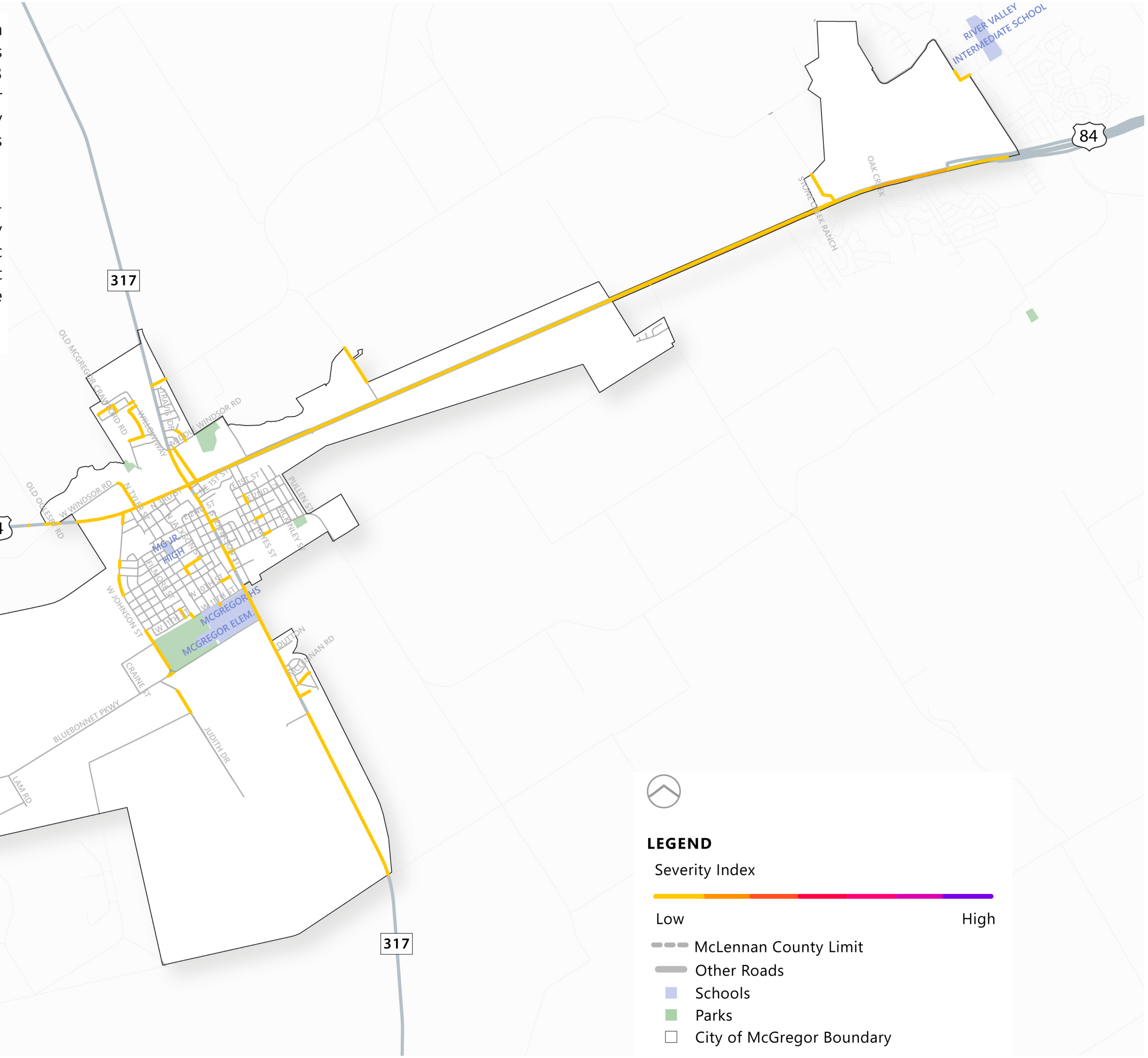
BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

The map shows the location of injury collisions involving bicyclists and pedestrians. In total there were seven bicycle and pedestrian collisions resulting in one fatal and two serious injury collisions.

SEVERITY INDEX

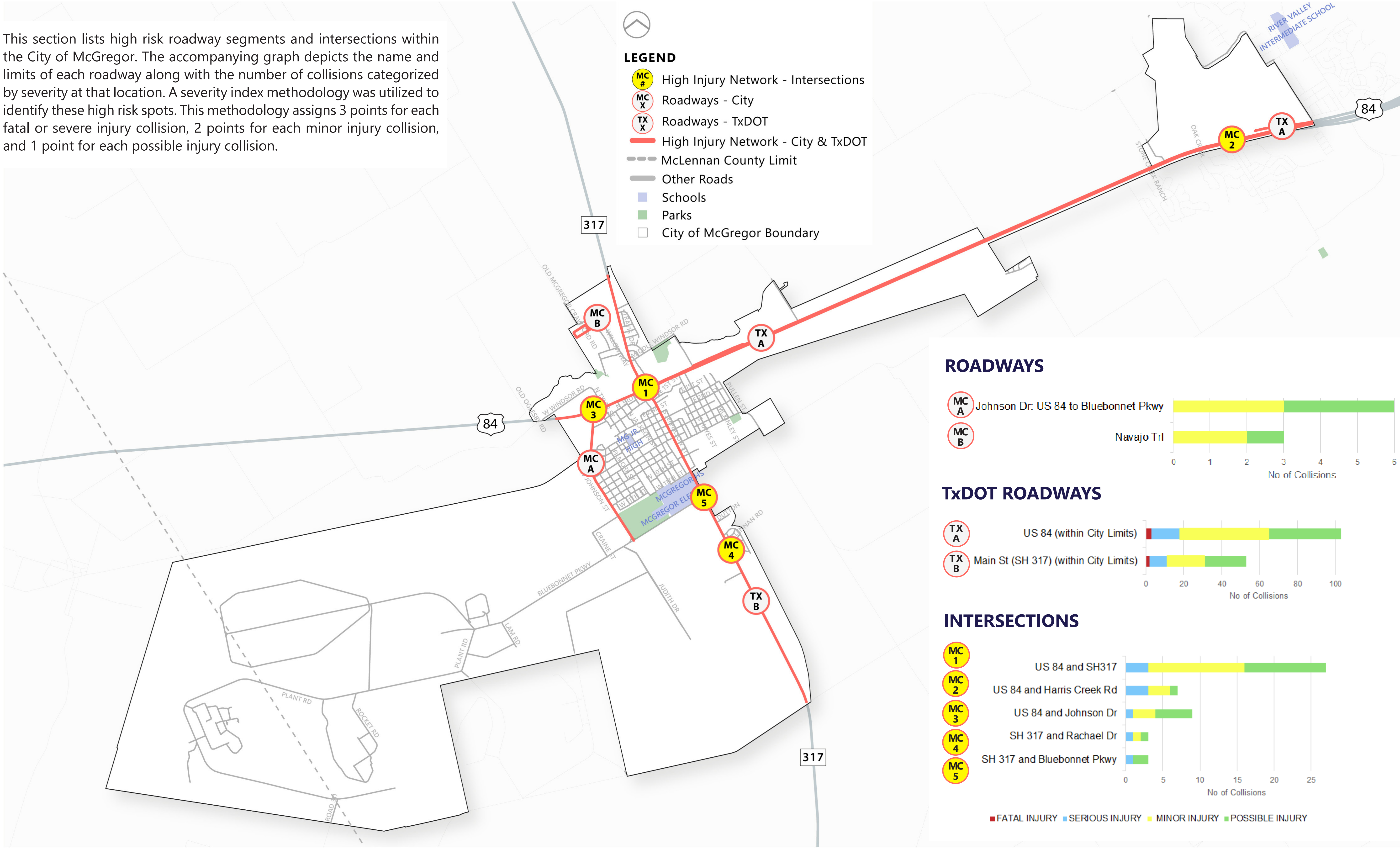
The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within the City of McGregor. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.



PROFILES - CITY

PROFILE 1 - HIT OBJECT

17 (53%)
HIT OBJECT

32 (100%)
TOTAL INJURY COLLISION

17 COLLISIONS

SEVERITY

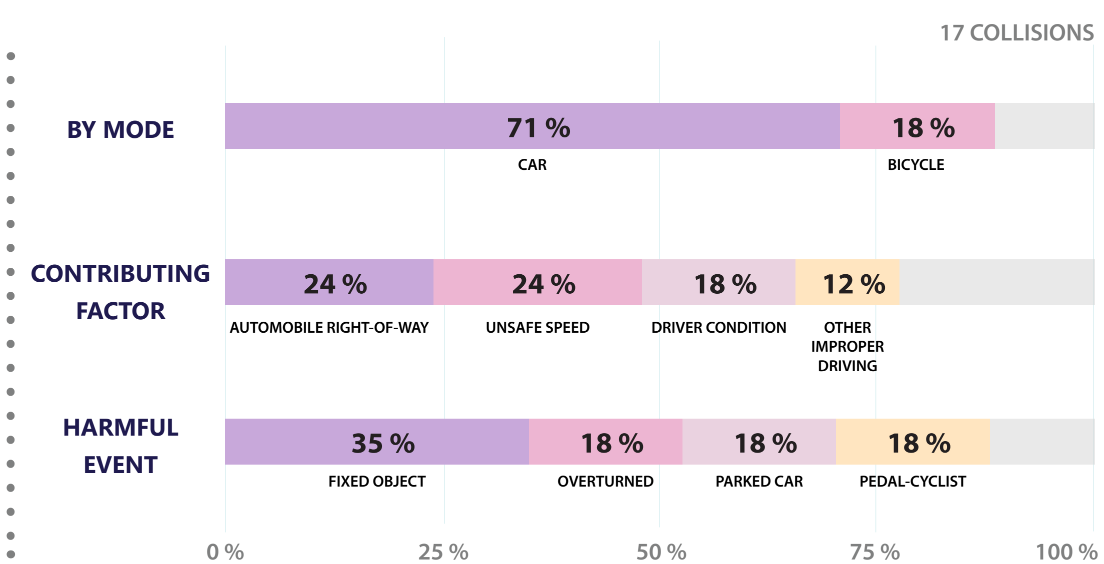
6 % | 12 %
59 % | 23 %

LOCATION

35 % | 65 %

LIGHTING

42 % | 0 %
29 % | 29 %



PROFILE 2 - UNSAFE SPEED

9 (28%)
UNSAFE SPEED

32 (100%)
TOTAL INJURY COLLISION

9 COLLISIONS

SEVERITY

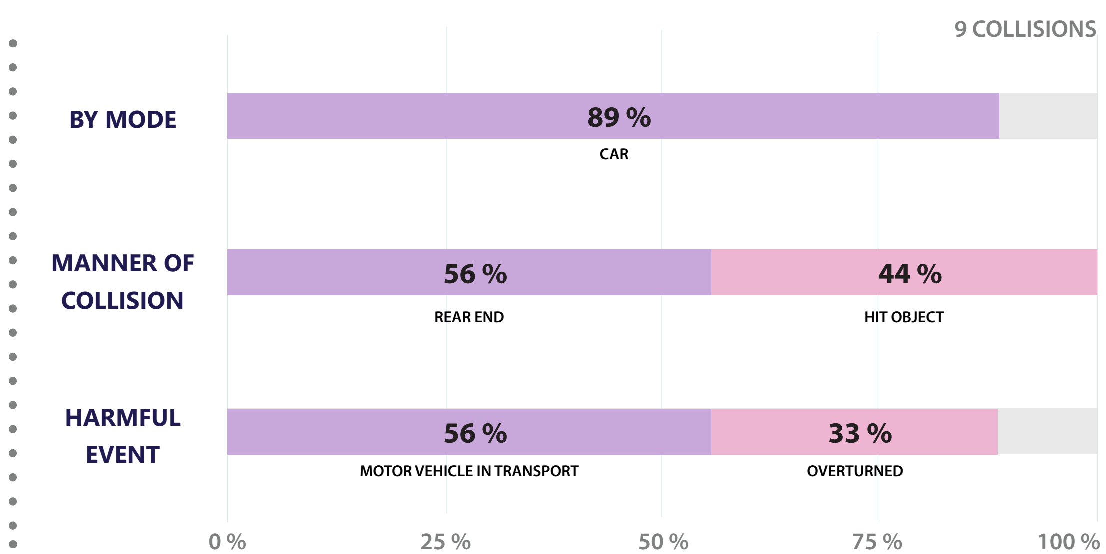
11 % | 22 %
34 % | 33 %

LOCATION

89 % | 11 %

LIGHTING

78 % | 0 %
0 % | 22 %



PROFILES - CITY

PROFILE 3 - AUTOMOBILE RIGHT-OF-WAY

9 (28%)
AUTOMOBILE RIGHT-OF-WAY

32 (100%)
TOTAL INJURY COLLISION

SEVERITY

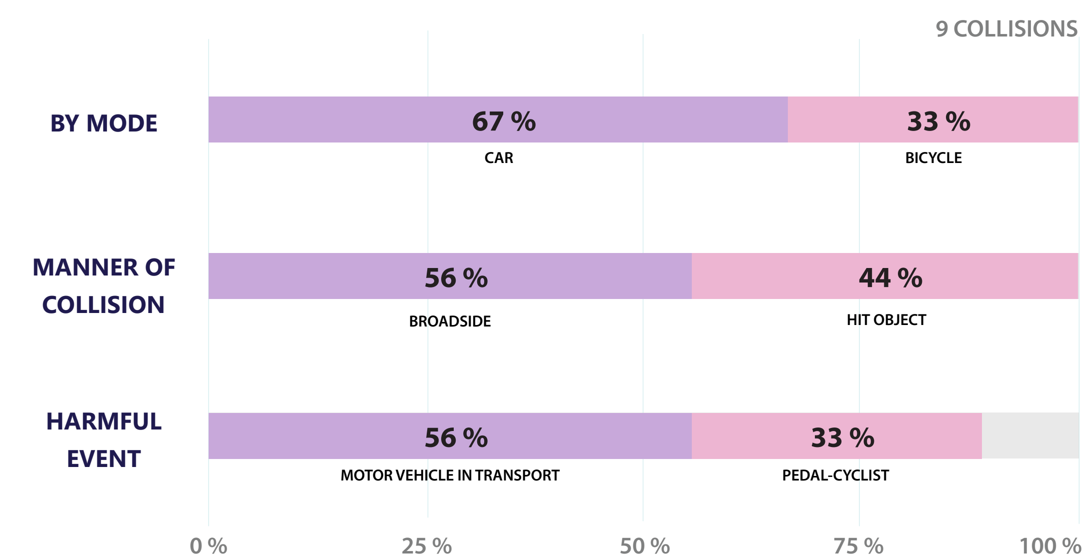
0 %
0 %
67 %
33 %

LOCATION

56 %
44 %

LIGHTING

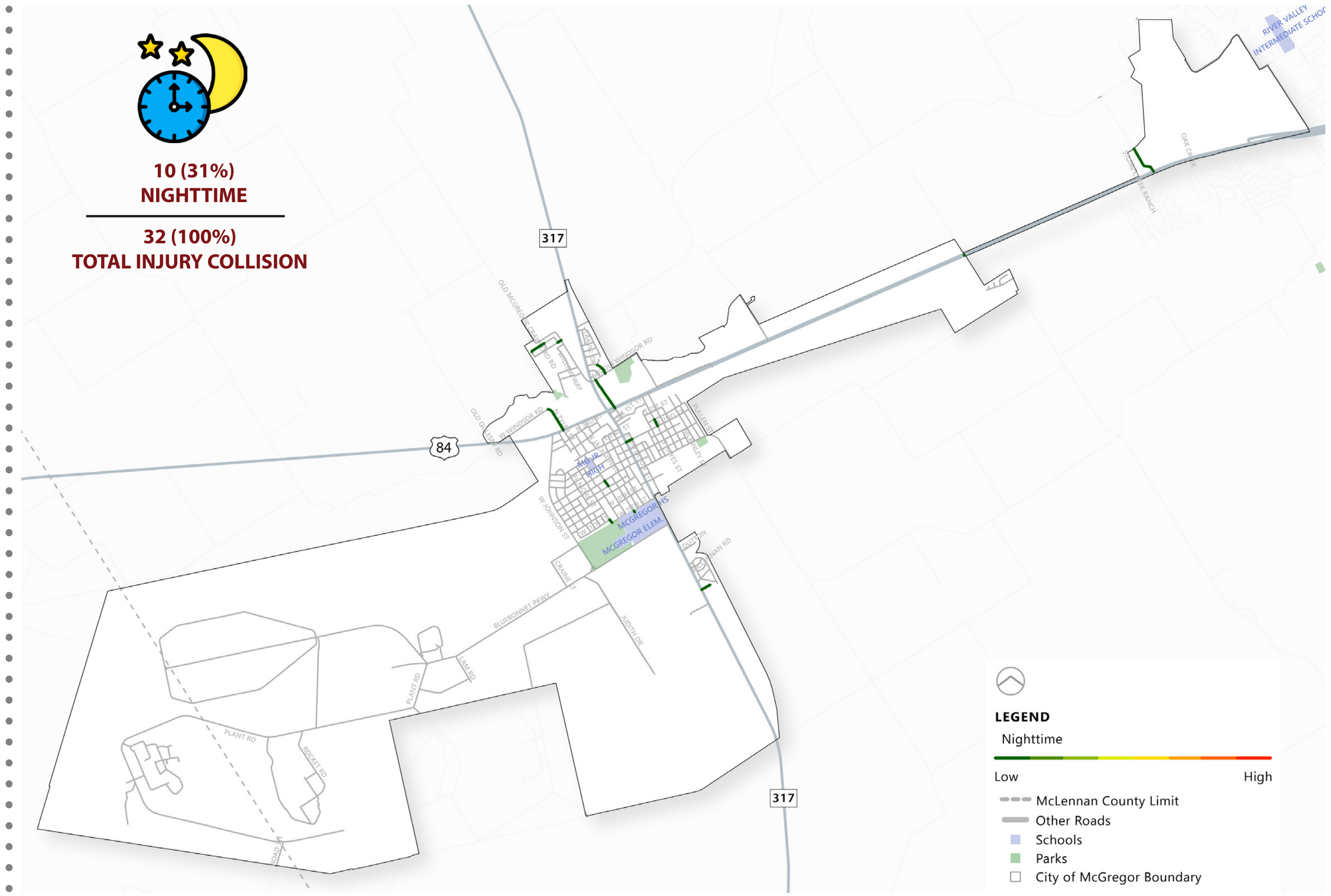
78 %
0 %
11 %
11 %



PROFILE 4 - NIGHTTIME

10 (31%)
NIGHTTIME

32 (100%)
TOTAL INJURY COLLISION

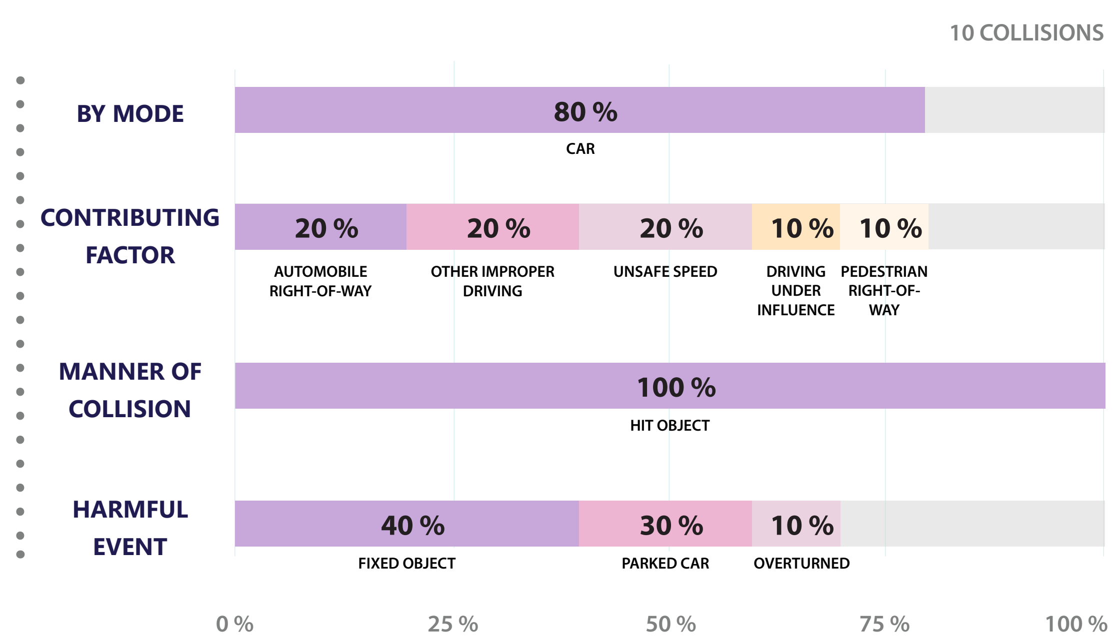


SEVERITY

0 %
10 %
60 %
30 %

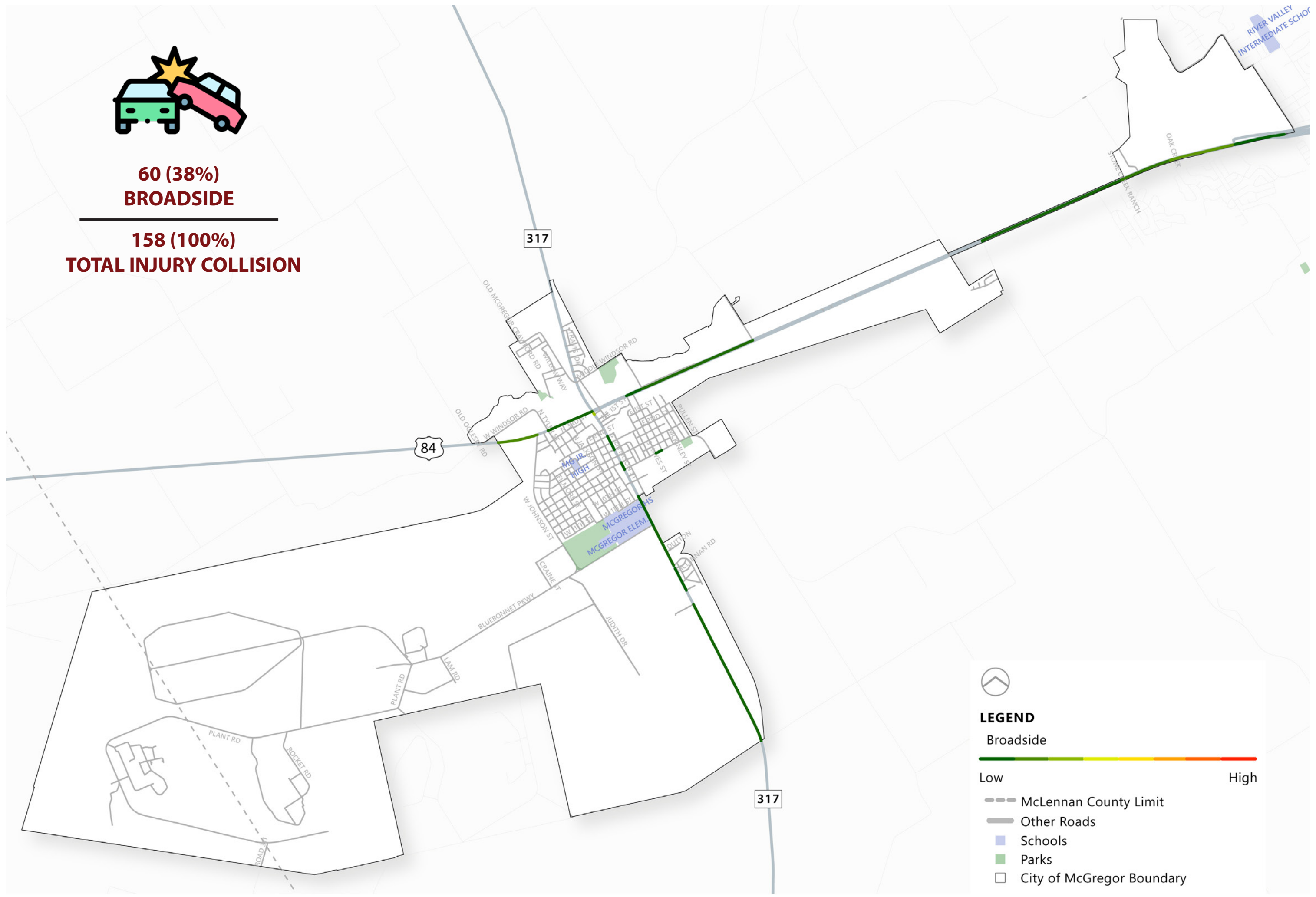
LOCATION

20 %
80 %



PROFILES - TXDOT

PROFILE 1 - BROADSIDE



SEVERITY

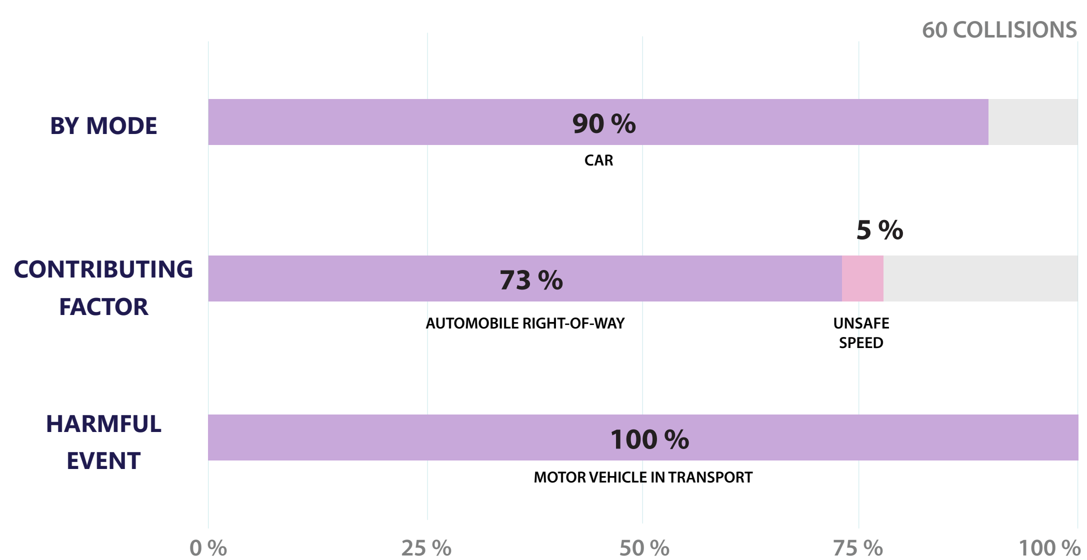
0 %
13 %
42 %
45 %

LOCATION

92 %
8 %

LIGHTING

72 %
2 %
14 %
12 %



PROFILE 2 - UNSAFE SPEED

SEVERITY

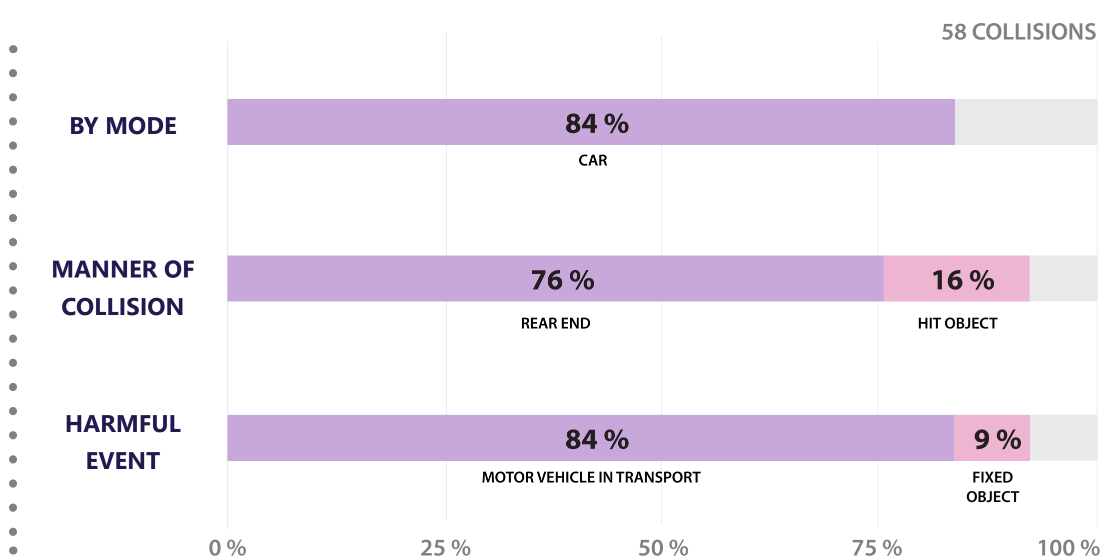
0 %
16 %
36 %
48 %

LOCATION

36 %
64 %

LIGHTING

71 %
3 %
3 %
22 %



PROFILES - TXDOT

PROFILE 3 - AUTOMOBILE RIGHT-OF-WAY

46 (29%)
AUTOMOBILE RIGHT-OF-WAY

158 (100%)
TOTAL INJURY COLLISION

SEVERITY

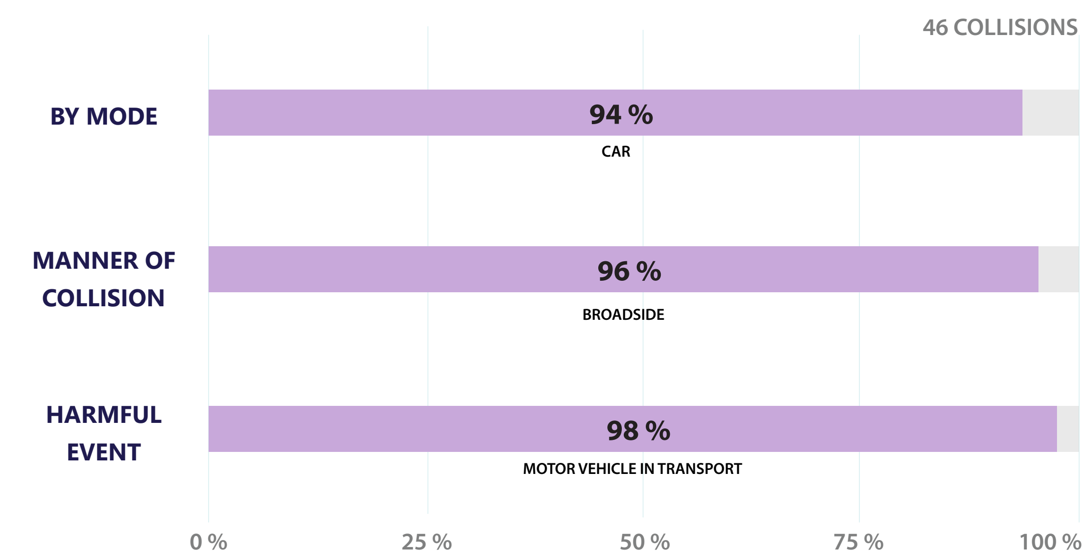
0 %
9 %
41 %
50 %

LOCATION

96 %
4 %

LIGHTING

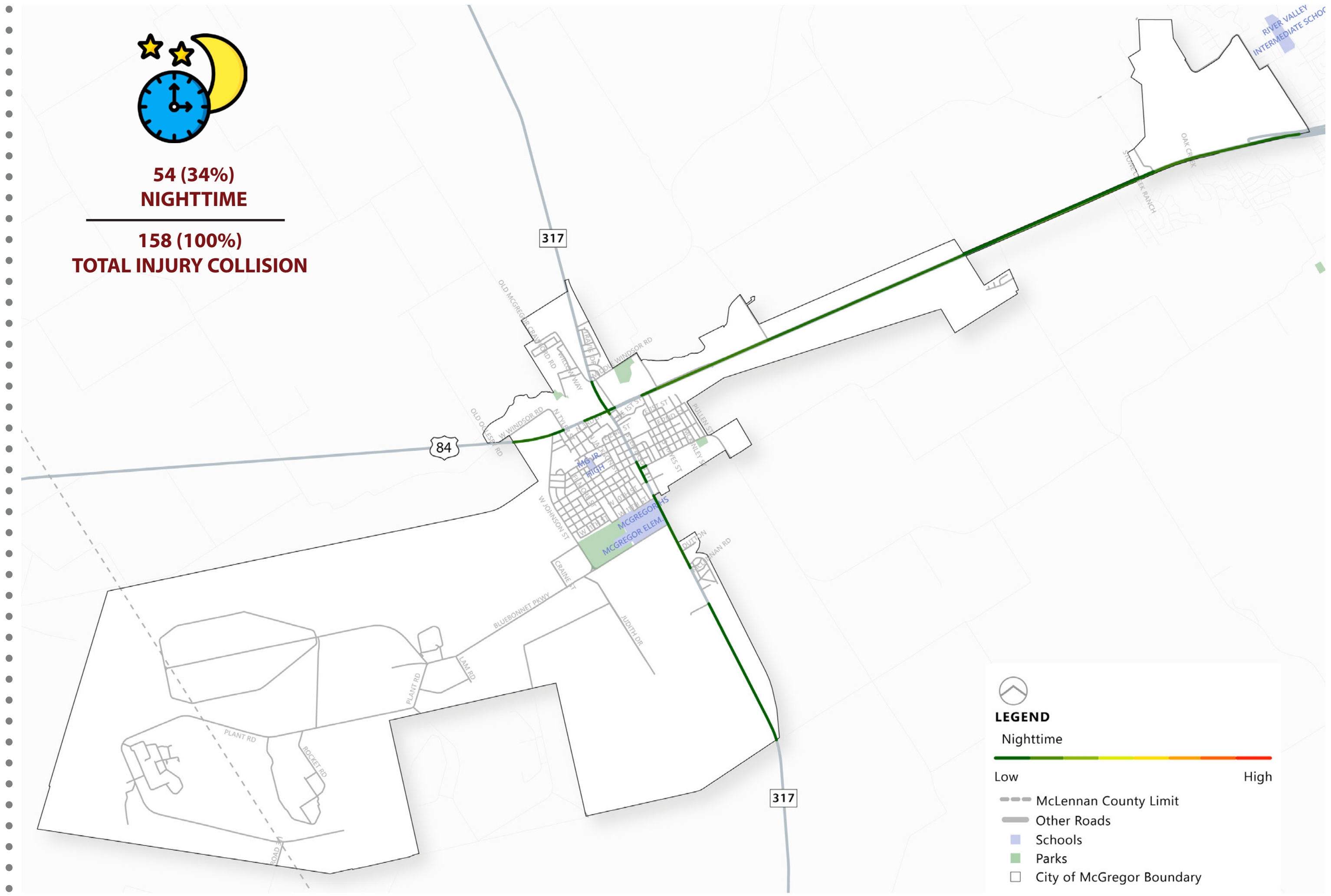
72 %
2 %
15 %
11 %



PROFILE 4 - NIGHTTIME

54 (34%)
NIGHTTIME

158 (100%)
TOTAL INJURY COLLISION

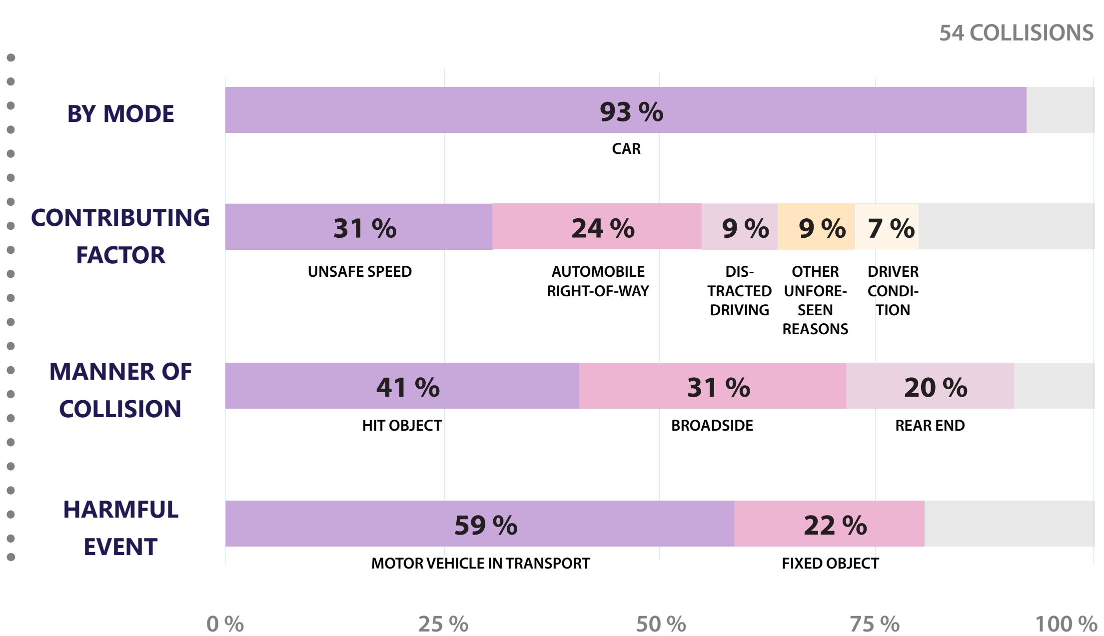


SEVERITY

6 %
22 %
42 %
30 %

LOCATION

39 %
61 %



NEIGHBORHOOD TRAFFIC CALMING PROJECT

The residential streets around Main Street between McGregor Dr. and 11th St need a Neighborhood Traffic Calming Project due to cut-through traffic and speeding issues created by the busy downtown corridor. A neighborhood traffic calming program typically involves initiatives aimed at reducing traffic speed and improving safety on residential streets. These programs often include measures such as speed humps, traffic circles, chicanes, curb extensions, and signage to encourage drivers to slow down and be more cautious in residential areas. The program also involves community engagement and input to identify specific traffic issues and develop appropriate solutions tailored to the neighborhood's needs. Overall, the goal of a neighborhood traffic calming program is to create safer and more livable streets for residents and pedestrians.

SAFE ROUTES TO SCHOOL

The City of McGregor is in need of implementing a Safe Routes to School program aimed at enhancing safety and accessibility for children who walk or bike to local schools. This program focuses on promoting walking and bicycling to school through various means, including infrastructure improvements, enforcement, tools, safety education, and incentives. Additionally, the program's scope includes evaluating arrival and dismissal procedures and identifying infrastructure needs such as sidewalks, bike lanes, and enhanced crossing locations around all schools.

McGREGOR TEXAS TRAIN STATION CONNECTIVITY PLANNING

This plan aims to ensure safe, multi-modal access to the new train station from all parts of the city. Potential elements of this plan should include the development of pedestrian and bicycle pathways, along with infrastructure improvements to support these modes of transportation. Additionally, the plan should consider the implementation of parking facilities, public transit connections, and street redesigns aimed at enhancing vehicular access to the station area. By incorporating these elements, the plan seeks to provide residents with a variety of transportation options while facilitating convenient and safe access to the train station.

ACTIVE TRANSPORTATION PLAN (PED & BIKE FACILITY)

The City of McGregor is in need of implementing an Active Transportation Plan (ATP) to promote increased walking, biking, and the use of other non-motorized transportation modes. This comprehensive plan will delineate strategies, policies, and infrastructure enhancements aimed at fostering safer and more accessible environments for pedestrians and cyclists within the city.

The ATP will entail an evaluation of existing multi-modal infrastructure improvements and safety measures, while also identifying gaps and deficiencies in infrastructure such as sidewalks and bike lanes. Additionally, the plan will focus on raising awareness about the benefits of walking and cycling, as well as educating the community about road safety and the importance of sharing the road with other users.

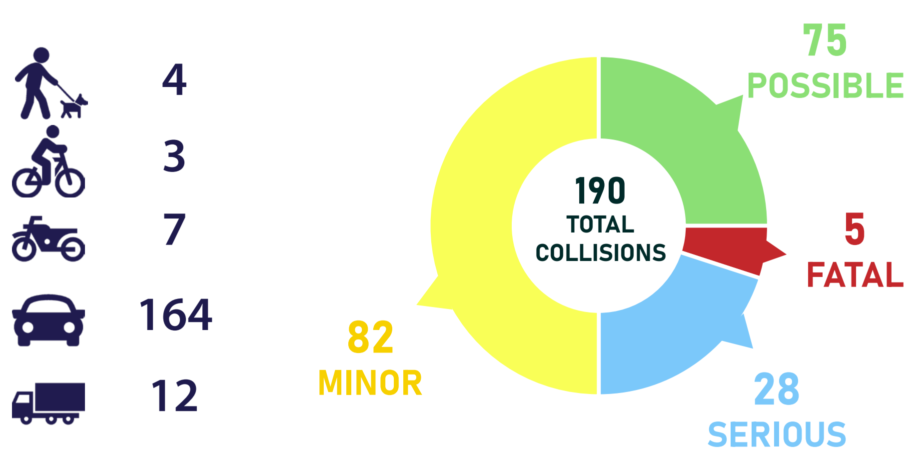
Furthermore, the ATP will involve the implementation of policies and regulations to support active transportation, including the adoption of Complete Streets policies, zoning regulations prioritizing pedestrian and cyclist safety, and incentives for developers to incorporate active transportation infrastructure into new developments.

Moreover, the ATP will provide an opportunity to integrate with public transit systems by ensuring seamless connectivity between walking, cycling, and public transit networks. By fostering a more pedestrian- and cyclist-friendly environment, the ATP aims to promote healthier lifestyles, reduce traffic congestion, and create more vibrant and livable communities in McGregor.

PROJECT 1: CITYWIDE SIGN INVENTORY & PAVEMENT DELINEATION

The City of McGregor is proposing a Citywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the city.

INJURY COLLISION STATISTICS



TRENDS

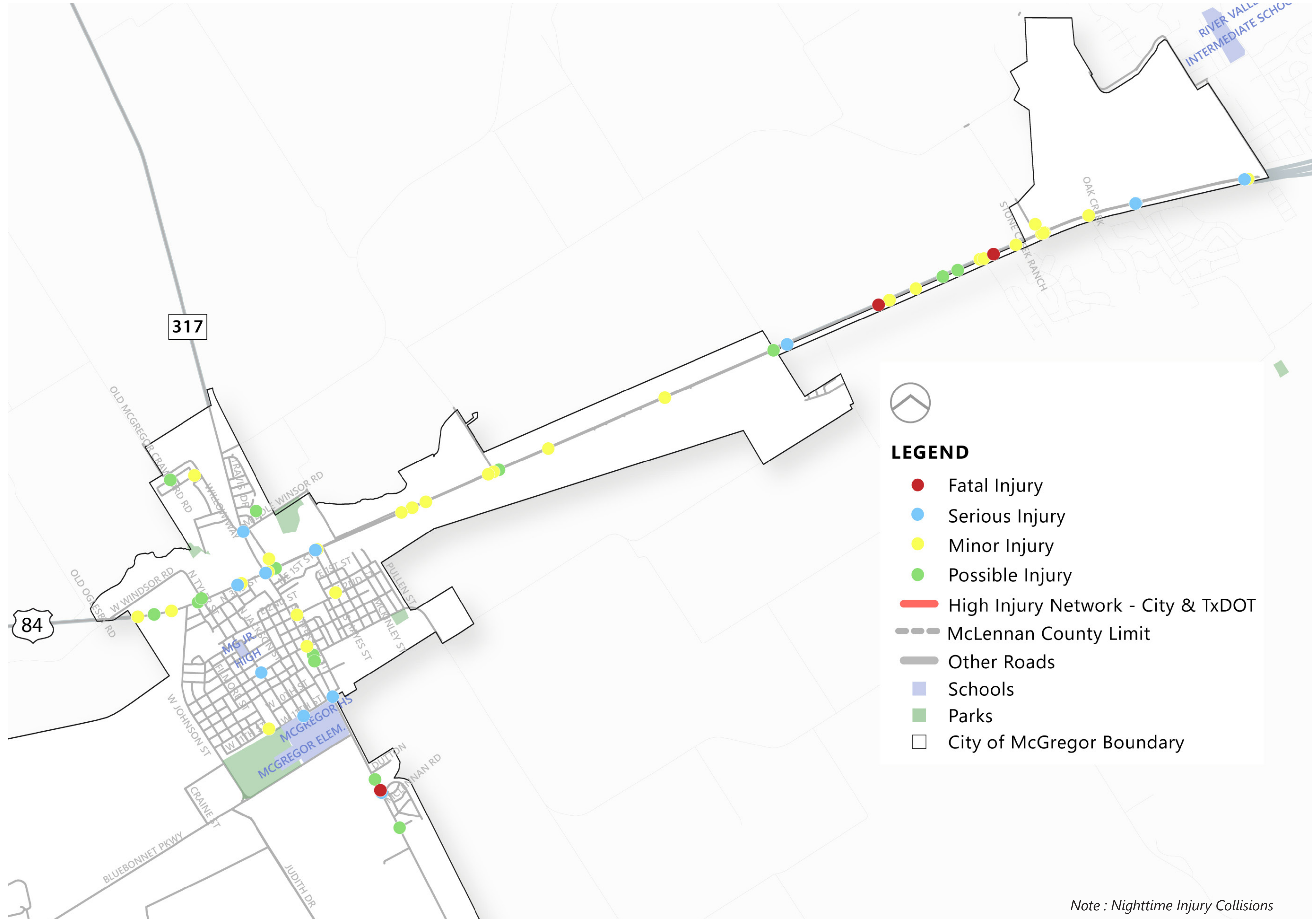
INTERSECTION	BROADSIDE	UNSAFE SPEED	NIGHTTIME
52%	36%	35%	34%
99 COLLISIONS	68 COLLISIONS	67 COLLISIONS	64 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Sign Inventory, Replacement & Installation	Citywide	$89,100
	Install Pavement Delineation	Citywide	$3,416,000
		CONTINGENCY COST	$701,100
		ENGINEERING COST	$1,051,600
		TOTAL COST	**$2,257,800**

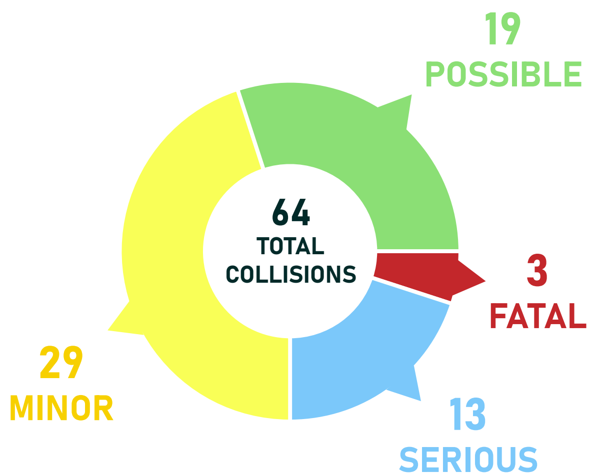
PROJECT 2: CITYWIDE STREET LIGHT INVENTORY

The City of McGregor is proposing a Citywide Streetlight Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the city to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating McGregor's streets during the nighttime hours.



NIGHTTIME INJURY COLLISION STATISTICS

Pedestrian	2
Bicycle	1
Motorcycle	2
Car	58
Truck	1



TRENDS

HIT OBJECT	INTERSECTION	UNSAFE SPEED	BROADSIDE
50%	36%	30%	27%
32 COLLISIONS	23 COLLISIONS	19 COLLISIONS	3 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Install/ Replace Street Lights	Citywide	$2,522,000
		CONTINGENCY COST	$504,400
		ENGINEERING COST	$1,059,300
		TOTAL COST	$4,085,700

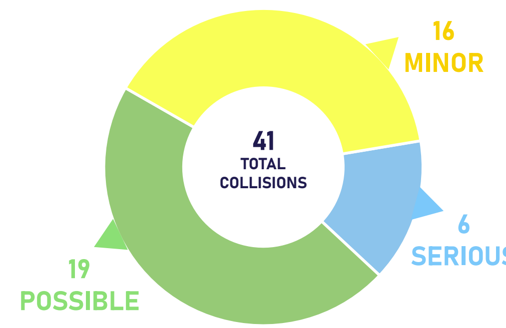
PROJECT 3-A: MAIN STREET (SH-317) : US-84 (McGREGOR DRIVE) TO 11TH STREET- SAFETY IMPROVEMENTS

Fatal Injury   Serious Injury   Minor Injury   Possible Injury

Main Street (SH-317), a two-lane minor arterial with a center two-way left turn lane, runs through downtown and provides parallel parking from 1st Street to 6th Street. The speed limits vary, set at 30 mph through downtown and 50 mph between 11th Street and Bluebonnet Parkway. Main Street provides access to the McGregor Primary, Elementary and High Schools. The McGregor Vision 2030 identifies a need for walkability and streetscape improvements.

INJURY COLLISION STATISTICS

- Pedestrian: 1
- Bicycle: 1
- Motorcycle: 3
- Automobile: 35
- Truck: 1



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	REAR END
83%	51%	41%	27%
34 COLLISIONS	21 COLLISIONS	17 COLLISIONS	11 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Main St (SH-317) at 7th St facing south

Existing Condition:
Main St (SH-317) at W 4th St facing north

ESTIMATED COST OF IMPROVEMENT

3A: MAIN STREET FROM US-84 (McGREGOR DR) TO 11th ST- SAFETY IMPROVEMENTS			
	IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
	Fill Sidewalk Gaps	US-84 (McGregor Dr) to W 1st St & 6th St to 11th St	$1,114,600
	Crosswalk Enhancement	2nd, 4th & 9th St	$340,400
	Install Speed Feedback Sign	Between 1st St & N 2nd St & 6th St & 7th St	$34,500
	Install Street Lighting & Medians	US-84 (McGregor Dr) to 11th St	$1,378,900
	Signalized Intersection Improvements	3rd St & 6th St	$27,600
	Install Pedestrian Hybrid Beacon (PHB)	11th St	$231,200
		CONTINGENCY COST	$625,500
		ENGINEERING COST	$1,313,500
		TOTAL COST	**$5,066,200**

PROJECT 3-B: MAIN STREET (SH-317) : 11TH STREET TO RACHAEL ROAD- SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Main Street (SH-317) is a two-lane minor arterial roadway, from 11th Street to Rachael Road. The speed limits vary, set at 50 mph between 11th Street and Bluebonnet Parkway and 55 mph south of Bluebonnet Parkway.

INJURY COLLISION STATISTICS

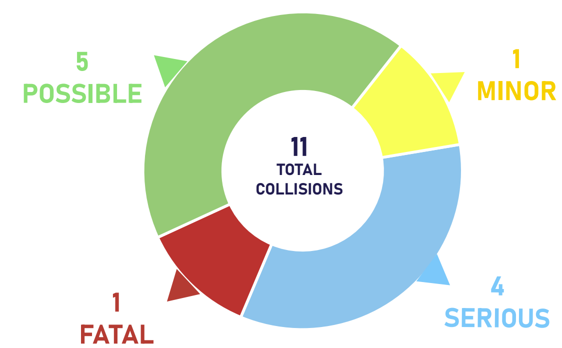
1

0

1

9

0



TRENDS

INTERSECTION	UNSAFE SPEED	NIGHTTIME	REAR END
82%	64%	36%	55%
9 COLLISIONS	7 COLLISIONS	4 COLLISIONS	6 COLLISIONS

EXISTING CONDITIONS

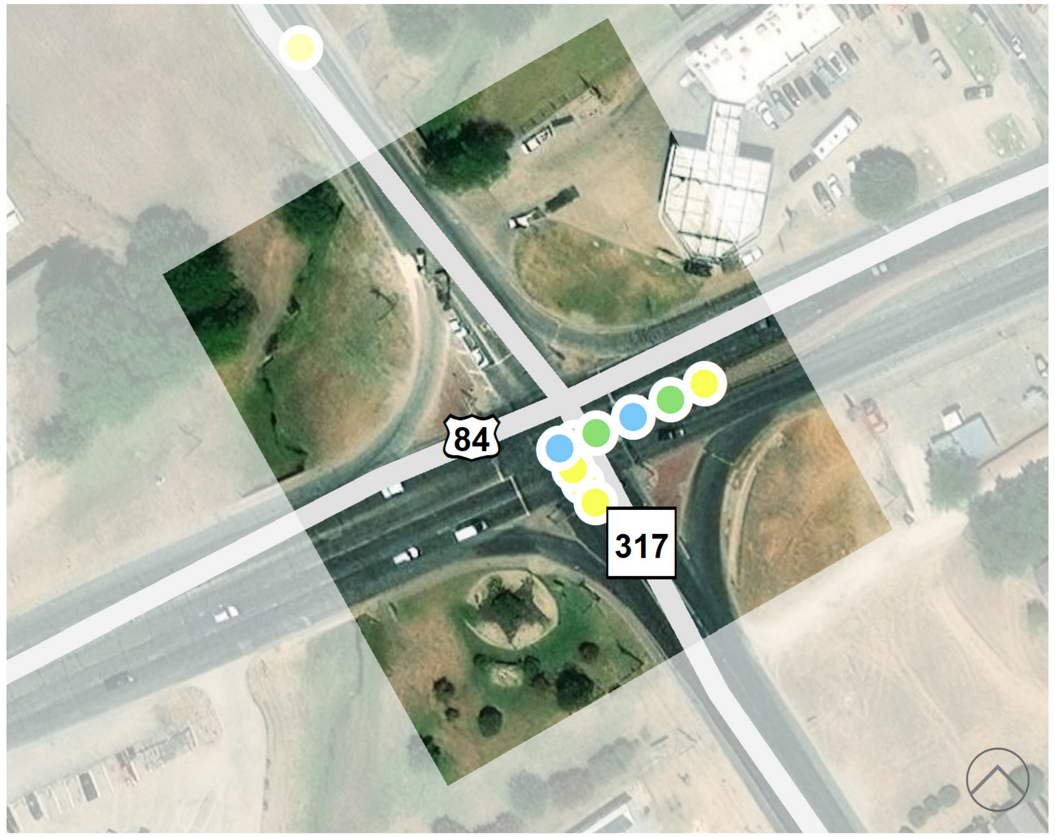
Existing Condition:
Main St (SH-317) at 11th St facing south

Existing Condition:
Main St (SH-317) at Dutton Dr facing north

ESTIMATED COST OF IMPROVEMENT

3B : MAIN STREET: 11TH STREET TO RACHAEL DR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Intersection Warning Sign and Beacon	Between Bluebonnet Pkwy and Rachael Rd	$17,300
	Install Speed Feedback Sign	Between Bluebonnet Pkwy and Rachael Rd	$17,300
	Install Sidewalk	11th St to David Davis Dr	$1,606,400
	Install Pedestrian Hybrid Beacon (PHB)	Bluebonnet Pkwy	$231,200
		CONTINGENCY COST	$374,500
		ENGINEERING COST	$786,400
		TOTAL COST	**$3,033,100**

PROJECT 4: US-84 (McGREGOR DRIVE)- INTERSECTION SAFETY IMPROVEMENTS



US-84 (McGregor Dr) & Main St (SH-317)

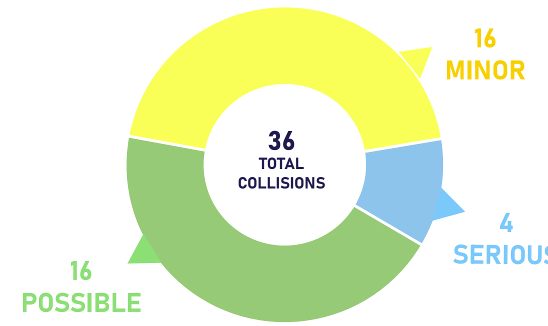
US-84 (McGregor Dr) & Johnson Dr

Fatal Injury · Serious Injury · Minor Injury · Possible Injury

The US-84 (McGregor Drive) corridor features two essential intersections: a signalized four-way crossing with Main Street (SH-317) and a signalized T-intersection at Johnson Drive; The speed limit for approaching the US-84/Main Street intersection is 35 mph, whereas it ranges between 35 mph to 45 mph at Johnson Drive.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	3
Automobile	31
Truck	2



TRENDS

BROADSIDE	AUTOMOBILE ROW	REAR END	UNSAFE SPEED
67%	58%	25%	19%
24 COLLISIONS	21 COLLISIONS	9 COLLISIONS	7 COLLISIONS

EXISTING CONDITIONS

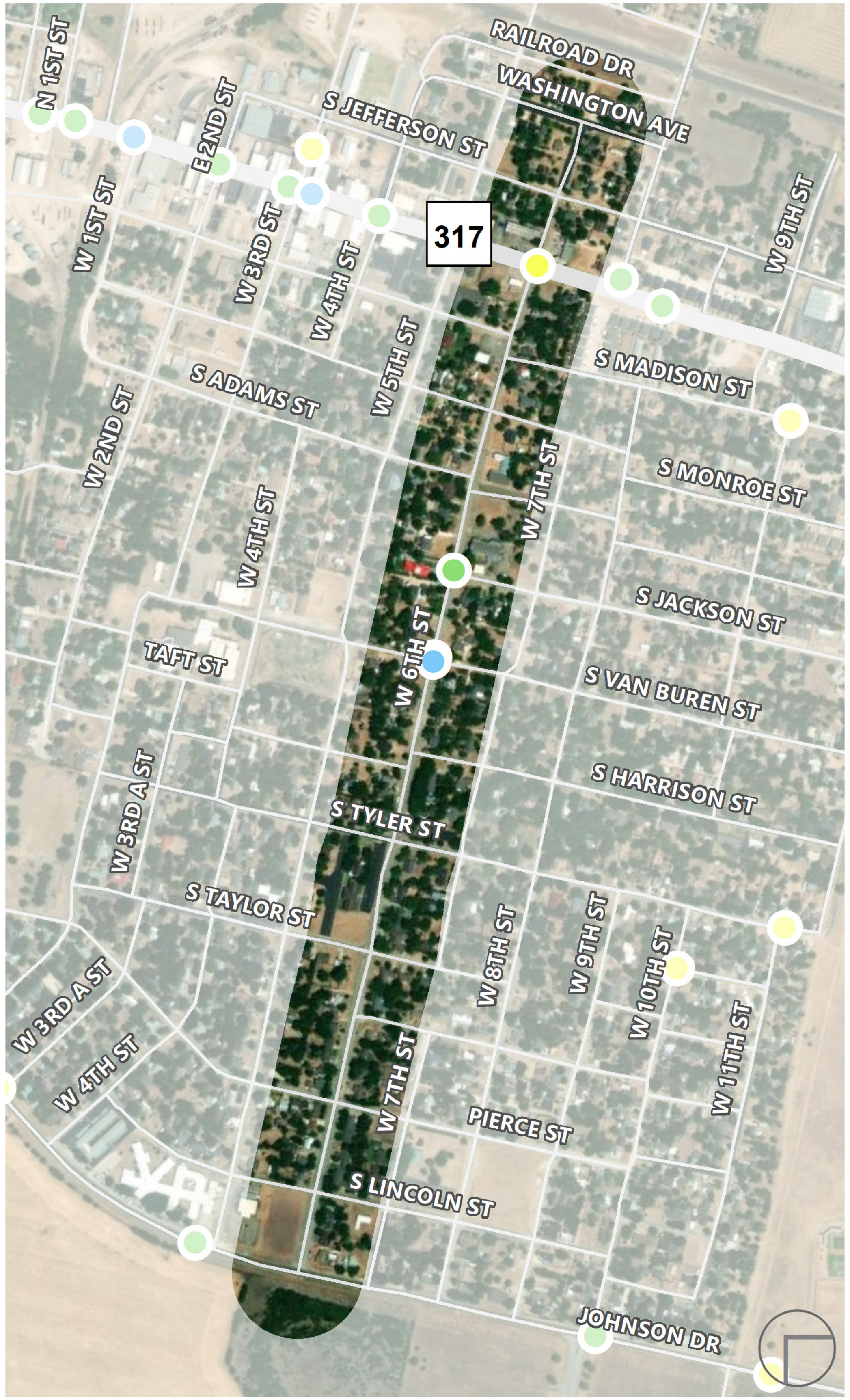
Existing Condition:
Main St (SH-317) at US-84 (McGregor Dr) facing south

Existing Condition:
Johnson Dr at US-84 (McGregor Dr) facing east

ESTIMATED COST OF IMPROVEMENT

4: US-84 (McGREGOR DR)- INTERSECTION SAFETY IMPROVEMENTS		
IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
Intersection Improvements: Crosswalks, Sidewalks, Protected Lefts, Remove Slip Lanes, Signal Head Backplates, Warning Beacons	US-84 (McGregor Dr) & Main St (SH-317)	$667,700
Intersection Improvements: Crosswalks, Sidewalks, Protected Lefts, Remove Slip Lanes, Signal Head Backplates, Warning Beacons	US-84 (McGregor Dr) & Johnson Dr	$579,300
	CONTINGENCY COST	$249,400
	ENGINEERING COST	$523,800
	TOTAL COST	**$2,020,200**

PROJECT 5: W 6TH STREET SAFETY IMPROVEMENTS

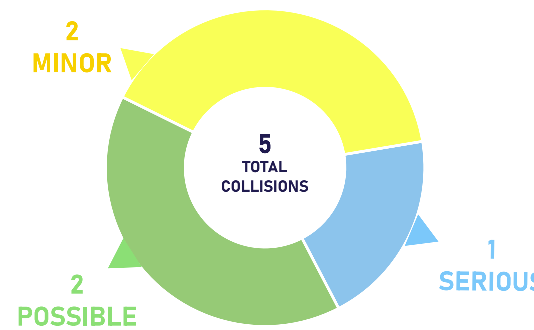


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

W 6th Street is a residential street with two undivided lanes accommodating two-way traffic and maintaining a posted speed limit of 30 mph. It is bordered by concrete curbs on both sides and offers intermittent on-street parking spaces. W 6th street lies within 0.25 mile of McGregor Junior High School.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	1
Motorcycle	0
Automobile	4
Truck	0



TRENDS

BROADSIDE	AUTOMOBILE ROW	HIT OBJECT	NIGHTTIME
60%	40%	40%	40%
3 COLLISIONS	2 COLLISIONS	2 COLLISIONS	2 COLLISIONS

EXISTING CONDITIONS

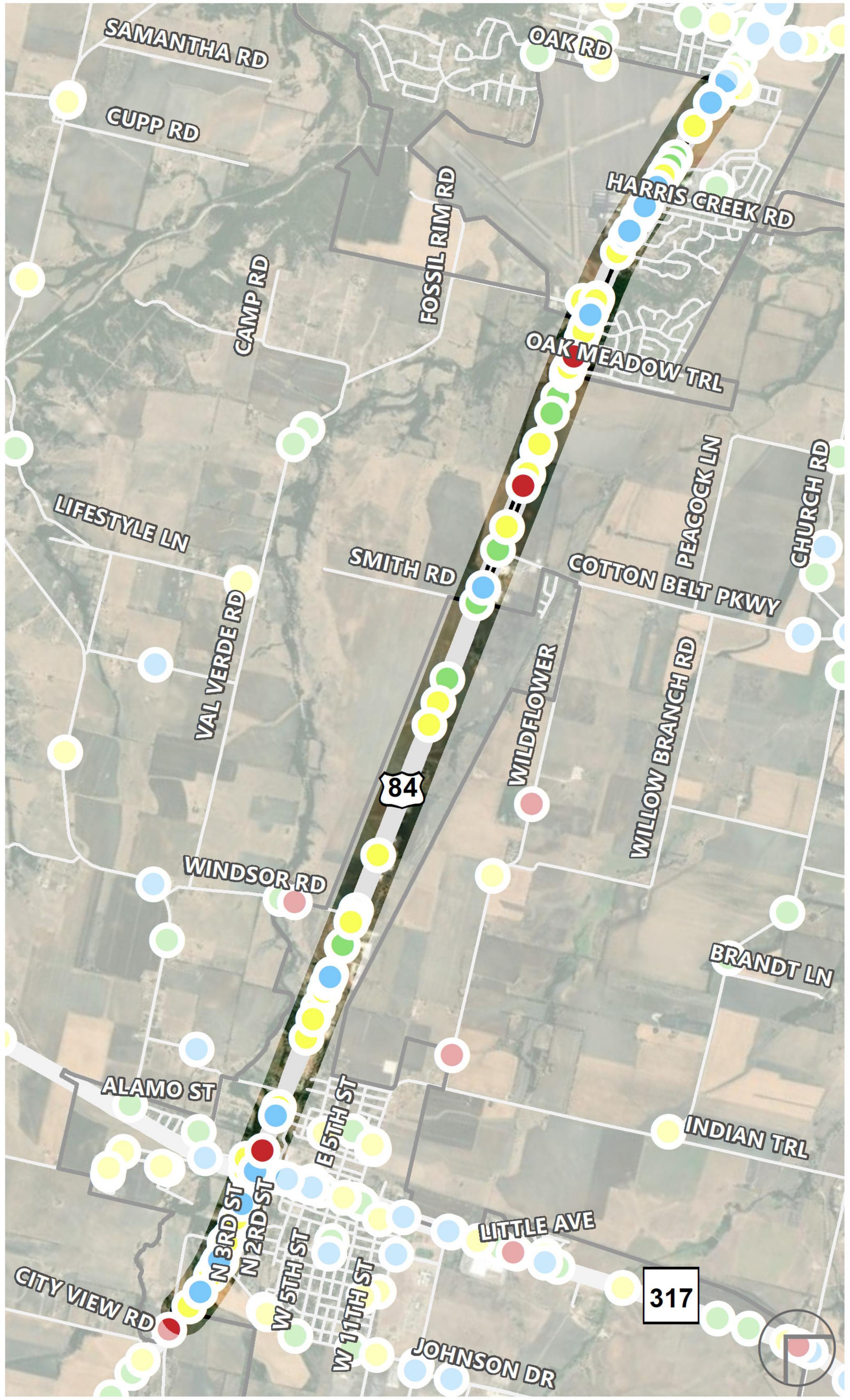
Existing Condition:
W 6th St at Johnson Dr facing east

Existing Condition:
W 6th St at S Tyler St facing east

ESTIMATED COST OF IMPROVEMENT

5 : W 6TH STREET: WASHINGTON AVE TO JOHNSON DR- SAFETY IMPROVEMENTS			
IMPROVEMENTS		LOCATIONS	ESTIMATED COST
	Install Stop Bars	From Washington Ave to Johnson Dr	$2,700
	Install Centerline Striping		$28,100
	Install Street Lighting		$453,100
	Sign Upgrades		$13,800
		CONTINGENCY COST	$99,600
		ENGINEERING COST	$209,100
		TOTAL COST	**$806,400**

PROJECT 6: US-84 (McGREGOR DRIVE): FROM CITY LIMIT EAST TO CITY LIMIT WEST- SAFETY IMPROVEMENTS

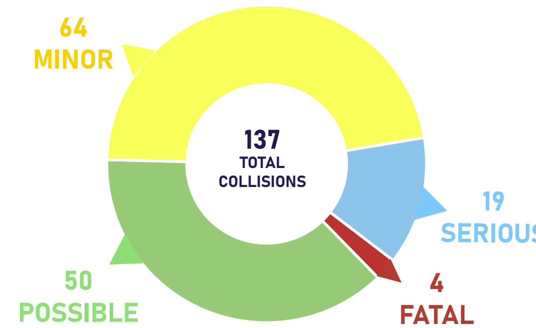


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

US-84 (McGregor Drive) is a major US highway designated as a principal arterial, traversing east-west through the City of McGregor. Within the city limits, this roadway is a four-lane divided highway to the east of N Main Street. However, to the west of N Main Street, US-84 expands to a five-lane configuration, incorporating a two-way left turn lane. The speed limit varies, it ranges from 50 mph to 70 mph within the city limits.

INJURY COLLISION STATISTICS

- 4
- 3
- 6
- 113
- 11



TRENDS

INTERSECTION	BROADSIDE	NIGHTTIME	AUTOMOBILE ROW
50%	42%	35%	35%
65 COLLISIONS	54 COLLISIONS	45 COLLISIONS	45 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
US-84 (McGregor Dr) at SH-317 (Main St) facing east

Existing Condition:
US-84 (McGregor Dr) at Johnson Dr facing west

ESTIMATED COST OF IMPROVEMENT

6: US-84 (McGREGOR DR): FROM EAST OF CITY LIMITS TO WEST OF CITY LIMITS- SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Street Lighting	From City Limit East to City Limit West	$1,162,400
	Install Guardrails	East of Main St and East of Garfield Ave	$14,400
	Install Median	Main St (SH-317) to City Limit West	$1,336,300
	Fill Sidewalk Gaps	Johnson Dr to West of City Limit	$3,896,100
	Install Shared Use Path	Along Railroad From Johnson St to Cotton Belt Pkwy	$8,001,700
	Install Shared Use Path	2nd and 3rd St from Main St to Johnson St	$1,296,700
		CONTINGENCY COST	$3,141,600
		ENGINEERING COST	$6,597,300
		TOTAL COST	**$25,446,500**

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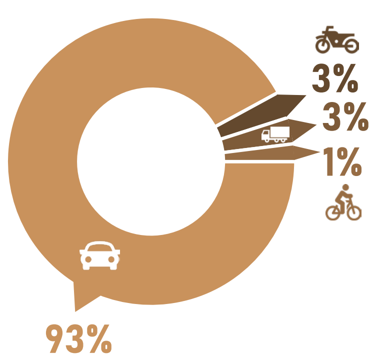
CHAPTER 6.5: CITY OF ROBINSON

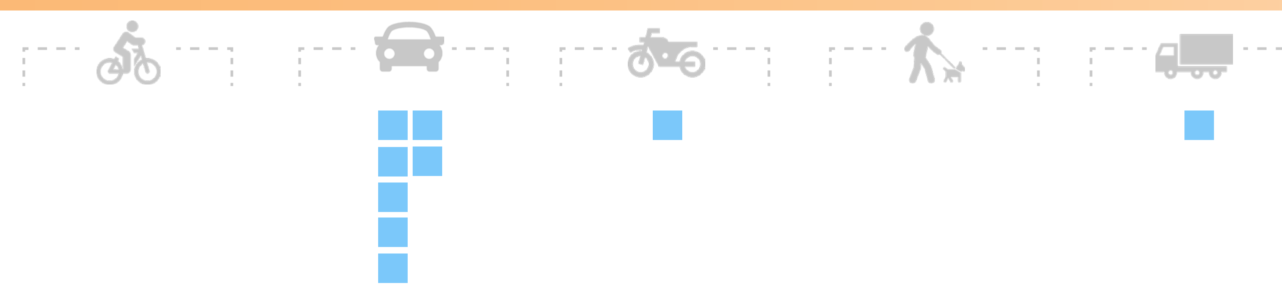
INTRODUCTION

The City of Robinson is located along US-77 due southeast of Waco in McLennan County. IH-35 and Highway 6 also are located in the city limits. The city has an estimated population of 12,443 according to the 2020 census. This chapter provides information on the City of Robinson's collision statistics from 2014 to 2023. A total of 76 collisions occurred on Robinson streets in the last 10 years including zero fatalities and nine serious injuries. TxDOT roadways within Robinson city limits observed 443 collisions during the same period, with 11 fatal injuries and 54 serious injuries. The majority of injury collisions in both City and TxDOT rights-of-way resulted in minor injuries, with 50 percent in City right-of-way and approximately 43 percent in TxDOT right-of-way.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**76**	**100 %**	**443**	**100 %**
Fatal Injury	0	0.00 %	11	2.48 %
Serious Injury	9	11.84 %	54	12.19 %
Minor Injury	38	50.00 %	190	42.89 %
Possible Injury	29	38.16 %	188	42.44 %
Total Persons Involved	**91**	**100 %**	**676**	**100 %**
Fatal Injury	0	0.00 %	12	1.78 %
Serious Injury	12	13.19 %	63	9.32 %
Minor Injury	43	47.25 %	284	42.01 %
Possible Injury	36	39.56 %	317	46.89 %

COLLISIONS BY MODE - CITY

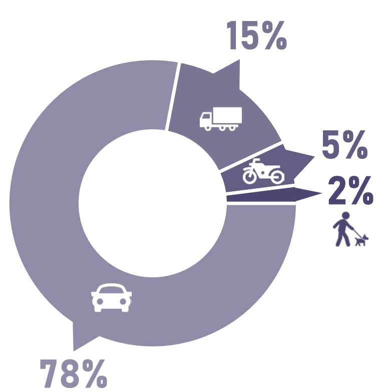


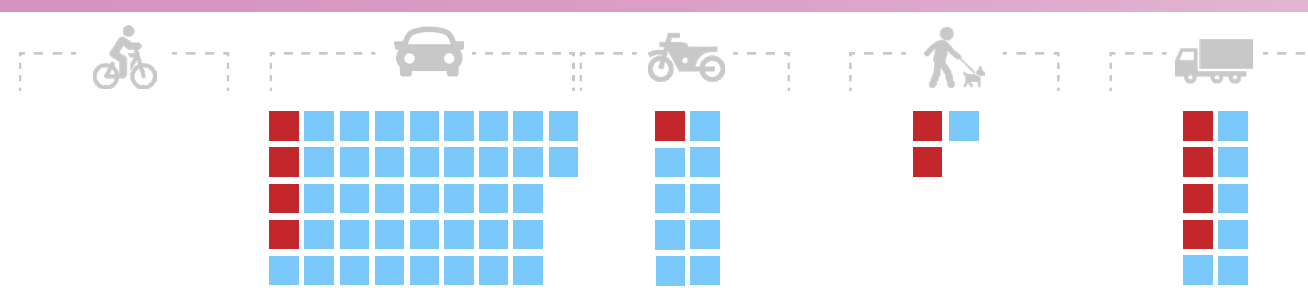


0 %	0 %	0 %	0 %	0 %	Fatal Injury
0 %	10 %	50 %	0 %	50 %	Serious Injury
100 %	49 %	50 %	0 %	50 %	Minor Injury
0 %	41 %	0 %	0 %	0 %	Possible Injury
100 %	100 %	100 %	0 %	100 %	

Note : Each box represents one fatal or severe injury collision.

COLLISIONS BY MODE - TxDOT





0 %	1 %	4 %	29 %	6 %	Fatal Injury
0 %	11 %	39 %	14 %	9 %	Serious Injury
0 %	42 %	57 %	14 %	46 %	Minor Injury
0 %	46 %	0 %	43 %	39 %	Possible Injury
0 %	100 %	100 %	100 %	100 %	

Note : Each box represents one fatal or severe injury collision.

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on Robinson's city streets, TxDOT facilities and McLennan County across various categories.

On Robinson city streets, there were a total of 76 collisions, resulting in 91 persons injured. In comparison, TxDOT reported a total of 443 collisions resulting in 676 persons injured within Robinson city limits.

This section also identifies several major collision trends on Robinson city streets, including hit object collisions involving unsafe speeds, right-of-way violations by automobiles, and nighttime collisions. On TxDOT roadways, the prominent trends were hit object collisions, rear end collisions, unsafe speed violations, and nighttime collisions. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. The charts indicate that roads with a 60 mph speed limit accounted for the highest proportion of KSI collisions out of the speed limits examined.

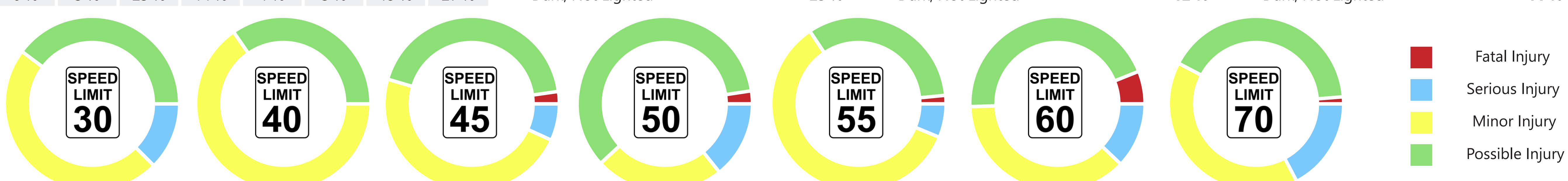
CITY	TxDOT
76	443
TOTAL COLLISIONS	TOTAL COLLISIONS
91	676
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED								
	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	1 %	0 %	0 %	0 %	0 %	0 %
Car	0 %	12 %	45 %	40 %	1 %	7 %	38 %	44 %
Motorcycle	0 %	1 %	1 %	0 %	0 %	1 %	2 %	0 %
Pedestrian	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Truck	0 %	0 %	0 %	0 %	0 %	0 %	2 %	2 %
AGE								
Below 15	0 %	0 %	1 %	1 %	0 %	0 %	4 %	6 %
15 - 65	0 %	13 %	42 %	33 %	1 %	8 %	34 %	37 %
Above 65	0 %	0 %	4 %	5 %	1 %	1 %	4 %	4 %
GENDER								
Male	0 %	10 %	22 %	25 %	1 %	6 %	23 %	20 %
Female	0 %	3 %	25 %	14 %	1 %	3 %	19 %	27 %

CITY OF ROBINSON VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

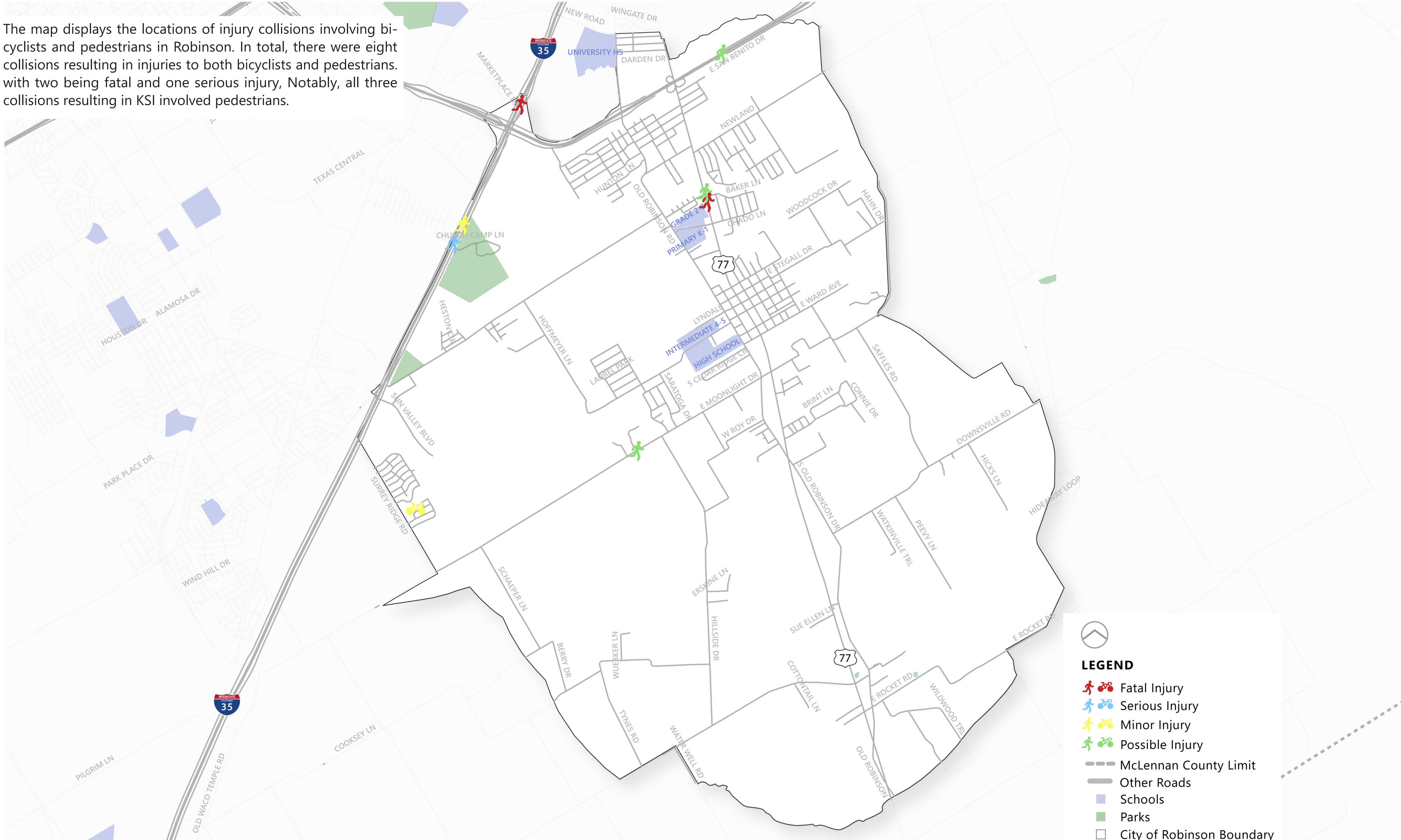
CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	1 %	Bicycle	**0 %**	Bicycle	**1 %**
Car	93 %	Car	**78 %**	Car	**85 %**
Motorcycle	3 %	Motorcycle	**5 %**	Motorcycle	**4 %**
Pedestrian	0 %	Pedestrian	**2 %**	Pedestrian	**3 %**
Truck	3 %	Truck	**15 %**	Truck	**7 %**
FIRST HARMFUL EVENT					
Fixed Object	54 %	Motor Vehicle in Transport	**63 %**	Motor Vehicle in Transport	**72 %**
Motor Vehicle in Transport	32 %	Fixed Object	**25 %**	Fixed Object	**17 %**
Overturned	7 %	Overturned	**7 %**	Overturned	**4 %**
MANNER OF COLLISION					
Hit Object	68 %	Hit Object	**37 %**	Broadside	**42 %**
Broadside	18 %	Rear End	**33 %**	Hit Object	**28 %**
Head On	8 %	Broadside	**19 %**	Rear End	**24 %**
Rear End	4 %	Sideswipe	**8 %**	Sideswipe	**5 %**
VIOLATION CATEGORY					
Unsafe Speed	20 %	Unsafe Speed	**32 %**	Unsafe Speed	**23 %**
Driving/ Bicycling under Influence	16 %	Over Improper Driving	**11 %**	Automobile Right-of-Way	**22 %**
Distracted Driving	16 %	Other Unforeseen Reasons	**9 %**	Traffic Signals and Signs	**12 %**
Driver Condition	14 %	Automobile Right-of-Way	**9 %**	Distracted Driving	**8 %**
Other Improper Driving	9 %	Distracted Driving	**9 %**	Other Improper Driving	**6 %**
Automobile Right-of-Way	8 %	Driving under Influence	**5 %**	Other Unforeseen Reasons	**6 %**
LOCATION					
Intersection	39 %	Intersection	**37 %**	Intersection	**59 %**
Roadway	61 %	Roadway	**63 %**	Roadway	**41 %**
LIGHTING					
Daylight	54 %	Daylight	**62 %**	Daylight	**70 %**
Dark, Lighted	16 %	Dark, Lighted	**21 %**	Dark, Lighted	**16 %**
Dark, Not Lighted	25 %	Dark, Not Lighted	**12 %**	Dark, Not Lighted	**11 %**

SPEED LIMIT



BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

The map displays the locations of injury collisions involving bicyclists and pedestrians in Robinson. In total, there were eight collisions resulting in injuries to both bicyclists and pedestrians. with two being fatal and one serious injury, Notably, all three collisions resulting in KSI involved pedestrians.



SEVERITY INDEX

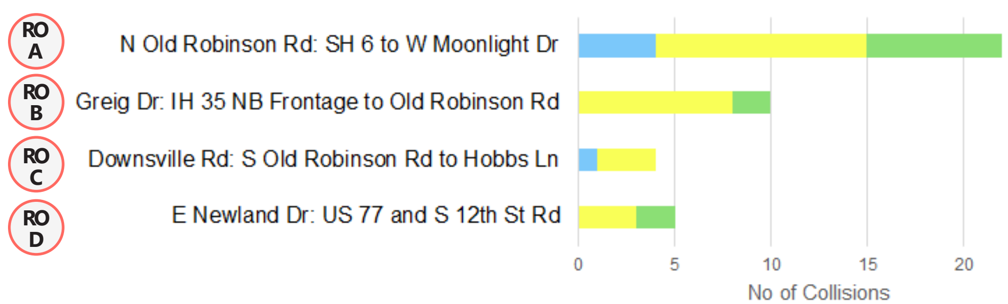
The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.

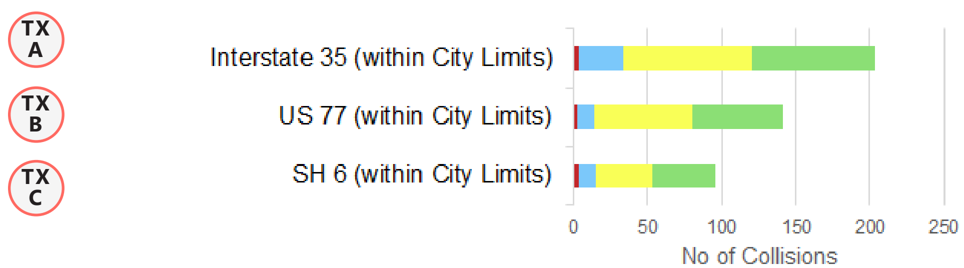
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within the City of Robinson. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

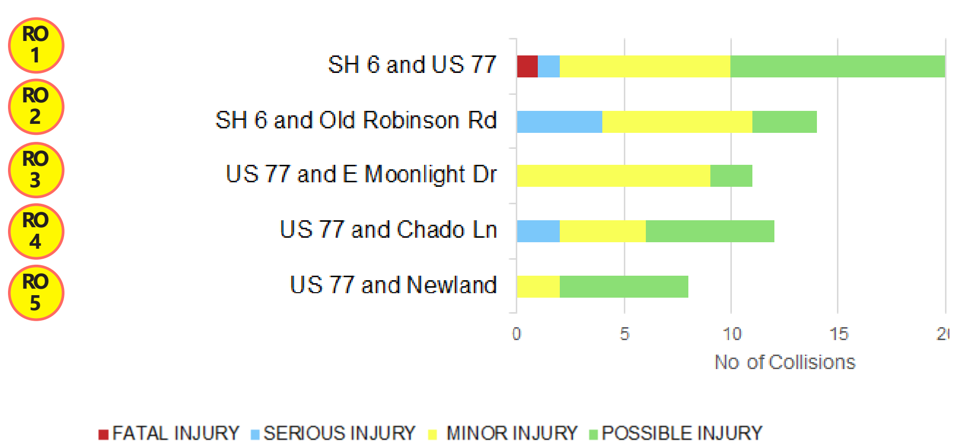
ROADWAYS

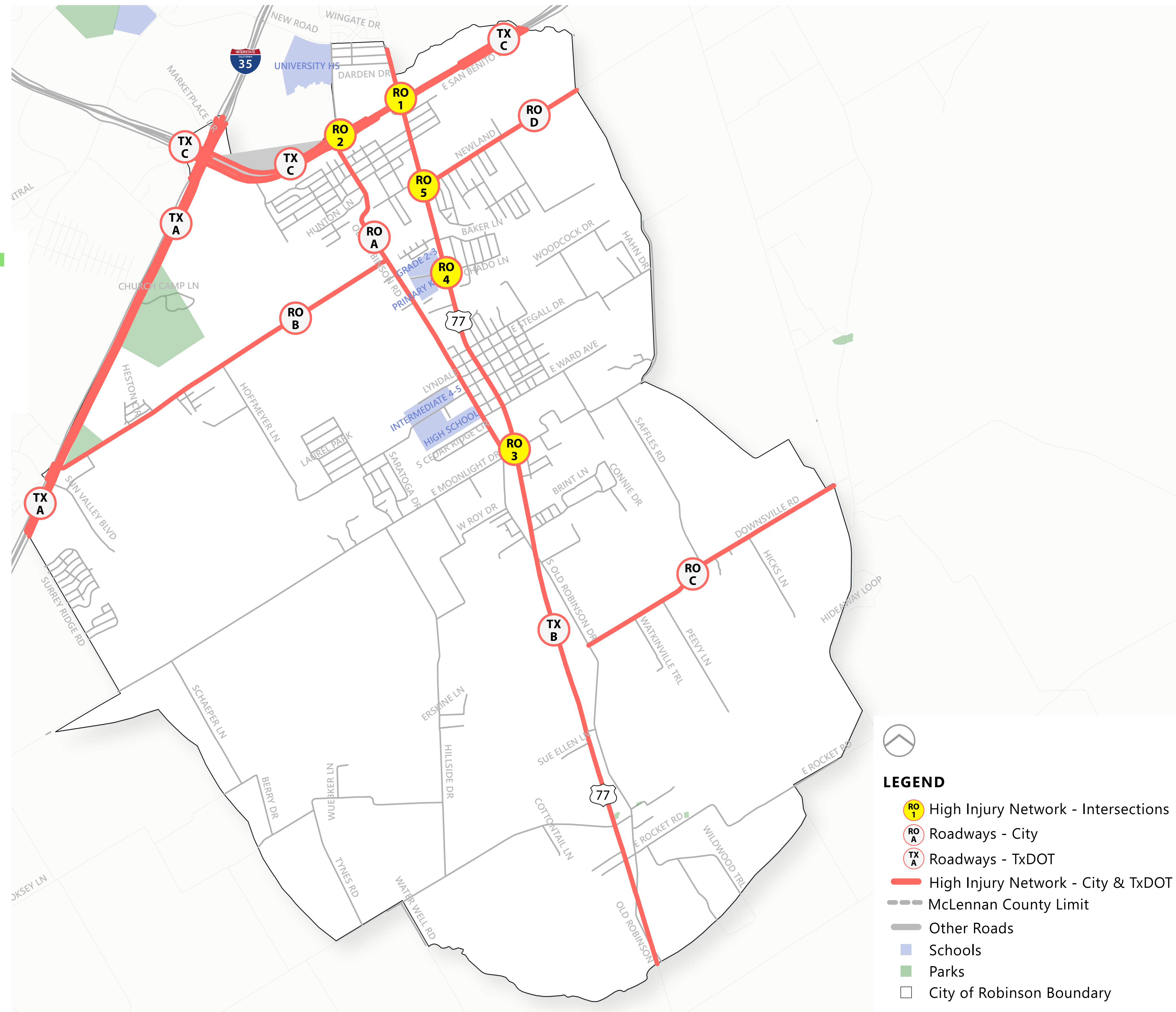


TxDOT ROADWAYS



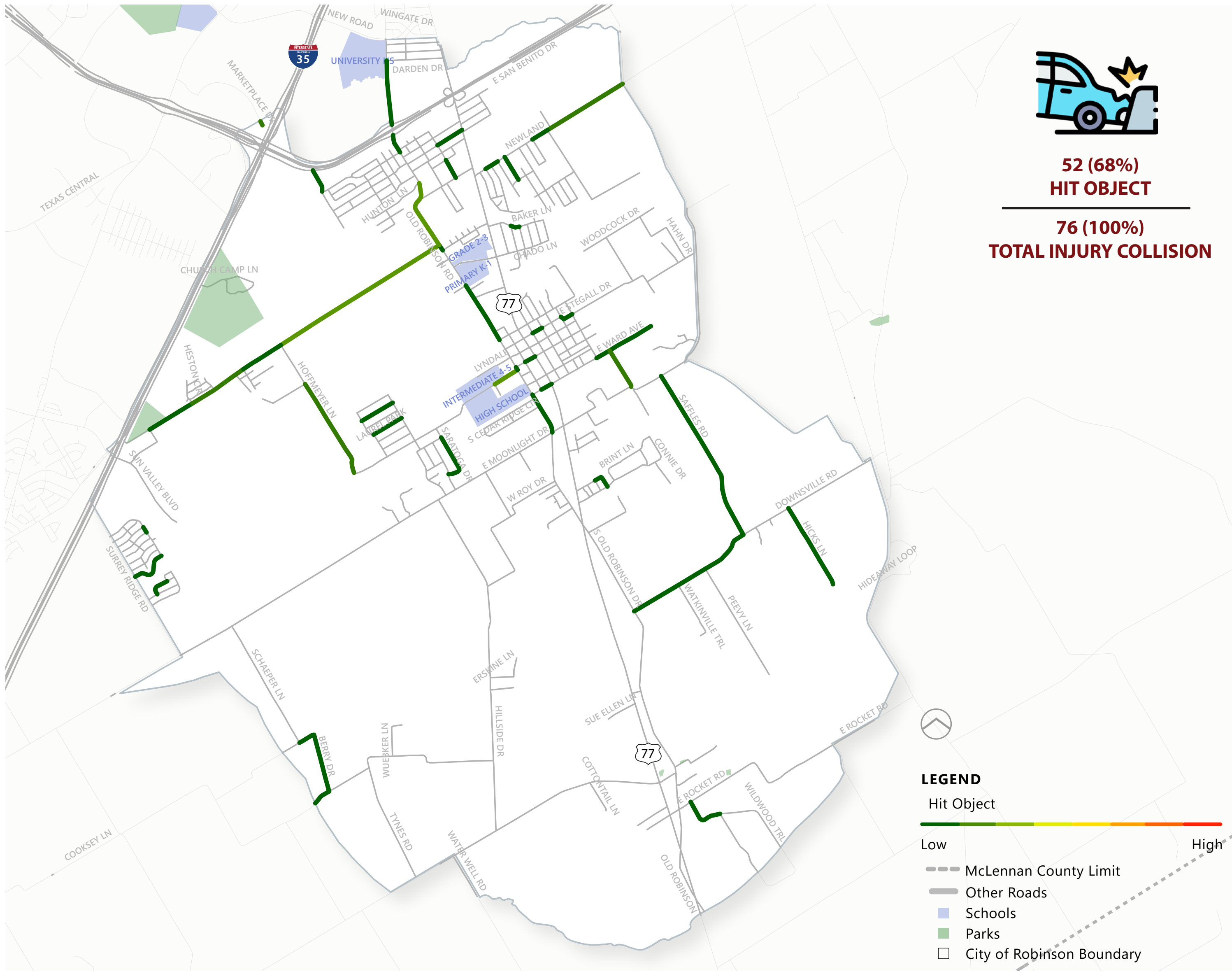
INTERSECTIONS





PROFILES - CITY

PROFILE 1 - HIT OBJECT



SEVERITY

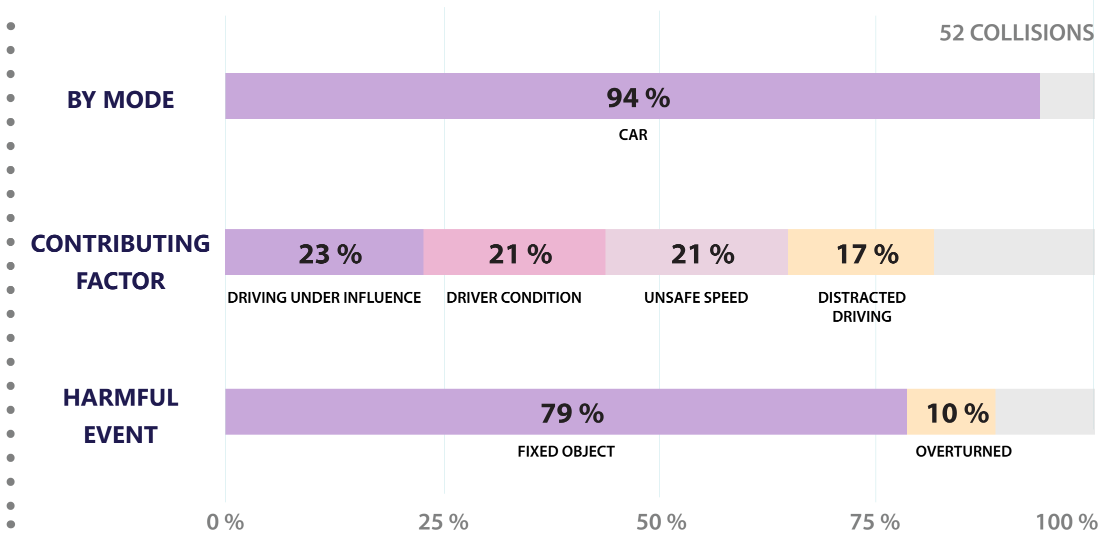
0 %
17 %
54 %
29 %

LOCATION

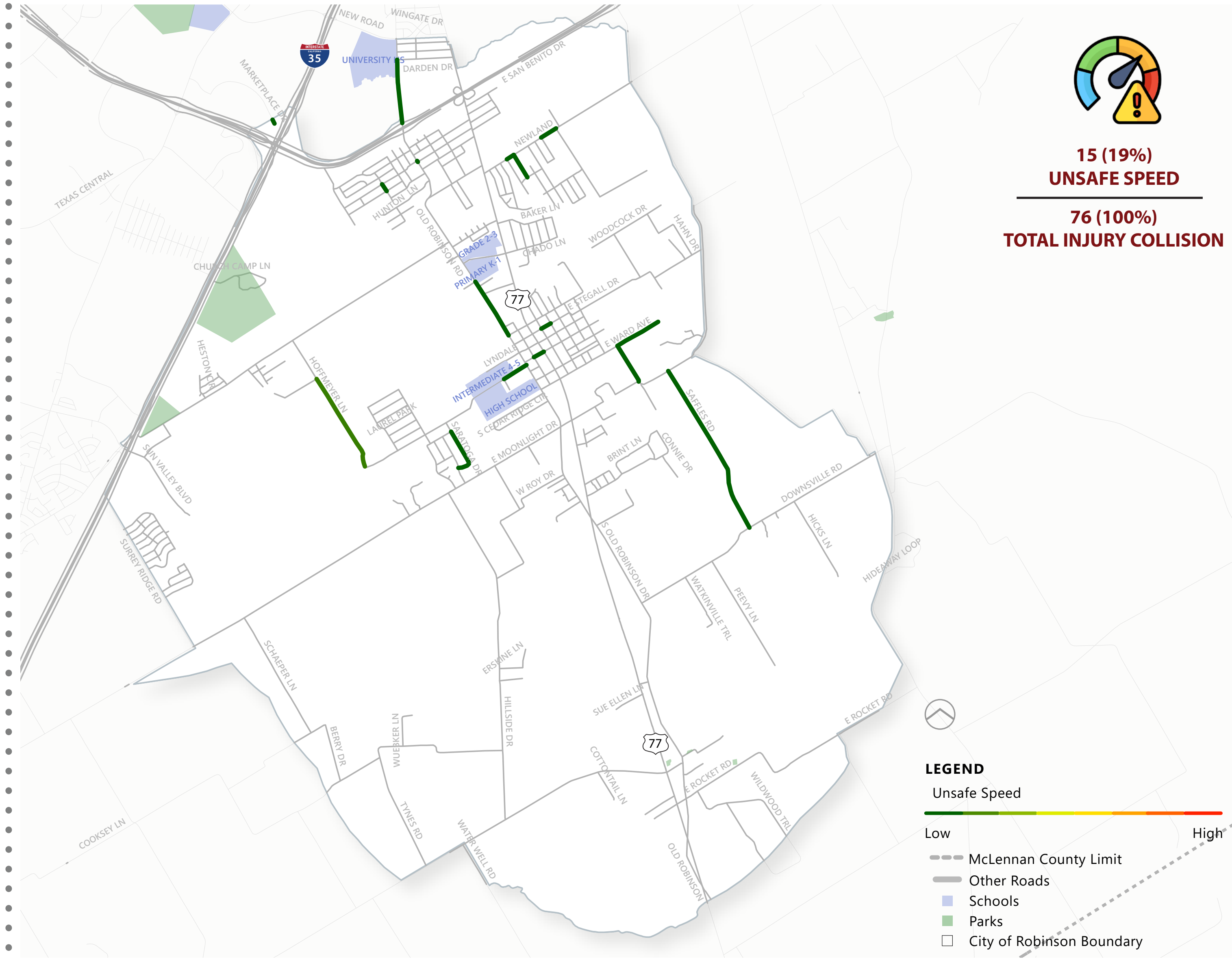
23 %
77 %

LIGHTING

42 %
4 %
21 %
33 %



PROFILE 2 - UNSAFE SPEED



SEVERITY

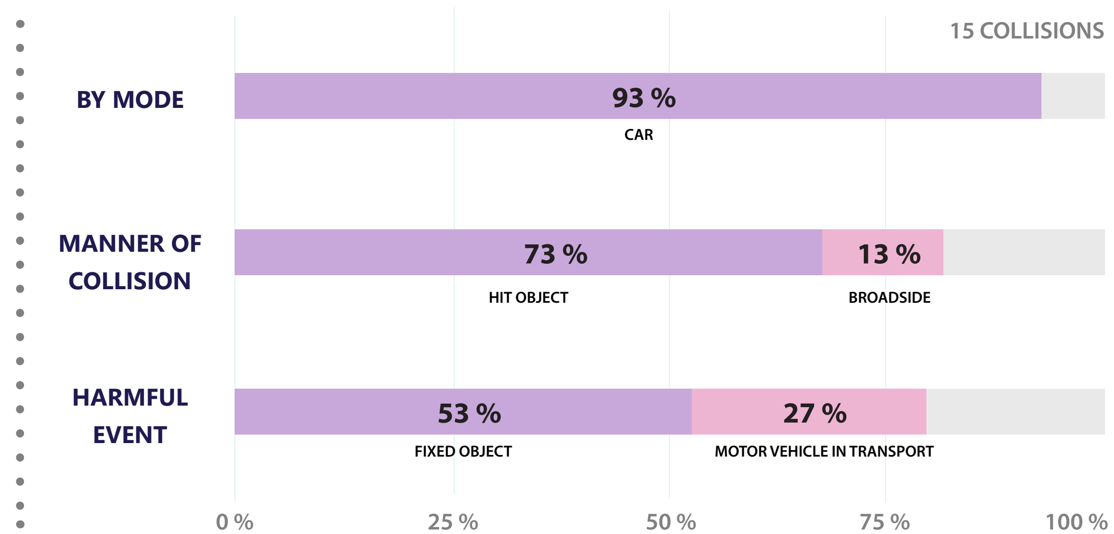
0 %
27 %
47 %
26 %

LOCATION

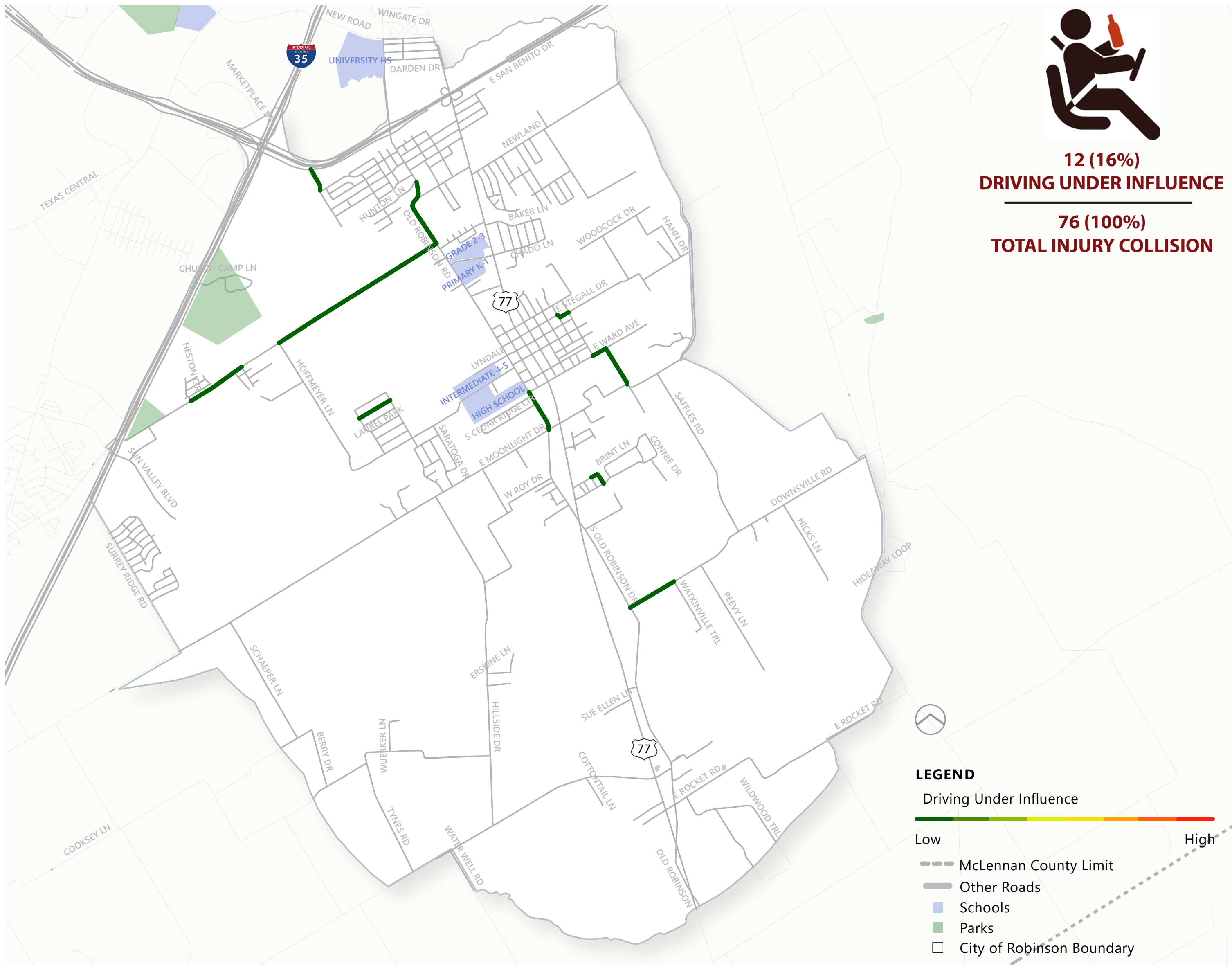
47 %
53 %

LIGHTING

40 %
0 %
13 %
47 %



PROFILE 3 - DRIVING UNDER INFLUENCE



SEVERITY

0 % | 17 %

50 % | 33 %

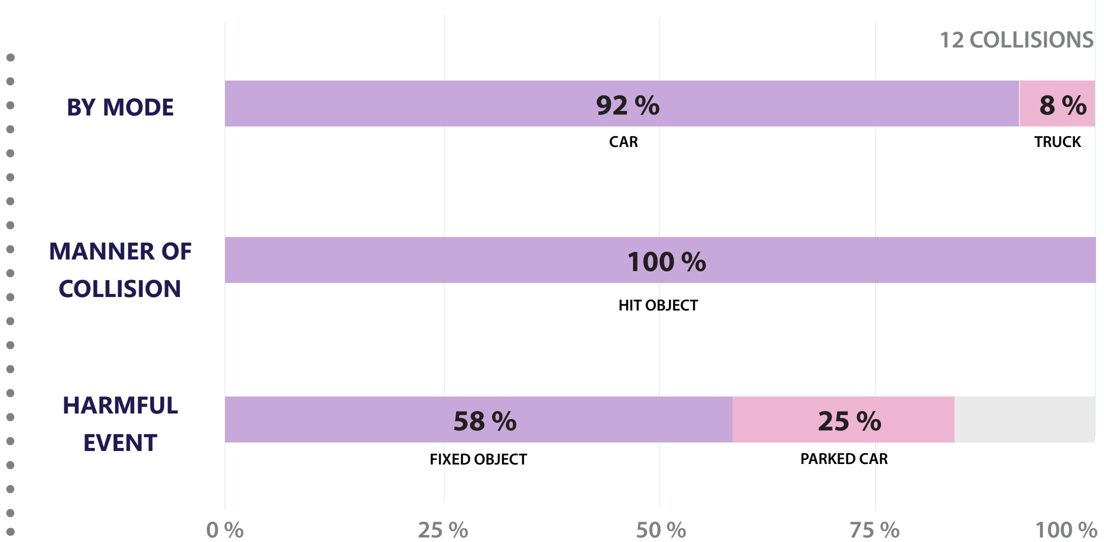
LOCATION

25 % | 75 %

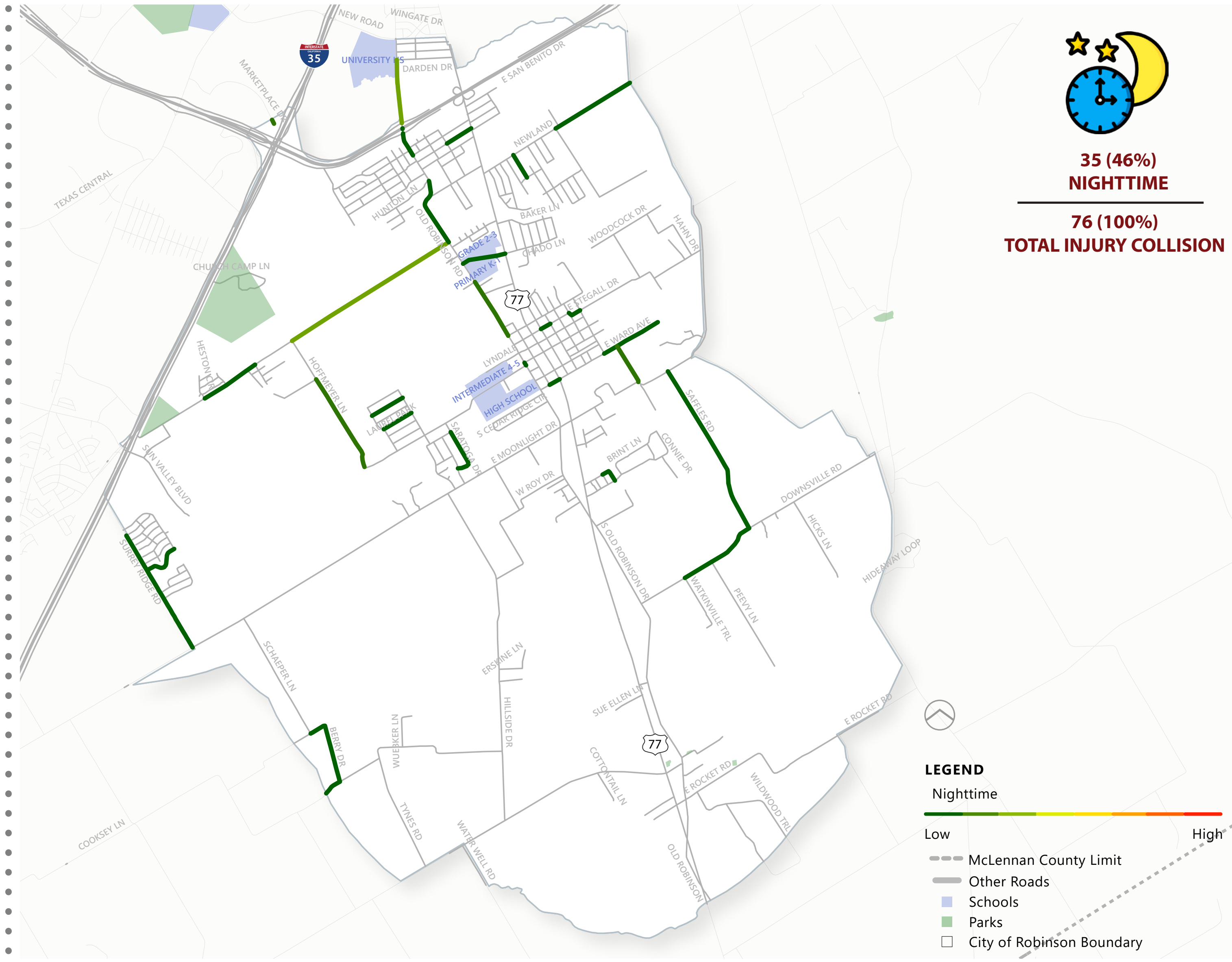
LIGHTING

33 % | 0 %

42 % | 25 %



PROFILE 4 - NIGHTTIME



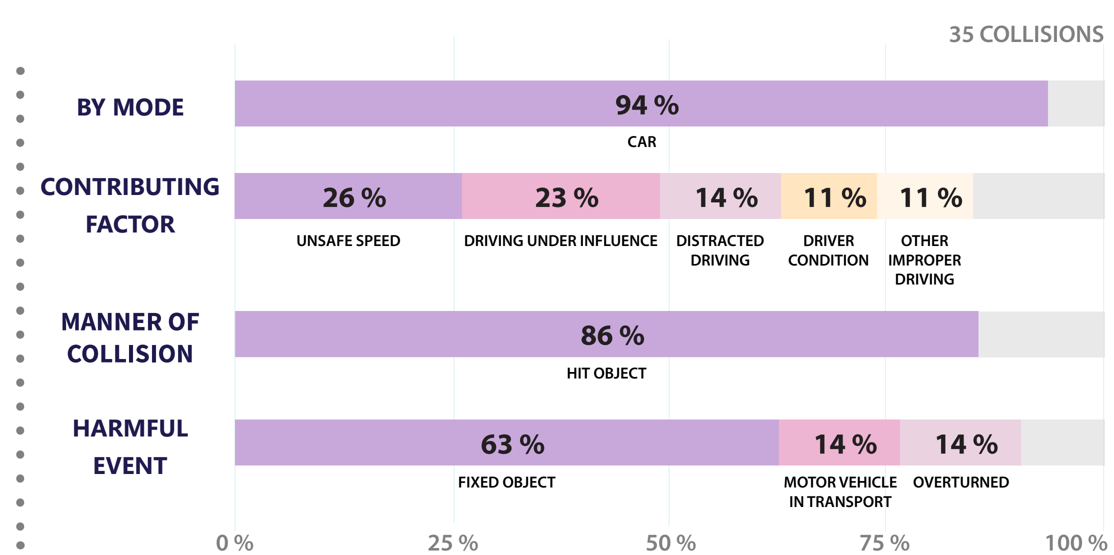
SEVERITY

0 % | 26 %

43 % | 31 %

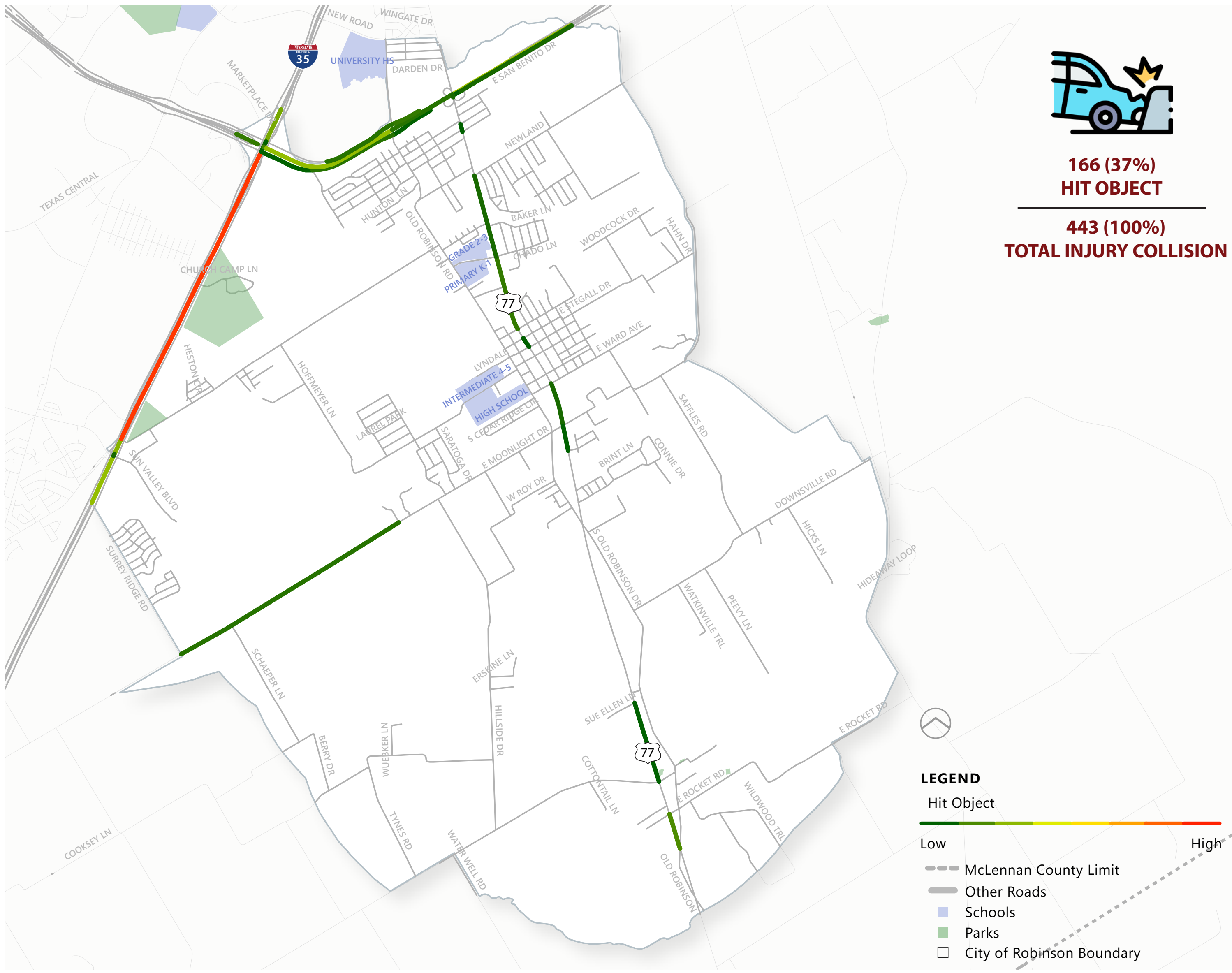
LOCATION

26 % | 74 %



PROFILES - TXDOT

PROFILE 1 - HIT OBJECT



SEVERITY

4 %

14 %

45 %

37 %

LOCATION

16 %

84 %

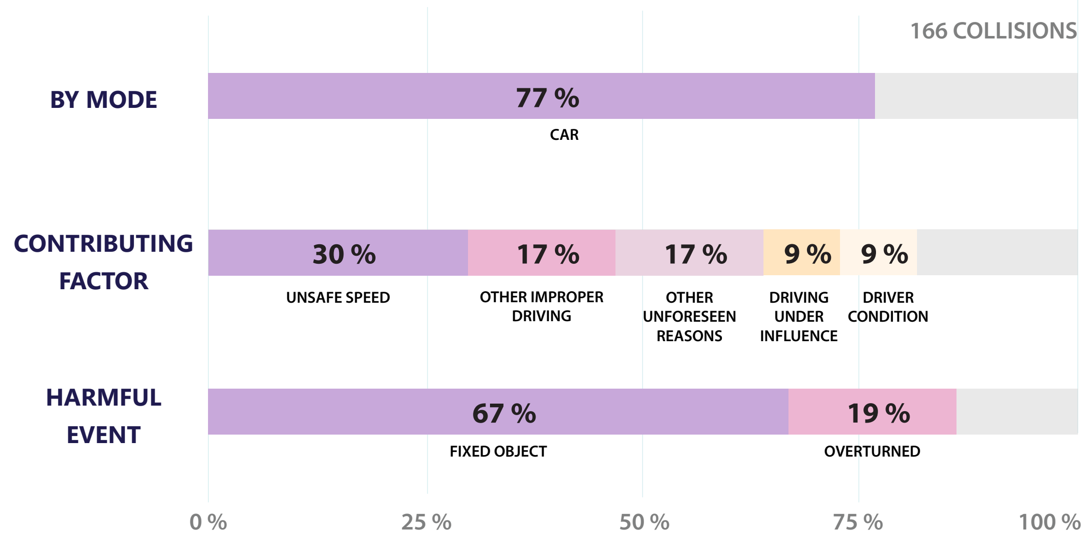
LIGHTING

48 %

7 %

30 %

15 %



PROFILE 2 - REAR END

SEVERITY

1 %

11 %

44 %

44 %

LOCATION

40 %

60 %

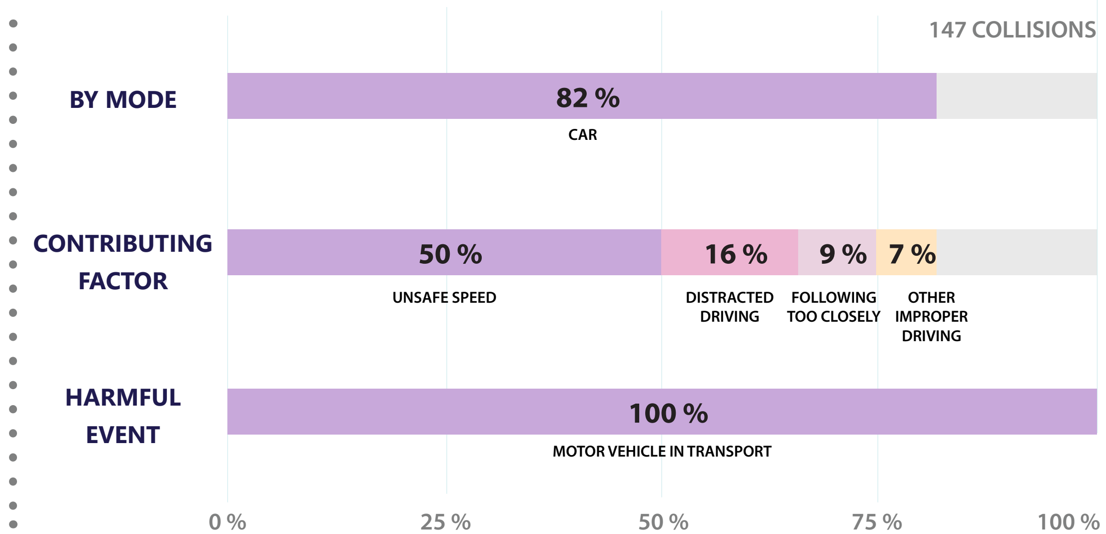
LIGHTING

71 %

4 %

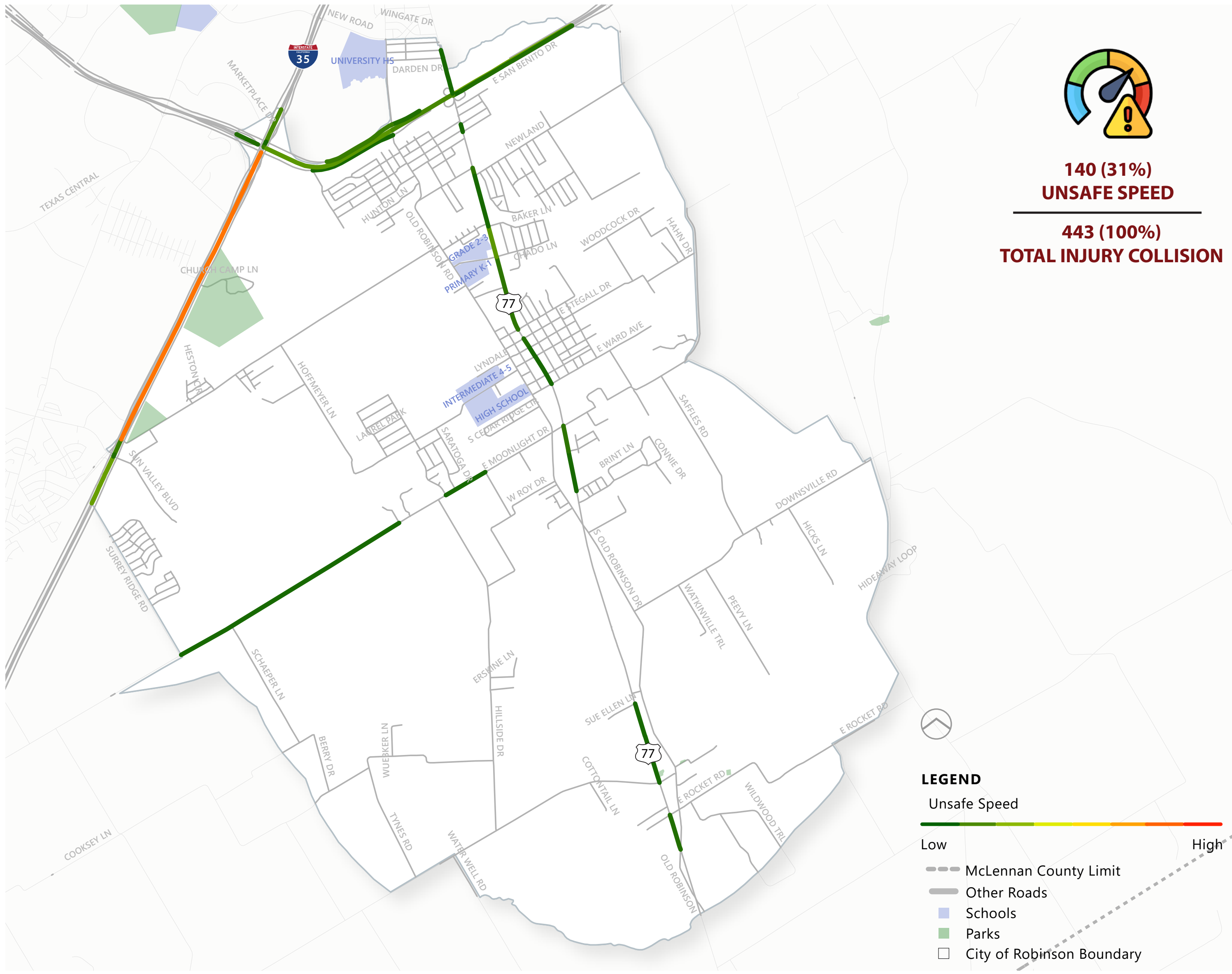
17 %

8 %



PROFILES - TXDOT

PROFILE 3 - UNSAFE SPEED



SEVERITY

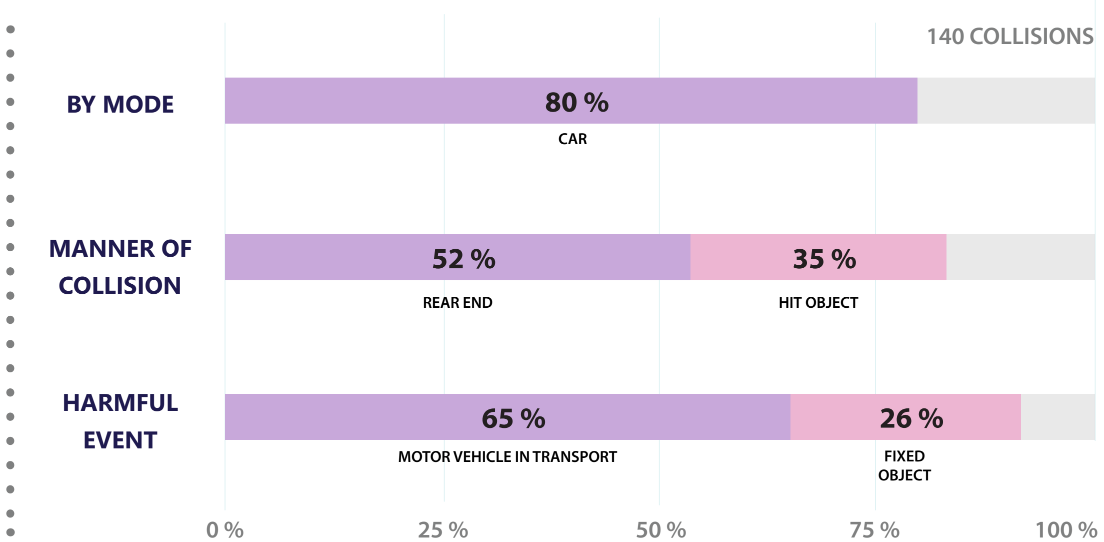
1 %
9 %
46 %
44 %

LOCATION

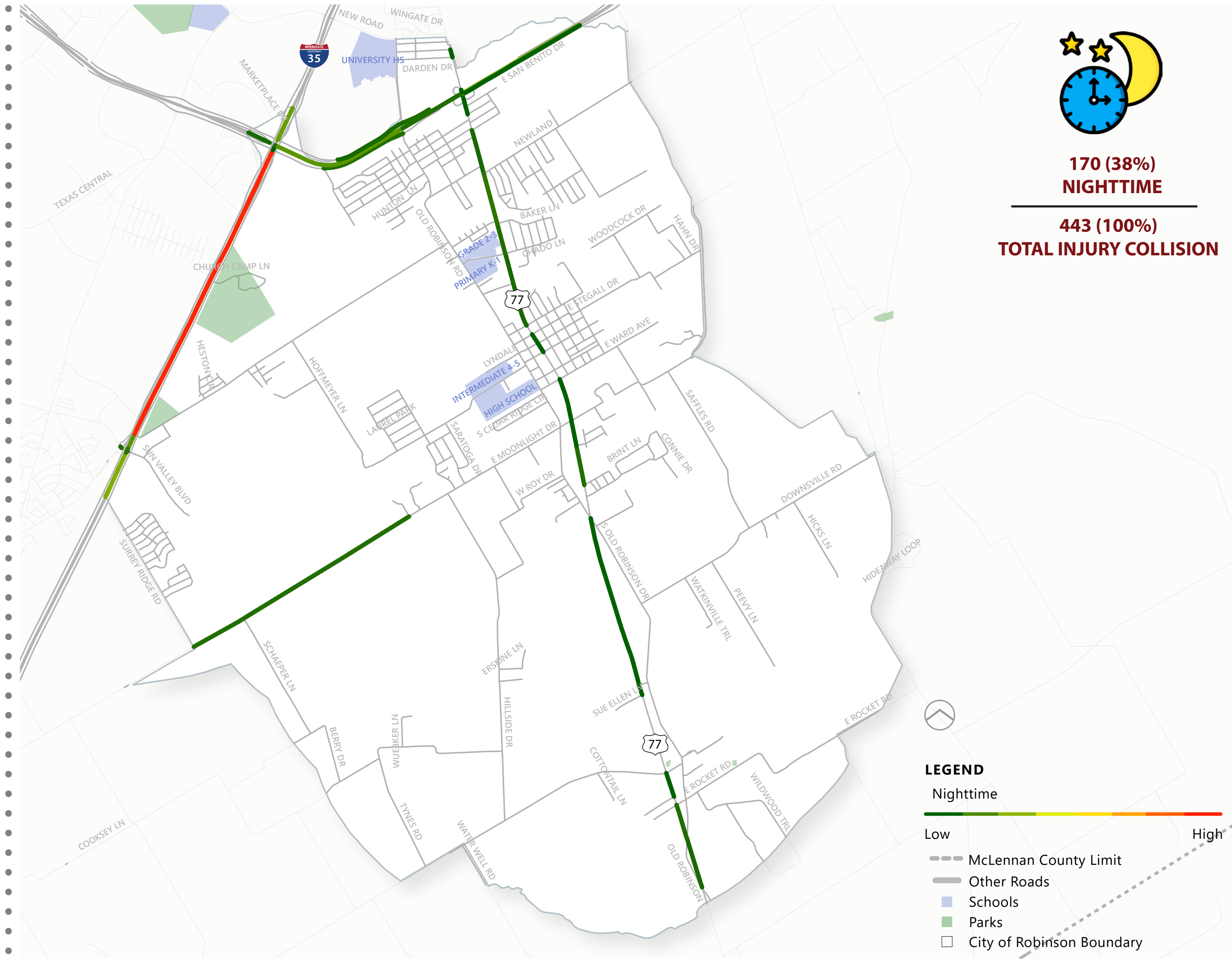
30 %
70 %

LIGHTING

66 %
4 %
23 %
7 %



PROFILE 4 - NIGHTTIME

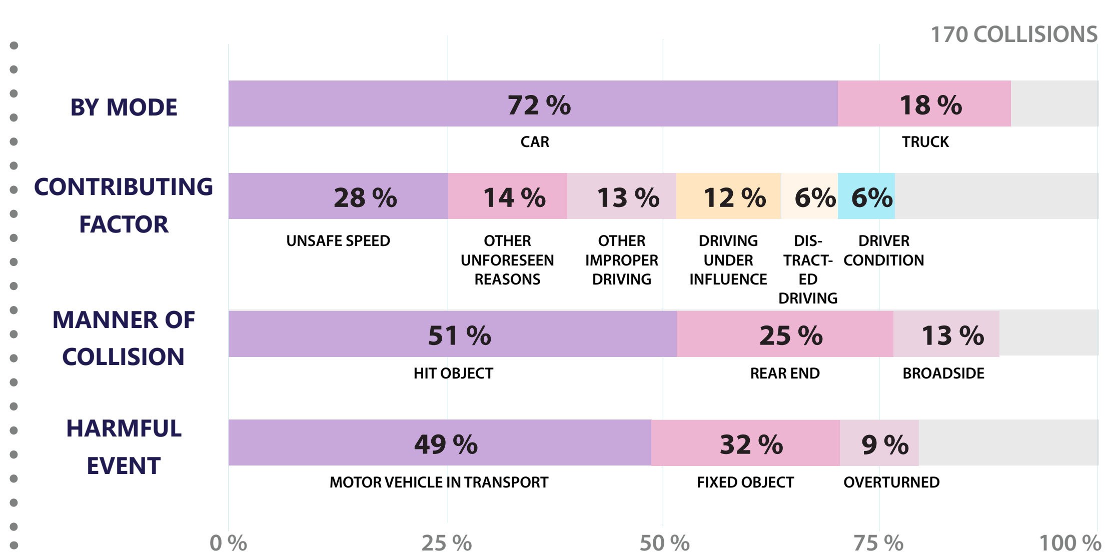


SEVERITY

3 %
18 %
47 %
32 %

LOCATION

29 %
71 %

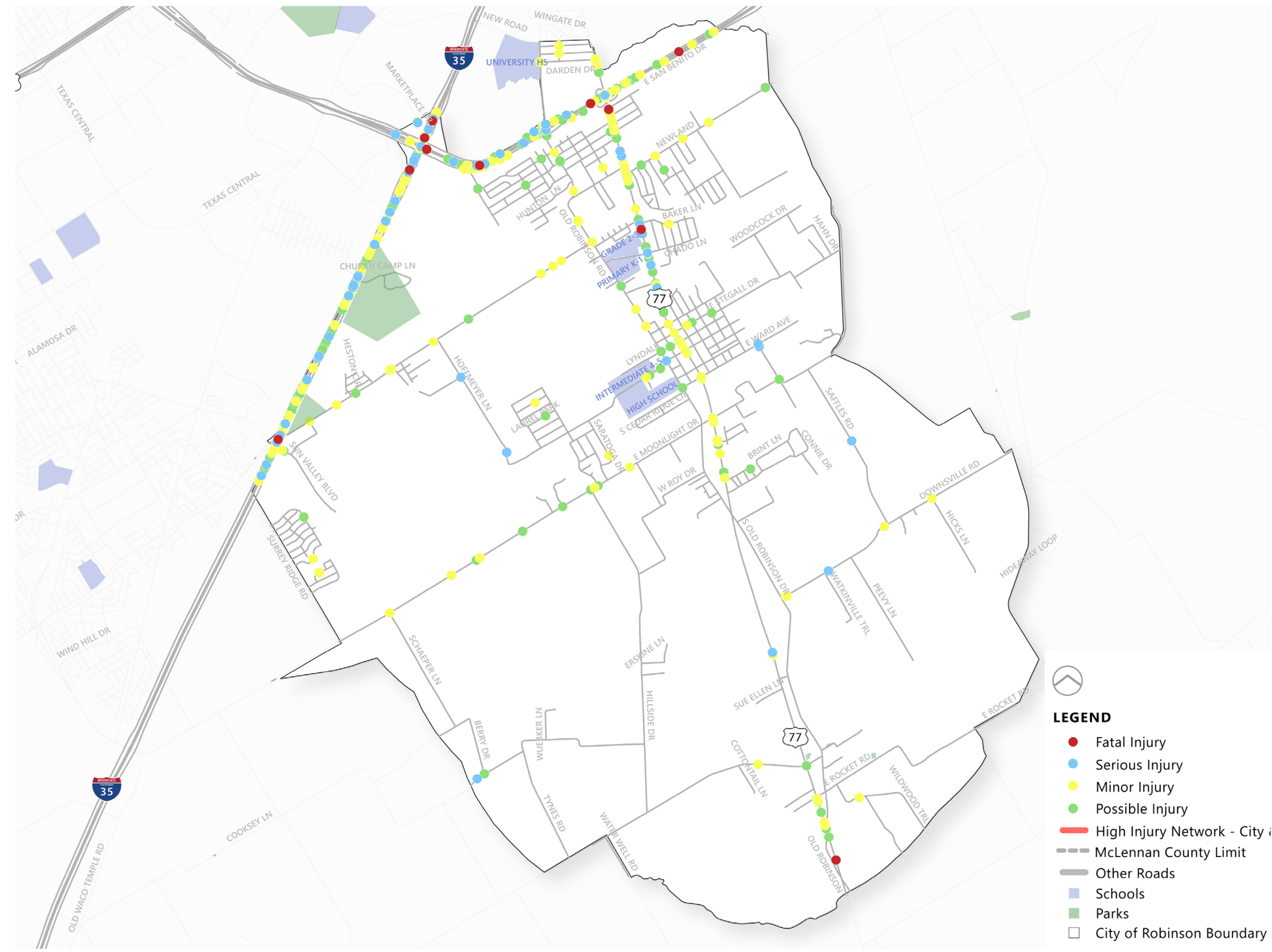


PAVEMENT MAINTENANCE & REPAIR PROGRAM

The City of Robinson should consider a comprehensive Pavement Maintenance and Repair Program to address the deteriorating condition of its roadways. Many streets throughout the city are showing signs of significant wear and tear, including cracking, potholes, and uneven surfaces. These pavement issues not only create an unpleasant driving experience for residents and visitors, but they also pose safety hazards and can lead to more costly repairs if left unchecked. The proposed program would involve a systematic evaluation of the condition of all city-maintained roads, followed by a strategic plan to prioritize and undertake necessary maintenance and rehabilitation activities. This may include resurfacing, patching, crack sealing, and other treatments to extend the useful life of the pavement. By proactively investing in the upkeep of its roadway infrastructure, the City of Robinson can improve overall transportation safety and efficiency, while also protecting its long-term capital assets.

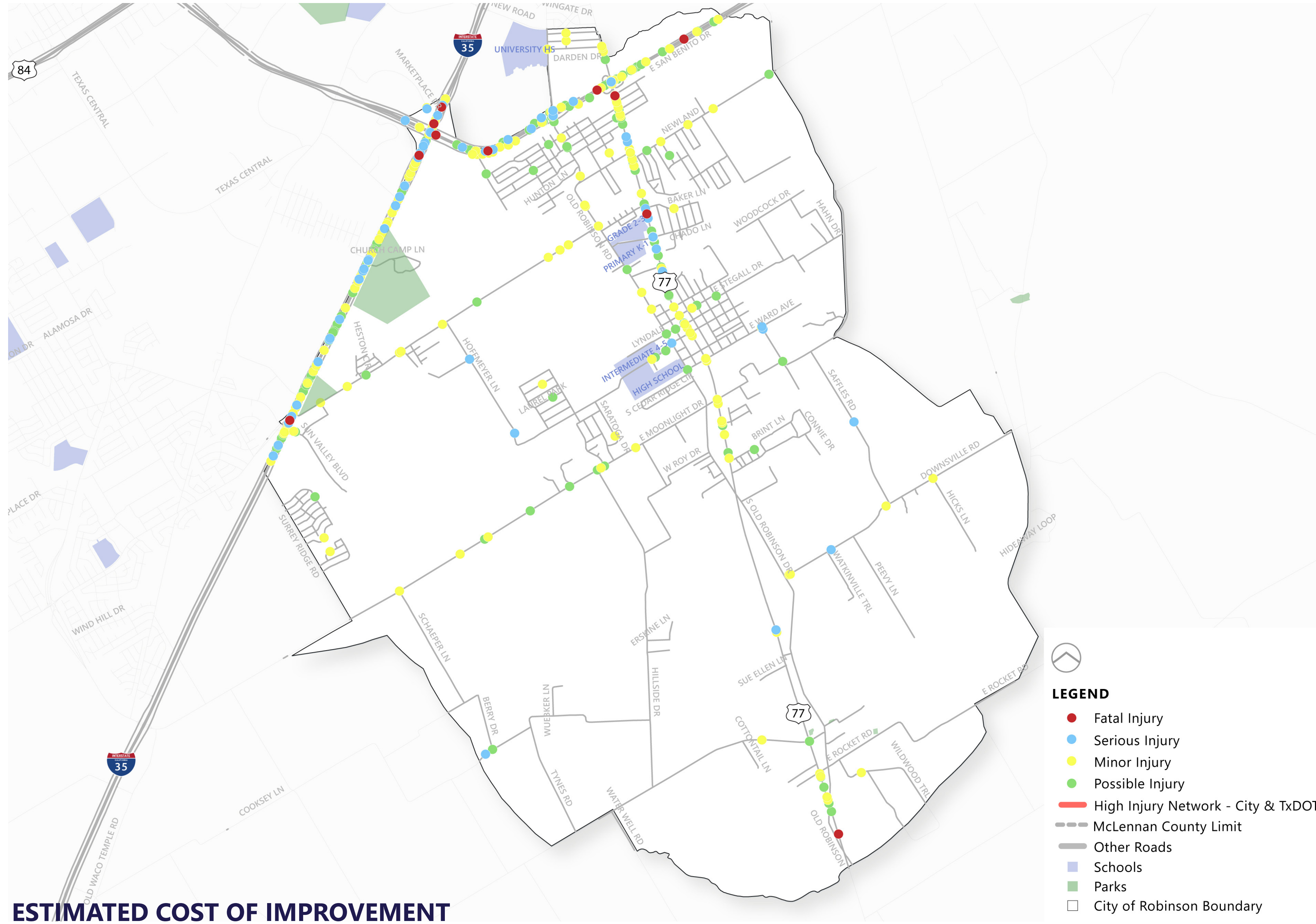
SUPPLEMENTAL PLANNING STUDY FOR FEASIBILITY OF SAFE ROUTES TO SCHOOL

The City of Robinson recognizes the importance of providing safe and accessible transportation options for students traveling to and from local schools. Currently, many neighborhoods lack sufficient pedestrian and bicycle infrastructure to allow children to safely walk or bike to school. This poses safety risks and discourages active transportation, leading to increased vehicle congestion and emissions around school zones. To address these concerns, the city is proposing to conduct a Supplemental Planning Study to evaluate the feasibility of implementing a comprehensive Safe Routes to School program. The study would involve assessing existing conditions, identifying key routes and infrastructure needs, and engaging with the community - including school districts, parents, and students - to develop a strategic plan for improving sidewalks, crosswalks, signage, and other safety enhancements around Robinson's schools. By investing in this planning effort, the city aims to remove barriers, promote healthy and sustainable transportation choices, and ensure the safety of its youngest residents as they commute to and from their places of learning.



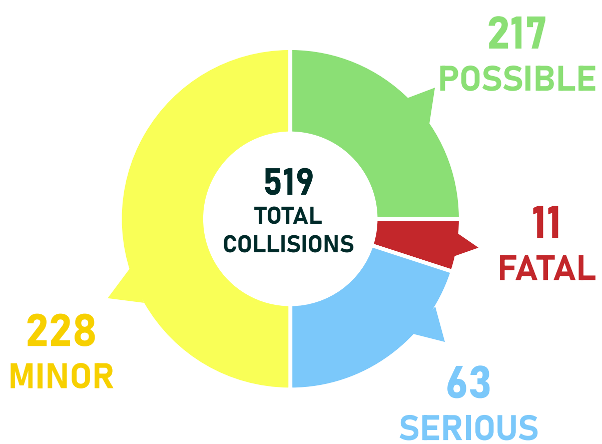
PROJECT 1: CITYWIDE SIGN INVENTORY & PAVEMENT DELINEATION

The City of Robinson is proposing a Citywide Sign Inventory and Pavement Delineation project to enhance roadway safety and navigation for drivers. The initiative would begin with a comprehensive evaluation of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed or non-compliant with current regulations. These signs would be replaced as needed to provide clear, up-to-date messaging for motorists. The project would also involve surveying all road markings such as lane lines, turn arrows, crosswalks and other pavement delineations across the city.



INJURY COLLISION STATISTICS

Pedestrian	7
Bicycle	1
Motorcycle	25
Car	417
Truck	69



TRENDS

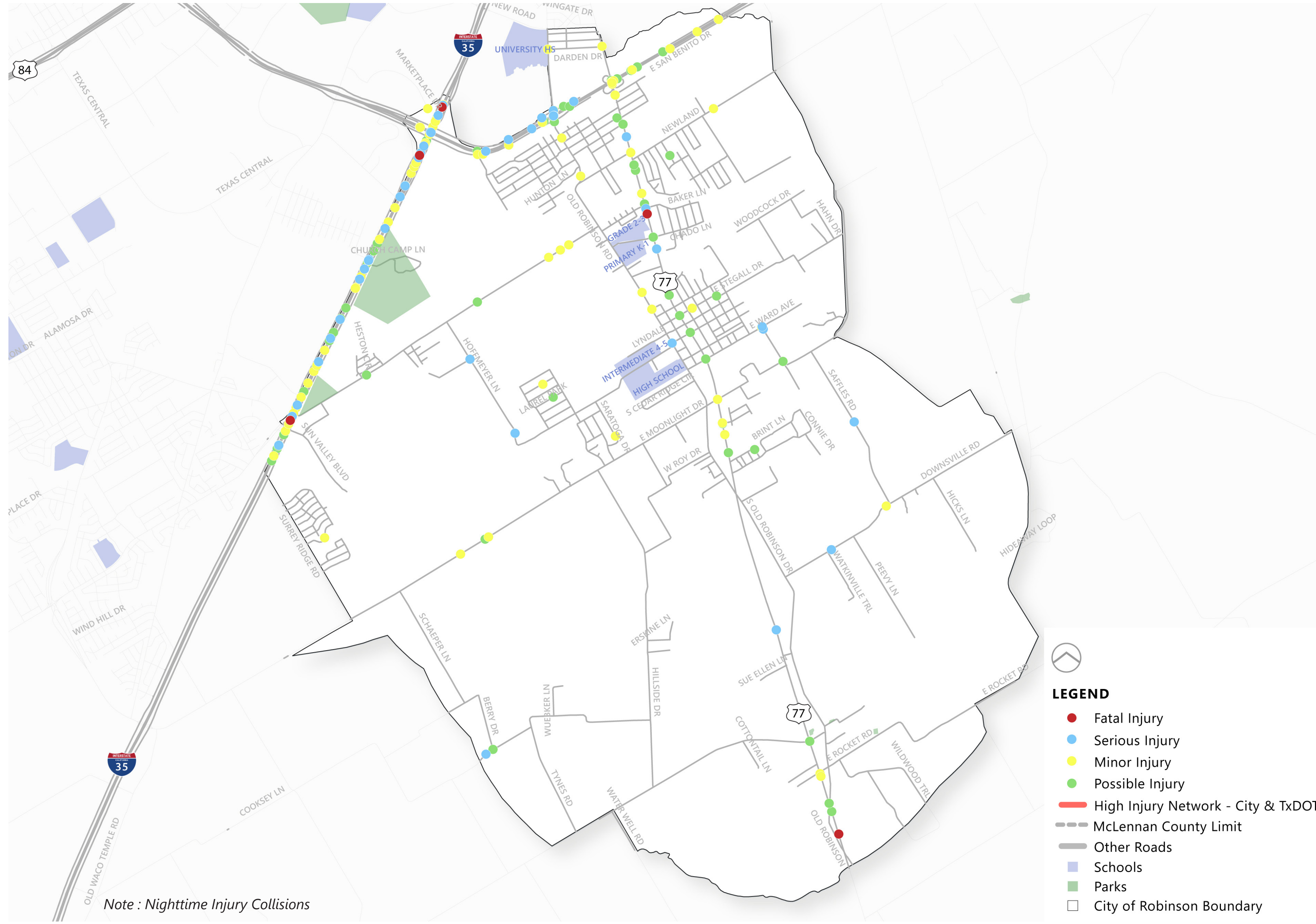
INTERSECTION	HIT OBJECT	UNSAFE SPEED	REAR END
38%	42%	30%	29%
196 COLLISIONS	218 COLLISIONS	155 COLLISIONS	150 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

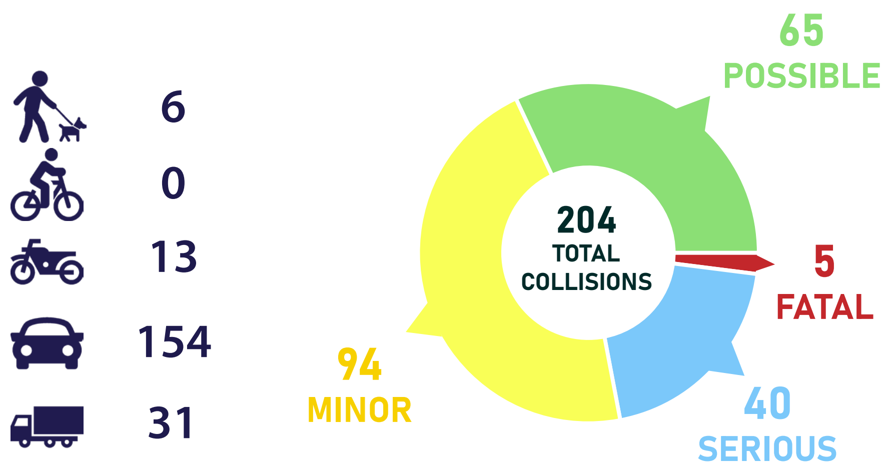
	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Citywide Sign Inventory, Replacement & Installation	Citywide	$576,900
	Citywide Pavement Delineation	Citywide	$5,320,500
		CONTINGENCY COST	$1,179,500
		ENGINEERING COST	$1,769,300
		TOTAL COST	**$8,846,200**

PROJECT 2: CITYWIDE STREET LIGHT INVENTORY & REPLACEMENT

The City of Robinson is proposing a Citywide Streetlight Inventory and Replacement project to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. The proposed project would involve conducting a comprehensive assessment of all existing streetlights throughout the city. The inventory would evaluate the condition, light output, and energy efficiency of the current streetlights. Lights that are outdated, damaged, or providing inadequate illumination would then be replaced with new, more efficient LED streetlights.



NIGHTTIME INJURY COLLISION STATISTICS



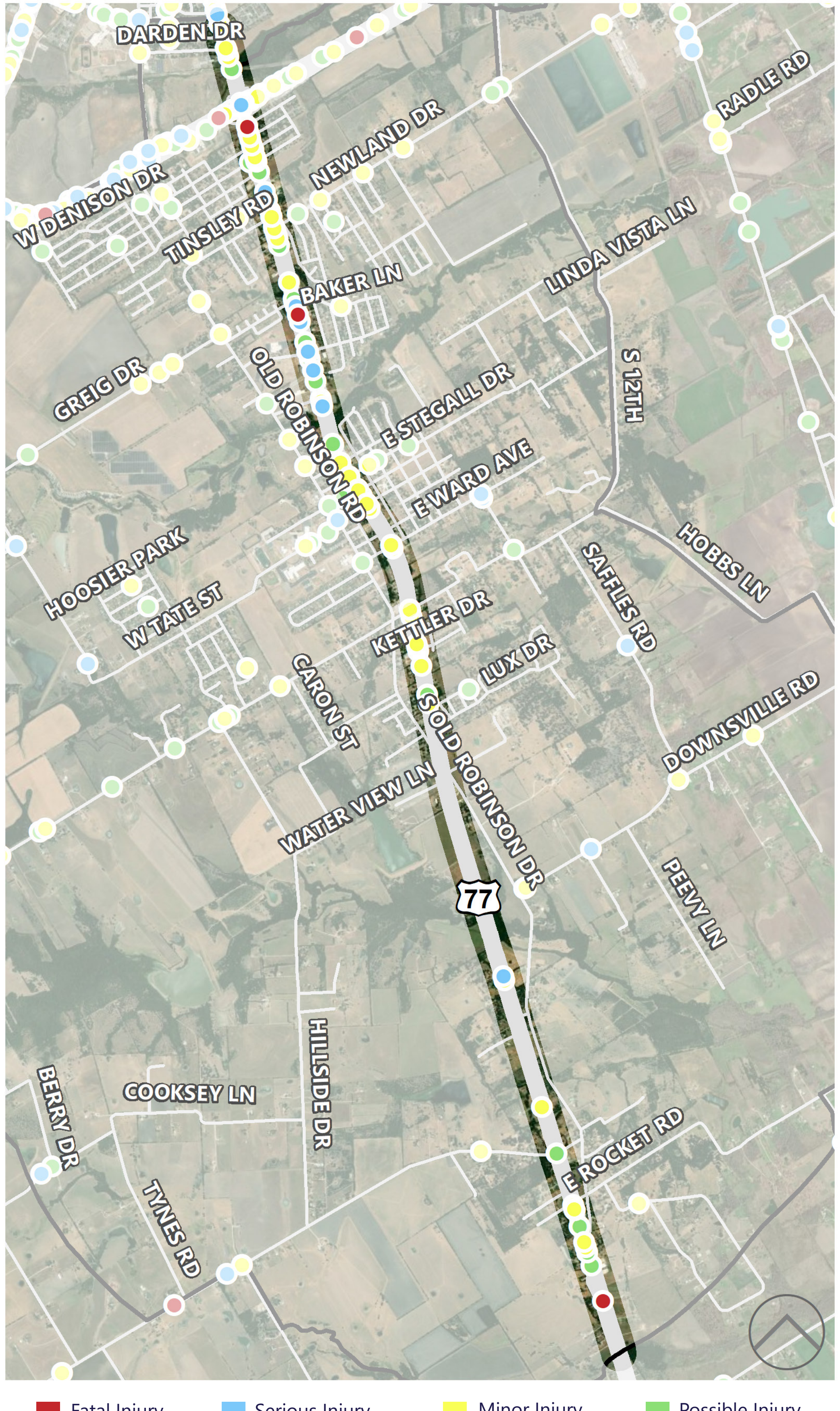
TRENDS

HIT OBJECT	UNSAFE SPEED	REAR END	DUI
56%	28%	21%	14%
115 COLLISIONS	57 COLLISIONS	42 COLLISIONS	28 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Install/ Replace Street Lights	Citywide	$6,595,300
		CONTINGENCY COST	$1,319,060
		ENGINEERING COST	$2,770,100
		TOTAL COST	**$10,684,460**

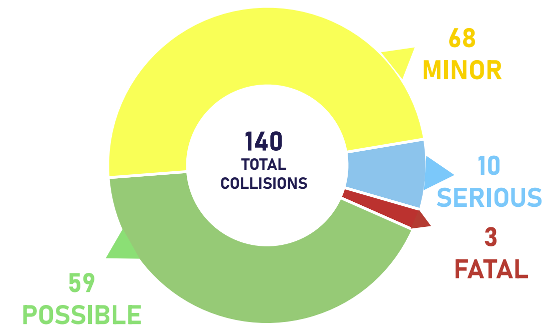
PROJECT 3: US-77 (ROBINSON DRIVE)- WITHIN CITY LIMITS- CORRIDOR SAFETY IMPROVEMENTS



Robinson Drive, part of US-77, serves as the primary north-south arterial within Robinson. This roadway consists of four lanes, including a center two-way turn lane. Speed limits along this section vary between 40 mph and 55 mph. The corridor is within 0.25 mile of Robinson Elementary and Primary School.

INJURY COLLISION STATISTICS

Pedestrian	2
Bicycle	0
Motorcycle	6
Car	112
Truck	20



TRENDS

INTERSECTION	REAR END	BROADSIDE	UNSAFE SPEED
68%	36%	36%	25%
95 COLLISIONS	51 COLLISIONS	50 COLLISIONS	35 COLLISIONS

EXISTING CONDITIONS

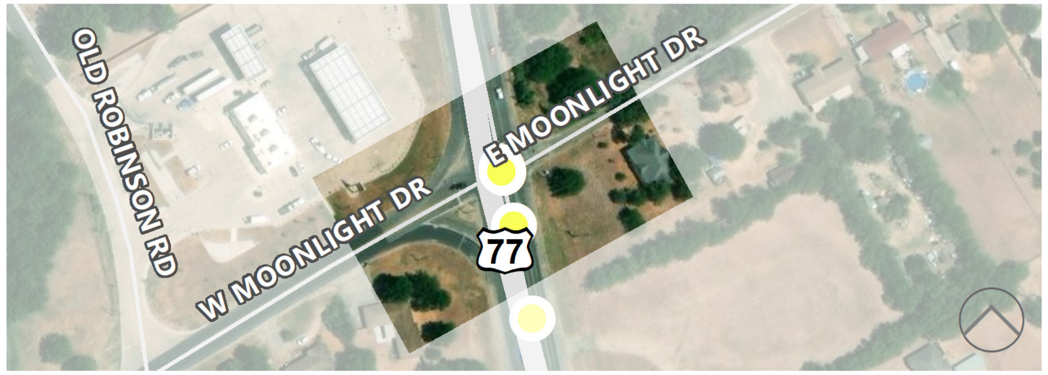
Existing Condition:
US-77 (Robinson Dr) facing north

Existing Condition:
US-77 (Robinson Dr) at Water View Ln facing south

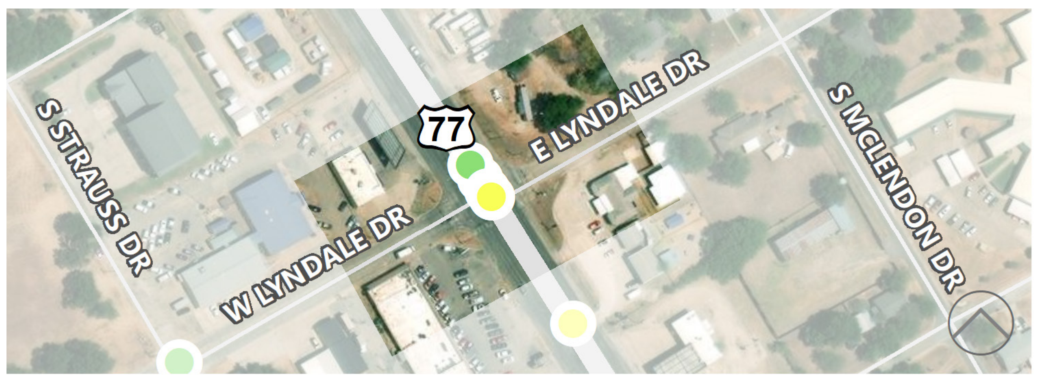
ESTIMATED COST OF IMPROVEMENT

3: US-77 (ROBINSON DR)- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Median and Access Management	From North City Limits to Lux Dr	$6,969,600
	Fill Street Light Gaps	From North City Limits to Lux Dr	$956,800
	Install Sidewalks	From North City Limits to Lux Dr	$11,319,000
	Install Speed Feedback Sign	From North City Limits to Lux Dr	$69,000
	Pedestrian Hybrid Beacon	US-77 and E Ward Ave	$462,300
	Shoulder Rumble Striping	From Lux Dr to the South City Limits	$86,300
		CONTINGENCY COST	$3,972,600
		ENGINEERING COST	$8,342,500
		TOTAL COST	**$32,178,100**

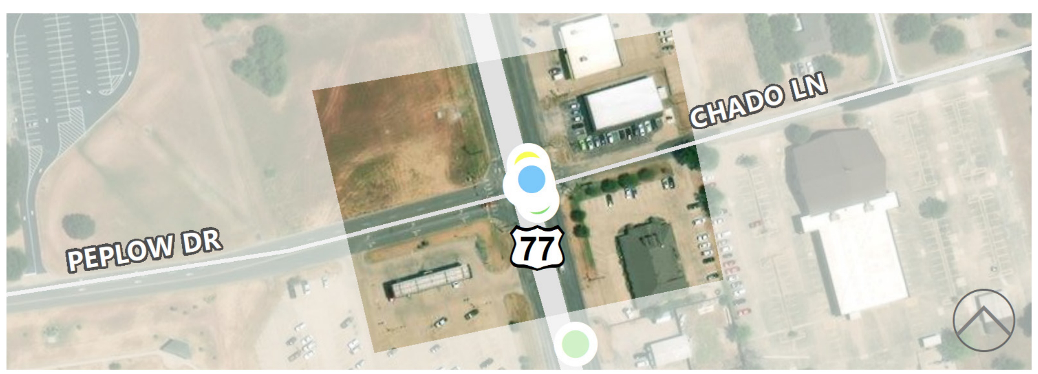
PROJECT 4: US-77 (ROBINSON DRIVE): SIGNALIZED INTERSECTION SAFETY IMPROVEMENTS



E/W Moonlight Dr



E Lyndale Dr



Peplow Dr/Chado Ln

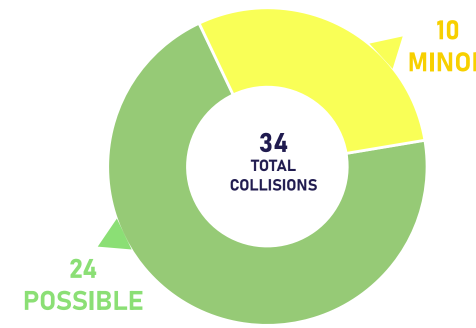
Newland Dr

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

US-77 (Robinson Drive) runs north-south through the city, serving as a primary road. It's a four lane undivided arterial with a center two-way left turn lane. Speed limits along this section range from 40 mph to 50 mph. The Peplow Dr/Chado Ln intersection of US-77 provides access to Robinson Elementary, and Primary Schools, and Peplow park.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Car	28
Truck	5



TRENDS

REAR END	BROADSIDE	UNSAFE SPEED	DISTRACTED DRIVING
59%	35%	29%	24%
20 COLLISIONS	12 COLLISIONS	10 COLLISIONS	8 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
US-77 Robinson Dr at W Lyndale Dr facing north

Existing Condition:
US-77 Robinson Dr at Peplow Dr facing south

ESTIMATED COST OF IMPROVEMENT

4: US-77 (ROBINSON DR)- SIGNALIZED INTERSECTION SAFETY IMPROVEMENTS		
IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
Intersection Lighting	Intersections along US-77 (Robinson Dr): E/W Moonlight Dr, E Lyndale Dr, Peplow Dr/ Chado Ln, Newland Dr	$430,100
Approach Medians		$914,000
Signal Hardware Upgrades		$34,500
Pedestrian Safety Enhancement (Sidewalk and Crosswalk)		$471,700
Protected Left Turn Improvements		$41,600
Advance Warning Flashing Beacon		$138,000
	CONTINGENCY COST	$406,000
	ENGINEERING COST	$852,600
	TOTAL COST	**$3,288,500**

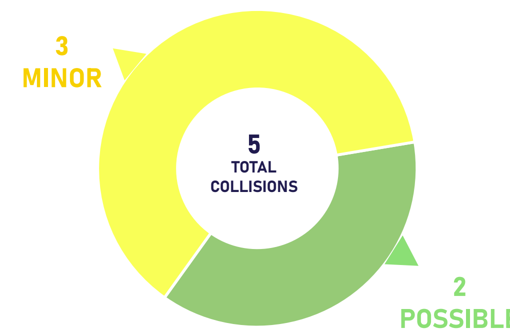
PROJECT 5: NEWLAND DRIVE- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Newland Drive is a east-west major collector within Robinson. The segment from US-77 (Robinson Drive) to South 12th Street, is a two lane undivided roadway with a posted speed limit of 30 mph.

INJURY COLLISION STATISTICS

0
0
0
5
0



TRENDS

HIT OBJECT	UNSAFE SPEED	DISTRACTED DRIVING	NIGHTTIME
80%	40%	40%	20%
4 COLLISIONS	2 COLLISIONS	2 COLLISIONS	1 COLLISION

EXISTING CONDITIONS

Existing Condition:
Newland Dr at Celeste Dr facing east

Existing Condition:
Newland Dr Rio at Bonito Dr facing west

ESTIMATED COST OF IMPROVEMENT

5: NEWLAND DR- CORRIDOR SAFETY IMPROVEMENT			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Clear Recovery Zone		$43,700
	Install Striping	From US-77 (Robinson Dr) to S 12th St Rd	$102,900
	Sign Upgrade		$6,500
		CONTINGENCY COST	$30,700
		ENGINEERING COST	$64,400
		TOTAL COST	**$248,100**

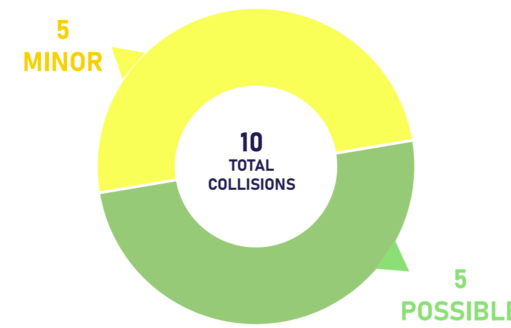
PROJECT 6: FM-3148 (W MOONLIGHT DRIVE)- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

FM-3148 (W Moonlight Drive) serves as an east-west arterial stretching from US-77 to the western boundary of the City of Robinson. Along this segment, from US-77 (Robinson Drive) to the city limit, the road is a two-lane undivided corridor with speed limits varying between 55 and 60 mph.

INJURY COLLISION STATISTICS

- Pedestrian: 1
- Bicycle: 0
- Motorcycle: 1
- Car: 8
- Truck: 0



TRENDS

DISTRACTED DRIVING	REAR END	HIT OBJECT	NIGHTTIME
30%	30%	30%	30%
3 COLLISIONS	3 COLLISIONS	3 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

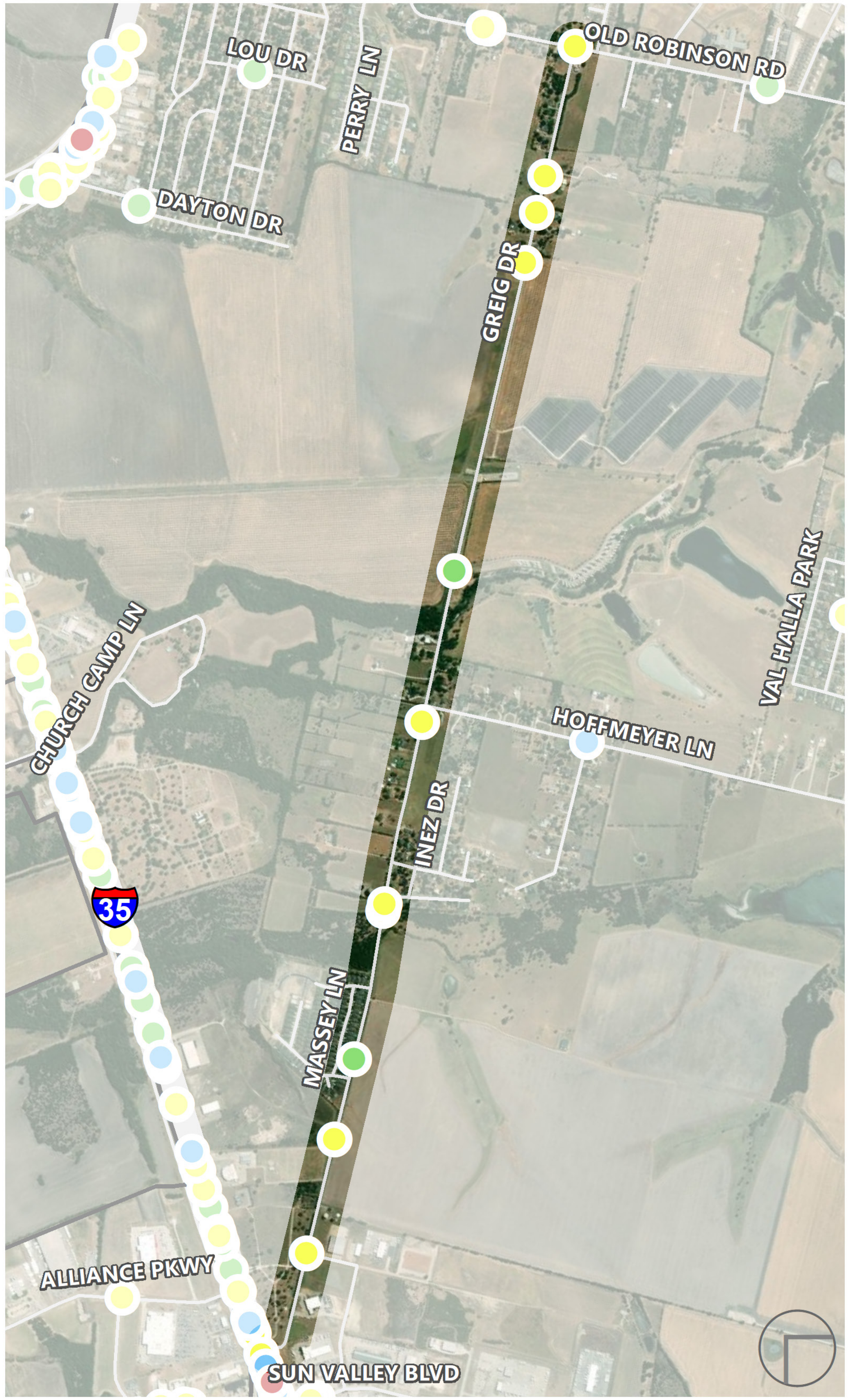
Existing Condition:
W Moonlight Dr at S Old Robinson Rd facing west

Existing Condition:
W Moonlight Dr at Clear Creek Ln facing east

ESTIMATED COST OF IMPROVEMENT

6: FM-3148 (W MOONLIGHT DR)- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Speed Feedback Sign	From US-77 (Robinson Dr) to West City Limits	$34,500
	Speed Reduction Marking		$8,300
	Install Shoulder Rumble Striping		$69,000
		CONTINGENCY COST	$22,400
		ENGINEERING COST	$47,000
		TOTAL COST	**$181,200**

PROJECT 7: GREIG DRIVE- CORRIDOR SAFETY IMPROVEMENTS

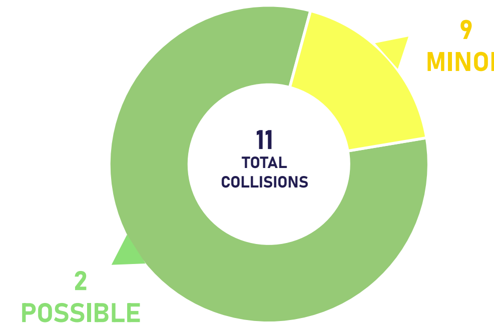


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Greig Drive is an east-west collector within Robinson. The corridor from North Old Robinson Road to I-35 N Frontage Road is a two lane undivided roadway, with a designated speed limit of 40 mph.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Car	10
Truck	0



TRENDS

HIT OBJECT	NIGHTTIME	DISTRACTED DRIVING	INTERSECTION
73%	36%	27%	27%
8 COLLISIONS	4 COLLISIONS	3 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Greig Dr at Hoffmeyer Ln facing east

Existing Condition:
Greig Dr at N Old Robinson Rd facing west

ESTIMATED COST OF IMPROVEMENT

7 : GREIG DR- CORRIDOR SAFETY IMPROVEMENTS		
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Add Shoulder	From N Old Robinson Rd to I- 35 N Frontage Rd	$423,000
Install Striping		$219,500
Install Signage		$4,400
Install Street Lighting		$490,700
	CONTINGENCY COST	$227,400
	ENGINEERING COST	$477,500
	TOTAL COST	**$1,841,600**

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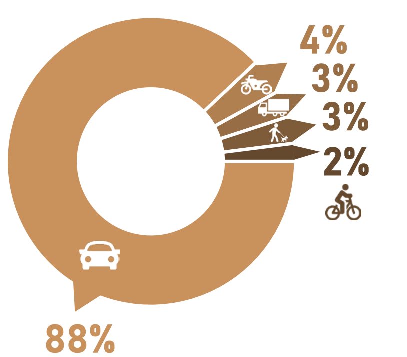
CHAPTER 6.6: CITY OF WACO

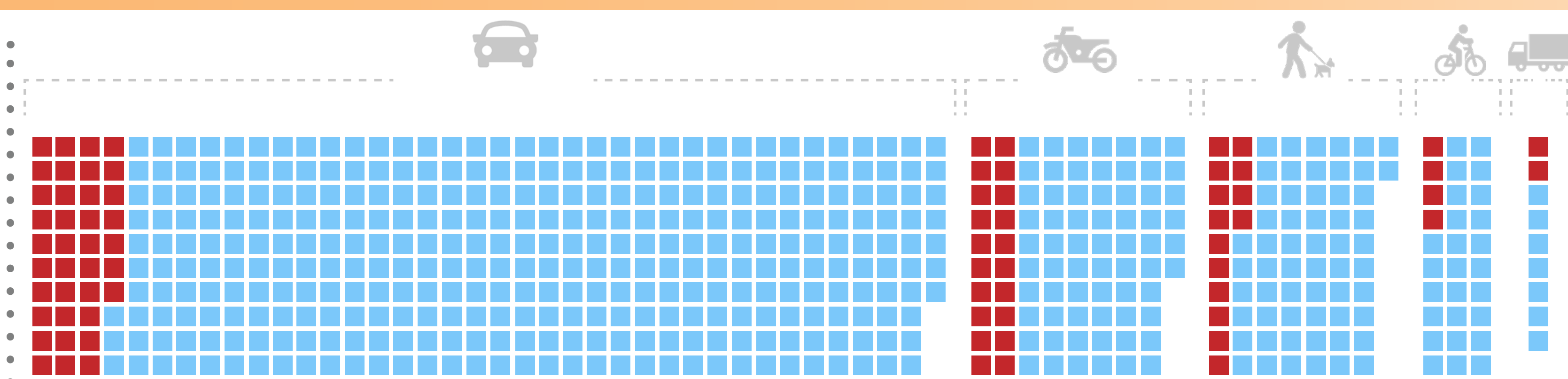
INTRODUCTION

Waco is a city in central Texas along the Brazos River and I-35, halfway between Dallas and Austin. It is the county seat of McLennan County. The city has an estimated population of 138,486 according to the 2020 census. This chapter provides information on the City of Waco's collision statistics from 2014 to 2023. A total of 7,159 collisions occurred on Waco streets in the last 10 years, including 77 fatalities and 495 serious injuries. TxDOT roadways within Waco city limits had 4,995 collisions during the same period, with 49 fatalities and 314 serious injuries. The majority of injury collisions in both City and TxDOT rights-of-way involved possible injuries, with 54 percent each in the City and TxDOT right-of-way.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**7159**	**100 %**	**4995**	**100 %**
Fatal Injury	77	1.08 %	49	0.98 %
Serious Injury	495	6.91 %	314	6.29 %
Minor Injury	2711	37.87 %	1923	38.50 %
Possible Injury	3876	54.14 %	2709	54.23 %
Total Persons Involved	**10819**	**100 %**	**7936**	**100 %**
Fatal Injury	79	0.73 %	53	0.67 %
Serious Injury	586	5.42 %	369	4.65 %
Minor Injury	3731	34.49 %	2843	35.82 %
Possible Injury	6423	59.37 %	4671	58.86 %

COLLISIONS BY MODE - CITY

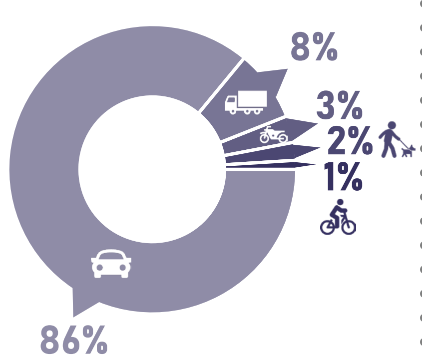


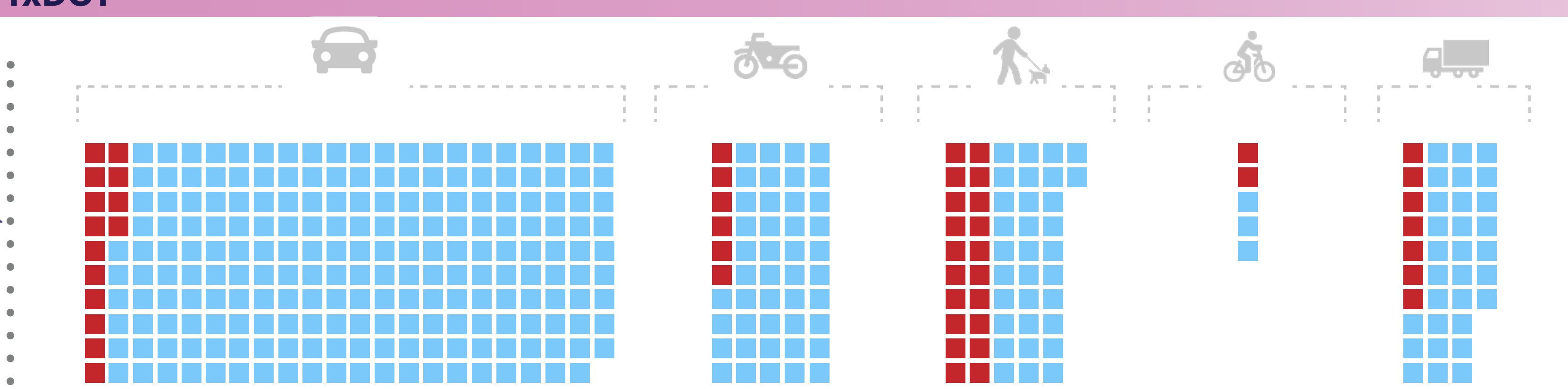


Note : Each box represents one fatal or severe injury collision.

3 %	1 %	8 %	6 %	1 %	Fatal Injury
17 %	5 %	27 %	25 %	3 %	Serious Injury
56 %	37 %	47 %	47 %	31 %	Minor Injury
24 %	57 %	17 %	22 %	65 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

7 %	0 %	4 %	22 %	2 %	Fatal Injury
10 %	5 %	27 %	35 %	8 %	Serious Injury
66 %	38 %	52 %	29 %	38 %	Minor Injury
17 %	57 %	18 %	14 %	53 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on Waco city streets, TxDOT facilities, and McLennan County across various categories. On city streets in Waco, there were a total of 7,159 collisions, resulting in 10,819 persons injured. In comparison, TxDOT reported a total of 4,995 collisions resulting in 7,936 persons injured within Waco city limits. Please note that Farm to Market roads are included as city streets within the City of Waco collision analysis.

This section also identifies several major collision trends on Waco city streets, including broadside collisions, hit object collisions, right-of-way violations by automobiles, and collisions involving unsafe speeds. On TxDOT roadways, the prominent trends were broadside collisions, rear end collisions, unsafe speed violations, and right-of-way violations by automobiles. A detailed summary analyzing these collision trends is provided in the Collision Profile section of this chapter.

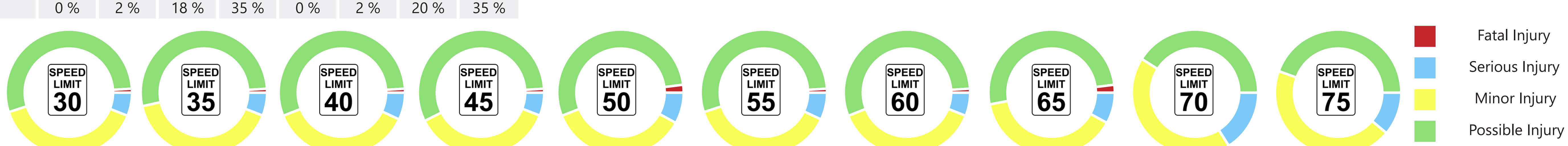
The pie charts below compare the severity of collisions on roadways with different speed limits. Of the speed limits examined, the charts indicate that roads with a 70 mph speed limit accounted for the highest proportion of severe injury collisions while roads with 65 mph accounted for the highest proportion of fatal injury collisions.

CITY	TxDOT
7159	4995
TOTAL COLLISIONS	TOTAL COLLISIONS
10819	7936
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED

	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	1 %	0 %	0 %	0 %	0 %	0 %
Car	0 %	4 %	31 %	57 %	0 %	4 %	33 %	57 %
Motorcycle	0 %	1 %	1 %	0 %	0 %	1 %	1 %	0 %
Pedestrian	0 %	1 %	1 %	1 %	0 %	0 %	0 %	0 %
Truck	0 %	0 %	0 %	1 %	0 %	0 %	1 %	1 %
AGE								
Below 15	0 %	0 %	3 %	7 %	0 %	0 %	3 %	6 %
15 - 65	1 %	5 %	29 %	47 %	1 %	4 %	30 %	47 %
Above 65	0 %	0 %	3 %	5 %	0 %	0 %	3 %	5 %
GENDER								
Male	1 %	3 %	16 %	25 %	0 %	3 %	16 %	23 %
Female	0 %	2 %	18 %	35 %	0 %	2 %	20 %	35 %

SPEED LIMIT

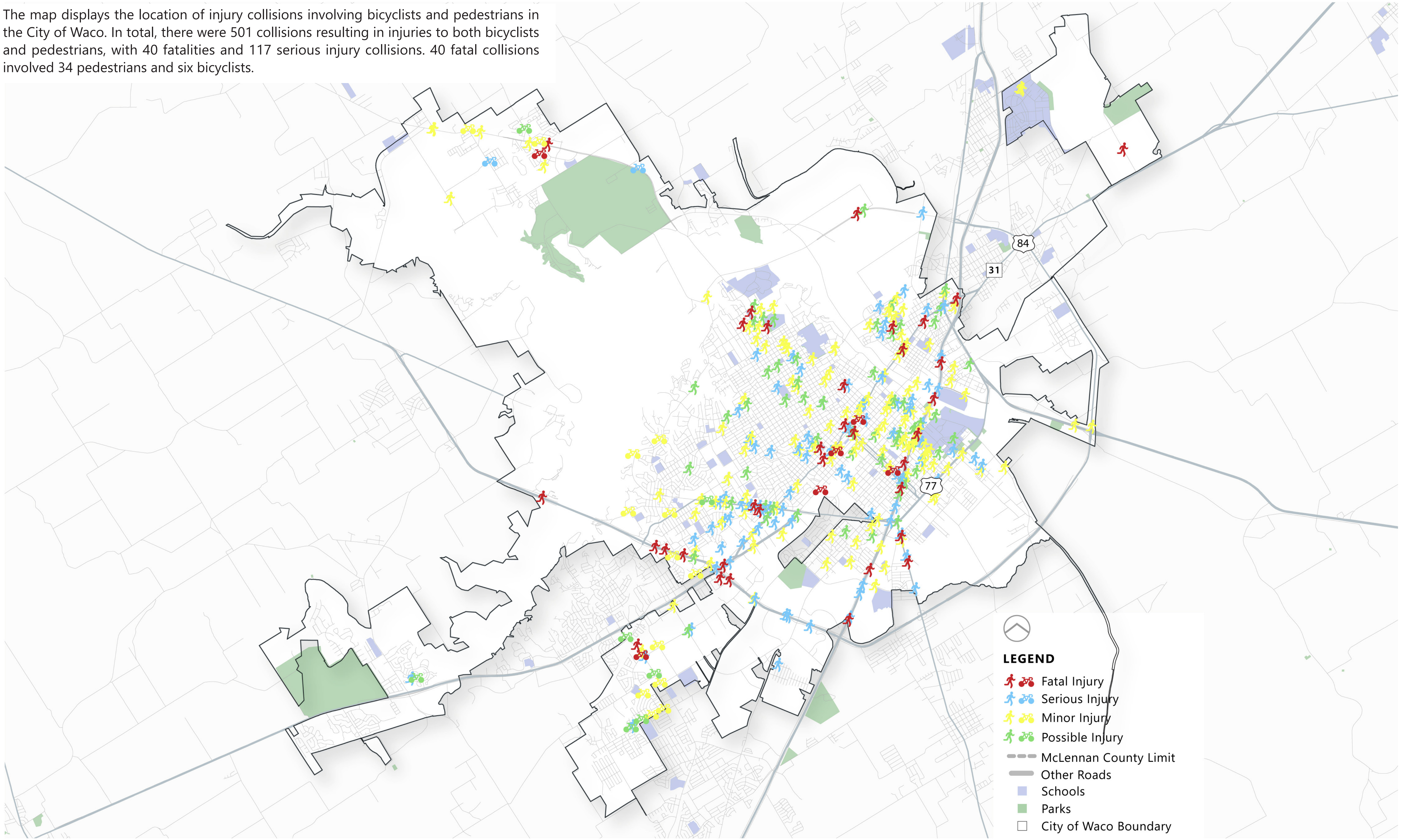


CITY OF WACO VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	2 %	Bicycle	1 %	Bicycle	1 %
Car	88 %	Car	86 %	Car	85 %
Motorcycle	3 %	Motorcycle	3 %	Motorcycle	4 %
Pedestrian	3 %	Pedestrian	2 %	Pedestrian	3 %
Truck	3 %	Truck	8 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	75 %	Motor Vehicle in Transport	85 %	Motor Vehicle in Transport	72 %
Fixed Object	13 %	Fixed Object	10 %	Fixed Object	17 %
Overturned	5 %	Pedestrian	2 %	Overturned	4 %
MANNER OF COLLISION					
Broadside	53 %	Broadside	44 %	Broadside	42 %
Hit Object	25 %	Rear End	34 %	Hit Object	28 %
Rear End	16 %	Hit Object	15 %	Rear End	24 %
Sideswipe	3 %	Sideswipe	6 %	Sideswipe	5 %
VIOLATION CATEGORY					
Automobile Right-of-Way	31 %	Unsafe Speed	24 %	Unsafe Speed	23 %
Unsafe Speed	17 %	Automobile Right-of-Way	19 %	Automobile Right-of-Way	22 %
Traffic Signals and Signs	14 %	Traffic Signals and Signs	16 %	Traffic Signals and Signs	12 %
Distracted Driving	6 %	Following Too Closely	8 %	Distracted Driving	8 %
Driving/ Bicycling under Influence	5 %	Distracted Driving	6 %	Other Improper Driving	6 %
Other Unforeseen Reasons	5 %	Other Unforeseen Reasons	5 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	72 %	Intersection	64 %	Intersection	59 %
Roadway	28 %	Roadway	36 %	Roadway	41 %
LIGHTING					
Daylight	70 %	Daylight	75 %	Daylight	70 %
Dark, Lighted	20 %	Dark, Lighted	18 %	Dark, Lighted	16 %
Dark, Not Lighted	8 %	Dark, Not Lighted	5 %	Dark, Not Lighted	11 %

BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

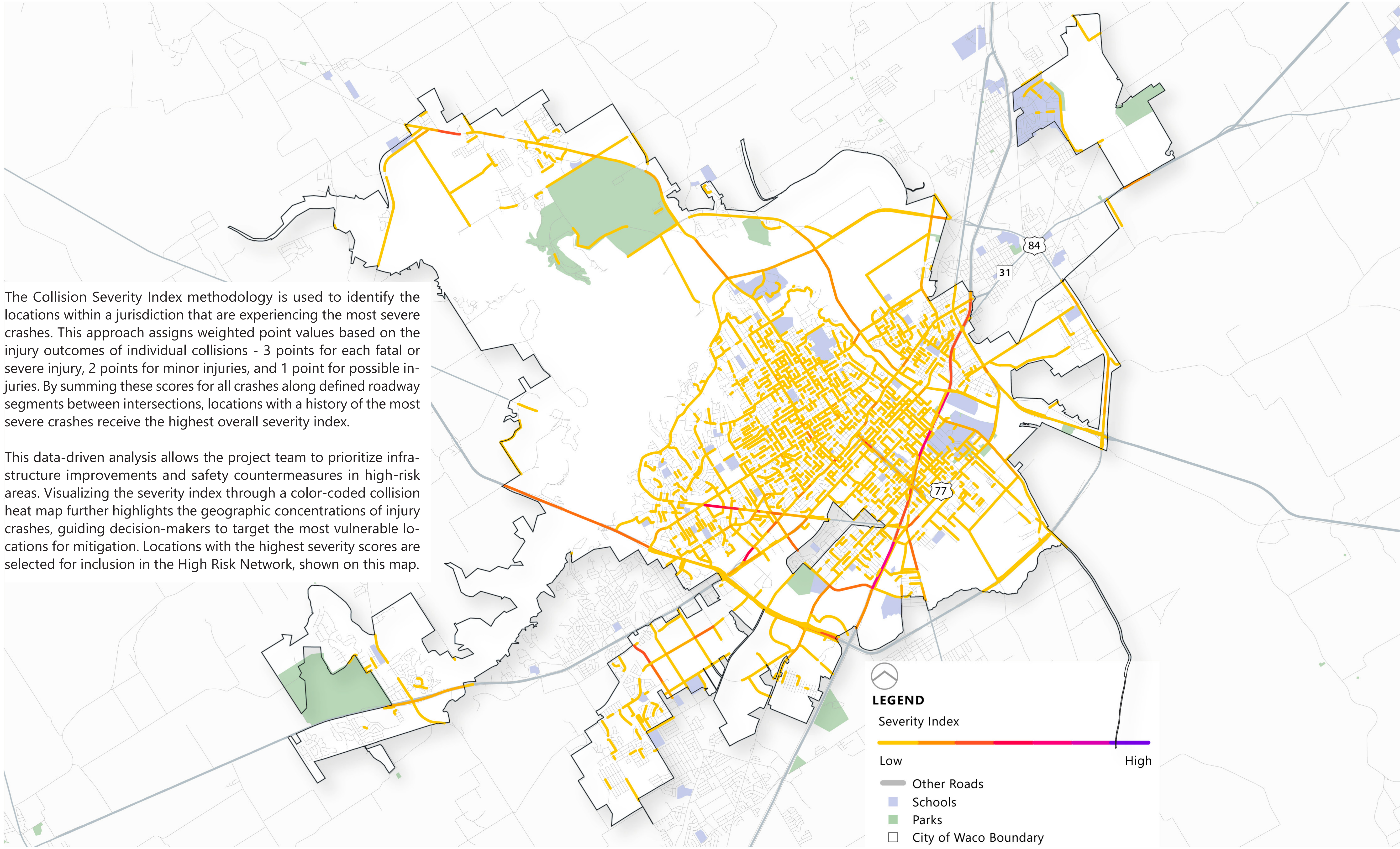
The map displays the location of injury collisions involving bicyclists and pedestrians in the City of Waco. In total, there were 501 collisions resulting in injuries to both bicyclists and pedestrians, with 40 fatalities and 117 serious injury collisions. 40 fatal collisions involved 34 pedestrians and six bicyclists.



SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

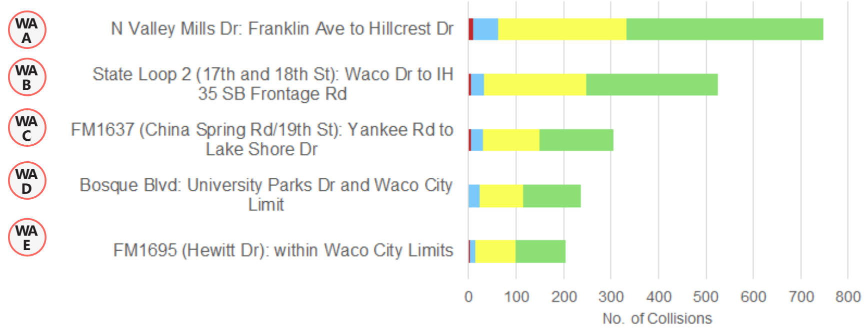
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



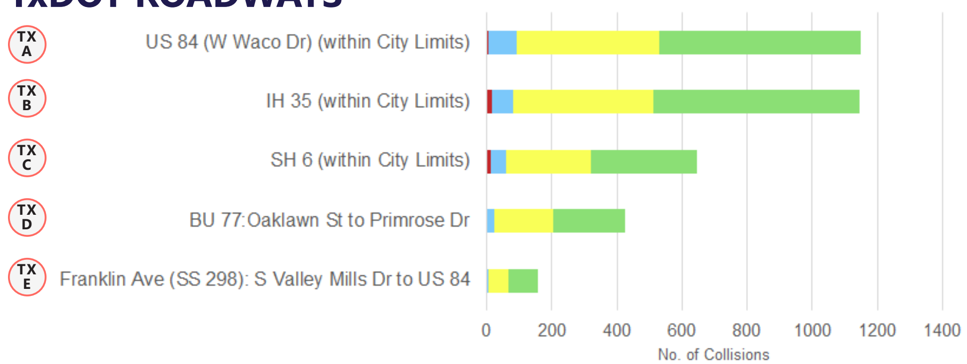
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within the City of Waco. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

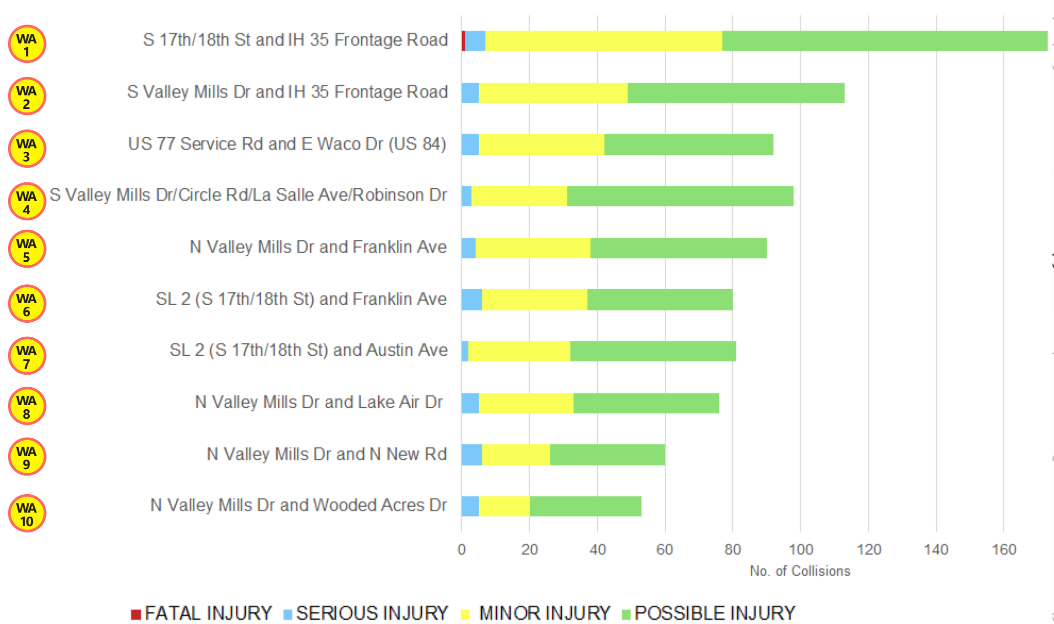
ROADWAYS

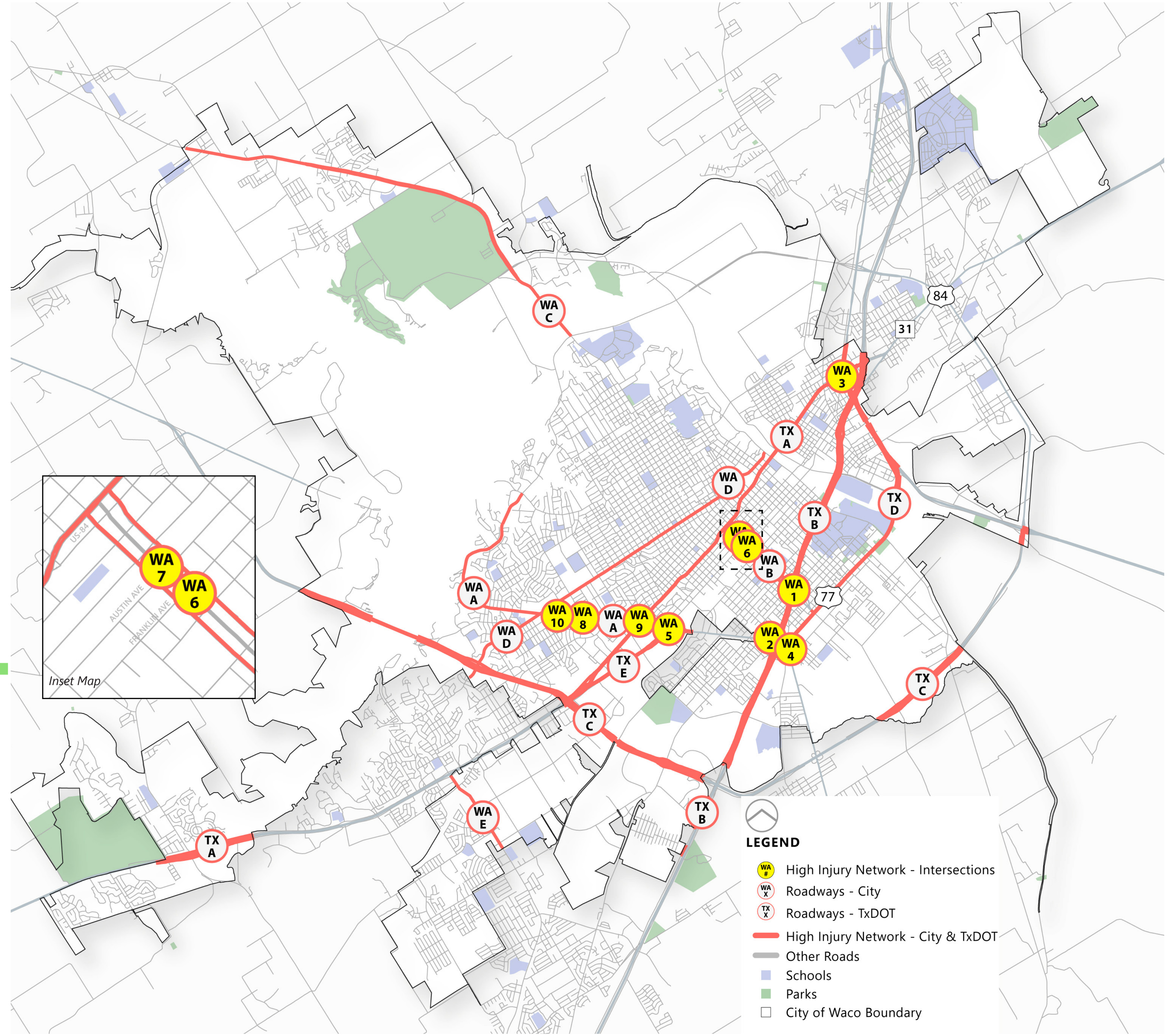


TxDOT ROADWAYS



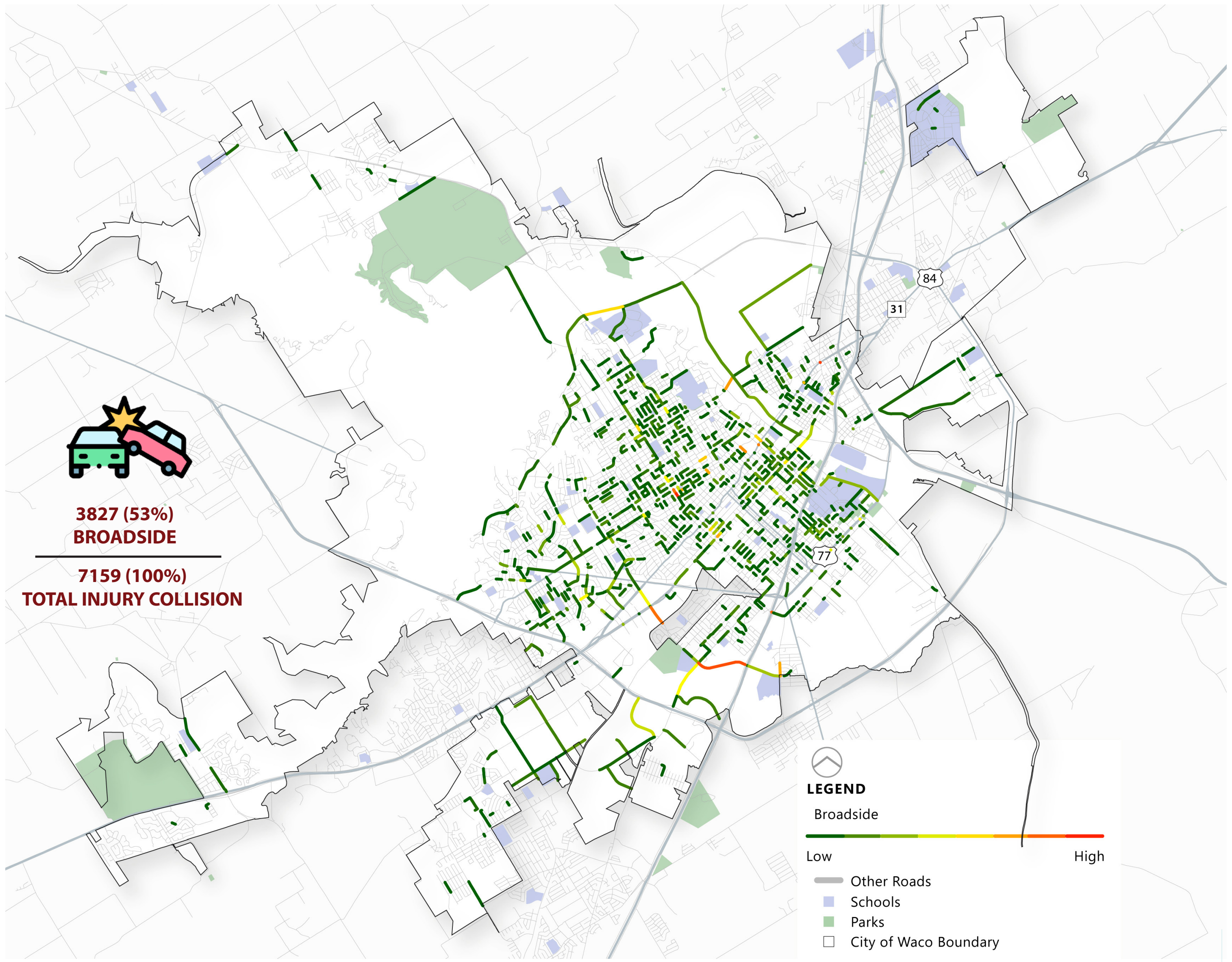
INTERSECTIONS





PROFILES - CITY

PROFILE 1 - BROADSIDE



3827 (53%)
BROADSIDE

7159 (100%)
TOTAL INJURY COLLISION

SEVERITY

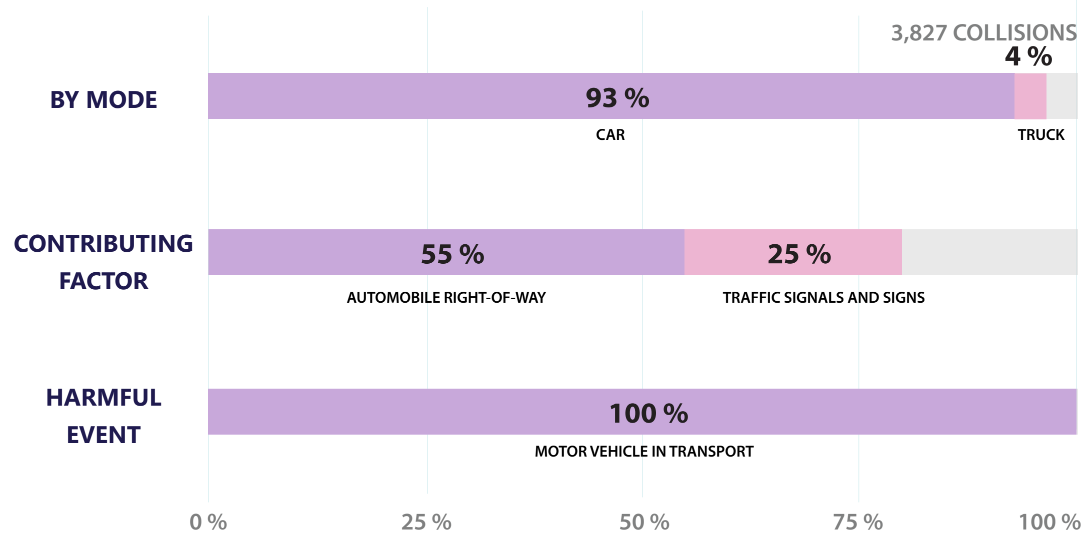
1 %
5 %
36 %
58 %

LOCATION

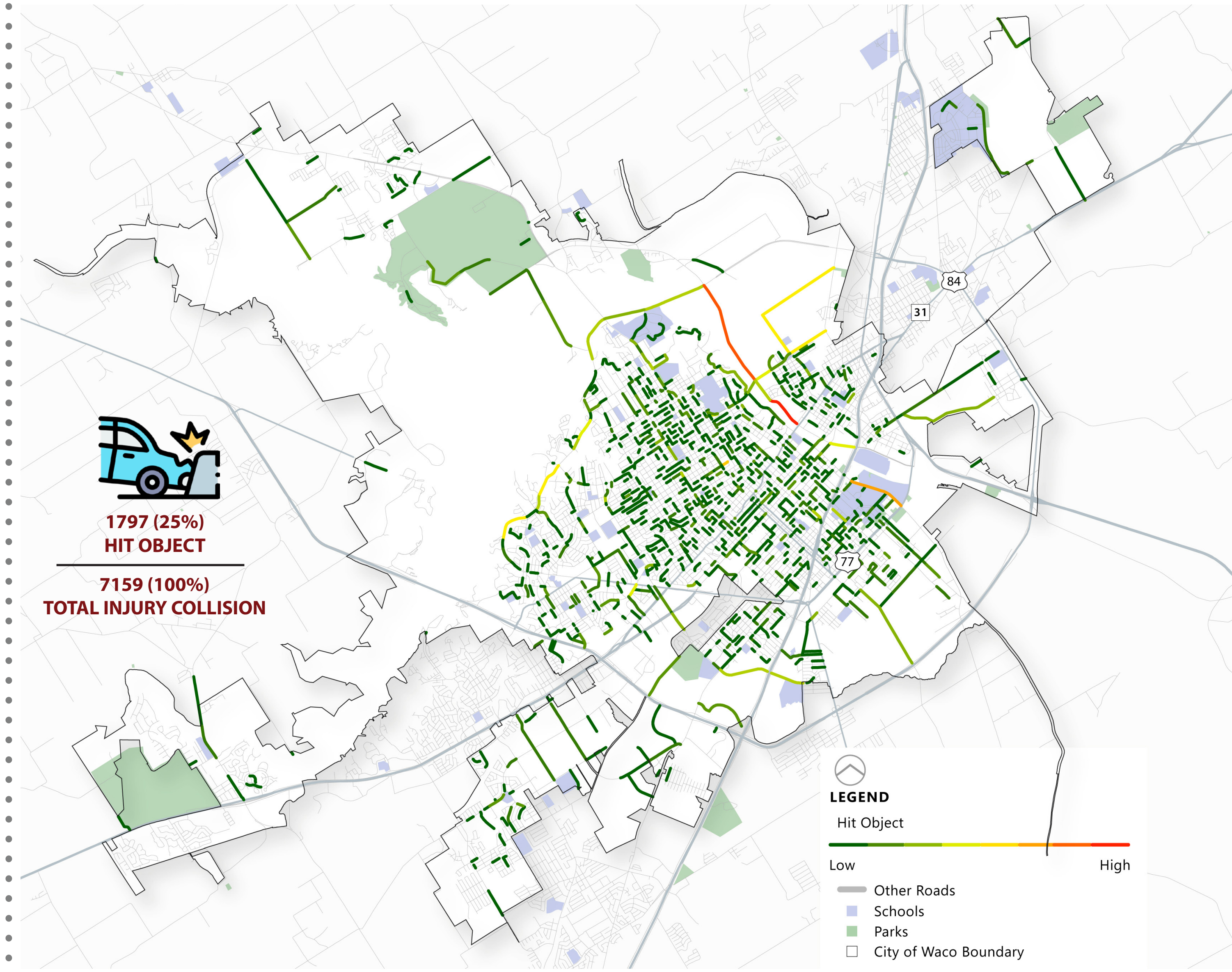
98 %
2 %

LIGHTING

79 %
1 %
16 %
3 %



PROFILE 2 - HIT OBJECT



1797 (25%)
HIT OBJECT

7159 (100%)
TOTAL INJURY COLLISION

SEVERITY

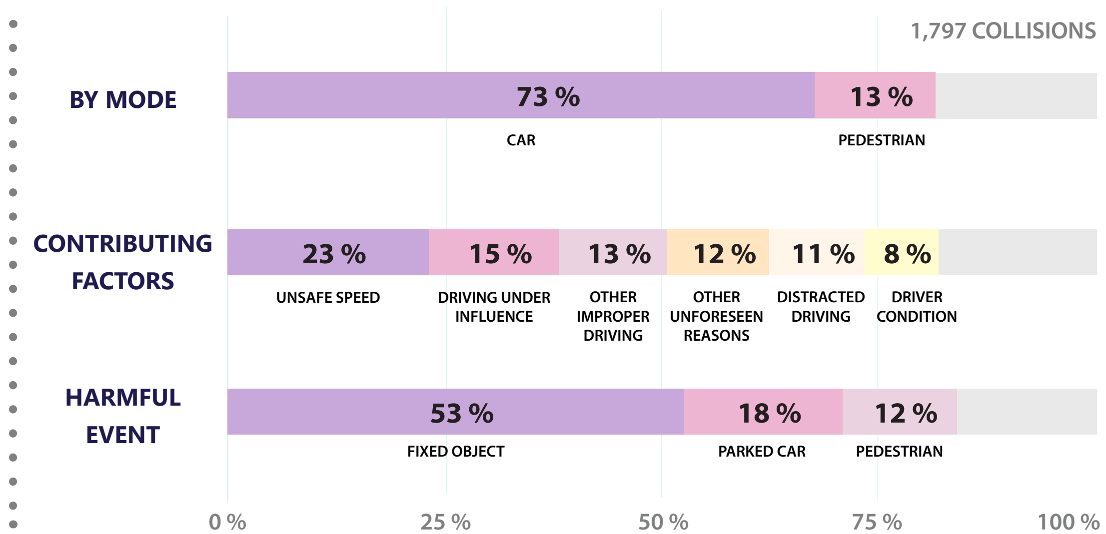
3 %
13 %
46 %
38 %

LOCATION

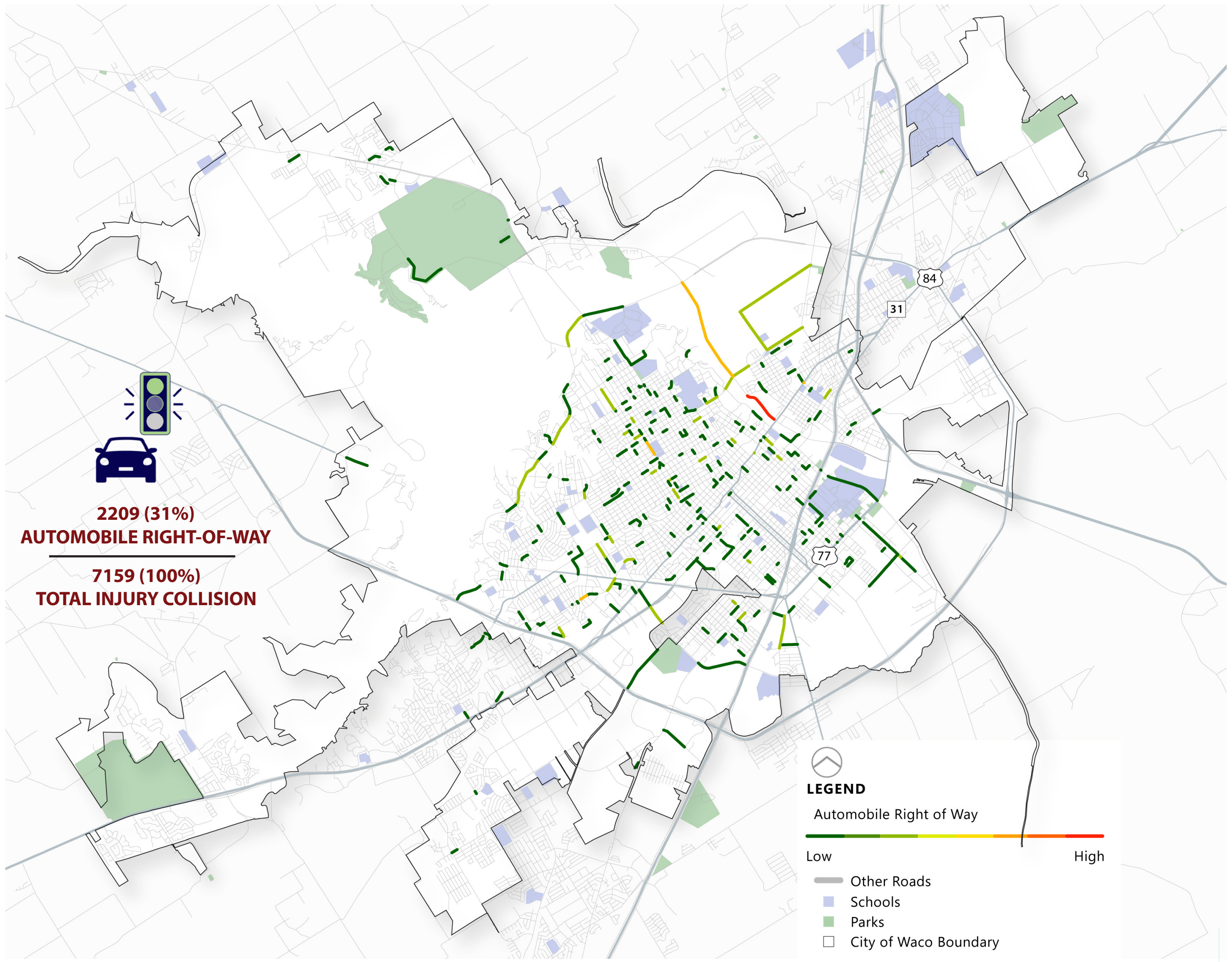
29 %
71 %

LIGHTING

46 %
3 %
32 %
19 %



PROFILE 3 - AUTOMOBILE RIGHT-OF-WAY



SEVERITY

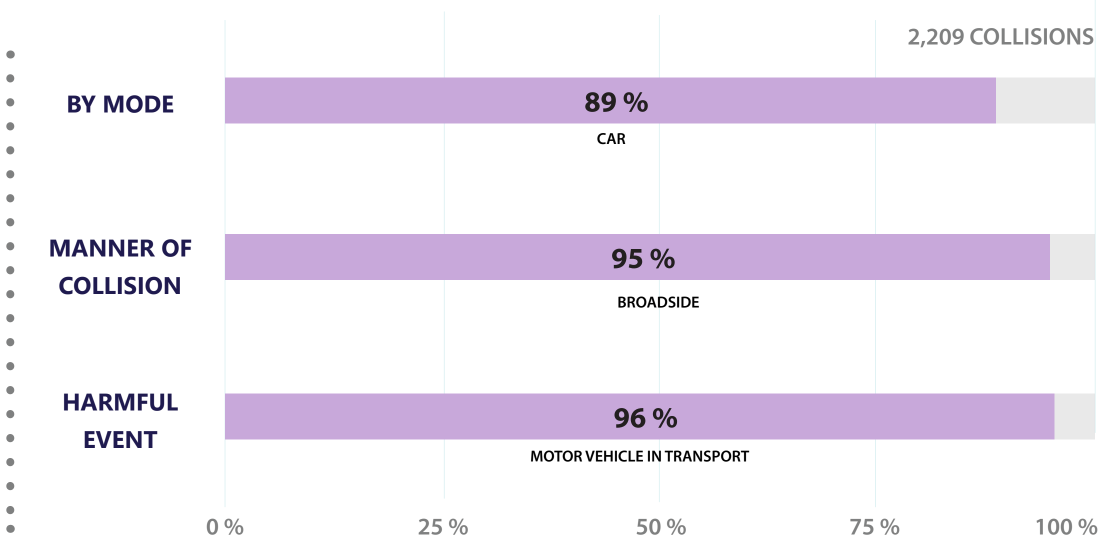
1 % | 5 % | 36 % | 58 %

LOCATION

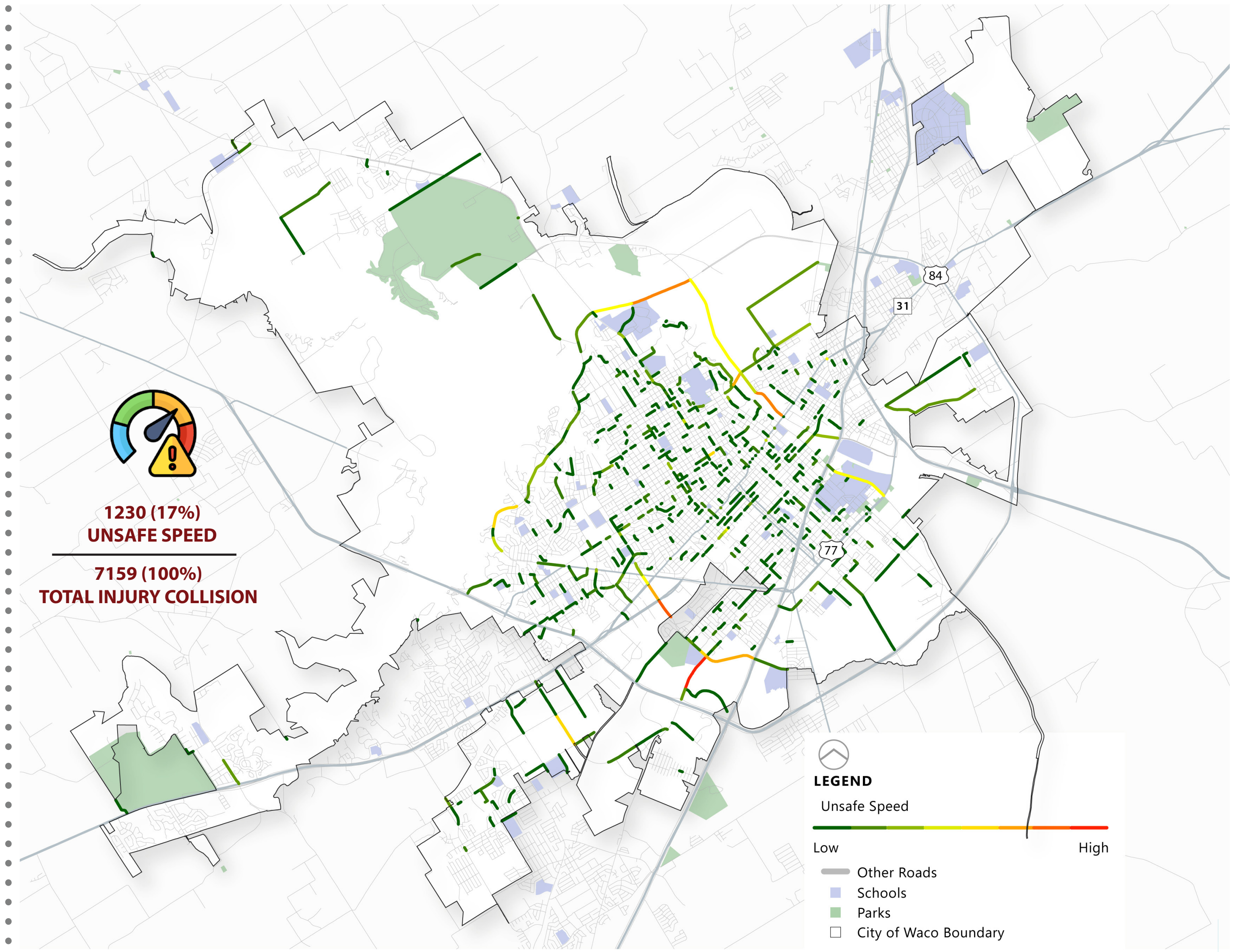
98 % | 2 %

LIGHTING

81 % | 2 % | 13 % | 4 %



PROFILE 4 - UNSAFE SPEED



SEVERITY

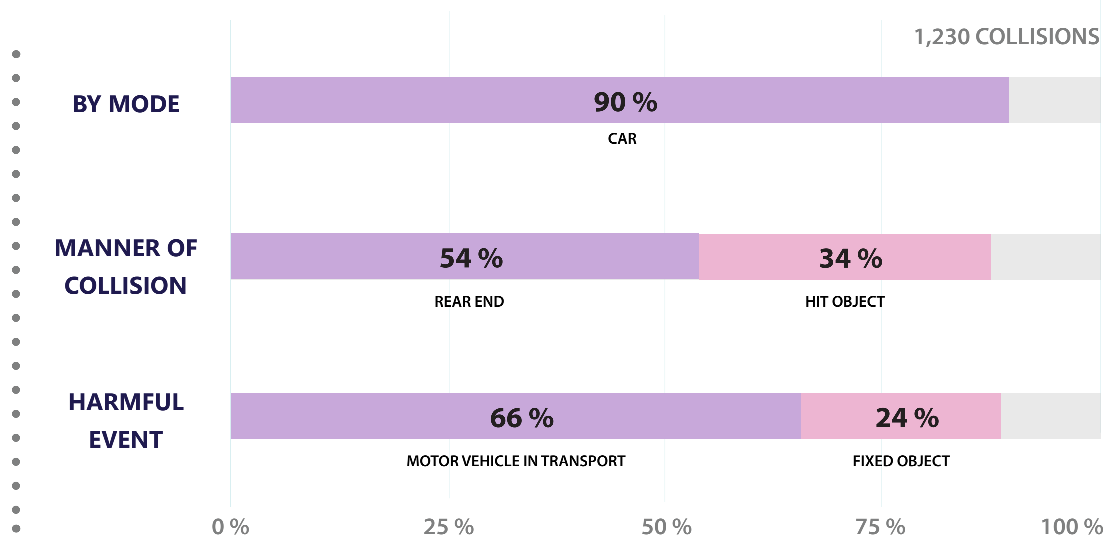
1 % | 7 % | 37 % | 55 %

LOCATION

54 % | 46 %

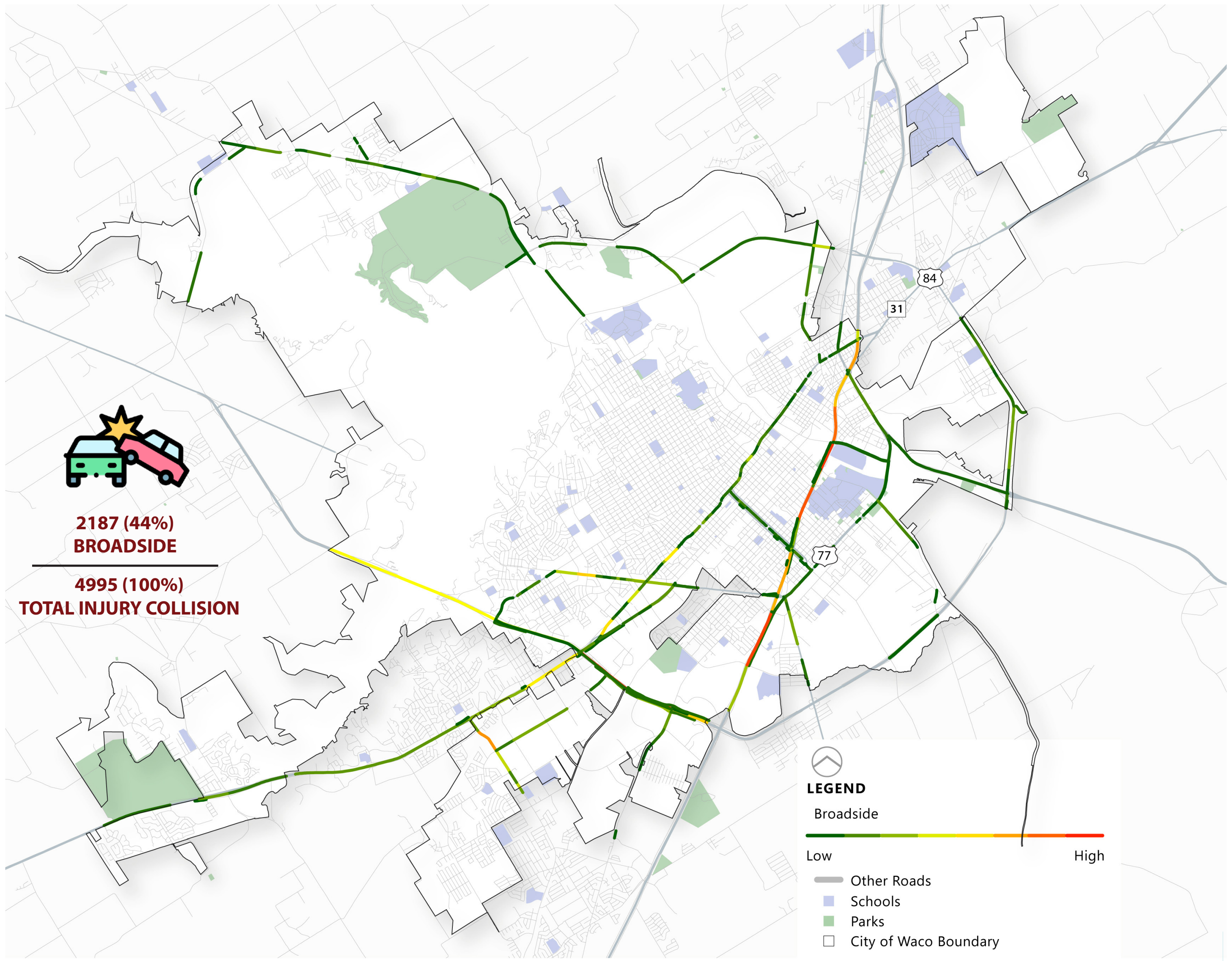
LIGHTING

65 % | 3 % | 23 % | 10 %



PROFILES - TXDOT

PROFILE 1 - BROADSIDE



SEVERITY

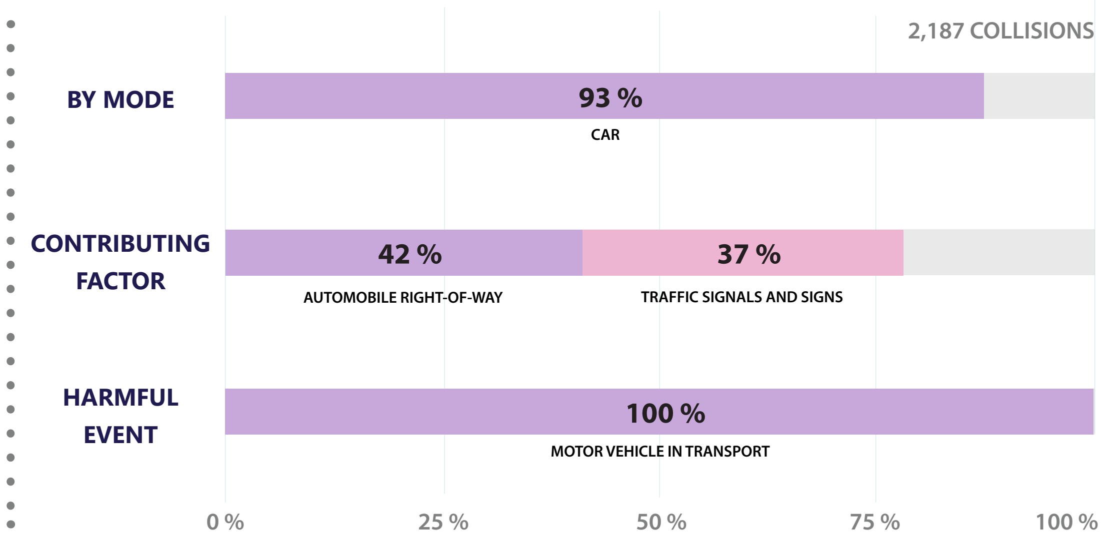
- 0 %
- 5 %
- 42 %
- 53 %

LOCATION

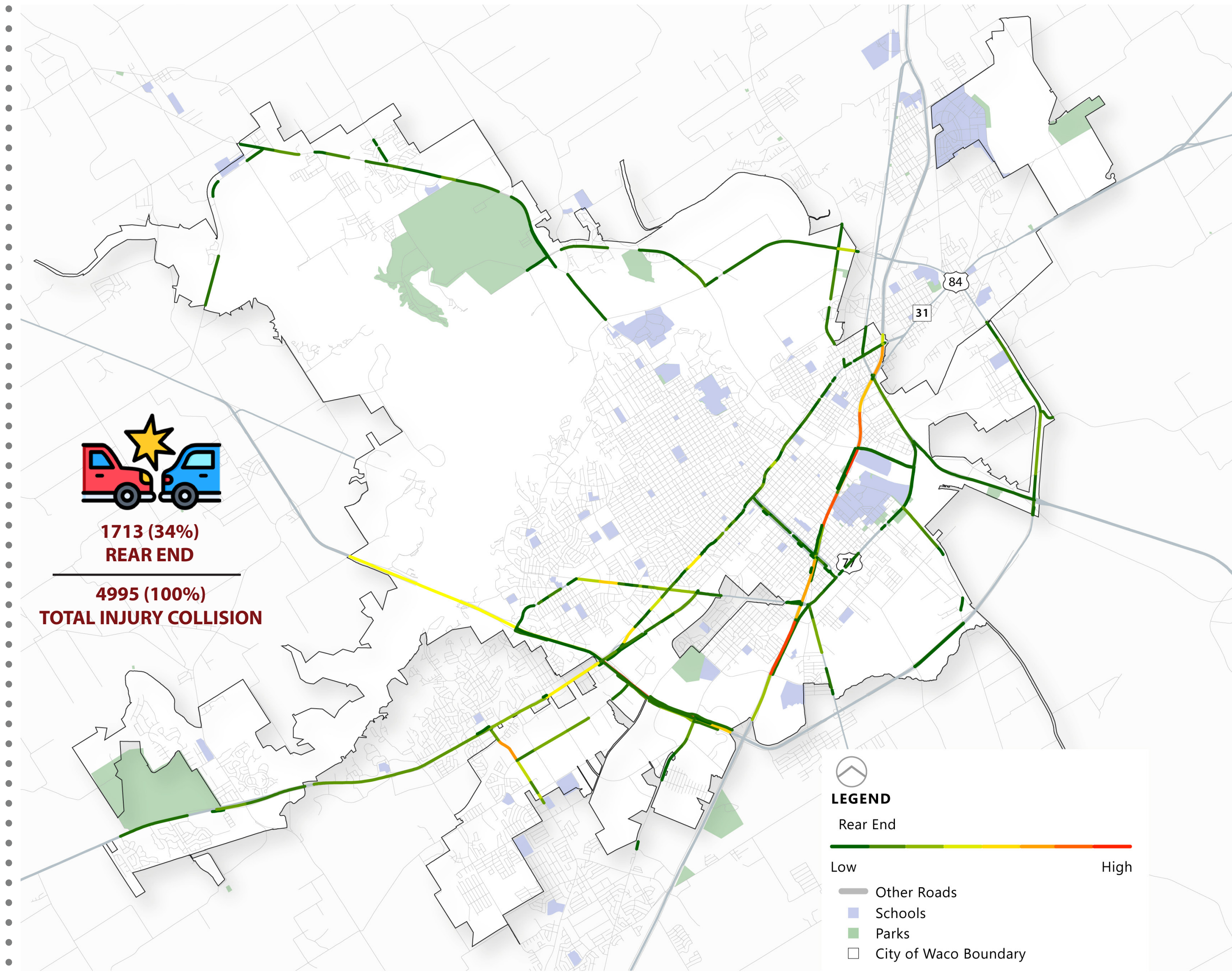
- 98 %
- 2 %

LIGHTING

- 76 %
- 1 %
- 20 %
- 3 %



PROFILE 2 - REAR END



SEVERITY

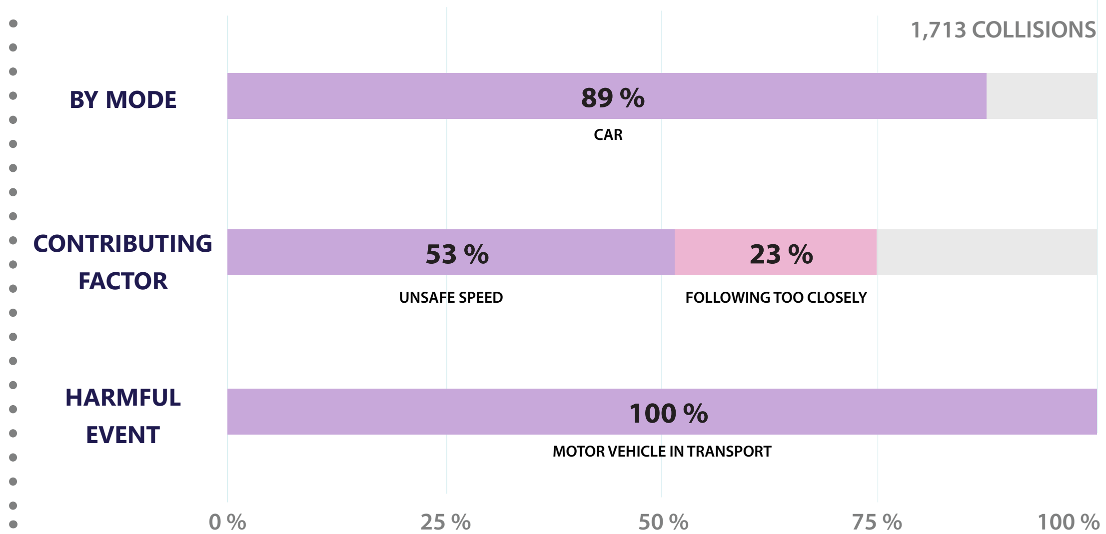
- 0 %
- 4 %
- 33 %
- 63 %

LOCATION

- 43 %
- 57 %

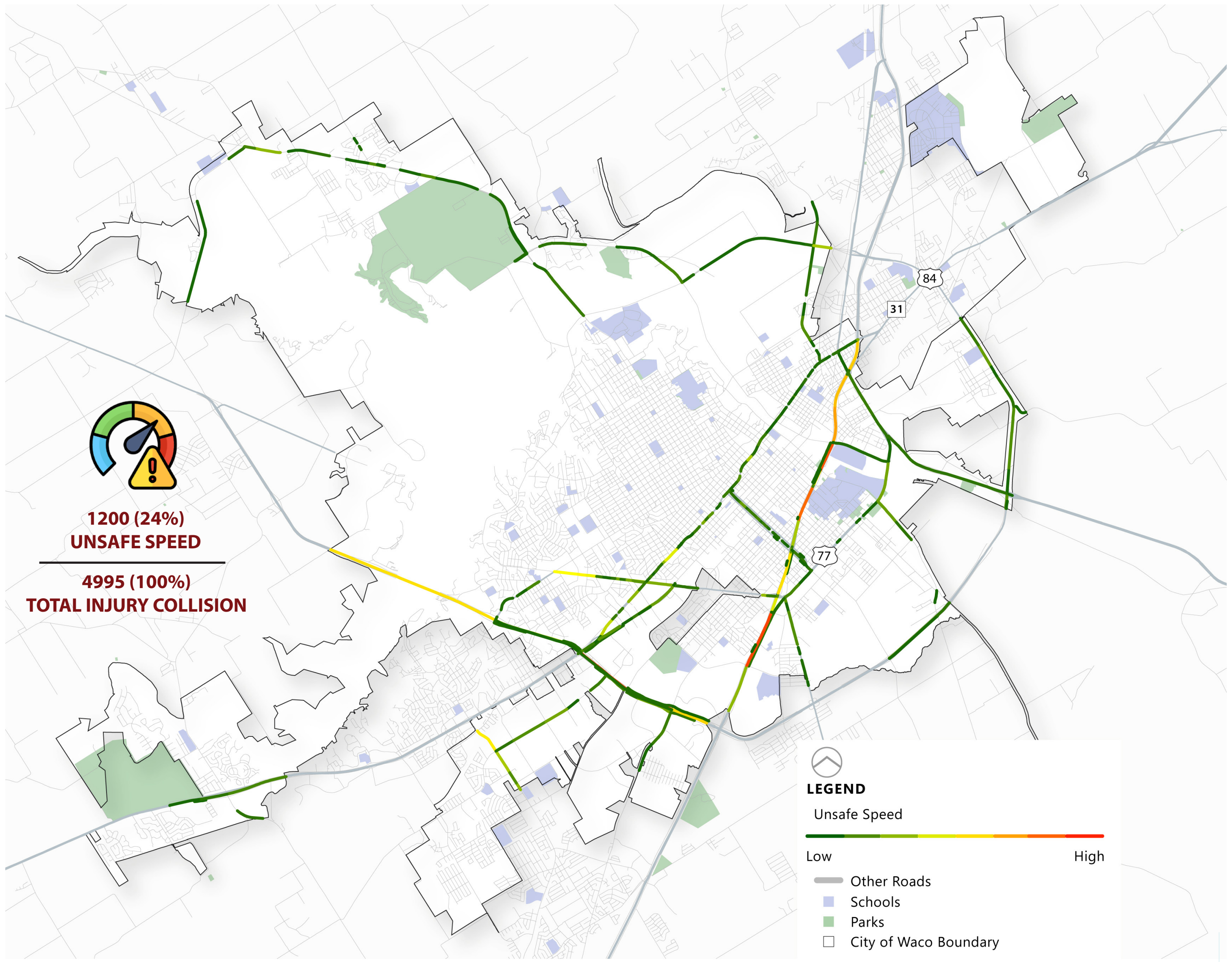
LIGHTING

- 82 %
- 2 %
- 12 %
- 4 %



PROFILES - TXDOT

PROFILE 3 - UNSAFE SPEED



SEVERITY

1 % 5 %

36 % 58 %

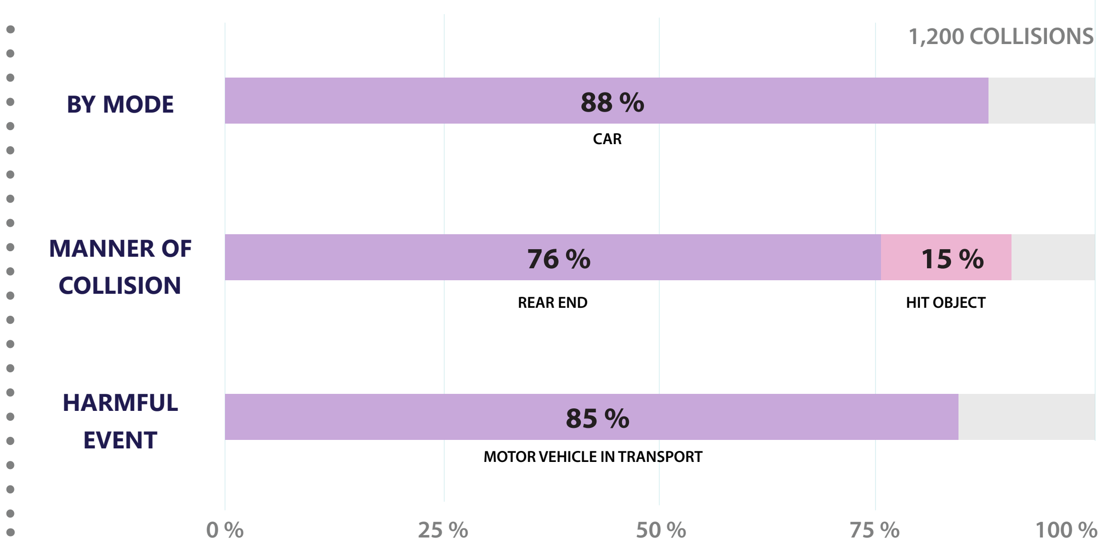
LOCATION

40 % 60 %

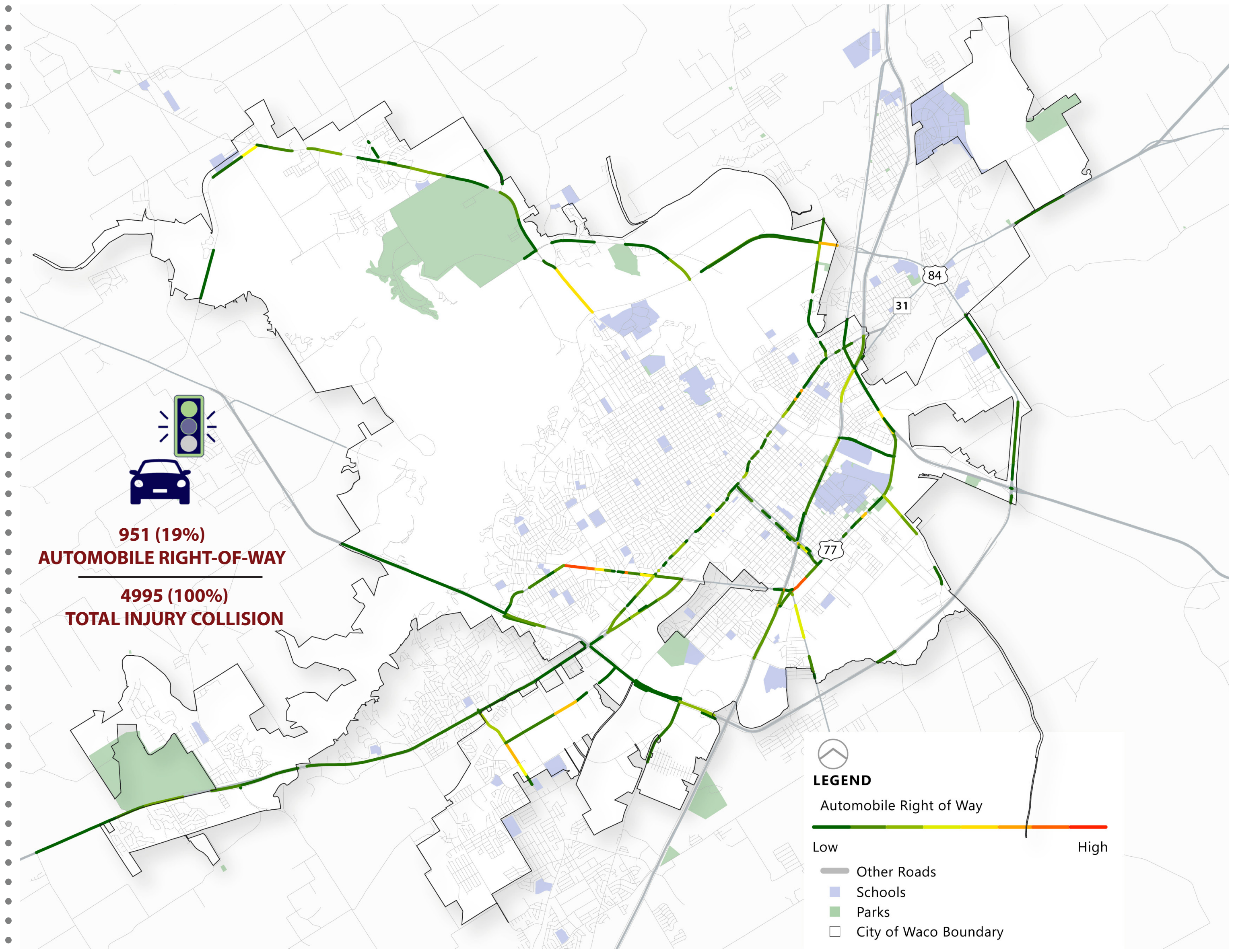
LIGHTING

76 % 2 %

17 % 5 %



PROFILE 4 - AUTOMOBILE RIGHT-OF-WAY



SEVERITY

0 % 5 %

39 % 56 %

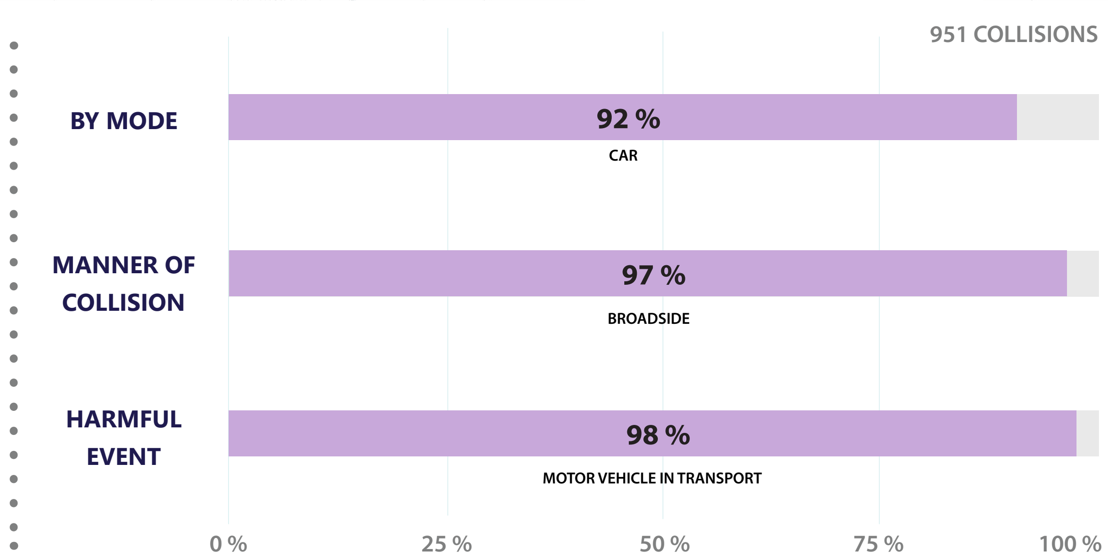
LOCATION

98 % 2 %

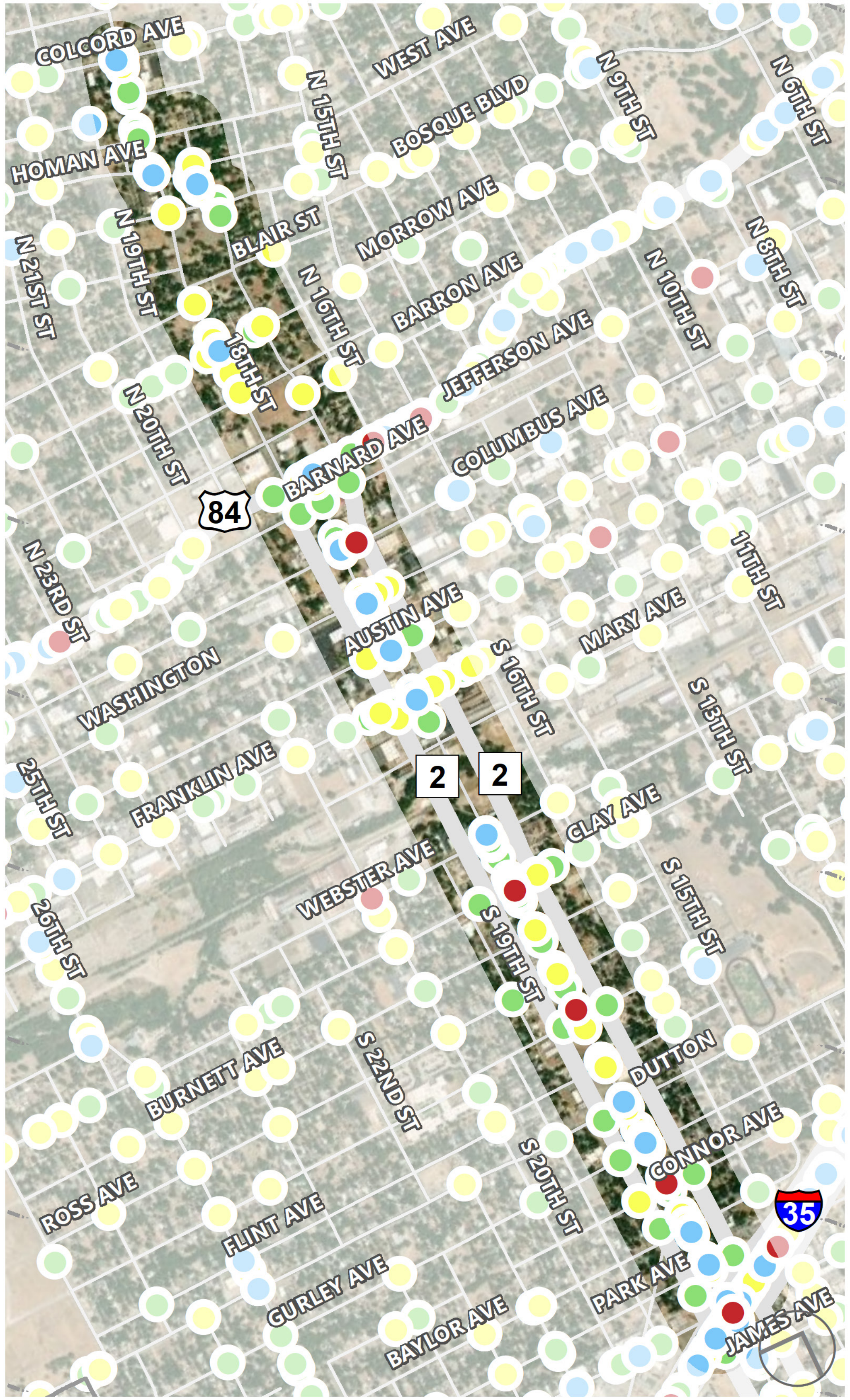
LIGHTING

79 % 2 %

17 % 2 %



PROJECT 1: 17TH & 18TH STREET- CORRIDOR SAFETY IMPROVEMENTS

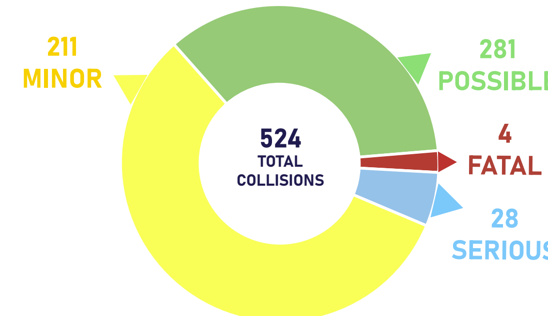


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

State Loop 2 (17th & 18th Street), a three-lane minor arterial where 17th Street serves northbound traffic and 18th Street serves southbound traffic, runs through commercial, residential, and industrial areas from Colcord Drive to IH 35 Southbound Frontage Road. The speed limits vary from 30 mph to 55 mph along the corridor. This corridor passes by schools including West Avenue Elementary School, Waco Montessori School, Bell's Hill Elementary School, and Cesar Chavez Middle School.

INJURY COLLISION STATISTICS

- 10
- 4
- 11
- 478
- 21



TRENDS

INTERSECTION	BROADSIDE	DISREGARD OF SIGNS & SIGNALS	NIGHTTIME
89%	73%	43%	25%
464 COLLISIONS	384 COLLISIONS	223 COLLISIONS	130 COLLISIONS

EXISTING CONDITIONS

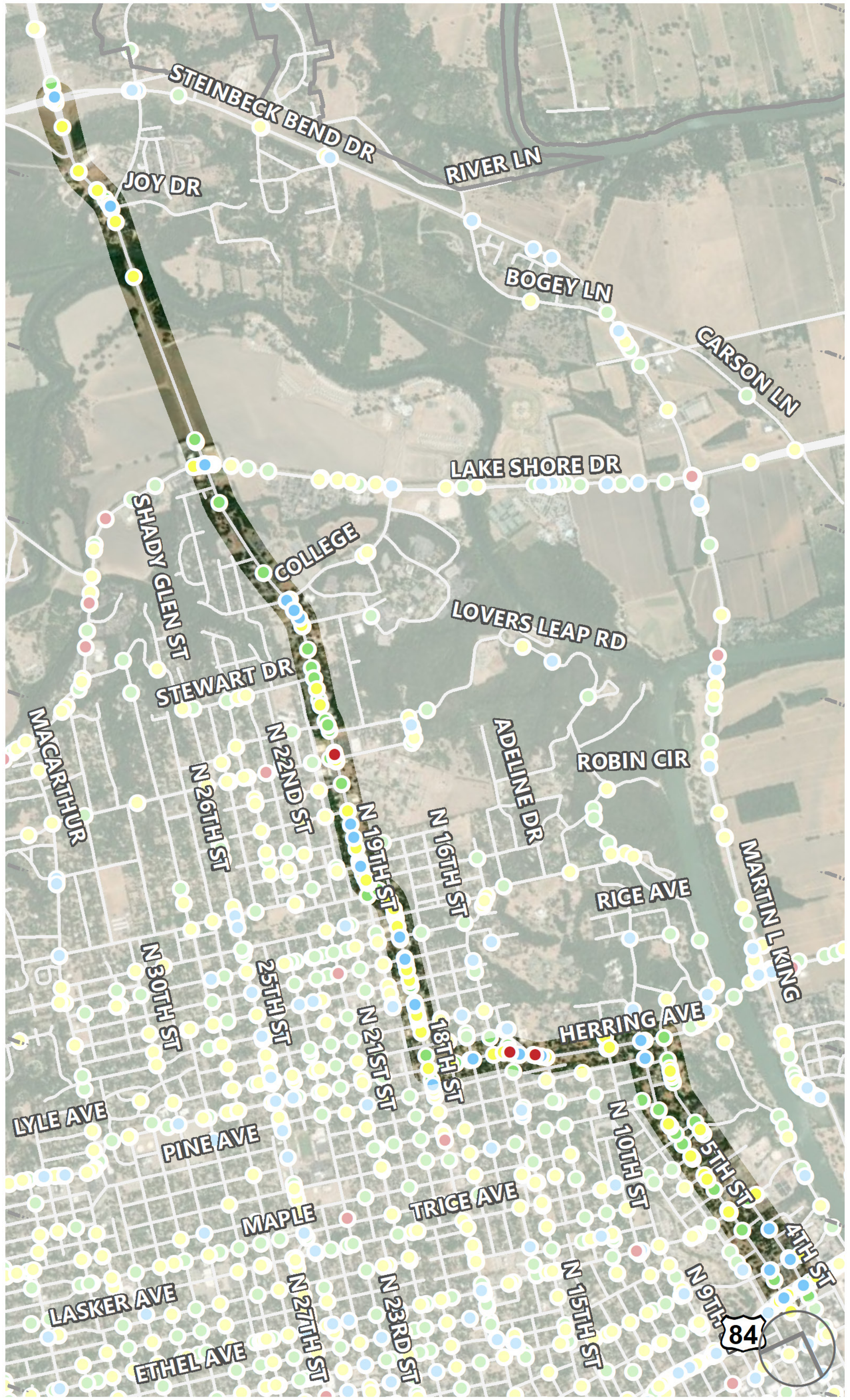
Existing Condition:
N 17th St at Morrow Ave facing north

Existing Condition:
N 18th St at Blair St facing south

ESTIMATED COST OF IMPROVEMENT

1: 17TH & 18TH ST- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Buffered Bike Lane	17th St from Bosque Blvd to IH 35	$213,200
	Install Sidewalk		$5,160,900
	Lane Reduction	18th St from Homan Ave to Colcord Ave	$24,400
	Fill Sidewalk Gaps		$587,700
	Install Street Lighting	17th St and 18th St from Colcord Ave to IH 35	$1,350,100
		CONTINGENCY COST	$1,467,300
		ENGINEERING COST	$3,081,300
		TOTAL COST	**$11,884,900**

PROJECT 2: FM 1637- CORRIDOR SAFETY IMPROVEMENTS



Fatal Injury | Serious Injury | Minor Injury | Possible Injury

FM 1637 (China Spring Road, N 19th Street and N 18th Street), a four-lane minor arterial with a center two-way left turn lane, provides access to a mix of commercial, residential, and agricultural areas from Steinbeck Bend Drive to US-84 (Waco Drive). The speed limits vary, with 30 mph through more populated areas and 55 mph in less developed sections along the corridor. This corridor is close to several schools, including Premier High School of Waco, McLennan Community College, Cedar Ridge Elementary School, and North Waco Elementary School.

INJURY COLLISION STATISTICS

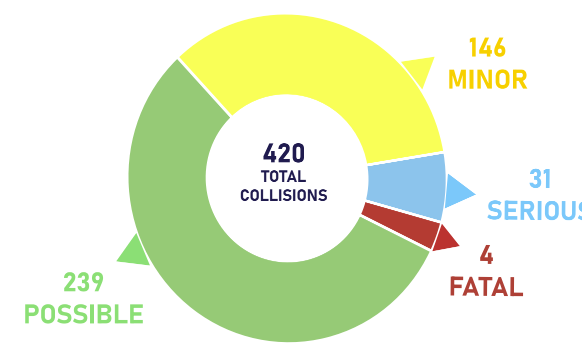
16

5

13

370

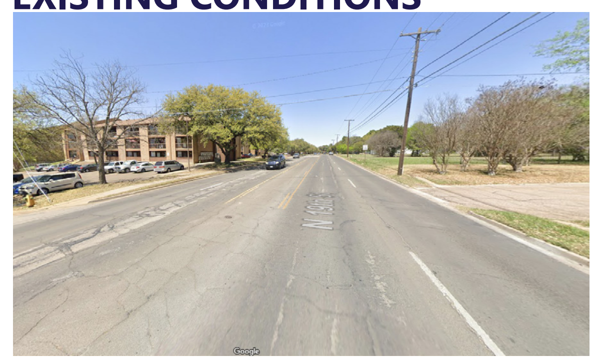
16



TRENDS

BROADSIDE	INTERSECTION	NIGHTTIME	HIT OBJECT
57%	35%	27%	22%
241 COLLISIONS	148 COLLISIONS	113 COLLISIONS	92 COLLISIONS

EXISTING CONDITIONS



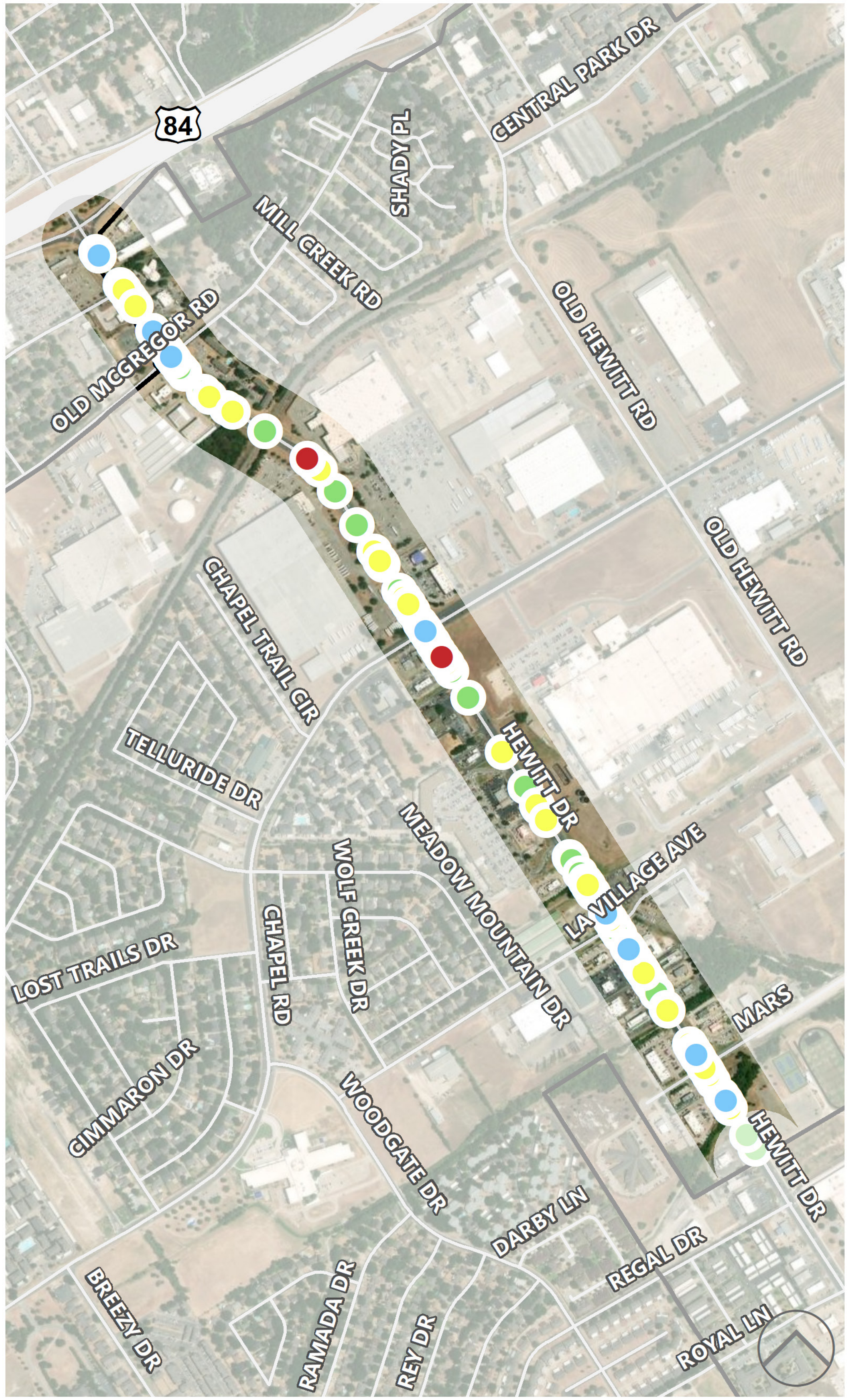
Existing Condition:
FM-1637 at Stewart Dr facing north

Existing Condition:
FM-1637 at N 4th St facing west

ESTIMATED COST OF IMPROVEMENT

2: FM 1637- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Street Lighting	From Steinbeck Bend Dr to Lake Shore Dr	$488,800
	Install Median		$2,980,800
	Install Median	18th St and 19th St from Lake Shore Dr to Vivian Ave	$4,356,200
	Fill Sidewalk Gaps & Install Street Lighting	Herring Ave from 18th St to 4th St	$1,860,100
	Install Street Lighting	18th St and 19th St from Lake Shore Dr to Herring Ave	$621,000
	Fill Sidewalk Gaps & Speed Feedback Signs	18th St and 19th St from Lake Shore Dr to Herring Ave	$5,461,900
	Install Bike Lane	4th St from Herring Ave to US 84 (Waco Dr)	$70,000
	Install Street Lighting & Sidewalk & Parking Striping	4th St and 5th St from Herring Ave to US 84 (Waco Dr)	$4,532,800
		CONTINGENCY COST	$4,074,400
		ENGINEERING COST	$8,556,100
		TOTAL COST	**$33,002,100**

PROJECT 3: HEWITT DRIVE- COMPLETE STREETS MULTIMODAL PROJECT

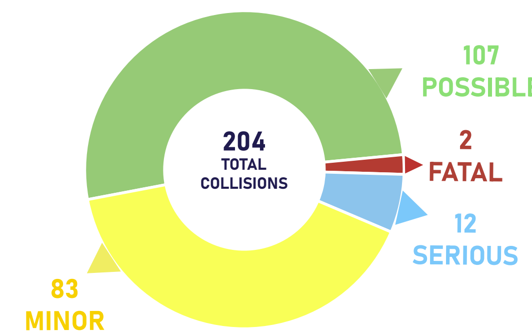


Fatal Injury — Serious Injury — Minor Injury — Possible Injury

Hewitt Drive, a four-lane minor arterial with a center two-way left turn lane, provides access to commercial and industrial areas. The speed limit is set at 45 mph along the entire corridor. Hewitt Drive provides primary access to Midway Middle School.

INJURY COLLISION STATISTICS

Pedestrian	3
Bicycle	2
Motorcycle	11
Automobile	180
Truck	8



TRENDS

INTERSECTION	REAR END	BROADSIDE	AUTOMOBILE ROW
74%	47%	46%	32%
151 COLLISIONS	95 COLLISIONS	93 COLLISIONS	65 COLLISIONS

EXISTING CONDITIONS

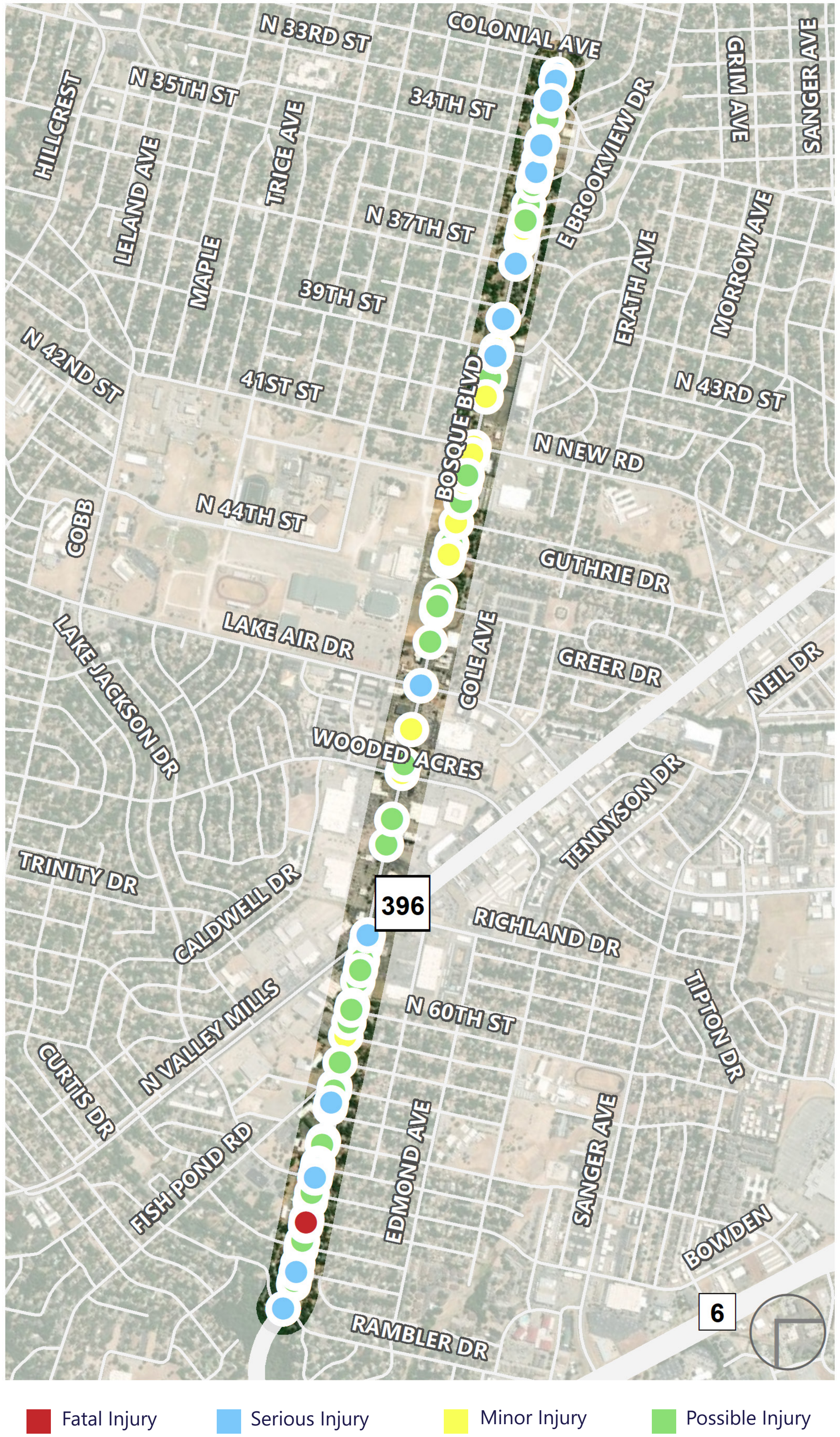
Existing Condition:
Hewitt Dr at La Village Ave facing south

Existing Condition:
Hewitt Dr at Chapel Rd facing north

ESTIMATED COST OF IMPROVEMENT

3: HEWITT DR- COMPLETE STREETS MULTIMODAL PROJECT			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Access Management and Install Median	From Regal Dr to Waco Dr	$2,416,200
	Speed Feedback Signs		$34,500
	Install Street Lighting		$678,500
	Install Sidewalk		$2,872,300
	Complete Streets Multimodal Project		$7,877,500
		CONTINGENCY COST	$2,775,800
		ENGINEERING COST	$5,829,200
		TOTAL COST	**$22,484,000**

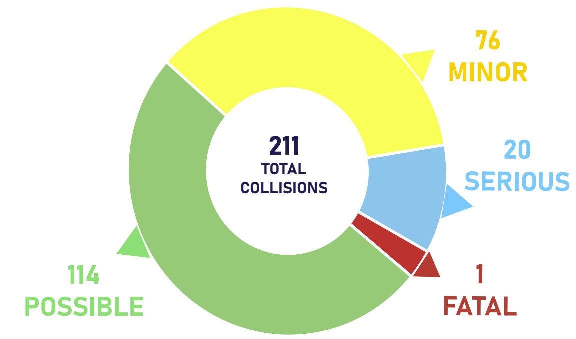
PROJECT 4: BOSQUE BOULEVARD- CORRIDOR SAFETY IMPROVEMENTS



Bosque Boulevard, a four-lane undivided major arterial, provides access through commercial and residential developments from N Valley Mills Drive to Rambler Drive. The speed limit is set at 35 mph along the corridor. Bosque Boulevard is within 0.25 mile of Parkdale Elementary School, Eagle Christian Academy, and Harmony Science Academy.

INJURY COLLISION STATISTICS

- Pedestrian: 3
- Bicycle: 1
- Motorcycle: 11
- Car: 190
- Truck: 6



TRENDS

INTERSECTION	BROADSIDE	REAR END	AUTOMOBILE ROW
81%	59%	25%	34%
170 COLLISIONS	124 COLLISIONS	52 COLLISIONS	71 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Bosque Blvd at N New Rd facing west

Existing Condition:
Bosque Blvd at Lake Air Dr facing east

ESTIMATED COST OF IMPROVEMENT

4: BOSQUE BLVD- CORRIDOR SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Median and Access Management	From N Valley Mills Dr to Colonial Ave	$4,641,500
	Fill Sidewalk Gaps		$1,544,500
	Fill Sidewalk Gaps	From N Valley Mills Dr to Rambler Dr	$2,306,900
		CONTINGENCY COST	$1,698,600
		ENGINEERING COST	$3,567,100
		TOTAL COST	**$13,758,600**

PROJECT 5: S NEW ROAD- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury Serious Injury Minor Injury Possible Injury

S New Road, a four-lane major arterial with a center two-way left turn lane, provides access through commercial and residential areas from Franklin Avenue to Old Robinson Road. The speed limit is set at 45 mph along the corridor. This corridor provides access to University High School and the Waco ISD Stadium.

INJURY COLLISION STATISTICS

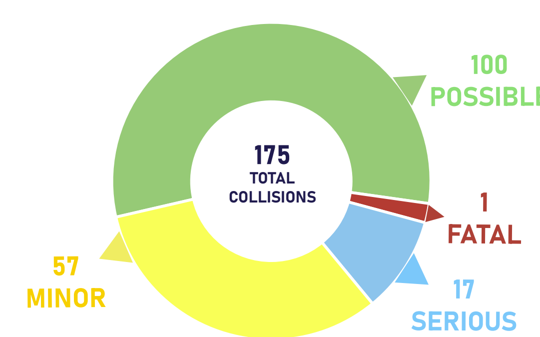
1

2

6

159

7



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	REAR END
66%	53%	44%	30%
116 COLLISIONS	93 COLLISIONS	77 COLLISIONS	52 COLLISIONS

EXISTING CONDITIONS

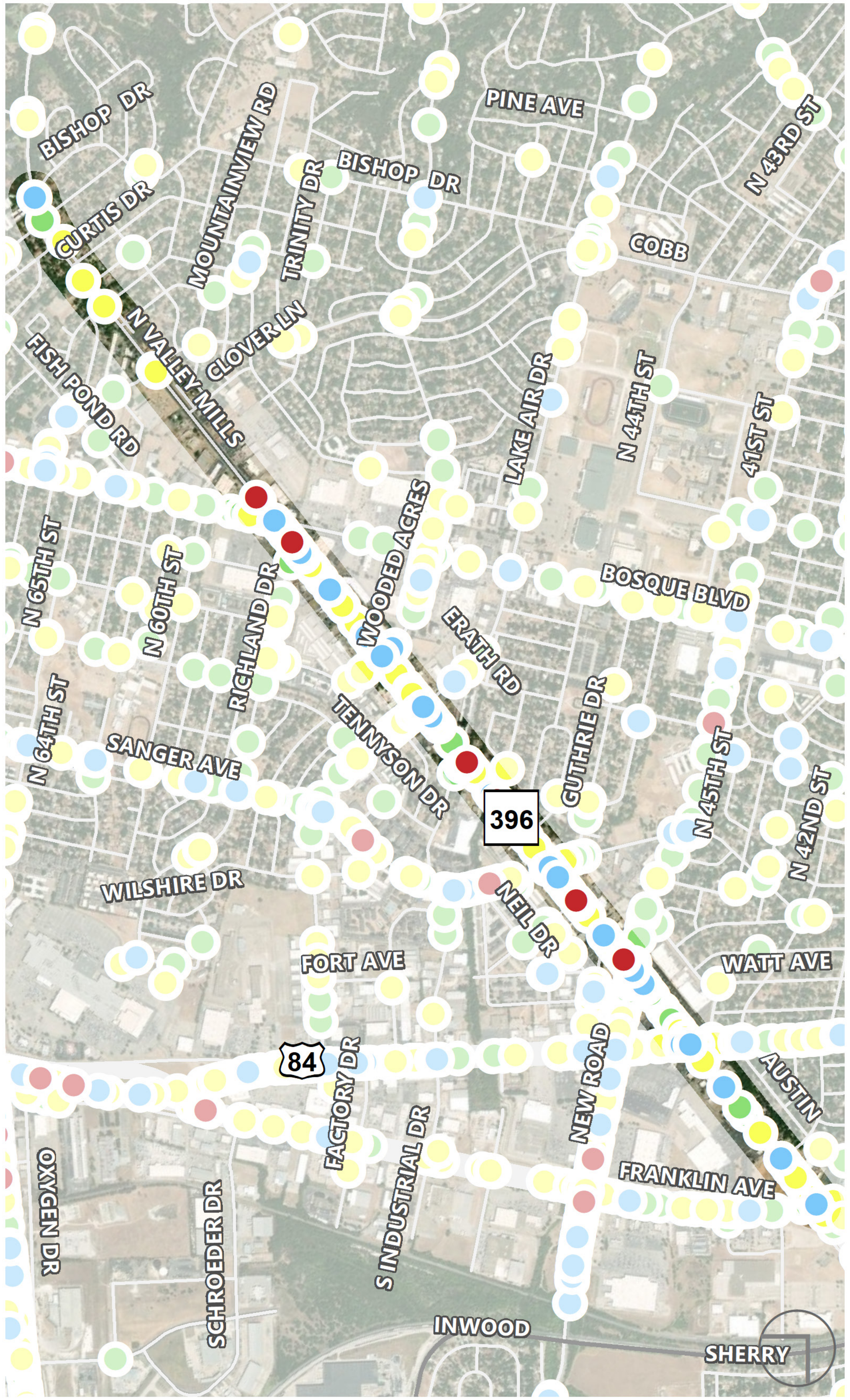
Existing Condition:
S New Rd at Creekview Dr facing west

Existing Condition:
S New Rd at Rolando Ave facing east

ESTIMATED COST OF IMPROVEMENT

5: S NEW RD- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	S New Rd from Franklin Ave to Old Robinson Rd & Beverly Dr from New Rd to Industrial Ave	$4,556,300
	Install Median	S New Rd from Franklin Ave to Old Robinson Rd	$4,953,600
	Install Striping Upgrades		$152,200
	Install Street Lighting		$143,800
		CONTINGENCY COST	$1,961,200
		ENGINEERING COST	$4,118,500
		TOTAL COST	**$15,885,600**

PROJECT 6: N VALLEY MILLS DRIVE- COMPLETE STREET IMPROVEMENTS



Fatal Injury | Serious Injury | Minor Injury | Possible Injury

N Valley Mills Drive, a four-to six-lane minor arterial with a center two-way left turn lane, runs through a mix of commercial and residential areas from Bishop Drive to Franklin Avenue. The speed limits vary, set at 40 mph from Bishop Drive and New Road and 55 mph between New Road and Franklin Avenue. Schools- including the Valor Preparatory Academy, Eagle Christian Academy, and Harmony Science Academy- are within 0.25 mile of this corridor.

INJURY COLLISION STATISTICS

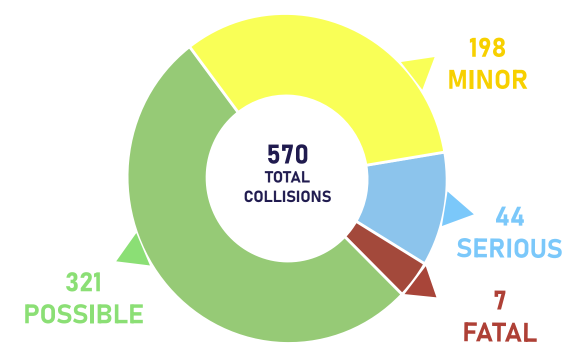
15

6

26

511

12



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	NIGTTIME
76%	55%	32%	29%
432 COLLISIONS	312 COLLISIONS	182 COLLISIONS	165 COLLISIONS

EXISTING CONDITIONS

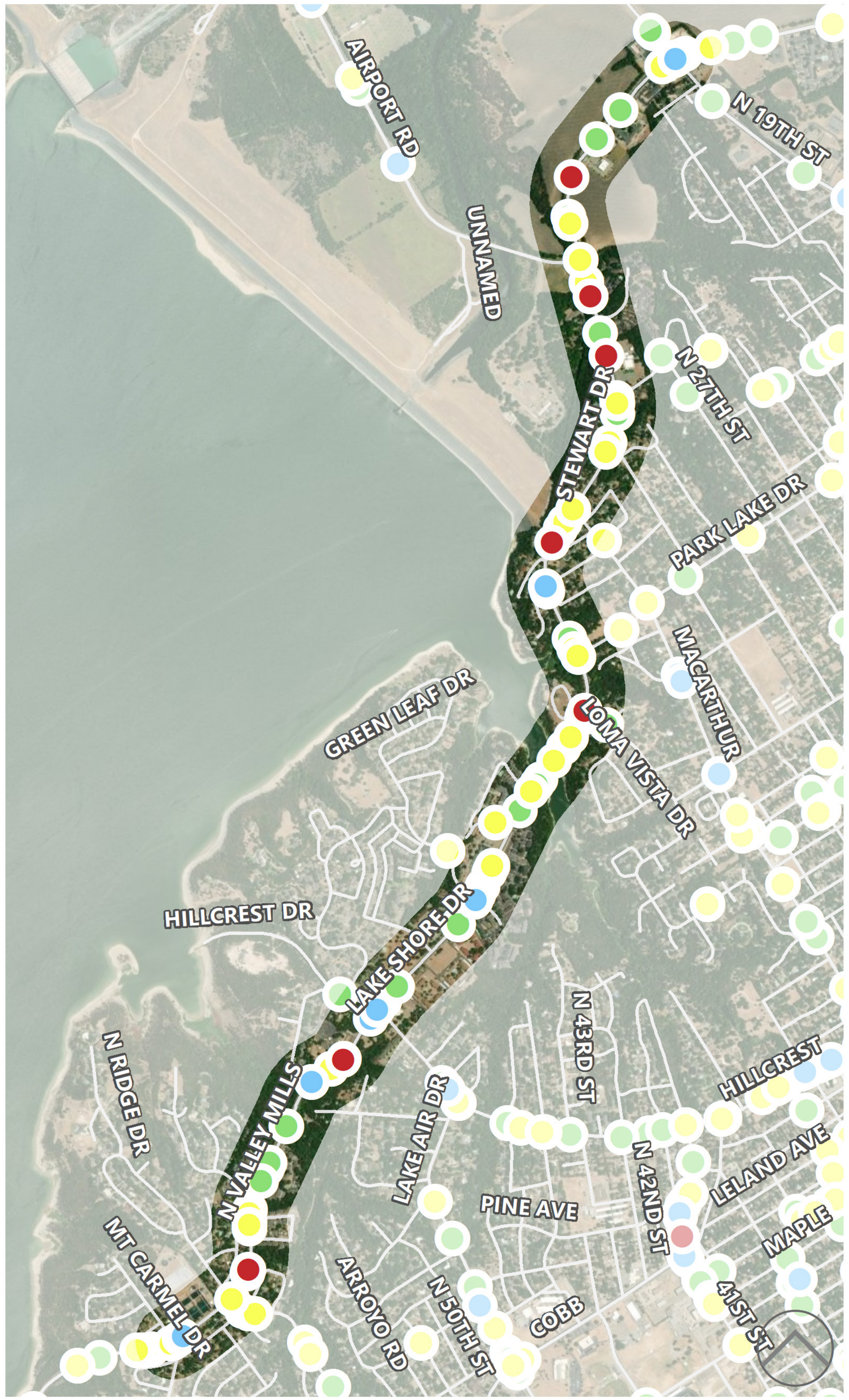
Existing Condition:
N Valley Mills Dr at Sanger Ave facing west

Existing Condition:
N Valley Mills Dr at Clover Ln facing east

ESTIMATED COST OF IMPROVEMENT

6: N VALLEY MILLS DR- COMPLETE STREET IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Road Diet		$558,900
	Access Management and Install Medians		$3,747,700
	Street Lighting	N Valley Mills Dr from Bishop Dr to Franklin Ave	$1,069,500
	Speed Limit Reduction		$3,800
	Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)		$4,739,700
		CONTINGENCY COST	$2,024,000
		ENGINEERING COST	$4,250,300
		TOTAL COST	**$16,393,900**

PROJECT 7-A: LAKE SHORE DRIVE- CORRIDOR SAFETY IMPROVEMENTS

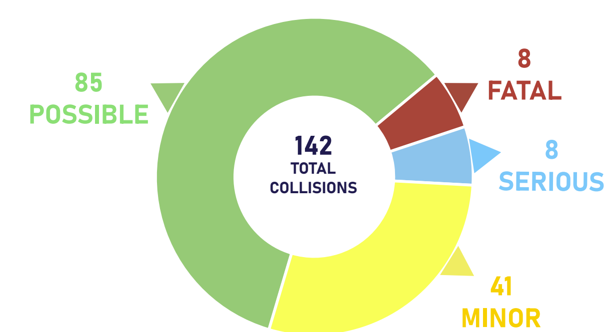


Fatal Injury Serious Injury Minor Injury Possible Injury

Lake Shore Drive, a four-lane minor arterial with a center two-way left turn lane, runs through a mix of commercial and residential areas from Mt Carmel Drive to N 19th Street. The speed limits vary, set at 40 mph from Mt Carmel Drive and Hillcrest Drive and 50 mph between Hillcrest Drive and N 19th Street. Lakeshore Drive is within 0.25 mile of Vanguard Preparatory School.

INJURY COLLISION STATISTICS

3
1
6
129
3



TRENDS

INTERSECTION	BROADSIDE	NIGHTTIME	HIT OBJECT
54%	39%	37%	33%
77 COLLISIONS	55 COLLISIONS	53 COLLISIONS	47 COLLISIONS

EXISTING CONDITIONS

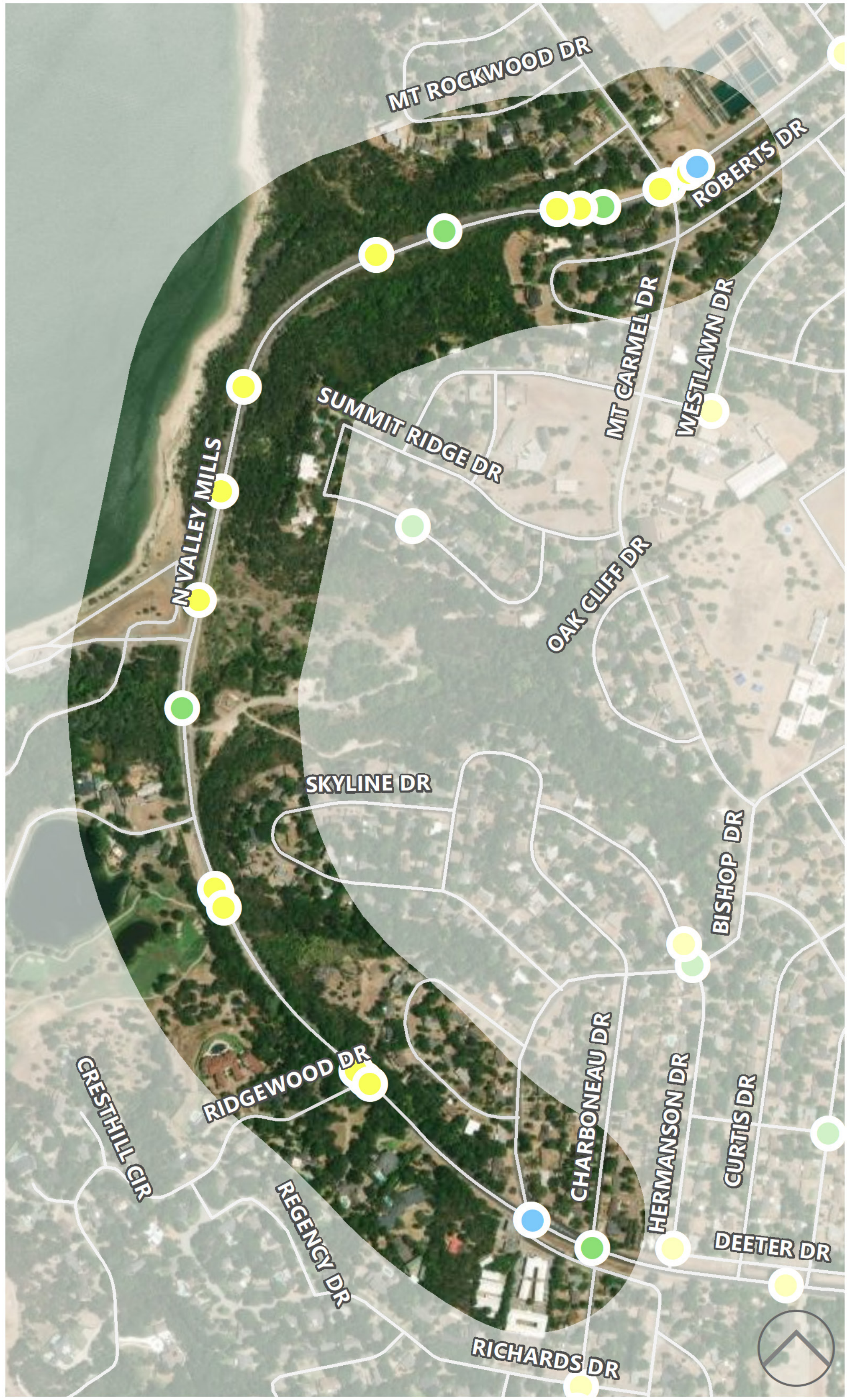
Existing Condition:
Lake Shore Dr at Airport Rd facing north

Existing Condition:
Lake Shore Dr at Park Lake Dr facing south

ESTIMATED COST OF IMPROVEMENT

7-A: LAKE SHORE DR- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Shared Use Path	From N 19th St to Mt Carmel Dr	$3,606,800
	Bridge Improved Pedestrian Access		$110,400
	Install Median		$8,245,000
	Install Street Lighting		$1,547,900
	Improve Sight Distance		$31,100
		CONTINGENCY COST	$1,958,600
		ENGINEERING COST	$4,113,100
		TOTAL COST	**$15,864,600**

PROJECT 7-B: LAKE SHORE DRIVE/N VALLEY MILLS DRIVE- CORRIDOR SAFETY IMPROVEMENTS

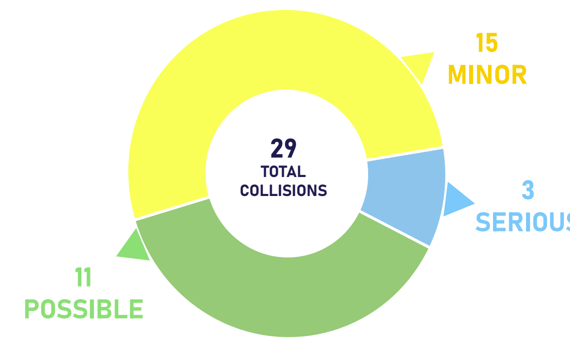


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Lake Shore Drive/N Valley Mills Drive, a two-lane undivided minor arterial, runs through a mix of residential and recreational areas from Mt Carmel Drive to Bishop Drive. The speed limit is set at 40 mph. Lakeshore Drive is within 0.25 miles of Vanguard Preparatory School.

INJURY COLLISION STATISTICS

0
1
3
24
1



TRENDS

INTERSECTION	BROADSIDE	UNSAFE SPEED	HIT OBJECT
45%	34%	45%	38%
23 COLLISIONS	10 COLLISIONS	13 COLLISIONS	11 COLLISIONS

EXISTING CONDITIONS

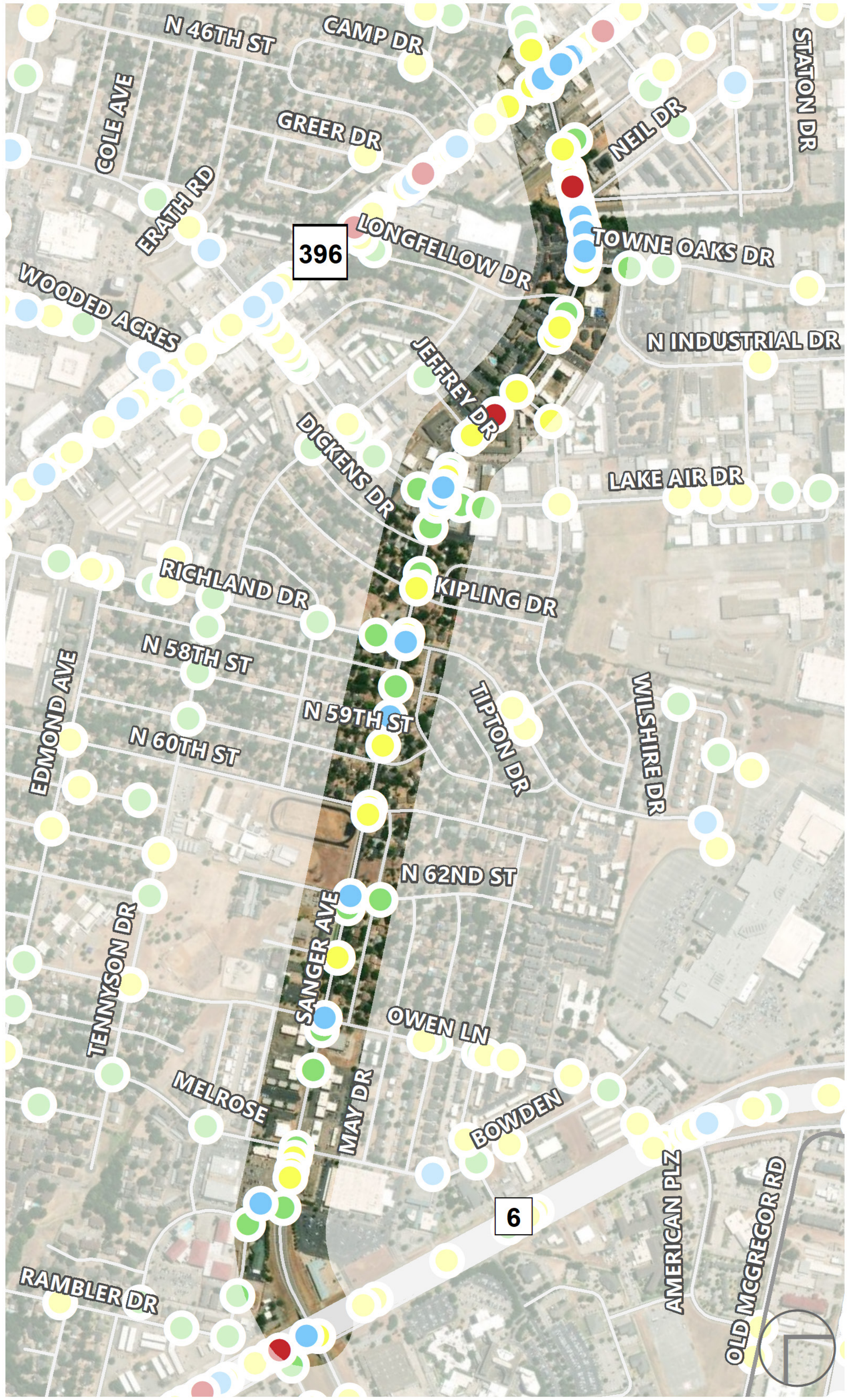
Existing Condition:
N Valley Mills Dr at La Porte Dr facing west

Existing Condition:
N Valley Mills Dr at Hanover Dr facing east

ESTIMATED COST OF IMPROVEMENT

7-B: LAKE SHORE DR/N VALLEY MILLS DR- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Street lighting	Mt Carmel Dr to Bishop Dr	$201,300
	Minor Streets Sight Distance Improvements		$15,000
	Install Speed Feedback Sign		$34,500
		CONTINGENCY COST	$50,200
		ENGINEERING COST	$105,400
		TOTAL COST	**$406,400**

PROJECT 8: SANGER AVENUE SAFETY IMPROVEMENTS

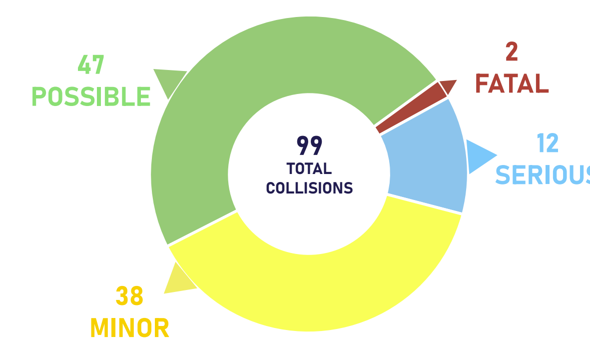


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Sanger Avenue, a four-lane minor arterial, provides access through a mix of commercial and residential areas from State Highway 6 to N Valley Mills Drive. The speed limit is set at 30 mph along the corridor. Sanger Avenue provides access to Tennyson Middle School.

INJURY COLLISION STATISTICS

Pedestrian	5
Bicycle	0
Motorcycle	5
Automobile	86
Truck	3



TRENDS

INTERSECTION	BROADSIDE	AUTOMOBILE ROW	NIGHTTIME
71%	48%	30%	28%
70 COLLISIONS	48 COLLISIONS	30 COLLISIONS	28 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Sanger Ave at Towne Oaks Dr facing east

Existing Condition:
Sanger Ave at N 60th St facing west

ESTIMATED COST OF IMPROVEMENT

8: SANGER AVENUE- SAFETY IMPROVEMENTS		
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Road Diet Improvements		$232,500
Fill Sidewalk Gaps		$3,747,000
Speed Feedback Signs	Sanger Ave from SH 6 to N Valley Mills Dr	$34,500
Access Management		$3,479,500
Install Street Lighting		$393,300
	CONTINGENCY COST	$1,577,400
	ENGINEERING COST	$3,312,500
	TOTAL COST	**$12,776,700**

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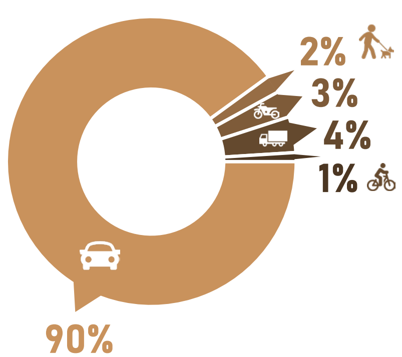
CHAPTER 6.7: CITY OF WOODWAY

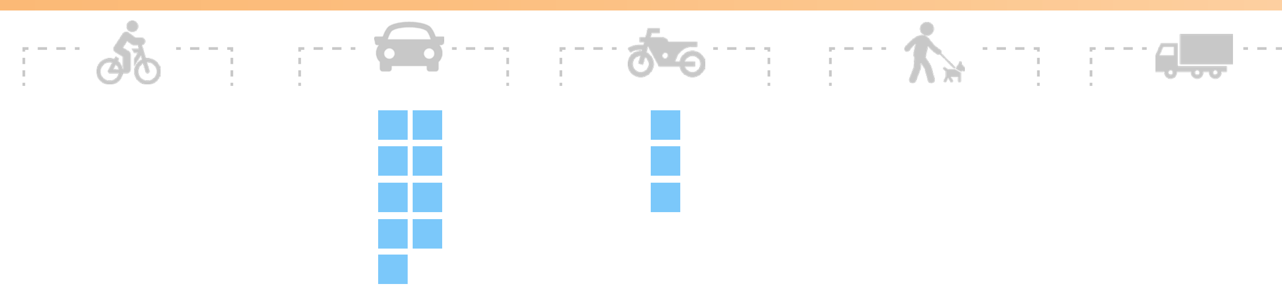
INTRODUCTION

Woodway, located southwest of Waco, is a city in central McLennan County. US-84 runs through Woodway. The city has an estimated population of 9,383 according to the 2020 census. This chapter provides information on the City of Woodway's collision statistics from 2014 to 2023. A total of 96 collisions occurred on Woodway streets in the last 10 years, including zero fatalities and 12 serious injuries. TxDOT roadways within Woodway city limits had 113 collisions during the same period, with four fatal injuries and nine serious injuries. On city-maintained roads, possible injuries accounted for the 50 percent of injury collisions. However, on roads maintained by TxDOT, the most common injury type is minor injury, representing 49 percent of injury collisions within their rights-of-way.

COLLISIONS 2014 TO 2023	CITY		TxDOT	
Total Collisions	**96**	**100 %**	**113**	**100 %**
Fatal Injury	0	0.00 %	4	3.54 %
Serious Injury	12	12.50 %	9	7.96 %
Minor Injury	36	37.50 %	55	48.67 %
Possible Injury	48	50.00 %	45	39.82 %
Total Persons Involved	**119**	**100 %**	**152**	**100 %**
Fatal Injury	0	0.00 %	4	2.63 %
Serious Injury	15	12.61 %	10	6.58 %
Minor Injury	45	37.82 %	70	46.05 %
Possible Injury	59	49.58 %	68	44.74 %

COLLISIONS BY MODE - CITY

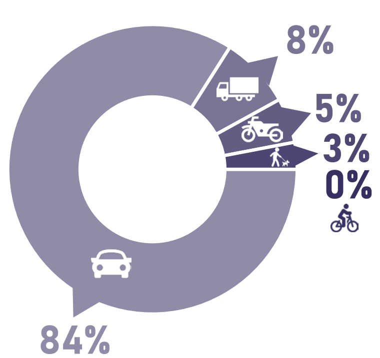


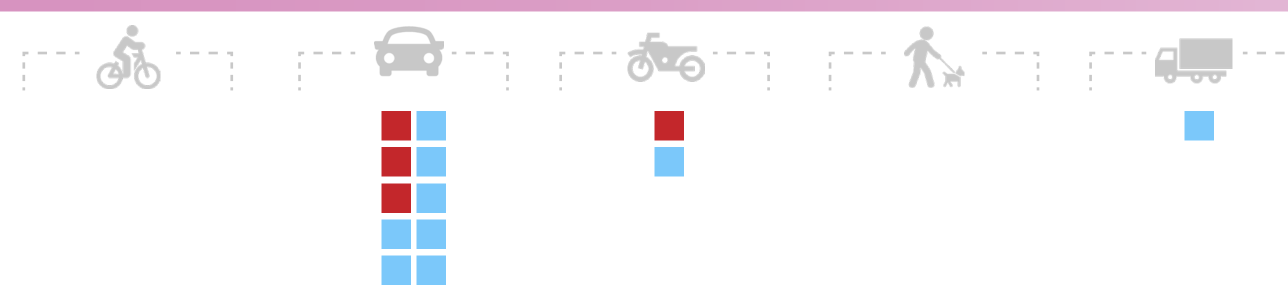


Note : Each box represents one fatal or severe injury collision.

Bicycle	Car	Motorcycle	Pedestrian	Truck	
0 %	0 %	0 %	0 %	0 %	Fatal Injury
0 %	10 %	100 %	0 %	0 %	Serious Injury
100 %	37 %	0 %	100 %	25 %	Minor Injury
0 %	52 %	0 %	0 %	75 %	Possible Injury
100 %	100 %	100 %	100 %	100 %	

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

Bicycle	Car	Motorcycle	Pedestrian	Truck	
0 %	3 %	17 %	0 %	0 %	Fatal Injury
0 %	7 %	17 %	0 %	11 %	Serious Injury
0 %	46 %	67 %	100 %	44 %	Minor Injury
0 %	43 %	0 %	0 %	44 %	Possible Injury
0 %	100 %	100 %	100 %	100 %	

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also draws comparisons between collisions on Woodway's city streets, TxDOT facilities, and McLennan County across various categories.

On Woodway city streets, there were a total of 96 collisions that resulted in 119 persons injured. In comparison, TxDOT reported a total of 113 collisions resulting in 152 persons injured within Woodway city limits.

This section also identifies several major collision trends on Woodway city streets, including broadside collisions, hit object collisions, right-of-way violations by automobiles, and unsafe speed violations. On TxDOT roadways, the prominent trends were broadside collisions, rear-end collisions, unsafe speed violations, and right-of-way violations by automobiles. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. Of the speed limits examined, the charts indicate that roads with a 60 mph speed limit accounted for the highest proportion of KSI collisions.

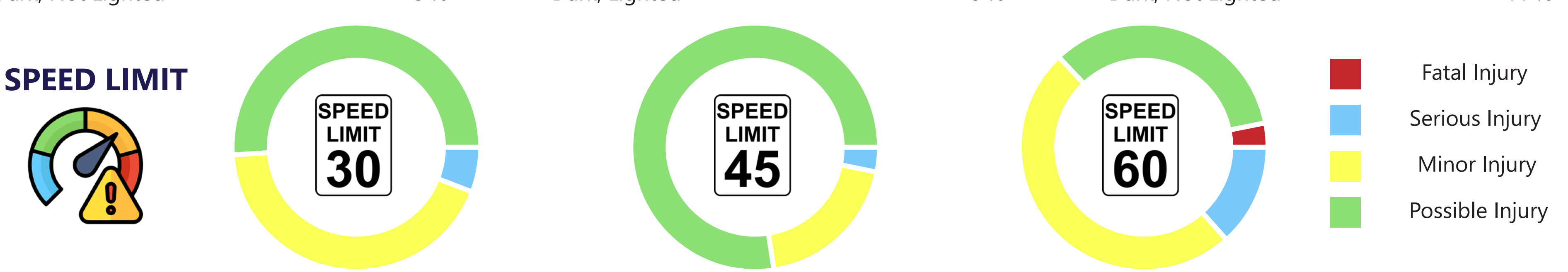
CITY	TxDOT
96	113
TOTAL COLLISIONS	TOTAL COLLISIONS
119	152
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED								
	CITY				TxDOT			
MODE								
Bicycle	0 %	0 %	1 %	0 %	0 %	0 %	0 %	0 %
Car	0 %	10 %	35 %	49 %	2 %	6 %	41 %	45 %
Motorcycle	0 %	3 %	0 %	0 %	1 %	1 %	3 %	0 %
Pedestrian	0 %	0 %	2 %	0 %	0 %	0 %	2 %	0 %
Truck	0 %	0 %	0 %	1 %	0 %	0 %	1 %	0 %
AGE								
Below 15	0 %	1 %	3 %	3 %	0 %	0 %	1 %	1 %
15 - 65	0 %	11 %	29 %	35 %	1 %	6 %	39 %	33 %
Above 65	0 %	1 %	6 %	11 %	1 %	1 %	5 %	10 %
GENDER								
Male	0 %	8 %	17 %	17 %	2 %	5 %	24 %	17 %
Female	0 %	5 %	21 %	33 %	1 %	2 %	22 %	28 %

CITY OF WOODWAY VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

CITY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	1 %	Bicycle	0 %	Bicycle	1 %
Car	90 %	Car	84 %	Car	85 %
Motorcycle	3 %	Motorcycle	5 %	Motorcycle	4 %
Pedestrian	2 %	Pedestrian	3 %	Pedestrian	3 %
Truck	4 %	Truck	8 %	Truck	7 %
FIRST HARMFUL EVENT					
Motor Vehicle in Transport	64 %	Motor Vehicle in Transport	79 %	Motor Vehicle in Transport	72 %
Fixed Object	27 %	Fixed Object	11 %	Fixed Object	17 %
Parked Car	4 %	Overturned	7 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	36 %	Rear End	47 %	Broadside	42 %
Broadside	32 %	Broadside	24 %	Hit Object	28 %
Rear End	22 %	Hit Object	21 %	Rear End	24 %
Sideswipe	6 %	Sideswipe	6 %	Sideswipe	5 %
VIOLATION CATEGORY					
Distracted Driving	25 %	Distracted Driving	32 %	Unsafe Speed	23 %
Automobile Right-of-Way	17 %	Unsafe Speed	17 %	Automobile Right-of-Way	22 %
Traffic Signals and Signs	15 %	Traffic Signals and Signs	11 %	Traffic Signals and Signs	12 %
Unsafe Speed	8 %	Automobile Right-of-Way	7 %	Distracted Driving	8 %
Other Unforeseen Reasons	8 %	Other Unforeseen Reasons	6 %	Other Improper Driving	6 %
Driver Condition	7 %	Other Improper Driving	4 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	61 %	Intersection	42 %	Intersection	59 %
Roadway	39 %	Roadway	58 %	Roadway	41 %
LIGHTING					
Daylight	76 %	Daylight	74 %	Daylight	70 %
Dark, Lighted	11 %	Dark, Not Lighted	13 %	Dark, Lighted	16 %
Dark, Not Lighted	8 %	Dark, Lighted	6 %	Dark, Not Lighted	11 %

SPEED LIMIT



BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

The map displays the location of injury collisions involving bicyclists and pedestrians in Woodway. In total there were six bicycle and pedestrian minor injury collisions which involved one bicyclist and five pedestrians.

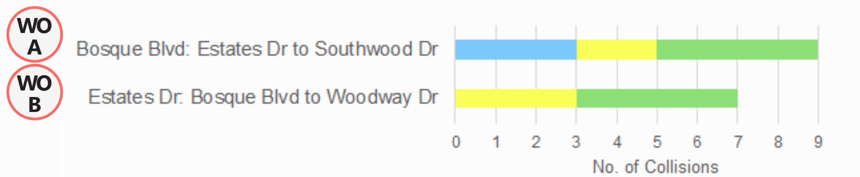
SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

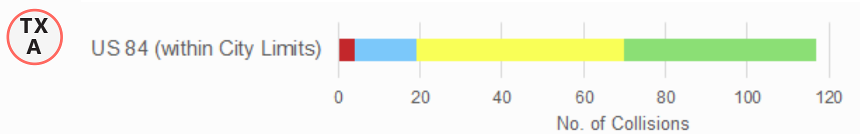
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.

ROADWAYS & INTERSECTIONS

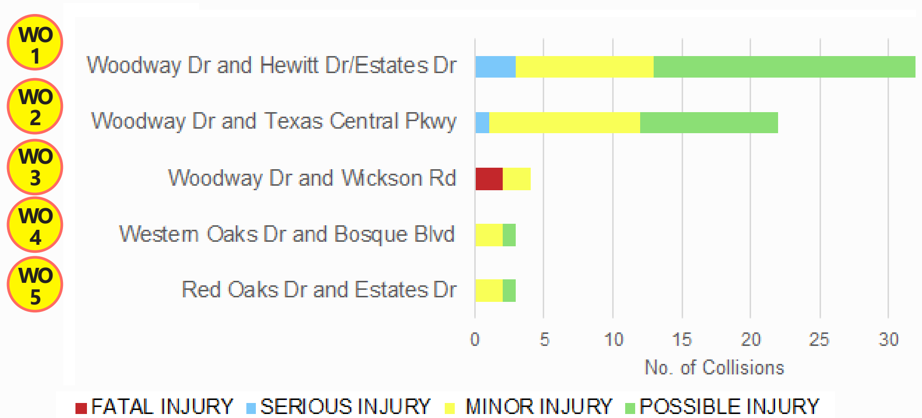
ROADWAYS



TxDOT ROADWAYS



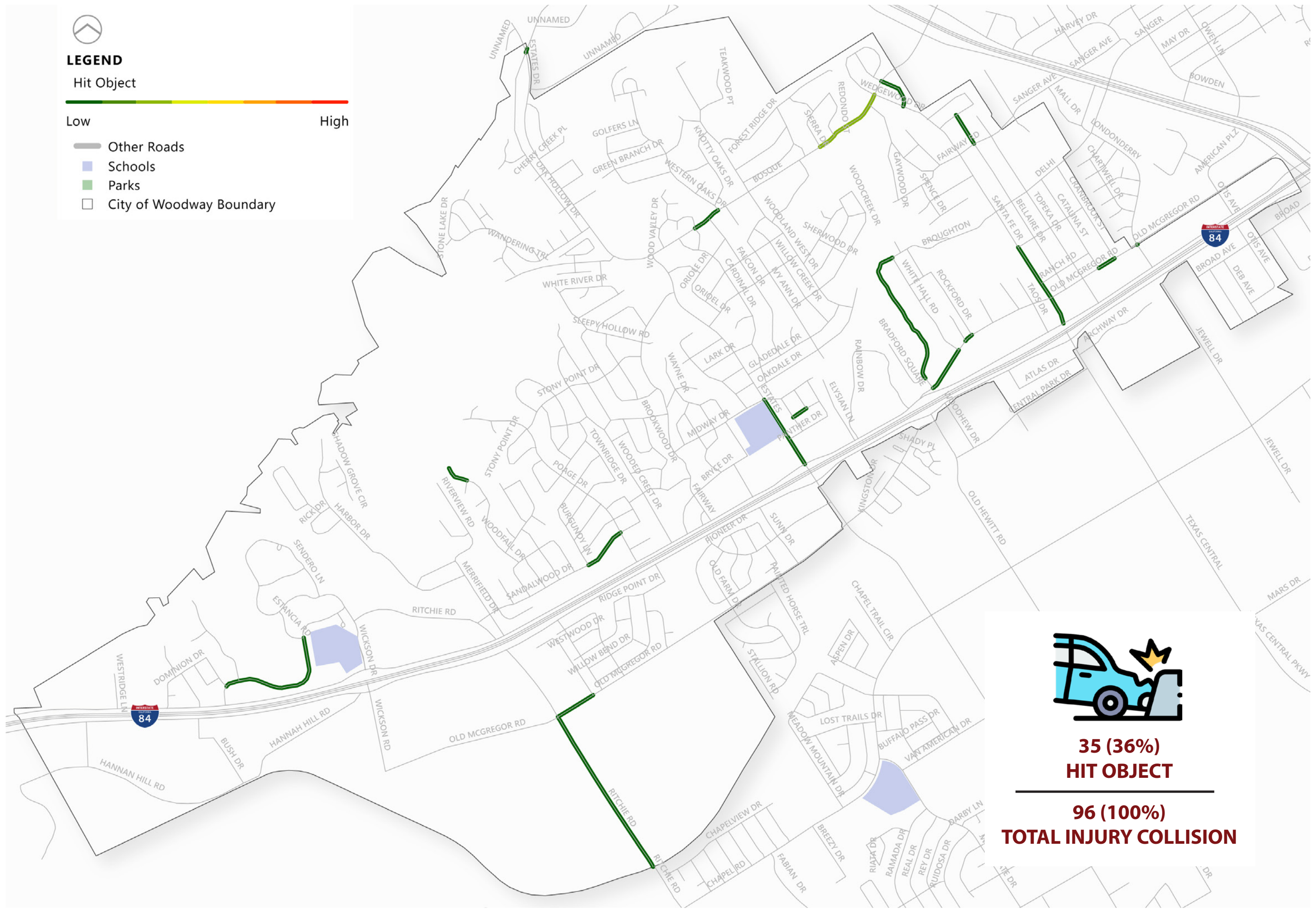
INTERSECTIONS



This section lists high risk roadway segments and intersections within Woodway city limits. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

PROFILES - CITY

PROFILE 1 - HIT OBJECT



SEVERITY

0 % | 15 %
54 % | 31 %

LOCATION

20 % | 80 %

LIGHTING

57 % | 6 %
17 % | 20 %

35 COLLISIONS

BY MODE: CAR 83 %

CONTRIBUTING FACTOR: DRIVER CONDITION 20 %; DISTRACTED DRIVING 17 %; OTHER UNFORESEEN REASONS 17 %; DRIVING UNDER INFLUENCE 14 %; UNSAFE SPEED 14 %

HARMFUL EVENT: FIXED OBJECT 74 %; PARKED CAR 11 %

0 % | 25 % | 50 % | 75 % | 100 %

PROFILE 2 - BROADSIDE

SEVERITY

0 % | 10 %
42 % | 48 %

LOCATION

100 % | 0 %

LIGHTING

87 % | 3 %
6 % | 3 %

31 COLLISIONS

BY MODE: CAR 97 %

CONTRIBUTING FACTOR: AUTOMOBILE RIGHT-OF-WAY 45 %; TRAFFIC SIGNALS AND SIGNS 39 %

HARMFUL EVENT: MOTOR VEHICLE IN TRANSPORT 100 %

0 % | 25 % | 50 % | 75 % | 100 %

PROFILES - CITY

PROFILE 3 - REAR END

SEVERITY

0 %

10 %

14 %

76 %

LOCATION

71 %

29 %

LIGHTING

90 %

0 %

10 %

0 %

21 COLLISIONS

BY MODE: 90 % CAR; 10 % TRUCK

CONTRIBUTING FACTORS: 57 % DISTRACTED DRIVING; 14 % FOLLOWING TOO CLOSELY; 10 % UNSAFE SPEED

HARMFUL EVENT: 50 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILE 4 - DISTRACTED DRIVING

SEVERITY

0 %

8 %

21 %

71 %

LOCATION

63 %

37 %

LIGHTING

71 %

8 %

17 %

4 %

24 COLLISIONS

BY MODE: 92 % CAR

MANNER OF COLLISION: 50 % REAR END; 25 % HIT OBJECT

HARMFUL EVENT: 75 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILES - TXDOT

PROFILE 1 - REAR END

SEVERITY

0 %
8 %
49 %
43 %

LOCATION

30 %
70 %

LIGHTING

83 %
6 %
8 %
4 %

53 COLLISIONS

BY MODE

87 % CAR

CONTRIBUTING FACTOR

51 % UNSAFE SPEED
21 % DISTRACTED DRIVING
9 % FOLLOWING TOO CLOSELY

HARMFUL EVENT

100 % MOTOR VEHICLE IN TRANSPORT

0 % 25 % 50 % 75 % 100 %

PROFILE 2 - HIT OBJECT

SEVERITY

8 %
21 %
42 %
29 %

LOCATION

8 %
92 %

LIGHTING

46 %
8 %
8 %
38 %

24 COLLISIONS

BY MODE

75 % CAR

CONTRIBUTING FACTOR

25 % OTHER UNFORESEEN REASONS
17 % DISTRACTED DRIVING
13 % DRIVER CONDITION
13 % UNSAFE SPEED
8 % DRIVING UNDER INFLUENCE

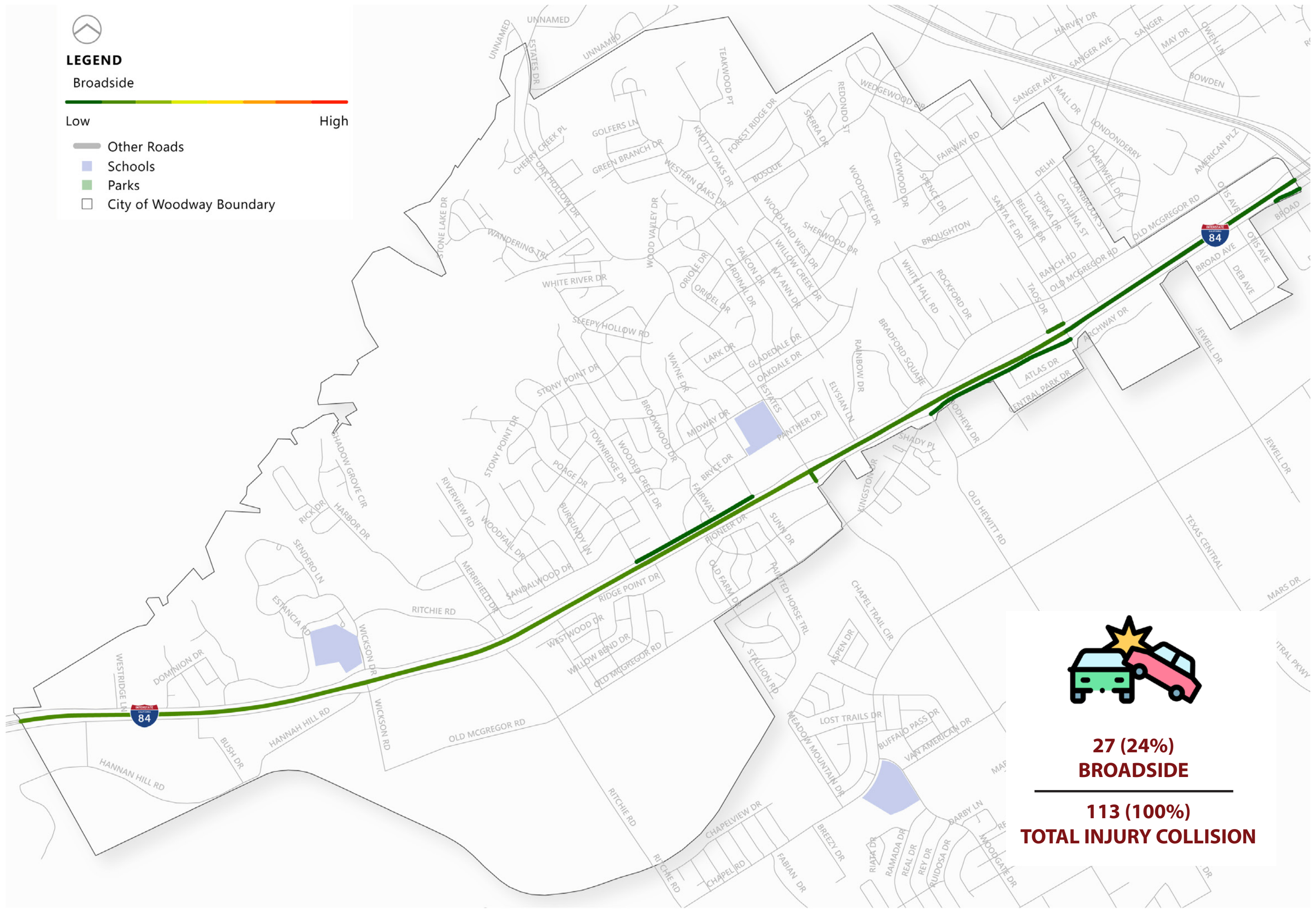
HARMFUL EVENT

50 % FIXED OBJECT
33 % OVERTURNED

0 % 25 % 50 % 75 % 100 %

PROFILES - TXDOT

PROFILE 3 - BROADSIDE



SEVERITY

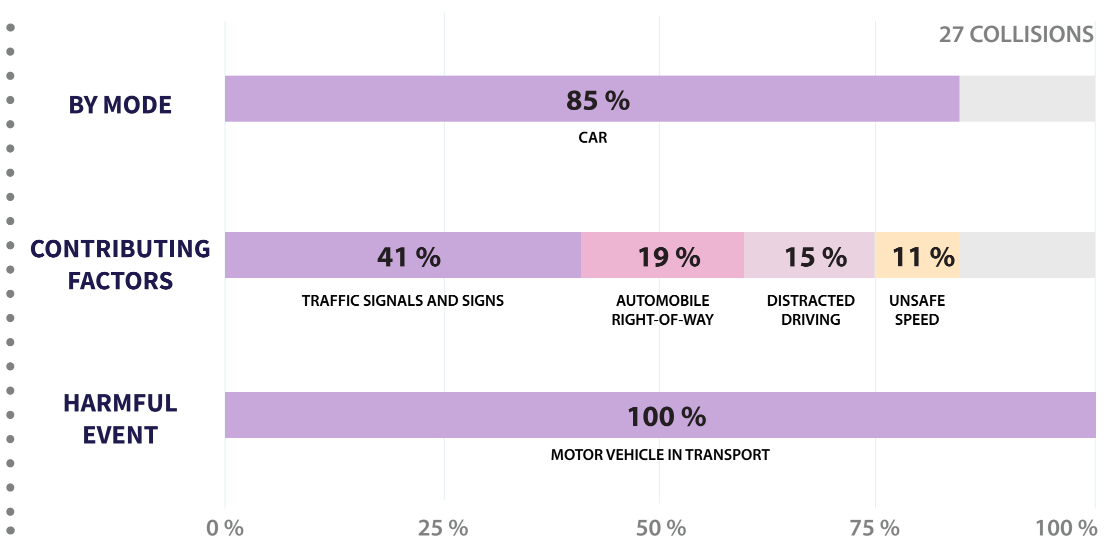
8 % | 0 %
48 % | 45 %

LOCATION

100 % | 0 %

LIGHTING

78 % | 8 %
4 % | 11 %



PROFILE 4 - DISTRACTED DRIVING

SEVERITY

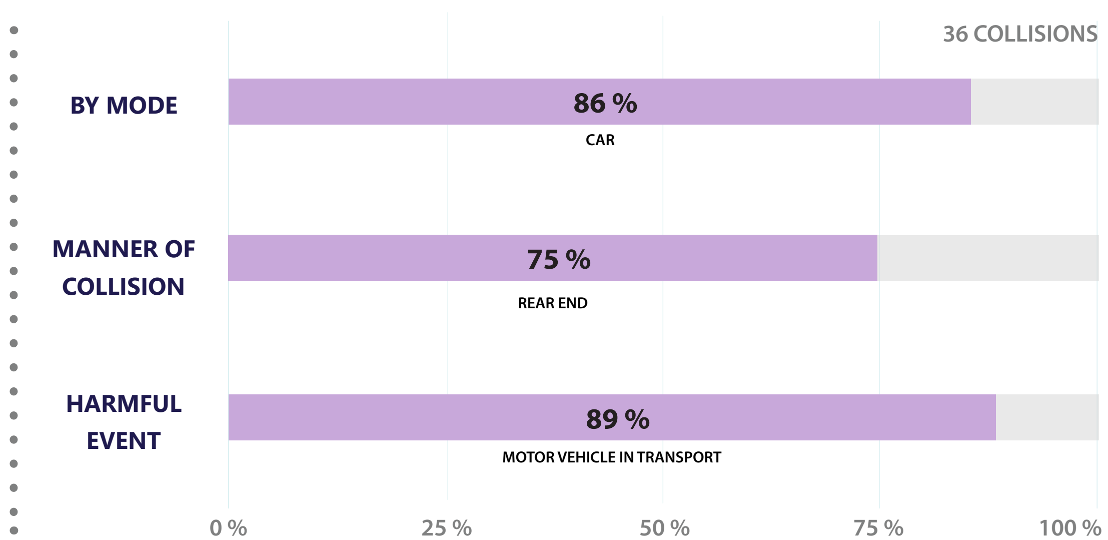
3 % | 3 %
58 % | 36 %

LOCATION

33 % | 67 %

LIGHTING

81 % | 3 %
6 % | 11 %



NEIGHBORHOOD TRAFFIC CALMING PROGRAM

Residential streets in Woodway would benefit from a Neighborhood Traffic Calming Project due to cut-through traffic and speeding issues. A neighborhood traffic calming program typically involves initiatives aimed at reducing traffic speed and improving safety on residential streets. These programs often include measures such as speed humps, traffic circles, chicanes, curb extensions, and signage to encourage drivers to slow down and be more cautious in residential areas. The program also involves community engagement and input to identify specific traffic issues and develop appropriate solutions tailored to the neighborhood's needs. Overall, the goal of a neighborhood traffic calming program is to create safer and more livable streets for residents and pedestrians.

ACTIVE TRANSPORTATION PLAN

The City of Woodway should consider implementing an Active Transportation Plan (ATP) to promote increased walking, biking, and the use of other non-motorized transportation modes. This comprehensive plan would delineate strategies, policies, and infrastructure enhancements aimed at fostering safer and more accessible environments for pedestrians and cyclists within the city.

The ATP would entail an evaluation of existing multi-modal infrastructure improvements and safety measures, while also identifying gaps and deficiencies in infrastructure such as sidewalks and bike lanes. Additionally, the plan would focus on raising awareness about the benefits of walking and cycling, as well as educating the community about road safety and the importance of sharing the road with other users.

Furthermore, the ATP would involve the implementation of policies and regulations to support active transportation, including the adoption of Complete Streets policies, zoning regulations prioritizing pedestrian and cyclist safety, and incentives for developers to incorporate active transportation infrastructure into new developments.

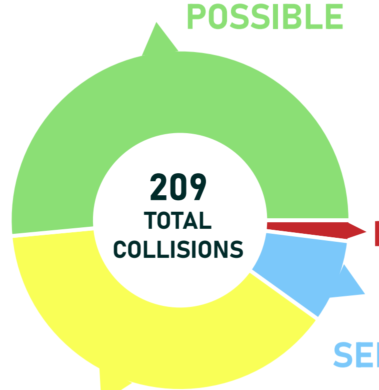
Moreover, the ATP would provide an opportunity to integrate with public transit systems by ensuring seamless connectivity between walking, cycling, and public transit networks. By fostering a more pedestrian and cyclist-friendly environment, the ATP would aim to promote healthier lifestyles, reduce traffic congestion, and create more vibrant and livable communities in Woodway.

PROJECT 1: CITYWIDE SIGN INVENTORY

The City of Woodway is proposing a Citywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the city to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the city.

INJURY COLLISION STATISTICS

- Pedestrian: 5
- Bicycle: 1
- Motorcycle: 9
- Car: 181
- Truck: 13



TRENDS

INTERSECTION	REAR END	DISTRACTED DRIVING	HIT OBJECT
51%	35%	29%	28%
106 COLLISIONS	74 COLLISIONS	60 COLLISIONS	59 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Sign Inventory, Replacement & Installation	Citywide	$758,400
	Citywide Pavement Delineation	Citywide	$4,368,300
		CONTINGENCY COST	$1,025,400
		ENGINEERING COST	$1,538,100
		TOTAL COST	**$7,690,200**

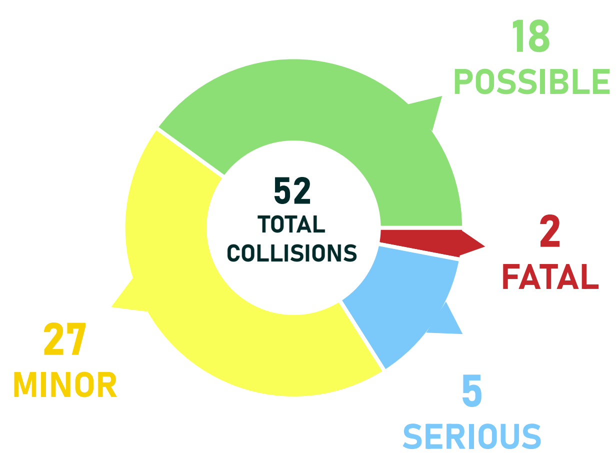
PROJECT 2: CITYWIDE STREET LIGHT INVENTORY

The City of Woodway is proposing a Citywide Streetlight Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the city to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating Woodway's streets during nighttime hours.

Note : Nighttime Injury Collisions

NIGHTTIME INJURY COLLISION STATISTICS

Pedestrian	1
Bicycle	1
Motorcycle	2
Car	48
Truck	0



TRENDS

HIT OBJECT	INTERSECTION	DISTRACTED DRIVING	BROADSIDE
54%	40%	27%	19%
28 COLLISIONS	21 COLLISIONS	14 COLLISIONS	10 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Citywide Street Light Inventory	Citywide	$7,015,000
		CONTINGENCY COST	$1,403,000
		ENGINEERING COST	$2,946,300
		TOTAL COST	$11,364,300

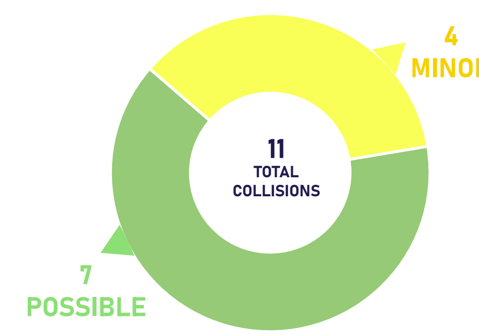
PROJECT 3: ESTATES DRIVE- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury
Serious Injury
Minor Injury
Possible Injury

Estates Drive, a four-lane minor arterial with a center two-way left turn lane, provides direct access to Woodway Elementary School. The posted speed limit is 30 mph on this section of Estates Drive. The City has previously considered improvements along this segment. This project provides the highest safety and connectivity benefits to the City by meaningfully extending multimodal improvements on Estates Drive to benefit the Elementary School.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	0
Car	9
Truck	2



TRENDS

INTERSECTION	BROADSIDE	REAR END	DISTRACTED DRIVING
73%	36%	36%	36%
8 COLLISIONS	4 COLLISIONS	4 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

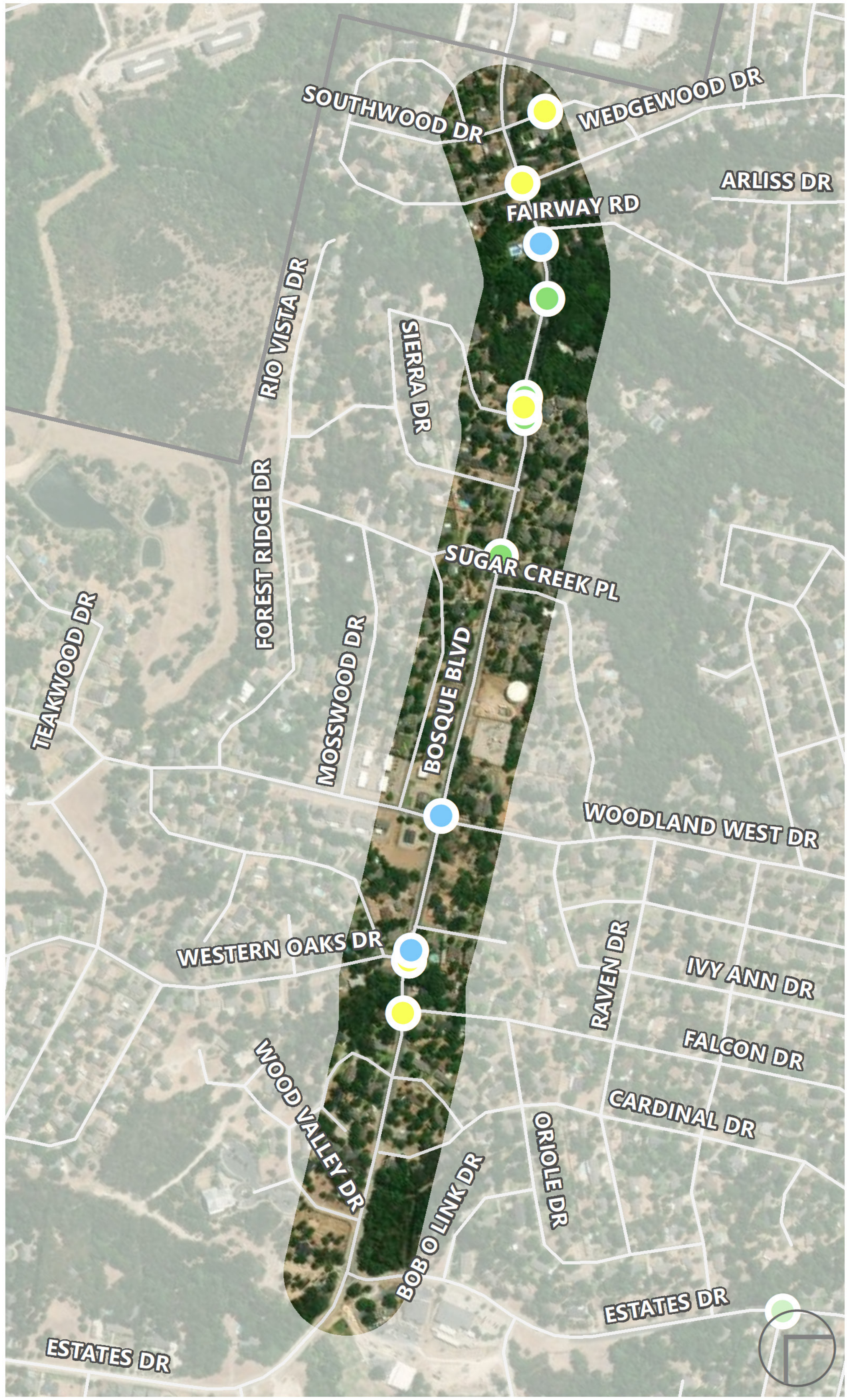
Existing Condition:
Estates Dr at Jordan Lane facing north

Existing Condition:
Estates Dr at Midway Dr facing south

ESTIMATED COST OF IMPROVEMENT

3: ESTATES DR- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
	Fill Sidewalk Gaps	From Midway Dr to US-84	$328,500
	Speed Feedback Sign		$17,300
	Install Bike Lane		$43,100
		CONTINGENCY COST	$77,800
		ENGINEERING COST	$163,400
		TOTAL COST	**$630,100**

PROJECT 4: BOSQUE BOULEVARD- CORRIDOR SAFETY IMPROVEMENTS

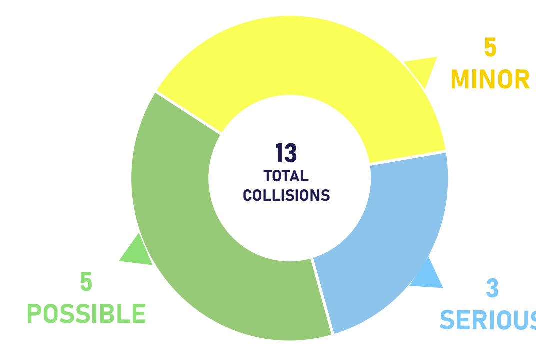


Fatal Injury · Serious Injury · Minor Injury · Possible Injury

Bosque Boulevard, a four-lane minor arterial, provides access to surrounding residential neighborhoods. The speed limit is set at 30 mph throughout the corridor. Bosque Boulevard has the highest 2022 AADT (8,594) in Woodway among local streets.

INJURY COLLISION STATISTICS

Pedestrian	1
Bicycle	0
Motorcycle	1
Vehicle	11
Truck	0



TRENDS

INTERSECTION	BROADSIDE	HIT OBJECT	NIGHTTIME
69%	38%	38%	31%
9 COLLISIONS	5 COLLISIONS	5 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

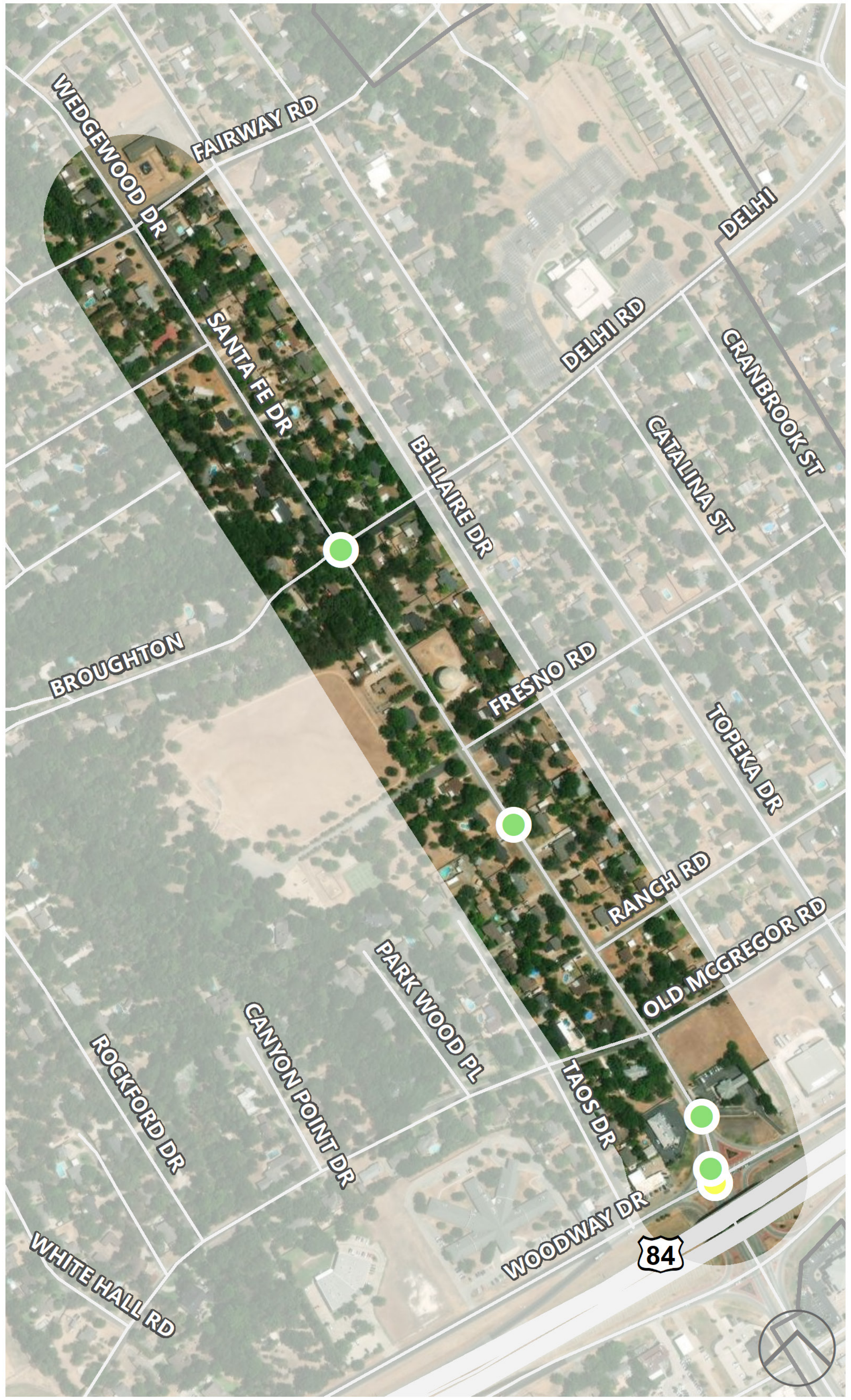
Existing Condition:
Bosque Blvd at Sugar Creek Place facing west

Existing Condition:
Bosque Blvd at Cardinal Dr facing east

ESTIMATED COST OF IMPROVEMENT

4: BOSQUE BLVD- CORRIDOR SAFETY IMPROVEMENTS		
IMPROVEMENTS	**LOCATIONS**	**ESTIMATED COST**
Install Speed Feedback Sign	Phase 1: From Southwood Dr to Estates Dr	$34,500
Minor Streets Sign and Striping Improvements	Phase 1: From Southwood Dr to Estates Dr	$27,700
Install Roundabout	Phase 1: Bosque Blvd & Estates Dr	$460,000
Pedestrian Connectivity Improvements	Phase 1: Bosque Blvd & Estates Dr	$65,600
Road Diet	Phase 2: From Southwood Dr to Estates Dr	$164,300
	CONTINGENCY COST	$150,500
	ENGINEERING COST	$316,000
	TOTAL COST	**$1,218,600**

PROJECT 5: SANTA FE DRIVE- CORRIDOR SAFETY IMPROVEMENTS

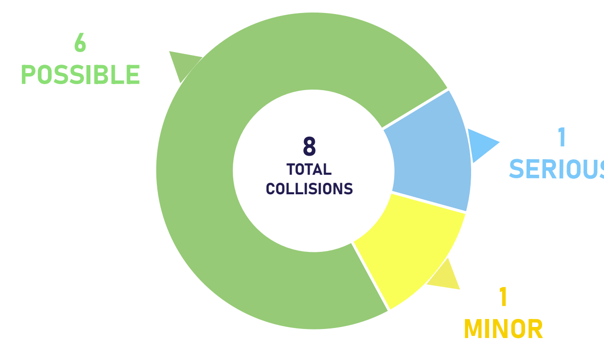


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Santa Fe Drive, a two-lane minor arterial with a bike lane on south side of the roadway, provides access to surrounding residential neighborhoods. The speed limit is set at 30 mph.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	0
Car	7
Truck	1



TRENDS

INTERSECTION	BROADSIDE	DISREGARD OF SIGNS & SIGNALS	HIT OBJECT
75%	63%	63%	25%
6 COLLISIONS	5 COLLISIONS	5 COLLISIONS	2 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Santa Fe Dr at Delhi Rd facing north

Existing Condition:
Santa Fe Dr at Ranch Rd facing south

ESTIMATED COST OF IMPROVEMENT

5: SANTA FE DR- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping	From Fairway Rd to Woodway Dr	$16,400
	Minor Streets Improvements		$15,600
	Install Bike Lane (NB)		$20,500
		CONTINGENCY COST	$10,500
		ENGINEERING COST	$22,100
		TOTAL COST	**$85,100**

PROJECT 6: RITCHIE ROAD AND OLD MCGREGOR ROAD – INTERSECTION SAFETY IMPROVEMENTS

Fatal Injury   Serious Injury   Minor Injury   Possible Injury

The intersection of Ritchie Road and Old McGregor Road is an all way stop controlled skewed-intersection. The speed limit approaching this intersection is 30 mph. Currently the intersection has an off-set geometry posing a safety challenge for drivers. Non-injury collisions have been reported at this intersection.

EXISTING CONDITIONS

Existing Condition:
Old McGregor Rd at Ritchie Rd facing east

Existing Condition:
Ritchie Rd at Old McGregor Rd facing north

ESTIMATED COST OF IMPROVEMENT

6: RITCHIE RD AND OLD MCGREGOR RD – INTERSECTION SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Clear Sight Triangles		$5,800
	Install Curb		$15,000
	Sign Upgrade	Ritchie Rd and Old McGregor Rd	$3,700
	Reduce Corner Radius		$34,500
	Upgrade Striping and Pavement Marking		$1,700
		CONTINGENCY COST	$12,200
		ENGINEERING COST	$25,600
		TOTAL COST	**$98,500**

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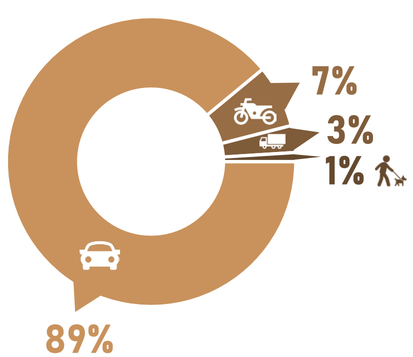
CHAPTER 6.8: UNINCORPORATED McLENNAN COUNTY

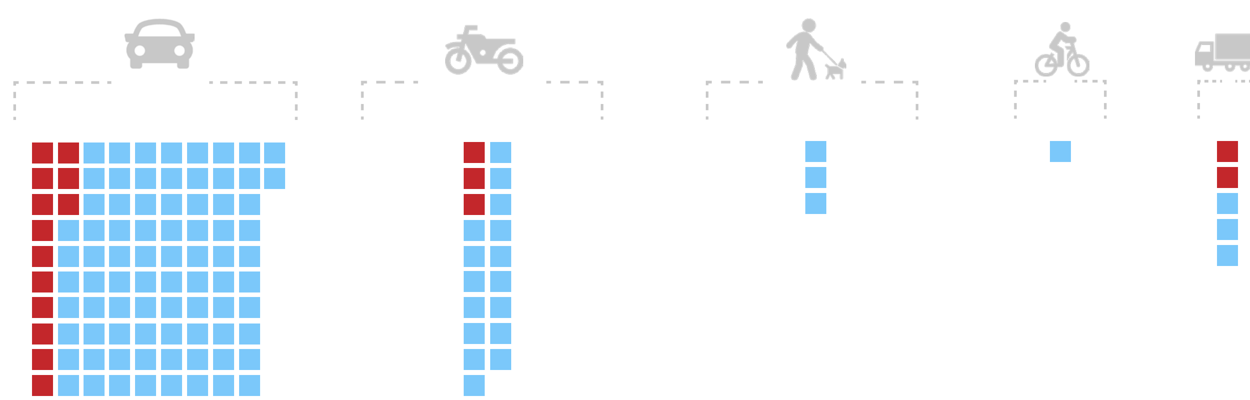
INTRODUCTION

McLennan County is located on the Edwards Plateau in Central Texas. As of the 2020 census, its population was 260,579. Its county seat and largest city is Waco. This chapter provides information on the unincorporated McLennan County's collision statistics from 2014 to 2023. A total of 512 collisions occurred on the roads of unincorporated McLennan County, including 18 fatalities and 102 serious injuries. TxDOT roadways within unincorporated county limits had a total of 2,009 collisions during the same period, with 102 fatalities and 359 serious injuries. For both county roads and TxDOT rights-of-way, the predominant type of injury collision is possible injury, accounting for 45 percent of collisions on county roads and 48 percent of collisions on TxDOT rights-of-way.

COLLISIONS 2014 TO 2023	UNICORPORATED COUNTY		TxDOT	
Total Collisions	**512**	**100 %**	**2009**	**100 %**
Fatal Injury	18	3.52 %	102	5.08 %
Serious Injury	102	19.92 %	359	17.87 %
Minor Injury	161	31.45 %	689	34.30 %
Possible Injury	231	45.12 %	859	42.76 %
Total Persons Involved	**648**	**100 %**	**3066**	**100 %**
Fatal Injury	19	2.93 %	120	3.91 %
Serious Injury	117	18.06 %	486	15.85 %
Minor Injury	198	30.56 %	967	31.54 %
Possible Injury	314	48.46 %	1493	48.70 %

COLLISIONS BY MODE - UNINCORPORATED McLENNAN COUNTY

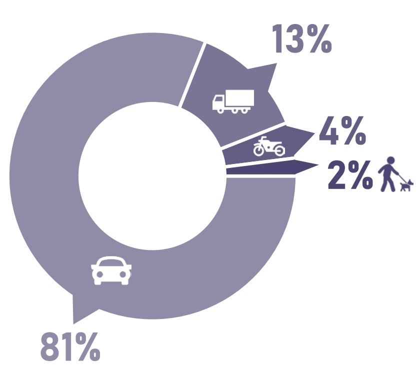


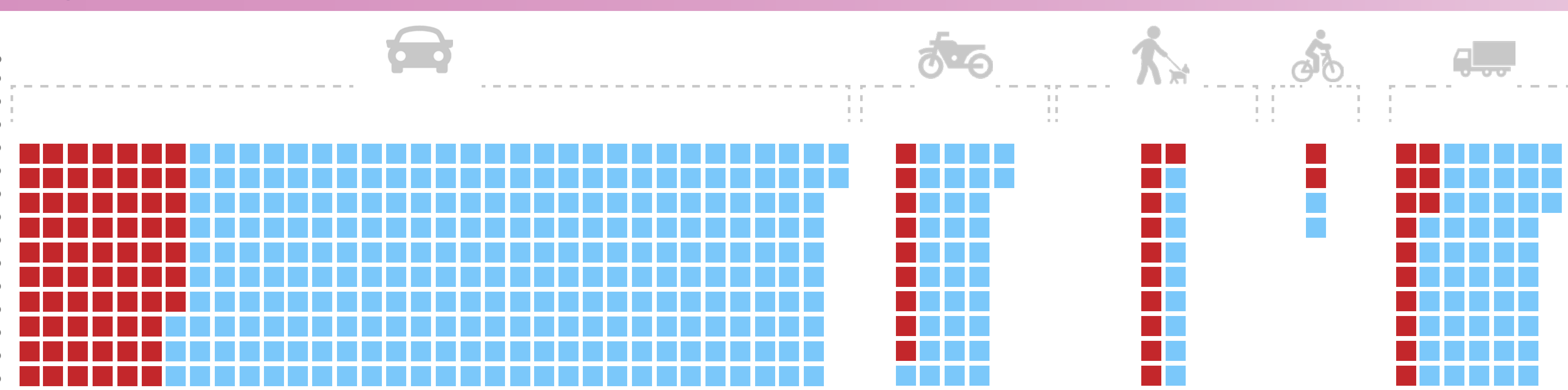


Note : Each box represents one fatal or severe injury collision.

Fatal Injury	0 %	3 %	8 %	0 %	13 %
Serious Injury	100 %	17 %	43 %	60 %	19 %
Minor Injury	0 %	32 %	24 %	20 %	44 %
Possible Injury	0 %	48 %	24 %	20 %	25 %
	100 %	100 %	100 %	100 %	100 %

COLLISIONS BY MODE - TxDOT





Note : Each box represents one fatal or severe injury collision.

Fatal Injury	33 %	4 %	11 %	35 %	5 %
Serious Injury	33 %	16 %	42 %	29 %	19 %
Minor Injury	33 %	34 %	34 %	23 %	39 %
Possible Injury	0 %	46 %	13 %	13 %	38 %
	100 %	100 %	100 %	100 %	100 %

UNINCORPORATED McLENNAN COUNTY

The following summary provides information on the number of collisions, persons injured, and the proportion of persons involved in collisions based on mode of transportation, age group, and gender. It also compares the collision shares between the unincorporated county and overall McLennan County for various categories.

On county roads, there were a total of 512 collisions, resulting in 648 persons injured. In comparison, TxDOT reported a total of 2,009 collisions resulting in 3,066 persons injured.

This section also identifies several major collision trends on McLennan County streets, including nighttime collisions, hit object collisions, unsafe speed violations and collisions due to driving under the influence. On TxDOT roadways, the prominent trends were nighttime collisions, hit object collisions, unsafe speed violations and overturned collisions. A detailed summary analyzing these collision trends is provided in the collision profile section of this chapter.

The pie charts below compare the severity of collisions on roadways with different speed limits. The charts indicate that roads with a 45 mph speed limit accounted for the highest proportion of severe injury collisions and 65 mph speed limit accounted for the highest proportion of fatal injuries.

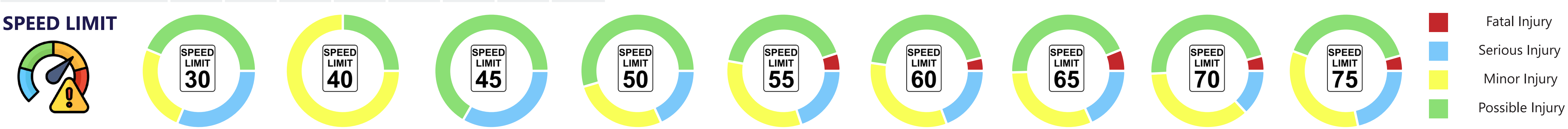
UNINCORPORATED COUNTY	TxDOT
512	2009
TOTAL COLLISIONS	TOTAL COLLISIONS
648	3066
TOTAL PERSONS INJURED	TOTAL PERSONS INJURED

PERSONS INVOLVED								
	UNINCOPORATED COUNTY				TxDOT			
MODE								
Bicycle	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Car	2 %	15 %	28 %	47 %	3 %	14 %	29 %	46 %
Motorcycle	0 %	2 %	2 %	1 %	0 %	1 %	1 %	0 %
Pedestrian	0 %	1 %	0 %	0 %	0 %	0 %	0 %	0 %
Truck	0 %	0 %	1 %	0 %	0 %	1 %	2 %	2 %
AGE								
Below 15	0 %	1 %	2 %	6 %	0 %	1 %	2 %	6 %
15 - 65	2 %	16 %	27 %	39 %	3 %	13 %	27 %	39 %
Above 65	0 %	1 %	2 %	4 %	1 %	2 %	2 %	4 %
GENDER								
Male	2 %	12 %	18 %	25 %	3 %	10 %	17 %	24 %
Female	0 %	6 %	13 %	23 %	1 %	6 %	14 %	24 %

UNINCORPORATED McLENNAN COUNTY VS. McLENNAN COUNTY COLLISIONS - RELATIVE SHARES

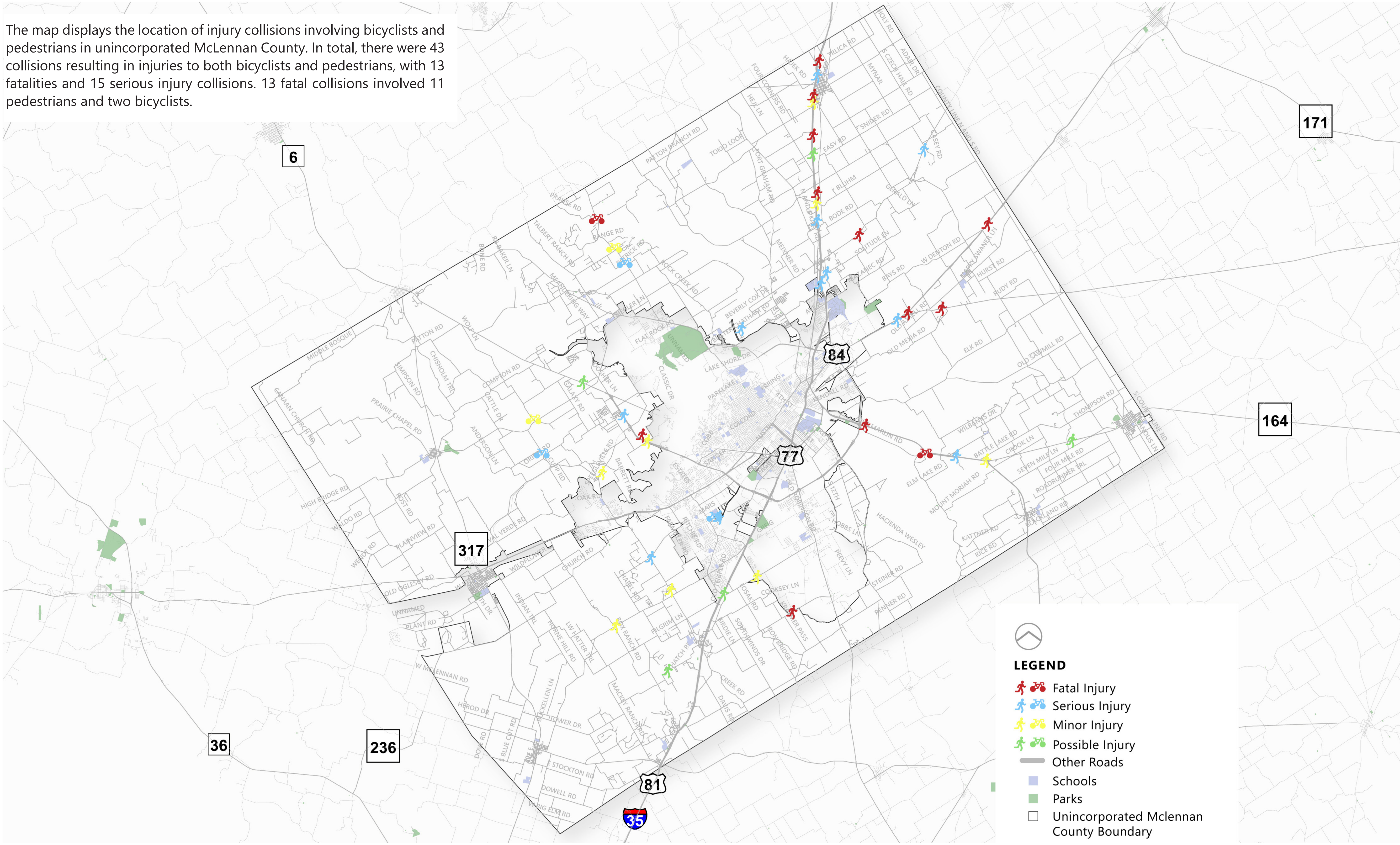
UNINCORPORATED McLENNAN COUNTY		TxDOT		McLENNAN COUNTY	
MODE					
Bicycle	0 %	Bicycle	0 %	Bicycle	1 %
Car	88 %	Car	81 %	Car	85 %
Motorcycle	7 %	Motorcycle	4 %	Motorcycle	4 %
Pedestrian	1 %	Pedestrian	2 %	Pedestrian	3 %
Truck	3 %	Truck	13 %	Truck	7 %
FIRST HARMFUL EVENT					
Fixed Object	62 %	Motor Vehicle in Transport	49 %	Motor Vehicle in Transport	72 %
Overturned	17 %	Fixed Object	31 %	Fixed Object	17 %
Motor Vehicle in Transport	17 %	Overturned	14 %	Overturned	4 %
MANNER OF COLLISION					
Hit Object	83 %	Hit Object	51 %	Broadside	42 %
Broadside	10 %	Rear End	20 %	Hit Object	28 %
Head-On	4 %	Broadside	20 %	Rear End	24 %
Rear End	3 %	Sideswipe	6 %	Sideswipe	5 %
VIOLATION CATEGORY					
Unsafe Speed	32 %	Unsafe Speed	37 %	Unsafe Speed	23 %
Driving under Influence	20 %	Other Improper Driving	12 %	Automobile Right-of-Way	22 %
Other Unforeseen Reasons	11 %	Automobile Right-of-Way	11 %	Traffic Signals and Signs	12 %
Automobile Right-of-Way	10 %	Other Unforeseen Reasons	7 %	Distracted Driving	8 %
Distracted Driving	8 %	Driving under Influence	7 %	Other Improper Driving	6 %
Driver Condition	7 %	Driver Condition	6 %	Other Unforeseen Reasons	6 %
LOCATION					
Intersection	21 %	Intersection	29 %	Intersection	59 %
Roadway	79 %	Roadway	71 %	Roadway	41 %
LIGHTING					
Daylight	57 %	Daylight	64 %	Daylight	70 %
Dark, Not Lighted	39 %	Dark, Not Lighted	26 %	Dark, Lighted	16 %
Dusk	2 %	Dark, Lighted	7 %	Dark, Not Lighted	11 %

SPEED LIMIT



BICYCLE & PEDESTRIAN COLLISION BY SEVERITY

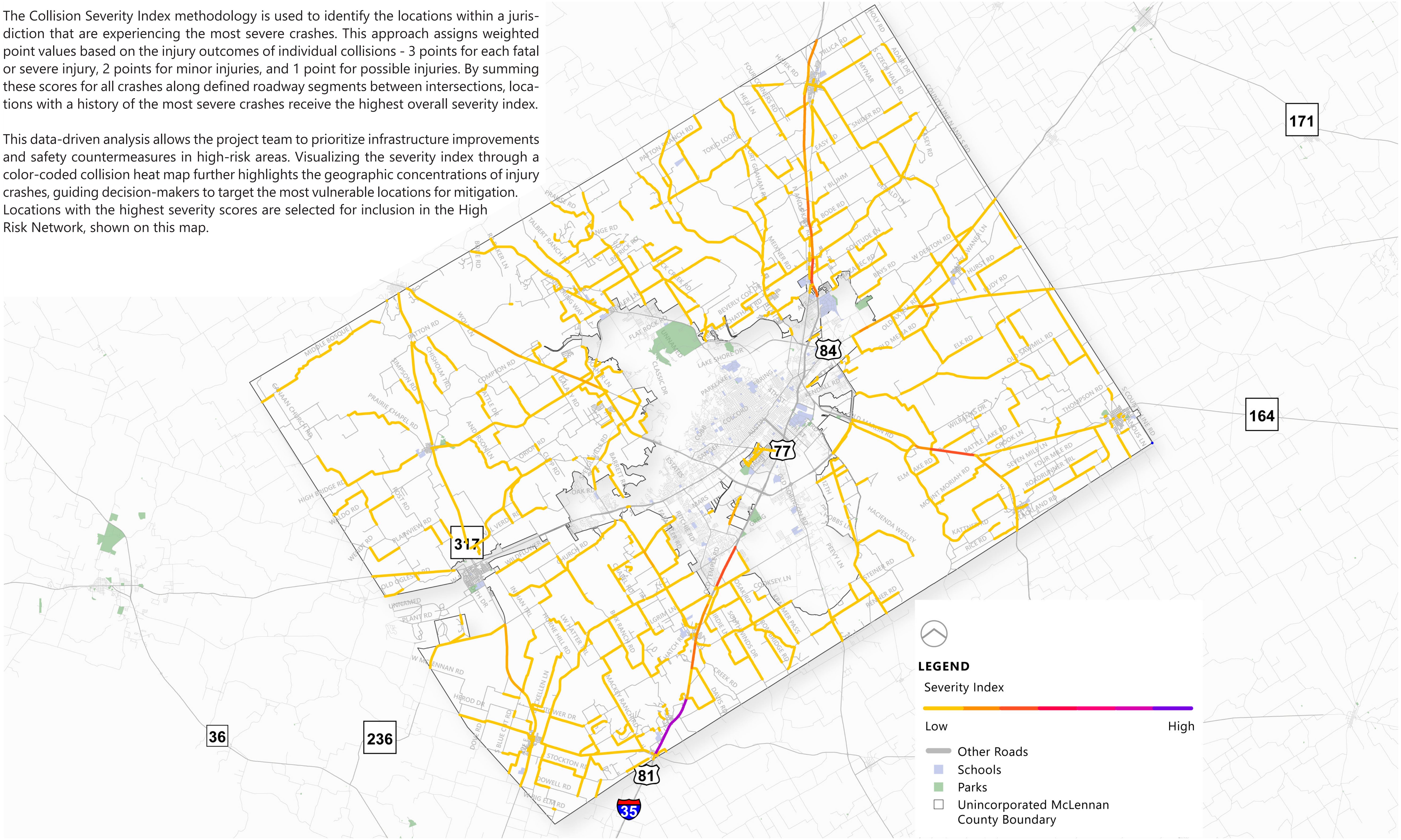
The map displays the location of injury collisions involving bicyclists and pedestrians in unincorporated McLennan County. In total, there were 43 collisions resulting in injuries to both bicyclists and pedestrians, with 13 fatalities and 15 serious injury collisions. 13 fatal collisions involved 11 pedestrians and two bicyclists.



SEVERITY INDEX

The Collision Severity Index methodology is used to identify the locations within a jurisdiction that are experiencing the most severe crashes. This approach assigns weighted point values based on the injury outcomes of individual collisions - 3 points for each fatal or severe injury, 2 points for minor injuries, and 1 point for possible injuries. By summing these scores for all crashes along defined roadway segments between intersections, locations with a history of the most severe crashes receive the highest overall severity index.

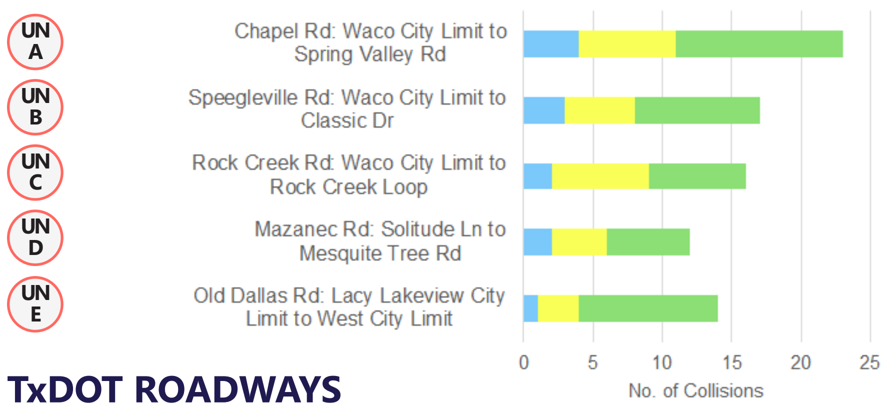
This data-driven analysis allows the project team to prioritize infrastructure improvements and safety countermeasures in high-risk areas. Visualizing the severity index through a color-coded collision heat map further highlights the geographic concentrations of injury crashes, guiding decision-makers to target the most vulnerable locations for mitigation. Locations with the highest severity scores are selected for inclusion in the High Risk Network, shown on this map.



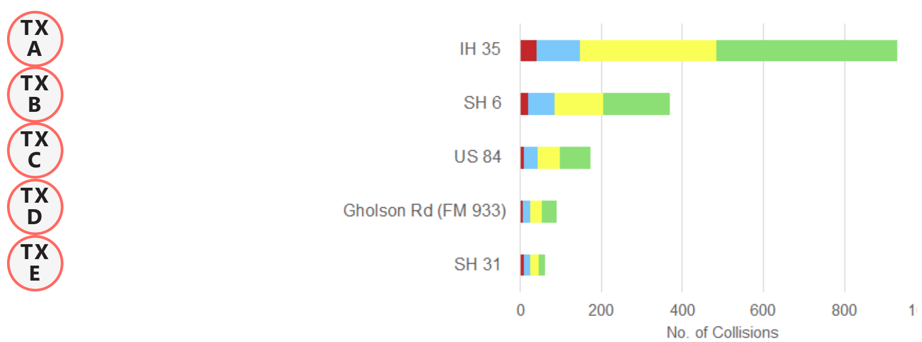
ROADWAYS & INTERSECTIONS

This section lists high risk roadway segments and intersections within the unincorporated McLennan County. The accompanying graph depicts the name and limits of each roadway along with the number of collisions categorized by severity at that location. A severity index methodology was utilized to identify these high risk spots. This methodology assigns 3 points for each fatal or severe injury collision, 2 points for each minor injury collision, and 1 point for each possible injury collision.

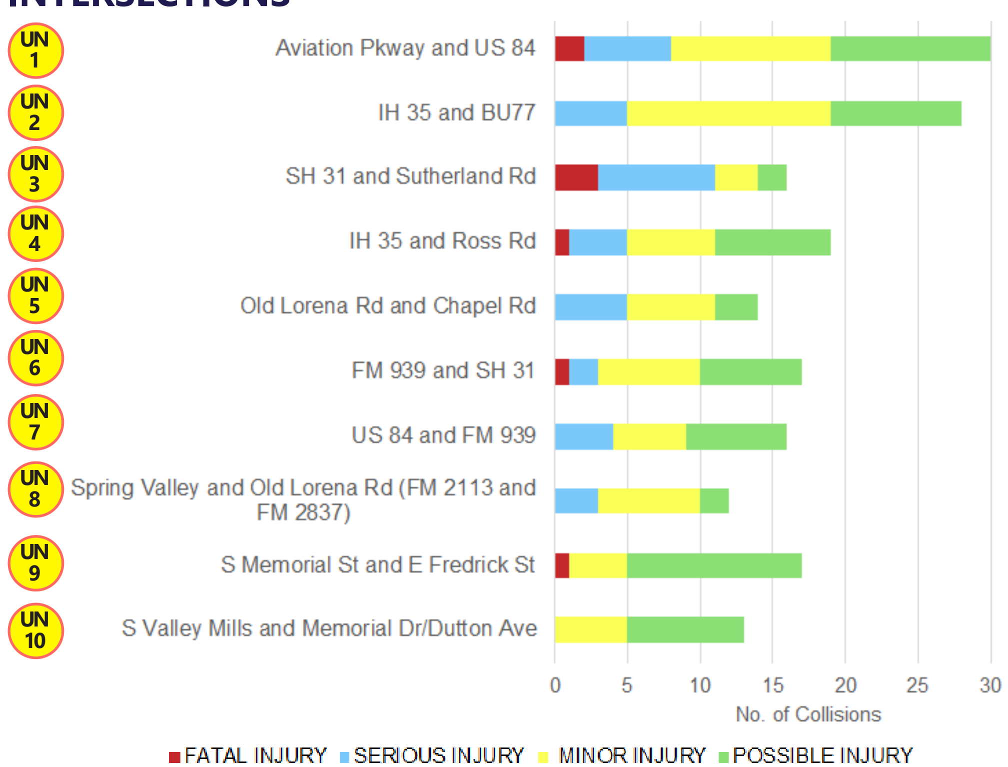
ROADWAYS

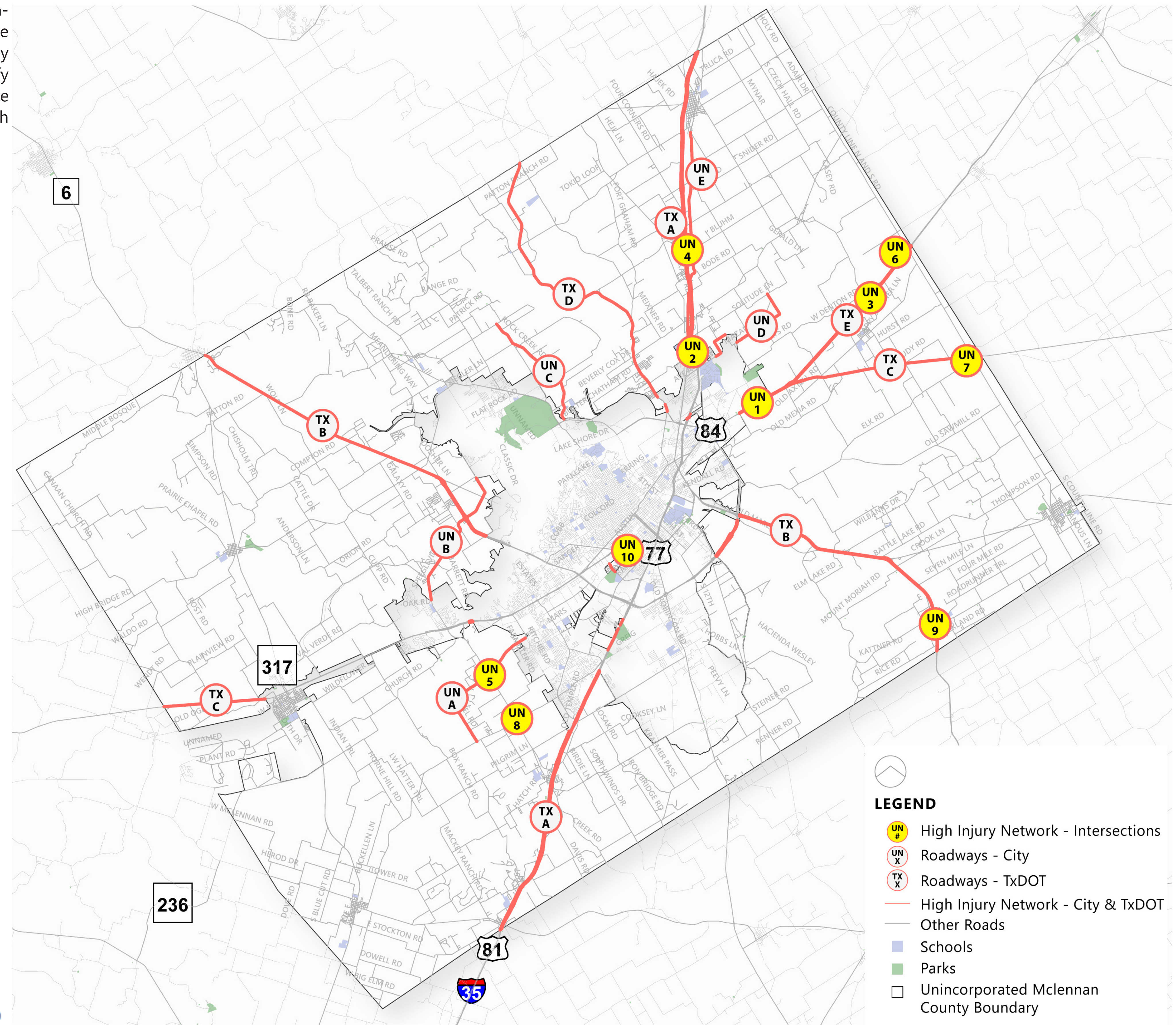


TxDOT ROADWAYS



INTERSECTIONS



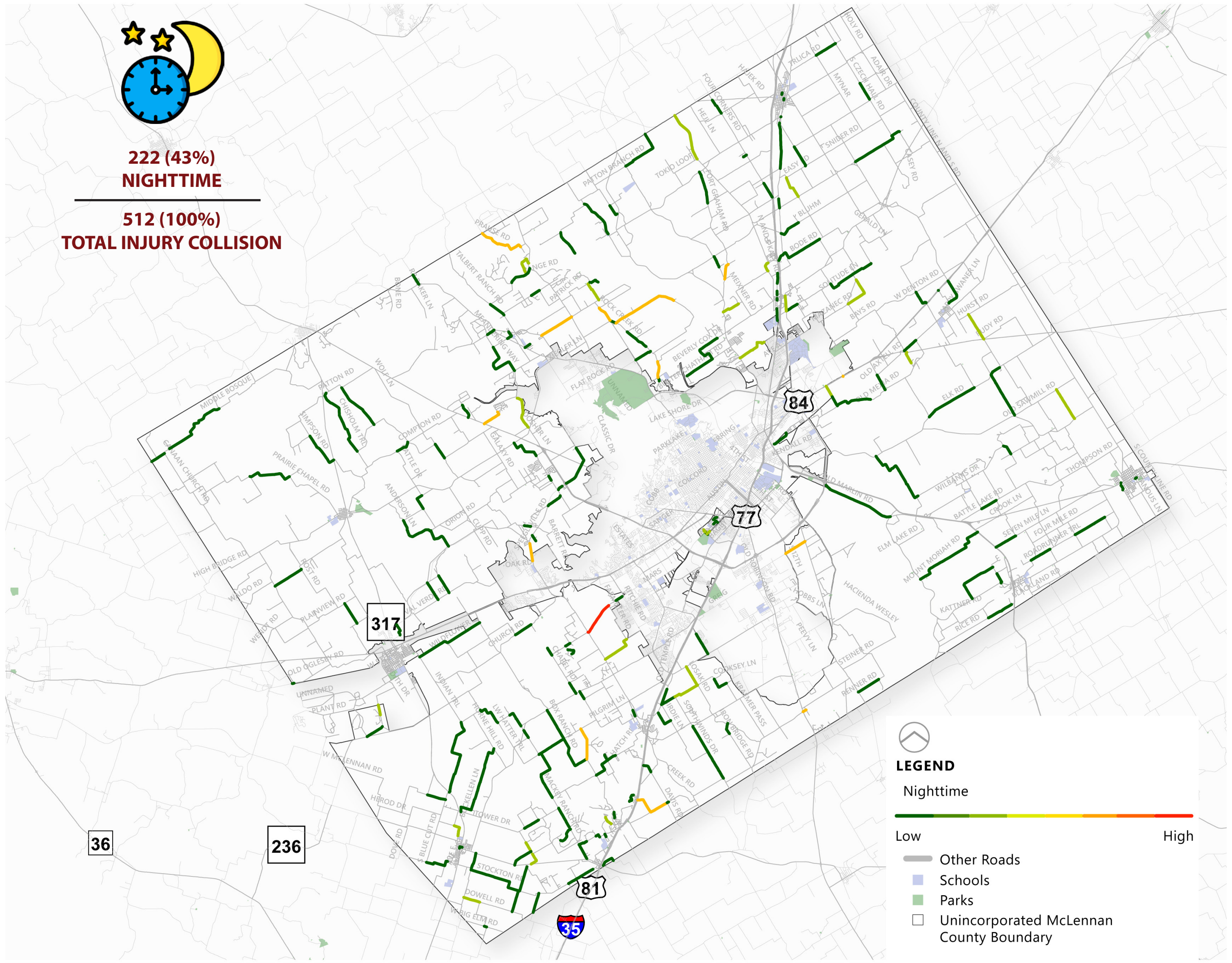


PROFILES - UNINCORPORATED McLENNAN COUNTY

PROFILE 1 - NIGHTTIME

222 (43%) NIGHTTIME

512 (100%) TOTAL INJURY COLLISION

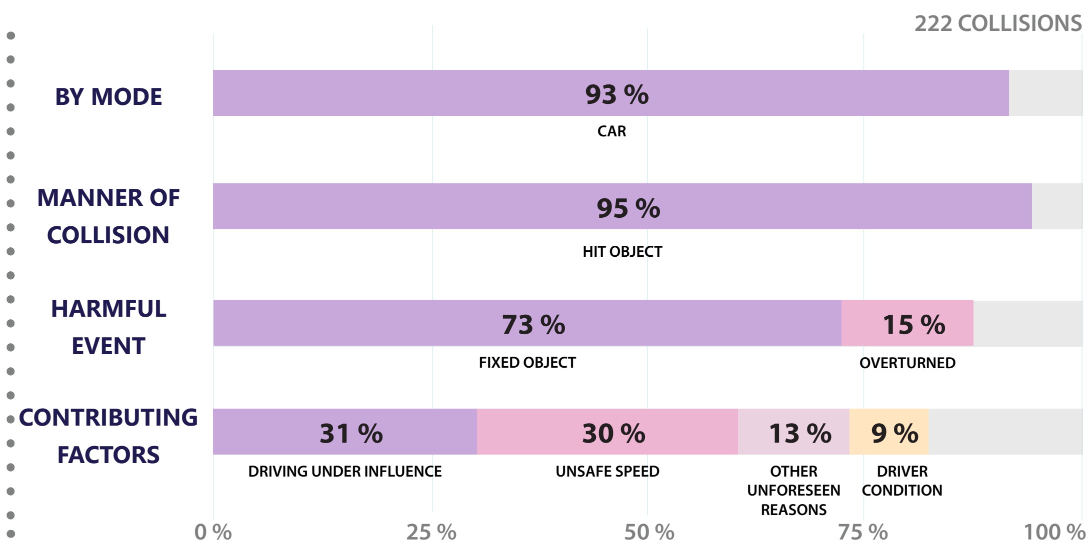


SEVERITY

- 5 %
- 23 %
- 32 %
- 40 %

LOCATION

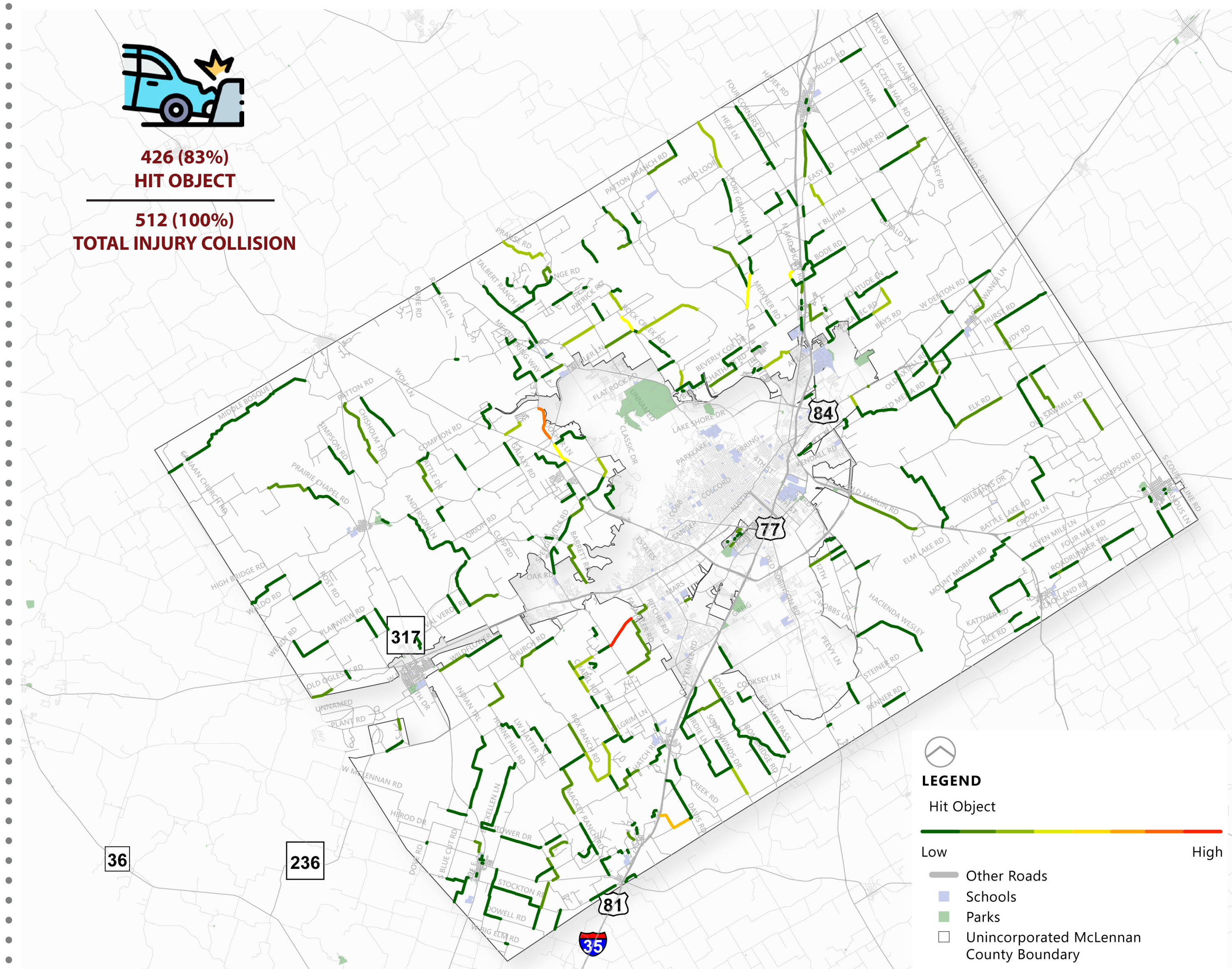
- 14 %
- 86 %



PROFILE 2 - HIT OBJECT

426 (83%) HIT OBJECT

512 (100%) TOTAL INJURY COLLISION



SEVERITY

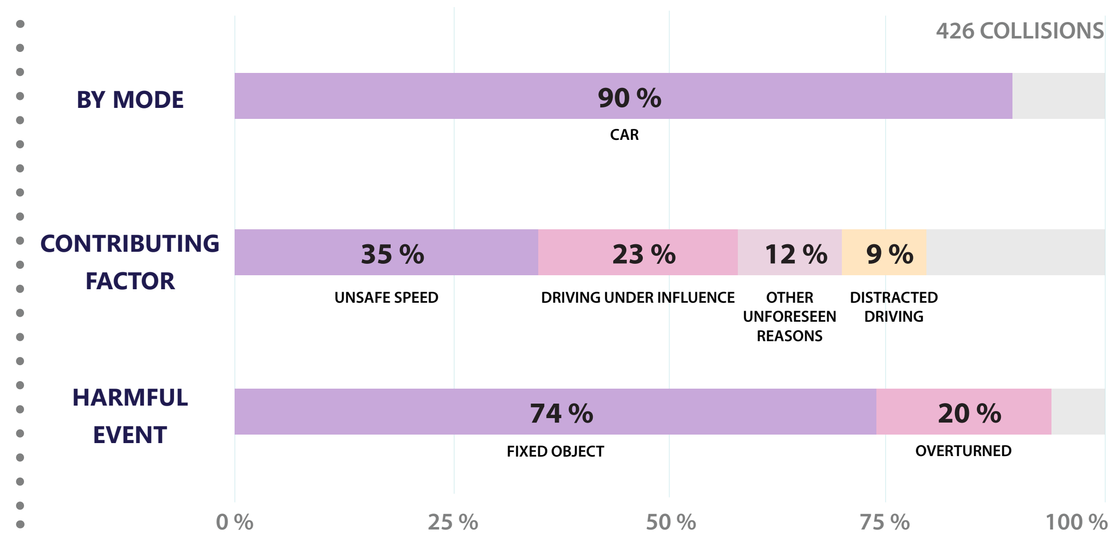
- 4 %
- 21 %
- 33 %
- 42 %

LOCATION

- 10 %
- 90 %

LIGHTING

- 50 %
- 3 %
- 2 %
- 45 %

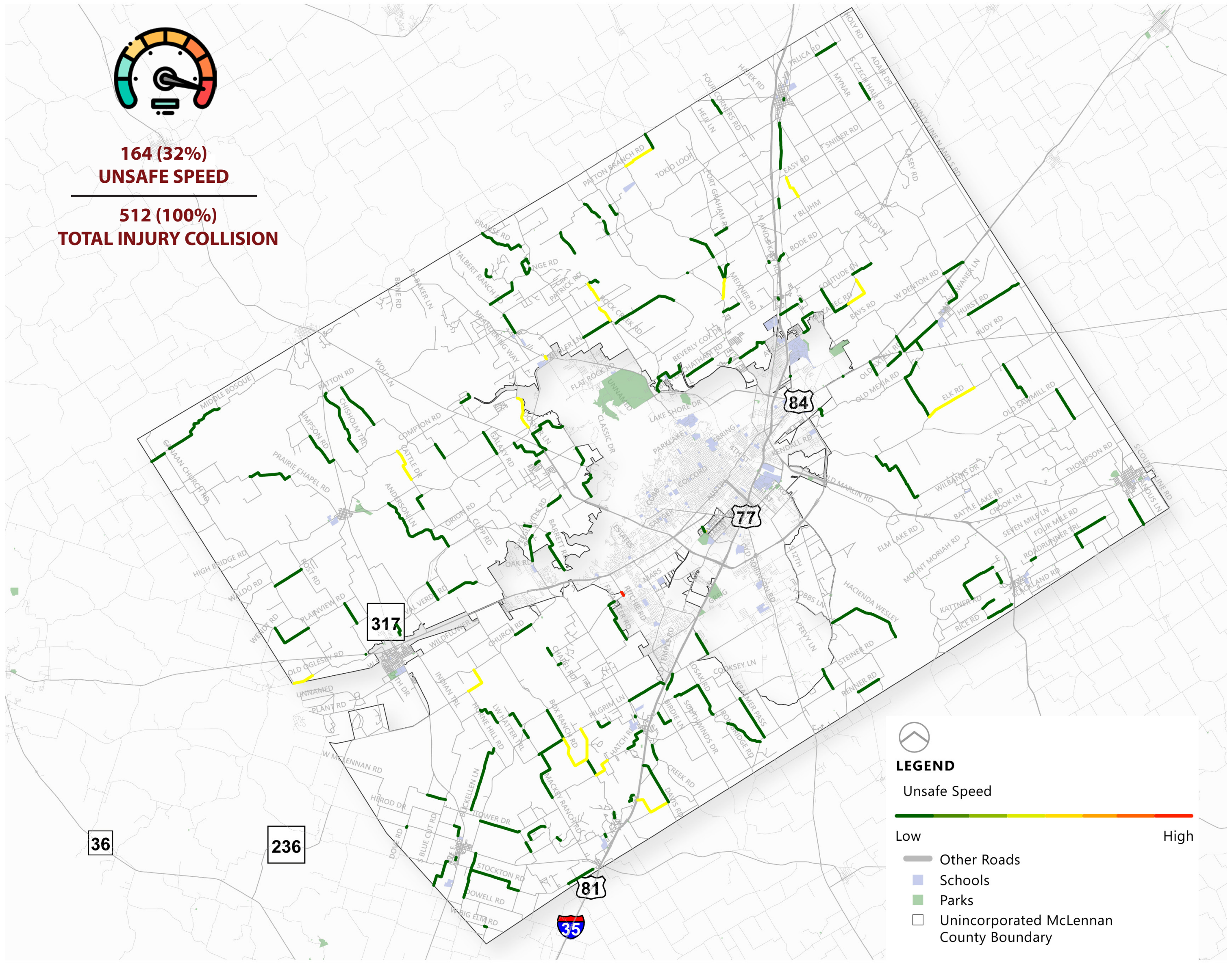


PROFILES - UNINCORPORATED MCLENNAN COUNTY

PROFILE 3 - UNSAFE SPEED

164 (32%)
UNSAFE SPEED

512 (100%)
TOTAL INJURY COLLISION



SEVERITY

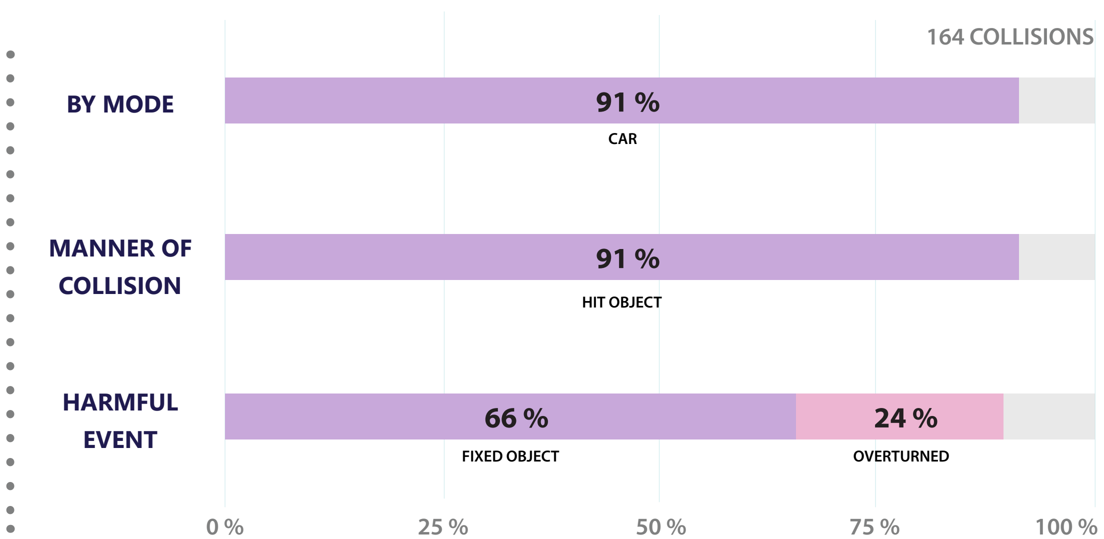
2 % | 23 %
33 % | 42 %

LOCATION

18 % | 82 %

LIGHTING

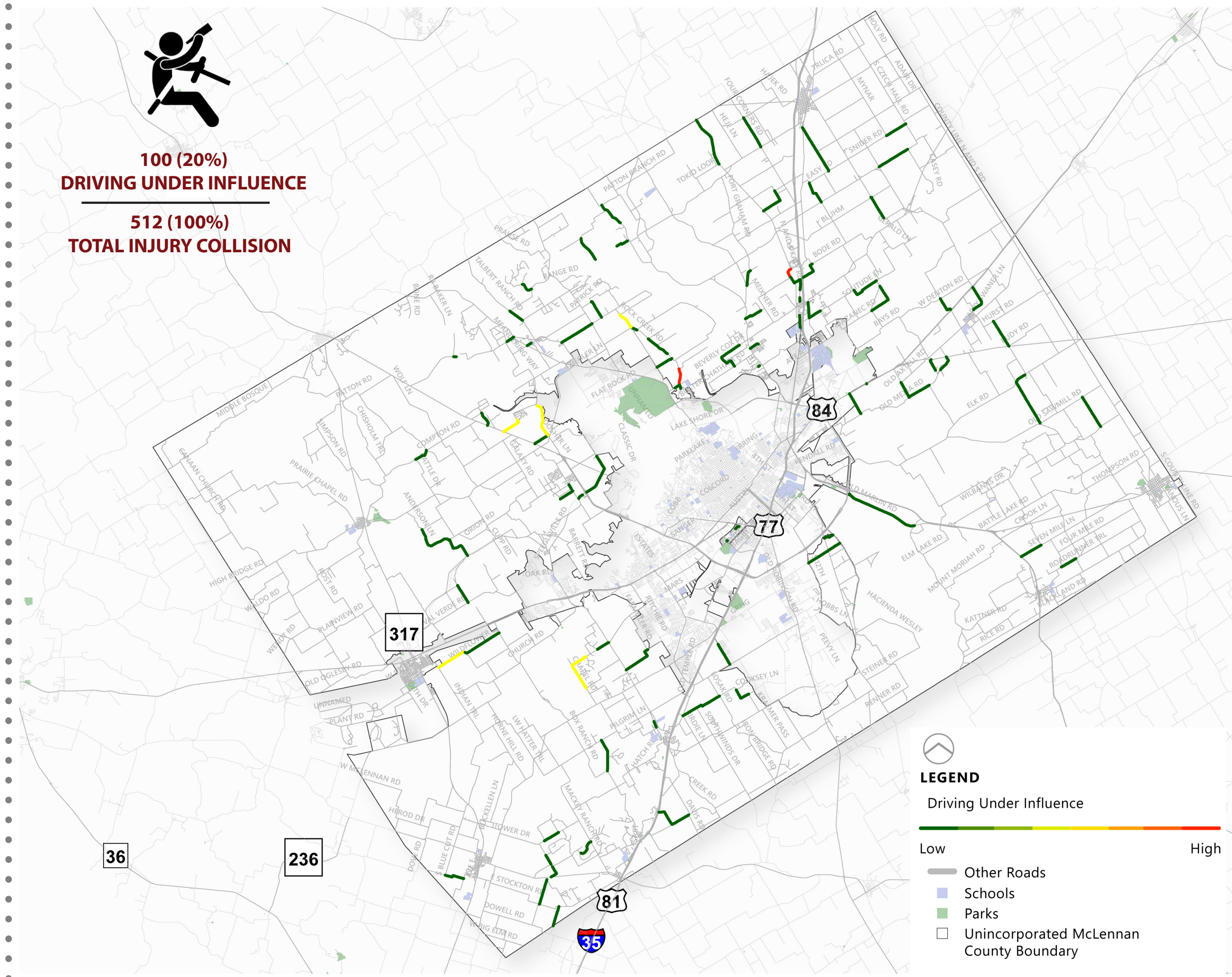
60 % | 2 %
1 % | 37 %



PROFILE 4 - DRIVING UNDER INFLUENCE

100 (20%)
DRIVING UNDER INFLUENCE

512 (100%)
TOTAL INJURY COLLISION



SEVERITY

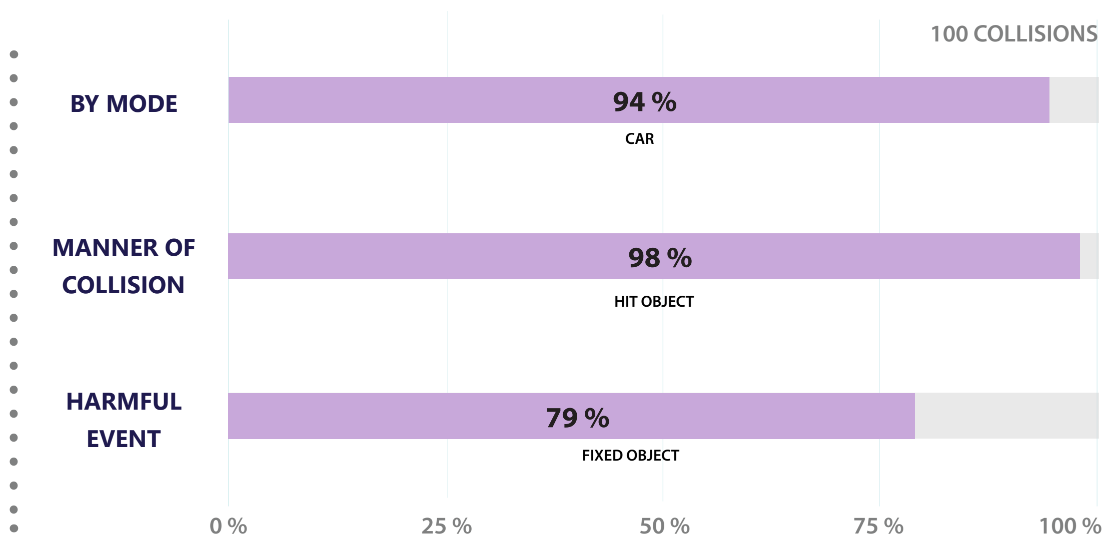
12 % | 21 %
35 % | 32 %

LOCATION

10 % | 90 %

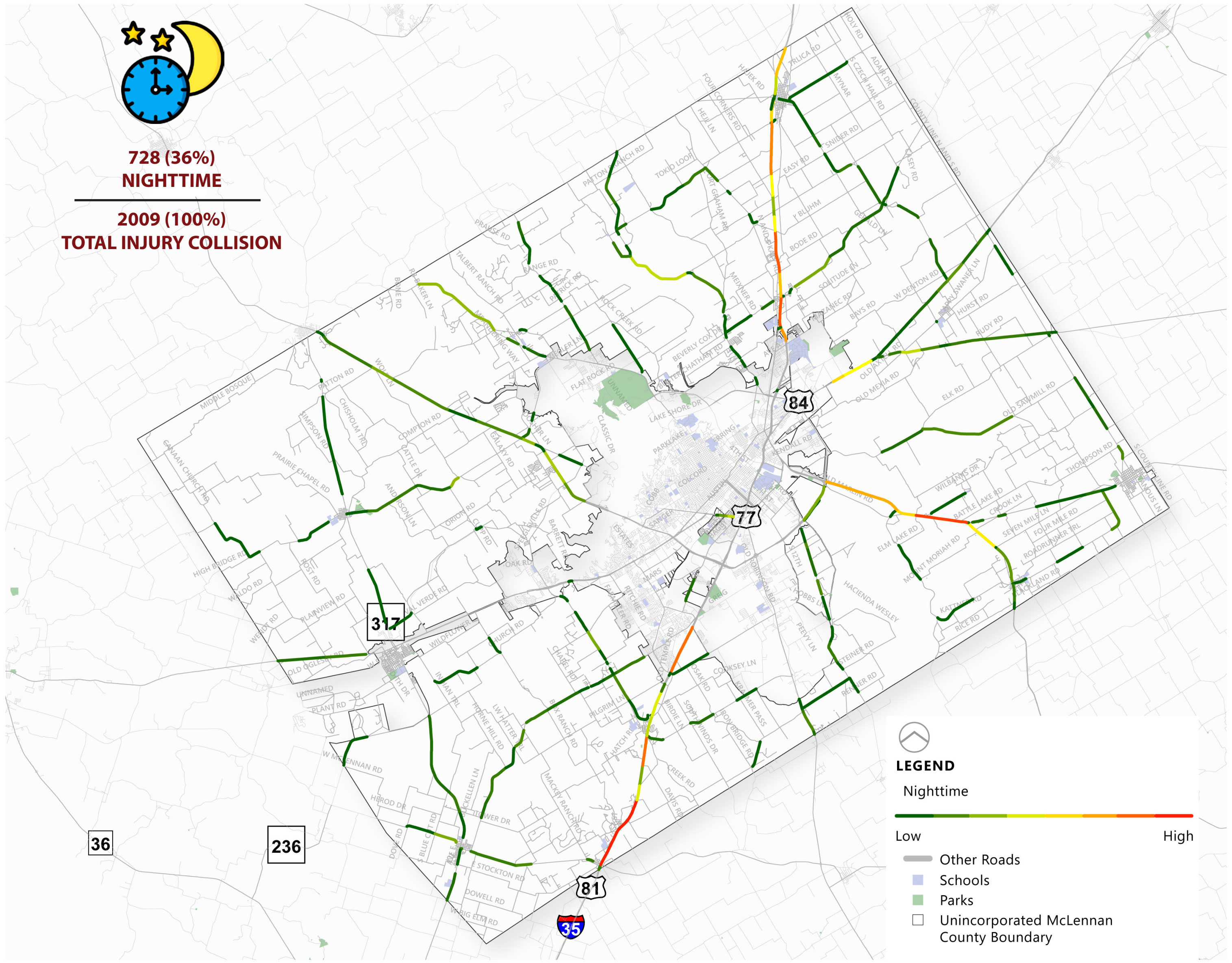
LIGHTING

32 % | 5 %
3 % | 60 %



PROFILES - TXDOT

PROFILE 1 - NIGHTTIME

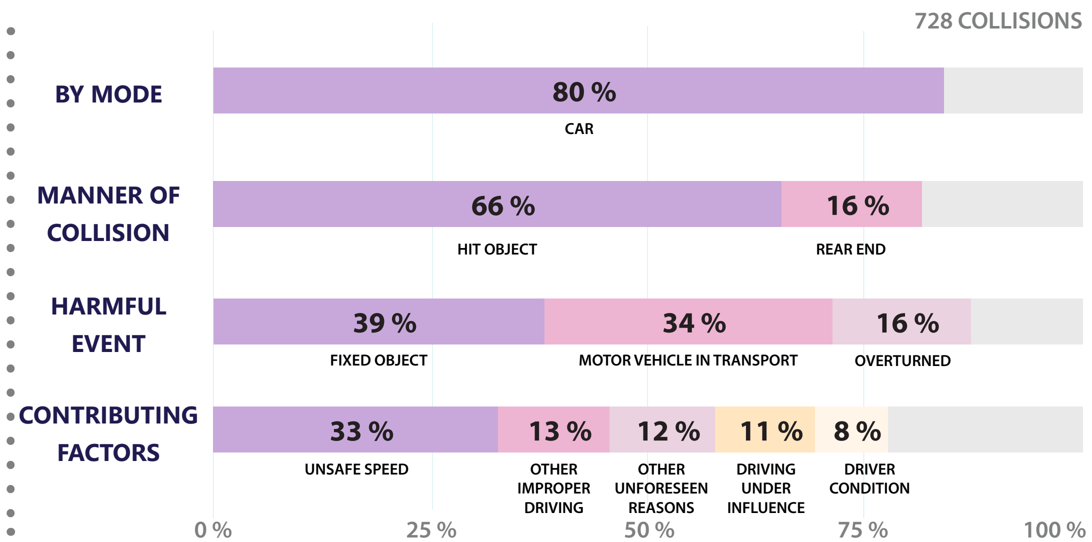


SEVERITY

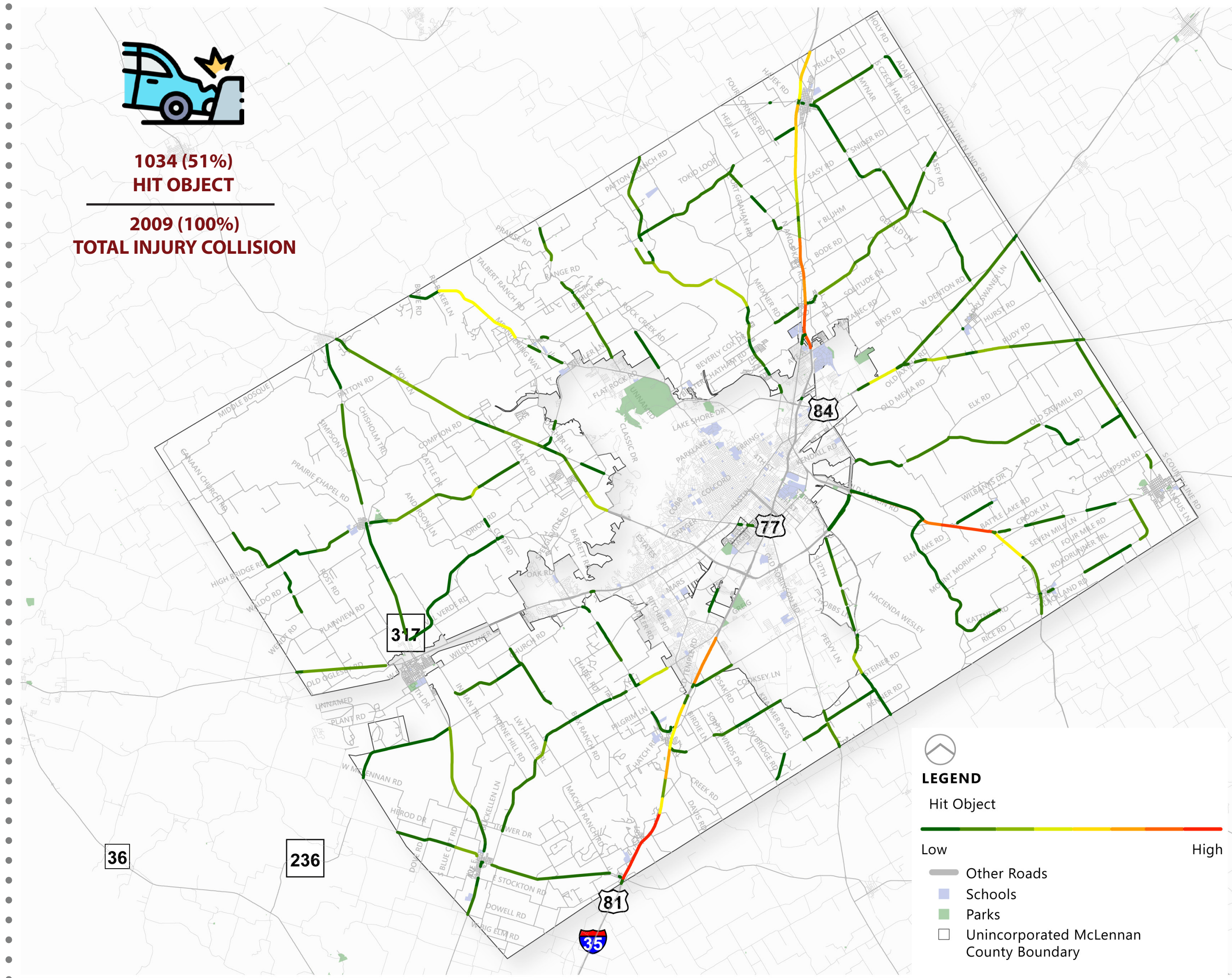
7 % | 17 % | 34 % | 42 %

LOCATION

21 % | 79 %



PROFILE 2 - HIT OBJECT



SEVERITY

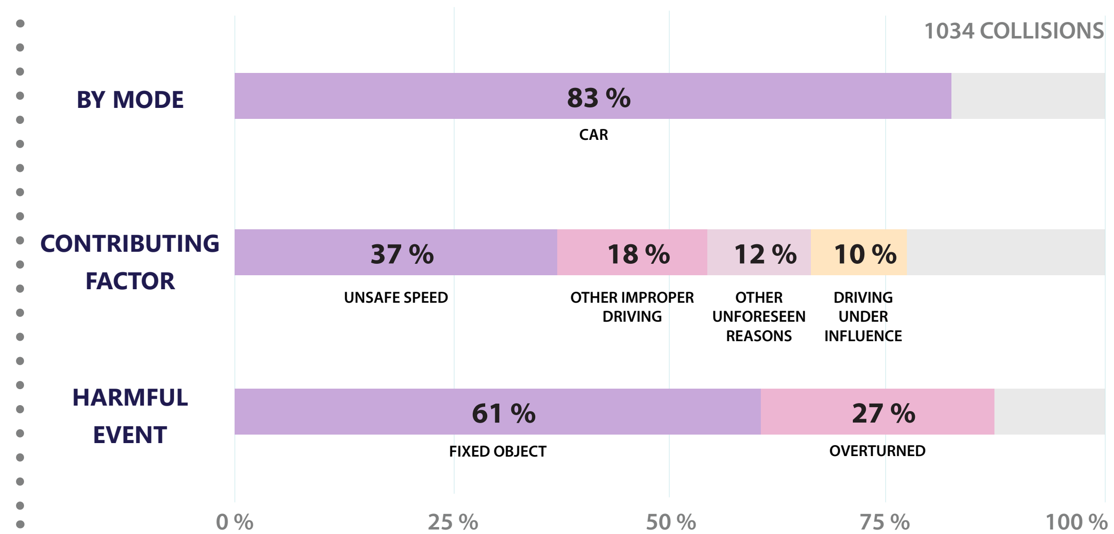
5 % | 18 % | 35 % | 42 %

LOCATION

8 % | 92 %

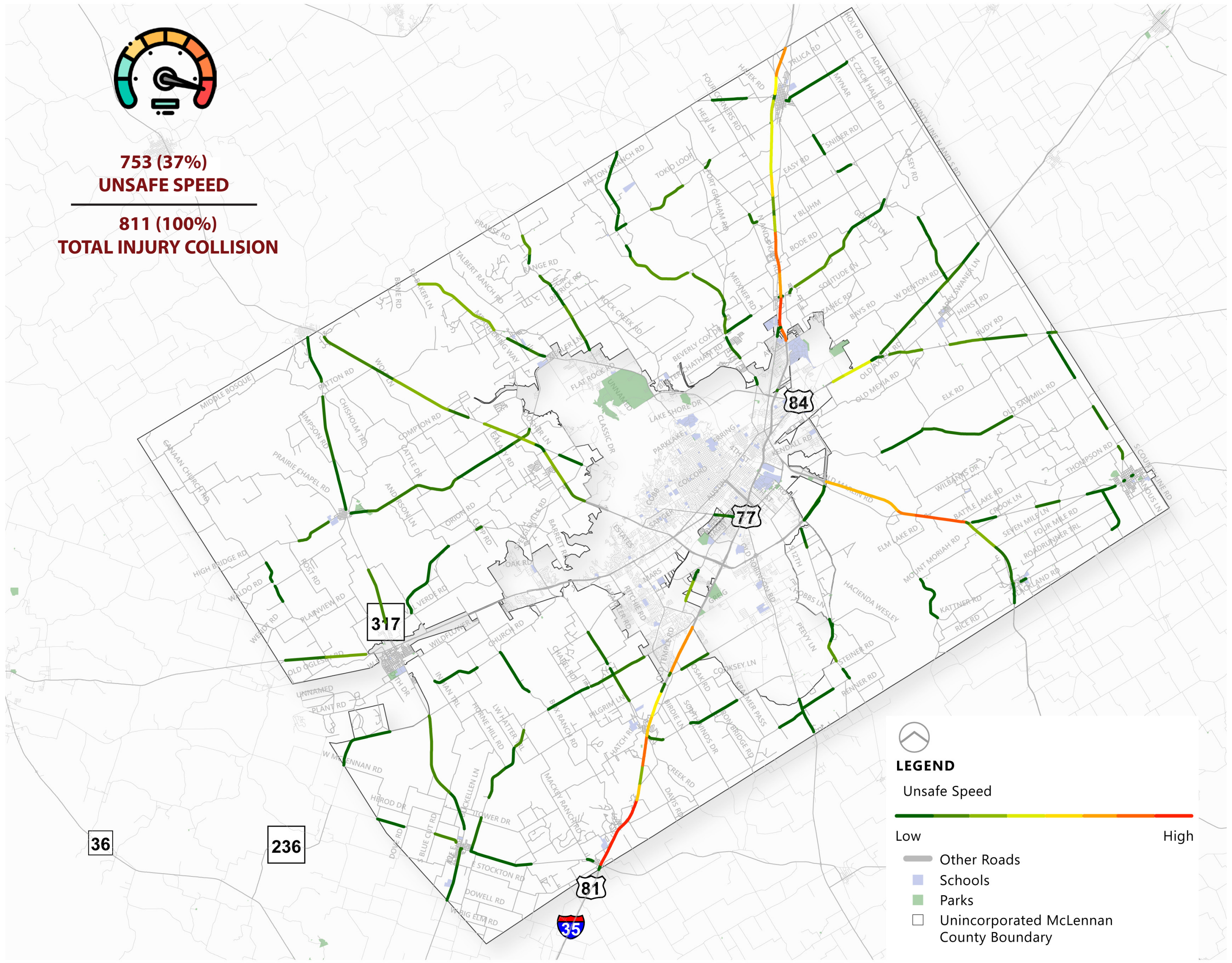
LIGHTING

54 % | 4 % | 6 % | 36 %



PROFILES - TXDOT

PROFILE 3 - UNSAFE SPEED



SEVERITY

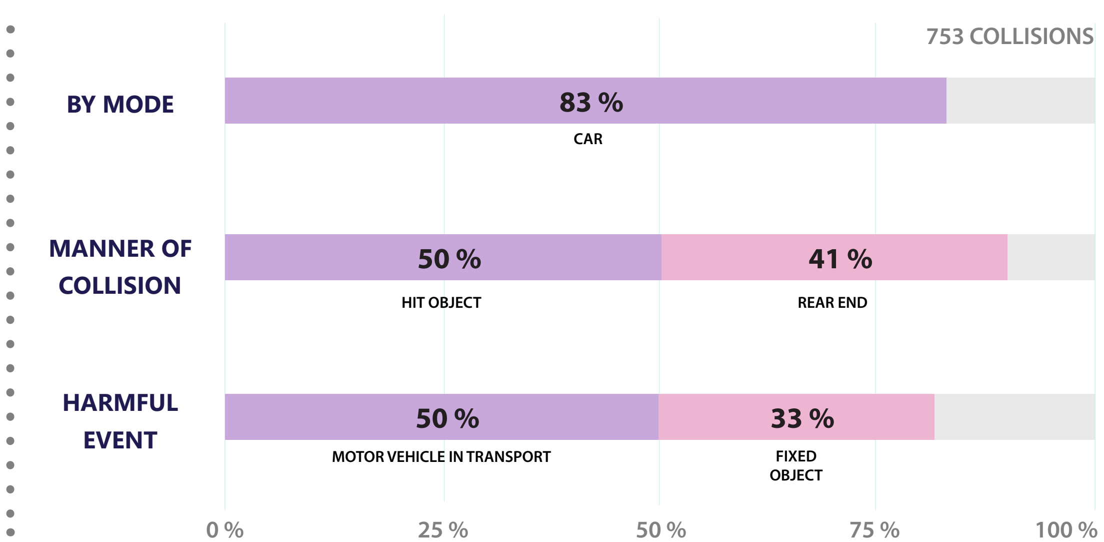
4 %
15 %
33 %
48 %

LOCATION

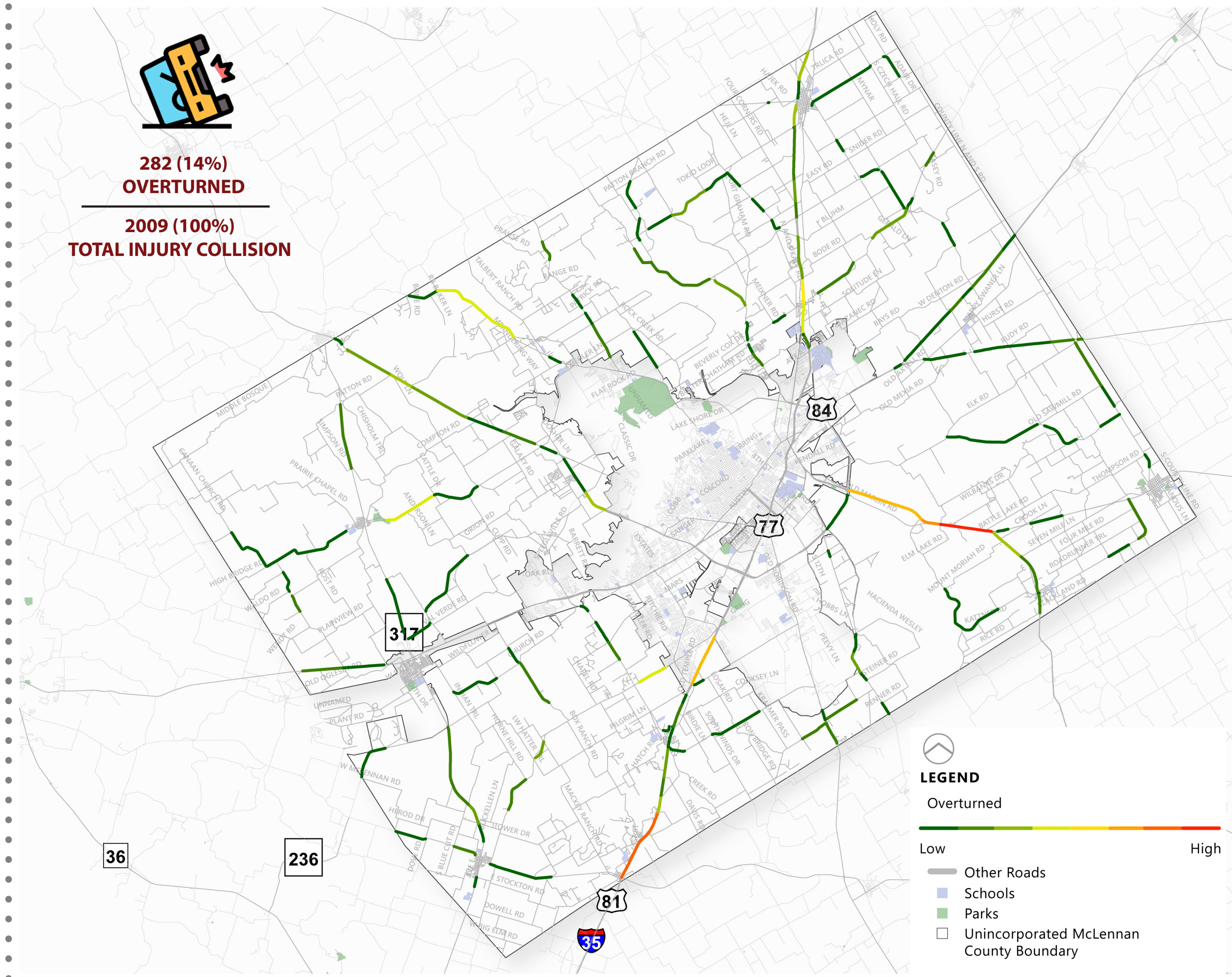
20 %
80 %

LIGHTING

68 %
2 %
7 %
22 %



PROFILE 4 - OVERTURNED



SEVERITY

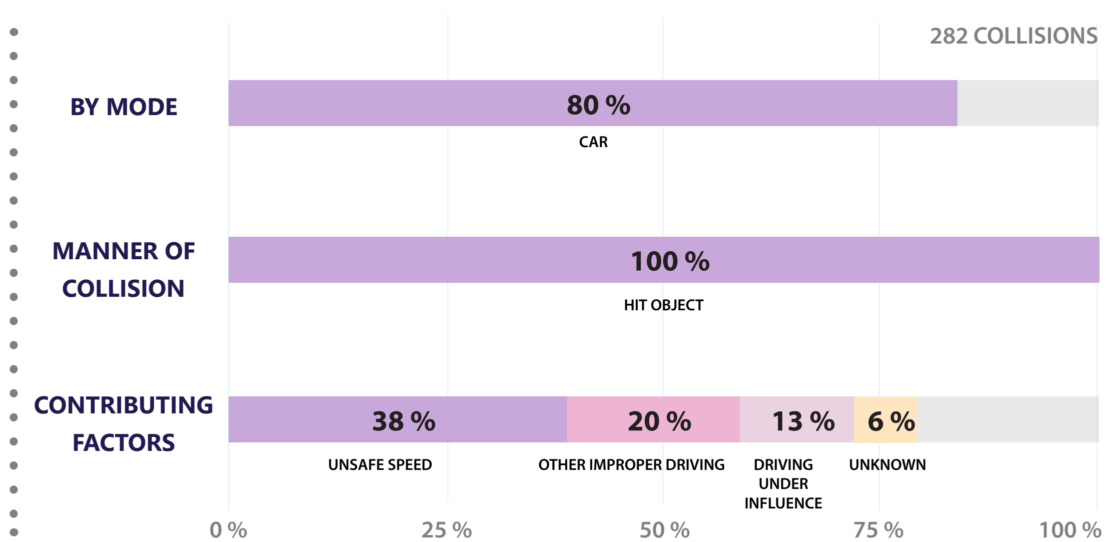
6 %
19 %
37 %
38 %

LOCATION

7 %
93 %

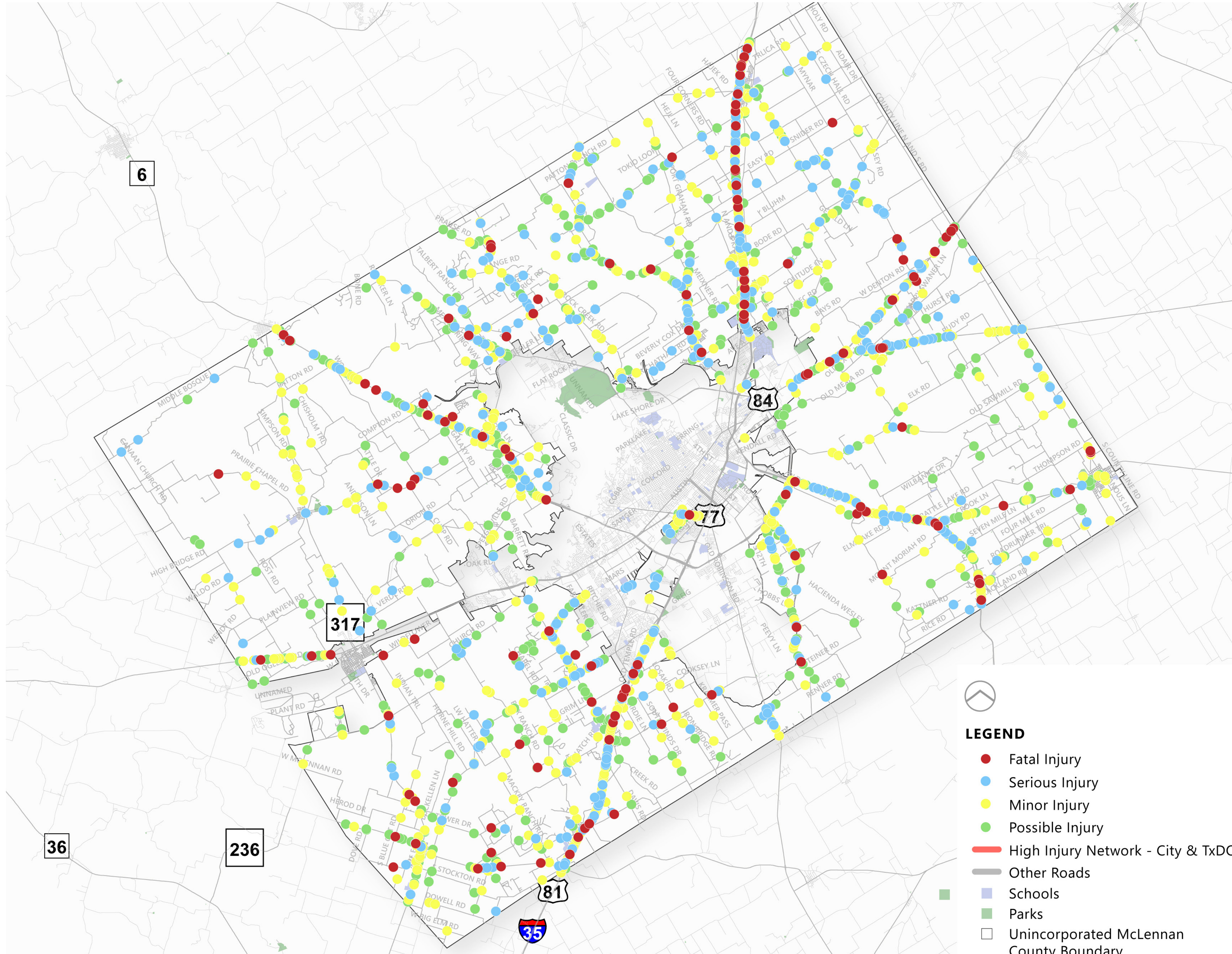
LIGHTING

60 %
2 %
4 %
34 %



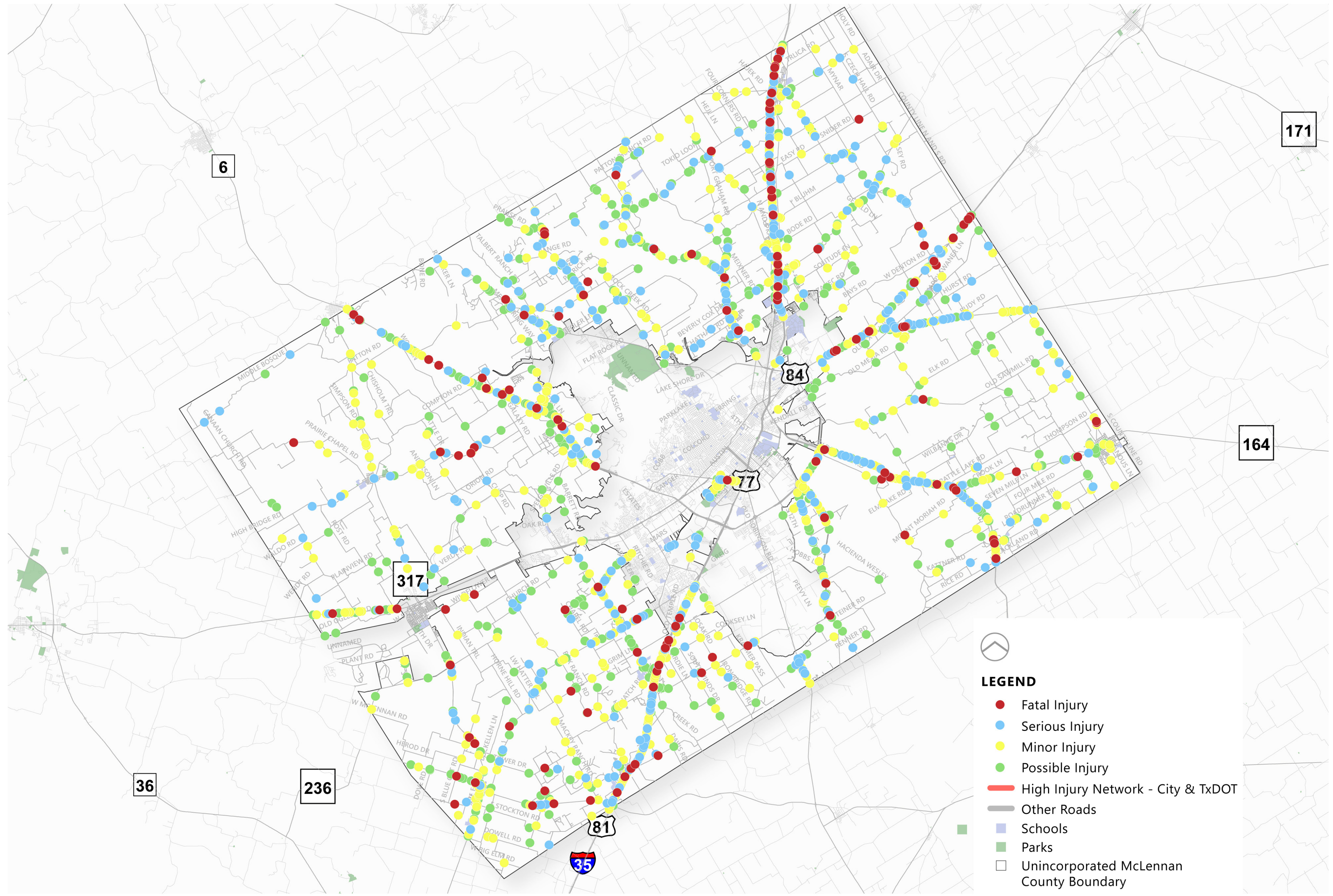
PEDESTRIAN CONNECTIVITY IMPROVEMENTS FOR UNINCORPORATED NEIGHBORHOODS

Many of the unincorporated neighborhoods in McLennan County lack adequate pedestrian infrastructure, creating challenges for residents who rely on walking or using mobility aids to get around. There is a need to improve pedestrian connectivity in these areas through the construction of new sidewalks, crosswalks, and other safety features. This project would aim to enhance walkability and accessibility, providing residents with safer routes to access local amenities, public transportation, and community resources. The project scope should involve surveying existing conditions, identifying high-priority corridors and intersections, and implementing a comprehensive plan to fill gaps in the pedestrian network. This investment in pedestrian infrastructure would greatly improve quality of life and promote more sustainable, equitable transportation options for unincorporated McLennan County.



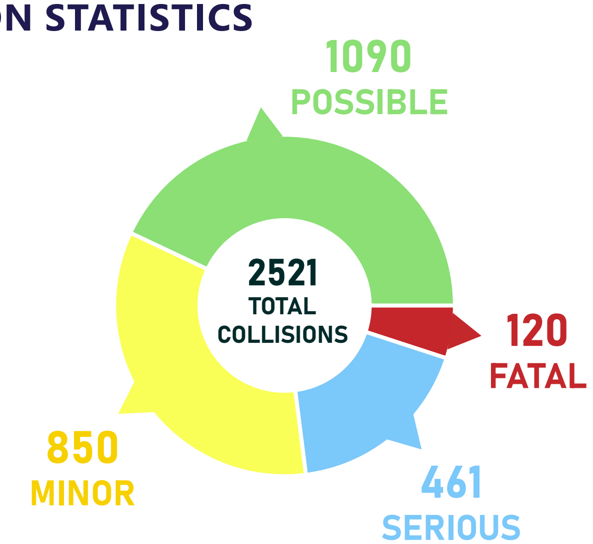
PROJECT 1: COUNTYWIDE SIGN INVENTORY

McLennan County is proposing a Countywide Sign Inventory and Pavement Delineation project to improve roadway safety and navigation for drivers. The proposed initiative would commence with a thorough assessment of all existing traffic signs throughout the county to identify any that are damaged, faded, obstructed, or non-compliant with current regulations regarding reflectivity. Such signs would be replaced as necessary to ensure clear visibility during both day and night. Additionally, the project would encompass surveying all road markings, including lane lines, turn arrows, crosswalks, and other pavement delineations across the county.



INJURY COLLISION STATISTICS

Pedestrian	36
Bicycle	7
Motorcycle	116
Car	2080
Truck	282



TRENDS

HIT OBJECT	UNSAFE SPEED	INTERSECTION	BROADSIDE
58%	36%	27%	18%
1460 COLLISIONS	917 COLLISIONS	693 COLLISIONS	450 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

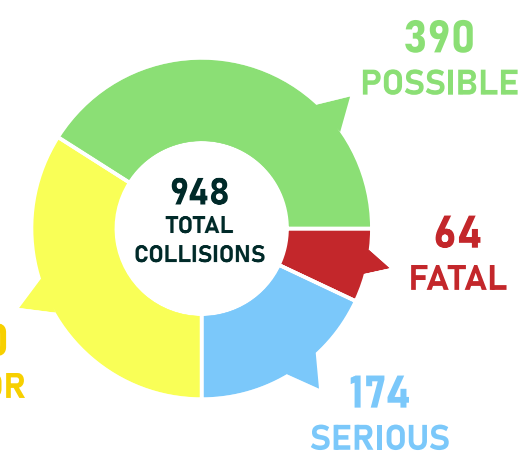
	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Sign Inventory	Countywide	$4,418,800
		CONTINGENCY COST	$883,800
		ENGINEERING COST	$1,325,700
		TOTAL COST	**$6,628,300**

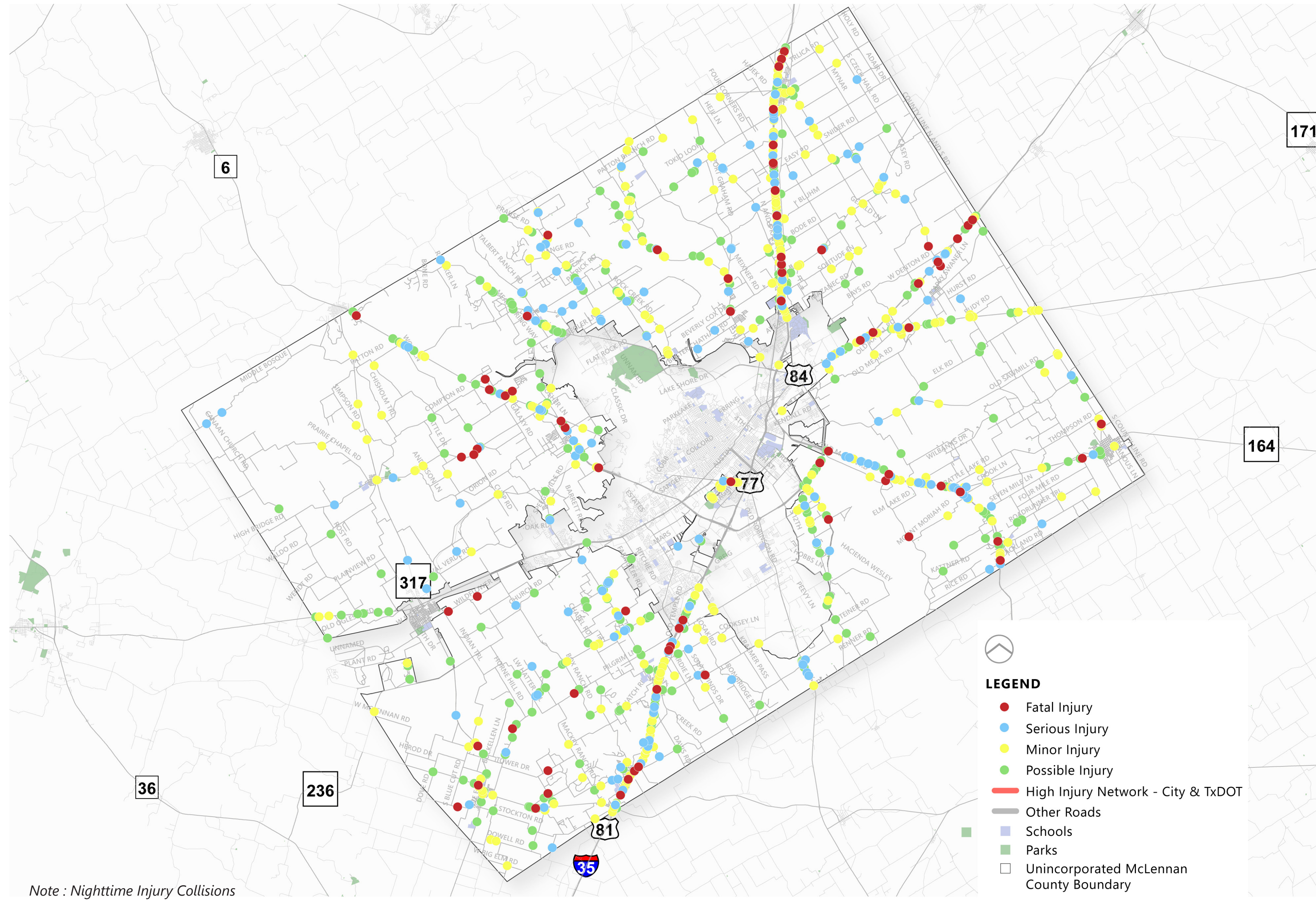
PROJECT 2: COUNTYWIDE STREET LIGHT INVENTORY

McLennan County is proposing a Countywide Street Light Inventory and Replacement initiative designed to improve nighttime visibility and safety for motorists, cyclists, and pedestrians. This project involves conducting a comprehensive inventory of all current streetlights across the unincorporated county to identify missing streetlights, update outdated inventories, generate reports for non-functioning fixtures, and identify types of lights. Subsequently, outdated, damaged, or inadequately illuminating lights will be replaced with new LED streetlights. It is expected that the enhanced lighting will reduce injury crashes and enhance safety for both residents and visitors navigating county roads during the nighttime hours.

NIGHTTIME INJURY COLLISION STATISTICS

Pedestrian	24
Bicycle	4
Motorcycle	33
Car	789
Truck	98





Note : Nighttime Injury Collisions

TRENDS

HIT OBJECT	UNSAFE SPEED	INTERSECTION	DUI
72%	32%	19%	16%
686 COLLISIONS	305 COLLISIONS	179 COLLISIONS	151 COLLISIONS

ESTIMATED COST OF IMPROVEMENT

	IMPROVEMENTS	LIMIT	ESTIMATED COST
	Countywide Street Light Inventory	Countywide	$14,291,200
		CONTINGENCY COST	$2,858,240
		ENGINEERING COST	$6,002,400
		TOTAL COST	**$23,151,840**

PROJECT 3: RITCHIE ROAD- PEDESTRIAN CONNECTIVITY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Ritchie Road, a two-lane major collector with a center two way left turn lane, provide direct access to Park Hill Elementary School. The speed limit is set at 30 mph along the corridor.

EXISTING CONDITIONS

Existing Condition:
Ritchie Rd at Park Place Dr facing north

Existing Condition:
Ritchie Rd at Warren Rd facing south

ESTIMATED COST OF IMPROVEMENT

3: RITCHIE RD- PEDESTRIAN CONNECTIVITY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Sidewalk	From Warren Rd to Park Place Dr	$611,600
	Install Crosswalk		$2,300
	Install Rectangular Rapid Flashing Beacon (RRFB)		$23,000
		CONTINGENCY COST	$127,400
		ENGINEERING COST	$267,600
		TOTAL COST	**$1,031,900**

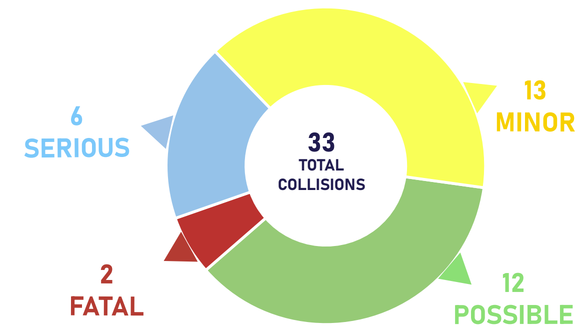
PROJECT 4: AVIATION PARKWAY & US-84- INTERSECTION SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

An intersection of Aviation Parkway & and US-84 is a signalized intersection. The speed limit for approaching this intersection is 70 mph on US-84 and 30 mph on Aviation Parkway.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Car	23
Truck	9



TRENDS

REAR END	BROADSIDE	NIGHTTIME	UNSAFE SPEED
48%	42%	36%	36%
16 COLLISIONS	14 COLLISIONS	12 COLLISIONS	12 COLLISIONS

EXISTING CONDITIONS

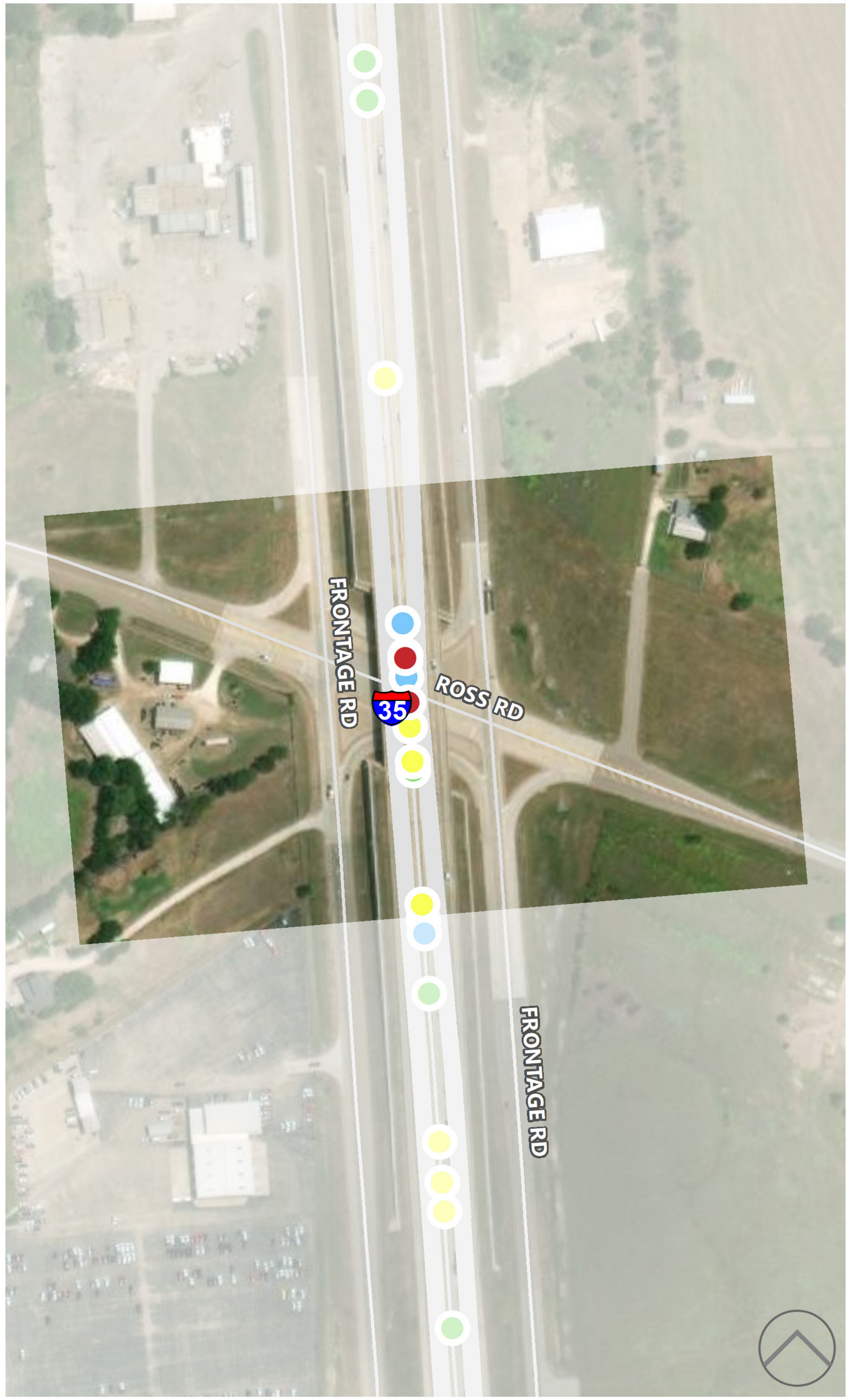
Existing Condition:
Aviation Pkwy at US-84 facing south

Existing Condition:
US-84 at Aviation Pkwy facing east

ESTIMATED COST OF IMPROVEMENT

4: AVIATION PKWAY & US-84- INTERSECTION SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Dilemma Zone Detection	Aviation Pkwy & US-84	$11,500
	High Friction Surfacce Treatment		$245,600
	Upgrade Striping		$11,500
	Install Street Lighting		$132,300
	Upgrade Pavement Markings		$1,500
	Signal Hardware Upgrade		$15,600
		CONTINGENCY COST	$83,600
		ENGINEERING COST	$175,600
		TOTAL COST	**$677,200**

PROJECT 5: IH-35 & ROSS ROAD- INTERSECTION SAFETY IMPROVEMENTS

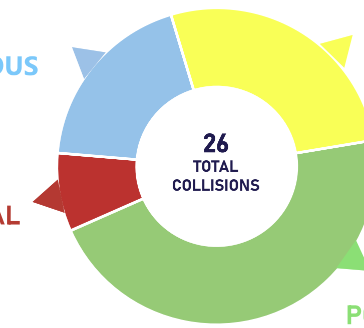


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

An interchange of IH-35 service roads and Ross Road is stop controlled on Ross Road. The speed limit for approaching this intersection is 45 mph on IH-35 service roads and 60 mph on Ross Road.

INJURY COLLISION STATISTICS

1
0
0
22
3



TRENDS

BROADSIDE	AUTOMOBILE ROW	NIGHTTIME	DISREGARD OF SIGNS & SIGNALS
77%	46%	23%	23%
20 COLLISIONS	12 COLLISIONS	6 COLLISIONS	6 COLLISIONS

EXISTING CONDITIONS

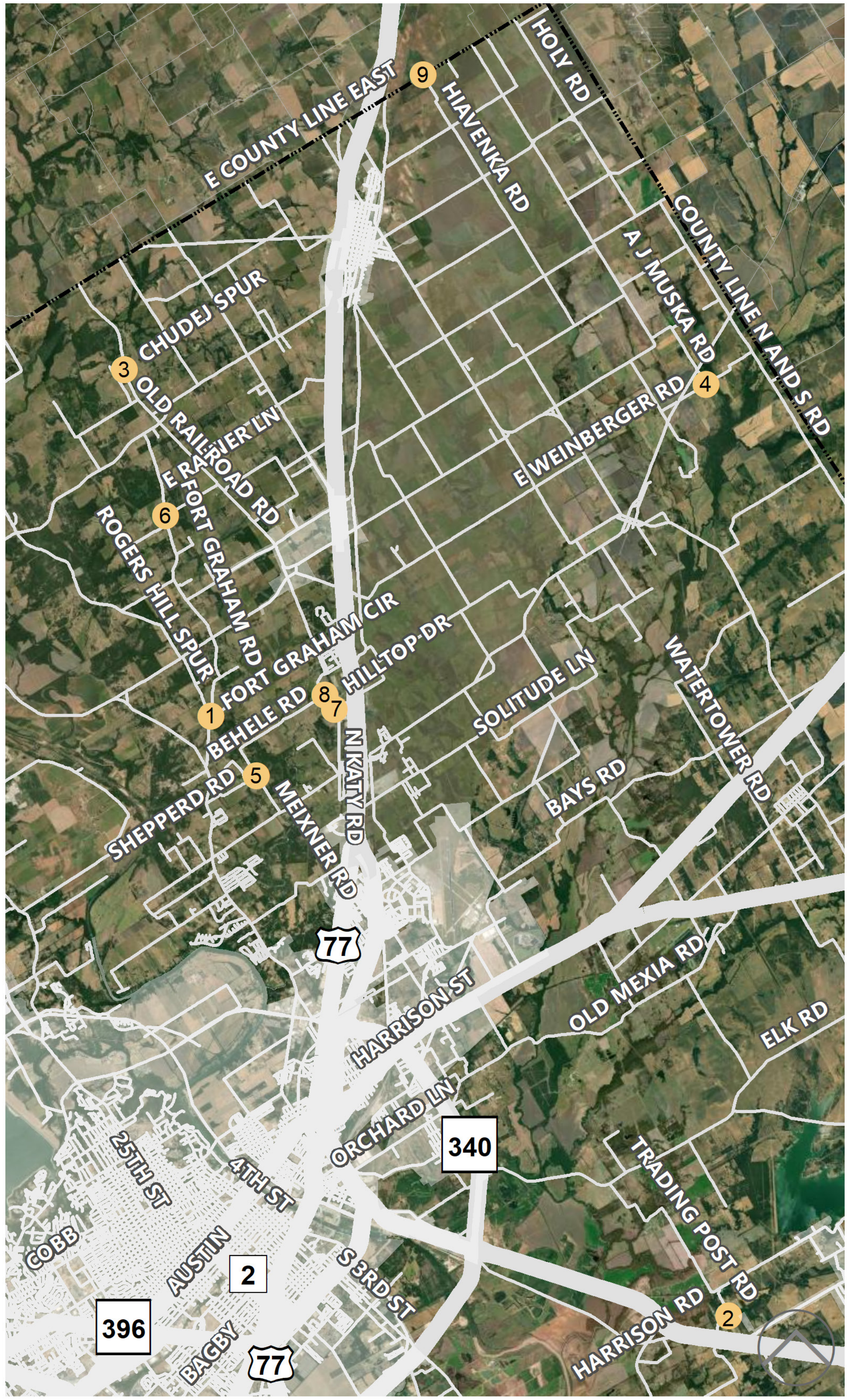
Existing Condition:
Ross Rd at IH 35 facing west

Existing Condition:
Ross Rd at IH 35 facing east

ESTIMATED COST OF IMPROVEMENT

5: IH-35 & ROSS RD- INTERSECTION SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Convert to All Way Stop	IH-35 & Ross Rd	$1,200
	Sign Upgrades		$5,100
	Striping Upgrades		$500
	Install Warning Flashing Beacons		$46,000
		CONTINGENCY COST	$10,600
		ENGINEERING COST	$22,200
		TOTAL COST	**$85,600**

PROJECT 6: COUNTYWIDE- INTERSECTION SAFETY IMPROVEMENTS

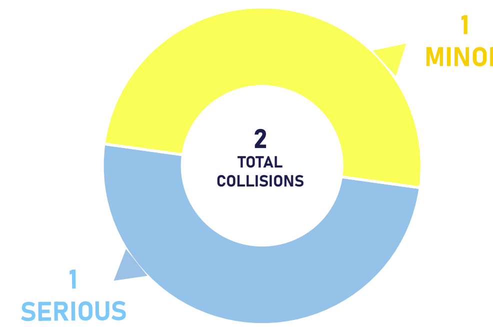


Fatal Injury | Serious Injury | Minor Injury | Possible Injury

McLennan County is planning to implement a series of intersection safety improvements at several key locations throughout the unincorporated areas. These upgrades aim to enhance traffic flow and reduce the risk of collisions, focusing on high-volume intersections that had previously experienced safety concerns. The improvements include sign and pavement delineation upgrades, installation of object markers, clearing sight distance obstructions, installation or upgrades to intersection lighting, and stop control upgrades.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Automobile	1
Truck	0



TRENDS

HIT OBJECT	AUTOMOBILE ROW	NIGHTTIME	BROADSIDE
50%	50%	50%	50%
1 COLLISION	1 COLLISION	1 COLLISION	1 COLLISION

ESTIMATED COST OF IMPROVEMENT

6: COUNTYWIDE- INTERSECTION SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Sign and Pavement Delineation Upgrades Install Object Markers Clear Sight Distance Install or Upgrade Intersection Lighting Stop Control Upgrades or Additions	Rogers Hill Spur and Fort Graham Rd	$87,800
		Hlavenka Rd & E County Line East	$61,300
		Beheler Rd & N Katy Rd	$49,300
		E Hilltop Dr & N Katy Rd	$61,400
		E Rainer Ln & Fort Graham Rd	$50,300
		Meixner Rd & Shepperd Rd	$64,300
		A J Muska Rd & E Weinberger Rd	$61,600
		Chudej Spur & Old Railroad Rd	$75,900
		Harrison Rd & Trading Post Rd	$668,200
		CONTINGENCY COST	$236,100
		ENGINEERING COST	$495,700
		TOTAL COST	**$1,911,900**

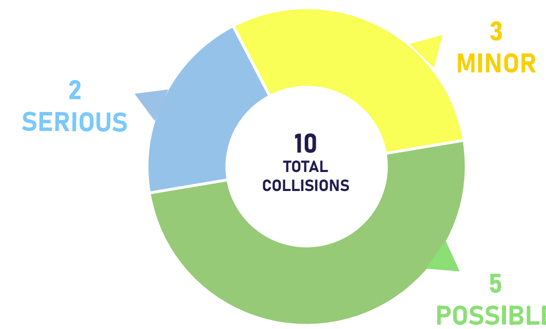
PROJECT 7: MAZANEC ROAD- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

Mazanec Road, a two-lane county road, runs through a rural and agricultural area from Solitude Lane to Mesquite Tree Road. The speed limit is set at 45 mph along the entire corridor.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	0
Car	10
Truck	0



TRENDS

HIT OBJECT	UNSAFE SPEED	NIGHTTIME	INTERSECTION
90%	70%	30%	20%
9 COLLISIONS	7 COLLISIONS	3 COLLISIONS	2 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Mazanec Rd at Our Way Rd facing east

Existing Condition:
Mazanec Rd at Oakdale Dr facing west

ESTIMATED COST OF IMPROVEMENT

7: MAZANEC RD- CORRIDOR SAFETY IMPROVEMENTS		
IMPROVEMENTS	LOCATIONS	ESTIMATED COST
Install Paved Shoulder and Safety Edge	From Solitude Ln to Mesquite Tree Rd	$2,208,000
Install Striping		$407,100
Install Guard Rail		$50,600
Clear Recovery Zone		$20,200
	CONTINGENCY COST	$537,200
	ENGINEERING COST	$1,128,100
	TOTAL COST	**$4,351,200**

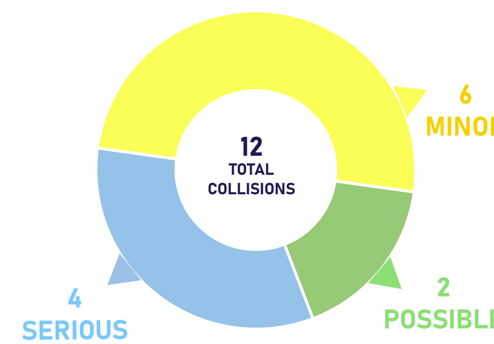
PROJECT 8: FM 2113 & FM 2837- INTERSECTION SAFETY IMPROVEMENTS

Fatal Injury | Serious Injury | Minor Injury | Possible Injury

The intersection of FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road) is a signalized intersection. The speed limit for approaching this intersection is 60 mph on all approaches.

INJURY COLLISION STATISTICS

- Pedestrian: 0
- Bicycle: 0
- Motorcycle: 1
- Car: 10
- Truck: 1



TRENDS

BROADSIDE	NIGHTTIME	UNSAFE SPEED	REAR END
67%	42%	33%	33%
8 COLLISIONS	5 COLLISIONS	4 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
FM-2837 (Old Lorena Rd) at FM-2113 (Spring Valley Rd) facing north

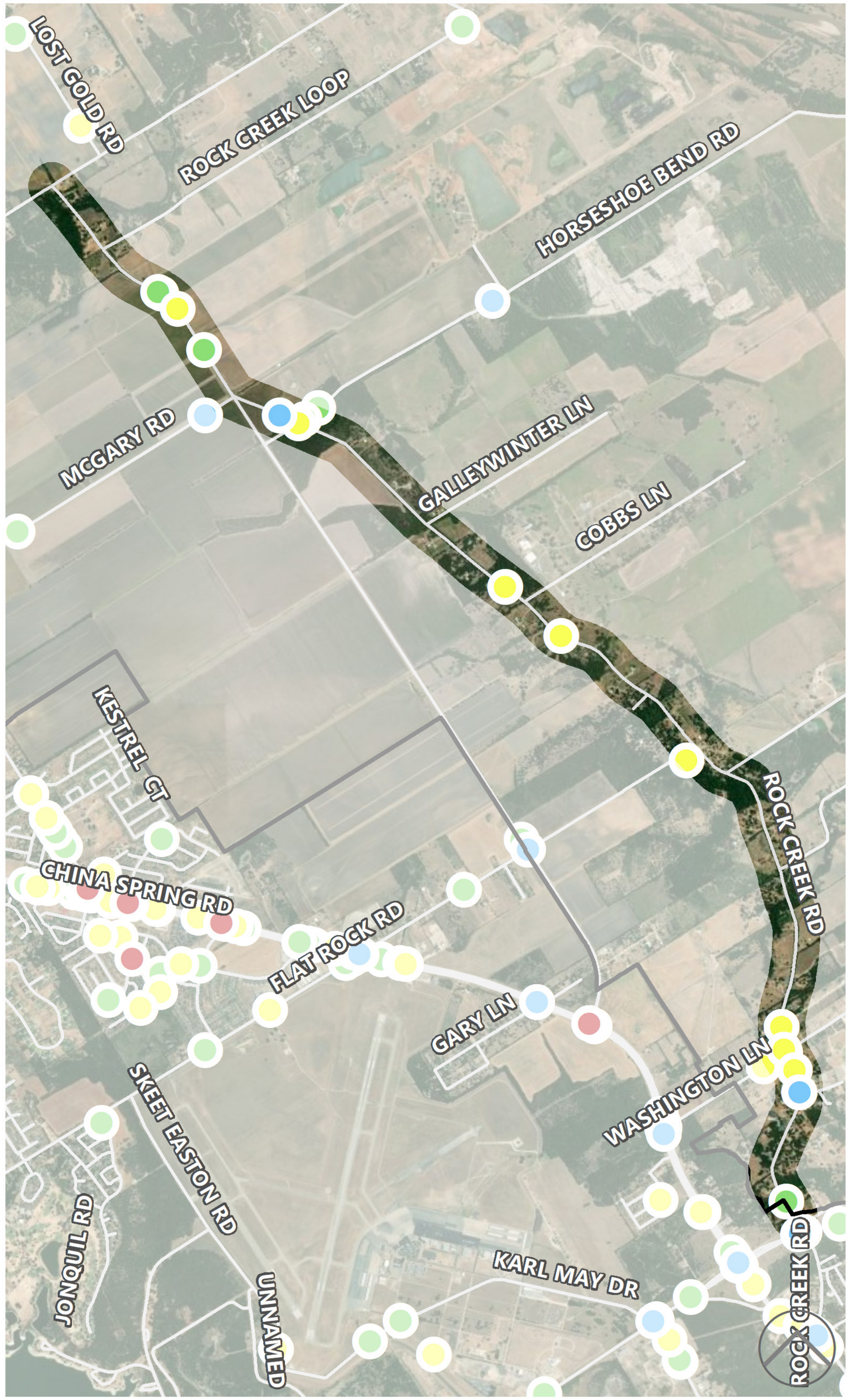
Existing Condition:
FM-2837 (Old Lorena Rd) at FM-2113 (Spring Valley Rd) facing south

ESTIMATED COST OF IMPROVEMENT

8: FM 2113 (SPRING VALLEY RD) & FM 2837 (OLD LORENA RD)- INTERSECTION SAFETY IMPROVEMENTS

	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Approach Median	FM-2113 (Spring Valley Rd) and FM-2837 (Old Lorena Rd)	$266,700
	Signal Hardware Upgrade		$13,800
	Upgrade to Protected Left Turns		$9,700
		CONTINGENCY COST	$58,100
		ENGINEERING COST	$122,000
		TOTAL COST	**$470,300**

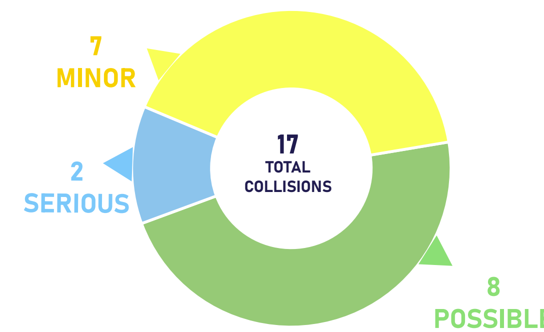
PROJECT 9: ROCK CREEK ROAD- CORRIDOR SAFETY IMPROVEMENTS



Rock Creek Road, a two-lane county road, runs through a mix of rural and residential areas between Rock Creek Loop and the Waco city limit. The speed limit is set at 40 mph along the corridor.

INJURY COLLISION STATISTICS

Pedestrian	0
Bicycle	0
Motorcycle	1
Car	16
Truck	0



TRENDS

HIT OBJECT	NIGHTTIME	DUI	UNSAFE SPEED
71%	59%	53%	24%
12 COLLISIONS	10 COLLISIONS	9 COLLISIONS	4 COLLISIONS

EXISTING CONDITIONS

Existing Condition: Rock Creek Rd at Galley Winter Ln facing west

Existing Condition: Rock Creek Rd at Horse Shoe Bend Rd facing east

ESTIMATED COST OF IMPROVEMENT

9: ROCK CREEK RD- CORRIDOR SAFETY IMPROVEMENT			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping	Rock Creek Rd to Waco City Limit	$400,200
	Install Guard Rail		$23,000
	Install Paved Shoulder and Safety Edge		$402,700
	Object Marker		$6,900
	Minor Street Sign and Striping Improvements		$10,400
	Install Intersection Lighting		$284,700
		CONTINGENCY COST	$225,600
		ENGINEERING COST	$473,800
		TOTAL COST	**$1,827,300**

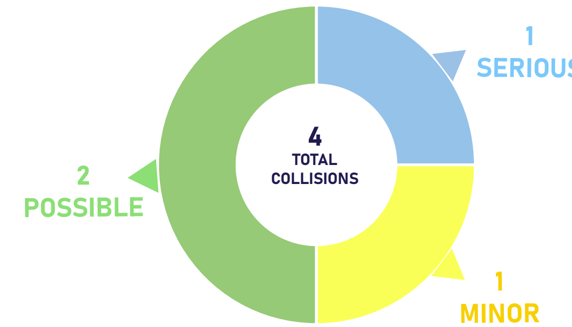
PROJECT 10: SPEEGLEVILLE ROAD- CORRIDOR SAFETY IMPROVEMENTS

Fatal Injury · Serious Injury · Minor Injury · Possible Injury

Speegleville Road, a two-lane major collector between State Highway 6 and McLaughlin Road and local Street between McLaughlin Road and Classic Drive, runs through a mix of rural and agricultural areas from State Highway 6 to Classic Drive. The speed limit is set at 50 mph along the corridor.

INJURY COLLISION STATISTICS

0
0
0
4
0



TRENDS

HIT OBJECT	NIGHTTIME	DUI	UNSAFE SPEED
100% 4 COLLISIONS	50% 2 COLLISIONS	50% 2 COLLISIONS	25% 1 COLLISION

EXISTING CONDITIONS

Existing Condition:
Speegleville Rd at SH 6 facing north

Existing Condition:
Speegleville Rd at Classic Dr facing south

ESTIMATED COST OF IMPROVEMENT

10: SPEEGLEVILLE RD- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Object Markers		$3,800
	Sign and Striping Upgrades for Curves		$21,200
	Install Centerline Striping	From SH 6 to Classic Dr	$135,300
	Install Safety Edge		$230,000
	Widen Road		$966,000
		CONTINGENCY COST	$271,300
		ENGINEERING COST	$569,700
		TOTAL COST	**$2,197,300**

PROJECT 11: CHAPEL ROAD- CORRIDOR SAFETY IMPROVEMENTS

Chapel Road, a two-lane county road, runs through a mix of rural and agricultural areas from FM-2837 (Old Lorena Road) to FM-2113 (Spring Valley Road). The speed limit is set at 60 mph along the entire corridor.

INJURY COLLISION STATISTICS

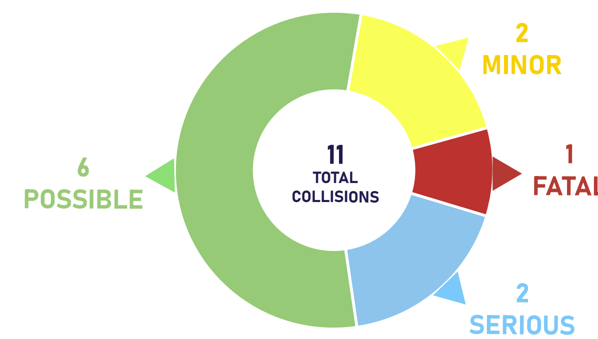
0

0

1

10

0



TRENDS

HIT OBJECT	NIGHTTIME	INTERSECTION	DUI
100%	27%	27%	27%
11 COLLISIONS	3 COLLISIONS	3 COLLISIONS	3 COLLISIONS

EXISTING CONDITIONS

Existing Condition:
Chapel Rd at Marcy Ln facing east

Existing Condition:
Chapel Rd at Hunter's Meadow Dr facing north

ESTIMATED COST OF IMPROVEMENT

11: CHAPEL RD- CORRIDOR SAFETY IMPROVEMENTS			
	IMPROVEMENTS	LOCATIONS	ESTIMATED COST
	Install Striping	From FM-2837 (Old Lorena Rd) to FM-2113 (Spring Valley Rd)	$303,600
	Install Safety Edge		$708,400
	Sign Upgrades		$4,200
	Widen Road		$2,125,200
	Advance Warning Flashing Beacon	Neal-Trice Ln and Chapel Rd	$23,000
	Clear Sight Triangles		$4,600
	Sign Upgrades and Curve Delineation		$2,300
		CONTINGENCY COST	$634,300
		ENGINEERING COST	$1,332,000
		TOTAL COST	**$5,137,600**

CHAPTER 7

EQUITY CONSIDERATION

CHAPTER 7: EQUITY CONSIDERATIONS

EQUITY IN ROADWAY SAFETY

Traffic collisions and safety concerns on roadway networks affect everyone, however the risk, cost, and injury associated with collisions are distributed unevenly across communities and neighborhoods. The US Department of Transportation (USDOT) published the National Roadway Safety Strategy in 2022 which shows that American Indian or Alaskan Native, Black or African American, and Native Hawaiian or other Pacific Islander communities have roadway fatality rates that are higher than the national rate. This disproportionate burden on certain communities arises from historical and structural inequities in transportation infrastructure which have led to the presence of inadequate infrastructure, roads with high volume and high speed traffic, a lack of pedestrian facilities, and insufficient safety measures.

In these communities, challenges from disproportionate roadway safety burden go beyond the immediate danger to life due to traffic collisions. Unsafe transportation networks can increase health stress due to resultant choices people make such as spending less time outside engaged in outdoor and social activities. A planning process that is blind to the inequities can aggravate the challenges further. Communities with limited means or ability to participate effectively in planning often face various barriers that diminish their voice in decision-making processes. Commonly used enforcement-based countermeasures might not correct unsafe policy and built environment characteristics that create the safety risks.

By actively involving these communities in the planning process and valuing their perspectives and input, policymakers and planners can work towards more equitable outcomes and address specific needs of all residents. This not only enhances the effectiveness of planning and investment decisions but also fosters a stronger sense of community ownership and empowerment.

The Waco MPO CSAP acknowledges and places an equity-informed approach at each step of the planning and implementation process. Equity analysis enables the CSAP to identify disproportionate roadway safety burdens in communities facing transportation disadvantage within the Waco metropolitan region. This is supplemented by community input gathered through various engagement mechanisms that have been part of the process. By identifying projects in disadvantaged areas in line with the Justice40 goals, and including equity in the project prioritization process, this plan lays a foundation for Waco MPO, McLennan County, and cities to pursue investments that bring equitable futures for residents of the Waco metropolitan area.

METHODOLOGY

USDOT's Equitable Transportation Community Explorer Screening Tool (ETC Explorer) has been used to identify communities facing transportation disadvantages within the Waco metropolitan area.

Transportation disadvantage is defined as consequences of inadequate transportation investment and infrastructure leading to transportation insecurity, environmental burden, social vulnerability, health vulnerability, and climate and disaster risks. The flow chart that follows describes these five components, each of which contain sub-components that are derived from 2020 census tract-level variables. For example, transportation insecurity combines transportation access – measured from commute time, access to various transportation modes, and access to jobs and destinations; cost burden – costs associated with using transportation options; and safety – traffic fatalities within communities. The ETC Explorer includes description of all subcomponents and their constituent variables.

The ETC Explorer assigns each census tract a disadvantage score for each of the five components. The scores are normalized based on all census tracts nationally, and reported as percentile ranks. The census tract having a 65th percentile rank or above is deemed disadvantaged.

Appendix I contains the census-tracts wise data used for the analysis. More information on the ETC Explorer, and links to the data platform is available on the USDOT website:
https://www.transportation.gov/priorities/equity/justice40/etc-explorer

This chapter presents the equity analysis for the Waco metropolitan area, and for the Cities of Bellmead, Hewitt, Lacy Lakeview, McGregor, Robinson, Waco, and Woodway. The MPO-wide analysis relies on McLennan County boundaries to identify relevant census tracts. City-wide analysis includes all the census tracts within the city limits.

The census-tract based boundaries used in this analysis varies slightly from the actual city boundaries. This is because census tracts are larger than individual cities and often spread across multiple municipalities, however the analysis here provides a comprehensive idea of overall transportation disadvantages faced by communities. For cities with below 65th percentile scores for overall disadvantage, a secondary analysis focusing on disadvantaged communities – census tracts with transportation disadvantage – is included.

For analysis of roadway collisions, each injury collision was assigned a disadvantage indicator based upon the census tract in which it is located. The average annual fatality rate has been calculated based on the Safe Streets and Roads for All calculation methodology from US DOT. It relies on persons killed in fatal collisions between 2017 and 2021 from the Fatality and Injury Reporting System Tool (FIRST). The rate calculation worksheet, containing the methodology and crash reports, is included as **Appendix J.**

Climate and Disaster Risk Burden: Current and future risks to an area from climate and natural disasters, based on potential losses from existing hazard exposure and vulnerability.

Environmental Burden: Measures factors such as pollution, hazardous facility exposure, water pollution and the built environment.

Health Vulnerability: Prevalence of health conditions such as asthma, cancer, high blood pressure, diabetes, and poor mental health.

Social Vulnerability: Identifies populations that are at a higher risk due to certain social conditions.

Transportation Insecurity: It is the condition in which people are unable to regularly and reliably satisfy the travel necessary to meet the needs of daily life.

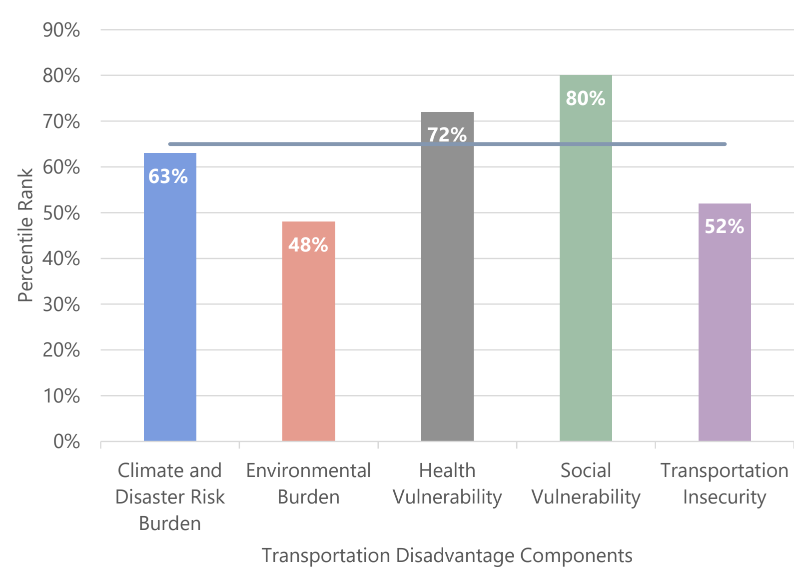
TRANSPORTATION DISADVANTAGE IN WACO METROPOLITAN AREA

57 percent of census tracts in the Waco metropolitan area are considered disadvantaged per the ETC Explorer. The map to the right shows these census tracts along with the city boundaries. KSI collisions are mapped with respect to the disadvantaged census tracts on the map on the following page. Cities including Waco, Bellmead, Lacy-Lakeview, Hewitt, Robinson, Woodway, and portions of McLennan County all have disadvantaged census tracts within their limits. The Waco metropolitan area, which covers all of McLennan County, is considered disadvantaged in terms of health vulnerability (65 percent). It ranks below the 65th percentile for social vulnerability (62 percent), transportation insecurity (54 percent), climate and risk burden (52 percent), and environmental burden (39 percent). Comparatively, 44 percent of census tracts in the State of Texas are considered disadvantaged.

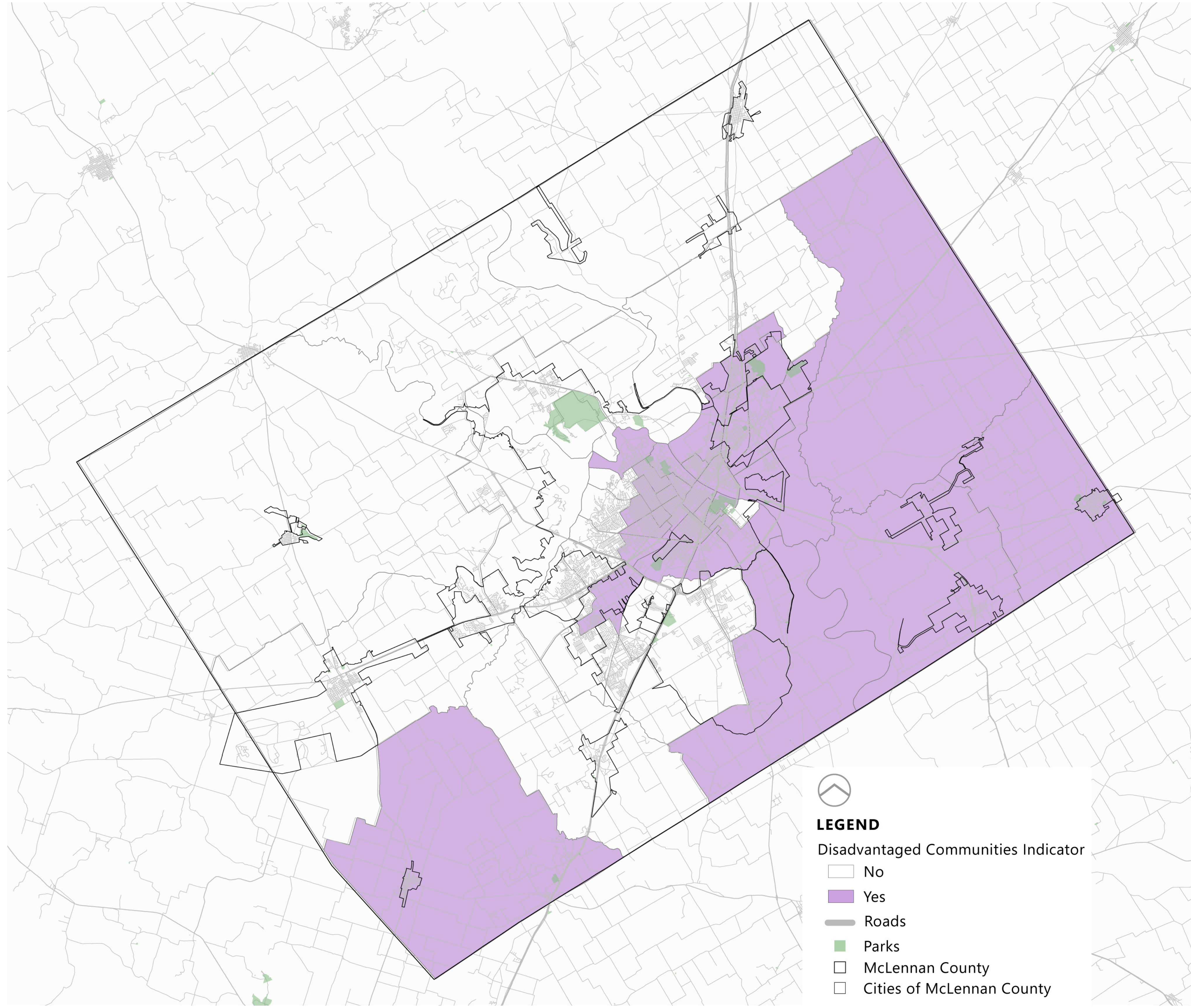
The graph below focuses on the transportation disadvantage component scores for disadvantaged communities within the MPO limits. The horizontal line indicates the 65th percentile rank, and any score above this line indicates a disadvantage. These census tracts exhibit high levels of social vulnerability (80 percent) and health vulnerability (72 percent). These tracts also face moderate climate and disaster risk burden (60 percent), transportation insecurity (52 percent), and environmental burden (48 percent). 138,100 people live in these census tracts, which represents 54 percent of the population of McLennan County. The transportation disadvantage percentiles are mapped for all census tracts in the Waco metropolitan area for each of the five components on the following page.

Further analysis of trends in roadway collision data, and identified safety projects for Waco metropolitan area, with respect to these equity areas, is presented on the following pages.

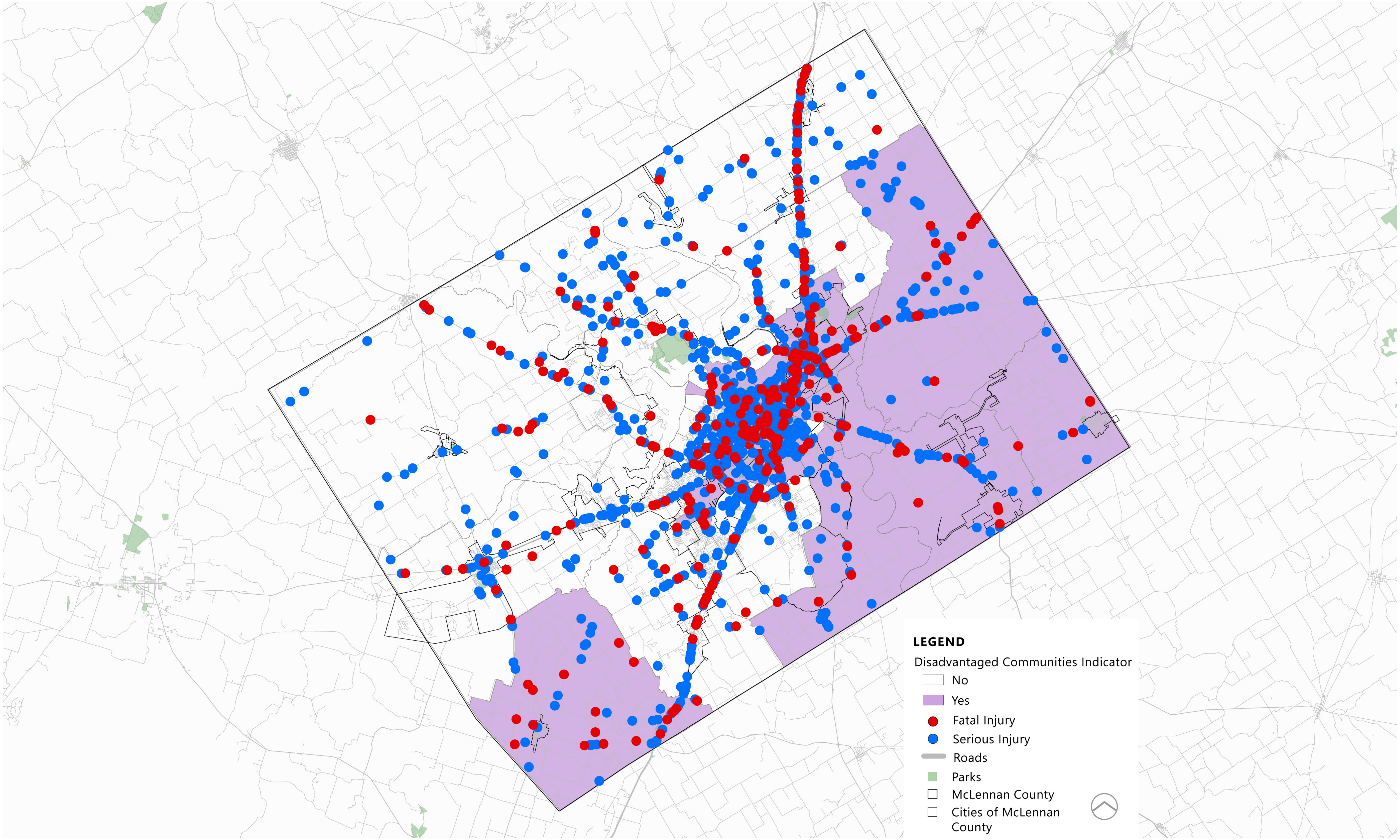
TRANSPORTATION DISADVANTAGE IN WACO METROPOLITAN AREA



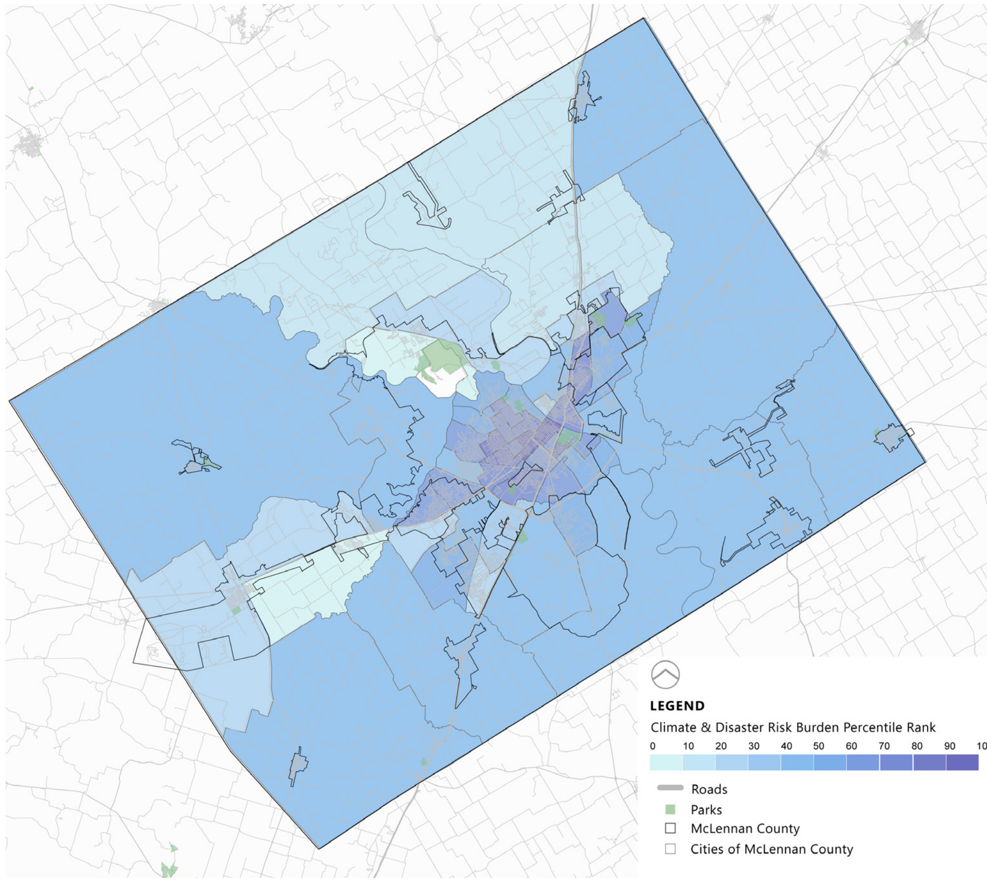
DISADVANTAGED COMMUNITIES IN MCLENNAN COUNTY



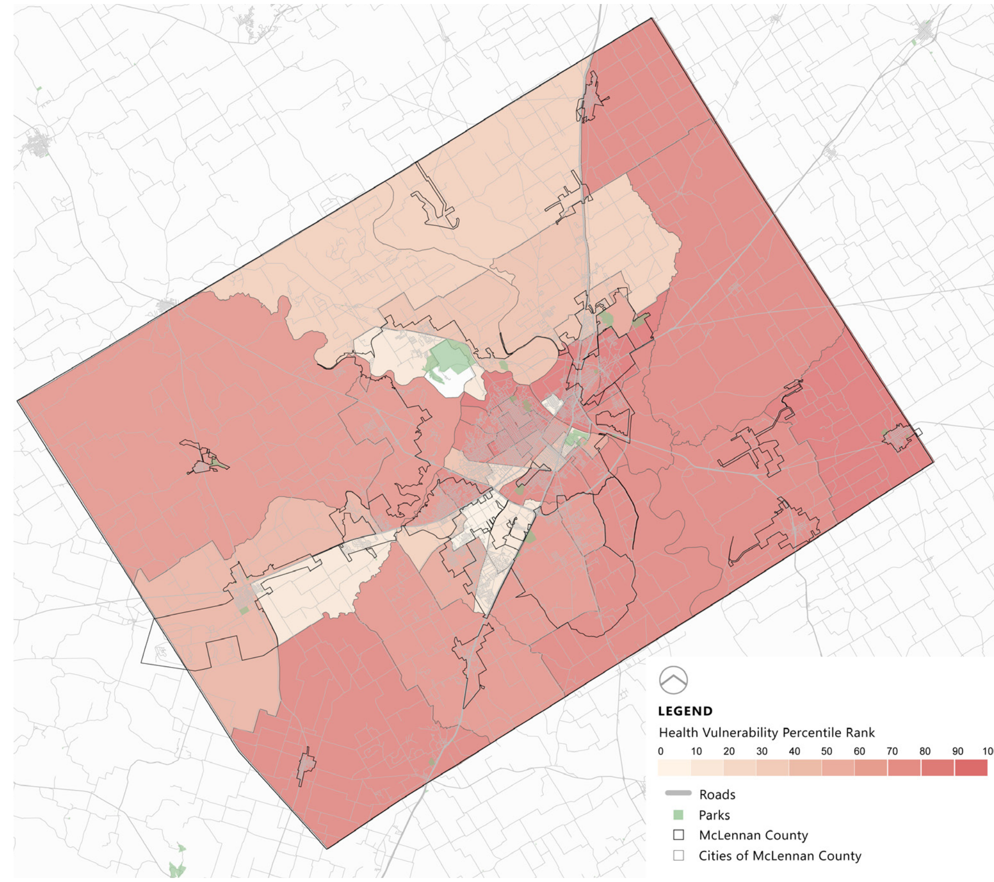
KSI COLLISIONS & DISADVANTAGED COMMUNITIES



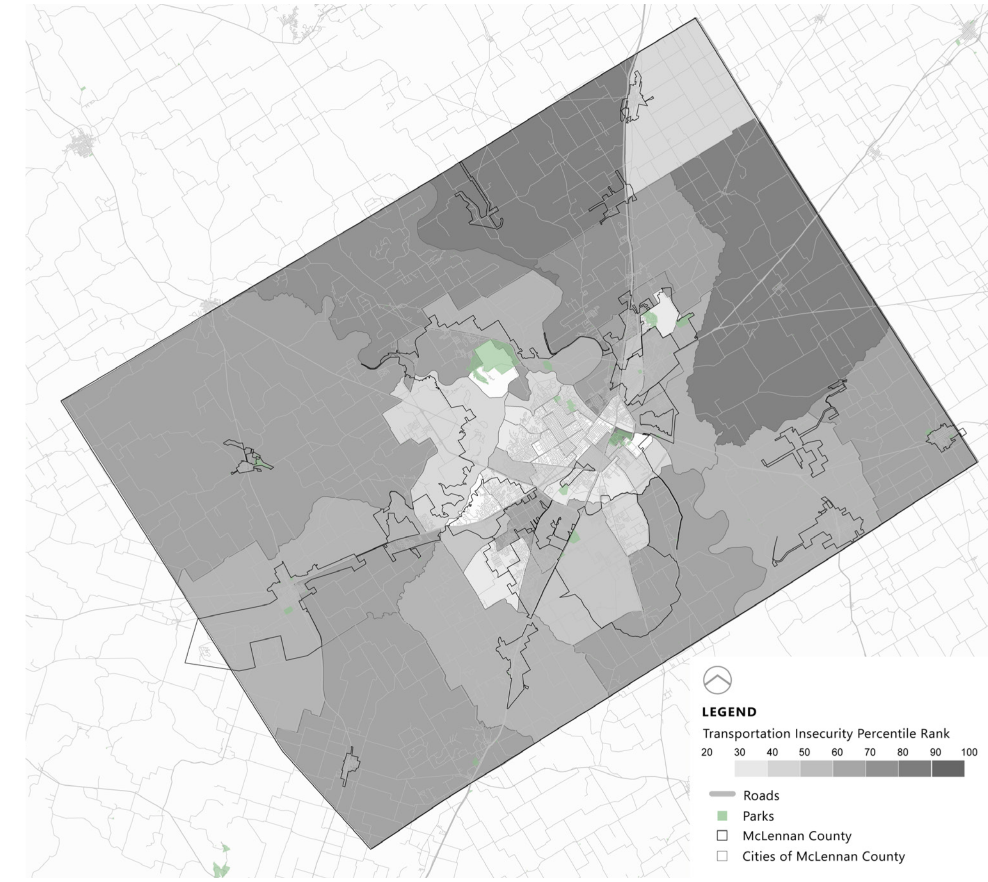
CLIMATE & DISASTER RISK



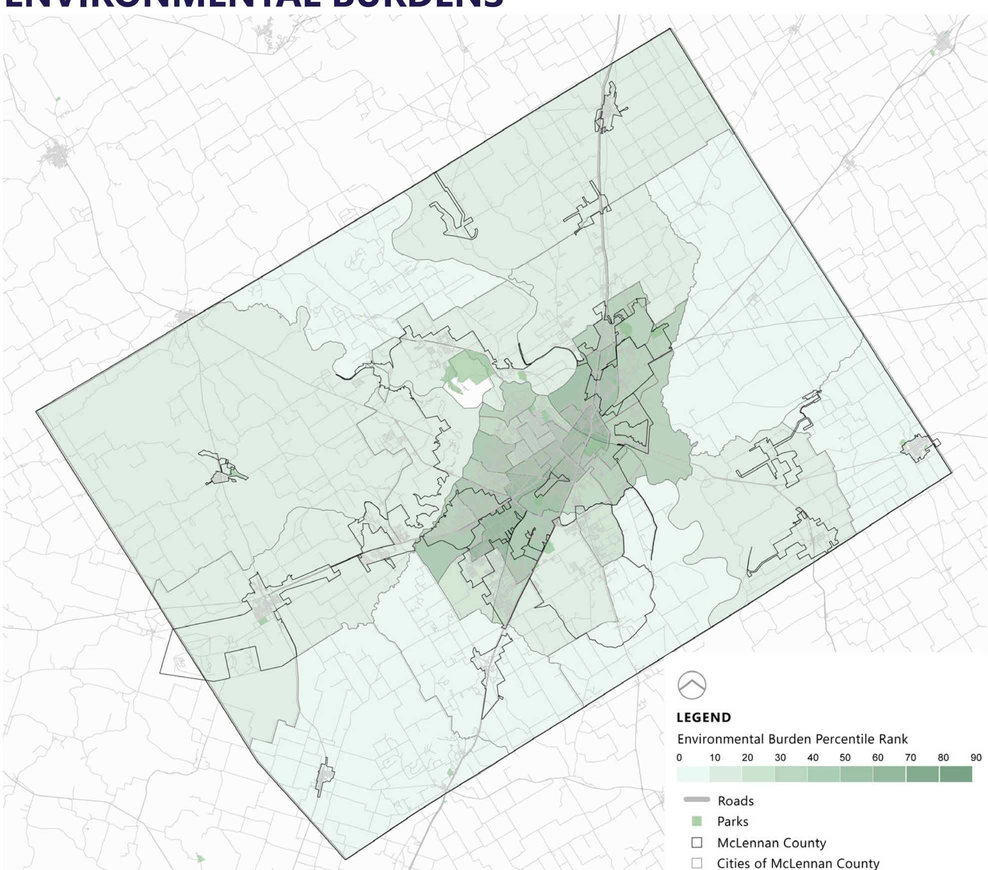
HEALTH VULNERABILITIES



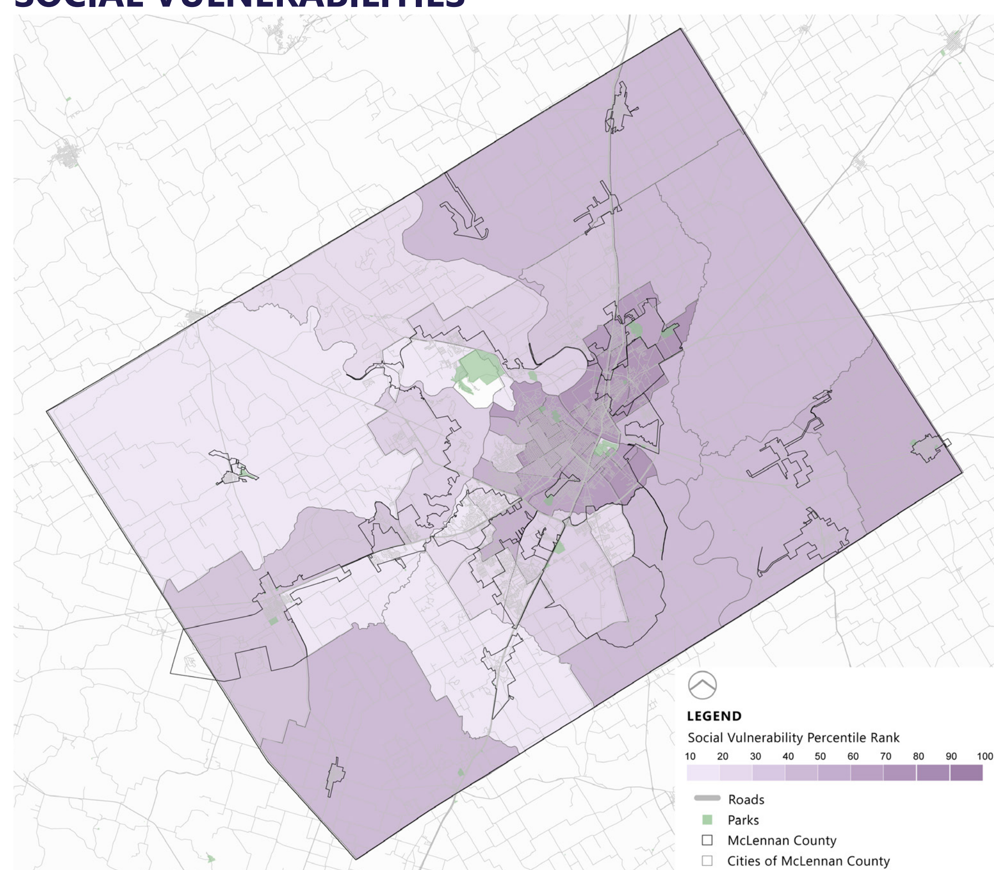
TRANSPORTATION INSECURITY



ENVIRONMENTAL BURDENS



SOCIAL VULNERABILITIES

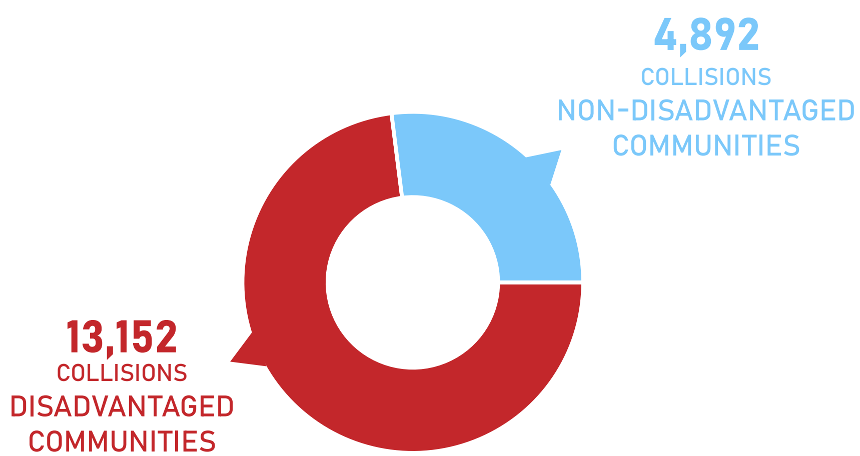


The transportation disadvantage component scores for each census tract in Waco metropolitan area is mapped here. Maps are color coded to darken with increasing percentile rank. Despite the variation in how the various components are spatially distributed, there are overlaps in areas with environmental burden, social vulnerability, health vulnerability, and climate and disaster risks. Census tracts within core areas of the cities of Waco, Bellmead, Lacy Lakeview, and Robinson have higher risk levels. Transportation insecurity is higher among parts of unincorporated McLennan County, than in city cores.

COLLISION TRENDS

Of the total 18,044 Collisions in the Waco metropolitan area, 73 percent (13,152) have occurred in disadvantaged communities. 54 percent of the County's population experiencing 73 percent of collisions is a cause for concern. Disadvantaged communities experience a disproportionately higher number of injury collisions in the MPO's planning area, however, KSI collisions are lower in these census tracts as compared to the rest of the County. The average annual fatality rate for McLennan County, which encompasses the Waco metropolitan area, is 14.72 per 100,000 residents. The comparable rate for the State of Texas is 13.55 persons killed per 100,000 residents. McLennan County presents a equity concern as it has a higher fatality rate and percentage of disadvantaged census tracts than the State of Texas.

For disadvantaged and non-disadvantaged communities in the Waco metropolitan area, this analysis compares trends in crash severity, harmful event, manner of collision, lighting conditions, modes, and top violation categories. The data reveals disadvantaged communities have higher broadside car-related collisions, automobile right-of-way violations, traffic signals and signs violations, and intersection collisions as compared to their non-disadvantaged counterparts.



DISADVANTAGED COMMUNITIES, NON-DISADVANTAGED COMMUNITIES & MCLENNAN COUNTY – RELATIVE SHARES

	DISADVANTAGED COMMUNITIES	NON-DISADVANTAGED COMMUNITIES	WACO METROPOLITAN AREA
Total Collisions	13,152	4,892	18,044
COLLISION SEVERITY			
Fatal Injury	1%	3%	2%
Serious Injury	8%	12%	9%
Minor Injury	37%	38%	38%
Possible Injury	53%	48%	52%
MODE			
Bike	1%	1%	1%
Car	86%	84%	85%
Motorcycle	3%	5%	4%
Pedestrian	3%	2%	3%
Truck	7%	8%	7%
MANNER OF COLLISION			
Broadside	46%	30%	42%
Hit Object	24%	38%	28%
Rear End	23%	25%	24%
Others	6%	8%	7%
TOP VIOLATION CATEGORIES			
Automobile Right-of-Way	24%	17%	22%
Unsafe Speed	21%	28%	23%
Traffic Signals and Signs	14%	7%	12%
Distracted Driving	8%	9%	8%
Other Improper Driving	5%	8%	6%
HARMFUL EVENT			
Fixed Object	14%	24%	17%
Motor Vehicle in Transport	76%	62%	72%
Overturned	3%	7%	4%
Others	7%	6%	7%
LOCATION			
Roadway	49%	66%	53%
Intersection	51%	34%	47%
LIGHTING CONDITIONS			
Daylight	71%	67%	70%
Dark - Not Lighted	9%	17%	11%
Dark - Lighted	18%	13%	16%
Other Conditions	2%	3%	3%

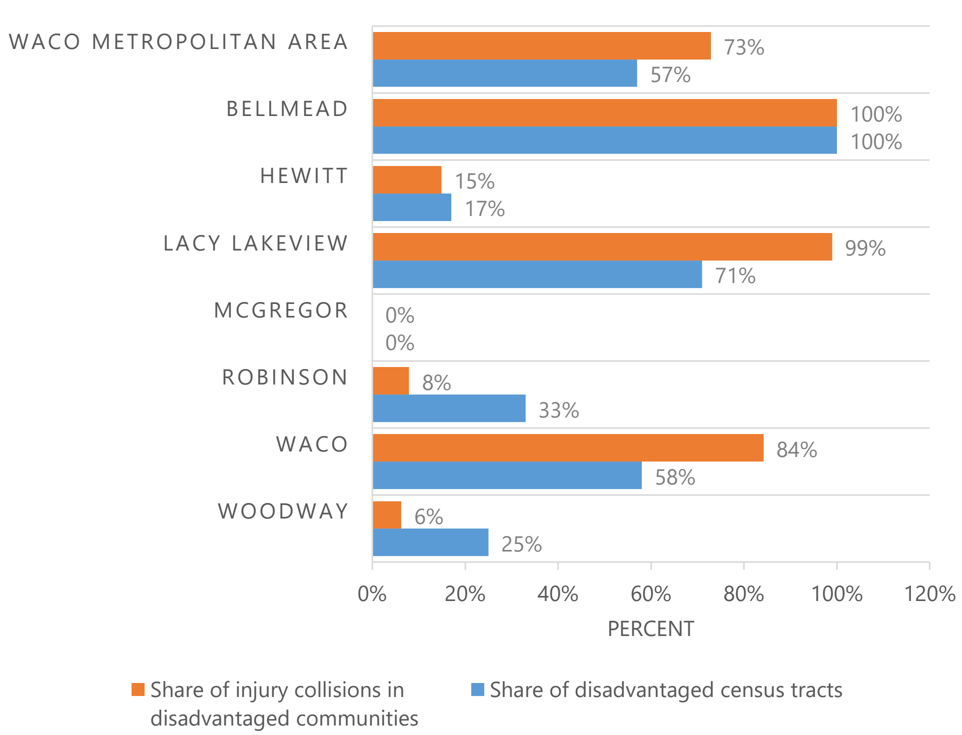
TRANSPORTATION DISADVANTAGES IN CITIES

Three cities – Bellmead, Lacy Lakeview, and Waco – facer higher levels of transportation disadvantage within McLennan County. Of these, Bellmead and Lacy Lakeview face severe disadvantages, with 100 percent and 71 percent of census tracts respectively considered to be disadvantaged. Transportation insecurity, when taken as a stand-alone disadvantage, is higher in McGregor, Lacy Lakeview, and Hewitt than other cities.

Bellmead, Lacy Lakeview, and Waco have a higher proportion of their injury collisions in disadvantaged communities. This is also higher than the overall trend for McLennan County. 100 percent of injury collisions in Bellmead, 99 percent in Lacy Lakeview, and 84 percent in Waco take place inside disadvantaged communities. This higher trend can be attributed to a greater percentage of downtown and core areas of these cities falling within the disadvantaged census tracts.

Sections that follow discuss how each city experiences transportation disadvantages. This plan identifies projects in areas with a disadvantage, and lays the foundation for cities to pursue investments that brings equitable futures for their residents in roadway safety.

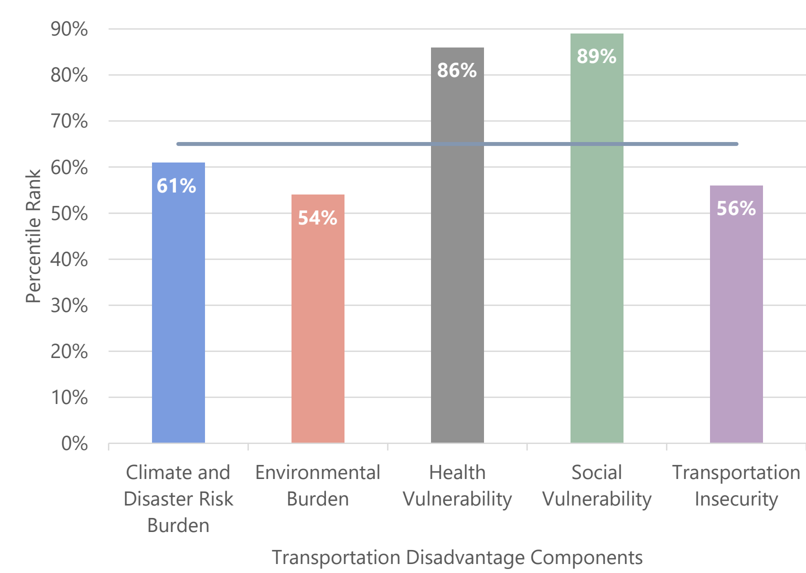
SHARE OF INJURY COLLISIONS & TRANSPORTATION DISADVANTAGE



Bellmead

All census tracts in the City of Bellmead are classified as disadvantaged, therefore all collisions in the city occurred in disadvantaged communities. These census tracts are home to 20,100 people. Bellmead faces higher levels of social vulnerability (89 percent), and health vulnerability (86 percent) due to transportation disadvantage. While the city is not disadvantaged in terms of transportation insecurity (56 percent), the residents of Bellmead face disproportionate transportation cost burden (90 percent), and transportation safety challenges (72 percent). The average annual fatality rate for the City of Bellmead is 12.94 per 100,000 residents.

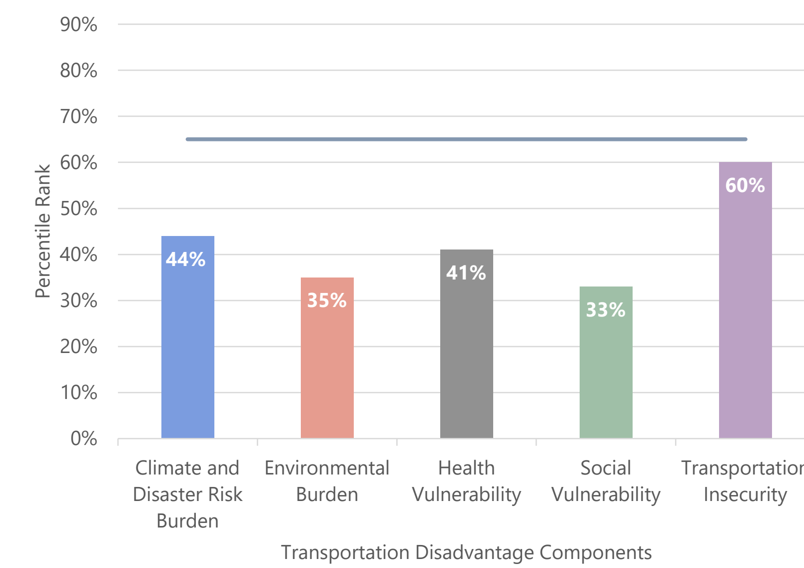
TRANSPORTATION DISADVANTAGE IN BELLMEAD



Hewitt

Of the census tracts in the City of Hewitt, 17 percent face transportation disadvantages. These census tracts are home to 6,100 people. Hewitt ranks below the 65th percentile for all components of transportation disadvantages as shown in the image that follows, however it faces disadvantages with respect to transportation safety (72 percent). Disadvantaged communities in Hewitt face high levels of transportation insecurity (78 percent), environmental burden (71 percent), and social vulnerability (68 percent). These census tracts face disadvantages both in terms of transportation access (71 percent) and transportation safety (89 percent). For the injury collisions, 15 percent happened in disadvantaged areas, generally located to the north of Panther Way and east of N Hewitt Drive. The average annual fatality rate for the City of Hewitt is 1.61 per 100,000 residents.

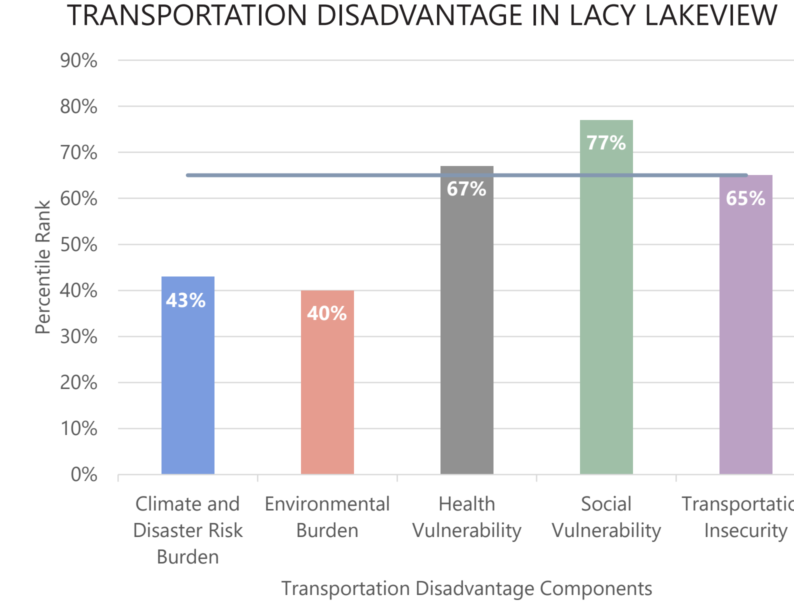
TRANSPORTATION DISADVANTAGE IN HEWITT



Lacy Lakeview

For the City of Lacy Lakeview, 71 percent of census tracts are classified as transportation disadvantaged. These tracts are disadvantaged in terms of social vulnerability (77 percent), health vulnerability (67 percent), and transportation insecurity (65 percent) as shown in the graph that follows. City residents also a face transportation cost burden (81 percent) and transportation safety challenges (67 percent). Of the injury collision that occurred in Lacy Lakeview, 99 percent took place in disadvantaged communities, which is home to 24,600 residents. These communities face a lower level of transportation insecurity (58 percent), but rank higher for components of transportation insecurity such as cost burden (90 percent), and safety (76 percent). The average annual fatality rate for the City of Lacy Lakeview is 3.19 per 100,000 residents.

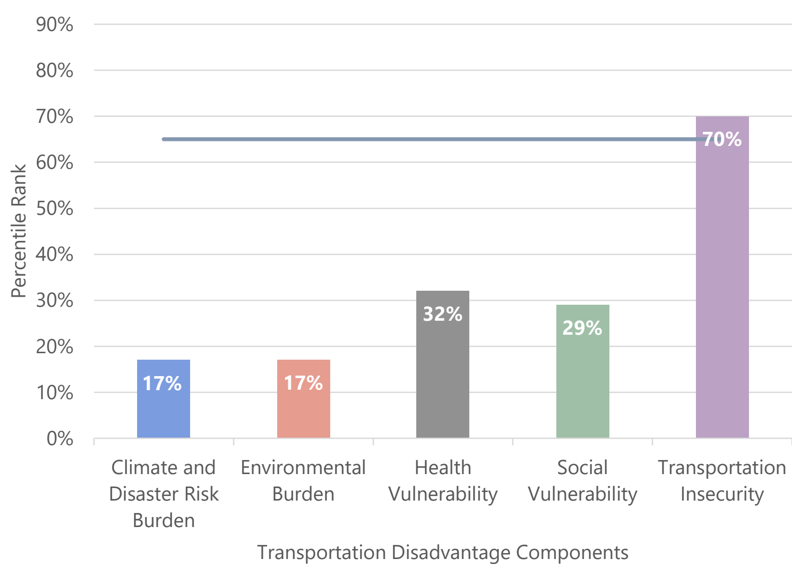
TRANSPORTATION DISADVANTAGE IN LACY LAKEVIEW



McGregor

The City of McGregor does not face overall transportation disadvantages due to lower levels of environmental burden, social and health vulnerability, and climate disaster risks. However, the City experiences severe transportation insecurity (70 percent) due to a lack of adequate transportation access (71 percent). The average annual fatality rate for the City of McGregor is 7.48 per 100,000 residents.

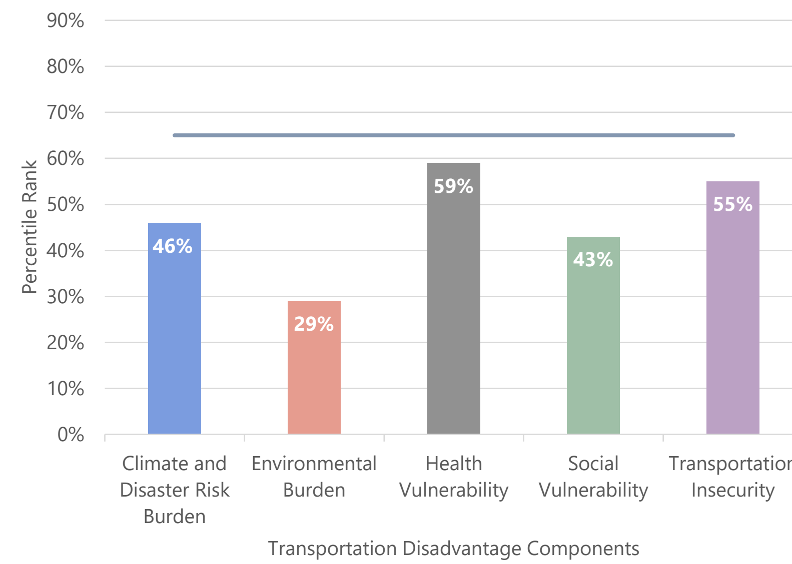
TRANSPORTATION DISADVANTAGE IN MCGREGOR



Robinson

For the City of Robinson, 33 percent of census tracts, with 8,700 residents, are considered transportation disadvantaged. eight percent of the injury collisions have occurred in these areas. Robinson ranks low on all components of disadvantage as shown in the graph that follows, however it is ranked at the 70th percentile for transportation safety sub-component. Disadvantaged communities in Robinson face above the 65th percentile health vulnerability (85 percent), and social vulnerability (71 percent). The average annual fatality rate for the City of Robinson is 5.26 per 100,000 residents.

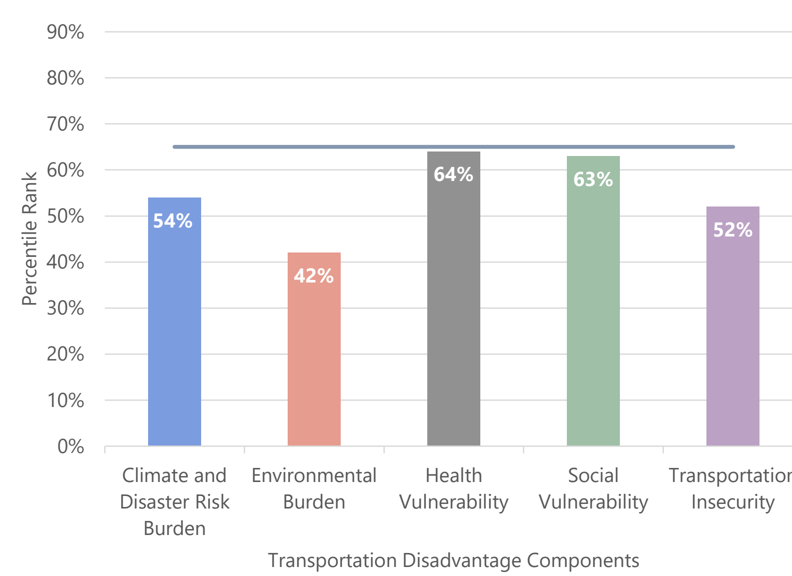
TRANSPORTATION DISADVANTAGE IN ROBINSON



Waco

For the City of Waco, 58 percent of census tracts are classified as disadvantaged. Of injury collisions, 84 percent occur in these disadvantaged areas, which are home to 125,700 residents. Waco faces moderate levels of health vulnerability (64 percent), and social vulnerability (63 percent) due to transportation disadvantage as shown in the graph that follows. Residents of Waco also face transportation cost burden (67 percent). The average annual fatality rate for the City of Waco is 6.45 per 100,000 residents.

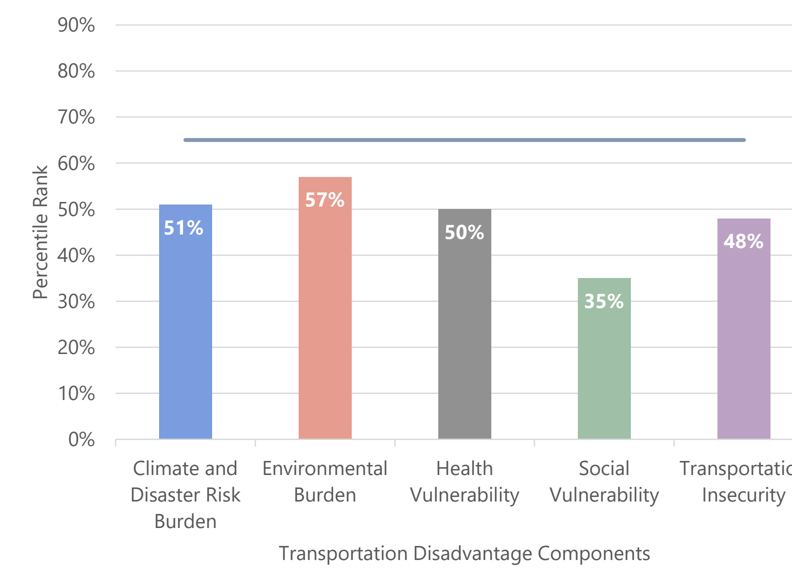
TRANSPORTATION DISADVANTAGE IN WACO



Woodway

In Woodway, 25 percent of census tracts are considered to be transportation disadvantaged although the City falls below the 65th percentile rank for transportation disadvantage components, as shown in the graph that follows. The 6,100 residents that live in disadvantaged areas face transportation insecurity (78 percent), environmental burden (71 percent), and social vulnerability (68 percent). They also experience challenges in transportation access (74 percent), and safety (89 percent). six percent of all injury collisions in Woodway took place in disadvantaged communities. The average annual fatality rate for the City of Woodway is 2.13 per 100,000 residents.

TRANSPORTATION DISADVANTAGE IN WOODWAY



EQUITABLE INVESTMENT

Equitably distributing improvements and investments, with a fair share of resources directed towards disadvantaged communities, is an important consideration in transportation safety planning. The US federal government's environmental justice initiative, Justice40, establishes a goal to direct 40 percent of the overall benefits of certain federal investments to disadvantaged communities.

The proposed safety projects for each jurisdiction and cost estimates are analyzed to determine the share of the total investment allocated to disadvantaged areas. The following table shows the result for each jurisdiction, and for the Waco metropolitan area. Detailed cost share analysis for each project within each jurisdiction is provided in **Appendix K.**

Approximately 54 percent of the proposed transportation safety investments, totaling approximately $287 million, would flow to disadvantaged areas within the Waco metropolitan area. While the metropolitan area as a whole exceeds the Justice40 threshold, there are variations in how each jurisdiction meets this goal.

The City of McGregor does not have any areas identified as disadvantaged, and only a small portion of the City of Woodway is disadvantaged. These cities do not have proposed improvements in disadvantaged areas. In contrast, the entirety of the Cities of Bellmead and Lacy Lakeview are identified as disadvantaged. 100 percent of improvement costs flow to disadvantaged areas in these cities.

Efforts have also been made to consider equity within the project prioritization as outlined in Chapter 6. This, along with the analysis presented in this chapter, demonstrates a commitment to ensure transportation resources and benefits flow to communities experiencing disadvantage. As projects identified in the Waco MPO CSAP advance to implementation, continued monitoring will ensure investments remain aligned with the Justice40 principles.

JURISDICTION	TOTAL COST ESTIMATES OF PROPOSED SAFETY PROJECTS	ESTIMATED COST OF PROJECTS IN DISADVANTAGED AREA	PERCENT OF COST APPLICABLE TO DISADVANTAGED AREAS
Bellmead	$60,453,900	$60,453,900	100%
Hewitt	$89,405,360	$28,014,600	31%
Lacy Lakeview	$68,519,100	$68,519,050	100%
McGregor	$45,715,900	$0	0%
Robinson	$57,268,300	$10,221,280	18%
Waco	$142,456,800	$104,185,100	73%
Woodway	$21,086,800	$483,400	2%
Unincorporated County	$47,470,500	$14,967,120	32%
Waco Metropolitan Area	$532,376,660	$286,844,450	54%

CHAPTER 8

IMPLEMENTATION, MONITORING & FUNDING OPPORTUNITIES

CHAPTER 8: IMPLEMENTATION, MONITORING & FUNDING OPPORTUNITIES

IMPLEMENTATION & MONITORING

The Waco MPO CSAP provides a comprehensive framework for improving transportation safety and reducing KSI collisions throughout McLennan County. This chapter outlines the key steps needed to effectively implement the strategies and countermeasures identified in the plan, as well as the process for monitoring progress and evaluating the success of the implemented measures.

Successful implementation and continual evaluation are essential to achieving the goals and objectives set forth in the CSAP. Without a structured approach to putting the plan into action and assessing its impact, the identified strategies and countermeasures may not be fully realized or may fail to produce the desired safety improvements.

This chapter serves as a guide for the Waco MPO and its partner agencies to follow in the years after the initial adoption of the CSAP. It provides recommendations for:

- Integrating the safety plan's recommendations into ongoing planning and project development processes
- Securing necessary funding and resources for implementation
- Establishing performance measures and monitoring protocols
- Conducting periodic evaluations to gauge the effectiveness of implemented countermeasures
- Updating the plan at regular intervals to address emerging safety issues and trends

By adhering to the implementation and evaluation processes outlined in this chapter, Waco MPO and their transportation agency partners can ensure that the CSAP remains a living document that adapts to changing conditions and continues to drive meaningful improvements in transportation safety for all road users.

IMPLEMENTATION

Successful implementation of the Waco MPO CSAP requires close coordination with identified safety partners such as local municipalities, TxDOT, law enforcement, emergency responders, community groups, and relevant state/regional agencies. It is recommended to extend the current Waco MPO Safety Action Task Force to meet regularly, coordinate activities, review progress, and address challenges.

The safety strategies and countermeasures should be systematically integrated into the MPO's and local agencies transportation planning processes, capital improvement programming, and project development efforts. This includes prioritizing safety projects for funding, incorporating countermeasures into all new projects during design, and coordinating with TxDOT and local cities to implement improvements on their respective road networks. Funding is a critical component of implementing any safety project. Securing adequate funding through pursuit of federal, state, and local sources, as well as other opportunities like grants or public-private partnerships is critical. The following table lists potential funding sources for recommended safety projects.

LIST OF POTENTIAL FUNDING SOURCES

FUNDING SOURCE	FUNDING AGENCY	AMOUNT AVAILABLE	NEXT OR MOST RECENT CALL FOR PROJECTS	APPLICABLE E'S	NOTES
Highway Safety Improvement Program	TxDOT/FHWA	Varies	2024	Engineering	Most common grant source for safety projects
RAISE Grant	USDOT	$25 million	2024	Engineering	Typically used for larger infrastructure projects
State and Community Highway Safety Grant Program (Section 402)	TxDOT	Varies	Annual	Engineering, Enforcement, Education	Funds can be used for various road safety initiatives, such as enforcement, education, and engineering projects
Transportation Alternatives Set-Aside	TxDOT	$250 million	2023	Engineering	Funds projects for alternative transportation to improve mobility and safety for people who don't use motor vehicles
Safe Streets and Roads for All (SS4A)	USDOT	$200K - $50 million	2024	Engineering, Enforcement, Education	Two types of SS4A grants available: Action Plan Grants and Implementation Grants
Safe Routes to School	TxDOT	Up to $300K	2024	Engineering	Funds projects that improve walking/biking access and safety near schools
Promoting Resilient Operations for Transformative, Efficient, and Cost- Saving Transportation (PROTECT) Program	USDOT	Minimum Award: $100K	2024	Engineering	Funding to ensure surface transportation resilience to natural hazards including climate change, sea level rise, flooding, extreme weather events, and other natural disasters

MONITORING & EVALUATION

Continuous monitoring and periodic evaluation are critical to ensure the CSAP achieves its intended goals. A set of quantifiable performance measures should be established, such as number of KSI collisions, citations, observational data, and public feedback. Consistent data collection protocols must be implemented countywide to accurately track these measures, involving compilation of collision data, roadway data from TxDOT, observational studies, citation data from law enforcement, and public feedback tools.

It is recommended that the Waco MPO designate a lead agency or working group (e.g. Safety Action Task Force) to oversee data compilation from all pertinent sources on a recurring schedule. Developing a regularly updated collision dashboard and GIS-based monitoring platform could enable the MPO and supporting agencies, to collaboratively track implementation progress over time. To validate effectiveness of higher-cost, area-specific countermeasures, detailed before/after studies should evaluate baseline conditions prior to implementation and compare changes in collision patterns, speeds, conflicts, etc. after a sufficient time period.

The compiled data and performance measure evaluations should undergo an annual review process with key stakeholders and partners. This will identify areas not meeting goals, allow for adjustments or new strategies, reveal emerging issues, and inform updates made to CSAP every two to five years. Continual monitoring, evaluation, and updating based on observed performance is essential for driving sustained safety improvements over time.

PLAN UPDATE

The Waco MPO CSAP should be treated as a living document, recommended to be updated every two-to-five years after adoption. The update process should involve reviewing the latest collision data, transportation network changes, and newly available data sources to identify any shifting needs. A thorough evaluation of implemented strategy effectiveness, using the monitoring process, is recommended. Stakeholder engagement through the Safety Action Task Force and public outreach is critical to solicit feedback and identify areas for modification. Based on these review findings, the goals, strategies, countermeasures, implementation plan, and performance measures may require updates to address persisting or emerging safety issues more effectively. Regular updates ensure the plan's continued relevance.

MEASURING EFFECTIVENESS OF SAFETY PROJECTS

Implementing effective countermeasures and validating their success is crucial for achieving the goals of the Waco MPO CSAP. This section outlines the key activities and protocols for monitoring and evaluating the performance of individual safety projects.

Pre-Implementation Data Collection

Before any safety project is implemented, comprehensive baseline data should be collected within the project area to enable future before/after comparison analysis. Data to be compiled includes:

Collision Data:

- Collision types (pedestrian, angle, rear end, etc.)
- Collision severity levels
- Locations and corridors
- Contributing factors

Traffic Data:

- Vehicle traffic volumes
- Pedestrian and bicycle traffic counts

Operations Data:

- 85th percentile and pace speeds
- Vehicle/pedestrian/bicycle conflict observations
- Observable road user behavior and compliance levels

Statistical Analysis Methodology

Appropriate statistical techniques can be applied to account for regression-to-mean effects, traffic volume changes over time, and other potential biases. Recommended approaches include Empirical Bayes method and advanced regression modeling.

Using these techniques, an estimate of the predicted long-term safety performance should be calculated assuming no safety improvements were implemented. This becomes the baseline for comparison.

Post-Implementation Data Collection

After allowing sufficient time following project implementation (typically one-to-three years), the same scope of "after" data can be re-collected to enable before/after comparison.

Performance Evaluation Measures

The following key safety performance measures can be evaluated by comparing predicted vs. actual post-implementation conditions:

- Total collisions
- KSI Collisions
- Collisions by type (pedestrian, intersection, roadway departure, etc.)
- Operating speeds
- Conflicts between modes (vehicle/pedestrian/bicycle)

Supplemental Measures for Behavioral Safety Projects

For safety initiatives focused on influencing driver, pedestrian, or bicyclist behavior (e.g. education campaigns, enforcement activities), leading indicators of compliance can be tracked, such as:

- Speeding violations
- Impaired driving arrests/citations
- Distracted driving violations
- Pedestrian and bicycle traffic counts
- Observed yielding/compliance behavior

Project Evaluation Report

All findings from the before/after analysis should be documented in a comprehensive Project Evaluation Report containing:

- Project scope and description of implemented countermeasures
- Implementation costs
- Data collection processes and sources
- Statistical analysis methodology
- Summary of before/after performance results
- Assessment of whether intended benefits were achieved
- Lessons learned and recommendations
- Supplemental policy, program or design guidance as applicable

Continual Monitoring Process

To ensure ongoing effectiveness evaluation, the Waco MPO should establish:

- Routine schedules for MOE (Measure of Effectiveness) data collection and analysis
- Designated staff responsibilities for MOE activities
- Integration of MOE findings into annual performance reviews
- Mechanism for refining project approach based on evaluation results

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