FORT WORTH VISION ZERO SAFETY ACTION PLAN

August 2025

Acknowledgments

Technical Advisory Committee

Chad Davis, Wise County

Chad Edwards, Trinity Metro

Cintia Ortiz, Parker County

Dee Long, Tarrant County

Dillon Maroney, Tarrant County Precinct 4

French Thompson, BNSF

Greg Royster, Aviation (DFW International Airport)

Jeff Neal, North Central Texas COG

John Polster, Denton County

Kelly Johnson, NTTA

Mary-Margaret Lemons, Fort Worth Housing Solutions

Matt Larseingue, BNSF

Russell Laughlin, Developer (Hillwood)

Myron Wilson, Fort Worth ISD

Richard Gonzalez, TxDOT

Russell Laughlin, Developer (Hillwood)

Scott Hall, Tarrant County

Tara Crawford, Trinity Metro

Tim Huya, BNSF

Travis Clegg, Developer (Peloton)

Victor Vandergriff, Tarrant Regional Transportation Coalition

Community Advisory Committee

Mendes David, District 2

Isaac Manning, District 3

Rusty Fuller, District 4

Nakia Cole, District 5

Haylee Carr, District 6

Ryan Smith, District 7

Dr. Sharla Horton, District 8

Austin James, District 9

Jacob Wurman, District 10

Dr. Erik Jones, District 11

Matt Dufrene, Pedestrian and Bicycle Advisory Committee & Blue Zones

Action Plan Team

Lauren Prieur, P.E., PMP, CCM, Transportation and Public Works (TPW) Director

Martin Phillips, P.E., TPW Assistant Director

Kelly Porter, AICP, TPW Assistant Director

Chelsea St. Louis, AICP, Sr. Capital Projects Officer

Rajnish Gupta, P.E., PTOE, City Traffic Engineer

Rashad Jackson, School Crossing Guard Program Manager

Marisa Conlin, P.E., Engineering Manager

Namoo Han, P.E., Sr. Professional Engineer

Consultants

VISION ZERO FORT WORTH

TOOLE DESIGN

AECOM

PAVLIK AND ASSOCIATES

CONTENTS

1: Why Does Fort Worth Need a Safety Action Plan? 6

Understanding the urgent need for safer streets in Fort Worth and the Safe System appproach

2: Road Safety in Fort Worth Today 11

Assessing the state of traffic safety in Fort Worth and the city's ongoing efforts to make streets safer" or "to eliminate deaths and severe injuries on our street network ongoing efforts to make streets safer" or "to eliminate deaths and severe injuries on our street network

3: Our Community Voices Matter 17

Explaining how stakeholder and public input was gathered and incorporated into the plan

4: Focus Areas & Actions 23

Establishing goals and outlining recommended strategies to improve safety throughout the city

5: Safe System Priorities 44

In-depth studies on Safer Speed Management, Truck Traffic Management, and recommended safety improvements for 10 priority corridors

6: Moving Forward 69

Recommending performance measures and funding strategies that support the City's ongoing efforts to track and enhance safety

APPENDIX

Appendix A - Existing Policy, Plan, and Program Review

Appendix B - State of Safety Report

Appendix C - Engagement Summary Report

Appendix D - Safe Speed White Paper

Appendix E - Truck Traffic Evaluation

Appendix F - Corridor and Intersection Prioritization

Appendix G - Corridor Road Safety Assessment

Appendix H- Additional Action Strategies

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, cost opinions, and commentary contained herein are based on limited data and information and on existing conditions that are subject to change. Further analysis and engineering design are necessary prior to implementing any of the recommendations contained herein. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

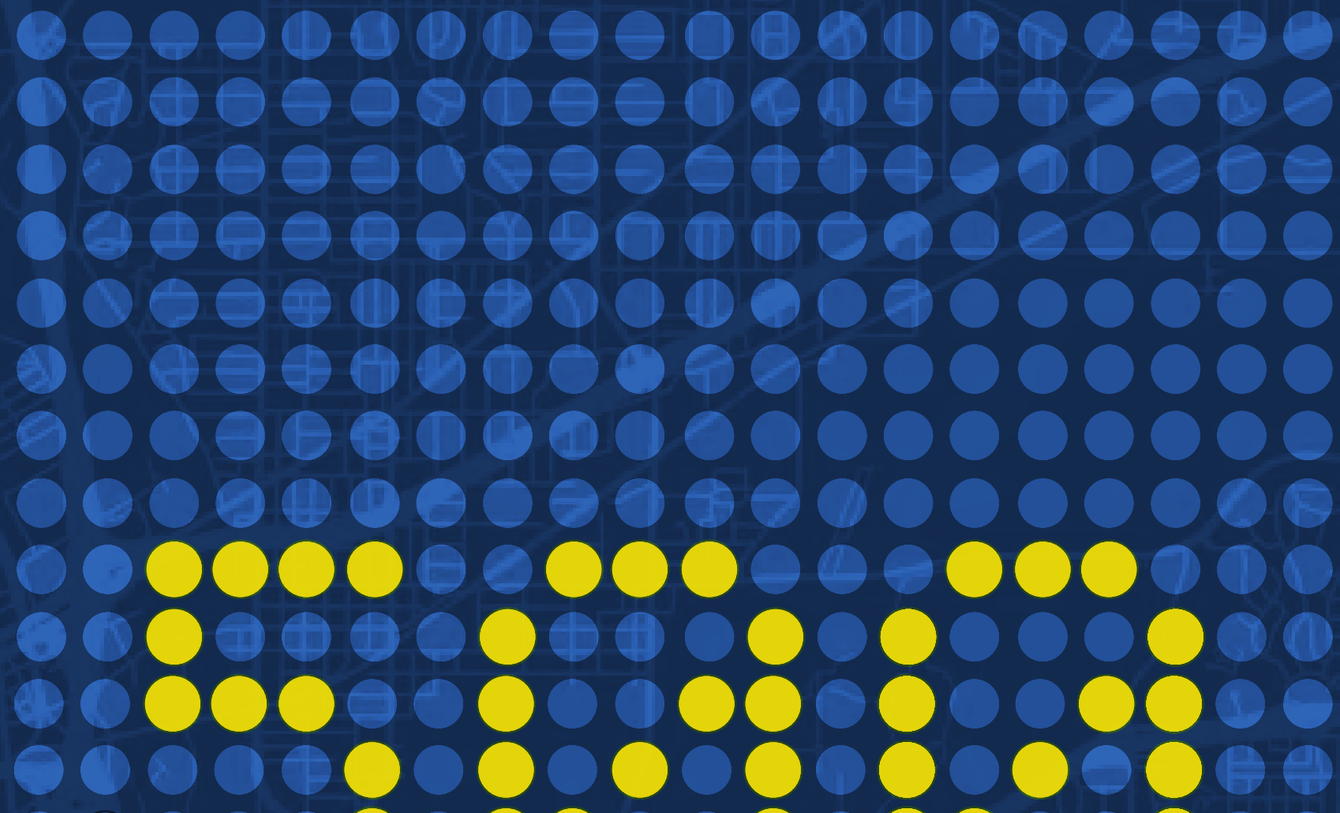
OUR GOAL

0

traffic fatalites and severe injuries on City of Fort Worth roadways by 2050.

1 INTRODUCTION

WHY DOES FORT WORTH NEED A SAFETY ACTION PLAN?



Over 500 people are killed or severely injured on Fort Worth roadways each year.

THE SAFE SYSTEM APPROACH

This Safety Action Plan is Fort Worth's roadmap to reducing roadway deaths and severe injuries. It is grounded in the Safe System Approach, which aims to eliminate deaths and severe injuries by anticipating human mistakes and minimizing impacts on the human body when crashes do occur.

The Safe System Approach is built around **six principles** and is backed by **five elements.**

SAFE SYSTEM APPROACH PRINCIPLES

1. Death & severe injury is unacceptable:

While minor incidents are almost inevitable, this plan focuses on preventing crashes that result in fatalities and severe injuries.

2. Humans make mistakes:

Even the best drivers will inevitably make mistakes that can lead to a crash. How we design and operate our transportation system can ensure these mistakes don't have life-altering impacts.

3. Humans are vulnerable:

Human bodies can only withstand so much impact from a crash before death or severe injuries occur.

4. Responsibility is shared:

Everyone involved in transportation, from elected officials to street designers to everyday people traveling around Fort Worth, has a role to play in creating safer roads.

5. Safety is proactive:

Rather than waiting for crashes to occur, transportation agencies should seek to proactively identify and address dangerous situations.

6. Redundancy is crucial:

Redundancy means using a layered approach where multiple design treatments are used to reinforce safe behaviors. This way, if one part fails, people are still protected.

SAFE SYSTEM ELEMENTS

1. Safe Road Users:

Working towards a culture of safety requires safe responsible driving and behavior by people who use the transportation system, as well as a network of City and civic partners who work together to address safety concerns.

2. Safe Vehicles:

Making vehicles safer can be done through advanced driver assistance systems and by ensuring future technology prioritizes vulnerable roadway users.

3. Safe Speeds:

Slower vehicle speeds increase visibility and reaction times for drivers and reduce impact forces when a crash occurs. Moving towards safe speeds can be done through speed limit reduction, traffic calming, and roadway design.

4. Safe Roads:

Safer roads come from providing physical separation (like separated bike lanes and sidewalks) as well as designing to accommodate needs.

5. Post Crash Safety:

A system-wide approach means working towards safety even after a crash has occurred. This comes from improving emergency response, traffic incident reporting, and traffic management.

HOW TO READ THIS PLAN

This Safety Action Plan will guide the City of Fort Worth's efforts to improve roadway safety and create safe streets for all users. The Safety Action Plan incorporates input from the Technical and Community Advisory Committees, as well as insights from community members throughout Fort Worth. The Safety Action Plan builds upon the City's past efforts, including the Vision Zero Resolution, Active Transportation Plan, Complete Streets Policy, and Master Thoroughfare Plan.

The implementation of this Plan will not be the responsibility of just one City department or division, rather it will be a collaborative process involving many different parties. The City will focus on both addressing issues on City-owned streets and working with County and State officials to improve streets owned by those agencies.

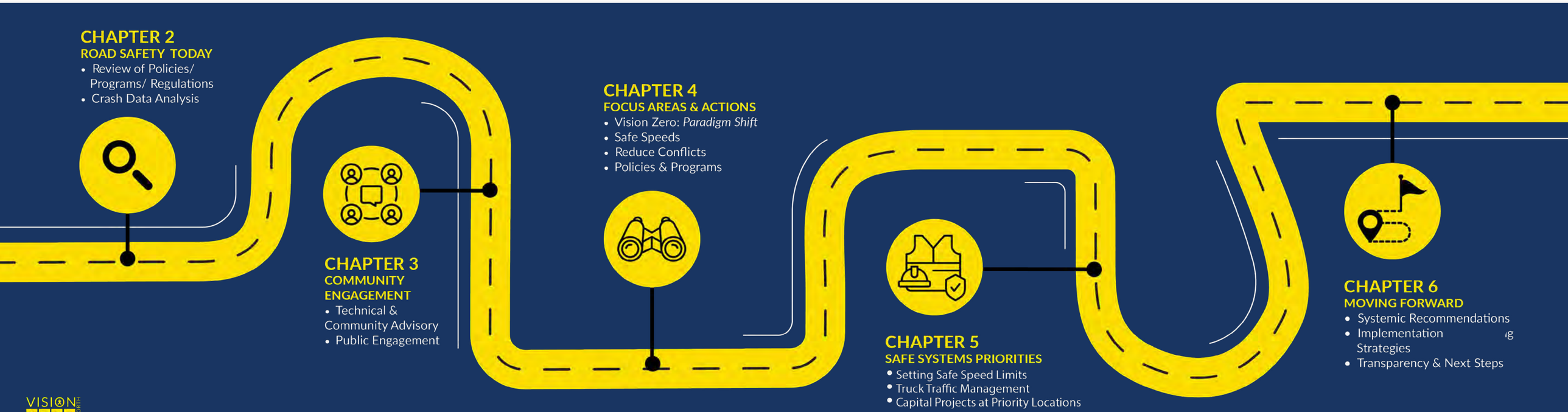
The Safety Action Plan identifies the state of road safety in Fort Worth by **reviewing past efforts and analyzing crash data** from the past five years. This review allows us to identify areas of concern and to focus our efforts on the areas with greatest need.

To complement this review, the City has worked closely with the **Technical and Community Advisory Committees**, which are composed of community members, local agency staff, and neighborhood elected officials. These individuals provided their unique perspectives as users of the Fort Worth roadway system to highlight areas of concern and focus our priorities. The study team also performed extensive **community engagement** throughout the development of this plan, which informed the Plan's priorities and actions.

From both the crash data analysis and community engagement, **four goals** were identified for the Safety Action Plan (Vision Zero: Paradigm Shift, Safe Speeds, Reduce Conflicts, Policies and Programs). Supporting these four goals, we have identified **34 safety action strategies** that will help the City improve traffic safety. These action strategies address the most important issues identified. For each safety action strategy, the Plan highlights the timeline, cost, leading party, and supporting party.

In addition to these Citywide goals and action strategies, we have identified specific **Priority Projects** for the implementation. These projects contain specific changes to corridors that have critical safety needs. These projects can improve roadway safety in Fort Worth.

The Safety Action Plan lays out **implementation strategies, funding strategies, performance measures** as well as a **transparency plan** to hold ourselves accountable. Fort Worth needs your help in implementing the Safety Action Plan. Read this Safety Action Plan and keep informed about the progress of its implementation. Provide feedback and input on the progress as we all work to make Fort Worth a safer place to get around.



IMPORTANT TERMS

VISION ZERO

A strategy aimed at eliminating all traffic fatalities and severe injuries while increasing safe, healthy, and fair access to mobility for all.

SAFE SYSTEM APPROACH

A holistic framework that acknowledges human error and vulnerability in crashes, emphasizing redundancy in roadway design, vehicle safety, and policies to prevent severe injuries and deaths.

TRAFFIC CRASH [NOT ACCIDENT!]

The word “accident” implies that these harmful and life-changing events are not preventable or avoidable. Traffic-related severe injuries and deaths are often preventable events for which there are proven solutions. As such, the Safety Action Plan refers to them as “crashes,” not “accidents.”

KILLED AND SEVERELY INJURED (KSI)

Killed and Severely Injured (KSI) stands for the highest level of severity resulting from a traffic crash with at least one person involved in the crash either dead or suffering incapacitating injury.

VULNERABLE ROAD USERS (VRU)

Vulnerable Road Users (VRUs) are those at most risk in a traffic crash by not being inside an enclosed vehicle. When they are involved in crashes, VRUs are more likely to be severely injured or killed.

HIGH INJURY NETWORK (HIN)

A data-driven map identifying streets and intersections with the highest concentration of fatal and severe crashes used to identify priority safety improvements.

SOCIAL VULNERABILITY

Social vulnerability refers to the potentially negative effects that external stressors have on communities. The Centers for Disease Control and Prevention (CDC) has developed a tool to help identify and map communities that are most likely to need support before, during, and after hazardous events. It measures the relative vulnerability of each U.S. census tract by ranking them on 16 social factors, including unemployment, racial and ethnic minority status, and disability status. These factors are grouped into four related themes, providing each census tract with a ranking for the individual variables, the four themes, and an overall ranking.

This tool was used to identify the most socially vulnerable communities in Fort Worth.

2 ROAD SAFETY IN FORT WORTH TODAY

PLANS, POLICIES, AND PROGRAMS

The City of Fort Worth's commitment to improving the safety and efficiency of its transportation system has led to numerous policies, regulations, plans, practices, and programs.

In developing the Fort Worth Safety Action Plan, the City reviewed its current plans, policies, and programs that support traffic safety. This includes an overview of policy frameworks, identification of potential policy gaps, and areas for improvement in both new and existing policies. By incorporating the takeaways from the policy review, along with data-informed analysis and public and stakeholder involvement, the SAP creates a holistic effort to identify and develop actionable strategies. A full review of the City's plans, policies, and programs can be found in **Appendix A**.

PLANS

Active Transportation Plan (ATP)

The Fort Worth ATP was adopted in 2019 and provides a shared vision for active transportation infrastructure priorities and a comprehensive framework for implementation. The ATP prioritizes infrastructure investments and emphasizes local, short trips and connections to transit. It includes prioritized project lists, cost opinions, and performance measures to guide investments and accountability.

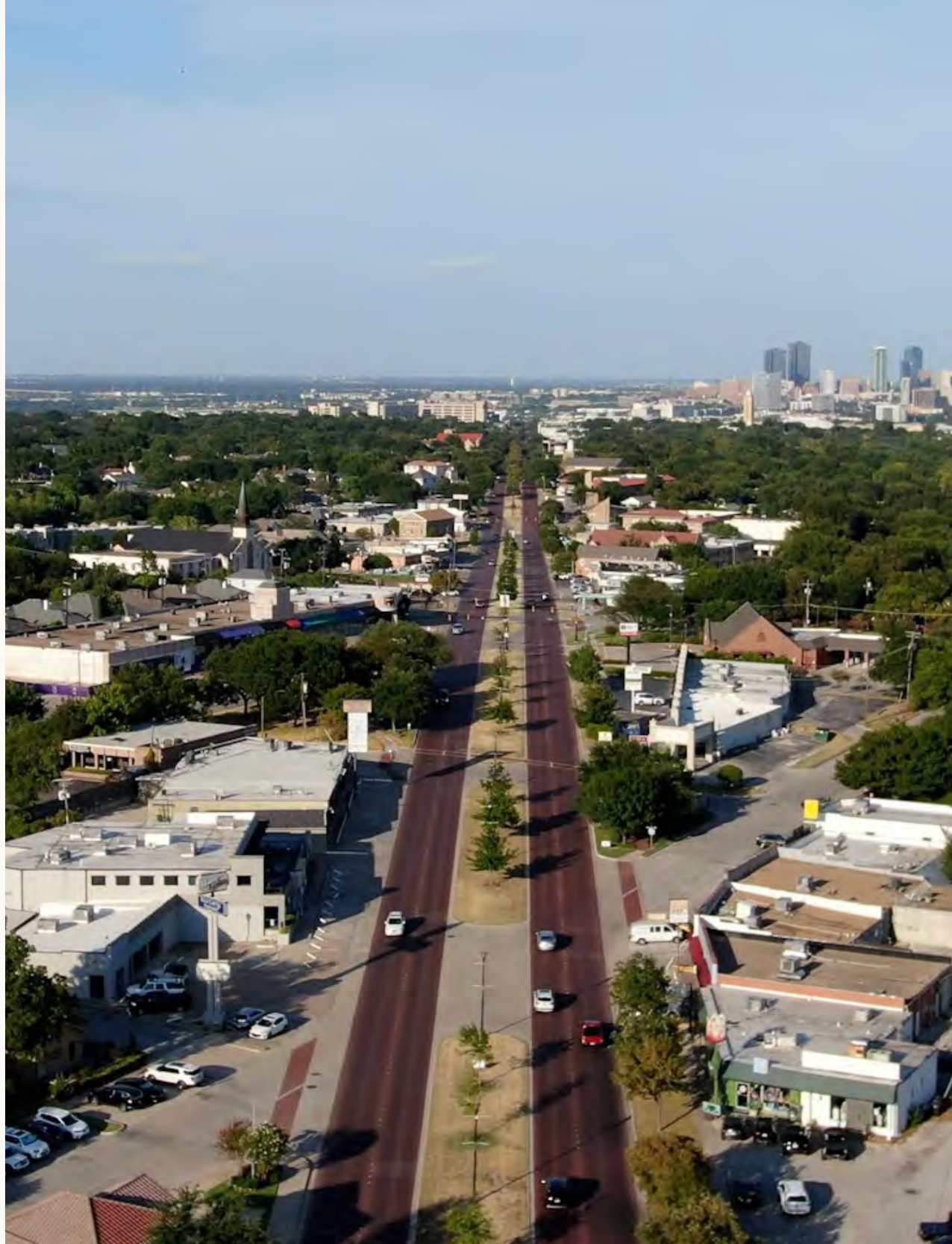
The ATP developed a policy framework based on input from stakeholders. The policy framework includes nine subjects that organize actions needed for implementation: Coordinated, Connected, Safe And Comfortable, Accessible, Equitable, Healthy, Community Awareness And Culture, Funding, and Economic Vitality.

Master Thoroughfare Plan (MTP)

The Fort Worth MTP was adopted by City Council in 2017 and updated in 2020. The goal of the MTP is to provide a complete and connected transportation system that supports mobility, safety and opportunity.

The MTP focuses on safety and comfort by narrowing street width where possible to facilitate pedestrian crossings, buffering people walking and biking from automobile traffic where appropriate, and providing space for streetscape elements to calm traffic.

The MTP sets Complete Streets as an ultimate goal for street design, with most streets in the City intended to have some level of accommodations for pedestrians and bicyclists. The MTP also incorporates the concept of target speed, which is the speed at which the roadway designer intends motorists to travel. This approach attempts to control vehicle speeds by implementing horizontal and vertical curves, narrower lane widths, and vertical elements (such as street trees).



POLICIES

Vision Zero Resolution

The City of Fort Worth adopted its Vision Zero Policy Resolution in 2019. The resolution supports a Vision Zero strategy to eliminate traffic fatalities and severe injuries in the City of Fort Worth.

While Fort Worth's Vision Zero resolution outlines key commitments, there are areas for enhancement. Although Vision Zero policies vary among different cities, key elements often include the safe system approach, community engagement, designing and maintaining roads to prioritize the safety of all road users, using data analysis to understand trends, managing speed for safe travel, and setting a clear timeline to achieve zero traffic deaths and severe injuries.

Complete Streets Policy

The City of Fort Worth adopted its Complete Streets Policy in 2016, together with the MTP. This policy is applicable to all development and redevelopment in the public domain in Fort Worth. To implement the policy, the City is working to incorporate Complete Streets principles into all existing plans, manuals, checklists, decision-trees, rules, regulations, and programs as appropriate. The design guidelines and standards will be updated to effectively implement Complete Streets. Staff trainings, project selection criteria, and project guides are recommended for implementation.

Fort Worth City Ordinances

The City of Fort Worth Ordinance, Chapter 22 covers the regulations related to motor vehicles and traffic. It highlights general traffic rules; truck traffic; operation of vehicles; crashes; stopping, standing, and parking; bicycle and pedestrian rules; and other aspects of traffic that have implications for the overall safety of all users of the city roads.

Relating to bicycles, the ordinances mandate the use of reflectors from 7pm to 5am, require the use of a proper seat and helmet, and prohibit cyclists from attaching themselves to vehicles or riding in a reckless manner. The ordinances also establish minimum separation distances when motorized vehicles are passing bicyclists or pedestrians.

Relating to pedestrians, the ordinances support pedestrian safety by establishing the right-of-way for pedestrians and vehicles, including that drivers must yield to pedestrians in crosswalks and pedestrians must yield to vehicles outside crosswalks. An update was made to the ordinances in 2001, adding provisions prohibiting solicitation on or near roadways.

Relating to truck traffic, the ordinances include provisions for designated truck and commercial delivery routes, restrictions on hazardous materials, and limits on vehicle dimensions and weight. These elements align with common regulations found in many truck traffic ordinances. This ordinance can support Vision Zero by having designated truck routes that avoid residential areas to limit the exposure of vulnerable road users to large trucks, enforcing weight and size restrictions to reduce the probability of accidents and mitigate crash severity, and providing hazardous materials transporting routes to minimize the risks of dangerous incidents in populated areas.

PROGRAMS

Transportation Management Programs

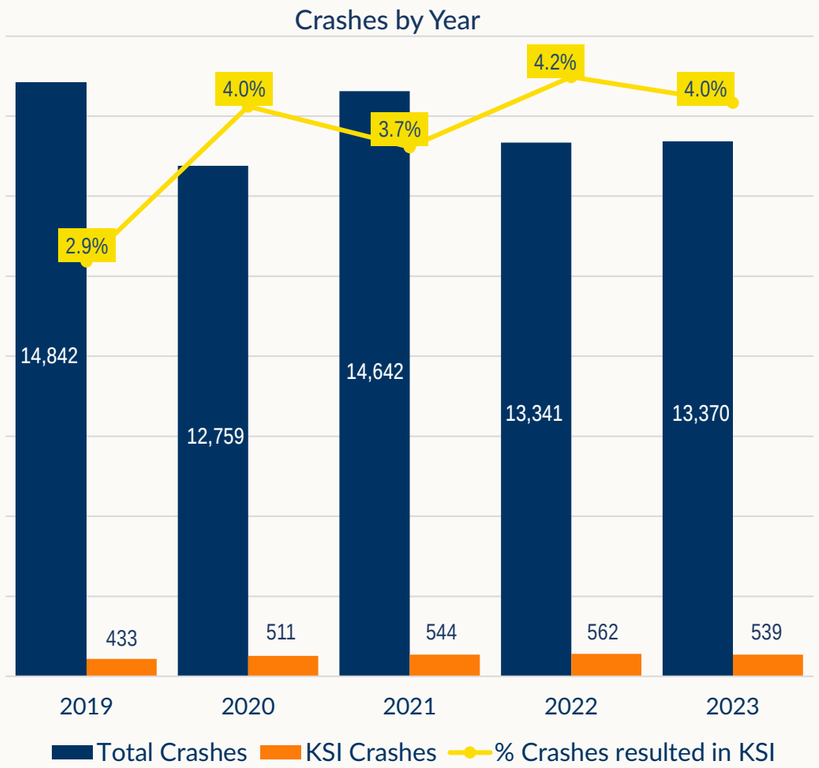
The Transportation Management division of the City's Transportation and Public Works Department is responsible for traffic operations and safety initiatives in Fort Worth. The division performs citywide maintenance of streetlights, traffic signals, and signs, fulfills utility relocation requests, performs signal retiming and signal design review for private development, and operates the Traffic Management Center. Additionally, the division administers the Sidewalk Program, School Crossing Guard Program, Parking Management and Operations, Right-of-Way Management, and receives all customer traffic safety requests for the city.

Transportation Management has key performance indicators for every service request type. Transportation Management's integration of Vision Zero-specific measures such as crash reduction targets into key performance indicators will be key to quantifying the division's success in improving traffic safety outcomes.

As part of the Vision Zero SAP process, the following areas have been identified as potential updates to the ordinance:

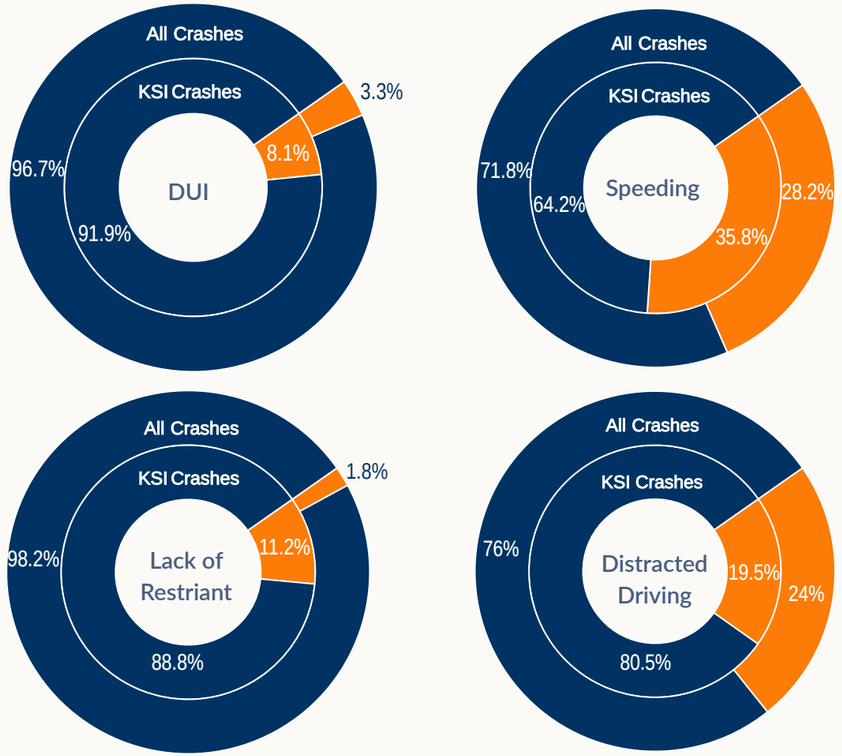
- Setting a clear timeline for achieving zero roadway deaths and sever injuries, also known as Vision Zero.
- Prioritizing safe speeds.
- Strengthening public engagement, particularly in underserved neighborhoods and the communities most impacted by traffic violence.
- Including clear metrics and responsibilities across city departments.
- Ensuring regular reporting and public transparency.

SAFETY IN NUMBERS



FIVE-YEAR TRENDS

Between 2019 and 2023, **68,936** crashes occurred in Fort Worth. Out of these, **533** resulted in a person dying and **2,056** resulted in severe injury. Crashes remained fairly steady from 2019 to 2023, with severe and deadly crashes comprising about 4% of total crashes per year. A full roadway safety analysis can be found in **Appendix B**.

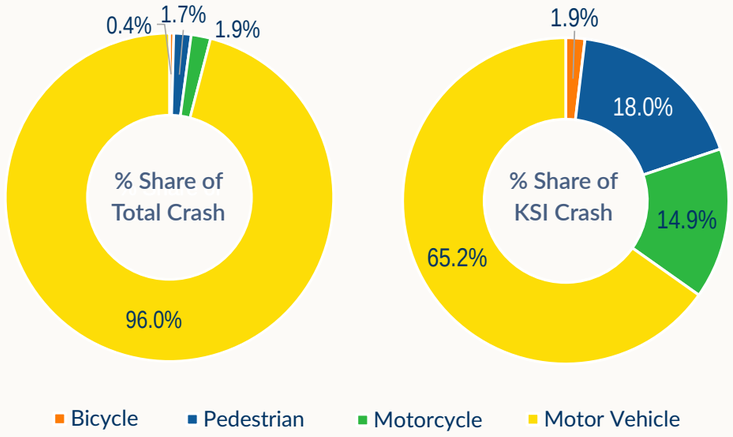


CONTRIBUTING FACTORS

Major factors that contributed to crashes, deaths, and severe injuries in Fort Worth included: **speeding, driving under the influence (DUI), lack of safety restraints (such as seat belts), and distracted driving.** The figures on the left show the percentage of all crashes and KSI crashes caused by these factors.

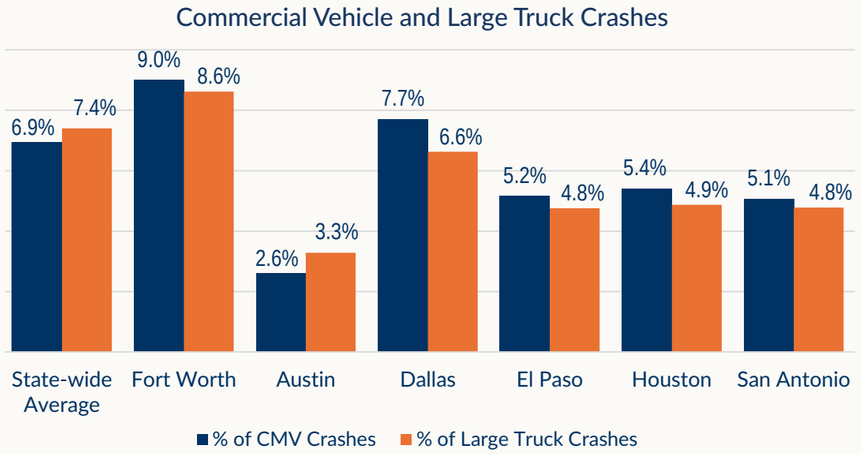
VULNERABLE ROAD USERS

Crashes involving bicycles, pedestrians, and motorcycles are much more likely to result in death or severe injury. These crashes accounted for only 4% of all crashes, but 34% of KSI crashes.



TRUCKS AND COMMERCIAL VEHICLES

Crashes involving large trucks and commercial motor vehicles made up a higher percentage of all crashes in Fort Worth, compared to the statewide average and other large Texas cities.



HIGH INJURY NETWORK

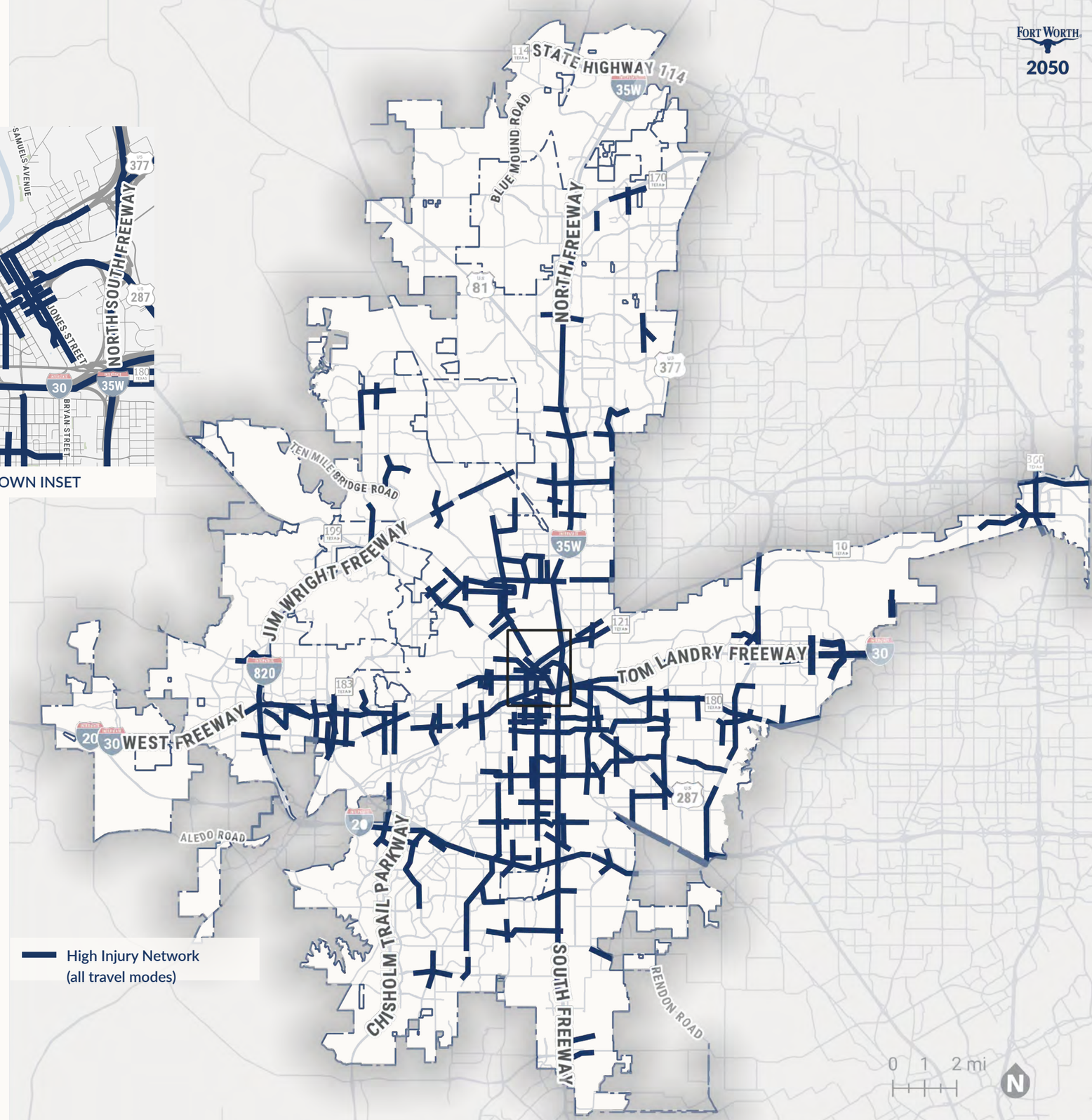
The **High Injury Network (HIN)** highlights corridors in Fort Worth with the highest concentration and severity of crashes, enabling the City to prioritize safety improvements where they are most needed. In developing the HIN, crashes are weighted by severity—fatal and severe injury crashes receive the highest weight.

Although the all-modes HIN covers just 6% of the city's streets, it accounts for 54% of all fatal and severe injury crashes.

Separate High Injury Networks that focus specifically on pedestrians, bicycles, motorcycles, commercial vehicles, and motor vehicles are in **Appendix B.**

The High-Injury Network comprises just 6% of the City's streets yet accounts for 54% of fatal and severe injury crashes.

DOWNTOWN INSET



SOCIALLY VULNERABLE COMMUNITIES

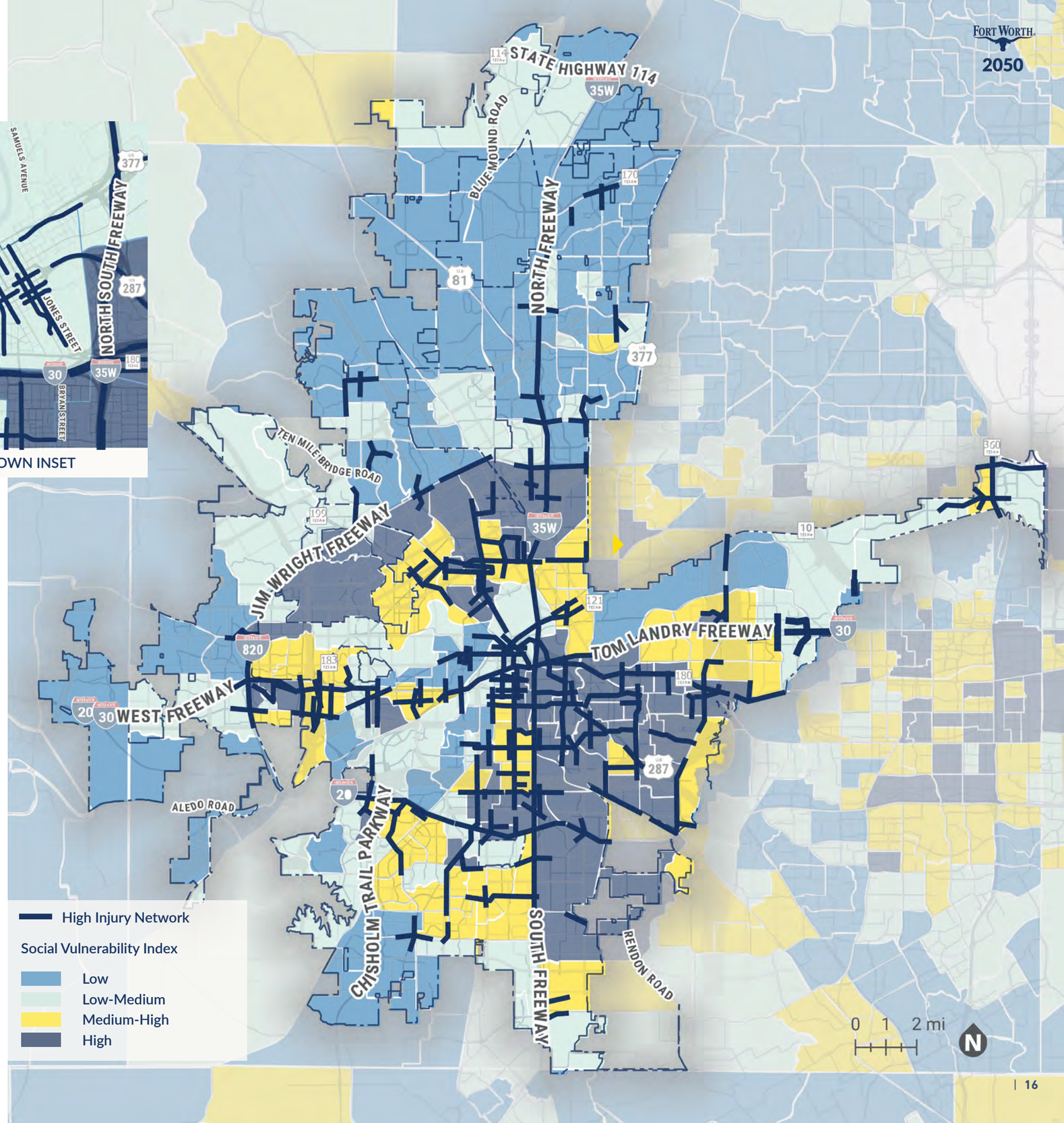
Addressing roadway safety in Fort Worth cannot be fully addressed without focusing on communities that face disproportionate roadway safety impacts. The roadway network in Fort Worth must work for everyone. For that reason, vulnerable groups are a focus throughout the Safety Action Plan.

The Safety Action Plan focuses its analysis on areas that score high on the Social Vulnerability Index (SVI), which is a tool developed by the Centers for Disease Control and Prevention (CDC) to help public health officials and emergency response planners identify and map communities that are most likely to need support before, during, and after hazardous events. It measures the relative vulnerability of each U.S. census tract by ranking them on 16 social factors. These factors are grouped into four related themes, providing each census tract with a ranking for the individual variables, the four themes, and an overall ranking.

These measures of social vulnerability were analyzed and compared with crash data to assess the level of disproportionate impact of crashes on vulnerable communities.

Over 34% of total crashes and 36% of severe and fatal crashes occurred in areas with high social vulnerability. Many of the corridors in the HIN are contained within areas of medium and high social vulnerability. Focusing on the corridors in these communities will help Fort Worth to address roadway safety in an equitable manner.

DOWNTOWN INSET



3 OUR COMMUNITY VOICES MATTER

WHAT WE DID

Safety planning, evaluation, and measuring performance are very data-driven processes. However, community input ensures that changes to infrastructure and policy meet the needs of diverse system users and highlights the need for shared responsibility and accountability.

Fort Worth community members participated in a variety of community engagement events where they provided important feedback that amplifies how the City can respond to a commitment to Vision Zero. These voices will drive the action to create safer streets, which our community deserves.

Engagement events and activities ranged from district open houses, steering committee meetings, community festival events, Trinity Metro Station outreach, newsletters, neighborhood association meetings, college campus visits, a project website, and online and paper surveys. Events were advertised through radio and news, neighborhood association email lists, social media, brochures and flyers, yard-signs, and business cards with QR codes.

300+ IN-PERSON OPEN HOUSE PARTICIPANTS

26 COMMUNITY EVENTS

IN-PERSON OPEN HOUSES **21**

OPEN HOUSE COMMENT CARDS **273**

1100 ONLINE SURVEY RESPONSES

1 PROJECT WEBSITE

2 NEWSLETTERS

14 MEETING INFORMATION POSTS

10 COMMITTEE MEETINGS

COMMUNITY AND TECHNICAL ADVISORY COMMITTEES

Fort Worth communities are comprised of many voices, from residents to elected officials, businesses, community advocates, and service agencies. **Two advisory committees** comprised of community advocates and agency representatives were formed to guide the planning process to ensure a strategic action plan customized for Fort Worth's varied contexts. They were tasked with:

- developing the plan's vision and purpose
- reviewing initial findings and analysis
- participating in discussions regarding messaging for engagement
- guiding the development of action strategies reviewing ongoing plan efforts.

Open House Events

The City held three rounds of open house events consisting of one open house in each council district per round of engagement in the first two rounds, plus a third in-person open house at the Hazel Harvey Peace Center and one virtual open house with live broadcasts on YouTube.

Open house events consisted of engagement activities for community input, including activities to prioritize goals, objectives, and measurable actions, countermeasure themes, participatory mapping of trips, hotspots, and network gaps, comment cards, and surveys.

In total, there were 23 open house events with participation by more than **300** participants generating **273** comments for the SAP.

COMMUNITY EVENTS

Outreach was conducted at 26 community events to gain input for the Vision Zero SAP and the parallel Moving A Million planning effort. Facilitators distributed traffic safety surveys, project information, and links to the Vision Zero website at each event.

Community events were chosen to engage with a diverse cross section of Fort Worth's population, emphasizing reaching underrepresented segments of the population. Many community events engaged large proportions of young people, people of color, those who are transit-dependent, do not speak English as a first language, and those who live in South/East Fort Worth.

The events varied in participation levels. The largest events were the Tarrant County Back to School Round-Up, Tarrant County Harambee Festival, and ArtsGoggle, each of which was attended by well over 1,000 people each.

LIST OF COMMUNITY EVENTS

DATE	OPPORTUNITY/EVENT	LOCATION
Aug. 2	Tarrant County Back to School Round-Up	Tarrant County College South Campus
Aug. 17	Shine With Loving Kindness Festival	Hương Đạo Buddhist Temple
Aug. 24	SteerFW Civic Summit	Amphibian Stage
Aug. 29	Fort Worth Report: Future of Transportation in Tarrant County panel	Texas Wesleyan University
Sept. 12	District 10 Town Hall	Texas Motor Speedway
Sept. 17	Booth at Texas Wesleyan University	Texas Wesleyan University
Sept. 19	Booth at Texas Wesleyan University	Texas Wesleyan University
Sept. 23	Polytechnic Neighborhood Association	Ridglea Hills Elementary School
Sept. 25	Booth at Tarrant County College South Campus	Tarrant County College South Campus
Sept. 26	Booth at Tarrant County College South Campus	Tarrant County College South Campus
Oct. 1	National Night Out - Historic Southside: Neighborhood Association	Glenwood Park
Oct. 1	National Night Out - Ventana HOA	Ventana Amenity Center
Oct. 5	Tarrant County Harambee Festival	William M. McDonald YMCA
Oct. 14	Trinity Metro - Sierra Vista	Sierra Vista Transfer Center
Oct. 14	Trinity Metro - La Gran Plaza	La Gran Plaza Transfer Center
Oct. 16	Trinity Metro - Central Station	Fort Worth Central Station
Oct. 17	Trinity Metro - Dr. Dennis Dunkins	Dr. Dennis Dunkins Transit Center
Oct. 19	Harvest Community Fair	Turning Point Church
Oct. 19	ArtsGoggle	Near Southside (Magnolia Avenue)

SURVEYS

An electronic survey was administered online and distributed via the newsletter, social media, and project website. Participants at the community events were provided the opportunity to take a short paper survey.

In total, **1100 online survey responses** and **273 comment cards** were received from the public.

TRAFFIC SAFETY SURVEY

Traffic Safety Survey

Age: ZIP code:

What are Fort Worth's biggest traffic safety problems?

What are the most dangerous places in Fort Worth (for driving, biking, walking, etc.)?
You may list as many places as you want.

For a chance to win $100 grocery gift card, please share your email address.
The winner will be notified at the conclusion of the survey.

For more information, visit www.MovingAMillion.org and click on Safety Action Plan.

SPANISH TRANSLATED SURVEY

Encuesta de seguridad vial

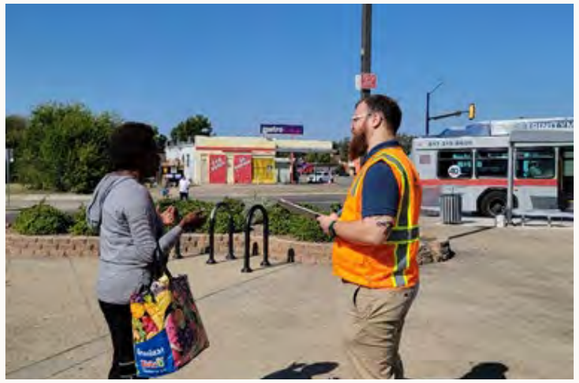
Edad: Código postal:

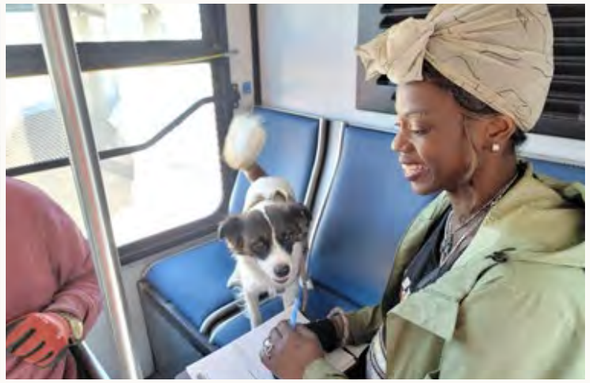
Cuáles son los mayores problemas de seguridad vial de Fort Worth?

¿Cuáles son los lugares más peligrosos de Fort Worth (para conducir, ir en bici, caminar, etc.)?
Puede enumerar tantos lugares como desee.

Para tener la oportunidad de ganar una tarjeta regalo de $100 para el supermercado, comparta su dirección de correo electrónico. El ganador será notificado al final de la encuesta.

Para más información, visite www.MovingAMillion.org.





Trinity Metro Transfer Station Outreach

Tarrant County Harambee Festival

ArtsGoggle

National Night Out

WHAT WE HEARD

COMMUNITY PRIORITIES

Based on extensive community engagement, the overarching priorities that we heard were:

PEDESTRIAN SAFETY

+

ACCESSIBILITY

+

MOBILITY

+

PROTECTED BIKE FACILITIES

+

MANAGING CONGESTION

COMMUNITY-DESIRED SAFETY ACTIONS

1

Make the transportation system more connected and accessible by adding and enhancing key infrastructure components such as lighting, wayfinding signage, street trees, sidewalks, crosswalks, ramps, and protected bike facilities.

2

Increase driver safety education and enhance enforcement to mitigate unsafe driving behaviors.

3

Redesign roadways to include complete street elements, reduce vehicle speeds, and prioritize people.

4 GOALS & ACTION STRATEGIES

SAFETY ACTION STRATEGIES

OVERVIEW & ORGANIZATION

The Fort Worth Vision Zero Action Strategies are 34 detailed ways to address specific safety challenges through a holistic approach to reducing fatal and severe injury crashes. These actions are prioritized based on the city's safety needs, crash analysis, and input from the Community and Technical Advisory Committee, as well as city staff. They are intended to supplement and support location-based project recommendations designed to address acute design and infrastructure needs for higher risk roadways.

ACTION STRATEGY SELECTION AND PRIORITIZATION

The basis for the Recommended Action Strategies and additional actions is drawn from best practices in safety planning and a thorough review of safety actions from a variety of regions across Texas and the U.S. Specific attention was given to actions based on FHWA's Proven Safety Countermeasures, which research has shown are particularly effective in reducing fatal and severe crashes. A list of potential action strategies was developed using detailed analysis of Fort Worth's crash data, a review of prior planning and policy efforts, and direct input from the stakeholders who will be involved in implementing the Fort Worth Vision Zero Safety Action Plan.

To further develop the draft Action Strategies list, the project team reviewed recent planning documents, including Texas Department of Transportation (TxDOT) Fort Worth District Safety Plan 2024 and draft findings from concurrent Fort Worth 2050–Moving a Million project deliverables. These introduced specific findings related to freight and commercial vehicle safety, speeds, and speed limit setting, which emerged as primary contributing factors to safety needs.

The project team presented a draft list of 54 potential recommendations during an Action Strategies Workshop in early December 2024. During the workshop, 26 stakeholders representing public, private, and nonprofit-sector stakeholders reviewed and prioritized the draft action strategies.

RECOMMENDED ACTION STRATEGIES

The following tables represent the 34 Safety Action Strategies that were prioritized during the December Stakeholder Workshop, which included city staff as well as members of the Technical Advisory Committee and Community Advisory Committee. An additional 20 strategies that were not indicated as priorities but which may warrant further consideration can be found in **Appendix H**.

The Safety Action Strategies are organized under the Plan's four safety goals: **Vision Zero: Paradigm Shift; Safe Speeds; Reduce Conflicts;** and **Policies and Programs**. They are further categorized under 18 focus areas:

- **ACCESS MANAGEMENT**
- **COMMERCIAL MOTOR VEHICLES (CMV) & FREIGHT**
- **COMMUNICATIONS**
- **COORDINATION**
- **CROSSINGS**
- **DATA ANALYSIS**
- **DEMAND MANAGEMENT**
- **EDUCATION**
- **GUIDELINES**
- **INTERSECTIONS**
- **MAINTENANCE**
- **NETWORKS**
- **REPORTING**
- **ROAD SAFETY AUDITS**
- **SAFETY COMMITTEE**
- **SAFE ROUTES TO SCHOOL (SRTS)**
- **SPEED**
- **TRANSIT**

Each strategy includes stakeholder input on implementation roles, partnerships, and considerations, including a high-level summary of the following factors:

TIIMELINE

IMMEDIATE:	Less Than 1 Year
SHORT:	1 To 3 Years
MEDIUM:	3 To 5 Years
LONG:	Over 5 Years

COST

$	Under $100,000
$$	$100,000 TO $250,000
$$$	$250,000 To $1 Million
$$$$	$1 Million To $5 Million
$$$$$	Over $5 Million

GOAL 1

VISION ZERO PARADIGM SHIFT

Vision Zero represents a fundamental change in how we approach transportation safety. Traffic deaths are not inevitable; they are preventable. This goal rejects the status quo and demands a bold commitment: human life must come first in every transportation decision.

GOAL 1 | VISION ZERO - PARADIGM SHIFT

1.1 TRUCK TRAFFIC ORDINANCE

Evaluate and consider amending Fort Worth Code of Ordinances Chapter 22, Article IV: Truck Traffic to better align with the city's evolving goals of protecting health, safety, and welfare and strengthen freight transportation safety and efficiency. Truck route designations could be updated to reflect current freight needs and consider future freight volume growth. Additional regulations of truck parking (e.g., prohibiting commercial vehicles from parking in residential areas during certain hours), loading zones (designated curb space for loading and unloading with appropriate signs and enforcement), and driver rest periods (mandatory rest break for truck drivers, referencing practices in peer cities) could be incorporated into the ordinance.

FOCUS AREA
CMV/Freight

COST
$

SUPPORT AGENCY
TxDOT, City Commercial Vehicle Enforcement (CVE)

TIMEFRAME
Short

LEAD
TPW

NEEDS
Data Tools, Staff Capacity

1.2 FREIGHT TRANSPORTATION PERFORMANCE MEASURES

Incorporate specific freight transportation performance measures into safety and mobility reporting and dashboards. Key metrics may include vehicle classification counts, facility inventory updates, reduction in annual number of crashes, travel speeds for truck and non-truck traffic, improved Truck Travel Time Reliability, and number of truck parking locations. This effort should include identifying the sources and ownership of relevant data and prioritizing facilities for inventory, given the current lack of a citywide vehicle count. Additionally, coordination with NCTCOG will be essential to align on travel time reliability performance measures.

FOCUS AREA
CMV/Freight

COST
$$

SUPPORT AGENCY
NCTCOG, Texas A & M Transportation Institute (TTI)

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Data Tools, Staff Capacity

1.3 INTEGRATE FREIGHT, TRANSPORTATION, AND LAND USE PLANNING

Analyze the geographic distribution of freight facilities, origins, and destinations for long-haul, through, and local truck trips, and commercial vehicles volumes and speeds to directly inform planning decisions, including reserving right-of-way for future freight corridors. Identify and designate truck routes that align with Fort Worth's land-use plans, strategically cluster freight siting and investments, and ensure surrounding land uses and transportation corridors are compatible. Prioritize Complete Streets-informed designs that incorporate freight needs and include context-sensitive design approaches tailored specifically to freight. Focus on facilitating freight transportation on key corridors and zones to divert truck traffic from residential areas, school zones, and pedestrian districts.

FOCUS AREA
CMV/Freight

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT

TIME
Short to Mid

LEAD
TPW, Planning, Economic Development

NEEDS
Plan/Study

GOAL 1 | VISION ZERO - PARADIGM SHIFT

1.4

PUBLIC COMMUNICATIONS CAMPAIGN

Develop a comprehensive multimedia public communications safety campaign to educate the community and promote transportation safety for all roadway users and all modes. Key considerations and tactics should include:

- **Aligning** with existing communication efforts to ensure consistency and effectiveness, while incorporating relevant data to support messaging and measure impact.
- **Focusing** on storytelling, such as stories of the personal and social impacts of traffic violence, neighborhood and project success stories, and messaging from trusted community leaders.
- **Content** tailored to specific audiences and platforms, including short-form video, earned media, and social media content, targeted print media, radio, television, and streaming services.
- **Outreach** to media partners to report traffic crashes more accurately and avoid victim blaming, specifically for VRUs.
- **Messaging & media** targeting drivers to promote safer driving, reduce driver distractions, and improve yielding to pedestrians and other VRUs.
- **Using languages,** messaging, and ambassadors representative of the cultural, generational, and demographic diversity of the Fort Worth community.

FOCUS AREA
Communications

COST
$$-$$$

SUPPORT AGENCY
NCTCOG

TIME
Mid to Long

LEAD
TPW, Communication

NEEDS
Partnerships; Plan/ Study, Staff Capacity

GOAL 1 | VISION ZERO - PARADIGM SHIFT

1.5

SAFETY PROJECTS AND PROGRAM ENGAGEMENT

Embed transportation safety into existing community engagement efforts and increase staff capacity for outreach related to safety-focused programs, policies, and infrastructure projects. Develop standard language regarding Vision Zero and roadway safety that is informed by and reflects the values and perspectives of the community. Conduct training for city agencies, staff, and partners to promote consistent messaging when interacting with media, community partners, and the public. Specific tactics may include:

- **Maintaining** communications tools that aid staff in sharing traffic safety-related information when doing engagement on street projects.
- **Developing** processes and funding to support community-based organization participation in the development and delivery of safety efforts.
- **Piloting** follow-up engagement at select locations where traffic safety improvements were installed as part of project evaluation.
- **Routinely incorporating** community input – specifically from underrepresented communities – throughout the planning and implementation of transportation safety projects.
- **Hosting** Vision Zero / Complete Streets design trainings and workshops for local government staff, elected officials, TxDOT project managers, consultants, and other stakeholders in project delivery.

FOCUS AREA
Communications

COST
$$

SUPPORT AGENCY
TxDOT, Communications

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Partnerships; Plan/ Study, Staff Capacity

1.6

VISION ZERO COORDINATOR

Create an upper-management level office Vision Zero coordinator position within City government tasked with promoting collaboration, managing implementation, and evaluating transportation safety progress across agencies and organizations. This position should be supported by cross-departmental staff assigned to the collaborative implementation of this plan and should ensure the City can proactively address safety efforts. The coordinator may also provide additional support in regional and state-level planning and implementation processes. Additionally, assess and consider increasing departmental capacity by redesignating or creating new positions dedicated to planning, designing, and implementing Vision Zero and safety projects.

FOCUS AREA
Coordination

COST
$$

SUPPORT AGENCY
City Council

TIMEFRAME
Immediate

LEAD AGENCY
TPW

NEEDS
Staff Capacity

GOAL 1 | VISION ZERO - PARADIGM SHIFT

1.7

STATE AND REGIONAL PARTNERSHIPS

Work with planning and funding partners, including TxDOT, NCTCOG, counties, neighboring jurisdictions, and representatives from developers to coordinate safety plans, strategies, projects, and campaigns. Strengthen partnerships to identify shared goals and objectives and promote consistent safety strategies across local and regional boundaries, prioritizing data sharing and collaboration. Some examples of potential collaborations include:

- **Aligning** thoroughfare plans with neighboring cities and the state to improve consistent design and safety on major regional corridors.
- **Advocating** for local priorities in state projects and policies, such as safe speed limit setting and design/infrastructure treatments for traffic calming paired with speed studies and education efforts.
- **Meeting routinely** with TxDOT to share data, identify streets of concern, develop consistent policies, and advance joint projects.

FOCUS AREA
Coordination

COST
$$

SUPPORT AGENCY
NCTCOG, TxDOT, Toll Authorization

TIMEFRAME
Ongoing

LEAD AGENCY
TPW

NEEDS
Partnerships, Plan/Study

1.8

SAFETY EDUCATION-LIFELONG LEARNING

Develop a suite of educational tools to reach community members at various stages of learning, from early childhood through post-secondary education and vocational training. These tools should include curriculum and educational materials suitable for a wide variety of settings, audiences, and delivery methods, and should broaden capacity through a “train-the-trainer” program. Specific target groups and approaches include:

- Elementary and middle school-age children and parent organizations.
- High-school and post-secondary level driver education.
- Professional driver education and fleet training and management.
- Volunteer and civic learning programs such as Citizens Police Academy and Leadership Fort Worth.
- Employers and office campuses.

FOCUS AREA
Education

COST
$$

SUPPORT AGENCY
TPW, Planning, Communications

TIMEFRAME
Immediate

LEAD AGENCY
TPW, All School Districts Private and Charter Schools

NEEDS
Partnerships, Plan/Study

GOAL 1 | VISION ZERO - PARADIGM SHIFT

1.9

TRANSPORTATION SAFETY DASHBOARD

Develop a citywide Transportation Safety Dashboard to track progress toward Fort Worth's Vision Zero goals, share summary safety data, highlight key safety projects, and communicate successes and lessons learned through implementation and evaluation. Publish an annual report to document implementation status of the Action Plan.

FOCUS AREA
Reporting

COST
$$

SUPPORT AGENCY
Information Technology, Communications

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Data Tools, Staff Capacity

1.10

VISION ZERO TASK FORCE / ROAD SAFETY ADVISORY COMMITTEE

Form a permanent advisory body to advise and support Vision Zero implementation, incorporating diverse perspectives from city departments and key stakeholders. This group should include representatives from Communications, Police, Fire, and Public Works and be tasked with reviewing crash reports and safety data, making recommendations for site-specific and systemic changes to eliminate future risk, and conducting activities like Road Safety Audits (RSAs). The committee's work should also include ride, bike, or walk-along assessments of streets with input from Neighborhood Associations and Neighborhood Patrols to better understand local safety concerns. Staff should provide the group with regular updates on traffic safety data, training in accessing and understanding traffic safety data, and support for tracking Vision Zero performance and determining strategies for improvements.

FOCUS AREA
Safety Committee

COST
$

SUPPORT AGENCY
Police, Fire, TxDOT, NCTCOG, NGOs, Advocates

TIMEFRAME
Immediate

LEAD AGENCY
TPW

NEEDS
Data Tools, Legislative Action, Staff Capacity

1.11

SAFE ROUTES TO SCHOOL

Establish a citywide or district-wide Safe Routes to School (SRTS) program and develop a schedule for completing school travel and safety action plans. Plans should identify both infrastructure and programming recommendations to increase safety, comfort, and convenience of walking, bicycling, or rolling to schools. Install safety projects near schools, including installing high visibility crosswalks and midblock crossings, walkways and bikeways, and enforcement measures.

FOCUS AREA
Safe Routes To School (SRTS)

COST
$$

SUPPORT AGENCY
NCTCOG, Adjacent Municipalities, School Districts, Charter and Private Schools

TIMEFRAME
Mid

LEAD AGENCY
City, TxDOT

NEEDS
Data Tools, Legislative Action, Staff Capacity

GOAL 2

SAFE SPEEDS
DESIGNING FOR LIFE

Speed kills and driving slower saves lives. This goal combines street design, policy, education, and behavioral change to ensure speeds are safe for all. By shaping both infrastructure and culture, we create streets that prevent deadly consequences and prioritize human life.

GOAL 2 | SAFE SPEEDS - DESIGNING FOR LIFE

2.1 LOCAL SPEED ZONES

Create localized speed zones, similar to school zones, to address locations with higher multimodal needs and high crash risks, including areas around schools, parks, and transit facilities. These zones should incorporate appropriate speed management treatments (e.g., signs, markings, speed tables) and connectivity improvements paired with lower posted speed limits. Collaborate with the Police Department to ensure effective enforcement of speed limits and compliance within these zones.

FOCUS AREA
Speed

COST
$$

SUPPORT AGENCY
Libraries, Parks and Recreation

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Partnerships, Plan/ Study, Project Funding

2.2 SPEED LIMIT SETTING

Evaluate and update the City's policy for setting posted speed limits on local roadways to de-emphasize the 85th percentile approach and use a more contextual approach to speed limit setting (SLS). The City's SLS policy should rely on the latest best practice in understanding the impact of speeds on roadway safety and be paired with design and infrastructure improvements to set and enforce safe speeds. Additional factors for SLS should include traffic volumes, road geometry, traffic control devices, multimodal access needs, and surrounding land use and development density.

FOCUS AREA
Speed

COST
$-$$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Immediate

LEAD AGENCY
TPW

NEEDS
None

2.3 SPEED MANAGEMENT

Evaluate posted speed limits and speeding-related crashes along the HIN and major thoroughfares; using the updated speed limit setting (SLS) policy recommended in this plan, identify corridors for speed studies and propose design, signalization, and infrastructure improvements to accompany reduced speed limits. Implement speed management on local roadways and seek agreement from TxDOT to reduce speed limits and manage speeds along on-system roadways.

FOCUS AREA
Speed

COST
$$

SUPPORT AGENCY
TxDOT, Counties, NCTCOG

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Plan/Study, Project Funding

GOAL 2 | SAFE SPEEDS - DESIGNING FOR LIFE

2.4

EVALUATE LOCAL NETWORK INTERSECTIONS WITH STATE HIGHWAYS AND INTERSTATES

Assess intersections between the local network and state highways or interstates, including all interstate off-ramps, to identify design and infrastructure opportunities that reduce speeding during transitions to city streets. This evaluation should also consider improvements to signage for motorists to enhance clarity and promote safer driving behavior at these critical transition points.

FOCUS AREA
Speed

COST
$

SUPPORT AGENCY
TxDOT

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Plan/Study, Partnerships

2.5

PRIORITIZE SAFETY IMPROVEMENTS ON TWO-LANE ROADWAYS

Identify and prioritize high-risk two-lane corridors and intersections for design improvements, infrastructure enhancements, and appropriate speed limit reductions, as over 40% of total crashes and 35.4% of KSIs—including 31% of VRU KSIs—occur on two-lane roadways that are often under local control for speed management. As a short-term, high-impact opportunity, focus on locations where immediate action is feasible. Develop and implement a data-driven prioritization plan to systematically assess crash history and risk factors, ensuring targeted safety interventions at the most critical locations.

FOCUS AREA
Speed

COST
$$$

SUPPORT AGENCY

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Plan/Study, Project Funding

2.6

FOSTER PARTNERSHIPS WITH PRIVATE-SECTOR EMPLOYERS AND VEHICLE FLEET MANAGERS

Collaborate with private-sector employers and fleet managers to implement safety actions aimed at promoting safe driving and reducing the negative impacts of large commercial vehicles. Begin by engaging with the private industry to understand existing practices and initiatives addressing these issues. Safety strategies could include:

- **Installation** of speed governors/regulators on trucks and other CMVs.
- **Safety education** and training for fleet drivers.
- **Diversifying** fleets with smaller vehicles for service or delivery in specific context zones, particularly for the 31% of trips that are under 10 minutes.
- **Collaboration** on truck size restriction and truck route setting policies.

FOCUS AREA
CMV/FREIGHT

COST
$$

SUPPORT AGENCY
None

TIMEFRAME
Short to Mid

LEAD AGENCY
NCTCOG, Regional Freight Advisory Committee (RFAC)

NEEDS
Partnerships

GOAL 3

REDUCE CONFLICTS

PREVENTING CRASHES BEFORE THEY HAPPEN

The more seamlessly different modes of travel interact, the safer our streets become. This goal focuses on street design that minimizes conflicts—through smart infrastructure, clear separation where needed, and intuitive spaces that protect all road users.

GOAL 3 | REDUCE CONFLICTS

3.1 ACCESS MANAGEMENT NEEDS ASSESSMENT

Conduct a detailed analysis of traffic conditions and crashes related to vehicle turning movements and commercial vehicles access on thoroughfares and other applicable roadways citywide (beginning with the HIN) to identify locations where access management improvements can be used to improve safety for all modes.

FOCUS AREA
Access Management

COST
$$-$$$

SUPPORT AGENCY
NCTCOG, Counties, TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Plan/Study

3.2 ACCESS MANAGEMENT POLICY

Update the City's 2018 Access Management Policy based on the findings of the Master Transportation Plan, Safety Action Plan, and related plans (Metropolitan Transportation Plan, Master Thoroughfare Plan, etc.) and recommended Access Management Needs Assessment to strengthen standards and prioritize access management projects, in particular hardened centerline and median installations, in the City's capital improvements.

FOCUS AREA
Access Management

COST
$

SUPPORT AGENCY
None

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW, Development Services

NEEDS
Plan/Study

3.3 COORDINATE WITH REGIONAL PARTNERS

Collaborate with NCTCOG and TxDOT to align Fort Worth's truck routes with regional freight corridors. This coordination will promote a cohesive and efficient regional network that minimizes unexpected detours and bottlenecks.

- **Update** truck route street designations to reflect current freight needs, future freight volume growth, and vehicle weight capacity, ensuring roads are rated appropriately for the vehicles using them.
- **Incorporate** enforcement and communication strategies to ensure compliance and improve awareness among freight operators.
- **Analyze** crash data to identify the percentage of crashes occurring on freight corridors and connect these findings with regional freight corridors to target safety improvements.
- **Differentiate** between smaller commercial vehicles and 18-wheelers when updating route designations and planning infrastructure to meet the specific needs of each vehicle type.

FOCUS AREA
CMV/Freight

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW, Planning

NEEDS
Data Tools, Partnerships, Staff Capacity

GOAL 3 | REDUCE CONFLICTS

3.4

REAL-TIME MONITORING AND MANAGEMENT ON KEY FREIGHT CORRIDORS

- **Real-Time Monitoring:** Track traffic volumes, crash data, and congestion trends on key freight corridors to quickly identify and address problem areas, leveraging technologies and communications systems, such as cameras and sensors, from initiatives like the Infrastructure for Rebuilding America (INFRA)Grant for Alliance Inland Port.
- **Adaptive Signal Control:** Equip key intersections with adaptive signals that adjust timing based on real-time conditions to reduce delays and congestion-related incidents. Integrate these systems with the existing TPW Traffic Management Center for streamlined operations.
- **Dynamic Lane Management:** Designate truck-only lanes or apply peak-hour lane adjustments to improve flow on freight corridors.
- **Freight and Curb Management:** Develop curb management strategies for freight trucks, ride-sharing services, and parking along busy corridors to optimize space and minimize congestion.
- **Freight Management Strategies:** Expand the use of technologies such as real-time route optimization, smart parking management, adaptive traffic signals, and enhanced data collection. Consider implementing systems to adjust freight drop-off and pick-up times to avoid peak congestion and extend these solutions into the public realm for broader impact.

FOCUS AREA
CMV/Freight

COST
$$$-$$$$

SUPPORT AGENCY
TxDOT

TIMEFRAME
Mid to Long

LEAD AGENCY
TPW, NCTCOG

NEEDS
Data Tools, Project Funding, Staff Capacity

3.5

OPTIMIZE INTERSECTIONS FOR TRUCK SAFETY

Redesign intersections on primary freight routes to accommodate large vehicles turning at safe speeds, reducing crash risks and conflicts with other modes. Intersection designs should prioritize safety and efficiency for the specific types of vehicles expected to use the road while ensuring that pedestrian and freight infrastructure are not treated as mutually exclusive. Design solutions should address the needs of both modes, recognizing that certain design choices must balance the safety of all users as the top priority. Incorporate these design considerations into the transportation engineering manual to standardize best practices across future projects.

FOCUS AREA
CMV/Freight

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW, Planning

NEEDS
Data Tools, Partnerships, Staff Capacity

GOAL 3 | REDUCE CONFLICTS

3.6

INTEGRATE HIGH-WATER WARNING SYSTEM (HWWS)

The City has identified approximately 400 roadway locations requiring flood mitigation or improved safety and flood warning measures, presenting a vital opportunity to integrate transportation safety with broader hazard and disaster preparedness. Implement high-water warning flashing beacons, enhanced lighting, barriers, and robust emergency communication systems to significantly reduce risks to both motorists and pedestrians during flooding events. Consider installing automated crossing arms to physically restrict access to hazardous areas during high-water incidents, providing an added layer of safety and protection. Integrate flood warning notifications with apps (such as 511DFW and WAZE) and assisted driving within vehicles, and integrate the HWWS with external traffic management signals, e-signs, and roadside signage to better warn and navigate drivers around flooded roadways.

FOCUS AREA
CMV/Freight

COST
$-$$

SUPPORT AGENCY
TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Legislative Action, Plan/ Study

3.7

ACTIVE TRANSPORTATION CROSSINGS

Evaluate warrant requirements and guidance and update city policies according to best practice for the placement, design, and installation of high-visibility crossing treatments, mid-block crossings, flashing or hybrid beacons, pedestrian refuge islands, grade separated active transportation crossings, and safety-focused signal enhancements.

Evaluate existing signal timing, crossing distances, and crosswalk spacing to prioritize pedestrian crossing improvements including leading pedestrian intervals, median refuge islands, high-visibility mid-block crossings, rapid rectangular flashing beacons (RRFB), pedestrian hybrid beacons (PHB), and pedestrian friendly cycle lengths based on a maximum of 3 feet per second of walking speed.

FOCUS AREA
Crossings

COST
$-$$

SUPPORT AGENCY
TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Legislative Action, Plan/ Study

3.8

IDENTIFY PRIORITY LOCATIONS FOR "DAYLIGHTING" AT INTERSECTIONS

Identify and prioritize locations for "daylighting" at intersections, focusing on removing obstacles that impair sight lines and formalizing on-street parking restrictions to maximize visibility and crossing safety. Initial efforts should begin along the High Injury Network (HIN), in downtown centers, and in high-volume pedestrian areas. Incorporate considerations for accessibility in all intersection treatments, including addressing challenges associated with roundabouts for people in wheelchairs. Partner with ADA specialists to ensure compliance and proactively address accessibility concerns, as roundabouts are a frequent source of complaints. Leverage existing internal city communications, such as training articles, to educate the public and city staff on effective use of roundabouts and other safety measures.

FOCUS AREA
Intersections

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Data Tools,Partnerships, Staff Capacity

GOAL 3 | REDUCE CONFLICTS

3.9 IMPLEMENT LEADING PEDESTRIAN INTERVALS (LPIS)

Deploy leading pedestrian intervals (LPIs) at signalized intersections, focusing on applicable High Injury Network (HIN) corridors and urban villages such as 7th Street, Rosedale, Berry, and North Main Street. Revise standard roadway project details to make LPIs the default condition at all intersections and signal replacements. Expand LPI implementation based on the positive impact already observed in improving pedestrian experiences in downtown Fort Worth, ensuring similar benefits are realized in other urban areas with high pedestrian activity.

FOCUS AREA
Intersections

COST
$-$$$

SUPPORT AGENCY
TxDOT

TIMEFRAME
Mid to long

LEAD AGENCY
TPW

NEEDS
Legislative Action, Project Funding

3.10 ACTIVE TRANSPORTATION CROSSINGS

Based on the City's current Active Transportation Plan and the forthcoming Moving 1 Million Master Transportation Plan, assess and install bicycle and pedestrian projects to increase separation and complete the active transportation network. Ensure that context-sensitive designs are used to ensure a more comfortable active transportation environment for people of all ages and abilities, including:

- Grade-separated bicycle and pedestrian crossings of roadways with 55 mph+ vehicle speeds.
- Use of "Bikes May Use Full Lane" signs (vs. "Share the Road") and high visibility lane markings for shared bicycle facilities where applicable (e.g., shared lanes with vehicles that are narrower than 14').
- Install side paths or separated, raised, or protected bicycle facilities on roadways with speeds exceeding 35 mph, following the guidelines outlined in the FHWA Bikeway Selection Guide.

FOCUS AREA
Networks

COST
$$$-$$$$

SUPPORT AGENCY
None

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Project Funding

GOAL 4

POLICY AND PROGRAM

EMBEDDING SAFETY IN EVERY DECISION

Achieve vision zero requires more than design—it takes strong policies and programs that prioritize safety. This goal ensures that laws, funding, and initiatives actively support safer streets, reinforcing a culture where protecting lives is always the first priority.

GOAL 4 | POLICY AND PROGRAM

4.1

ACCESS MANAGEMENT NEEDS ASSESSMENT

Conduct annual or bi-annual crash analysis updates to track progress and changes in the high injury network and crash risks over time, with a particular focus on:

- Single-vehicle crash locations for roadway departure risks, fixed object risks, or potential risks to Vulnerable Road Users
- Large vehicle crashes for implications related to commercial motor vehicles
- Crash trends in areas of persistent poverty and other socially vulnerable communities
- Crash locations near transit stops and facilities, parks, and schools
- Locations near recent safety improvement & other infrastructure projects
- Speed related crash locations

FOCUS AREA
Data Analysis

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Ongoing

LEAD AGENCY
TPW

NEEDS
Data Tools, Plan/Study, Staff Capacity

4.2

TRANSPORTATION DEMAND MANAGEMENT (TDM)

Evaluate current conditions and consider setting a stated mode shift goal for converting trips from single-occupancy vehicles (SOV) to other modes. Update, adopt, and implement land use plans, TDM incentives, and street design policies that increase safety and provide travel and other benefits for people who travel in ways other than driving alone.

FOCUS AREA
Demand Management

COST
$-$$

SUPPORT AGENCY
NCTCOG

TIMEFRAME
Short

LEAD AGENCY
TPW

NEEDS
Legislative Action, Plan/Study

4.3

ADOPT REQUIREMENTS FOR MAINTAINING MULTIMODAL ACCESS DURING TEMPORARY CLOSURES

Develop and enforce requirements, provide guidance, and coordinate with city engineers, construction companies, and external stakeholders to ensure that access for people walking, bicycling, and using transit is maintained during all phases of roadway or site construction, special events, and other temporary closures. Address challenges experienced by transit users, such as limited access to busy bus stops during construction, by collaborating closely with transit authorities. Promote successful practices, such as the construction of temporary ramps to maintain access to bus stops, as demonstrated during bike lane construction on W 7th Street. Incorporate these best practices into standard operating procedures to improve consistency and accessibility across projects.

FOCUS AREA
Guidelines

COST
$

SUPPORT AGENCY
TPW

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW, Development Services

NEEDS
Legislative Action, Partnerships

GOAL 4 | POLICY AND PROGRAM

4.4

REVIEW AND UPDATE CITY SITE AND STREET DESIGN STANDARDS

Conduct a comprehensive review and update of all City site and street design standards to ensure alignment with this plan's recommendations, the Complete Streets Policy, and the latest best practices in design guidance. Reference updated resources such as the Manual on Uniform Traffic Control Devices (MUTCD)11th Edition, AASHTO Bike Guide 5th Edition, FHWA Separated Bike Lane Planning and Design Guide, and Public Rights-of-Way Accessibility Guidelines. Incorporate design guidelines that prioritize speed management, prevent left-angle crashes, and reduce pedestrian and bicycle risks.

- As a first step, add all orphaned roads to the Master Thoroughfare Plan (MTP) to create a consistent and comprehensive network.
- Clearly designate bike-friendly roads, including downtown streets and potential bike highways, and highlight pedestrian-friendly streets with modern sidewalks.
- Update the MTP to reflect these designations and ensure consistency across the network.
- Incorporate buffering infrastructure, such as tree-lined narrow points, to enhance pedestrian and cyclist safety while contributing to speed management.
- Address residential and neighborhood streets, recognizing that smaller streets with on-street parking can naturally reduce speeds and improve safety.

FOCUS AREA
Guidelines

COST
$$-$$$

SUPPORT AGENCY
NCTCOG

TIMEFRAME
Short

LEAD AGENCY
TPW, Planning, Development Services

NEEDS
Legislative Action, Plan/ Study

4.5

ASSESS AND IMPROVE PAVEMENT AND STRIPING CONDITIONS ALONG HIN ROADWAYS

Evaluate pavement and striping conditions along High Injury Network (HIN) roadways and identify locations where repaving and restriping can be leveraged to implement safer road designs, particularly for vulnerable road users. Coordinate with resurfacing, restriping, and other maintenance programs to prioritize safety improvements at locations with a demonstrated crash history or high-risk factors. Ensure city streets are maintained to accommodate vulnerable road users by integrating safety improvements into ongoing asset management and maintenance plans. Leverage the City's increased funding for street maintenance to support these initiatives and develop a long-term funding strategy to sustain these efforts.

FOCUS AREA
Maintenance

COST
$$-$$$

SUPPORT AGENCY
None

TIMEFRAME
Short to Mid

LEAD AGENCY
TPW

NEEDS
Plan/Study, Project Funding

GOAL 4 | POLICY AND PROGRAM

4.6

ESTABLISH A ROAD SAFETY AUDIT (RSA) PROGRAM, POLICY, AND PROCEDURES

Develop a comprehensive RSA program to evaluate locations with a history of KSI crashes, sites of new KSI crashes, and segments or intersections identified through crash risk assessments for safety improvements. Build on any prior City or TPW experiences with internal reviews of KSI locations to ensure continuity and learning. Assign a cross-disciplinary and cross-department RSA team, including representatives from police, fire, EMS, parks, and other relevant departments, to meet regularly to evaluate crash patterns and risks, identify programmatic and infrastructure safety interventions, and provide annual recommendations for budgets and improvements to address identified issues.

The RSA program should emphasize actionable fixes, such as infrastructure upgrades, signage, markings, lighting, and other immediate safety measures, in addition to long-term studies. Equip the RSA team with the capacity for technical analyses, high-level strategic thinking, and driving systemic change toward Fort Worth's goal.

FOCUS AREA
Road Safety Audits

COST
$

SUPPORT AGENCY
NCTCOG, TxDOT, Corridor Stakeholders, PD, FD, EMS, Parks Department

TIMEFRAME
Immediate

LEAD AGENCY
TPW, FWPD, Admin

NEEDS
Data Tools, Plan/Study, Project Funding

4.7

COORDINATE WITH TRINITY METRO FOR TRANSIT PLANNING AND INVESTMENTS

Collaborate with Trinity Metro to align this plan with their ongoing transit planning and investments, including route and network organization, bus stop replacements, and transit station access. Work with Trinity Metro to incorporate their upcoming bus stop siting policy, ensuring alignment with the City's goals. Encourage the placement of stops near intersections, preferably far-side locations, and prioritize the installation of high-visibility pedestrian crossings at stops and stations along the transit system.

Support Trinity Metro in the development of their Strategic Action Plan and upcoming System Plan (expected in FY26), ensuring consistency with City objectives. Continue coordination on bus stop pad installation and explore funding opportunities, including grants that require a 20% local match, to support these initiatives.

FOCUS AREA
Transit

COST
$-$$$

SUPPORT AGENCY
NCTCOG, TxDOT

TIMEFRAME
Immediate

LEAD AGENCY
TPW, Trinity Metro

NEEDS
Partnerships, Project Funding

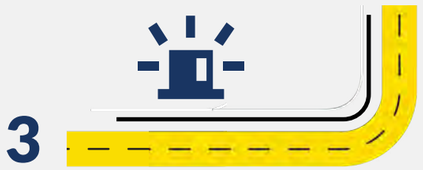
5 SAFE SYSTEM PRIORITIES

FOCUS AREAS

Based on the existing safety conditions analysis, identified goals and recommended action strategies, the Fort Worth Safety Action Plan identifies four priorities that align with the Safe System Approach elements.

1 Setting Safe Speeds [Safe Speed]

2 Managing Truck Traffic [Safe Roads/Safe Vehicles]



3 Prioritizing Specific Projects [Safe Roads]

4 Implementing a Traffic Safety Campaign [Safe People]

SETTING SAFE SPEEDS

One of the immediate action priorities for the City of Fort Worth is developing a comprehensive policy for setting speed limits that are safer and help reduce the occurrence of KSI crashes. Following a review of national best practices and standards, the City of Fort Worth identified three tools it can use to set safe speeds citywide. A full review of national best practices and standards, and detailed recommendations can be found in **Appendix D.**

1 Default Speed Limit	Establish a streamlined framework for setting speed limits based on street classification and context. This process will be supported by automated tools that analyze key data—including existing speeds, crash history, and roadway characteristics—to determine appropriate speed limits efficiently and consistently.
2 Slow Zones	Evaluate the implementation of 'slow zones' in select areas with higher concentrations of vulnerable road users, such as pedestrians and bicyclists. These zones are typically located near schools, parks, urban villages, and downtown, where lower speed limits can help enhance safety and reduce crash severity.
3 Corridor Speed Limits	Adopt a more detailed, data-driven approach to setting speed limits for select corridors, including those on the High Injury Network. Utilizing a Safe Speed Study, assess current speeds, roadway characteristics, and safety data to establish appropriate speed limits that enhance safety and reduce crash risk.

The City will develop a Safe Speeds Policy and Methodology that integrates these three key tools to guide speed management. As part of this policy, the City will update the ordinance to define all speed limits beyond prima facie speeds and establish guidelines for implementing variable speed limits. Additionally, the City will provide clear guidance for staff and private developers on setting safe speed limits when designing new roads, expanding existing roadways, or extending current corridors.

MANAGING TRUCK TRAFFIC

Fort Worth, when compared to several other larger cities in the state, such as Austin, Dallas, El Paso, Houston and San Antonio, has the highest share of freight trips among all trips and highest share of crashes that involve large trucks. Unsurprisingly, truck traffic was identified by the community as one of the top concerns.

Fort Worth's current truck traffic was evaluated, including freight trips on the city roadway network, top freight trip origins and destinations, locations of truck parking facilities, a review of current truck and commercial vehicle policies, and a review of national leading practices and standards. From this evaluation, the following issues were identified and actions are recommended. A full review of truck and commercial vehicle policies and detailed recommendations can be found in **Appendix E.**

ISSUES

- The City's existing truck routes as designated by the truck traffic ordinance do not capture all high freight volume corridors

- Short-distance freight trips that last less than 10 minutes make up 31% of the total freight trips. Over 50% of total freight trips have a duration of less than 20 minutes. Most freight trips with less than 20 minutes duration are on local roads instead of interstate and other major highways

- No public truck parking facilities exist within the City boundary. Private truck parking facilities are limited and often over capacity, especially those along I-35

RECOMMENDED ACTIONS

- Establish criteria for adding and removing truck routes to better align freight movement with industrial growth and safety objectives

- Implement no-trucking zones in residential areas and areas sensitive to freight traffic

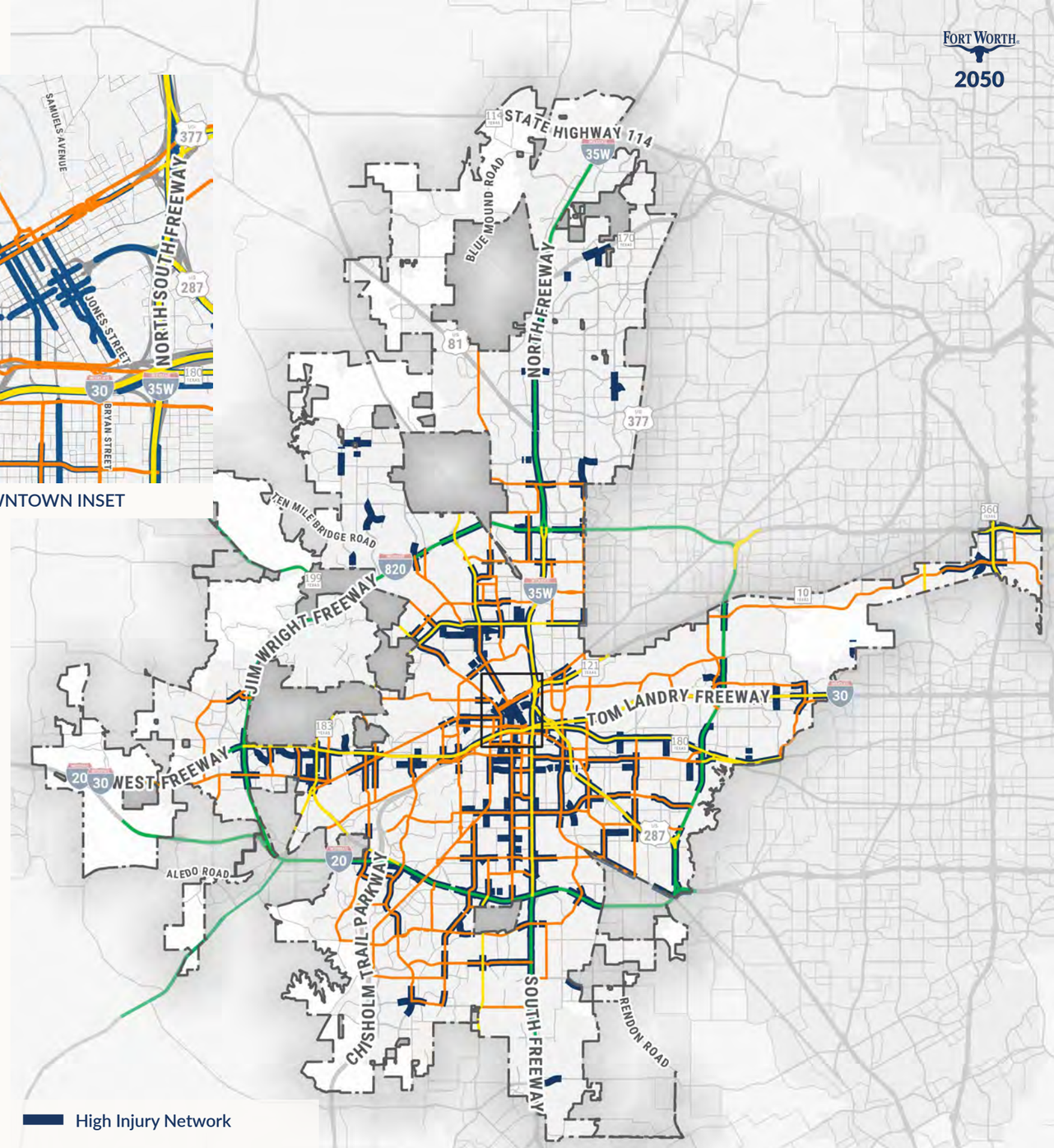
- Introduce additional regulations on truck parking & loading zones

- Identify high-need locations for truck parking and utilize public-private partnerships to expand truck parking solutions across the city

- Implement technology-driven freight traffic management, such as adaptive signal control and automated incident detection

Close coordination and collaboration between the City and other regional partners, such as TxDOT, counties, and NCTCOG, is crucial to improving truck traffic management and safety.

DOWNTOWN INSET



PRIORITIZING SPECIFIC PROJECTS

The City of Fort Worth has developed a prioritization framework to identify high-impact locations and projects, ensuring that limited funding is allocated effectively to address the most critical safety concerns. This approach supports the City's goal of eliminating traffic fatalities and severe injuries.

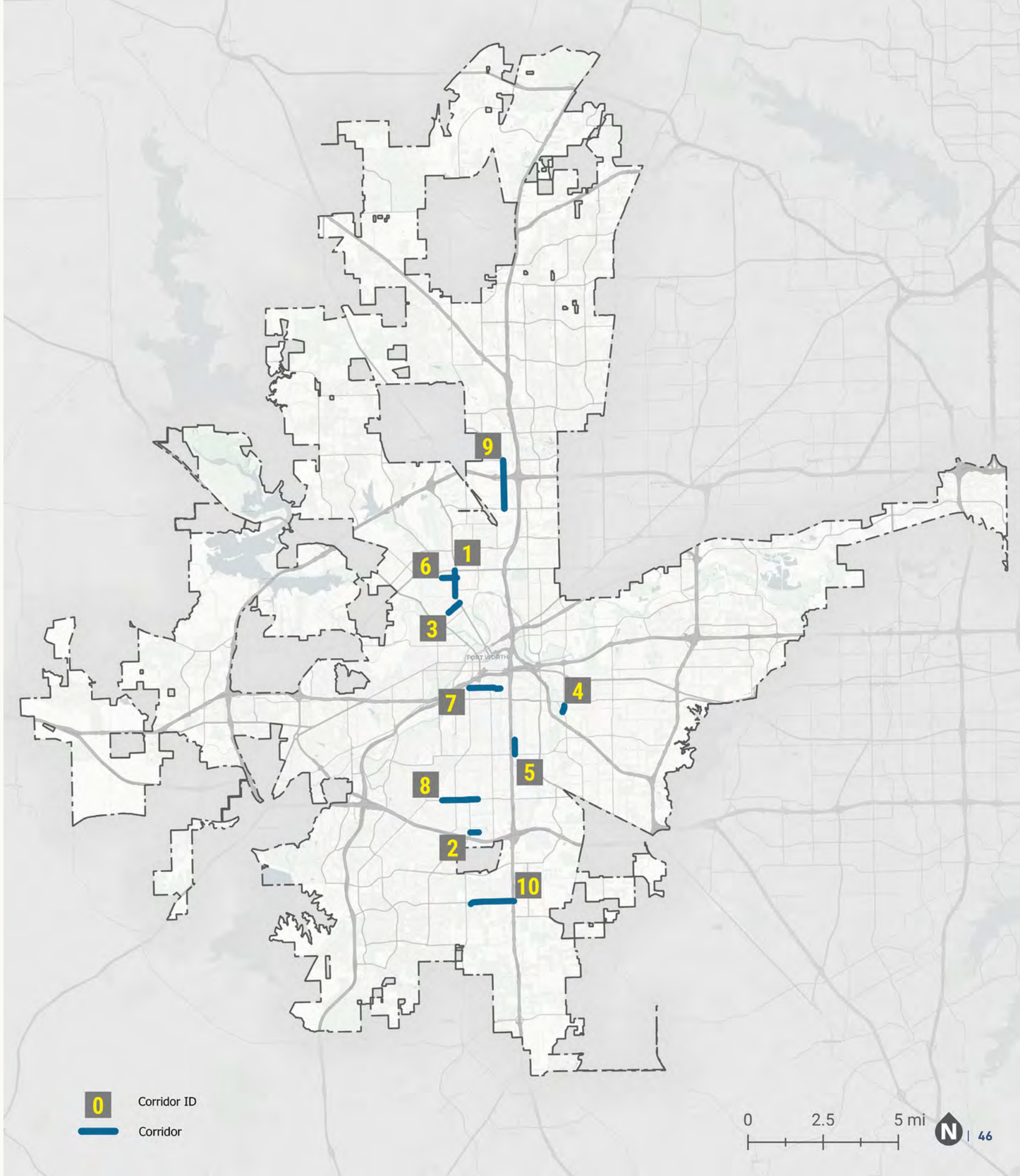
The framework evaluates locations and projects based on four key categories:

- **CRASH HISTORY**
- **ROADWAY CHARACTERISTICS**
- **LAND USE CONTEXT**
- **SOCIAL VULNERABILITY**

A detailed description of the prioritization framework, along with the top 50 roadway segments and top 30 intersections, is available in **Appendix F**.

Among the top 15 ranked roadways, ten corridors (shown on the map to the right) were selected for a more in-depth roadway safety assessment and capital project recommendations.

Detailed information on the roadway safety assessments, project recommendations for each corridor, and how the benefits and costs were calculated can be found in **Appendix G.**



PRIORITIZING SPECIFIC PROJECTS

Based on field observations and crash data analysis, both corridor-wide countermeasures and location-specific safety improvements were identified for each corridor. Countermeasures were selected primarily from FHWA's **Proven Safety Countermeasures Initiative (PSCi),** categorized into five key areas:

- **Speed Management**
- **Pedestrian/Bicyclist Safety**
- **Roadway Departure**
- **Intersections**
- **Crosscutting Measures**

Additional countermeasures beyond PSCi were recommended where they could provide meaningful safety benefits based on the corridor's crash profile. Each proposed countermeasure includes a suggested implementation timeframe to support project execution.

BENEFIT COST ANALYSIS

A benefit-cost analysis (BCA) compares the total benefits of recommended improvements to their overall cost over a specified period. The benefit-cost ratio is calculated using a **20-year horizon** by estimating the **monetized value of crashes prevented**. Future crashes are projected assuming a stable crash rate with traffic growth, while a **crash modification factor (CMF)** adjusts for expected reductions with safety improvements.

Project costs include **initial expenses** (construction, survey, and engineering) and **ongoing maintenance** over 20 years. Cost estimates, based on City bid tab data, are presented in **2025 dollars**.

ID	ROADWAY	FROM	TO	FUNCTIONAL CLASSIFICATION	HIN MODE	BENEFIT COST RATIO
1	Ellis Ave	NW 21st St	NW 28th St	Residential	Pedestrian, Motor Vehicle	16.29
2	Sharondale St	6th Ave	James Ave	Residential	Bicycle	22.07
3	NW 14th St	N Main St	Gould Ave	Residential	Pedestrian	48.08
4	S Beach St	Ave H	Mitchell Blvd	Major Arterial	Motor Vehicle	17.04
5	Evans Ave	E Morningside Dr	E Berry St	Major Arterial	Motor Vehicle	5.54
6	NW 26th St	N Main St / Stockyards Blvd	Angle Ave / Refugio Ave	Residential	Pedestrian	6.69
7	Pennsylvania Ave	E Pennsylvania Ave / S Main St	8th Ave	Minor Arterial	Pedestrian, Motor Vehicle	30.90
8	W Seminary Dr	6th Ave	Rector Ave	Major Arterial	Bicycle, Pedestrian	35.82
9	Mark Iv Pkwy	Meacham Blvd	Crossover Ramp	Major Arterial	Motor vehicle, Commercial motor vehicle, Motorcycle	18.26
10	Sycamore School Rd	South Fwy Sr Nb	W Everman Pkwy	Minor Arterial	Bicycle, Pedestrian, Motor vehicle	26.56

ELLIS AVENUE

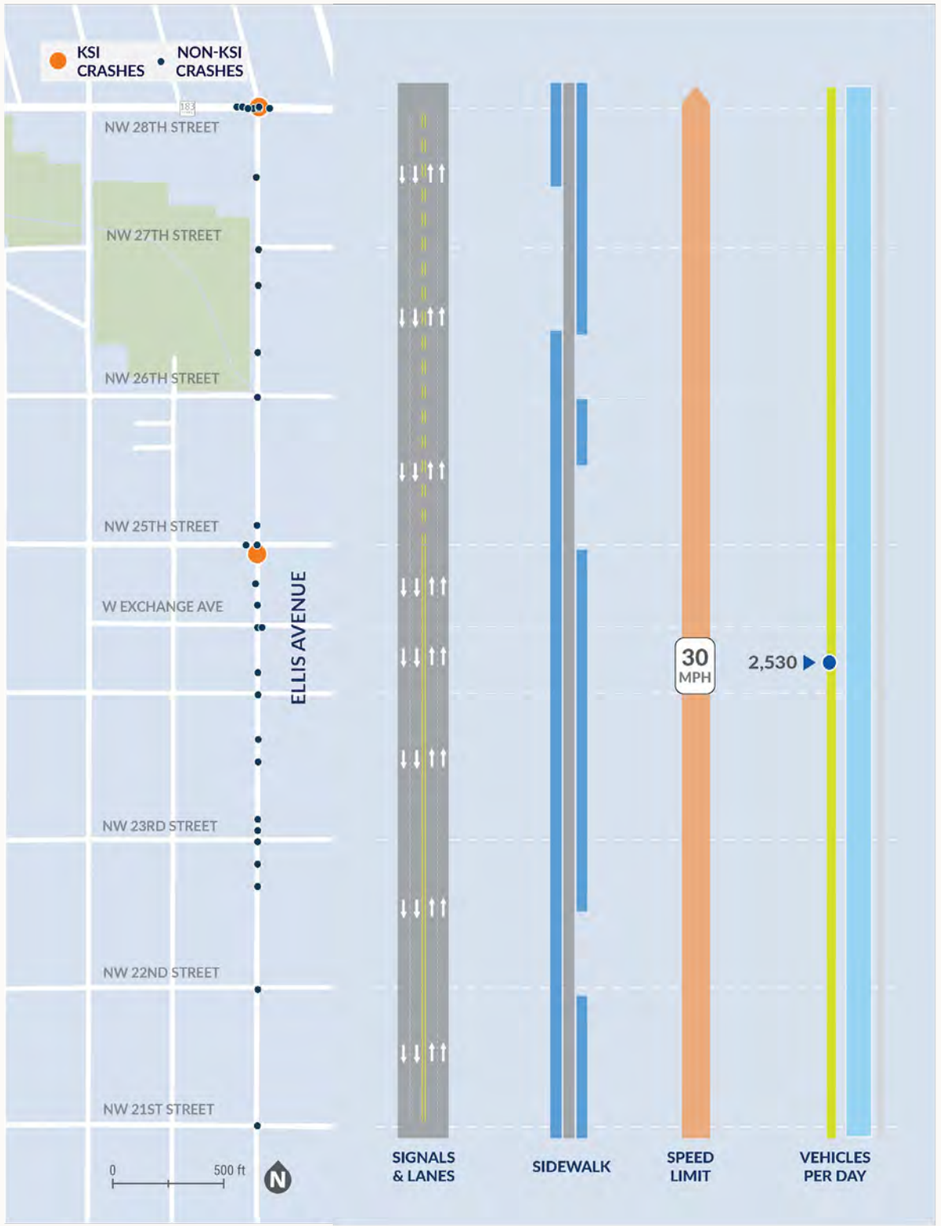
FROM NW 21ST STREET TO NW 28TH STREET (0.86 MILES)

FORT WORTH 2050

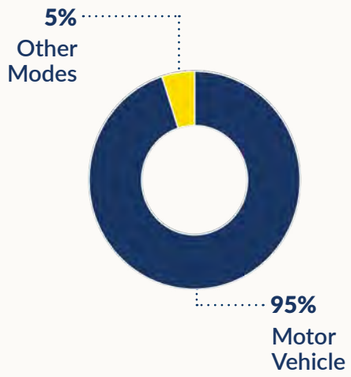
CONTEXT

This is a minor arterial in the Historic Stockyards District, lined with residential properties and commercial developments. The roadway has four lanes with unmarked parallel parking, a pavement width of 52 to 58 feet, and a right-of-way of 80 to 86 feet. All intersections are stop-controlled, and sidewalks on both sides are mostly continuous. Key destinations include Rodeo Park and All Saints Catholic School. The corridor is part of both the Pedestrian High Injury Network (HIN) and the Motor Vehicle HIN.

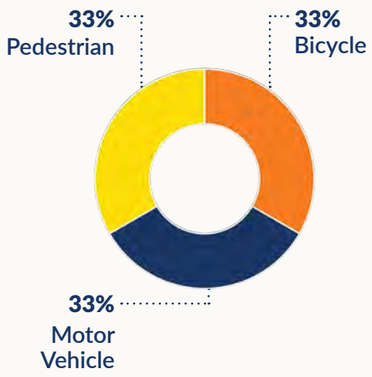
TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
139	3



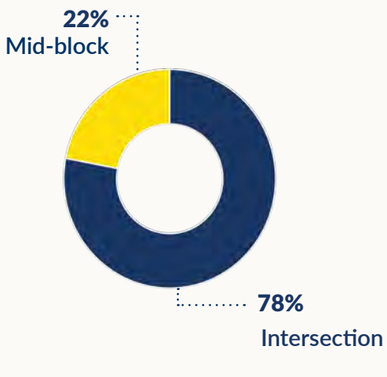
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

- Angle Crashes
- One Motor Vehicle Crashes

KEY CONTRIBUTING FACTORS

- Failed to Yield Right of Way – Stop Sign
- Driver Inattention

VISION ZERO FORT WORTH

ELLIS AVENUE

FROM NW 21ST STREET TO NW 28TH STREET (0.86 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Corridor Access Management

Crosswalk Visibility Enhancements

Walkways

FINAL BENEFIT/ COST RATIO	22.78	BENEFITS $57,280,000	PROJECT COST $2,676,600
CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$4,140	$817,108	$0
INTERSECTION	$31,828	$461,700	$70,000
TOTAL	**$35,968**	**$1,278,808**	**$70,000**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS

Install high-visibility crosswalks, curb extensions, and install a sidewalk on the east side of Ellis Ave

Install high-visibility crosswalks, curb extensions. Create sidewalk green buffer, and widen sidewalk

Install high-visibility crosswalks, install curb ramps, install lighting, and install bulb-outs

Install high-visibility crosswalks, curb extensions, median crossing island, install curb ramps, and wayfinding signage

NW 21ST ST

NW 23RD ST

NW 24TH ST

W EXCHANGE AVE

NW 25TH ST

NW 26TH ST

183 TEXAS

ELLIS AVENUE

NW 22ND ST

NW 27TH ST

NW 28TH ST

Install high-visibility crosswalks, curb extensions, and median crossing island

Recommend eliminating parking at intersection if property gets redeveloped, install lighting, and wayfinding signage

Install high-visibility crosswalks, curb extensions. Reconstruct wider sidewalks, and install lighting

Install high-visibility crosswalks, curb extensions, create sidewalk green buffer, install lighting, and wayfinding signage

0 500 ft

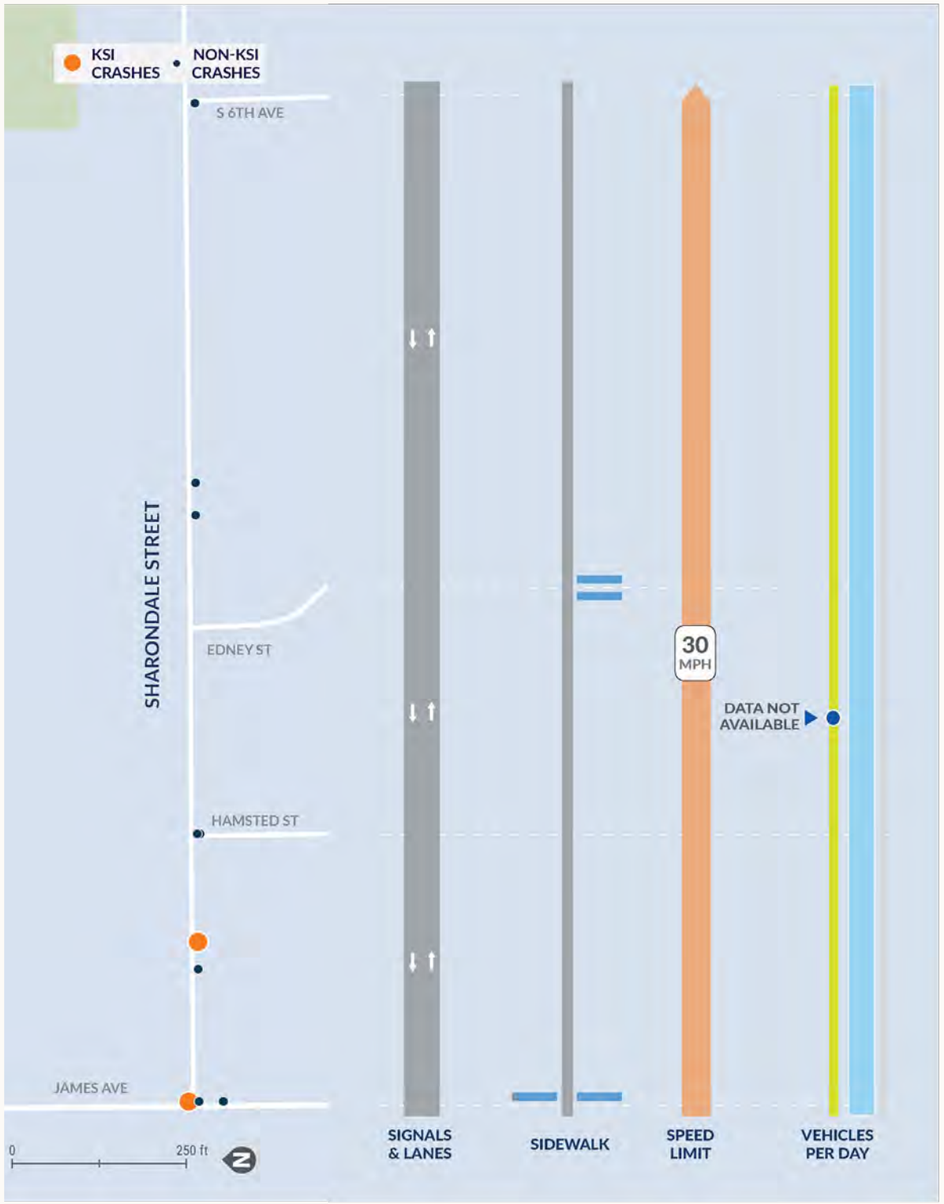
SHARONDALE STREET

FROM 6TH AVENUE TO JAMES AVENUE (0.28 MILES)

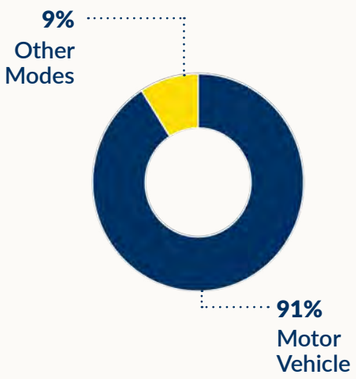
CONTEXT

This is a residential corridor with a two-lane roadway and unmarked on-street parking on both sides. There are no sidewalks, and no posted speed limit. The corridor spans approximately 0.28 miles, with a pavement width of 26 to 28 feet and a right-of-way of about 50 feet. The corridor is part of the Bicycle High Injury Network (HIN).

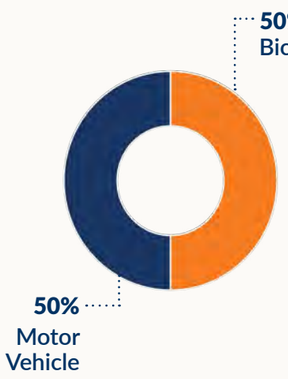
TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
22	2



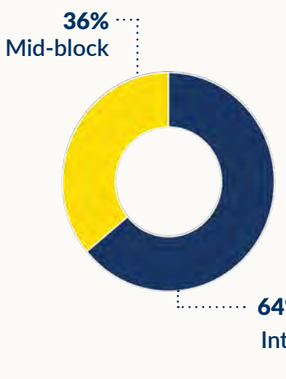
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

Same Direction Crashes

Angle Crashes

KEY CONTRIBUTING FACTORS

Driver Inattention

Speeding

SHARONDALE STREET

FROM 6TH AVENUE TO JAMES AVENUE (0.28 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Crosswalk Visibility Enhancements

Walkways

Bicycle Lanes

FINAL BENEFIT/ COST RATIO **22.07**

BENEFITS	PROJECT COST
$16,880,000	$764,900

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$0	$194,738	$0
INTERSECTION	$2,100	$168,000	$0
TOTAL	$2,100	$362,738	$0

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS

NORTHWEST 14TH STREET

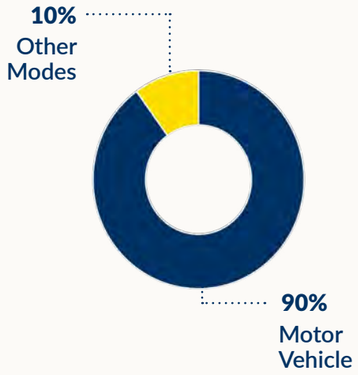
FROM N MAIN STREET TO GOULD AVENUE (0.49 MILES)

CONTEXT

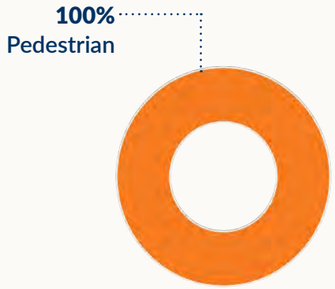
This corridor is a residential street with some commercial use near its northeastern section. Rufino Mendoza Elementary School is located at the southwest end of the corridor. The roadway has two lanes with unmarked on-street parking and a speed limit of 30 mph. Sidewalks are present on both sides but are not continuous along the entire corridor. Pavement width ranges from 28 to 34 feet, with a right-of-way of approximately 60 to 80 feet. The corridor is part of the Pedestrian High Injury Network (HIN).

TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
21	2

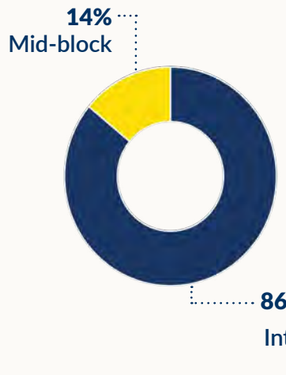
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION

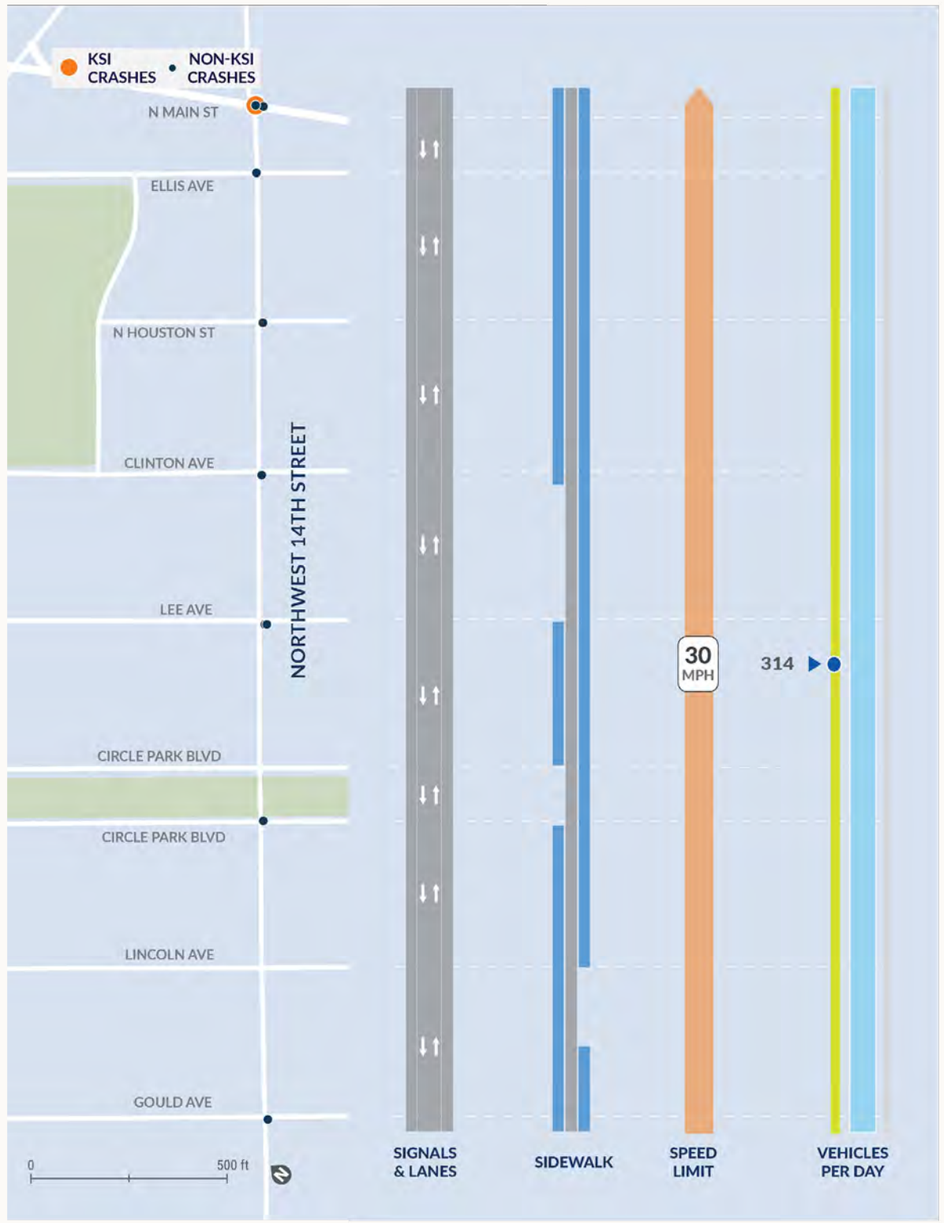


KEY CRASH TYPES

- Angle Crashes
- One Motor Vehicle Crashes

KEY CONTRIBUTING FACTORS

- Failed to Yield Right of Way – Stop Sign
- Driver Inattention



NORTHWEST 14TH STREET

FROM N MAIN STREET TO GOULD AVENUE (0.49 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Crosswalk Visibility Enhancements

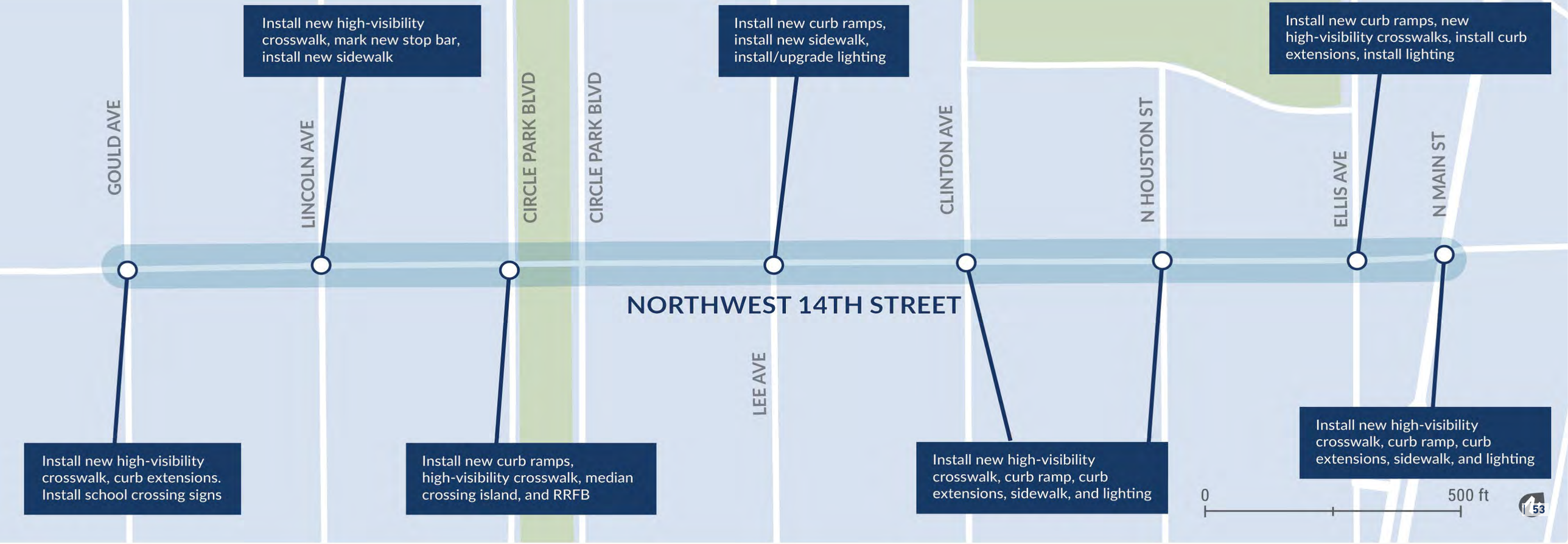
Bicycle Pavement Marking

Speed Management

Walkways

FINAL BENEFIT/ COST RATIO	48.08	BENEFITS $66,020,000	PROJECT COST $1,373,000
CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$6,000	$337,456	$0
INTERSECTION	$25,330	$221,400	$0
TOTAL	**$31,330**	**$558,856**	**$0**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS



SOUTH BEACH STREET

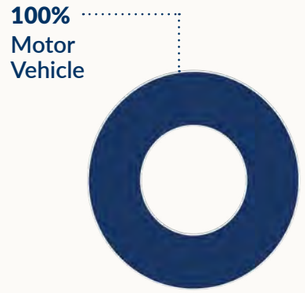
FROM AVENUE H TO MITCHELL BOULEVARD (0.22 MILES)

CONTEXT

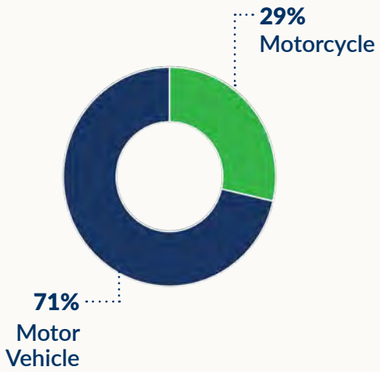
This is a major arterial with Sycamore Park and Polytechnic Senior High School located just north of the study area. The roadway has four to five lanes with a median between Avenue I and Mitchell Boulevard. Continuous sidewalks are present on both sides, and the corridor is designated as a commercial delivery route. Pavement width ranges from 62 to 83 feet, including the median, with a right-of-way of approximately 92 to 115 feet. The corridor is part of the Motor Vehicle High Injury Network (HIN).

TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
66	7

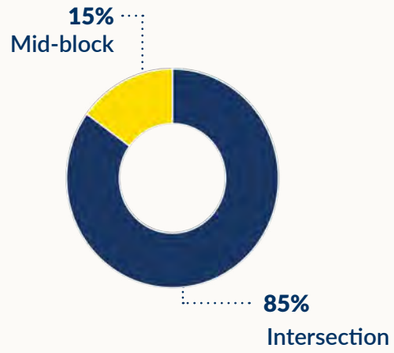
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

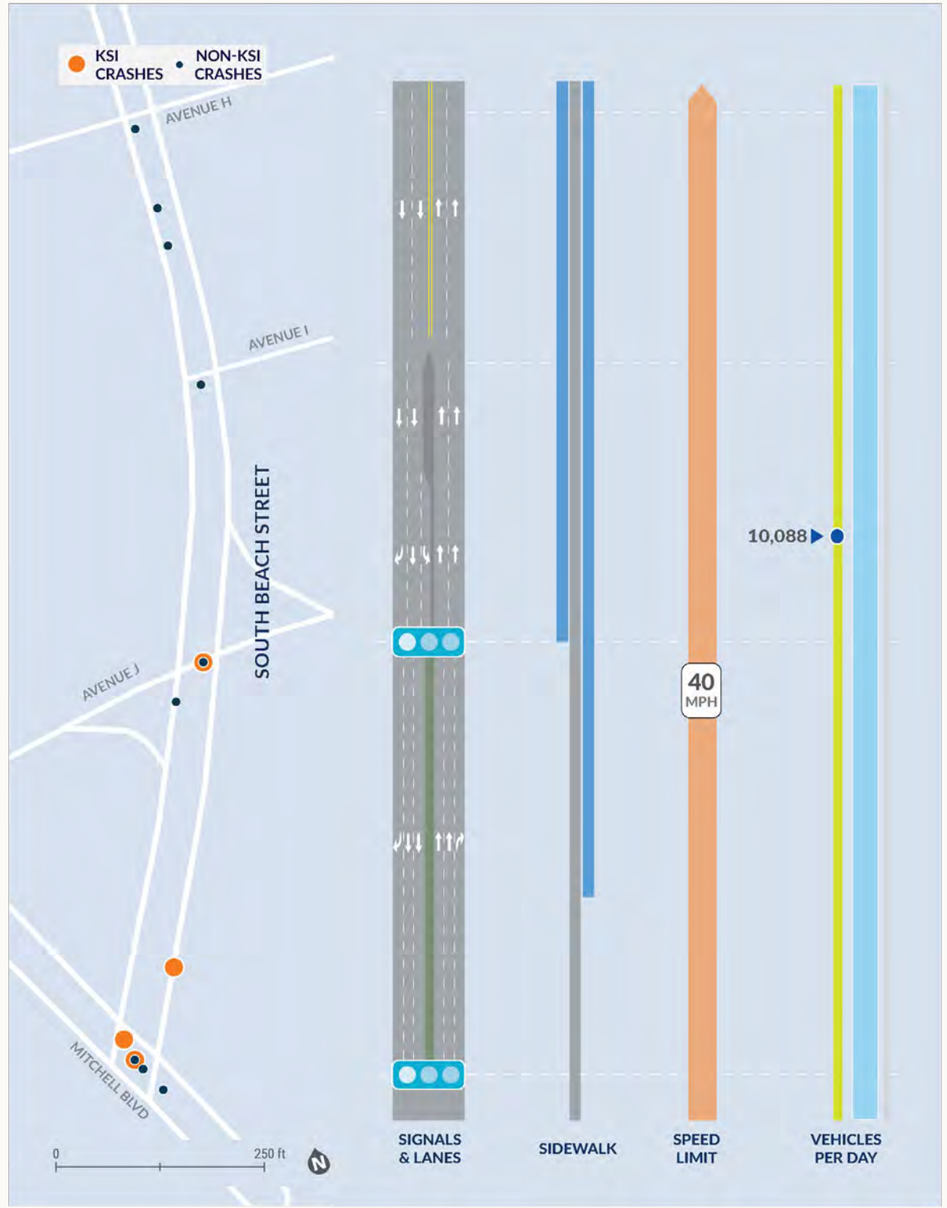
Angle Crashes

Opposite Direction Crashes

KEY CONTRIBUTING FACTORS

Driver Inattention

Disregard Stop And Go Signal



SOUTH BEACH STREET

FROM AVENUE H TO MITCHELL BOULEVARD (0.22 MILES)

CORRIDOR-WIDE RECOMMENDATIONS

Median Refuge Island

Roadway Reconfiguration

Speed Management

Walkways

Bicycle Lanes

FINAL BENEFIT/ COST RATIO **17.04**

BENEFITS $20,060,000

PROJECT COST $1,177,100

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$400	$205,506	$0
INTERSECTION	$44,918	$128,700	$77,000
TOTAL	**$45,318**	**$334,206**	**$77,000**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS

Install high-visibility crosswalks, curb ramps, consolidate driveways, and construct sidewalk

Install high-visibility crosswalks, curb extensions, median crossing island. Install curb ramps, and construct buffered sidewalk

Install high-visibility crosswalks, curb extensions, median crossing island, install curb ramps, and construct buffered sidewalk

MITCHELL BLVD

AVENUE J

AVENUE H

SOUTH BEACH STREET

AVENUE I

Install high-visibility crosswalks, curb extensions, median crossing island, install RRFB, pedestrian refuge island, curb ramps, and other crossing treatments

0 500 ft

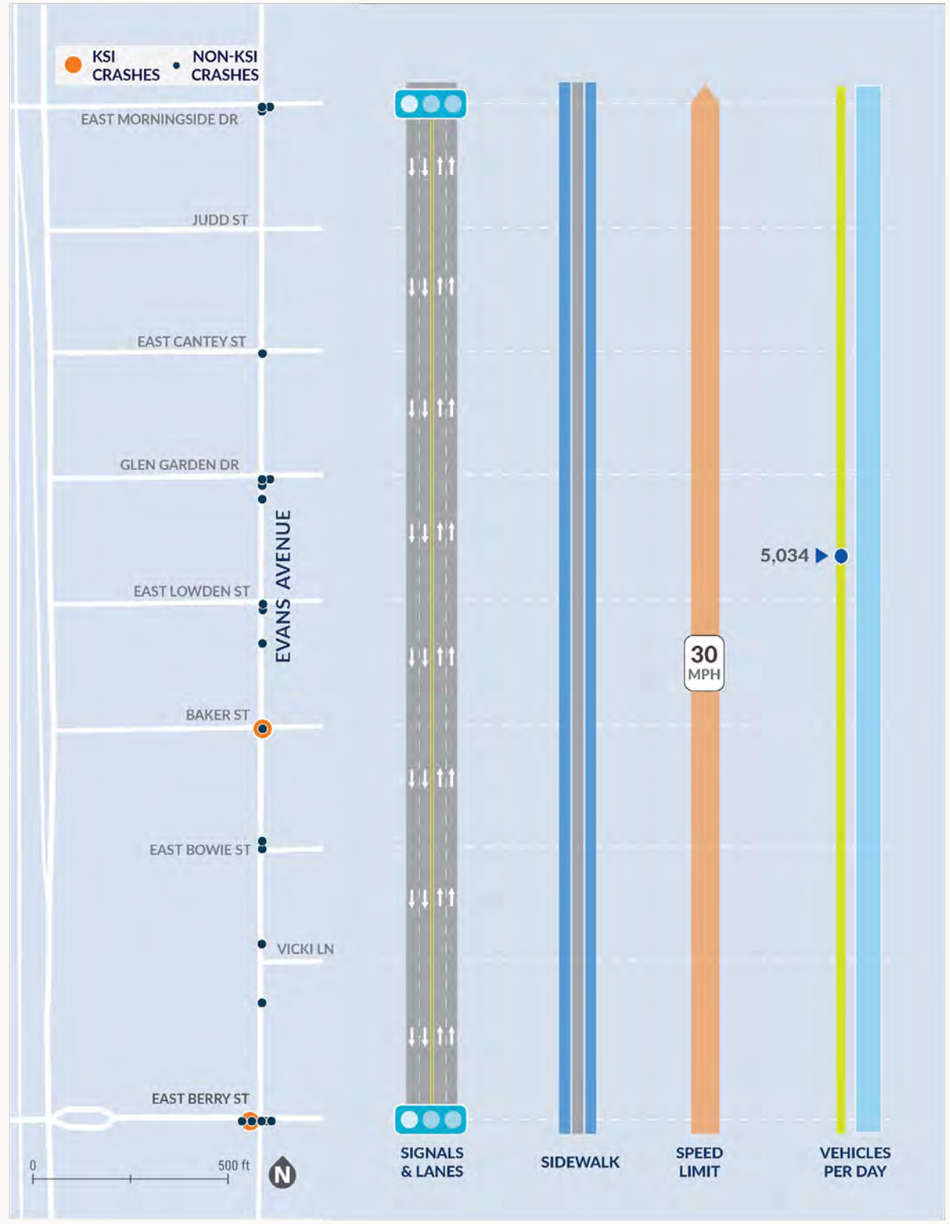
EVANS AVENUE

FROM E MORNINGSIDE DRIVE TO E BERRY STREET (0.5 MILES)

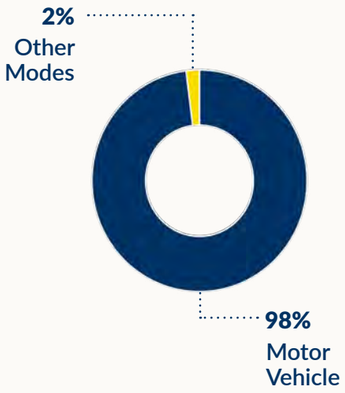
CONTEXT

This is a minor arterial lined with residential properties and medium-scale commercial developments. The roadway has continuous sidewalks on both sides throughout the corridor, with a pavement width of 45 to 48 feet and a right-of-way of approximately 80 feet. Morningside Elementary School is located north of the corridor, and a Trinity Metro bus route operates nearby. The corridor is part of the Motor Vehicle High Injury Network (HIN).

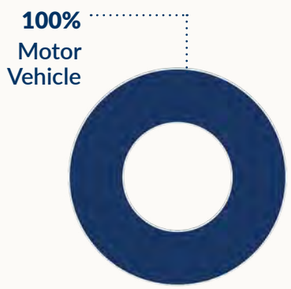
TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
94	2



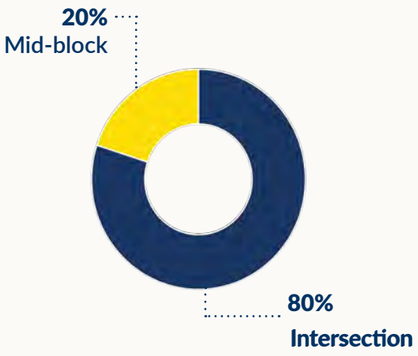
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

- Angle Crashes
- Opposite Direction Crashes

KEY CONTRIBUTING FACTORS

- Driver Inattention
- Failed To Yield Right of Way – Turning Left

EVANS AVENUE

FROM E MORNINGSIDE DRIVE TO E BERRY STREET (0.5 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Corridor Access Management

Crosswalk Visibility Enhancements

Speed Management

Walkways

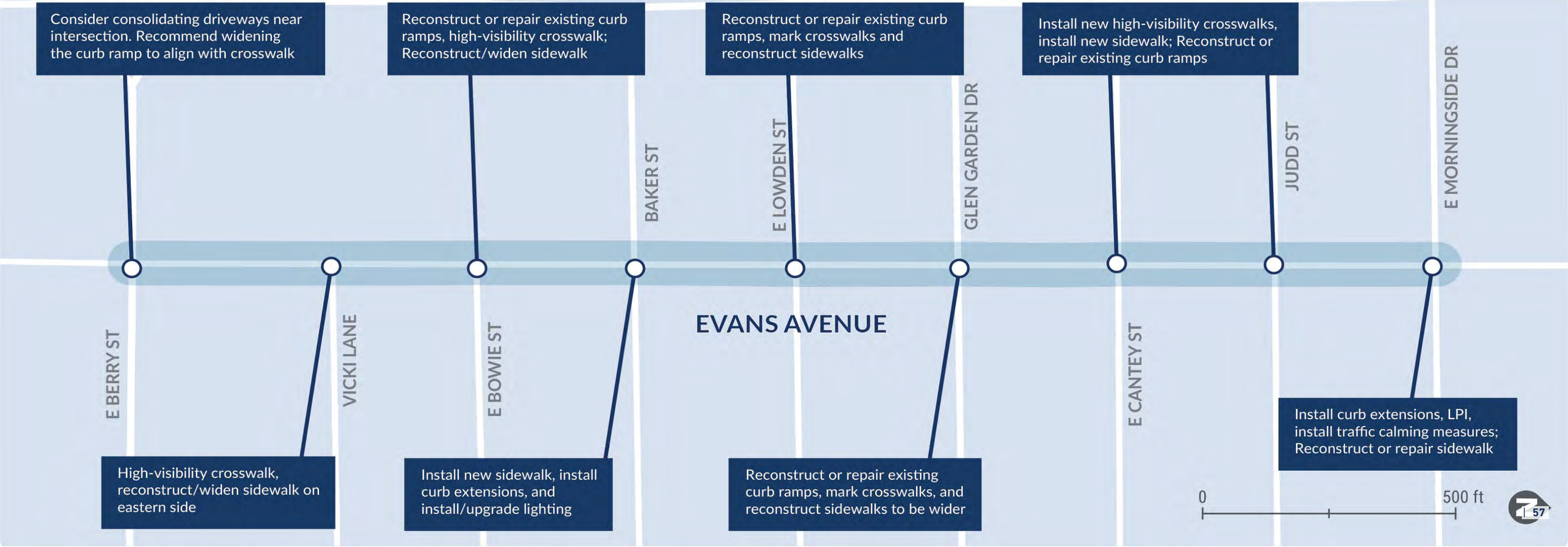
Bicycle Lanes

FINAL BENEFIT/ COST RATIO 5.54

BENEFITS	PROJECT COST
$18,840,000	$3,401,300

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$0	$731,577	$0
INTERSECTION	$157,085	$263,790	$0
TOTAL	$157,085	$995,367	$0

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS



NORTHWEST 26TH STREET

FROM N MAIN STREET TO ANGLE AVENUE (0.5 MILES)

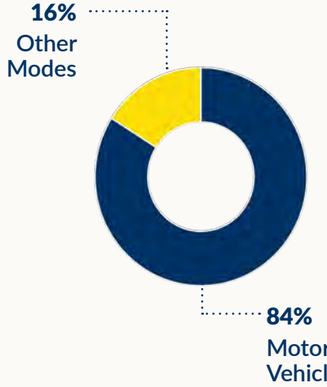
FORT WORTH 2050

CONTEXT

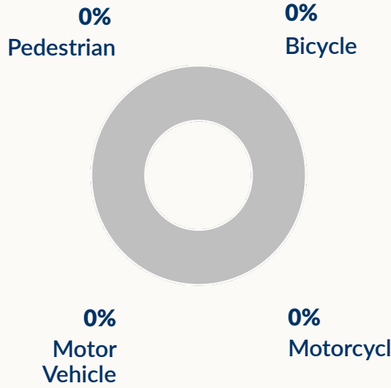
This corridor is a residential street with commercial use at its eastern end. It intersects with Ellis Avenue at Rodeo Park and terminates in the Historic Stockyards District. The roadway consists of two lanes in residential areas and expands to four lanes in commercial sections, with unmarked on-street parking. Sidewalks are intermittent on both sides. Pavement width ranges from 26 feet in residential areas to 48 feet in commercial areas, with a right-of-way of approximately 68 feet. This corridor is on the pedestrian HIN due to crash frequency—six pedestrian-involved crashes from 2019–2023—even though none were fatal or severe injury crash.

TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
43	0

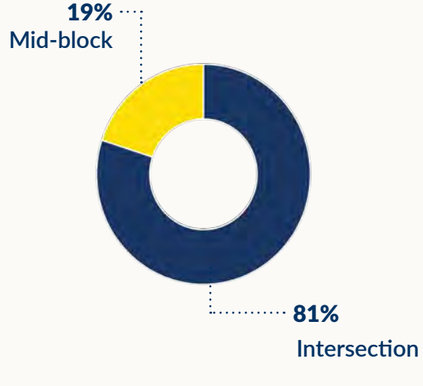
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

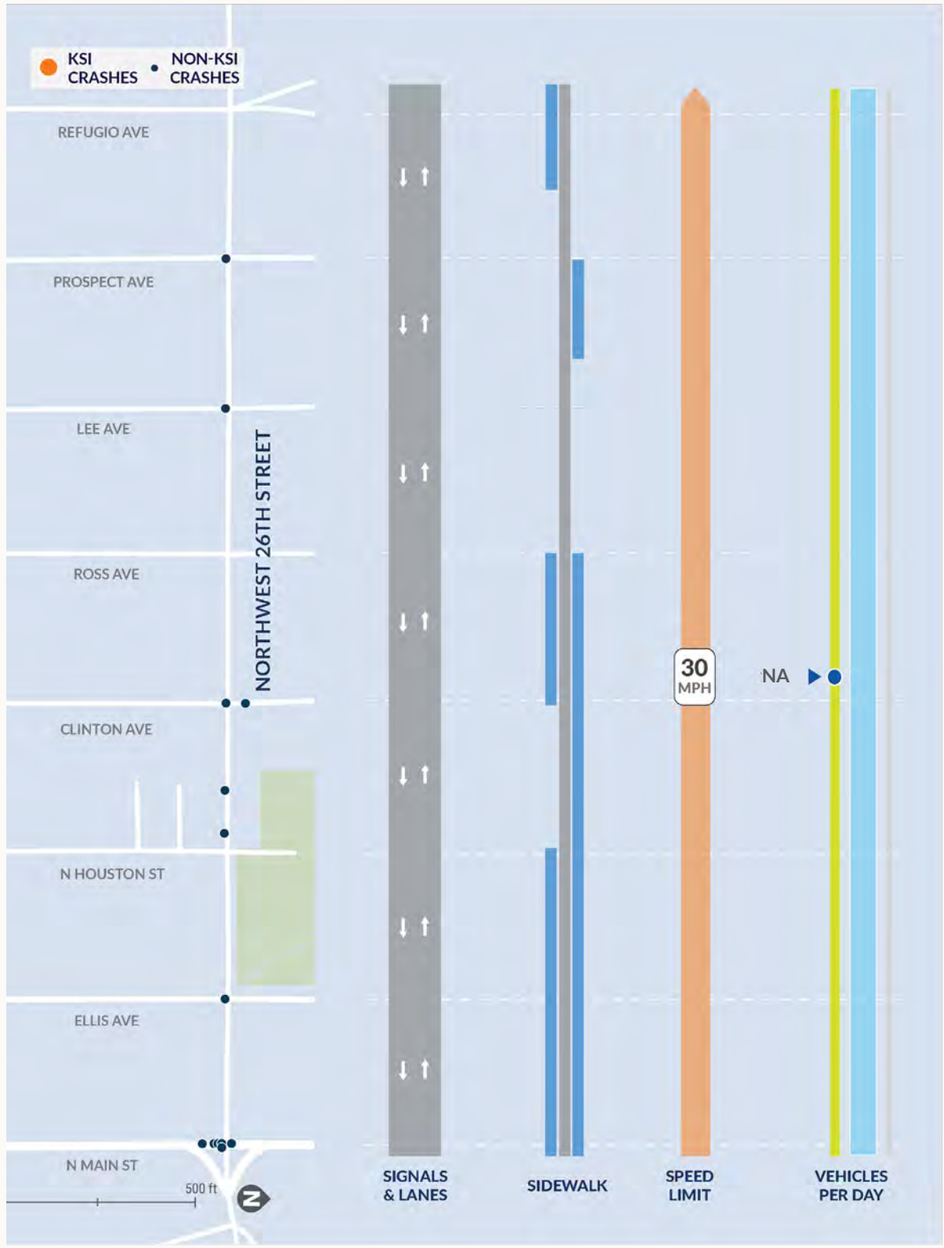
Angle Crashes

Same Direction Crashes

KEY CONTRIBUTING FACTORS

Driver Inattention

Speeding



VISION ZERO FORT WORTH

NORTHWEST 26TH STREET

FROM N MAIN STREET TO ANGLE AVENUE (0.5 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

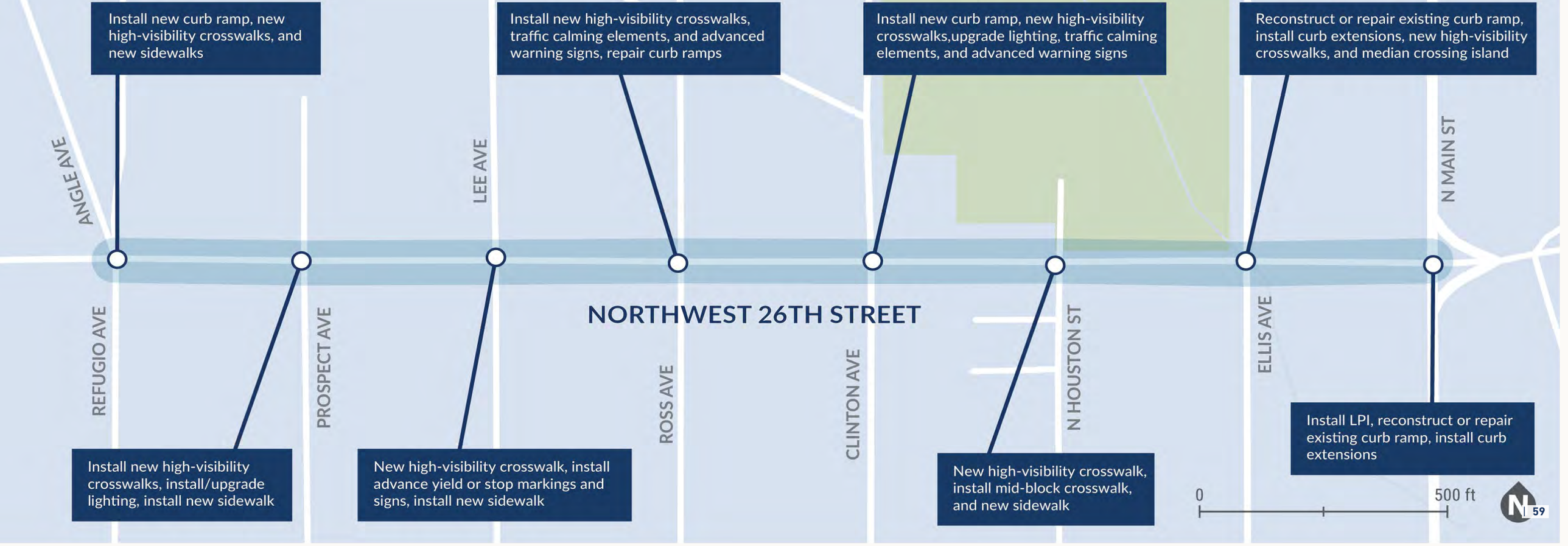
Crosswalk Visibility Enhancements

Bicycle Lanes

Walkways

FINAL BENEFIT/ COST RATIO **6.69**	BENEFITS $10,400,000	PROJECT COST $1,553,700
CONSTRUCTION COST	**SHORT TERM (0-2 YEARS)**	**MEDIUM TERM (2-5 YEARS)**	**LONG TERM (5+ YEARS)**
SEGMENT	$0	$93,298	$335,138
INTERSECTION	$24,510	$216,600	$0
TOTAL	**$24,510**	**$309,898**	**$335,138**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS



PENNSYLVANIA AVENUE

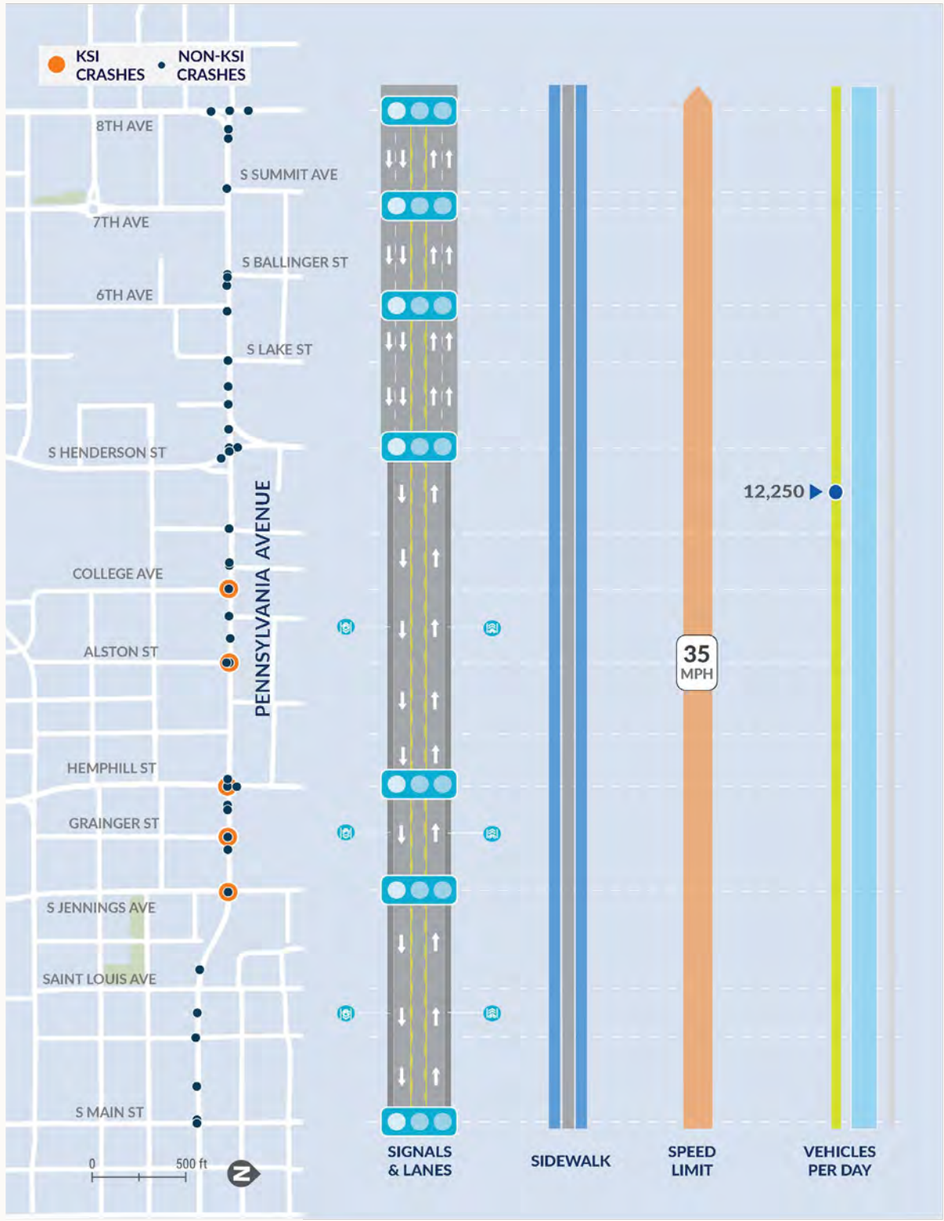
FROM S MAIN STREET TO 8TH AVENUE (1.04 MILES)

FORT WORTH 2050

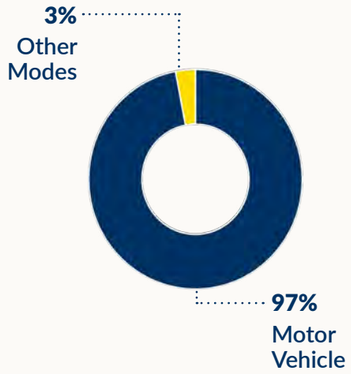
CONTEXT

This is a minor arterial primarily lined with commercial uses, with a large medical campus—including Cook Children's Medical Center and Harris Methodist Hospital—at its western end. The roadway has three to five lanes, with marked on-street parking at the eastern end. It is a designated bike route with intermittent directional bike lanes and features continuous sidewalks on both sides. A Trinity Metro bus route serves the corridor. Pavement width ranges from 50 to 60 feet, with a right-of-way of approximately 80 to 84 feet. The corridor is part of the Pedestrian High Injury Network (HIN) and Motor Vehicle HIN.

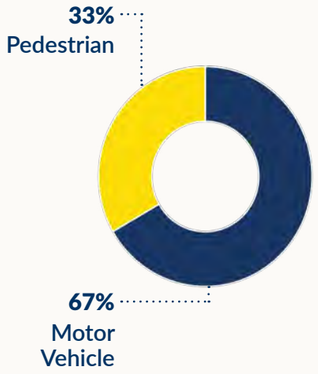
TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
124	6



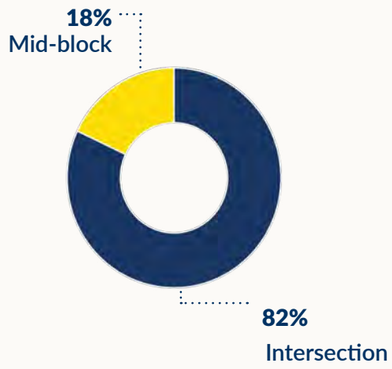
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

- Angle Crashes
- Opposite Direction Crashes

KEY CONTRIBUTING FACTORS

- Driver Inattention
- Failed To Yield Right of Way – Turning Left

PENNSYLVANIA AVENUE

FROM S MAIN STREET TO 8TH AVENUE (1.04 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Corridor Access Management

Crosswalk Visibility Enhancements

Roadway Reconfiguration

Walkways

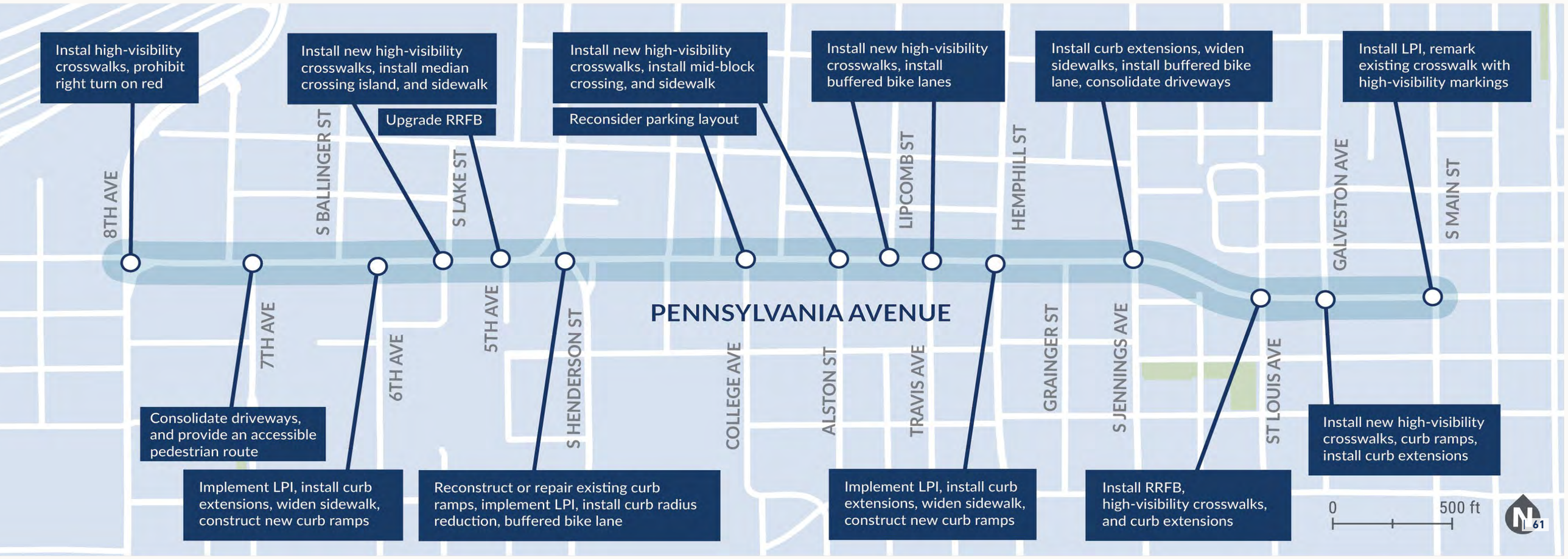
Bicycle Lanes

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS

FINAL BENEFIT/ COST RATIO **30.9**

BENEFITS	PROJECT COST
$109,940,000	$3,558,400

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$0	$505,616	$0
INTERSECTION	$596,726	$56,904	$231,000
TOTAL	**$596,726**	**$562,520**	**$231,000**



WEST SEMINARY DRIVE

FROM 6TH AVENUE TO RECTOR AVENUE (1.18 MILES)

CONTEXT

This is a major arterial with residential uses and key destinations such as Rosemont Middle School, Rosemont Park, and Southwestern Baptist Theological Seminary on its eastern end. An at-grade railroad crossing is located between William Fleming Court and Frazier Avenue. The roadway has four travel lanes and a center lane that functions as a turn lane or median. Sidewalks are mostly continuous on both sides, and a Trinity Metro bus route serves the corridor. Pavement width, including medians, ranges from 58 to 70 feet. The corridor is part of the Pedestrian High Injury Network (HIN) and Bicycle HIN.

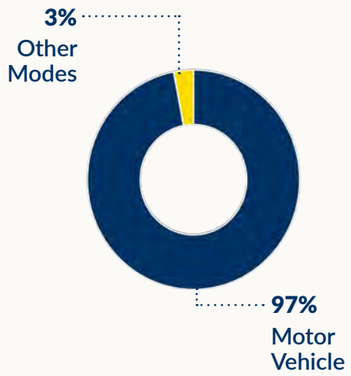
TOTAL CRASHES (2019-2023)

176

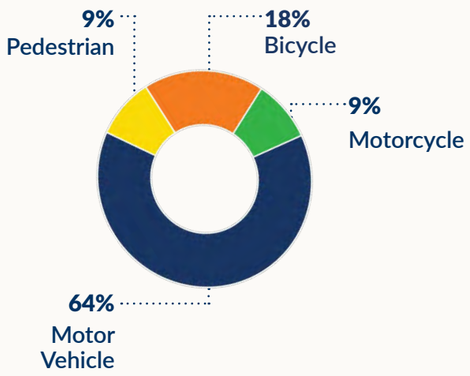
FATAL & SEVERE INJURY CRASHES

11

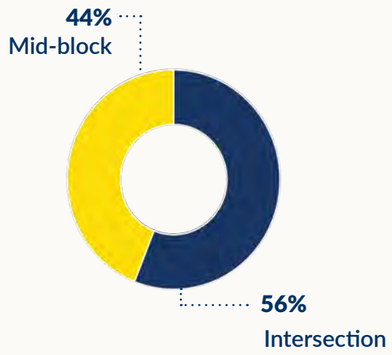
TOTAL CRASHES



FATAL & SEVERE CRASHES

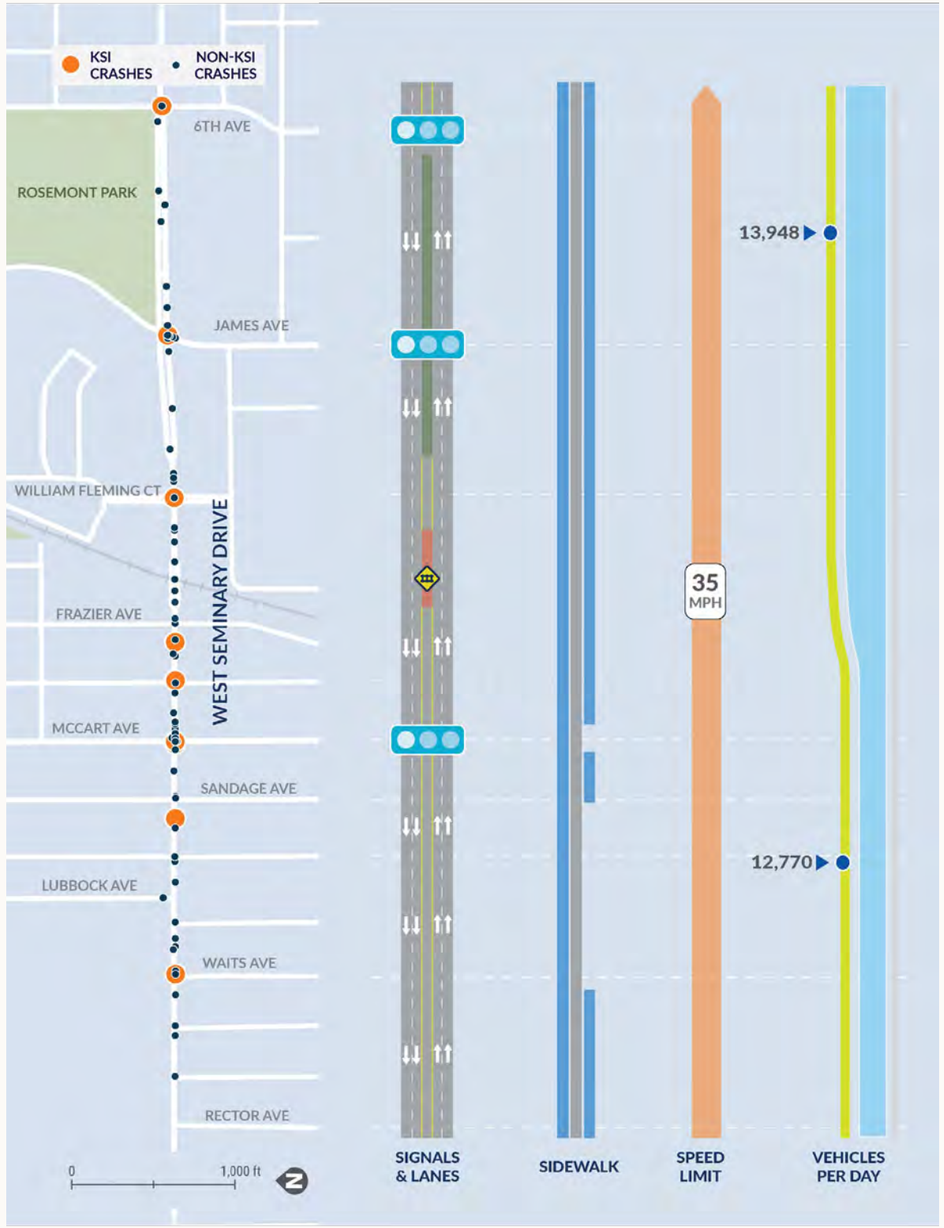


CRASH LOCATION



KEY CRASH TYPES

KEY CONTRIBUTING FACTORS



WEST SEMINARY DRIVE

FROM 6TH AVENUE TO RECTOR AVENUE (1.18 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Crosswalk Visibility Enhancements

Roadway Reconfiguration

Speed Management

Walkways

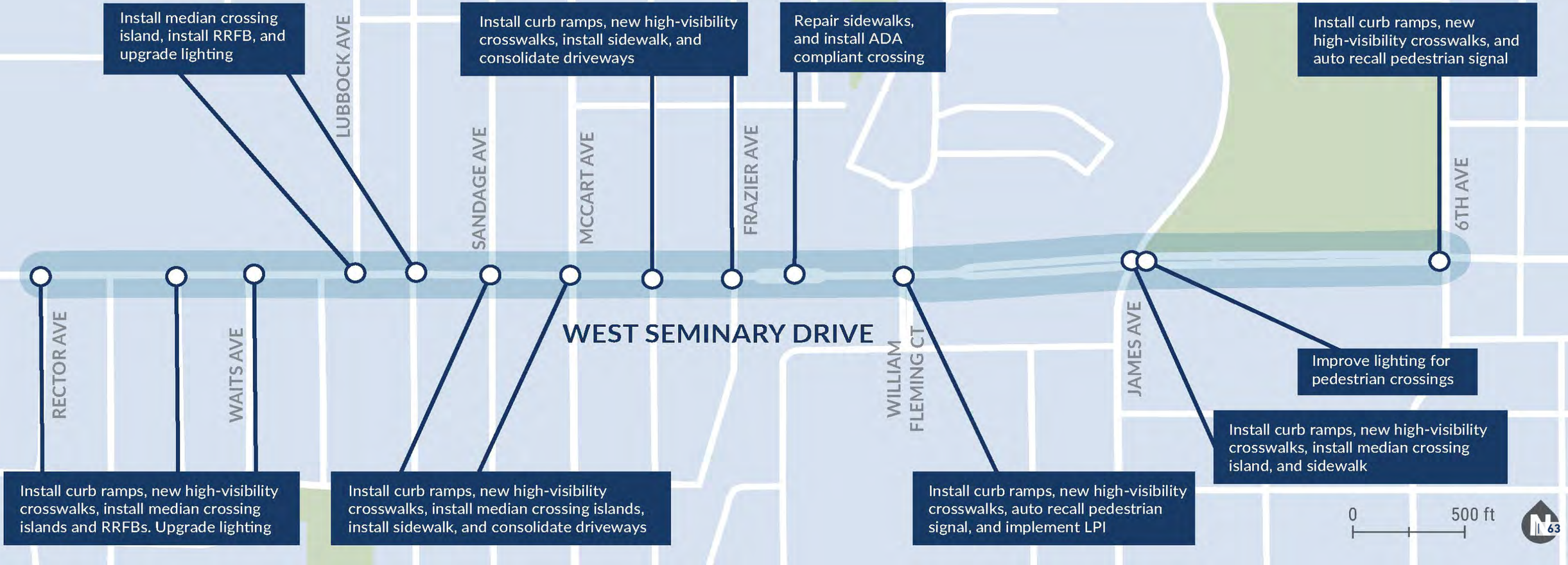
Bicycle Lanes

FINAL BENEFIT/ COST RATIO 35.82

BENEFITS	PROJECT COST
$164,000,000	$4,578,300

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$223,029	$147,840	$0
INTERSECTION	$221,964	$466,088	$0
TOTAL	**$444,993**	**$613,928**	**$0**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS



MARK IV PARKWAY

FROM MEACHAM BOULEVARD TO CANTRELL SANSOM ROAD (1.61 MILES)

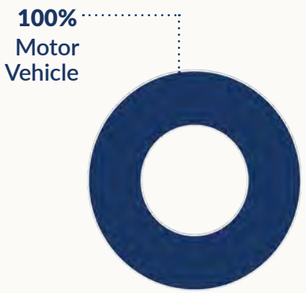
FORT WORTH 2050

CONTEXT

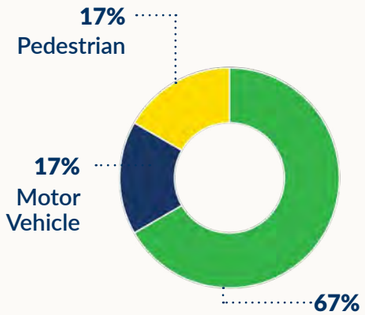
This is a major arterial primarily lined with industrial uses, including distribution centers for USPS, FedEx Freight, DHL, and Amazon. The roadway consists of four to six lanes with a grass median featuring curb breaks at major driveways. The median varies in width, with mostly unmarked left turn lanes. Sidewalks are limited but present on both sides north of I-820. Pavement width ranges from 82 to 98 feet, with a right-of-way of approximately 120 to 124 feet. The corridor is part of the Motor Vehicle High Injury Network (HIN), Commercial Motor Vehicle HIN, and Motorcycle HIN.

TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
208	6

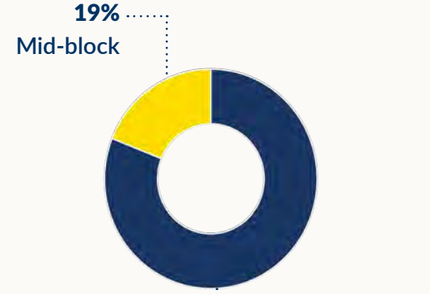
TOTAL CRASHES



FATAL & SEVERE CRASHES



CRASH LOCATION



KEY CRASH TYPES

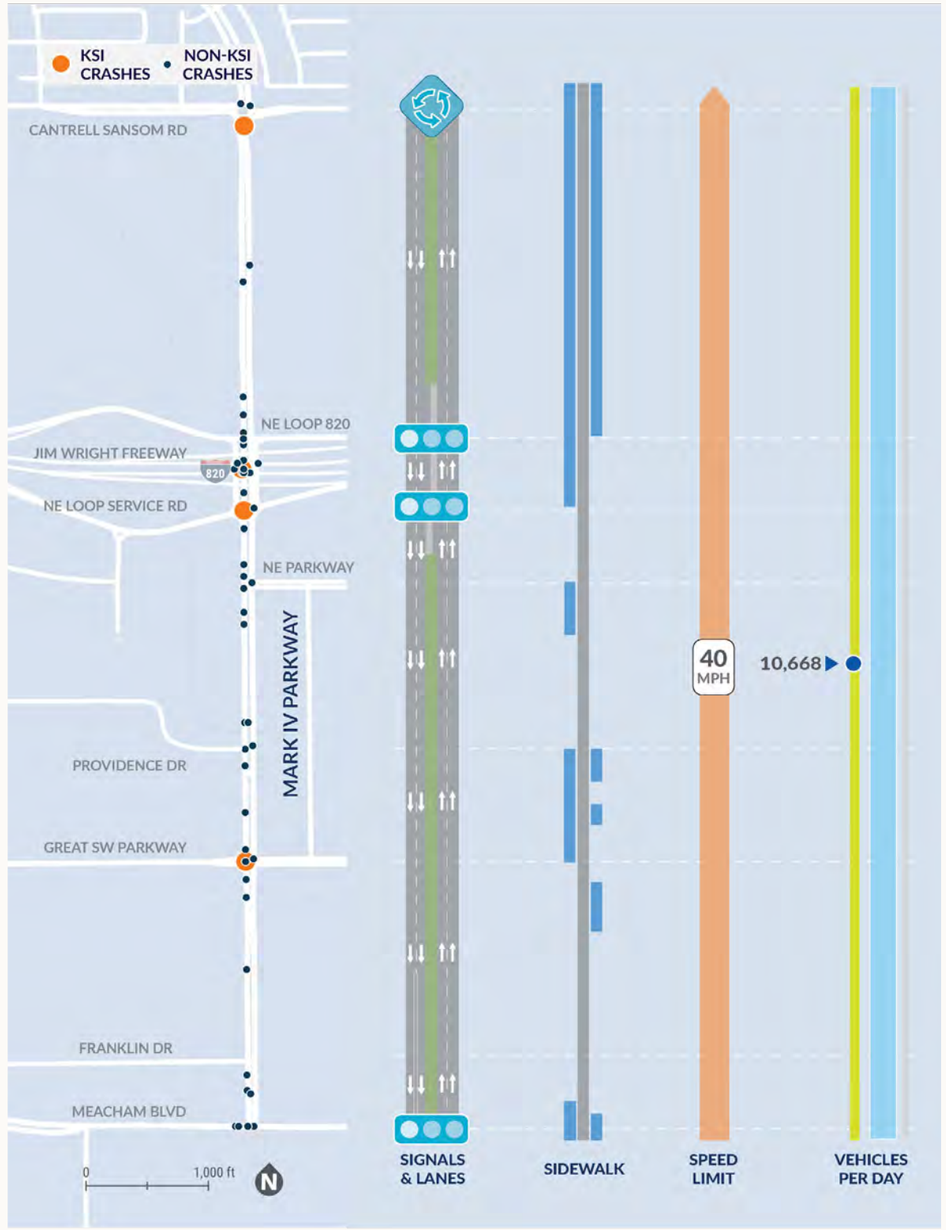
Opposite Direction Crashes

Same Direction Crashes

KEY CONTRIBUTING FACTORS

Driver Inattention

Failed To Yield Right of Way – Turning Left



MARK IV PARKWAY

FROM MEACHAM BOULEVARD TO CANTRELL SANSOM ROAD (1.61 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

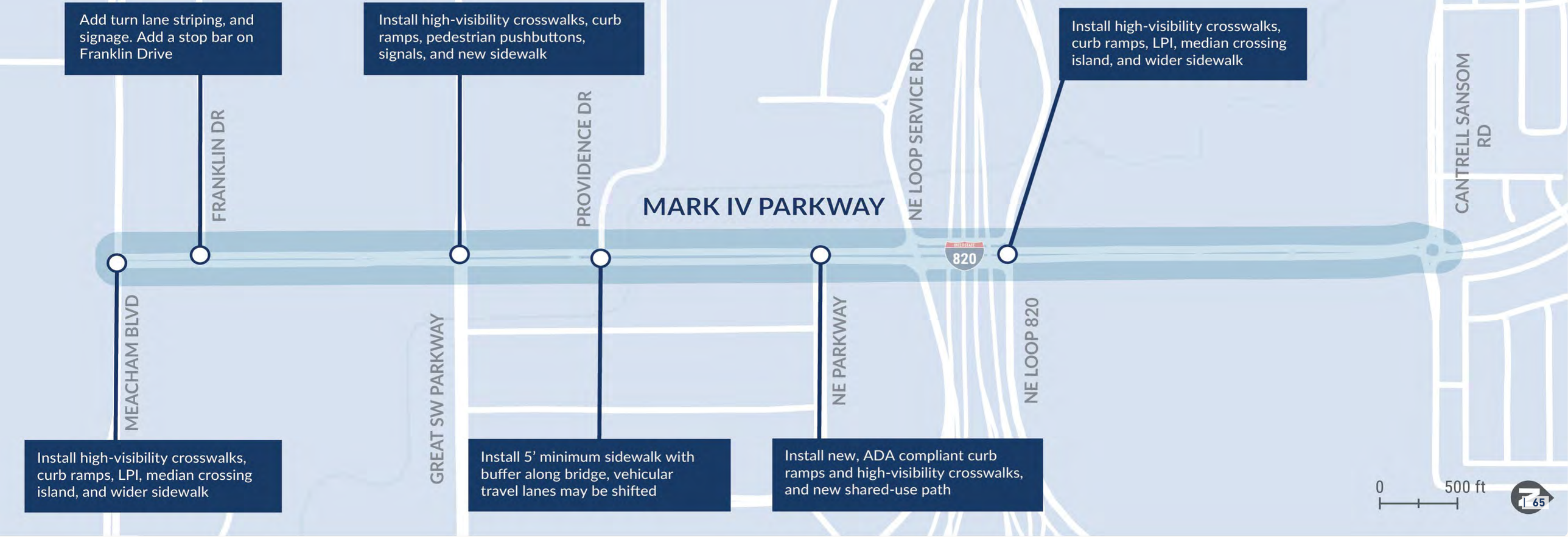
- Corridor Access Management
- Crosswalk Visibility Enhancements
- Dedicated Left- and Right-Turn Lanes
- Walkways

FINAL BENEFIT/ COST RATIO 18.26

	BENEFITS	PROJECT COST
	$92,480,000	$5,063,400

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$2,910	$78,095	$1,406,637
INTERSECTION	$5,764	$32,072	$150,000
TOTAL	**$8,674**	**$110,167**	**$1,556,637**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS



SYCAMORE SCHOOL ROAD

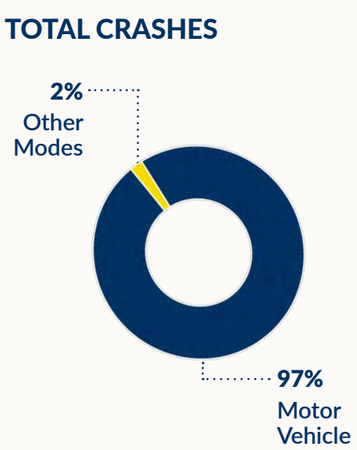
FROM SOUTH FREEWAY TO W EVERMAN PARKWAY (1.4 MILES)

CONTEXT

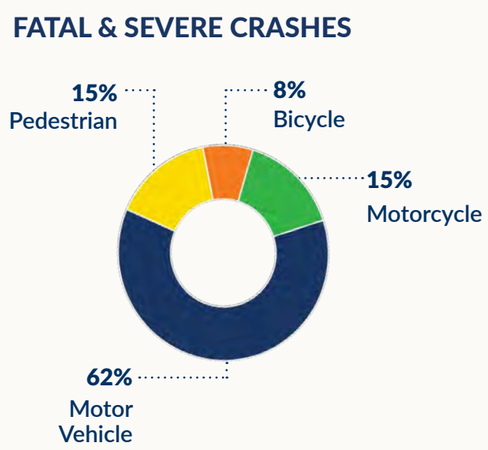
This is a residential minor arterial with some commercial use. Hallmark Park is located midway between the Sycamore Creek bridge and an at-grade railroad crossing. The roadway has four lanes and is designated as a commercial delivery route. Sidewalks are intermittent, with one on the south side extending to the creek and another on the north side from Hemphill Street to W Everman Parkway. Pavement width ranges from 40 to 42 feet. The corridor is part of the Bicycle High Injury Network (HIN), Pedestrian HIN, and Motor Vehicle HIN.

TOTAL CRASHES (2019-2023)	FATAL & SEVERE INJURY CRASHES
292	13

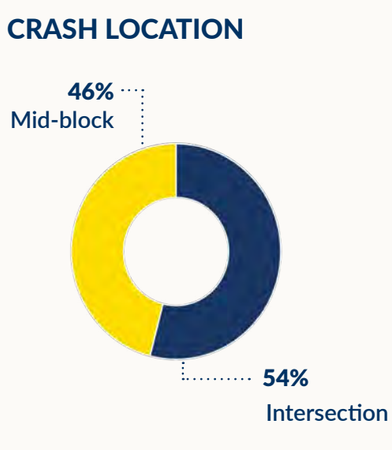
TOTAL CRASHES



FATAL & SEVERE CRASHES

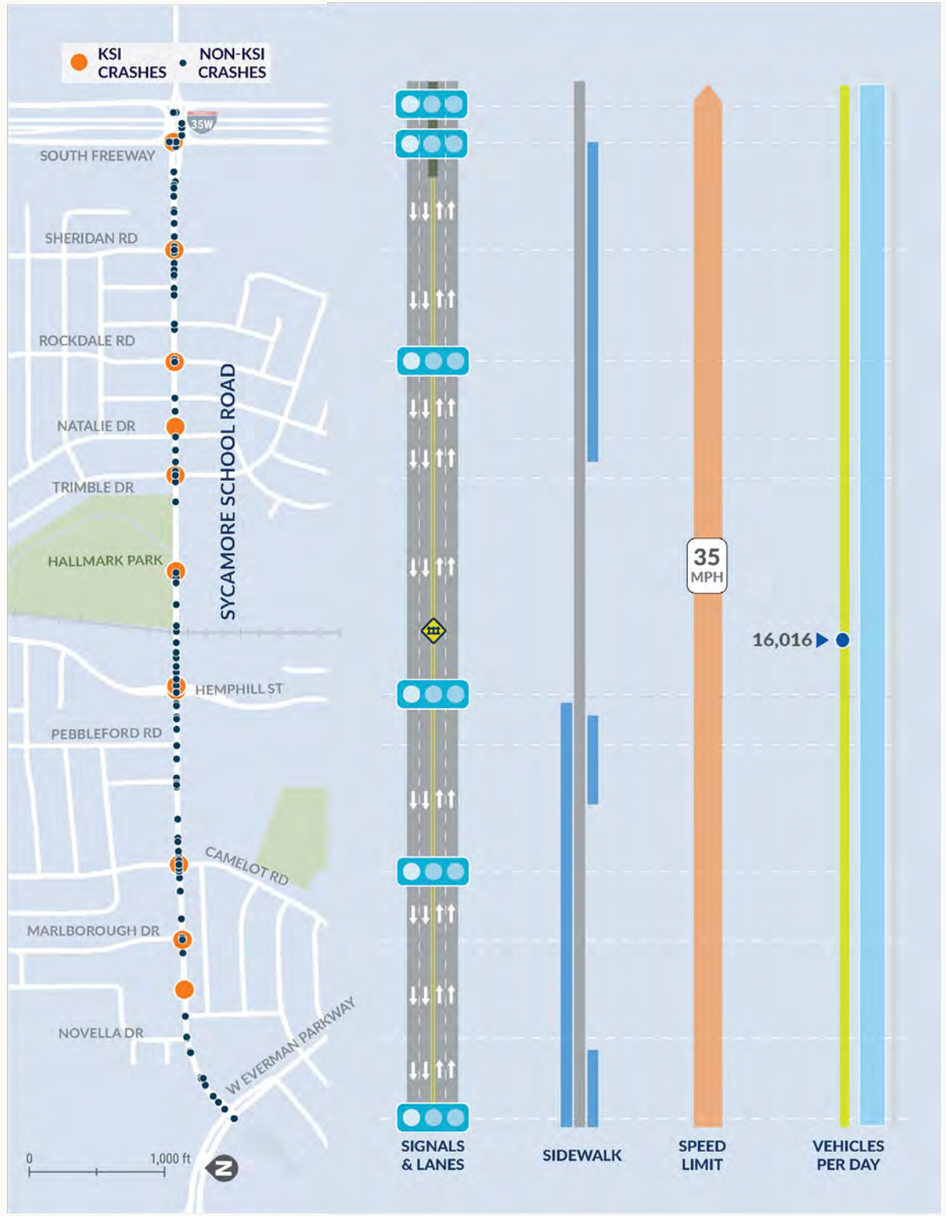


CRASH LOCATION



KEY CRASH TYPES

KEY CONTRIBUTING FACTORS



SYCAMORE SCHOOL ROAD

FROM SOUTH FREEWAY TO W EVERMAN PARKWAY (1.4 MILES)

FORT WORTH 2050

CORRIDOR-WIDE RECOMMENDATIONS

Crosswalk Visibility Enhancements

Roadway Reconfiguration

Speed Management

Walkways

Bicycle Lanes

FINAL BENEFIT/ COST RATIO 26.56

BENEFITS	PROJECT COST
$128,960,000	$4,854,600

CONSTRUCTION COST	SHORT TERM (0-2 YEARS)	MEDIUM TERM (2-5 YEARS)	LONG TERM (5+ YEARS)
SEGMENT	$50,160	$1,424,844	$0
INTERSECTION	$29,160	$269,960	$0
TOTAL	**$79,320**	**$1,694,804**	**$0**

MAP OF INTERSECTION SPECIFIC RECOMMENDATIONS

SYSTEMIC RECOMMENDATIONS

Systemic safety countermeasures are low-cost, scalable solutions that can be applied broadly across a roadway network. In Fort Worth, these treatments should be implemented citywide with minimal need for site-specific analysis. Rather than relying solely on crash history or focusing only on the High Injury Network (HIN), a systemic approach enables proactive intervention based on recurring design features and risk factors.

This effort identifies and deploys systemic countermeasures across Fort Worth's street network, aiming for strategic, data-driven safety improvements that address both documented high-risk locations and areas with potential for severe crashes.

METHODOLOGY

The analysis began by identifying crash profiles linked to the highest share of Killed or Seriously Injured (KSI) incidents. insights from Fort Worth's State of Safety Report was integrated. Other notable crash patterns that pose significant risks despite lower severity are also considered.

For each profile, appropriate countermeasures were selected primarily from the FHWA's Proven Safety Countermeasures list and supplemented with best practices from peer cities. These were adapted to Fort Worth's local context, modal priorities, and street typologies.

Pedestrian Hybrid Beacons

Pedestrian Refuge Islands

RECOMMENDED SYSTEMIC SAFETY COUNTERMEASURES

MODE	TARGETING CRASH TYPES	FHWA PROVEN SAFETY COUNTERMEASURES	ADDITIONAL COUNTERMEASURES
PEDESTRIAN	Pedestrian Crashes at Dark, Unlighted Locations	• Roadway Lighting • Pedestrian Hybrid Beacons (PHBs) • Crosswalk Visibility Enhancements	• Intersection Daylighting • Reflective Signage and Pavement Markings • Overhead flashing beacons at midblock crossings • Raised crosswalks
	Pedestrian Crashes on Roadways with Speed Limits of 35 or 40 mph	• Lane Reconfigurations • Leading Pedestrian Intervals (LPIs) • Pedestrian Refuge Islands • Rectangular Rapid Flashing Beacons (RRFB)	• Reduced Speed Limit Zones • Enhanced Enforcement • Curb extensions • Pedestrian crossing signage with flashing beacons • Dynamic speed display signs
	Pedestrian Crashes on High-Volume Roadways (AADT ≥ 30,000)	• Pedestrian Hybrid Beacons (PHBs) • Pedestrian Refuge Islands • Roadway Lighting	• Grade Separated Crossings (where AADT ≥ 40,000) • Access Management • Dynamic speed display signs • Turn restrictions
	Pedestrian Crashes at Transit Stops/Bus Stops	• Walkways/Paved Shoulders • Crosswalk Visibility Enhancements/ Enhanced lighting/illumination	• Transit stop relocation or consolidation • Raised crosswalks and curb extensions near stops • Transit island platforms with protected access
	Left Turn Motor Vehicle vs. Pedestrian Crashes (Signalized, 2+ lanes per direction)	Pedestrian Crashes at Transit Stops/ Bus Stop	• Raised crosswalks or pedestrian refuge islands • Advanced signage • Signal countdown timers • Protected left turn phasing
BICYCLIST	Bicycle Crashes with Motor Vehicles on Roadways with Speed Limits of 35 mph or more	• Separated Bike Lanes • Lane Reconfiguration •LBI/LPI at signalized intersections	• Bicycle Signal Heads at intersections • High Visibility Bike Lane Markings • Buffered bike lanes • Protected intersections

Intersection Daylighting

Protected Intersection

Separated Bike Lanes

Variable Speed Limit

Backplates with Retroreflective Borders

Chevron Signs for Enhanced Delineation

R cuts or Median Uturn

RECOMMENDED SYSTEMIC SAFETY COUNTERMEASURES

MODE	TARGETING CRASH TYPES	FHWA PROVEN SAFETY COUNTERMEASURES	ADDITIONAL COUNTERMEASURES
MOTOR-CYCLE	Motorcycle Crashes at Dark, Unlighted Roadways with AADT ≥ 40,000	• Roadway Lighting/illumination • Enhanced Delineation and Friction for Horizontal Curves	• High Friction Surface Treatments • Motorcycle Specific Warning Signs • Advanced curve warning systems • Centerline and edge line rumble strips • Improved helmet and safety gear awareness signage
	Motorcycle Angle Crashes at Intersections	• Roundabouts • Backplates with Retroreflective Borders • Intersection Lighting	• Flashing yellow arrows for left turns • High visibility signal backplates • Intersection advance warning signs
MOTOR VEHICLE	Commercial Motor Vehicle Crashes on Roadways with Speed Limits ≥ 60 mph and AADT ≥ 40,000	• Variable Speed Limits (VSLs) • Access Management	• Truck climbing lanes • Enhanced signage for commercial vehicles • Ramp metering systems • Runaway truck ramps • Dedicated freight lanes
	Motor Vehicle Single-Vehicle Crashes on Two-Lane Roadways	• Wider Edge Lines • Pavement Friction Management • Enhanced curve delineation	• Shoulder and centerline rumble strips • Clear zone hazard removal and roadside barriers • Enhanced lighting/illumination
	Motor vehicles Run Off Road Crashes on Curved Rural Two Lane Roads	• Wider Edge Lines • Pavement Friction Management • Enhanced curve delineation	• Shoulder and centerline rumble strips • Clear zone hazard removal and roadside barriers • Enhanced lighting/illumination
	Motor Vehicle Angle / Left Turn Crashes at Signalized Intersections (2+ approach lanes)	• R cuts or Median Uturn • Dedicated Left Turn Lanes • Roundabout	• Signal phasing with protected left turn arrows
	Unsignalized Intersections Involving Motor Vehicle Angle Collisions	• Systemic Low Cost Countermeasures combination See FHWA Website for details • R cuts or Median U-turn • Access Management	• Stop control upgrades (e.g-all way stops) • Enhanced sight distance • Flashing warning beacons or intersection rumble strips • Install Traffic Signal (if warrants are met)
MIXED MODE	Crashes at Railroad Crossings (Vehicle or Pedestrian)	• Enhanced lighting/illumination	• Anti-Trespass Panels • Gates, flashing lights, bells per FRA standards • Fencing to direct safe crossings • Enhanced signage and pavement markings

SYSTEMIC VERSATILITY OF COUNTERMEASURES

To maximize citywide impact, each countermeasure was also assessed for its broader applicability beyond its associated crash profile. This enables Fort Worth to address current safety issues while anticipating future risks as roadway conditions, travel behaviors, and crash trends evolve.

The table on the right summarizes these versatile applications, supporting a proactive, scalable, and resilient safety strategy for the city.

Transit Island

Dynamic Speed Sign

Motorcycle Warning Sign

Crosswalk Visibility Enhancement

Anti Trespassing Panel for Rail Road Crossing

Truck Climb Lane

FHWA COUNTERMEASURES CONSIDERED	OTHER CRASH TYPES CAN BE ADDRESS				
ROADWAY LIGHTING	Motorcycle crashes at dark, unlighted locations	Pedestrian crashes at signalized intersections	Vehicle pedestrian crashes during dawn/ dusk hours	Nighttime rear end and angle crashes	
PEDESTRIAN HYBRID BEACONS (PHBS)	Midblock pedestrian crashes	Pedestrian crashes on multilane roads	Crashes involving yielding conflicts at uncontrolled crossings	Pedestrian crashes near transit stops	
CROSSWALK VISIBILITY ENHANCEMENTS	Crashes involving turning vehicles at crosswalks	Nighttime pedestrian crashes at marked crosswalks	Pedestrian crashes at uncontrolled intersections or midblock locations		
LANE RECONFI-GURATIONS	Rear end crashes from left turning vehicles	Angle crashes at driveways and minor streets	Speed related crashes in urban settings/ commercial districts	Bicycle crashes due to lack of lateral separation	
LEADING PEDESTRIAN INTERVALS (LPIS)	Turning vehicle vs. pedestrian crashes at signalized intersections	Crashes where pedestrians are hit in crosswalks by vehicles turning right or left	Conflicts in high pedestrian activity zones		
PEDESTRIAN REFUGE ISLANDS	Pedestrian crashes on multilane roads	Crashes where pedestrians misjudge gaps in traffic	Elderly or slower-moving pedestrian crashes		
SEPARATED BIKE LANES	Bicycle-motor vehicle sideswipe and overtaking crashes	Bicycle crashes at high-speed corridors	Conflicts at intersections involving right-turning vehicles		
ENHANCED DELINEATION AND FRICTION FOR HORIZONTAL CURVES	Lane departure crashes on curves	Nighttime crashes at rural horizontal curves	Wet weather single-vehicle crashes		
R CUTS OR MEDIAN UTURN	Head-on and angle crashes at uncontrolled median openings	High-speed left-turn crashes on divided highways	Rear-end crashes from delayed left-turn movements	Multi-threat crashes involving pedestrians crossing multiple lanes	Crashes at intersections with high left-turn volumes and limited gaps

VISION ZERO EDUCATION CAMPAIGN

Fort Worth's Vision Zero educational campaign is a multi-faceted initiative aimed at improving safety for everyone on the city's streets. The campaign materials are designed to:

- Introduce the Vision Zero concept and raise awareness that Fort Worth is a Vision Zero city
- Promote real and perceived safety for people walking and biking
- Highlight the most common crash-causing behaviors and encourage safer choices
- Deliver inclusive messaging that resonates with residents of all ages, abilities, races, and backgrounds

CAMPAIGN TOOLKIT CONTENT

To ensure residents encounter Vision Zero messaging in their daily lives, the Fort Worth Vision Zero education campaign uses a multifaceted approach. The toolkit includes:

- **Branding** – A consistent visual identity, including the Fort Worth Vision Zero logo and color palettes
- **Social Media Strategy** – Pre-designed graphics, suggested text, and a release schedule to maintain an active online presence
- **Campaign Kits** – Ready-to-use materials for community pop-up events and neighborhood outreach, usable by City staff, community groups, and neighborhood associations
- **Radio Resources** – Audio messages designed for broadcast to expand audience reach
- **Vision Zero Safety Video** – A concise, engaging video that explains the Vision Zero initiative and promotes key safety messages

Example of Vision Zero Education Campaign Pamphlet

VISION ZERO EDUCATION CAMPAIGN

TARGET AUDIENCE

This education campaign and toolkit, identified as a priority in the Vision Zero Safety Action Plan, is designed to reach a broad and diverse audience, including:

- The general public
- People walking, biking, driving, or using micromobility
- Older adults
- K–12 students
- Non-English-speaking residents
- Residents across different neighborhoods

Campaign toolkit materials is tailored to engage these groups in accessible, relevant settings—such as schools, neighborhoods, community events, and social media—using messages that are clear, appealing, and culturally appropriate.

Example of Vision Zero Education Campaign Yard Signs

Example of Vision Zero Education Campaign Social Media Content

6 MOVING FORWARD

IMPLEMENTATION STRATEGIES

Implementation Strategies outline the key actions Fort Worth will take to achieve Vision Zero, translating recommendations into tangible steps. This section provides a framework for executing safety improvements through demonstration projects, capital investments, policy actions, and community education.

By incorporating a mix of short-term, low-cost interventions and long-term infrastructure upgrades, the city can test innovative solutions, address critical safety needs, and build public support. These strategies serve as a roadmap to guide decision-making, prioritize resources, and ensure sustained progress toward safer streets for all.

DEMONSTRATION PROJECTS

Quick build projects can be used to demonstrate the potential of roadway improvements in a relatively fast and cost-effective way. While typically limited to temporary “paint and plastic” type projects, these initiatives can still have an immediate impact on roadway user safety. Due to their typically low cost, these kinds of projects can be used for communities to experience and explore designs before they become permanent, creating not only an engagement opportunity, but likely a better end design. And by including community members in their design, demonstration projects can also serve as a motivational tool for alternative commuting modes.

In Fort Worth, for example, using paint and temporary materials to create bulb-outs (curb extensions) to slow vehicle speeds and shorten pedestrian crossing distances at key intersections could be used to demonstrate how these kinds of safety treatment can be effective at achieving easy wins.

CAPITAL PROJECTS

These are larger projects that serve the long-term goals of a Safety Action Plan. Therefore, costs are higher, and more design and planning are required. While quick build projects focus on temporary measures, capital projects are permanent changes to the roadway. Capital projects may be former quick build installations that have proved to be effective in improving safety and are ready for long term implementation. Typical examples include traffic calming, enhanced pedestrian lighting, or bike lane installation. Capital projects can help connect Vision Zero projects with other realms of enhanced transportation like transit.

POLICY ACTIONS AND TOOLS

Changes to policy require enabling legislation or local ordinance to support the implementation of specific decisions or actions. Policy changes can be used to establish permanent guidelines in which the city will follow as it implements infrastructure improvements. Improving policies for VRUs (vulnerable road users) can be as simple as evaluating local codes regarding sidewalks or jaywalking. More expansive policies, such as a citywide Complete Streets Policy, will require the institutionalization of its approach, such as retraining engineers, planners, and project managers. Policy tools can also be used for the prioritization of underinvested and underserved communities, a vital element of any Safety Action Plan or approach to achieving Vision Zero.

COMMUNITY EDUCATION

Safe streets in part rely on **user behavior,** which is influenced by a user’s understanding of the transportation system in which they are participating. Knowledge of traffic safety issues and their countermeasures equips communities with an awareness of the network around them and allows for more valuable input into the decision-making process. Community education can be provided in the form of **education guides, safety campaigns, or neighborhood events.** Through the education of users, a culture of safety can be promoted, changing the norms around traffic safety.

FUNDING STRATEGIES

FEDERAL FUNDING

Safe Streets and Roads for All (SS4A)

The SS4A grant is an annual funding opportunity from the Federal Highway Administration that supports improving roadway safety for all users by reducing or eliminating serious-injury and fatal crashes. It requires the development and implementation of a comprehensive safety plan, such as a Safety Action Plan or a Vision Zero Plan. The grant provides funding for planning, demonstration, and implementation grants. This grant requires a local funding match of no less than 20 percent, but North Central Texas Council of Governments (NCTCOG) may help cover local match for some project using Transportation Development Credits (TDCs). The City of Fort Worth has applied TDCs in the past and may do so in the future to help meet the funding needs for implementing the actions and projects identified in this plan.

STATE FUNDING

Highway Safety Improvement Program (HSIP)

Texas's Highway Safety Improvement Plan (HSIP), directed by the Strategic Highway Safety Plan (SHSP), aims to reduce traffic fatalities and severe injuries on all public roads. It provides a standardized approach for identifying and reviewing specific traffic safety concerns throughout the state. Program funds are eligible to cover up to 90 percent of project construction costs. HSIP funds are only eligible to cover construction costs.

Traffic Safety Grant via NHTSA

NHTSA awards grants for occupant protection, state traffic safety information systems, impaired driving countermeasures, distracted driving, motorcyclist safety, state graduated driver licensing laws, and non-motorized safety. Funds are awarded to the state and administered through TxDOT.

TxDOT Transportation Alternatives Program (TAP)

TxDOT TAP provides funds for locally sponsored bicycle and pedestrian infrastructure in the state. TxDOT TAP has four different project categories that decide eligibility and funding amounts: community-based, large scale, network enhancements, and non-infrastructure. All require a local match of 20 percent. The current call for projects will provide funding for FY2027-FY2029.

REGIONAL FUNDING

Metropolitan Transportation Plan (MTP)

The MTP is a long-range plan that serves as a guide for the projects and programs the region would like to implement over the life of the plan. Projects and programs may only be included in the MTP if funding exists or can be identified for their implementation. The Transportation Improvement Plan (TIP) lies within the greater MTP.

Transportation Improvement Program (TIP)

The NCTCOG and TxDOT, along with local governments and transportation agencies, develop a new TIP every two years. It is a staged, multi-year listing of transportation projects and programs within the Dallas-Fort Worth Metropolitan Area with committed funding from federal, state, and local sources. The TIP outlines four years of funded transportation projects within the long-range Metropolitan Transportation Plan.

NCTCOG TAP

Fort Worth is also eligible to apply for TAP funds through NCTCOG. Approximately $50 million in TA federal funds will be available to award eligible projects which may include Safe Routes to School Planning; Safe Routes to School Infrastructure; Shared-Use Paths (trails); On-street Bikeways; Sidewalks, Crosswalks and Curb Ramps; Sidewalks and Bikeways to Transit; Pedestrian and Bicycle Safety Countermeasures and Technology; and Protected Intersections, according to the 2025 NCTCOG TA Program Call for Projects.

LOCAL FUNDING

Tarrant County Transportation Bond Program

In 2021, Fort Worth proposed and passed a transportation bond program. Projects identified in the bond have a goal to increase mobility, reduce congestion, enhance safety, and improve connectivity

General Obligation (GO) Bond

A General Obligation (GO) Bond provides cities with a tool to raise funds for capital improvement projects that are otherwise not funded by city revenue. This debt is guaranteed by the full faith and credit of the city. The funding source for GO bond payments is property taxes, which are generated each year based on the tax rate adopted by the City Council. GO bonds can only be used to fund the projects authorized in the propositions approved by the voters. These projects can include initiatives such as the construction and improvement of highways, bridges, ports, airports, rail lines, and public transit systems.

Pay-As-You-Go (PayGo) Financing

Pay-As-You-Go (PayGo) is another alternative to debt financing. It uses cash, not debt to maintain, improve, and reinvest in the city's infrastructure. PayGo financing saves the City from paying interest costs on debt and reduces debt, thereby improving financial flexibility. Improvements can be made in the current fiscal year instead of waiting for the next bond program. Using PayGo to supplement the capital program helps the city meet its capital needs without adding to the total debt outstanding.

Transportation Impact Fee

A transportation impact fee is a one-time charge charged by the city to new development projects to help raise revenue for transportation projects. Impact fees are based on the anticipated demand for infrastructure that the new development creates. The general purpose of impact fees is to help fund transportation improvements that are needed as development occurs and to help pay for the infrastructure necessary to accommodate new development or re-development.

TRANSPARENCY / MEASURING PROGRESS

METRIC OF SUCCESS

Measuring progress toward Vision Zero is crucial for maintaining a data-driven approach to road safety. Regular monitoring and reporting enhance transparency, accountability, and decision-making, helping to identify which strategies are most effective. Analyzing trends allows the city to refine its approach—expanding successful initiatives and adjusting or discontinuing those that fall short.

Achieving Vision Zero requires **sustained commitment** over time. Monitoring efforts should track both **outcomes**—such as reductions in traffic crashes, particularly fatal and severe injuries—and **outputs**, including the number and percentage of safety projects implemented, especially along the High-Injury Network (HIN). These insights ensure resources are directed toward the most impactful safety improvements.

BE TRANSPARENT ABOUT THE CITY'S STATE OF SAFETY

The City will publish the **State of Safety Report** developed as part of this Safety Action Plan (SAP) and update it every 2–3 years as new data becomes available. Regular updates will help the public understand local safety trends and enable the City to monitor and track crash patterns over time. To enhance accessibility, key safety data should be presented through an **online dashboard,** providing the public with an easy-to-use platform for reviewing and analyzing safety trends.

MAINTAIN AND UPDATE ONLINE SAFETY RESOURCES

The City will publish this Safety Action Plan on its **Vision Zero (VZ) webpage** and the **Safety Action Plan website**. As safety strategies are implemented and progress is made toward Vision Zero, the City will continue sharing important updates, such as the **annual safety report**, on these platforms. These online resources will be actively maintained and incorporated into **safety campaigns** to establish them as the primary sources for transportation safety information.

THE FOLLOWING METRICS WILL BE TRACKED ANNUALLY TO GAUGE PROGRESS TOWARDS VISION ZERO:

- Number of traffic fatalities and severe injuries within the region, in total and by mode.
- Number of crashes on and off the High Injury Network (HIN).
- Number of crashes occurring on roadways adjacent to schools, parks, and transit stops within vulnerable areas of the community.
- Percentage of roadways on the High Injury Network with new street safety improvements.
- Number of safety or street reconstruction projects with multimodal facilities, especially along the HIN.
- Number of safety projects on roadways adjacent to vulnerable communities.
- Number of traffic fatalities and severe injuries within the region, in total and by mode.
- Number of crashes on and off the High Injury Network (HIN).
- Number of crashes occurring on roadways adjacent to schools, parks, and transit stops within vulnerable communities.
- Number of safety or street reconstruction projects with multimodal facilities, especially along the HIN.
- Number of safety projects on roadways adjacent to vulnerable communities.
- Miles of sidewalk and bikeways constructed and maintained along the HIN or priority roadways.
- Percentage of the HIN covered by Road Safety Audits within the past 5 years.
- Average travel speeds within the region by roadway functional classification and median speeds on the High Injury Network or priority roadways.
- Commute mode shares for the region.
- Number of people reached through road safety outreach, education campaigns, and Vision Zero engagement activities.
- Number of agencies and representatives participating in Vision Zero working groups.

VISION ZERO FORT WORTH

FORT WORTH®

2050

FORT WORTH 2050

APPENDIX A
Documentation of Current Policies, Programs, and Regulations

Table of Contents

Introduction 1

Review of Relevant Areas 2

Vision Zero Resolution No. 5149-11-2019 2
Active Transportation Plan 3
Master Thoroughfare Plan 6
Complete Streets Policy 8
Fort Worth City Code of Ordinances 9
Transportation Management Programs—Maintenance, Safety, and Operations 11

Summary 14

Introduction

The City of Fort Worth's commitment to improving the safety and efficiency of its transportation systems has led to the development of the Safety Action Plan (SAP). The purpose of this review is to identify existing policies, regulations, plans, practices, and programs supporting traffic safety in the City of Fort Worth. In coordination with the city, the project team reviewed relevant documents, including the Vision Zero Resolution, Active Transportation Plan (ATP), Master Thoroughfare Plan (MTP), Complete Streets Policy, Fort Worth City Code of Ordinances, and Transportation Management Program Areas.

The review focused on the key components relevant to traffic safety, the alignment with Vision Zero, and the identification of potential areas for updates and/or implications for SAP development. This review will help the city better understand traffic safety related policies, planning, and implementation, and will serve as a reference document when developing strategies and actions as part of the SAP or other citywide safety initiatives. Specifically, this policy review focused on the City's current practices in safety planning and implementation. This includes an overview of policy frameworks, identification of potential policy gaps, and areas for improvement in both new policies and the implementation of existing policies. By incorporating the takeaways from the policy review into recommendation development, along with data-informed analysis and public and stakeholder involvement, the SAP will create a holistic effort to identify and develop actionable recommendations.

Review Areas

- Vision Zero Resolution No. 5149-11-2019
- ATP
- MTP
- Complete Streets Policy
- Fort Worth City Code of Ordinances, Chapter 22: Motor Vehicles and Traffic (particularly Bicycles, Pedestrians, and Truck Traffic)
- Transportation Management Program Areas—Maintenance and Operations

Review of Relevant Areas

For this section of the report, various documents were reviewed to understand the city's previous and ongoing safety efforts, identify potential gaps, and highlight areas for improvements to support the development of the SAP.

Vision Zero Resolution No. 5149-11-2019

Vision Zero is a strategy to eliminate all traffic fatalities and serious injuries through policies and regulations that prioritize safe, multimodal streets. Based on the Vision Zero Network, a Vision Zero Community meets the following minimum criteria:

- A clear goal of eliminating traffic fatalities and severe injuries has been set.
- The mayor has publicly, officially committed to Vision Zero.
- A Vision Zero plan or strategy is in place, or the mayor has committed to a clear time frame for doing so.
- Key departments (including transportation, public health, and the mayors' offices) are leading Vision Zero; this has not been a requirement for receiving SS4A implementation funds, but it is likely to become one in the future.

Unlike traditional road safety policies, Vision Zero acknowledges that traffic fatalities and severe injuries are not accidents but preventable events. Its goals are to eliminate traffic fatalities and serious injuries and increase safe, healthy, and equitable mobility for all. Vision Zero proactively targets and uses a risk-based systematic approach to build a safer road system. Rather than focusing solely on individual behavior—such as enforcing speed limits or driver education—Vision Zero takes a broader, systems-based approach. It acknowledges that the responsibility for safety extends across the entire transportation ecosystem, encompassing road design, policymaking, and enforcement strategies that ensure safe outcomes for all road users.

Many states, metropolitan planning organizations (MPOs), cities, and counties have adopted Vision Zero. The Texas Department of Transportation (TxDOT) has a "Road to Zero" goal of reducing the number of deaths on Texas roadways to zero by 2050. To track progress towards the statewide transportation goals, TxDOT has established performance measures and targets related to promoting safety, including annual fatalities and fatality rate. At the regional level, the North Central Texas Council of Governments (NCTCOG) supports the Toward Zero Deaths (TZD) vision,

focusing on eliminating fatalities and serious injuries across all modes of travel. The NCTCOG's regional Roadway Safety Plan sets a goal to eliminate all fatalities on their roadways by 2050.

The City of Fort Worth adopted its Vision Zero Policy Resolution[1] in 2019. The resolution supports a Vision Zero strategy to eliminate traffic fatalities and serious injuries in the City of Fort Worth. City of Fort Worth was designated by the Federal Highway Administration as a Pedestrian Safety Focus City due to its high pedestrian fatality rate. Prior to this designation, the city already made significant efforts to improve safety through the Bike Fort Worth Plan, Safety Passing Ordinance, Walk Fort Worth Plan, Complete Streets Policies, and ATP, but the Vision Zero Resolution represents a formal commitment to support the development of a Vision Zero-based strategy.

While Fort Worth's Vision Zero resolution outlines key commitments, there are areas for enhancement. Although Vision Zero policies vary among different cities, some of the key elements include safe system approach, community engagement, designing and maintaining roads to prioritize the safety of all road users, using data analysis to understand trends, managing speed for safe travel, and setting a clear timeline to achieve zero traffic deaths and serious injuries.

As part of the Vision Zero SAP process, the following areas have been identified as potential updates to the ordinance:

- Setting a clear timeline for achieving the Vision Zero goal;
- Prioritizing safe speeds;
- Strengthening public engagement, particularly in underserved neighborhoods and the communities most impacted by traffic violence;
- Including clear metrics and responsibilities across city departments; and
- Ensuring regular reporting and public transparency.

Active Transportation Plan

The Fort Worth ATP[2], adopted in April 2019, serves as an update to the 2010 Bike Fort Worth Plan and the 2014 Walk Fort Worth Plan, and it is Fort Worth's first-ever citywide trails master plan. The ATP provides a shared vision for active transportation priorities and a comprehensive

[1] City of Fort Worth, Vision Zero Resolution, accessed May 31, 2024, vision-zero-resolution5149-11-2019.pdf (fortworthtexas.gov).

[2] City of Fort Worth. (2020). *City of Fort Worth Active Transportation Plan.* https://www.fortworthtexas.gov/files/assets/public/v/1/tpw/documents/atp/active-tranport-plan.pdf.

framework for implementation. It identifies the priority infrastructure network for citywide and regional active transportation travel, emphasizing on local, short trips and connections to transit. It also includes policy recommendations, performance measures to guide investments and accountability, and prioritized project lists with cost opinions.

The ATP calls for a connected All Ages and Abilities network for pedestrians, bicyclists, and trail and transit users. It accomplishes this through analysis, network planning, and design guidance. Walking conditions were analyzed using a Pedestrian Experience Index (PEI) developed specifically for the ATP, and bicycling conditions were analyzed using a Level of Traffic Stress analysis based on nationally accepted best practices. The results of these analyses—which identify more and less comfortable blocks and intersections—informed the development of the ATP's recommendations for the network design through project identification and prioritization. The ATP Facility Selection Guide provides procedures for selecting an appropriate bicycle facility for users of All Ages and Abilities based on traffic volumes, lanes, and motor vehicle speeds.

The ATP projects were scored and ranked through the ATP prioritization process in the pedestrian, bicycle, and trails networks. Prioritization factors (as seen in Table 1) were derived from project goals and stakeholder input, including **social vulnerability, spine trail, connectivity, demand, crash history, comfort, stakeholder input, funding, and feasibility**.

Table 1. Prioritization Factors for ATP Projects

Prioritization Factors	Description
Social vulnerability	Majority minority area, low-income populations, population of people with disabilities
Spine trail	On a spine network alignment
Connectivity	Intersection with existing bikeway or trail
Demand	Population density, employment density, transit stations/stops, trailheads, schools, and households without access to a motor vehicle
Crash history	Available crash record
Comfort	PEI or Level of Traffic Stress
Stakeholder input	Interactive map priority

Funding	20% funding from external sources
Feasibility	Evaluated through 30% design

For the pedestrian network, sidewalk gaps in 20 locations were given top priorities, with Cedar Street/Cypress Street/East El Paso Street/East Presidio Street given #1 priority. Out of 20 locations, Rosedale Street from Main Street to Evans Avenue was given top priority for on-street bicycle projects. For trails, ATP recommended approximately 174 miles of trails, 94 river crossings, and 25 railroad crossings for the TEXRail Trail from Trinity River to TEXRail Mercantile Center Station (14,054 feet) as #1.

In addition to project prioritization, the ATP developed a policy framework based on input from stakeholders. The policy framework includes nine subjects that organize actions needed for implementation: **Coordinated, Connected, Safe and Comfortable, Accessible, Equitable, Healthy, Community Awareness and Culture, Funding, and Economic Vitality**. Specifically, the top policies that are most relevant to the SAP are detailed in the table below.

Table 2. Policy Framework Top Safety Related Policies

Subject	Policy	Implementers	Timeline
Coordinated	Implement the Complete Streets Implementation Plan to ensure interdepartmental and interagency coordination during project scoping and consideration of all users and modes, connected travel networks, and nearby land uses.	Transportation/Public Works, Planning and Development (P&D)	1 to 2 years
Connected	Continue to prioritize opportunities that create a complete transportation network that provides connected facilities to serve all people and modes of travel now and in the future. Use project selection criteria that support Complete Streets projects.	Transportation/ Public Works, P&D	Ongoing
Safe and Comfortable	Develop traffic signal timing and actuation along transit, bicycle, and heavy pedestrian use areas.	Transportation/ Public Works, P&D, Park and Recreation	2 to 3 years

Subject	Policy	Implementers	Timeline
Accessible	Adopt Americans with Disabilities Act (ADA) infrastructure standards for all infrastructure types in the active transportation network.	Transportation/ Public Works	2 to 3 years
Equitable	Achieve the sidewalk condition and gap-filling targets established in the Race and Culture Task Force final report.	Transportation/ Public Works, P&D	5 years
Community Awareness and Culture	Continue to educate the public on safe behavior and interaction on the roads between all road users, including people walking, bicycling, using transit, and driving.	P&D, Fort Worth Police Department	1 to 2 years
Funding	Continue to coordinate with school districts to create and implement Safe Routes to School plans.	Transportation/ Public Works	Ongoing

The City of Fort Worth Transportation and Public Works Department is the administrator and primary implementer of the ATP. Fiscal Year 2020 was the first year that Transportation and Public Works had a funded sidewalk program designed to support ATP implementation. The sidewalk program, which began with a budget of $742,000 increased to $3,000,000 by Fiscal Year 2025, including a 28% set-aside for Trinity Metro bus pad replacements and new installations. Between FY 20 and FY 24, the City has installed approximately 15 miles of new sidewalks, 80% (12 miles) of which are located in majority minority areas and 23% (3.45 miles) of which provide transit facility connections.

The City and its departments continue to coordinate between regional and community organizations, develop policies and implementation plans, establish accessibility and equality in projects, encourage active transportation promoting programs, and continue community education regarding active transportation.

Master Thoroughfare Plan

The current MTP was adopted by the Fort Worth City Council in May 2016 and updated in November 2020. Another MTP update is currently underway as part of the M1M Master Transportation Plan development effort. The MTP vision statement is to “provide a complete and

connected, context-sensitive transportation system for all users that supports mobility, healthy living and economic benefit," supported by three goals—**Mobility**, **Safety**, and **Opportunity**. For Mobility, the MTP includes a network of thoroughfares to provide citywide transportation connectivity and capacity. For Safety, the MTP includes street cross sections that encourage moderate automobile speeds and provide safe accommodations for non-motorized transportation modes. For Opportunity, the MTP includes future transportation facilities serving planned growth areas.

The MTP is grounded in the "Complete Streets" idea that supports all transportation users placing an increased emphasis on active transportation (walking and cycling) compared to previous plans. The MTP's Complete Streets approach to active transportation is two-pronged:

1. Providing basic connectivity and accessibility by including accessible active transportation elements in each street cross section with an eye toward building a citywide network.
2. Focusing on safety and comfort by narrowing street widths wherever possible (to facilitate pedestrian crossings), buffering people walking and biking from automobile traffic where appropriate, and providing space for streetscape elements (such as trees) to calm traffic and provide a more comfortable user experience.

The MTP sets "Complete Streets" as the ultimate goal for street types. All street cross sections in the MTP are intended to include some level of bicycle access, whether on-street or off-street. In general, the preference of the ATP—and therefore, the MTP—is to accommodate bicyclists off-street (using a side path/shared-use path) wherever possible. The exception for areas with higher driveway density and low to moderate motorized vehicle volumes and speeds would be buffered bike lanes. Additionally, the assignment for bicycle facility types using the Typical Section Selection flow chart is suggested.

The MTP incorporates the concept of target speed—the speed at which the road designer intends for motorists to travel. Target speed has become an important element of a Complete Streets and Safe Systems approach to roadway design. This approach attempts to control vehicle speeds by means beyond horizontal and vertical curvature, most notably, via lane widths and vertical elements (such as street trees). Target speeds in the MTP are set to no lower than 25 miles per hour. The default target speed should be used in the design of all roadway elements, including horizontal and vertical curvature, and should ultimately be the posted speed limit.

All activity street sections and many of the commerce/mixed-use street sections include on-street parking. Automobile lanes need to be wide enough to safely carry not only passenger cars but buses, trucks, and emergency vehicles as well. However, excessive widths can encourage excessive speeds. Thus, the MTP strives for a balance that harmonizes both mobility and safety. The default lane width in the MTP is 11 feet, with exceptions.

Complete Streets Policy

The City's Complete Streets Policy was adopted in May 2016 together with the MTP. Its vision is to "provide a safe, accessible, complete, connected, comfortable, efficient, and community-oriented transportation system for all people that supports mobility options, healthy living, and economic benefit." This policy is applicable to all development and redevelopment in the public domain within the City of Fort Worth. The policy states that the city shall adopt design standards using the best and last standards based on Texas Accessibility Standards, the ADA, Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), and National Association of City Transportation Officials (NACTO). These guidelines include but are not limited to the Fort Worth Master Thoroughfare Plan, *ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*; *AASHTO Guide for Planning, Designing and Operating Pedestrian Facilities*, and *AASHTO Guide for Designing Bicycle Facilities*. Other design standards may be considered as long as a comparable level of safety for all travel modes is present.

The policy recommended some performance measures for the success of the Complete Streets Policy, including reductions in injuries, fatalities, and transportation gaps. Other measures included improved emergency services response times, impacts and benefits for traditionally disadvantaged communities, increased usage of alternative transportation modes, reduction in obesity-related illnesses, and economic performance of transportation investments.

To implement the policy, the city will incorporate the Complete Streets principles into all existing plans, manuals, checklists, decision-trees, rules, regulations, and programs as appropriate. The design guidelines and standards will be updated to effectively implement Complete Streets; staff trainings, project selection criteria, and project guides are recommended for implementation. Lastly, the policy emphasizes the importance of including an education component to ensure that all people using the transportation system understand and can safely utilize Complete Streets project elements.

To help the City of Fort Worth develop actionable strategies as part of the Vision Zero SAP process, the following areas have been identified as potential policy gaps and areas for further implementation related to the Complete Streets Policy:

- Need to better understand how the Complete Streets Policy has been implemented in project selection and development.
- The current policy lacks a clear implementation timeline, specific strategies for community engagement, and details on how to effectively involve residents in the planning process, as well as mechanisms for feedback and participation.
- Additionally, the policy does not outline collaborative strategies between departments, such as regular meetings or joint initiatives involving transportation, public health, and urban planning.
- Funding is also unclear, with no guidance on how financial resources will be allocated for successful project implementation.
- Social vulnerability considerations are inadequately addressed, lacking clear guidelines on prioritizing safety improvements in underserved neighborhoods and actively involving marginalized communities in decision-making.

Fort Worth City Code of Ordinances

The City of Fort Worth Ordinance, Chapter 22[3] covers the regulations related to motor vehicles and traffic. This chapter of the city ordinances highlights general traffic rules; truck traffic; operation of vehicles; accidents; stopping, standing, and parking; bicycle and pedestrian rules; and other aspects of traffic that have implications for the overall safety of all users of the city roads.

Article VII: Bicycles

This ordinance, adopted in 2002, regulates several key elements of bicycle operation. It mandated the use of reflectors from 7:00 pm to 5:00 am, required the use of a proper seat and helmet, and prohibited cyclists from attaching themselves to moving vehicles or riding in a reckless manner. This ordinance updated previous regulations that addressed similar regulations. The current ordinance is generally supportive of Vision Zero. However, since the ordinance was adopted before the concept of Vision Zero was recognized and implemented in the US, it does

[3] American Legal Publishing. (n.d.). *Fort Worth City Code of Ordinances: Chapter 22: Motor Vehicles and Traffic.* https://codelibrary.amlegal.com/codes/ftworth/latest/ftworth_tx/0-0-0-28259.

not specifically or adequately address safety issues related to vulnerable road users including bicyclists and pedestrians.

Despite accounting for only 4% of total crashes, crashes that involved pedestrian, bicyclist and motorcyclist are overrepresented in KSI crashes; they accounted for more than 34% of KSI crashes during 2019- 2023 in Fort Worth. We recommend exploring the vulnerable road user crash patterns (e.g., using CRIS's Pedestrian and Bicycle Crash Analysis Tool (PBCAT) attribution) along with the Bicycle High Injury Network (HIN) findings to better understand the leading contributing factors for bicycle crashes. Conducting further analysis of bicycle crash contributing factors will help pinpoint the issues that the ordinance could be amended to address more adequately. This approach is likely to gain more support from leadership and residents, preparing for council adoption.

Regardless of contributing factors, providing sufficient space for bicyclists, separate from motorized traffic, is one of the primary countermeasures to improve bicyclist safety. Based on best practice, some potential updates could include enhanced lighting in areas where bicyclists frequently ride at night, adding separated bike lanes when streets are reconstructed[4], and specific infrastructure requirements such as bike parking spaces and bike rack standards.[5] If separate lanes or paths cannot be provided, then it is important to consider whether speed limits should be lower so that overtaking motorists have sufficient sight distance and time to react to any bicyclist ahead. One related ordinance that has been passed by the City of Fort Worth is the Safe Passing Ordinance (No. 19570-03-2011), which establishes minimum separation distance when motorized vehicles are passing vulnerable road uses.

Article VIII: Pedestrians

The original pedestrian ordinance is from the 1964 code. It supported pedestrian safety by establishing the right-of-way for pedestrians and vehicles, including that drivers must yield to pedestrians in crosswalks under certain circumstances (if traffic-control devices are absent and pedestrians are on the half of the roadway on which the vehicle is traveling), and pedestrians must yield to vehicles if crossing outside crosswalks. A significant update was made in 2001,

[4] City of Cambridge. Cycling Safety Ordinance. https://www.cambridgema.gov/streetsandtransportation/policiesordinancesandplan%20s/cyclingsa%20fetyordinance

[5] City of St. Louis. Ordinance 69148. https://www.stlouis-mo.gov/government/city-laws/ordinances/ordinance.cfm?ord=69148

adding provisions prohibiting solicitation on or near roadways. The provision stated that no person shall stand on or near a roadway to solicit rides, employment, business, art, or offer to watch or guard parked vehicles.

We recommend similar steps to further understand the contributor factors related to pedestrian crashes, pinpoint HIN locations, using a data-informed approach (e.g., a city-wide streets and intersection pedestrian safety study) to develop specific areas for amendments. Based on research and best practice, some potential updates could include pedestrian infrastructure requirements such as using high-visibility crosswalks, improving street lighting, requiring the use of pedestrian refuge when crossing the road, and reducing conflicts between pedestrian and drivers on roadways with high volumes of traffic or high-speed limits.

Article IV: Truck Traffic

The truck traffic ordinance was passed in different sections around the 1980s. This article includes provisions for designated truck and commercial delivery routes, restrictions on hazardous materials transportation, limits on vehicle dimensions and weight, and permits for overweight or oversized vehicles under special conditions. These elements align with common regulations found in many truck traffic ordinances. This ordinance can support Vision Zero by having designated truck routes that avoid residential areas to limit the exposure of vulnerable road users to large trucks, enforcing weight and size restrictions to reduce the probability of accidents and mitigate crash severity, and providing hazardous materials transporting routes to minimize the risks of dangerous incidents in populated areas.

Transportation Management Programs—Maintenance, Safety, and Operations

The City of Fort Worth Transportation and Public Works Department has six divisions: 1) Transportation Management, 2) Regional Transportation and Innovation, 3) Stormwater Management 4) Street and Stormwater Operations 5) Capital Delivery, and 6) Business Support. Transportation Management (TM) has primary responsibility for traffic operations and safety initiatives within the department. The division performs citywide maintenance of streetlights, traffic signals and signs, fulfills utility locate requests, performs signal retiming and signal design review for private development and operates the Traffic Management Center. Additionally, the division administers the Sidewalk Program, School Crossing Guard Program, Parking Management

and Operations, Right-of-Way Management and receives all customer traffic safety requests for the city. In Fiscal Year 2024, the division received 26,397 service requests across all assets.

Transportation Management has key performance indicators for every service request type. However, existing performance indicators measure team response times and the division's ability to meet targets for asset maintenance rather than progress toward the Vision Zero goal. Transportation Management's integration of Vision Zero-specific measures such as crash reduction targets into key performance indicators will be key to quantifying the division's success in improving traffic safety outcomes.

Figure 1 shows the map with service request the City received in fiscal year 2024 overlaid with the overall HIN. About 11% of service requests falling in the 100 ft buffer zone of HIN locations, as shown in Table 3. This is double the percentage of HIN mileage among the roadway network which is about 6.3%. In particular, issues related to Pavement Marking, New Signs and Increased Traffic/Traffic Calming are the top issue types along HIN locations. Their share along HIN is higher than their share at all locations, indicating a potential correlation between these issues and safety risks at HIN locations.

Table 3: Summary of Service Request Issues and their alignment with HIN

Issue Types	Issues within 100ft Buffer of HIN		Percentage of Total Issues	Total Number of Issues
	#	%	%	#
Increased Traffic / Traffic Calming	46	16%	7%	679
New Crosswalk / Pavement Markings	11	4%	13%	82
New ERB	0	0%	0%	22
New Guardrail	3	1%	19%	16
New Sidewalk	15	5%	7%	213
New Sign	70	25%	11%	640
New Warning Lights	5	2%	16%	31
Parking Restrictions	16	6%	11%	146
Pavement Marking Issue	90	32%	18%	507
School Safety	9	3%	7%	122
Traffic Safety / Speeding	14	5%	12%	113
Total	**279**	**100%**	**11%**	**2571**

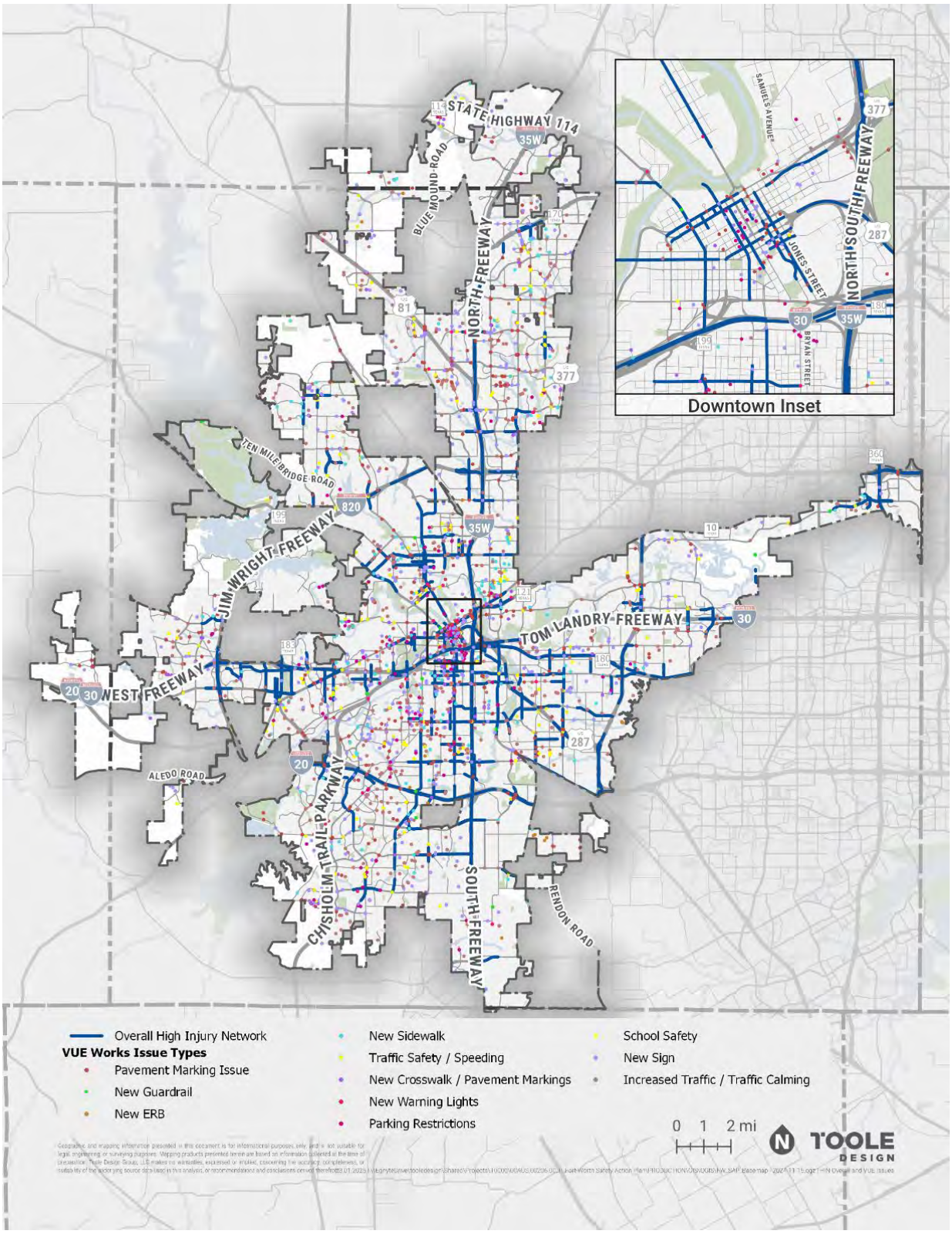


Figure 1: Service Requests Overlay with HIN

Summary

In summary, Fort Worth's transportation safety-related policies display promising potential for cultivating safer streets. Most policies and programs align well with Vision Zero's safety objectives. Road safety policies and programs implemented by the city demonstrate its commitment to Vision Zero principles. While recognizing these strengths, our analysis underscores the need for concerted action and strategic investment to fully realize Vision Zero's objectives and safeguard the well-being of all road users.

Moving forward, Fort Worth can leverage its existing initiatives to establish a more cohesive and effective transportation safety framework focusing on:

- Clearly establishing timelines and efficiently allocating resources to meet safety goals.
- Enhancing coordination among stakeholders for streamlined implementation and strengthening community engagement efforts to instill a culture of safety and responsibility.
- Implementing proactive safety measures using data-driven methods and the Safe System Approach.
- Exploring innovative advanced technologies such as traffic data analysis tools, smart infrastructure, and emergency response systems to improve safety and efficiency.
- Addressing issues faced by vulnerable road users through infrastructure improvements and awareness campaigns.
- Assuring that all residents have access to safe and efficient transportation options, regardless of socioeconomic background or mode of transportation.
- Tracking and developing key performance indicators to measure progress.

References

City of Fort Worth. (2016). Complete Streets Policy. https://www.fortworthtexas.gov/files/assets/public/v/1/tpw/documents/adopted-complete-streets-policy.pdf.

City of Fort Worth. (2019). Vision Zero Resolution No. 5149-11-2019. https://www.fortworthtexas.gov/files/assets/public/v/1/tpw/documents/vision-zero-resolution5149-11-2019.pdf.

City of Fort Worth. (2019). Active Transportation Plan implementation. https://www.fortworthtexas.gov/departments/tpw/atp.

City of Fort Worth. (2022). Roadway Safety Assessments. (Utilized City of Fort Worth High Injury Network Corridor Evaluation Report; no link available).

City of Fort Worth. (2023). Fort Worth Code of Ordinances, Chapter 22 Motor Vehicles and Traffic. https://codelibrary.amlegal.com/codes/ftworth/latest/ftworth_tx/0-0-0-23749.

City of Fort Worth. (2023). Fort Worth Code of Ordinances, Chapter 30 Streets and Sidewalks. https://codelibrary.amlegal.com/codes/ftworth/latest/ftworth_tx/0-0-0-28259.

City of Fort Worth. (2014). Walk Fort Worth. https://www.fortworthtexas.gov/departments/tpw/walkfw#:~:text=The%20Walk!,thanks%20to%20increased%20physical%20activity.

City of Fort Worth. (2009). Bike Fort Worth. https://www.fortworthtexas.gov/files/assets/public/v/1/tpw/documents/bike-fort-worth-final.pdf.

City of Fort Worth. (2019). City of Fort Worth Vision Zero. https://www.fortworthtexas.gov/departments/tpw/services/vision-zero#:~:text=Vision%20Zero%20is%20an%20internationally,is%20forgiving%20of%20human%20error.

City of Fort Worth. (2023). City of Fort Worth Comprehensive Plan. https://www.fortworthtexas.gov/departments/the-fwlab/planning/comprehensiveplan

City of Austin Budget Office. FY 2024 Budget. https://financeonline.austintexas.gov/afo/afo_content.cfm?s=1.

Seattle Department of Transportation. (2023). Seattle Transportation Funding. https://seattle.gov/transportation/about-us/funding.

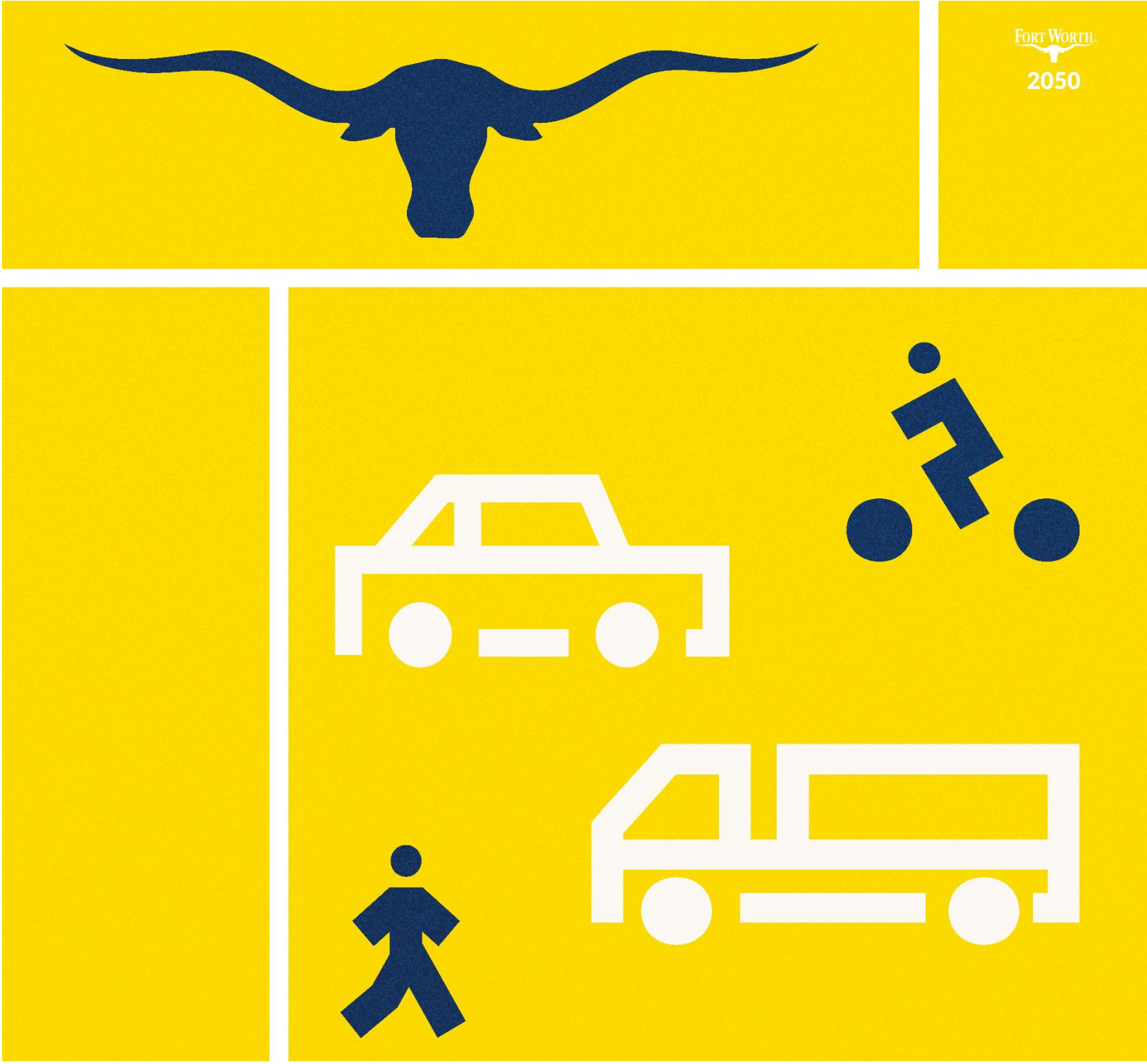
Seattle Department of Transportation. (2024). Seattle Transportation Plan. https://seattle.gov/documents/Departments/SDOT/STP/Feb2024/STP_at_a_Glance_02_2024.pdf.

Seattle Department of Transportation. (2024). Seattle 2035 Comprehensive Plan. https://www.seattle.gov/opcd/ongoing-initiatives/seattle-2035-comprehensive-plan.

City Budget Office, Seattle. (2022-2027). 2022-2027 Proposed Capital Improvement Program (CIP). https://www.seattle.gov/city-budget-office/capital-improvement-program-archives/2022-2027-proposed-cip.

Seattle Department of Transportation. (2024). Vision Zero. https://seattle.gov/transportation/projects-and-programs/safety-first/vision-zero.

FORT WORTH 2050



APPENDIX B
State of Safety Report

Table of Contents

List of Abbreviations 2
Introduction 3
Summary of Key Findings 3
Crash Trends and Patterns 5
- Crashes by Year 6
- Injury Severity 7
- Crashes by Mode 7
- Commercial Motor Vehicle and Large Truck-Involved Crashes 9
- Crashes by Roadway Ownership 11
- Parties Involved 12
- Social Vulnerability Index 13
- Crash Causation 14
- Behaviors 19
- Roadway Characteristics 23
- Environmental Characteristics 37

High Injury Network 46
- Sliding Windows Analysis Methodology 46
- High Injury Network Development 47

Appendix A: Crash Data Preparation 50
Appendix B: Spatial Data Consolidation 54
Appendix C: Crash Maps 57
Appendix D: HIN Maps 64
Appendix E: Crash Rate and HIN 71

List of Abbreviations

AADT	Annual Average Daily Traffic
ACS	American Community Survey
CMV	Commercial Motor Vehicle
CRIS	Crash Records Information System
DUI	Driving Under the Influence
FHWA	Federal Highway Administration
HIN	High Injury Network
KABCOU	Injury Severity Scale (Texas): **K:** Fatal injury **A:** Suspected incapacitating injury **B:** Non-incapacitated injury **C**: Possible injury **O:** Not injured **U:** Unknown
KSI	Killed or Serious Injury
LRS	Linear Referencing System
OSM	OpenStreetMap
SHSP	Strategic Highway Safety Plan
TX	Texas
TxDOT	Texas Department of Transportation
VMT	Vehicle Miles Traveled
VRU	Vulnerable Road User includes Pedestrian and Bicyclist

Introduction

This State of Safety Report summarizes the results of the crash data analysis conducted as part of the Fort Worth Vision Zero Safety Action Plan (SAP) development process. The focus of this SAP is to develop a holistic, well-defined strategy to prevent roadway fatalities and serious injuries within the City of Fort Worth, Texas. This report includes the descriptive crash data analysis that identifies trends, patterns, and key factors from the latest 5-year crash data, as well as the high injury network (HIN) developed based on these historical crash data.

This report helps create a picture of the existing safety conditions within Fort Worth. It helps pinpoint the city's traffic safety needs and gaps and will serve as a foundation for other components of the SAP, such as countermeasure selection and strategy identification.

Summary of Key Findings

This section summarizes key findings from the descriptive crash data analysis.

Overall Crash Trends and Patterns

- **Number of Crashes:** In total, 68,936 crashes happened within the City of Fort Worth between 2019 and 2023. Out of these, 2,589 of them resulted in death (533) or serious injury (2,056)
- **Crashes by Year:** The year 2019 had the highest share of all crashes across the five years (21.5% or 14,842 out of 68,936 total crashes), while 2022 had the highest share of KSI crashes (21.6% or 562 out of 2,589 KSI crashes). The number of KSI crashes has been trending up since 2019 except for a small drop from 2022 to 2023.
- **Injury Severity:** While most crashes in Fort Worth resulted in minor or no injuries, the city experienced an annual average of 107 crashes resulting in death and over 411 crashes resulting in serious injury.
- **Crashes by Mode:** Vulnerable roadway user (i.e., bicyclists and pedestrians) crashes and motorcycle crashes are overrepresented in KSI crashes. Crashes involving pedestrians, bicyclists, and motorcyclists, accounted for less than 4% of the total crashes but made up 35% of KSI crashes.

- **Commercial Motor Vehicles (CMV) or Large Truck-Involved Crashes:** The City of Fort Worth exceeded the statewide average percentage of CMV and large truck-involved crashes. This percentage is also much higher than other major Texas cities including Austin, Dallas, El Paso, Houston, and San Antonio.
- **On-System Crashes:** Despite representing less than half of all crashes and one-third of VRU crashes, on-system roadways accounted for more than half of the KSI crashes, indicating that on-system road crashes were more likely to result in severe outcomes.
- **Parties Involved:** Young adults aged 15 to 34 were most likely to be involved in a KSI crash.
- **Social Vulnerability:** Over 34% of total crashes and more than 36% of KSI crashes occurred in areas with high social vulnerability. Combined medium-high and high vulnerability areas accounted for over 50% of both total crashes and KSI crashes.

Crash Causation

- **Contributing Factors:** The factors that most often contributed to all crashes and severe crashes were speeding and driver inattention or distraction. Crashes caused by pedestrians who failed to yield have the highest risk of resulting in a KSI outcome.
- **First Harmful Event:** The most common crashes involved motor vehicle collisions with another moving vehicle, followed by collisions with fixed objects and parked cars. Vehicle collisions with pedestrians and bicyclists occurred less frequently but are more likely to be severe. Railroad crashes, despite being very rare, tend to be deadly as well.
- **Collision Manner:** The top collision manners are vehicles going the same direction, crashes that involved only one vehicle, and angle crashes. More than half of the most severe crashes occurred as the result of the action of one motor vehicle.

Behavior

- The behaviors that contributed most to the KSI rate were speeding and distracted driving.
- Speeding, driving under the influence, and not using safety restraints are more likely to cause severe outcomes.

Roadway Characteristics

- **Intersections vs. Segments:** Crashes occurred more often along segments (i.e., away from intersections). Crashes at intersections were less likely to cause severe outcomes compared to those that occurred along roadway segments.

- **Intersection Control:** While less than half of VRU crashes occurred at signalized intersections, they are 25% more likely to result in severe outcomes than those at unsignalized intersections.
- **Speed Limit, Functional Class, Traffic Volume, and Number of Lanes:** Comparing their share of crashes and lane miles, roadways with higher speed limit, higher functional class, higher traffic volume, and larger number of lanes were overrepresented in crashes. This overrepresentation was even more pronounced in KSI crashes.

Environmental Factors

- **Time of Day and Day of Week:** KSI crashes were more likely to happen during early hours on weekdays and from late afternoon to late night on Fridays and the weekend.
- **Lighting Conditions:** Crashes at night or when it was dark (whether lit or unlit) were more likely to cause severe outcomes.

Land Use Context

- **Transit Stop, School, and Park Approximation:** More than half of crashes across all modes and an even higher percentage of VRU crashes occurred within a quarter mile of a transit stop and a half mile of a school and a park, highlighting the importance of improving safety in those areas, especially for VRUs.

Crash Trends and Patterns

The descriptive crash analysis provides an overview of factors and contexts that contributed to reported crashes on the Fort Worth road network from 2019 to 2023, including those resulting in killed and serious injury (KSI). The first part of this report presents descriptive statistics of those crashes stratified by various attributes such as injury severity, environmental conditions, behaviors, harmful events, and road user characteristics. The attributes examined in this report are also aligned with safety emphasis areas identified in TxDOT's 2022-2027 Strategic Highway Safety Plan (SHSP)[1].

[1] TxDOT Strategic Highway Safety Plan 2022 – 2027: https://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/gov/shsp.pdf

The following sections summarize City of Fort Worth crash data from 2019 through 2023, and provide statistical trends, temporal patterns, crash severity, and modes.

Crashes by Year

Figure 1 summarizes the number of crashes and crashes that resulted in KSI from 2019 through 2023. During those five years, there were 68,936 crashes, 2,589 of which were KSI crashes. The overall KSI rate (i.e., the percentage of crashes resulting in KSI) is about 3.8%. In 2019 the city saw the highest share of all crashes across the five years (21.5% or 14,842 out of 68,936 total crashes), while 2022 had the highest share of KSI crashes (21.6% or 562 out of 2,589 KSI crashes), and the highest percentage of crashes resulting in KSI (4.2%). From 2022 to 2023, the total number of crashes increased and KSI crashes decreased slightly, but the percentage of crashes resulting in KSI remained high (4%).

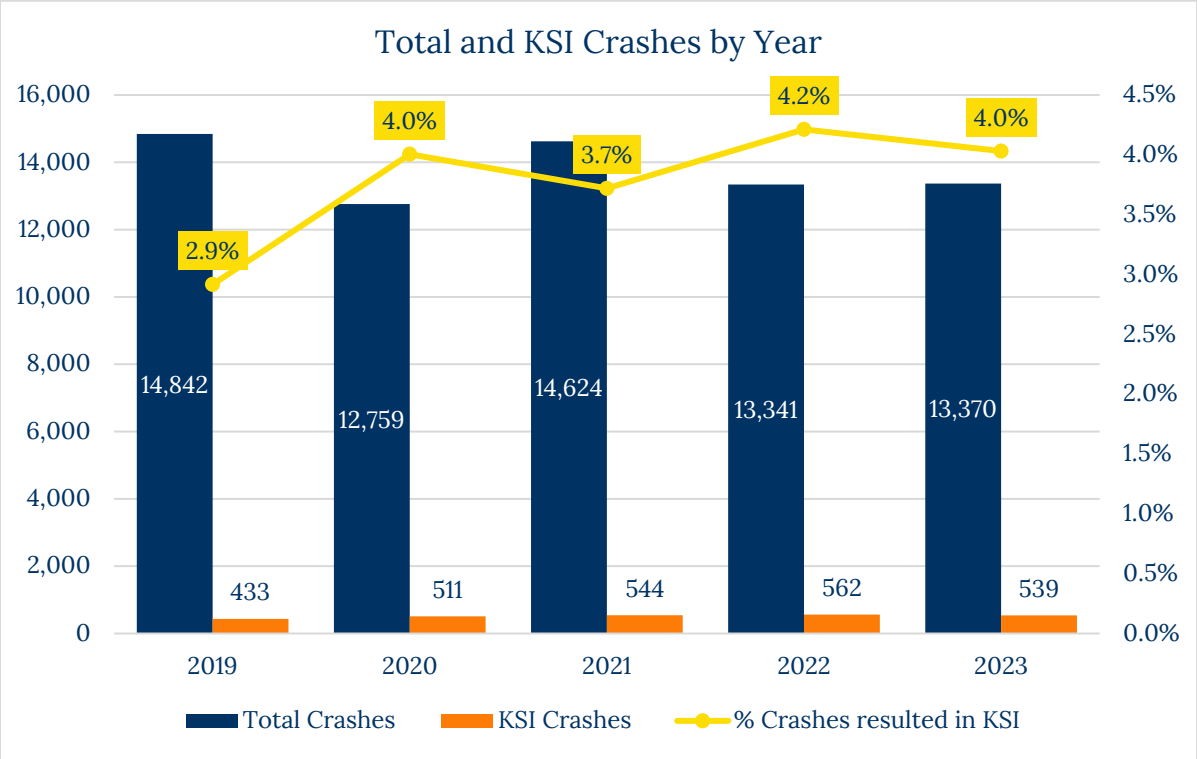


Figure 1: Total and KSI Crashes by Year, All Modes, 2019-2023

Injury Severity

Table 1 summarizes crashes by injury severity based on the highest level of injury reported to be sustained in the crash. In the five-year period from 2019 to 2023, a total of 533 crashes resulted in at least one death and 2,056 crashes resulted in at least one serious injury, accounting for about 3.8% of all crashes. KSI crashes represent a small percentage of overall crashes, but they should be the focus of any safety effort, due to their severe consequences and the need to prevent debilitating injuries or loss of life. More details about the location of these crashes and the dynamics related to them will be described throughout this analysis.

Table 1: Crashes by Injury Severity, All Modes, 2019-2023

Injury Severity	# of Crashes	% of Crashes
Fatal injury (K)	533	0.8%
Suspected serious injury (A)	2,056	3.0%
Suspected minor injury (B)	8,710	12.6%
Possible injury (C)	14,404	20.9%
No apparent injury (O)	40,110	58.2%
Unknown	3,123	4.5%
Total	**68,936**	**100%**

Crashes by Mode

Table 2 summarizes crashes by mode. Motor vehicle crashes accounted for 96% of total crashes. This is expected as most trips in the United States are typically made by motor vehicle. Motorcycle crashes followed with roughly 1.9% of all crashes. Pedestrian crashes ranked third highest with roughly 1.7% of the total crashes, while bicycle crashes had the lowest crash share at 0.4%.

Table 2: Crashes by Mode, 2019-2023

Mode	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% Crashes Resulted in KSI
Bicycle	292	0.4%	49	1.9%	16.8%
Pedestrian	1,174	1.7%	465	18%	39.6%
Motorcycle	1,317	1.9%	387	14.9%	29.4%
Motor Vehicle	66,153	96%	1,688	65.2%	2.6%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Despite accounting for only 4% of total crashes, crashes that involved pedestrian, bicyclist and motorcyclist are overrepresented in KSI crashes; they accounted for more than 34% of KSI crashes (see **Figure 2**). Over one-third of pedestrian crashes, one-fourth of motorcycle crashes, and close to one-seventh of bicycle crashes resulted in death or severe injury.

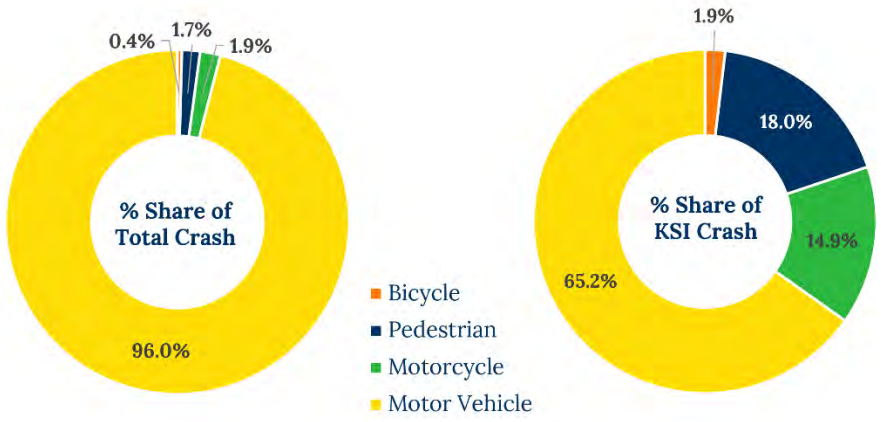


Figure 2: All crashes and KSI Crashes by Mode, 2019-2023

Commercial Motor Vehicle and Large Truck-Involved Crashes

We examined the Commercial Motor Vehicle (CMV)-involved Crashes and large truck-involved crashes[2]. The City of Fort Worth has a higher than statewide average percentage of CMV and large truck crashes, as shown in **Figure 3** and Error! Reference source not found.. Compared to several peer cities, Fort Worth has the highest percentage of CMV and truck-involved crashes despite having the sixth-lowest total number of crashes, just below Austin.

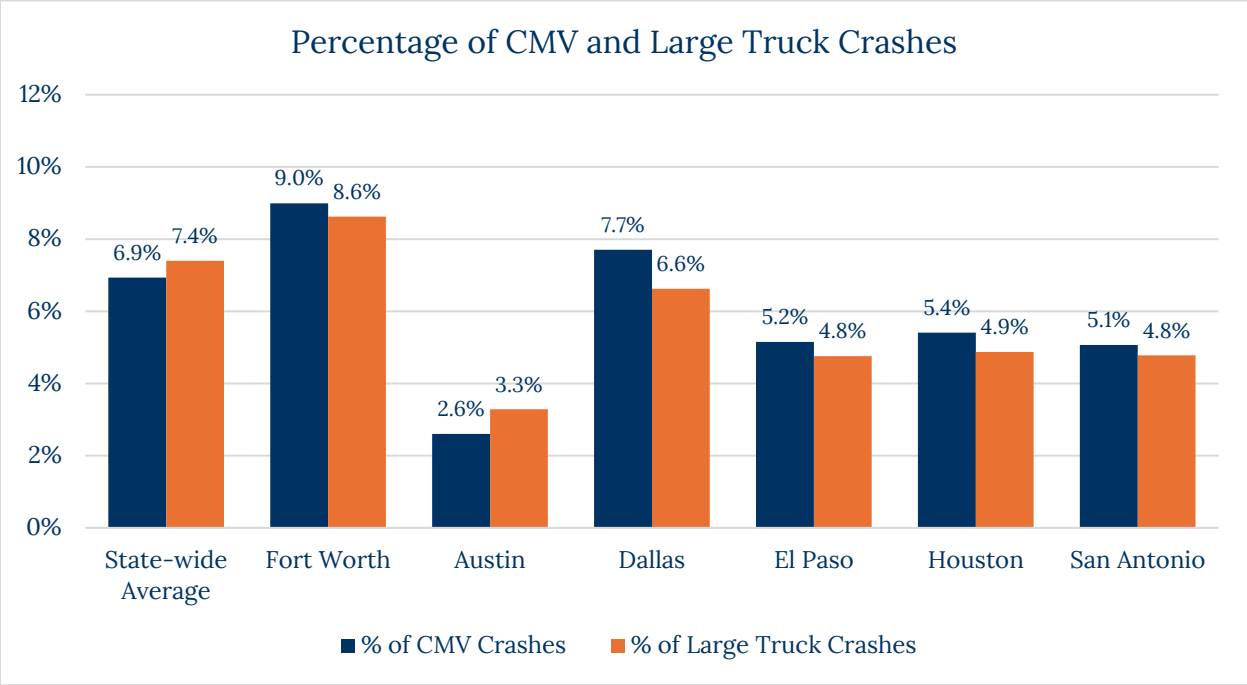


Figure 3: Percentage of CMV and Large Truck Crashes

However, when compared to these other cities in terms of CMV or Large Truck crashes per million commercial vehicle miles traveled (VMT), Fort Worth is the second lowest, only higher than the City of Austin, as shown in

Table 3.

The results depicted in **Figure 3** and **Table 3** in combination show that despite not having a higher large truck crash rate considering the amount of freight vehicle movements within the City, when compared to crashes involving other modes, large truck-involved crashes in Fort

[2] CMV crashed are identified directly using the CMV flag in CRIS data, while large truck crashes are identified based on vehicle body type. Any crash involves a vehicle with a body type of truck tractor or semi-trailer, as defined in TxDOT SHSP.

Worth have a higher share than that in the other cities and the statewide average. City of Fort Worth also has the highest share of Freight trips among all trips.

Table 3: CMV and Large Truck Crashes per Freight VMT

	Statewide Average	Fort Worth	Austin	Dallas	El Paso	Houston	San Antonio
Total Crashes	2,705,297	68,936	65,747	169,629	76,840	328,787	195,898
CMV Crashes	187,594	6,193	1,711	13,073	3,959	17,782	9,930
% of CMV-Involved Crashes	6.90%	9.00%	2.60%	7.70%	5.20%	5.40%	5.10%
Large Truck Crashes	200,215	5,943	2,160	11,239	3,656	16,018	9,362
% of Large Truck Crash	7.40%	8.60%	3.30%	6.60%	4.80%	4.90%	4.80%
Freight Trips[3]	4,622,536	229,307	160,270	328,578	106,784	609,195	250,383
% of Freight Trips among All Trips	3.95%	3.96%	2.72%	3.75%	3.27%	3.19%	3.14%
Average Freight Trip Miles[1]	23	36	31	37	25	21	33
Median Freight Trip Miles[1]	10	16	9	15	6	8	9
CMV Crashes per One Million Freight Trip VMT[4]	1,734	744	340	1,075	1,507	1,410	1,187
Large Truck Crashes per One Million Freight Trip VMT	1,851	714	429	924	1,392	1,270	1,119

The high percentage of CMV-involved crashes in Fort Worth merit a focused study of these crashes. Therefore, we developed a CMV Crash HIN as part of the HIN development process to help identify locations that have a higher concentration of historical CMV crashes.

Truck crashes, when they occur, can result in serious injuries and death, in addition to causing disruptions that delay truck travel. Even non-recurring or less severe crashes can still disrupt travel and create delays, impacting freight reliability, consumers, and businesses alike. This trend proposed the need for better freight safety analysis and freight traffic management in Fort Worth.

[3] Source: Replica. These are typical daily trips on a weekday from Replica. Freight trips were obtained by filtering down to commercial vehicle (freight) mode and intersecting with the city (trips that started, ended, or passed through the selected city); Replica confidence level to the total trip data - High Certainty, freight trip data - Medium Certainty

[4] Freight Trip VMT are calculated by multiplying freight trips with the average miles

Crashes by Roadway Ownership

Roadways within the City of Fort Worth boundary are either owned by TxDOT (on-system) or by the city (off-system). This section compares the number of total crashes and KSI crashes that occurred on on-system and off-system roadways. The result of this analysis is shown in Table 4. Despite representing less than half of all crashes and only about 36% of VRU crashes, on-system roadways account for more than half of all mode KSI crashes and VRU KSI crashes, indicating that crashes on on-system roads are more likely to have severe outcomes, likely due to the higher functional classes and speed limits typically found on on-system roadways.

Considering the different mileage and number of traffic carried by these two roadway systems, the total annual vehicle miles traveled (VMT) on each roadway system were calculated to determine if crashes are overrepresented on either system[5] compare to their share of VMT. The on-system roadways in Fort Worth carry about 84% of the total VMT. Comparing the on-system share of crashes shown in **Table 4** with the share of VMT, crashes on on-system roadways are not overrepresented. On the other hand, despite carrying only 16% of annual VMT, the off-system roadways are overrepresented, with more than 50% of all crashes and over 80% of VRU crashes.

Table 4: All and VRU Crashes by Roadway System, 2019-2023

Roadway System	All Crashes				VRU Crashes				*VMT*
	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	
Off-System	35,966	52.2%	1,226	47.4%	933	63.6%	241	46.9%	16%
On-System	32,970	47.8%	1,363	52.6%	533	36.4%	273	53.1%	84%
Total	**68,936**	**100%**	**2,589**	**100%**	**1,466**	**100%**	**514**	**100%**	**100%**

Looking at CMV crashes by roadway systems, over two-thirds of CMV crashes happened on TxDOT-maintained on-system roadways and they are almost two times more likely to result in severe injuries or death.

[5] The VMT was calculated using TxDOT roadway inventory and AADT data conflated to the roadway network received from the city.

Table 5: CMV Crashes by Roadway System, 2019-2023

Roadway System	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes Resulted in KSI
Off-system	1,985	32.1%	34	20.7%	1.7%
On-system	4,208	67.9%	130	79.3%	3.1%
Total	**6,193**	**100%**	**164**	**100%**	**2.6%**

Parties Involved

In addition to identifying the conditions under which crashes occurred and the specifics of those crashes, it is critical to understand who was most affected by unsafe roadway conditions in the City of Fort Worth. The following section illustrates the distribution of people involved in a crash by age group. These comparisons are based on the number of parties involved, not the number of crashes, as any given crash may injure multiple parties, to varying degrees of severity.

In general, young adult travelers were involved in a larger share of total crashes, with road users aged 15-34 accounting for over 46% of people involved in all crashes and close to 49% of people involved in KSI crashes (**Table 6** and **Figure 4**). When compared to the percentage of the total population that accounts for this age group, travelers aged 15-34 are overrepresented in both total and KSI crashes.

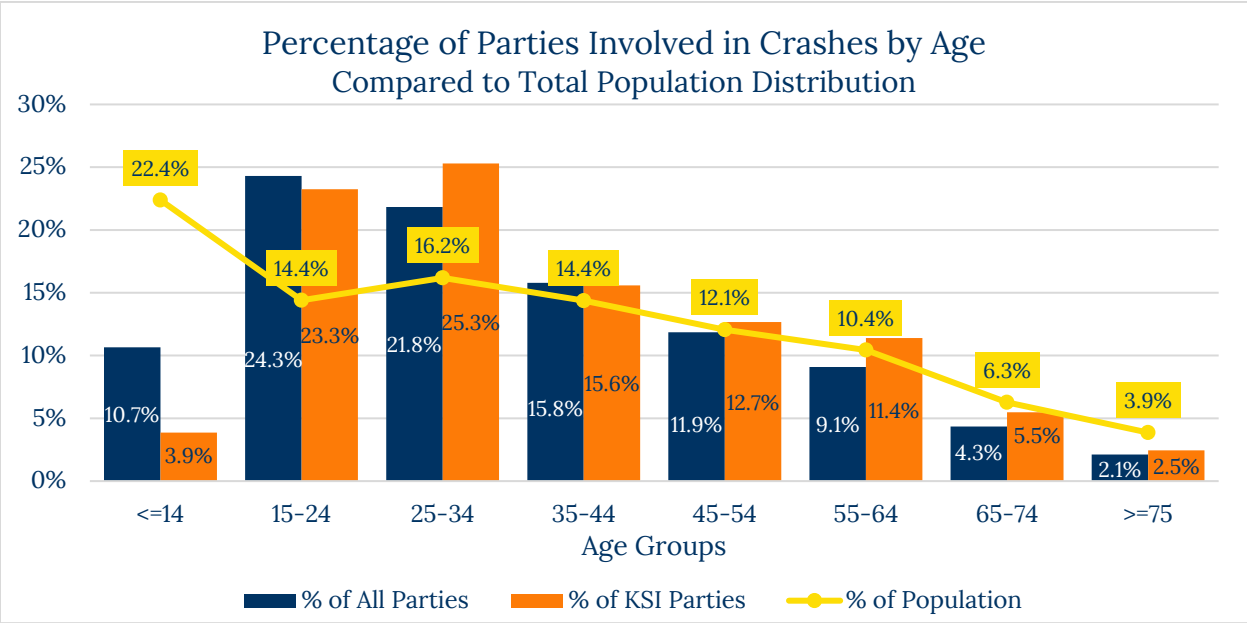


Figure 4: Percentage of Parties Involved in Crashes by Age, All Modes, 2019-2023

Table 6: Parties Involved in Crashes by Age, All Modes, 2019-2023

Age	# of Parties	% of Parties	# of KSI Parties	% of KSI Parties	% of Parties Resulting from a KSI	Age % of Population	All Crashes: Population Ratio	KSI: Population Ratio
<=14	18,169	10.7%	115	3.9%	0.6%	22.4%	0.48	0.17
15-24	41,419	24.3%	692	23.3%	1.7%	14.4%	1.69	1.61
25-34	37,206	21.8%	753	25.3%	2.0%	16.2%	1.35	1.56
35-44	26,911	15.8%	464	15.6%	1.7%	14.4%	1.10	1.08
45-54	20,212	11.9%	377	12.7%	1.9%	12.1%	0.98	1.05
55-64	15,486	9.1%	339	11.4%	2.2%	10.4%	0.87	1.09
65-74	7,405	4.3%	163	5.5%	2.2%	6.3%	0.69	0.87
>=75	3,618	2.1%	73	2.5%	2.0%	3.9%	0.55	0.63
Total	**170,426**	**100%**	**2,976**	**100%**	**1.7%**	**100%**	**1**	**1**

Social Vulnerability Index

The Social Vulnerability Index[6] (SVI) is a tool designed to help public health officials and emergency response planners identify and map communities that are most likely to need support before, during, and after hazardous events. It measures the relative vulnerability of each U.S. census tract by ranking them on 16 social factors, including unemployment, racial and ethnic minority status, and disability status. These factors are grouped into four related themes, providing each census tract with a ranking for the individual variables, the four themes, and an overall ranking. These SVI elements were analyzed and compared with crash data to assess the level of disproportionate impact of crashes on vulnerable communities. **Table 7** reveals that over 34% of total crashes and more than 36% of KSI crashes occurred in areas with high social vulnerability. When combining medium-high and high vulnerability areas, these zones accounted for more than 60% of both total and KSI crashes. This underscores the disproportionate safety concerns faced by communities in these vulnerable areas.

Table 7: Crashes by CDC Social Vulnerability Index, All Mode, 2019-2023

[6] https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

SVI Score	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% Crashes Resulted in KSI
Low	12,179	17.8%	456	17.6%	3.7%
Low-Medium	14,438	21.1%	474	18.3%	3.3%
Medium-High	18,263	26.7%	683	26.4%	3.7%
High	23,394	34.3%	952	36.8%	4.1%
Total	**68,274**[7]	**100%**	**2,565**[8]	**100%**	**3.8%**

Appendix D of this report includes a map showing census tracts with different levels of SVI scores overlaid with the overall HIN.

Crash Causation

Collision Manner

Over 41% of crashes happened between vehicles traveling the same direction, followed by crashes involving only one vehicle, and angle crashes[9]. More than half of the most severe crashes resulted from the action of one motor vehicle **Figure 5** and **Table 8**.

[7, 6] The total and KSI crashes analyzed differ from 68,936 and 2,589, respectively, because some crashes occurred in tracts without an assigned Social Vulnerability Index (SVI).

[9] An angle collision occurs when one vehicle strikes another vehicle at an angle somewhere between 90 degrees (referred to as a side-impact collision) and 180 degrees (known as a rear-end collision).

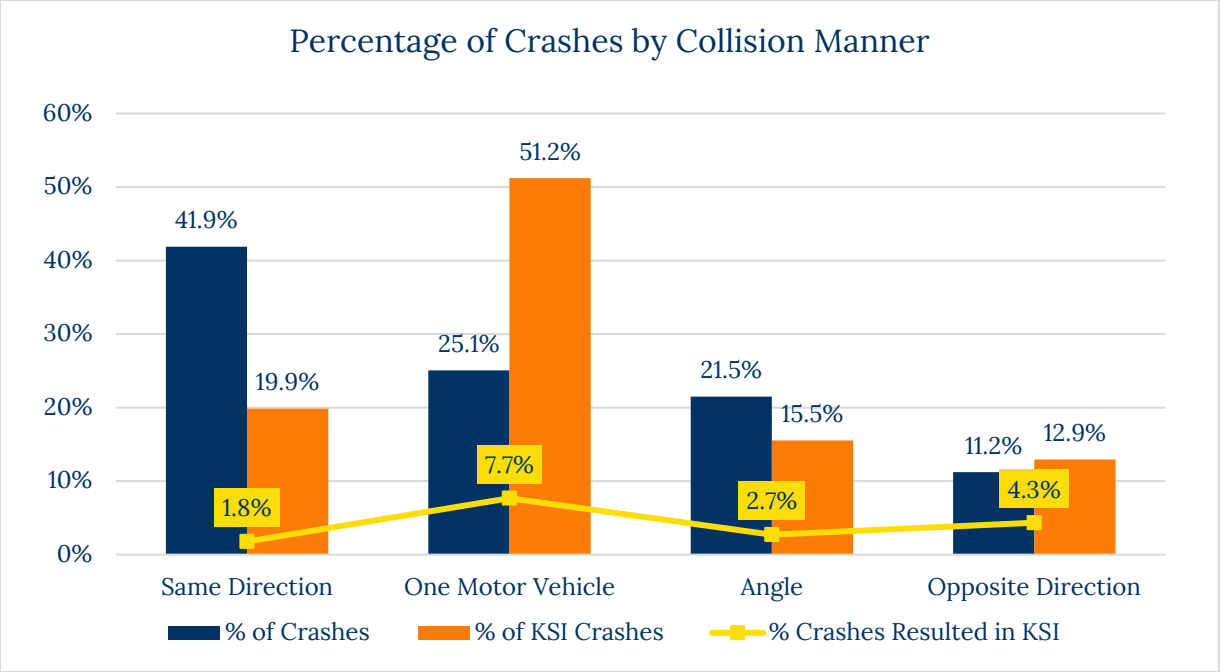


Figure 5: Percentage of Crashes by Collision Manner, All Modes, 2019-2023

Table 8: Crashes by Collision Manner, All Modes, 2019-2023

Collision Manner	All Crashes	% of Crashes	KSI Crashes	% of KSI Crashes	% Crashes Resulted in KSI
Same Direction	28,878	41.9%	514	19.9%	1.8%
One Motor Vehicle	17,279	25.1%	1,326	51.2%	7.7%
Angle	14,818	21.5%	402	15.5%	2.7%
Opposite Direction	7,734	11.2%	335	12.9%	4.3%
Other	227	0.3%	12	0.5%	5.3%
Total	68,936	100%	2,589	100%	3.8%

Table 9 includes more details on the top manner of collision and illustrates that the highest share of KSI crashes, 47%, were crashes that involved one motor vehicle traveling straight. However, crashes in which two cars collided while going straight and traveling in opposite directions had a disproportionately high risk, 10.9%, of resulting in a KSI outcome.

Table 9: Crashes by Top Types of Crash Manner, All Modes, 2019-2023

Collision Manner	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes Resulted in KSI
Angle					
Both Going Straight	9,862	14.3%	280	11%	2.8%
One Motor Vehicle					
Going Straight	14,817	21.5%	1,224	47%	8.3%
Opposite Direction					
Both Going Straight	1,059	1.5%	115	4%	10.9%
One Straight, One Left Turn	6,150	8.9%	211	8%	3.4%
Same Direction					
Both Going Straight, Rear End	10,138	14.7%	228	9%	2.2%
Both Going Straight, Sideswipe	7,204	10.5%	128	5%	1.8%

Contributing Factors

While a specific movement by one or multiple road users could result in a crash, there were a multitude of extraneous factors that affected the likelihood of a crash occurring. **Table 10** lists some of the top contributing factors for crashes that occurred in the City of Fort Worth from 2019 to 2023. The factors that most often contributed to crashes and severe crashes were speed and distraction. Despite accounting for a lower number of crashes, crashes caused by "pedestrian failed to yield right of way" had the highest risk of resulting in a KSI outcome. More than half of those crashes caused death or severe injury when a pedestrian "failed to yield," which may indicate a lack of convenient or safe walking paths and crossing locations. Crashes involving an intoxicated driver under the influence of drugs or alcohol also tended to be more likely to cause severe outcomes.

Table 10: Crashes by the Top Contributing Factors, All Modes, 2019-2023

Contributing Factors	# of Crashes[10]	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes resulted in KSI
Speed-Related	19,430	28.2%	927	35.8%	4.8%
Distraction	16,732	24.3%	512	19.8%	3.1%
Failure to Yield Right of Way	9,038	13.1%	280	10.8%	3.1%
Changed Lane When Unsafe	5,104	7.4%	102	3.9%	2.0%
Disregard Red-Yellow-Green Signal	3,291	4.8%	132	5.1%	4.0%
Alcohol/Drugs	2,346	3.4%	235	9.1%	10.0%
Faulty Evasive Action	2,251	3.3%	110	4.2%	4.9%
Improper/Unsafe Turn	2,210	3.2%	43	1.7%	1.9%
Fail to Maintain Single Lane/Took Half of Roadway	1,792	2.6%	107	4.1%	6.0%
Followed Too Closely	1,679	2.4%	23	0.9%	1.4%
Disregard Stop Sign/Light	1,601	2.3%	58	2.2%	3.6%
Backed without Safety	556	0.8%	7	0.3%	1.3%
Pedestrian Failed to Yield Right of Way	380	0.6%	195	7.5%	51.3%

First Harmful Event

Figure 6 and **Table 11** illustrate the crash causes based on the recorded first harmful event, when known, for all crashes and KSI crashes. The most common crashes involved motor vehicle collisions with other vehicles in transport[11] (74.9%), followed by collisions with fixed objects

[10] Note that one crash may have more than one associated contributing factors. The % of crashes shown in this table is the percentage among the total number of crashes (i.e., 68,936) and the % of KSI crashes is the percentage among the total number of KSI crashes (i.e., 2,589).

[11] In Transport - Denotes the state or condition of a motor vehicle which is in motion or within the portion of a way ordinarily used for travel by similar vehicles. When applied to motor vehicles, in transport means in motion or on a roadway. Source: https://ftp.txdot.gov/pub/txdot-info/trf/crash_statistics/2020/b.pdf

(15.7%), and parked cars (5.7%). Vehicle collisions with pedestrians and bicyclists occurred less frequently but produced much higher KSI rates (39% and 17%, respectively). Railroad crashes, despite being very rare, also tend to be deadly.

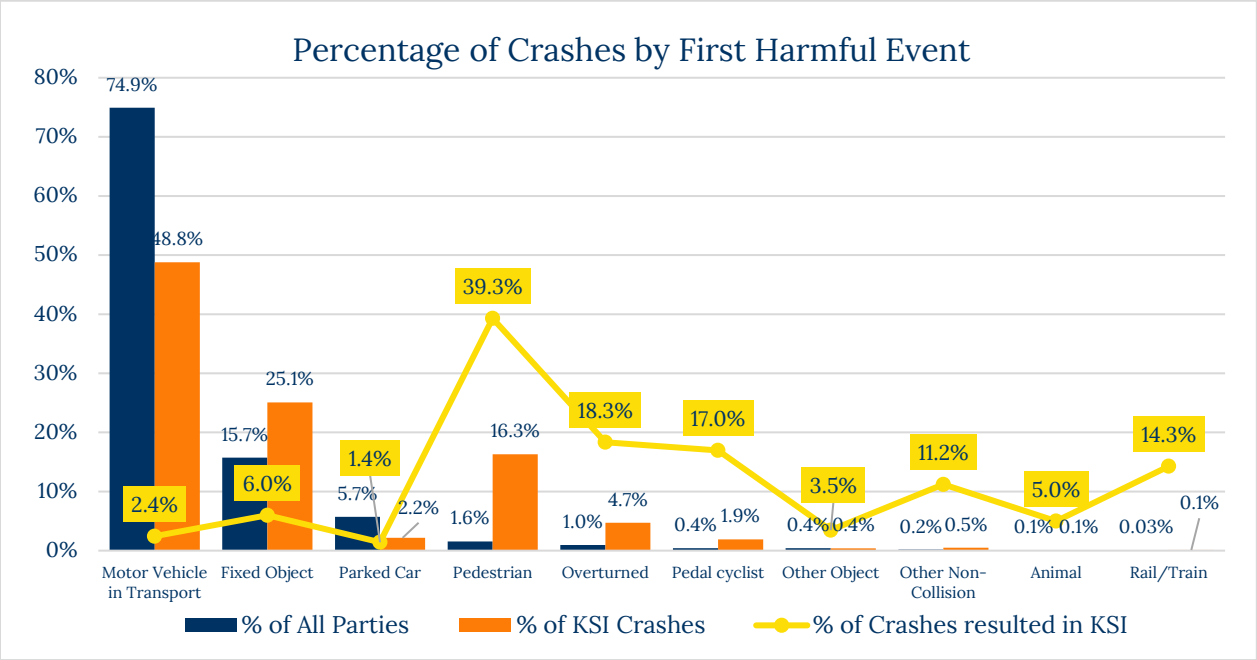


Figure 6: Percentage of Total Crashes and KSI Crashes by the First Harmful Event, 2009-2023

Table 11: Crashes by the First Harmful Event, All Mode, 2019-2023

First Harmful Event	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Motor Vehicle in Transport	51,657	74.9%	1,263	48.8%	2.4%
Fixed Object	10,848	15.7%	649	25.1%	6.0%
Parked Car	3,938	5.7%	56	2.2%	1.4%
Pedestrian	1,074	1.6%	422	16.3%	39.3%
Overturned	665	1.0%	122	4.7%	18.3%
Pedal cyclist	289	0.4%	49	1.9%	17.0%
Other Object	288	0.4%	10	0.4%	3.5%
Other Non-Collision	116	0.2%	13	0.5%	11.2%
Animal	40	0.1%	2	0.1%	5.0%
Rail/Train	21	0.03%	3	0.1%	14.3%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Behaviors

As revealed while analyzing contributing factors for crashes, several behavior-related factors are associated with a higher number of or more severe crashes. In this section, each of those factors and the likelihood of them resulting in severe outcomes were presented.

Speeding

Figure 7 and **Table 12** summarize speed-related crashes in which at least one driver was traveling above the speed limit or driving at an unsafe speed. Speeding-related crashes comprised 28.2% of all crashes and 35.8% of KSI crashes. This indicates that speeding is not only a leading contributing factor of crashes, with more than one out of every four crashes being speeding-related, but also tends to result in more severe outcomes: one out of every three KSI crashes were speeding-related.

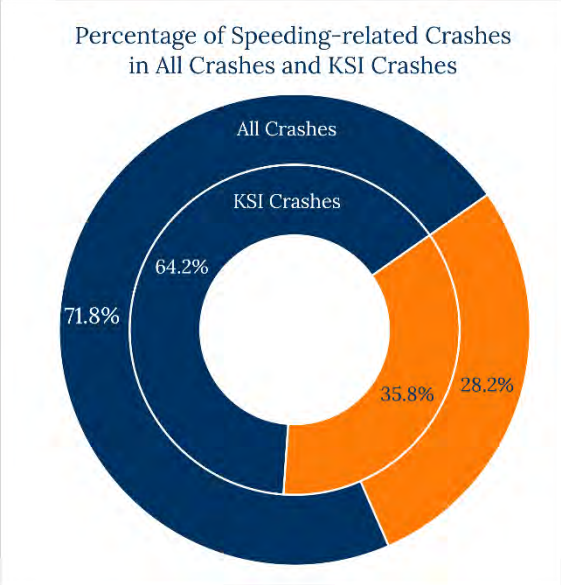


Figure 7: Percentage of Speeding-Related Crashes

Table 12: Crashes by Reported Speeding, All Modes, 2019-2023

Speed-related	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Yes	19,430	28.2%	927	35.8%	4.8%
No	49,506	71.8%	1,662	64.2%	3.4%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Driving Under the Influence (DUI)

Figure 8 and **Table 13** Crashes caused by driving under the influence of alcohol or drugs include those where the reported alcohol level was over the legal limit, or where the collision report listed alcohol use as a contributing While alcohol-impaired driving accounted for just 3.3% of crashes, they make up 8.1% of KSI crashes, indicating that these crashes are more likely to cause severe outcomes.

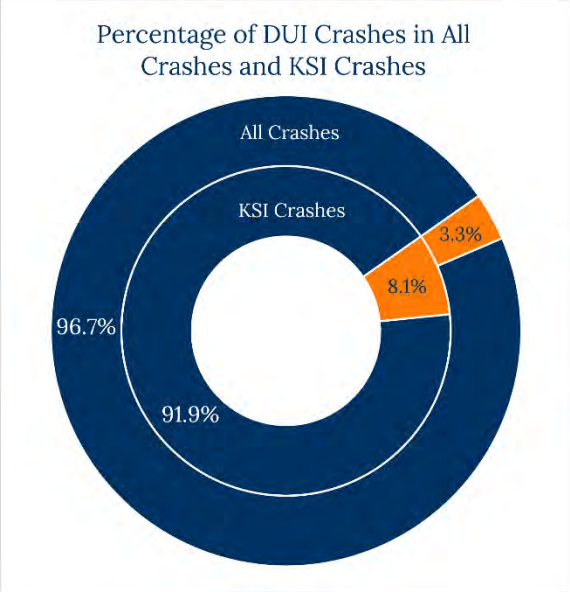


Figure 8: Percentage of DUI-Related Crashes

Table 13: Crashes by Reported DUI, All Modes, 2019-2023

DUI	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Yes	2,266	3.3%	210	8.1%	9.3%
No	66,670	96.7%	2,379	91.9%	3.6%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Lack of Safety Restraints

Safety restraints are designed to reduce the risk of harm by keeping occupants securely in place during a collision. **Figure 9** and **Table 14** summarize crashes where restraint usage is known and applicable, and an unrestrained driver or occupant died or was injured. Of the 1,226 such crashes, 290 of them were KSI crashes. They accounted for just 1.8% of all crashes, but 11.2% of KSI crashes. This indicates that crashes that involve a lack of restraint can be six times more likely to result in severe injuries or fatalities (as shown in **Table 14**).

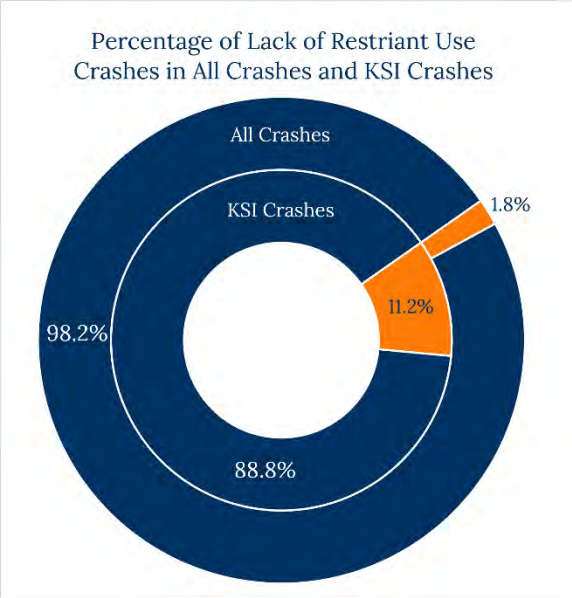


Figure 9: Percentage of Lack of Restraint Crashes

Table 14: Crashes by Reported Lack of Safety Restraint, All Modes, 2019-2023

Lack of Restraint Crash	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Yes	1,226	1.8%	290	11.2%	23.7%
No	67,710	98.2%	2,299	88.8%	3.4%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Distracted Driving

Distracted driving crashes are those in which at least one driver was distracted, inattentive, or using a cell phone. Distracted driving is a leading contributing factor for all crashes, with almost one out of every four crashes related to distracted driving. However, these crashes represented a smaller share, 19.5%, of KSI crashes. Overall, about 3.1% (505 out of 16,536) of distracted driving-related crashes resulted in KSI. This rate is similar to the overall KSI rate of 3.8% of all crashes, indicating that distracted driving isn't a prominent contributing factor in crashes with severe outcomes.

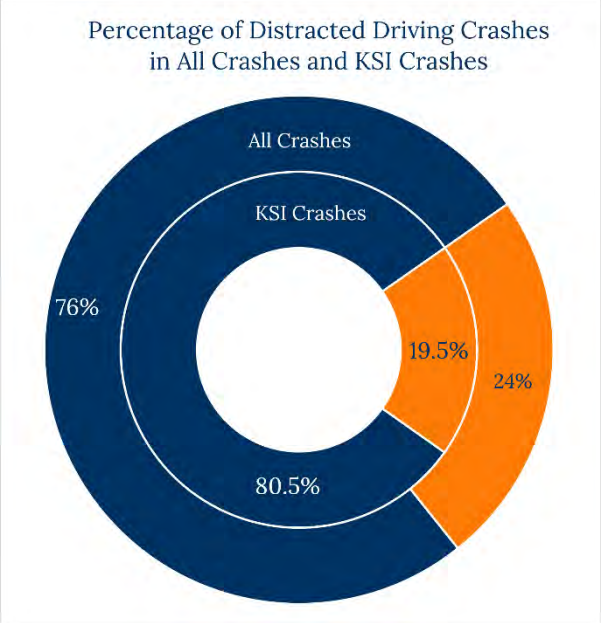


Figure 10: Percentage of Distracted Driving Crashes

Table 15: Crashes by Distracted Driving, All Modes, 2019-2023

Distracted Driving Crash	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Yes	16,536	24%	505	19.5%	3.1%
No	52,400	76%	2,084	80.5%	4.0%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

Roadway Characteristics

This section summarizes crashes by roadway characteristics to see if any of them are associated with a higher percentage of overall and KSI crashes.

Crash Location (Intersection vs. Segment)

This section summarizes crash frequencies by location type for all modes, all crashes, and VRU crashes. A crash was identified as an intersection crash if it occurred within the boundaries of an intersection, if the first harmful event occurred on an approach to or exit from an intersection, or if it resulted from an activity or behavior related to the movement of traffic units through the intersection.

All modes crashes occurred more often on roadway segments (**Figure 11** and **Table 16**). Segment crashes accounted for 56.8% of all crashes and 65.9% of KSI crashes. Intersection crashes made up slightly more than 43% of overall crashes and an even smaller share of KSI crashes, at 34%. Crashes that happened at intersections seem less likely to cause severe outcomes compared to those happened along roadway segments (3% vs 4.4%).

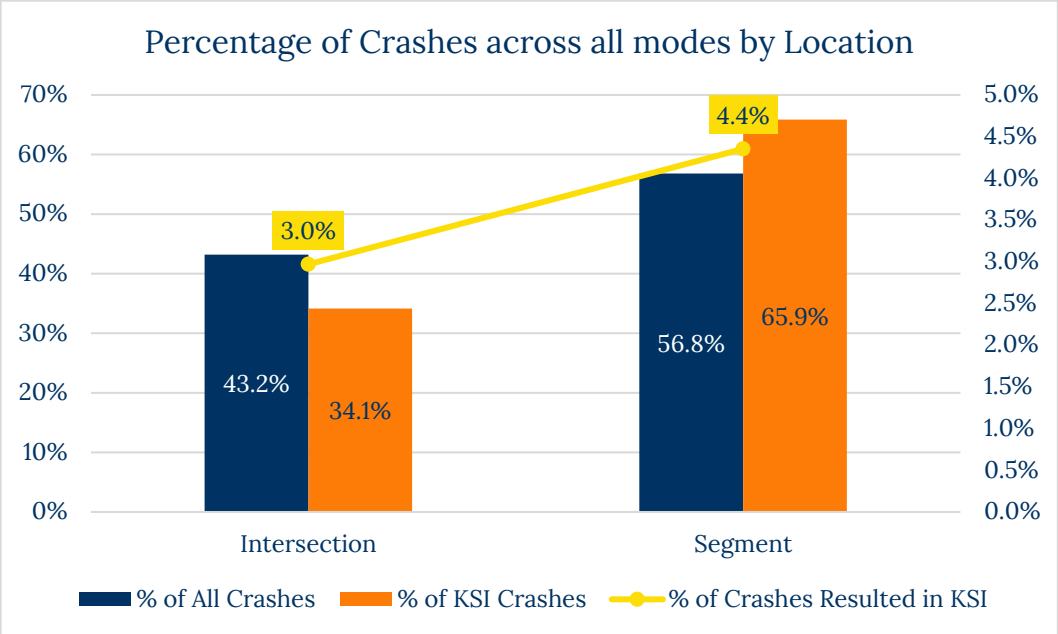


Figure 11: Percentage of All Modes Crashes by Location, 2019-2023

Table 16: Crashes by Location, All Modes, 2019-2023

Crash Location	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes Resulted in KSI
Intersection	29,771	43.2%	884	34.1%	3.0%
Segment	39,165	56.8%	1,705	65.9%	4.4%
Total	**68,936**	**100%**	**2,589**	**100%**	**3.8%**

The location distribution of VRU-involved crashes (**Figure 12** and **Table 17**) shows a similar pattern, though an even higher percentage of them occurred outside an intersection, accounting for 59.3% of all crashes and 74.9% of KSI crashes. Compared to VRU crashes at intersections, VRU crashes on roadway segments between intersections were almost twice as likely to cause severe outcomes.

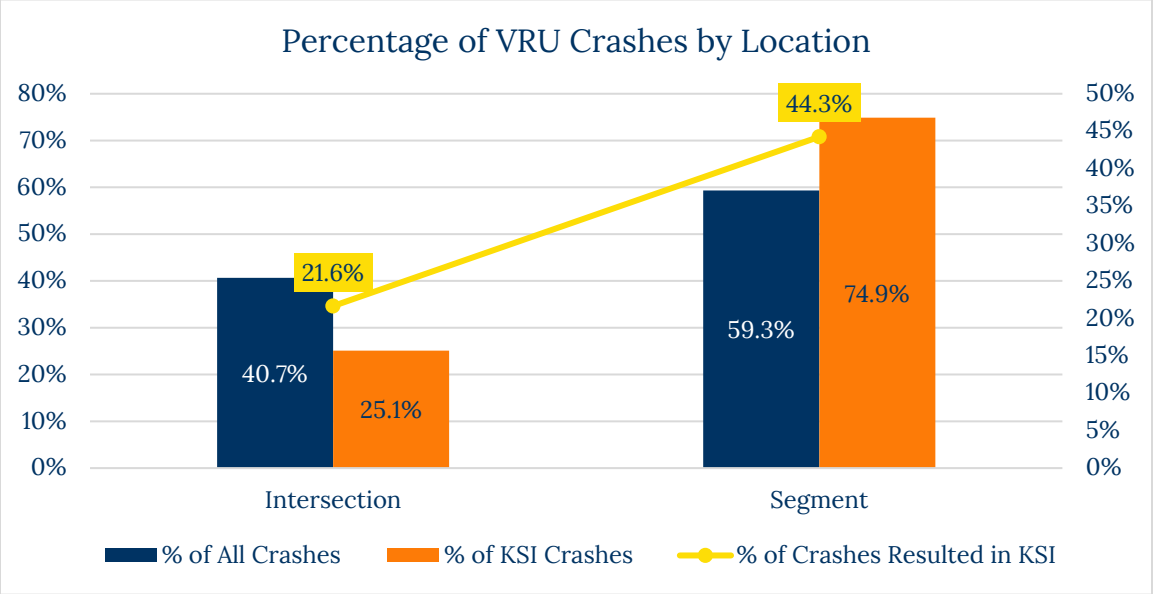


Figure 12: Percentage of VRU Crashes by Location, 2019-2023

Table 17: Crashes by Location, VRU Crashes, 2019-2023

Crash Location	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes Resulted in KSI
Intersection	596	40.7%	129	25.1%	21.6%
Segment	870	59.3%	385	74.9%	44.3%
Total	**1,466**	**100%**	**514**	**100%**	**35.1%**

Intersection Control

Figure 13 and **Figure 14** depict crashes by intersection control (where data is available) for all modes and for VRUs. For all modes, crashes occurred slightly more often at signalized intersections (53.4% of all crashes). The share of KSI crashes at signalized and unsignalized intersections is roughly the same. However, crashes at unsignalized intersections tended to result in slightly more severe outcomes.

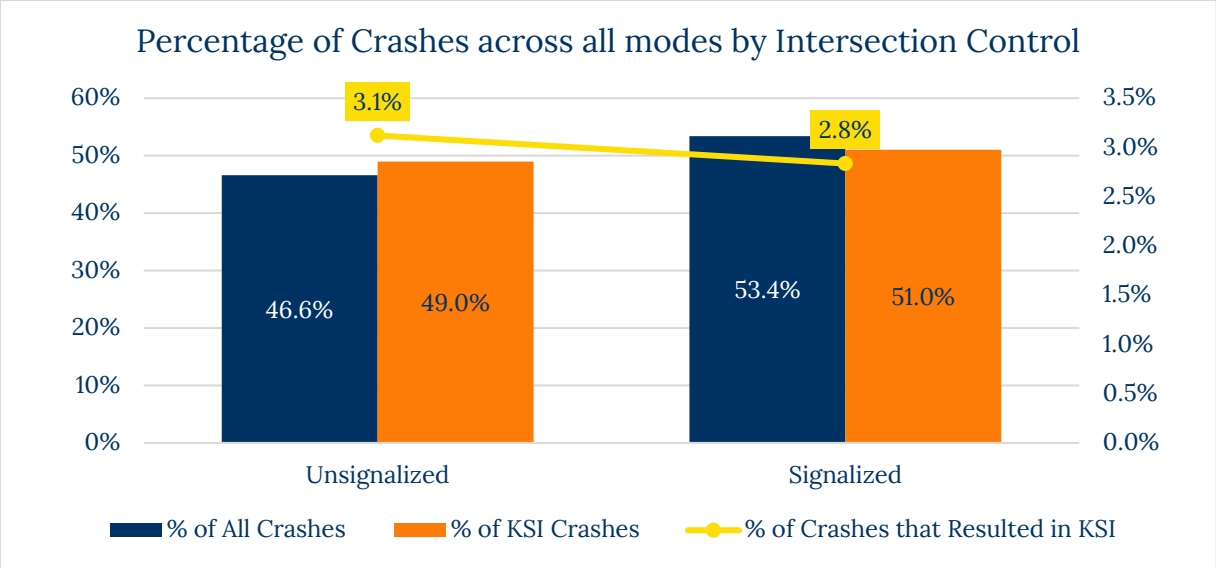


Figure 13: Percentage of Crashes across all modes by Intersection Control, 2019-2023

Table 18: All mode crashes by Intersection Control, 2019-2023

Crash Location	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes Resulted in KSI
Unsignalized	13,871	46.6%	433	49%	3.1%
Signalized	15,900	53.4%	451	51%	2.8%
Total	**29,771**	**100%**	**884**	**100%**	**3%**

The VRU-involved crashes show a different pattern from all mode crashes (see **Figure 14**). Despite a slightly smaller percentage of VRU crashes at signalized intersections (49.8%), a higher percentage of those crashes were KSI crashes. VRU crashes at signalized intersections are 1.3 times more likely to result in severe outcomes than those at unsignalized intersections.

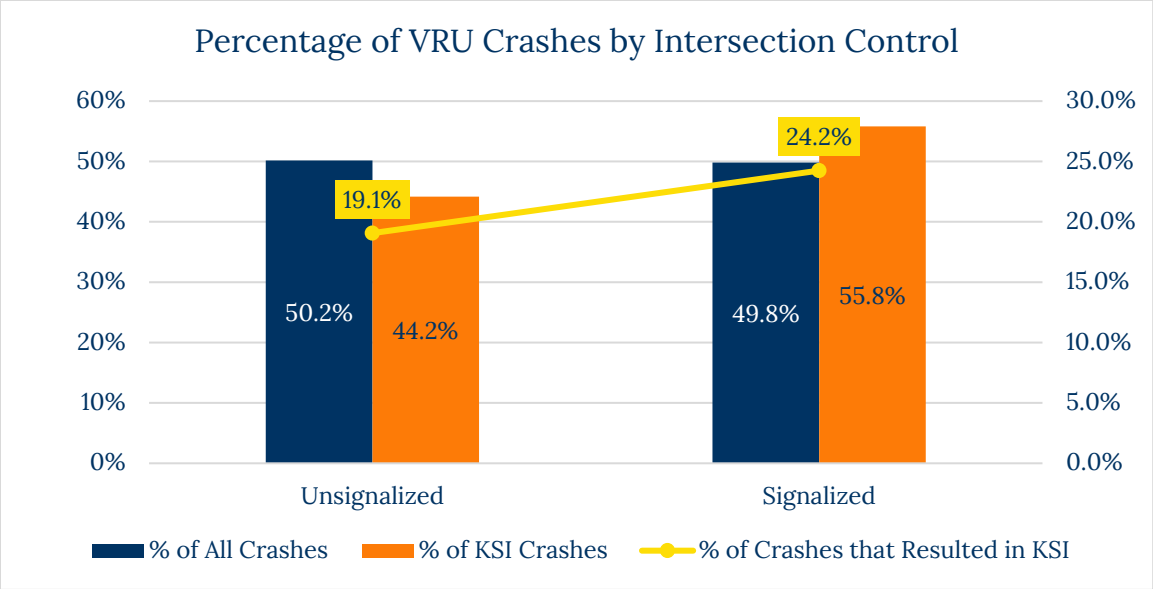


Figure 14: Percentage of VRU Crashes by Intersection Control, 2019-2023

Table 19: VRU Crashes by Intersection Control, 2019-2023

Crash Location	# of Crashes	% of Crashes	# of KSI	% KSI	% of Crashes Resulted in KSI
Unsignalized	299	50.2%	57	44.2%	19.1%
Signalized	297	49.8%	72	55.8%	24.2%
Total	**596**	**100%**	**129**	**100%**	**21.6%**

Posted Speed Limit

Figure 15 and **Table 20** summarize all modes crashes on roadway segments by speed limit. When comparing all crashes and KSI crashes, those that occurred on roadways with speed limit of 35 mph, 40 mph, and 55 mph and above were more likely to cause severe injury outcomes. Roadways with a speed limit of 30 mph or less represent more than half of all roadway lane miles but account for just 15% of all crashes and only slightly more than 10% of KSI crashes. This is the only category of roadway segments that has a much lower percentage of KSI crashes than all crashes, indicating crashes on roadways posted at 30 mph or less are less likely to cause severe outcomes. This finding is consistent with the proven relationship between speeds and crash

severity[12]. On the other hand, roadways with speed limits higher than 30 mph, despite representing less than half of roadway lane miles, accounted for more than 80% of total crashes and nearly 90% of KSI crashes. Overall, the data indicates that higher-speed roads are overrepresented in all crashes, with this overrepresentation being even more pronounced in KSI crashes.

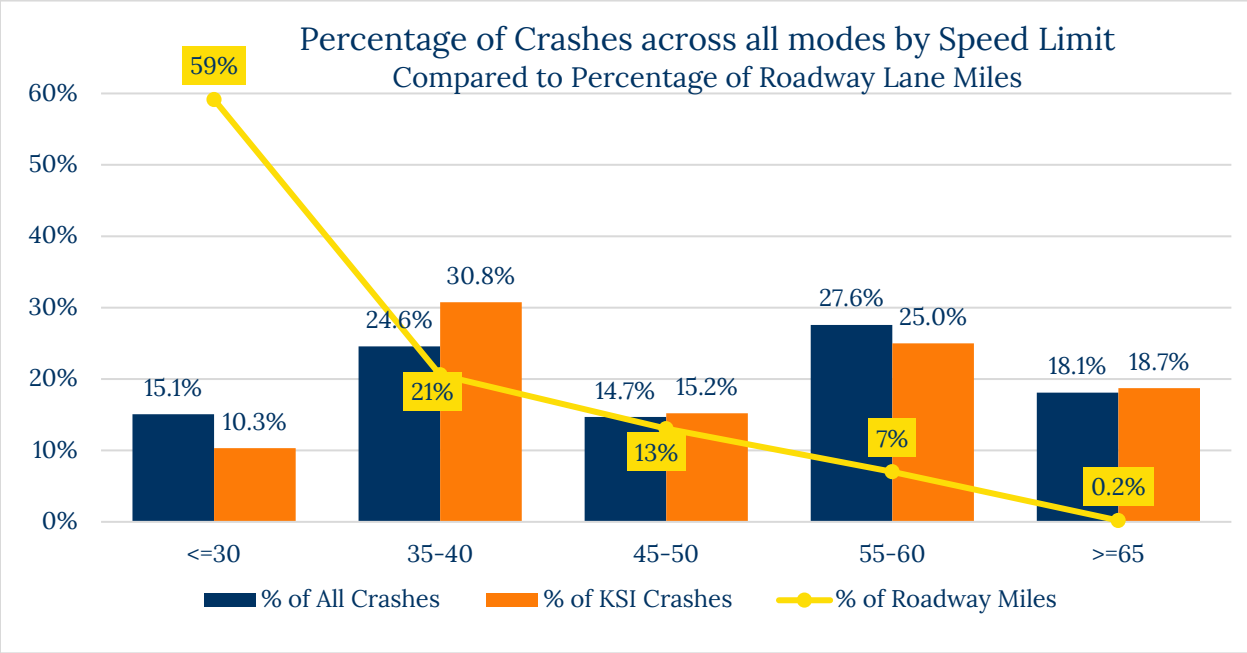


Figure 15: Percentage of Crashes across all modes by Speed Limit, 2019-2023

Table 20: Crashes across all modes by Speed Limit, 2019-2023

Posted Speed Limit (MPH)	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	All Crash/ Miles	KSI Crashes/ Mile	Lane Miles	% of Roadway Lane Miles
<=30	5,893	15.1%	176	10.3%	2.2	0.1	2,737	59%
35-40	9,611	24.6%	524	30.8%	10.1	0.6	953	21%
45-50	5,743	14.7%	259	15.2%	9.5	0.4	604	13%
55-60	10,785	27.6%	426	25.0%	33.2	1.3	325	7%
>=65	7,079	18.1%	319	18.7%	797.1	35.9	9	0.2%
Total	**39,111**[13]	**100%**	**1,704**[14]	**100%**	**8.5**	**0.4**	**4,627**	**100%**

[12] FHWA Fact Sheet on the relation between speed and crashes https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa1304/Resources3/08%20-%20The%20Relation%20Between%20Speed%20and%20Crashes.pdf

[13] The total is different from 39,165 because 54 segment crashes occurred on road segments without available speed limit data.

[14] The total is different from 1,705 because one segment crash occurred on road segments without available speed limit data.

Figure 16 and **Table 21** present the same information for VRU crashes. Compared to crashes for all modes, VRU crashes mostly occur on lower-speed limit roadways, with nearly 70% occurring on roadways with a speed limit of 40 mph or less. This is expected since walking and biking happen mostly on lower-speed roadways. Although roadways with a speed limit of 30 mph or less have the highest share of VRU crashes (41%), they account for only 20% of VRU KSI crashes. Neither of these shares is overrepresented compared to these roadways' share of roadway lane miles. Roadways with a speed limit above 50 mph, despite carrying a small portion of all VRU crashes, represent over a quarter of VRU KSI crashes. Roadways with a speed limit of 35 or higher are overrepresented in VRU KSI crashes.

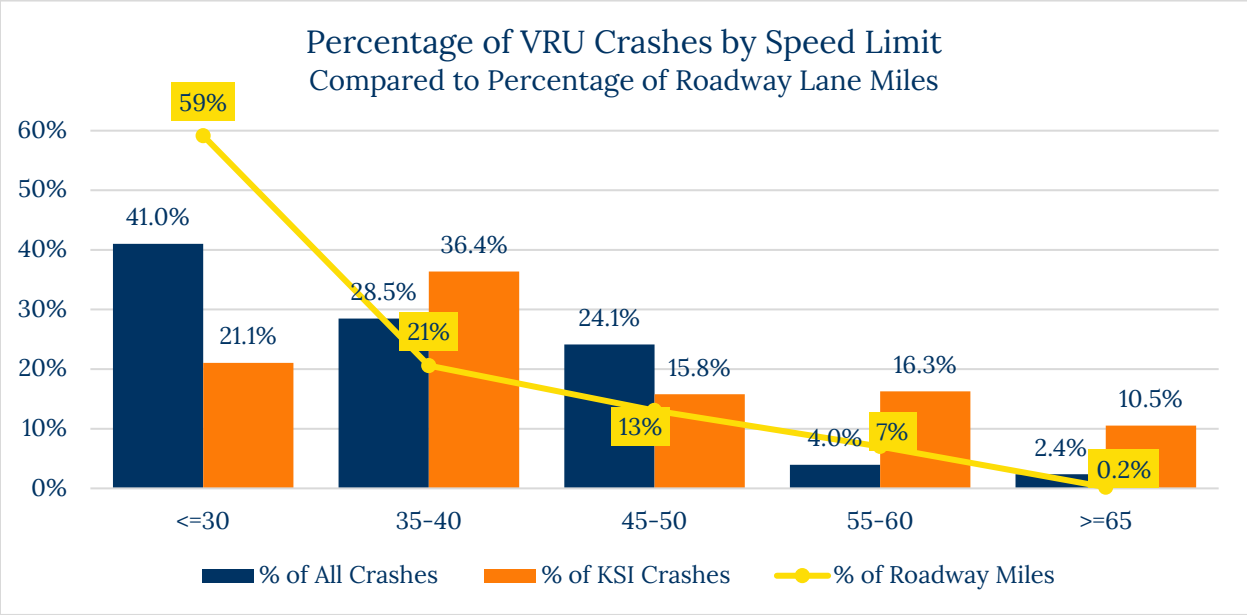


Figure 16: Percentage of VRU Crashes by Speed Limit, 2019-2023

Table 21: VRU Crashes by Speed Limit, 2019-2023

Posted Speed Limit (MPH)	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	All Crash/ Miles	KSI Crashes/ Mile	Lane Miles	% of Roadway Lane Miles
<=30	265	41.0%	64	21.1%	0.10	0.02	265	59%
35-40	302	28.5%	147	36.4%	0.32	0.15	302	21%
45-50	152	24.1%	62	15.8%	0.25	0.10	152	13%
55-60	92	4.0%	69	16.3%	0.28	0.21	92	7%
>=65	59	2.4%	43	10.5%	6.64	4.84	59	0.2%
Total	**870**	**100%**	**385**	**100%**	**0.19**	**0.08**	**870**	**100%**

Functional Class

Figure 17 and **Table 22** break out crashes for all modes by roadway classification[15], compared to each classification's percentage of roadway lane miles. Tollway / freeway represented the largest share of total and severe crashes, comprising 44.1% of all crashes and 40.9% of KSI crashes. Less than 18% of all crashes and 16% of KSI crashes occurred on residential and collector roads, despite those representing 60% of the roadway lane miles. This indicates that all crashes, and KSI crashes in particular, are concentrated on higher functional class roadways.

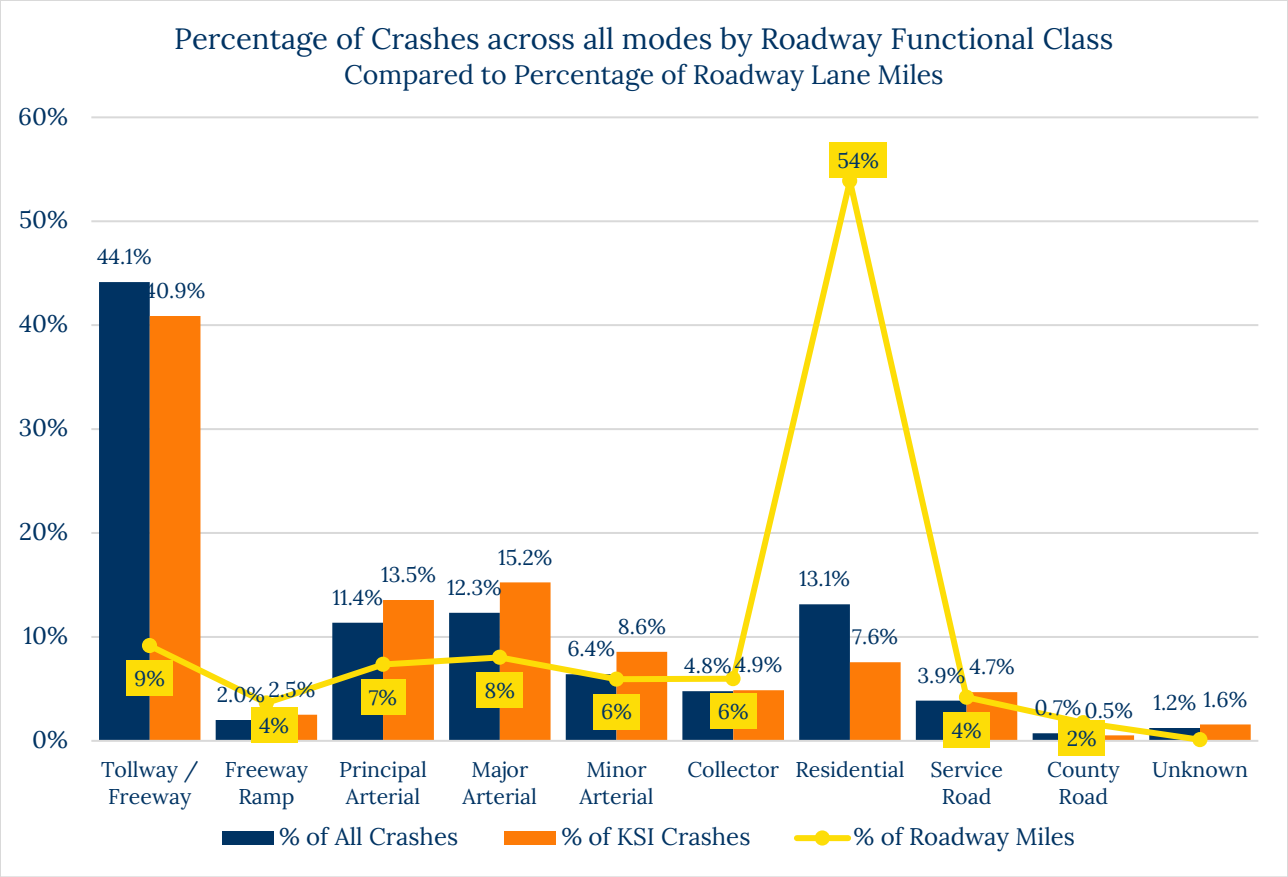


Figure 17: Percentage of Crashes across all modes by Roadway Functional Class, 2019-2023

[15] Functional classification is a federally-mandated categorization of roadways based on the level of traffic service and degree of access they provide. For specific definitions of each functional class, refer to https://www.nctcog.org/getmedia/c77e7aab-3464-440e-a6de-336963269498/Functional-Class-Eligibility.pdf

Table 22: Crashes across all modes by Roadway Functional Class, 2019-2023

Functional Class	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI	Roadway Lane Miles
Tollway / Freeway	17,290	44.1%	697	40.9%	4.0%	9.2%
Freeway Ramp	784	2.0%	43	2.5%	5.5%	3.6%
Principal Arterial	4,450	11.4%	231	13.5%	5.2%	7.4%
Major Arterial	4,824	12.3%	260	15.2%	5.4%	8.0%
Minor Arterial	2,512	6.4%	146	8.6%	5.8%	5.9%
Collector	1,869	4.8%	83	4.9%	4.4%	6.0%
Residential	5,149	13.1%	129	7.6%	2.5%	53.9%
Service Road	1,516	3.9%	80	4.7%	5.3%	4.2%
County Road	287	0.7%	9	0.5%	3.1%	1.7%
Unknown	484	1.2%	27	1.6%	5.6%	0.1%
Total	**39,165**	**100%**	**1,705**	**100%**	**4.4%**	**100%**

The distribution of VRU crashes by functional class shows a similar pattern (see **Figure 18** and **Table 23**), but with much fewer crashes on tollway/freeway and more on lower functional class roadways. However, tollway/freeway still represented the highest share of KSI crashes, likely due to the high traveling speeds. Again, roadways with higher functional classes are overrepresented in both overall and KSI crashes while residential roads, despite accounting for more than half of the roadway lane miles, have a much lower share of crashes, especially KSI crashes.

Overall, a disproportionate number of total and KSI crashes happened on higher functional class roadways, such as tollway/freeway and arterials, regardless of the mode involved.

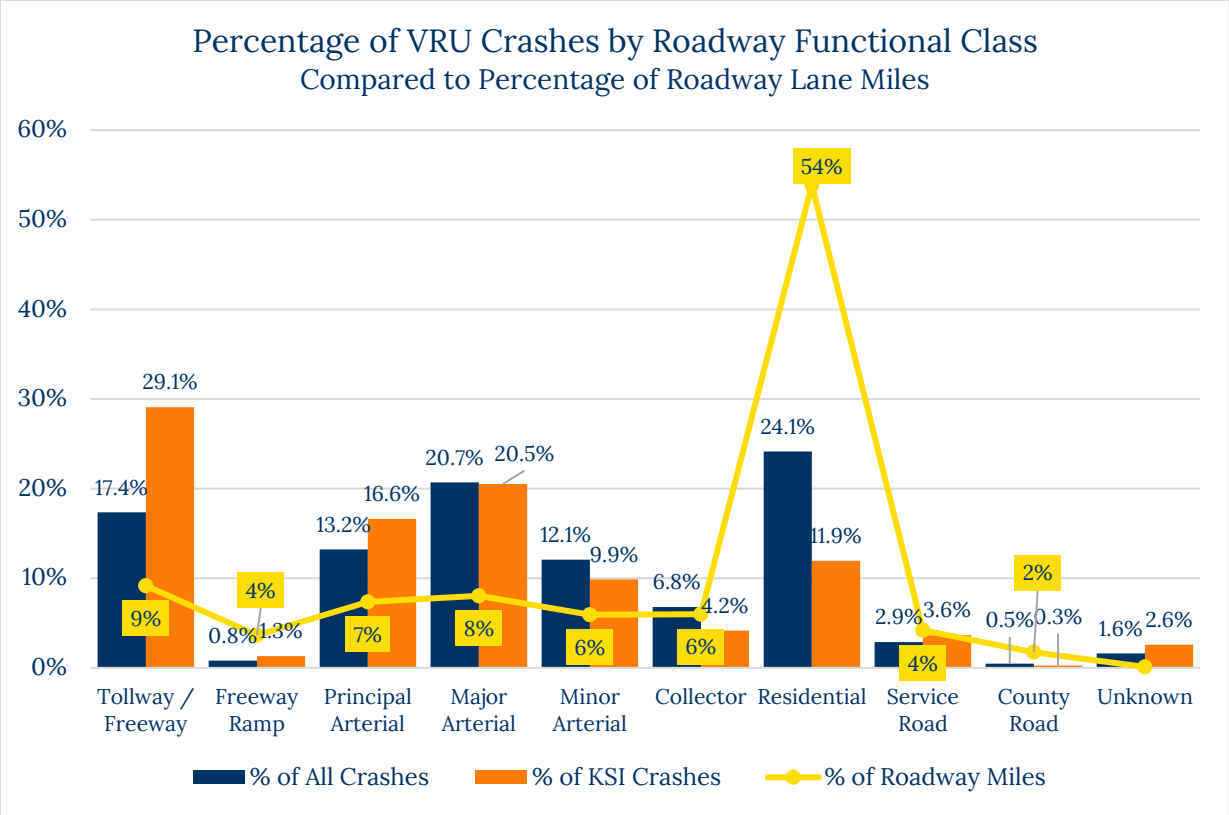


Figure 18: Percentage of VRU Crashes by Roadway Functional Class, 2019-2023

Table 23: VRU Crashes by Roadway Functional Class, 2019-2023

Functional Class	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI	Roadway Lane Miles
Tollway / Freeway	151	17.4%	112	29.1%	74.2%	9.2%
Freeway Ramp	7	0.8%	5	1.3%	71.4%	3.6%
Principal Arterial	115	13.2%	64	16.6%	55.7%	7.4%
Major Arterial	180	20.7%	79	20.5%	43.9%	8.0%
Minor Arterial	105	12.1%	38	9.9%	36.2%	5.9%
Collector	59	6.8%	16	4.2%	27.1%	6.0%
Residential	210	24.1%	46	11.9%	21.9%	53.9%
Service Road	25	2.9%	14	3.6%	56.0%	4.2%
County Road	4	0.5%	1	0.3%	25.0%	1.7%
Unknown	14	1.6%	10	2.6%	71.4%	0.1%
Total	**870**	**100%**	**385**	**100%**	**44.3%**	**100%**

Traffic Volume

Figure 19 and **Table 24** summarize crashes by average annual daily traffic, or AADT, for all modes, compared to the percentage of the total lane mileage within each AADT range. Only crashes that occurred on segments with available AADT data were included in this comparison. Roadways with an AADT of over 40,000 had the largest share of overall crashes (44%) and KSI crashes (40.1%), more than four times higher than their share of the roadway lane miles. Roadways with AADT less than 5,000, despite representing over 70% of roadway lane miles, experienced just over 20% of all crashes and about 15% of KSI crashes, resulting in lower crashes per lane mile. Roads with an AADT over 5,000 are overrepresented in both all crashes and KSI crashes when compared to their share of lane miles. They are also more likely to result in severe outcomes, as indicated by a higher share of KSI crashes.

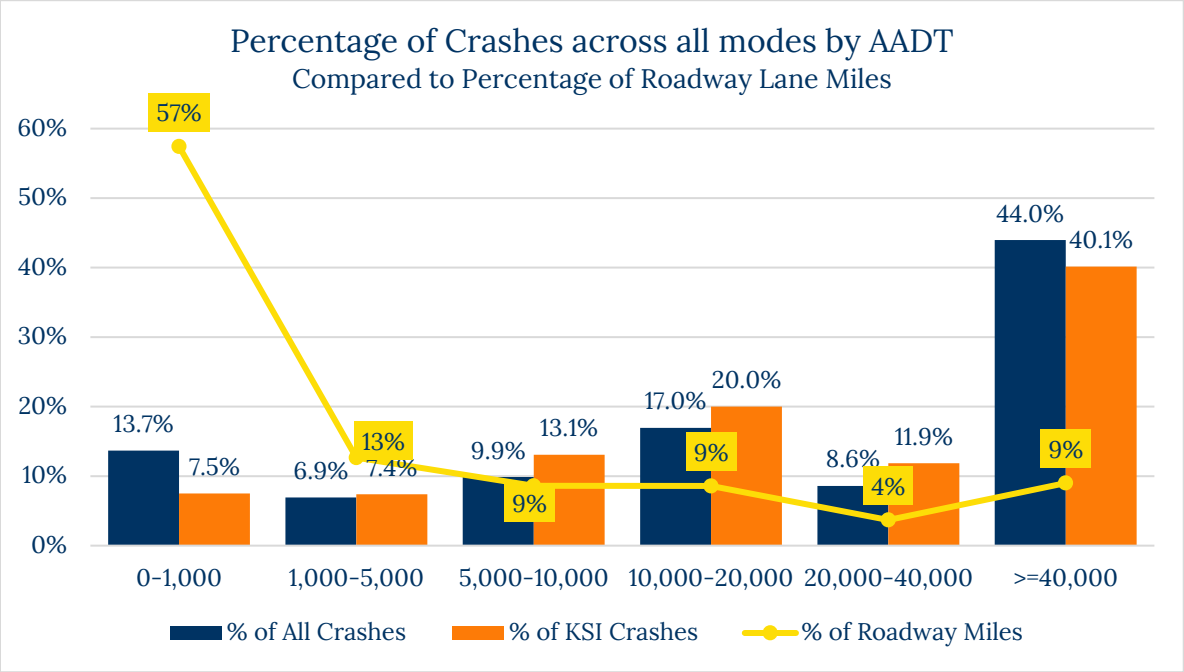


Figure 19: Percentage of Crashes across all modes by AADT, 2019-2023

Table 24: Crashes across all modes by AADT, 2019-2023

Traffic Volume (AADT)	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Miles
0-1,000	5,348	13.7%	128	7.5%	57.4%
1,000-5,000	2,708	6.9%	126	7.4%	12.7%
5,000-10,000	3,855	9.9%	223	13.1%	8.6%

10,000-20,000	6,624	17.0%	341	20.0%	8.6%
20,000-40,000	3,359	8.6%	202	11.9%	3.7%
>=40,000	17,184	44.0%	684	40.1%	9.0%
Total	**39,078**[16]	**100%**	**1,704**[17]	**100%**	**100%**

The distribution of VRU crashes with AADT (**Figure 20**) is similar to that of all mode crashes, except that a higher percentage of VRU crashes happened on roadways with lower AADT. Despite having a higher share of all crashes, roadways with AADT less than 5,000 don't have a much higher share of KSI crashes (15% in **Figure 19** above and 16% in **Figure 20** below), indicating roadways with lower AADT are generally safer for VRU. In contrast, roadways with higher AADT tend to have a higher share of VRU KSI crashes than overall VRU crashes, indicating these roadways are more dangerous for VRUs.

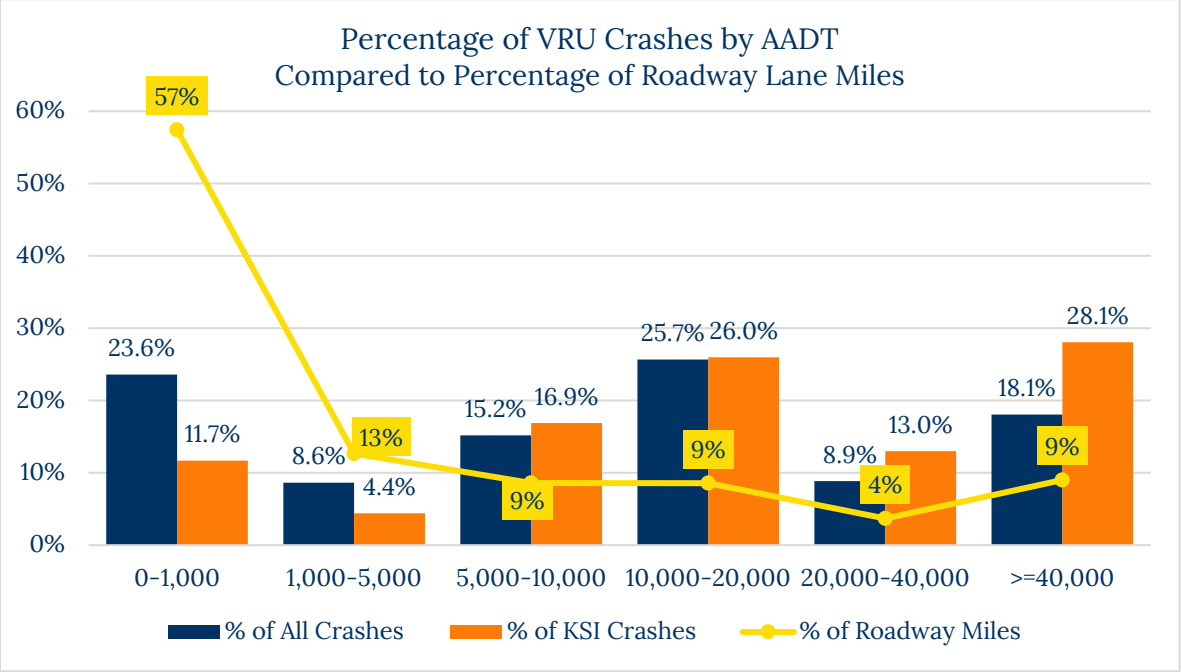


Figure 20: Percentage of VRU Crashes by AADT, 2019-2023

[16] The total is different from 39,165 because 87 segment crashes occurred on road segments without available Average Annual Daily Traffic (AADT) data.

[17] The total is different from 1,705 because one segment crash occurred on road segments without available Average Annual Daily Traffic (AADT) data.

Table 25: VRU Crashes by AADT, 2019-2023

Traffic Volume (AADT)	# of Crashes	% of Crashes	# of KSI Crashes	% KSI Crashes	% of Miles
0-1,000	205	23.6%	45	11.7%	57.4%
1,000-5,000	75	8.6%	17	4.4%	12.7%
5,000-10,000	132	15.2%	65	16.9%	8.6%
10,000-20,000	223	25.7%	100	26.0%	8.6%
20,000-40,000	77	8.9%	50	13.0%	3.7%
>=40,000	157	18.1%	108	28.1%	9.0%
Total	**869**[18]	**100%**	**385**	**100%**	**100%**

Number of Lanes

Figure 21 and **Table 26** summarize crashes across all modes by the number of traffic lanes. Crashes occurred most often on two-lane roads (40.6% of total crashes, 35.4% of KSI crashes), which can be attributed to their 75% share of the city's total road network lane miles. Roadways with three or more lanes, while far less prevalent in the city's roadway network, accounted for about 59% of all crashes and over 64% of KSI crashes, indicating higher density of crashes on roadways with more lanes.

[18] The total is different from 870 because one segment crash occurred on road segments without available Average Annual Daily Traffic (AADT) data.

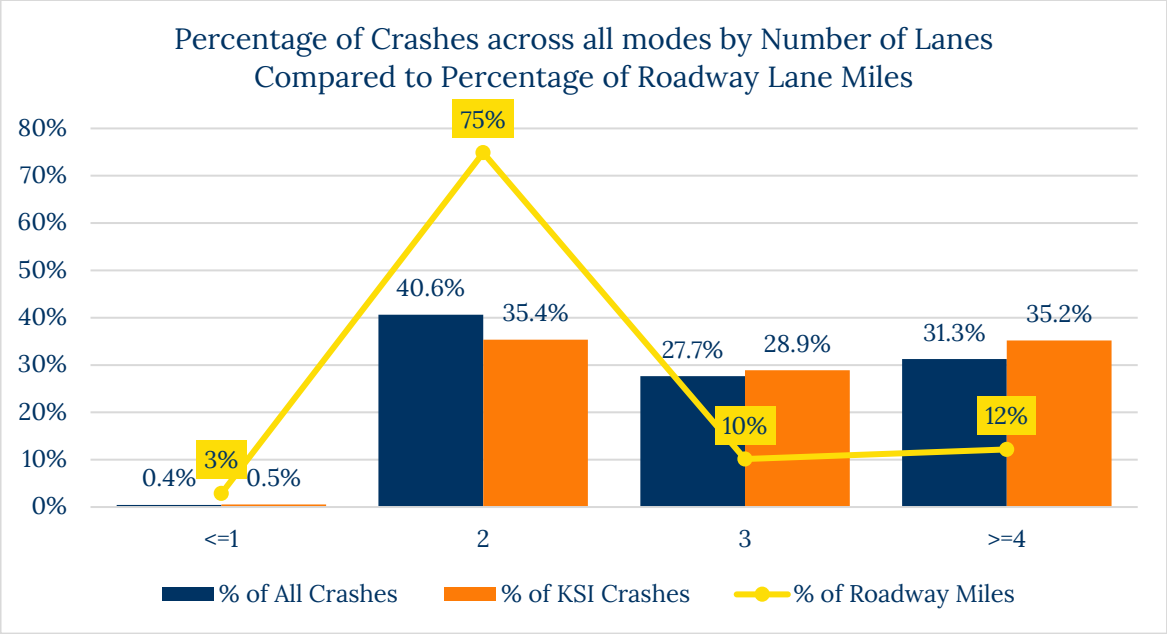


Figure 21: Percentage of Crashes across all modes by Number of Lanes, 2019-2023

Table 26: Crashes across all modes by Number of Lanes, 2019-2023

Number of Lanes	# of Crashes	% of Crashes	# of KSI Crashes	% KSI Crashes	% of Miles
<=1	170	0.4%	9	0.5%	3%
2	15,884	40.6%	603	35.4%	75%
3	10,809	27.7%	493	28.9%	10%
>=4	12,220	31.3%	600	35.2%	12%
Total	**39,083**[19]	**100%**	**1,705**	**100%**	**100%**

The distribution of VRU crashes by number of lanes follows a similar trend as that for crashes across all modes (**Figure 22 and Table 27**). However, a higher share of severe crashes involving VRUs occurred on roads with four or more lanes (41.6% of all VRU-involved crashes compared to 35.2% for crashes across all modes).

[19] The total is different from 39,165 because 82 segment crashes occurred on road segments without available lane count data.

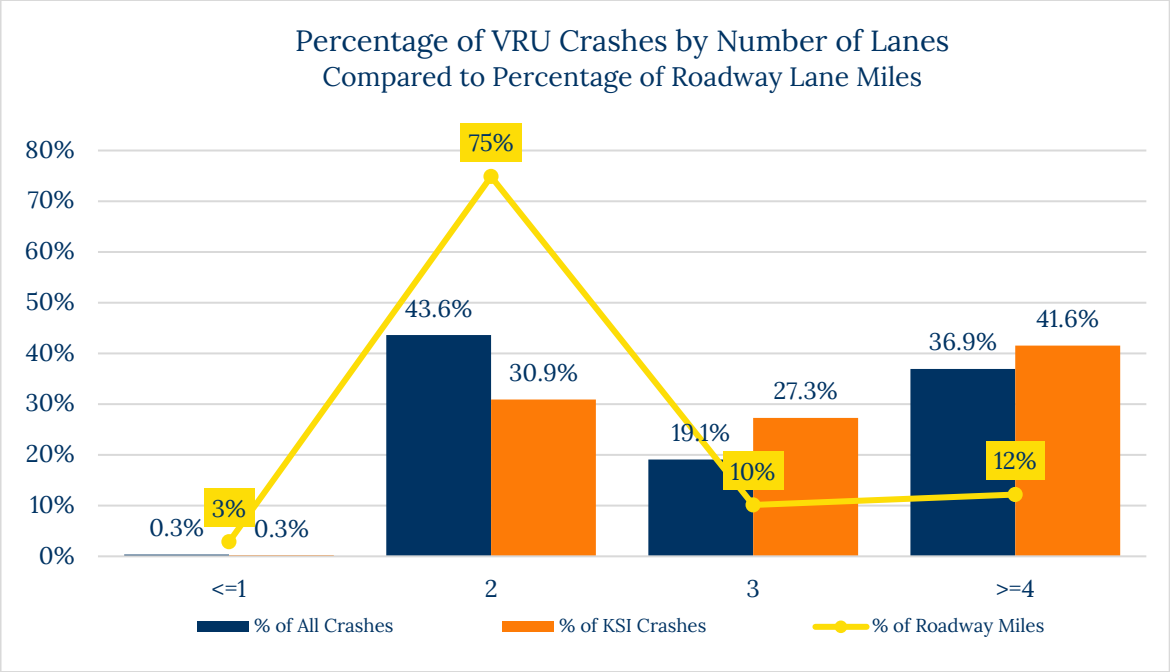


Figure 22: Percentage of VRU Crashes by Number of Lanes, 2019-2023

Table 27: VRU Crashes by Number of Lanes, 2019-2023

Number of Lanes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Miles
<=1	3	0.3%	1	0.3%	3%
2	379	43.6%	119	30.9%	75%
3	166	19.1%	105	27.3%	10%
>=4	321	36.9%	160	41.6%	12%
Total	**869**[20]	**100%**	**385**	**100%**	**100%**

The analysis in the above sections demonstrates that roadways with three or more lanes are overrepresented in terms of both overall crashes and KSI crashes, regardless of the mode involved.

[20] The total is different from 870 because one segment crash occurred on road segment without available lane count data.

Environmental Characteristics

Period of Day

From **Figure 23**, crashes are more likely to happen during daylight time and nighttime as more travelling happen during these periods. However, nighttime crashes are overrepresented in KSI crashes, indicating they are more likely to result in severe outcomes and highlighting the impact of lighting on safety.

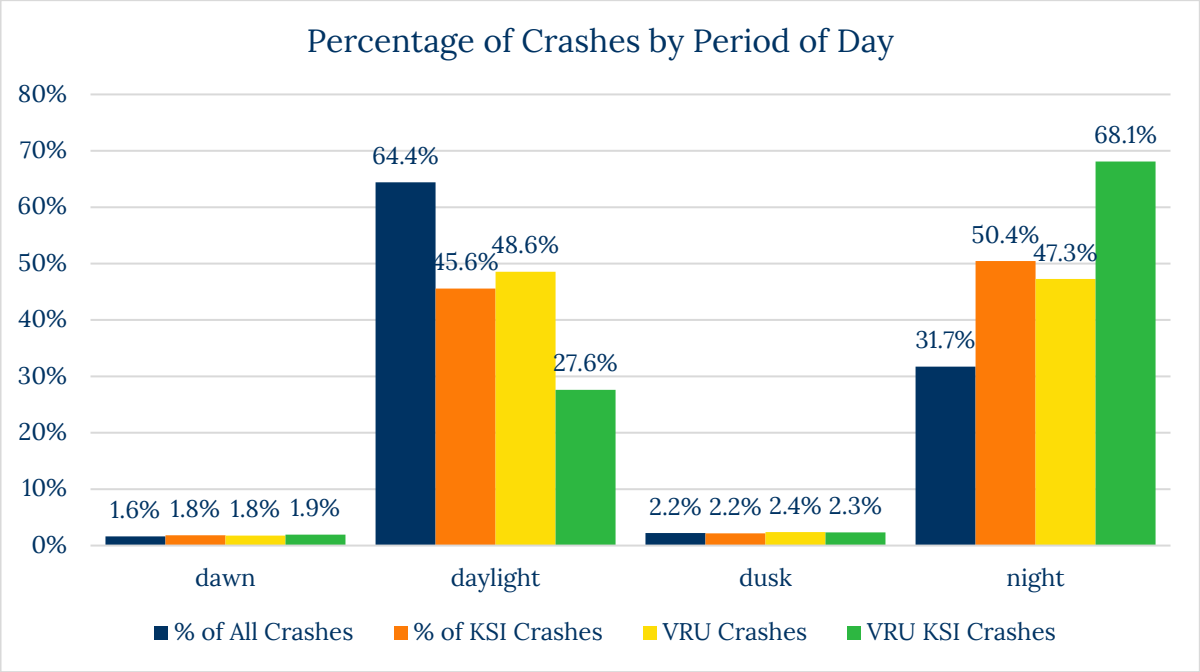


Figure 23: Percentage of Crashes by Period of Day, 2019-2023

Table 28: All and VRU Crashes by Period of Day, 2019-2023

Lighting	All Crash				VRU Crash			
	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes
Dawn	1,130	1.6%	47	1.8%	26	1.8%	10	1.9%
Daylight	44,386	64.4%	1,180	45.6%	712	48.6%	142	27.6%

Dusk	1,523	2.2%	56	2.2%	35	2.4%	12	2.3%
Night	21,868	31.7%	1,306	50.4%	693	47.3%	350	68.1%
Total	**68,907**[21]	**100%**	**2,589**	**100%**	**1,466**	**100%**	**514**	**100%**

Time of Day and Day of Week

Figure 24 illustrates crashes by time of day for all modes and VRU-involved crashes. Percentages shown represent the percentage of KSI crashes that took place during every time period (where data was available) on any day of the week. Overall, crashes across all modes and VRU KSI crashes peak during the early evening (6 PM – 10 PM). This peak is particularly obvious for VRU KSI crashes; nearly 50% of them happened between 6 PM and midnight.

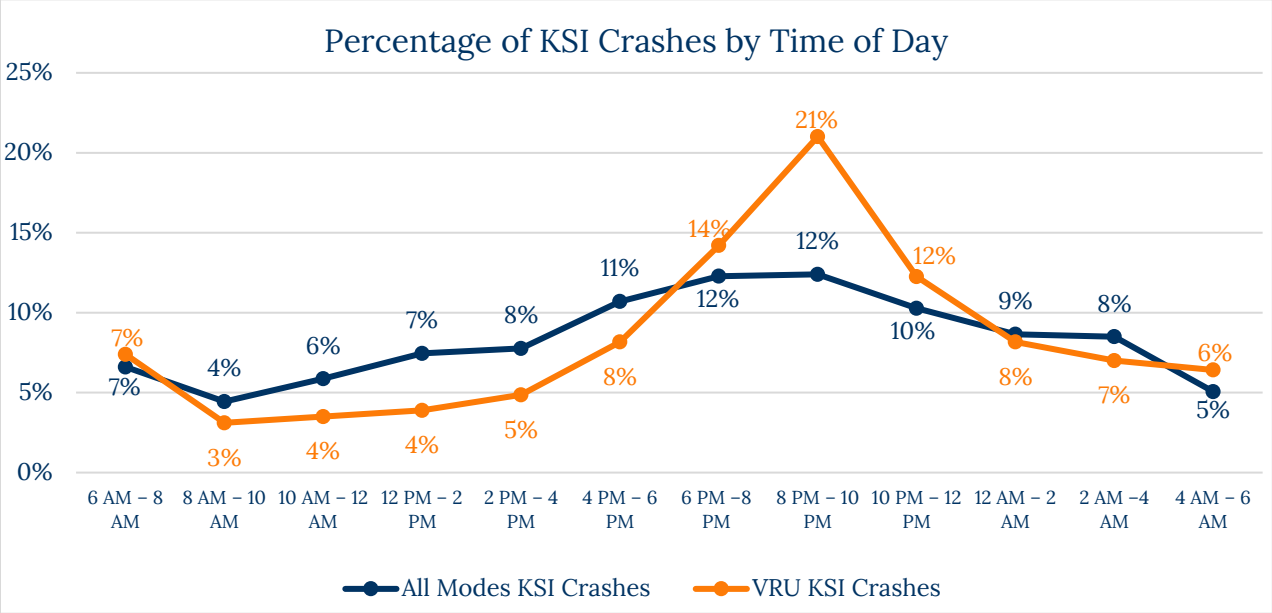


Figure 24: Percentage of KSI Crashes by Time of Day, 2019-2023

Table 29: All and VRU crashes by Time of Day, 2019-2023

Time of the Day	All Crash				VRU Crash			
	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes
6 AM – 8 AM	5,761	8.4%	171	6.6%	117	8.0%	38	7.4%
8 AM – 10 AM	5,793	8.4%	115	4.4%	91	6.2%	16	3.1%

[21] The total is different from 68,936 because 29 crashes did not have Period of Day data available.

10 AM – 12 AM	5,645	8.2%	152	5.9%	91	6.2%	18	3.5%
12 PM – 2 PM	6,991	10.1%	193	7.5%	86	5.9%	20	3.9%
2 PM – 4 PM	8,650	12.5%	201	7.8%	132	9.0%	25	4.9%
4 PM – 6 PM	10,096	14.6%	277	10.7%	179	12.2%	42	8.2%
6 PM –8 PM	7,778	11.3%	318	12.3%	213	14.5%	73	14.2%
8 PM – 10 PM	5,698	8.3%	321	12.4%	237	16.2%	108	21.0%
10 PM – 12 PM	4,328	6.3%	266	10.3%	122	8.3%	63	12.3%
12 AM – 2 AM	3,073	4.5%	224	8.7%	77	5.3%	42	8.2%
2 AM –4 AM	2,887	4.2%	220	8.5%	65	4.4%	36	7.0%
4 AM – 6 AM	2,236	3.2%	131	5.1%	56	3.8%	33	6.4%
Total	**68,936**	**100%**	**2,589**	**100%**	**1,466**	**100%**	**514**	**100%**

Figure 25 and **Table 30** show that crashes across all modes and VRU KSI crashes were more likely to occur on Friday and during the weekend.

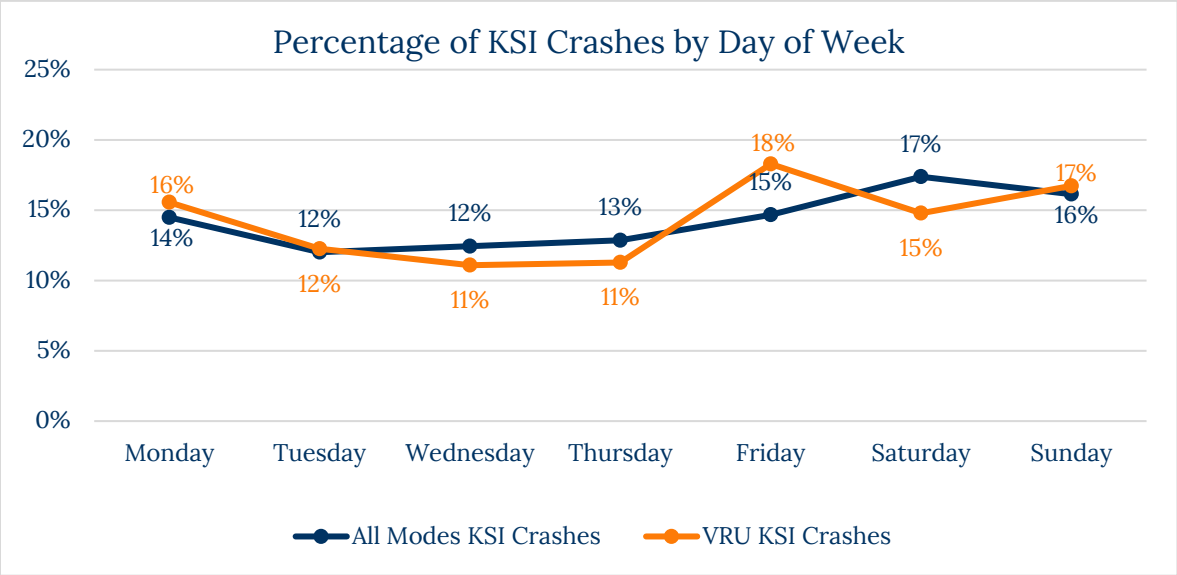


Figure 25: Percentage of KSI Crashes by Day of Week, 2019-2023

Table 30: All and VRU Crashes by Day of Week, 2019-2023

Day of the Week	All Crash				VRU Crash			
	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes
Monday	9,738	14.1%	375	14.5%	203	16%	80	15.6%

Tuesday	9,805	14.2%	311	12.0%	209	12%	63	12.3%
Wednesday	10,078	14.6%	322	12.4%	203	11%	57	11.1%
Thursday	9,833	14.3%	333	12.9%	214	11%	58	11.3%
Friday	11,201	16.2%	380	14.7%	242	18%	94	18.3%
Saturday	9,829	14.3%	450	17.4%	213	15%	76	14.8%
Sunday	8,452	12.3%	418	16.1%	182	17%	86	16.7%
Total	**68,936**	**100%**	**2,589**	**100%**	**1,466**	**100%**	**514**	**100%**

When cross-checking the distribution of KSI crashes against time of day and day of the week (**Table 31** for crashes across all modes and **Table 32** for VRU crashes), more KSI crashes across all modes occurred during between late afternoon and late night, and slightly more of these crashes happened between Friday and Monday.

Table 31: All Modes KSI Crashes by Day of Week and Time of Day, 2019-2023

Time of Day	6 AM – 7 AM	8 AM – 9 AM	10 AM – 11 AM	12 PM – 1 PM	2 PM – 3 PM	4 PM – 5 PM	6 PM – 7 PM	8 PM – 9 PM	10 PM – 11 PM	12 AM – 5 AM
Monday	34	15	18	39	29	47	43	38	37	75
Tuesday	35	15	20	25	21	38	40	44	31	42
Wednesday	24	17	22	29	34	39	44	34	25	54
Thursday	27	24	25	22	25	32	43	44	45	46
Friday	26	18	22	28	31	41	45	57	40	72
Saturday	14	16	24	26	28	49	48	55	53	137
Sunday	11	10	21	24	33	31	55	49	35	149

The distribution shows that severe daytime crashes (morning through early evening) most often occurred during the week, while severe evening and late-night crashes most often occurred over the weekend.

Analysis of KSI crashes involving VRU underscores this pattern. Most severe crashes occur between early morning and afternoon in the first half of the week but switch in the latter half of the week to occur between late afternoon and late night. Severe late-night crashes occurred much more often over the weekend; only one-third of all late night KSI crashes occurred during the first four days of the week.

Table 32: VRU KSI Crashes by Day of Week and Time of Day, 2019-2023

Time of Day	Early Morning	Morning		Afternoon		Late Afternoon	Early Evening	Evening		Late Night
	6 AM – 7 AM	8 AM – 9 AM	10 AM – 11 AM	12 PM – 1 PM	2 PM – 3 PM	4 PM – 5 PM	6 PM – 7 PM	8 PM – 9 PM	10 PM – 11 PM	12 AM – 5 AM
Monday	6	1	6	7	7	1	9	16	12	15
Tuesday	8	1	5	1	2	7	9	14	8	8
Wednesday	5	8	1	1	3	6	7	14	6	6
Thursday	6	3	3	1	2	5	9	16	6	7
Friday	9	2	3	3	5	7	14	20	13	18
Saturday	1	1	0	4	3	7	10	15	9	26
Sunday	3	0	0	3	3	9	15	13	9	31

Lighting Condition

Table 33 and **Figure 26** summarize crashes by reported lighting conditions. Only crashes with available lighting condition data were included in this comparison. Both overall crashes and KSI crashes occurred most often in daylight and when it was dark, under lighted conditions. This is understandable since most of the travel occurs during the daytime. However, crashes that occur in dark conditions, with or without lighting, are more likely to cause severe outcomes, as they are overrepresented in KSI crashes compared to their share of all crashes.

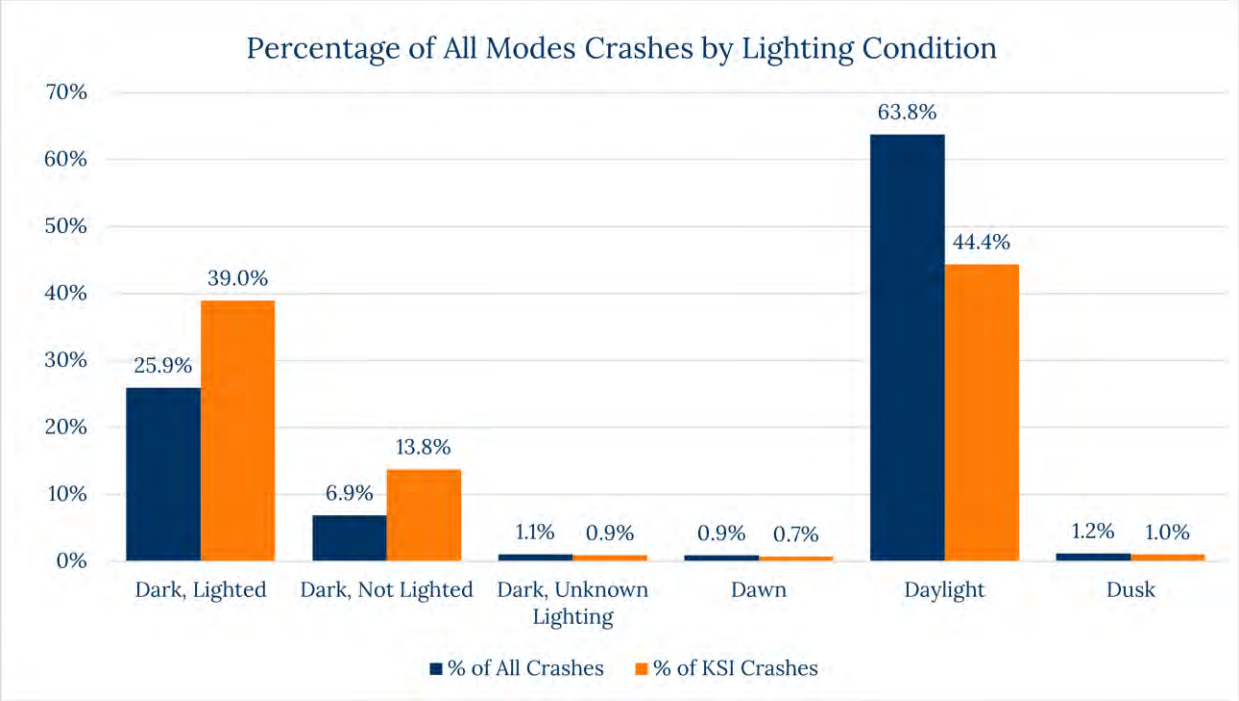


Figure 26: Percentage of Crashes across all modes by Lighting Condition, 2019-2023

Table 33: Crashes by Reported Lighting Condition, All Modes, 2019-2023

Reported Lighting Condition	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	% of Crashes that Resulted in KSI
Dark, Lighted	17,844	25.9%	1,007	39%	5.6%
Dark, Not Lighted	4,748	6.9%	356	13.8%	7.5%
Dark, Unknown Lighting	756	1.1%	24	0.9%	3.2%
Dawn	622	0.9%	19	0.7%	3.1%
Daylight	43,876	63.8%	1,147	44.4%	2.6%
Dusk	843	1.2%	27	1.0%	3.2%
Other	91	0.1%	4	0.2%	4.4%
Total	**68,780**[22]	**100%**	**2,584**[23]	**100%**	**3.8%**

[22] The total is different from 68,936 because 156 crashes did not have reported lighting condition data available.

[23] The total is different from 2.584 because five KSI crashes did not have reported lighting condition data available

Hazardous Roadway Overtopping Locations

Every year, vehicles drive into Fort Worth's many hazardous roadway overtopping locations. Many locations frequently were the scene of fatalities, bodily injury, or property damage. Even locations without reported incidents were identified as problematic thanks to citizen complaints. In 2005, the worst locations were identified and ranked.

Since then, the list of hazardous crossings in Fort Worth has expanded from 40 to approximately 400 locations, which were further investigated and prioritized based on several criteria and site observations.

To address safety issues, within resource constraints, , the below mitigation elements are considered for implementation:

- Installation of high water warning systems
- Upsizing culverts to provide more conveyance capacity
- Guard rails,
- Lighting,
- Flood warning flashers and
- Staff gauges

The flood warning system in Fort Worth, also known as the High-Water Warning System (HWWS), relies on real-time water level measurements taken at 52 hazardous low-water crossing locations. Roadside flashers at these locations immediately warn drivers of the flood hazard. Email alarms are sent to first responders and emergency managers at the city, county, school districts, the National Weather Service, and other partners when the sensors of each flasher system are triggered by rising water. First responders from the Stormwater Division of TPW barricade the roads to prevent vehicles from entering the flooded areas. Many of the locations without flashers have roadside flood warning signage.

Hazardous road overtopping and flood warning systems are integral to Vision Zero because they enhance safety, promote infrastructure resilience, support effective emergency response, and ensure the safety of all roadway users. The Vision Zero SAP will integrate these elements into recommended strategies and identify action items for the city and its partner agencies to help create safer and more resilient transportation systems and contribute to the vision of zero traffic fatalities and severe injuries.

Land Use Context

Figure 27 and **Table 34** illustrate crashes by proximity to transit stops, schools, parks, and senior centers for all modes and for vulnerable road users. The following criteria were applied when defining "nearby" for each facility type:

- Crashes near transit include crashes that occurred within 0.25 miles of a transit stop[24]
- Crashes near schools include crashes that occurred within 0.5 miles of a school[25]
- Crashes near parks include crashes that occurred within 0.5 miles of a park[26]
- Crashes near senior centers include crashes that occurred within 0.5 miles of a senior living facility[27]

Regardless of the involved mode, the majority of KSI crashes happened near transit stops, schools, and parks. This share is even higher for VRU crashes: more than 70% of VRU KSI crashes occurred near a transit stop or a park and almost 54% of them occurred near a school. In contrast, not many KSI crashes happened near senior living facilities. However, a comparison of the share of KSI crashes (whether across all modes or just those involving VRU) with the amount of land they cover, as well as their buffer areas, demonstrates that all four facility types are overrepresented in KSI crashes.

The higher incidence of severe crashes near transit stops, schools, and parks involving vulnerable road users is likely due to the high exposure of VRU in those areas. These findings highlight the importance of providing safe access to these essential destinations, especially for VRU.

[24] From Trinity Metro, includes bus stops and stations.
[25] From Texas Education Agency, includes elementary/middle/high schools from all districts within the Fort Worth area.
[26] From the City of Fort Worth
[27] From OpenStreetMaps, includes nursing homes, assisted living facilities, and senior social centers.

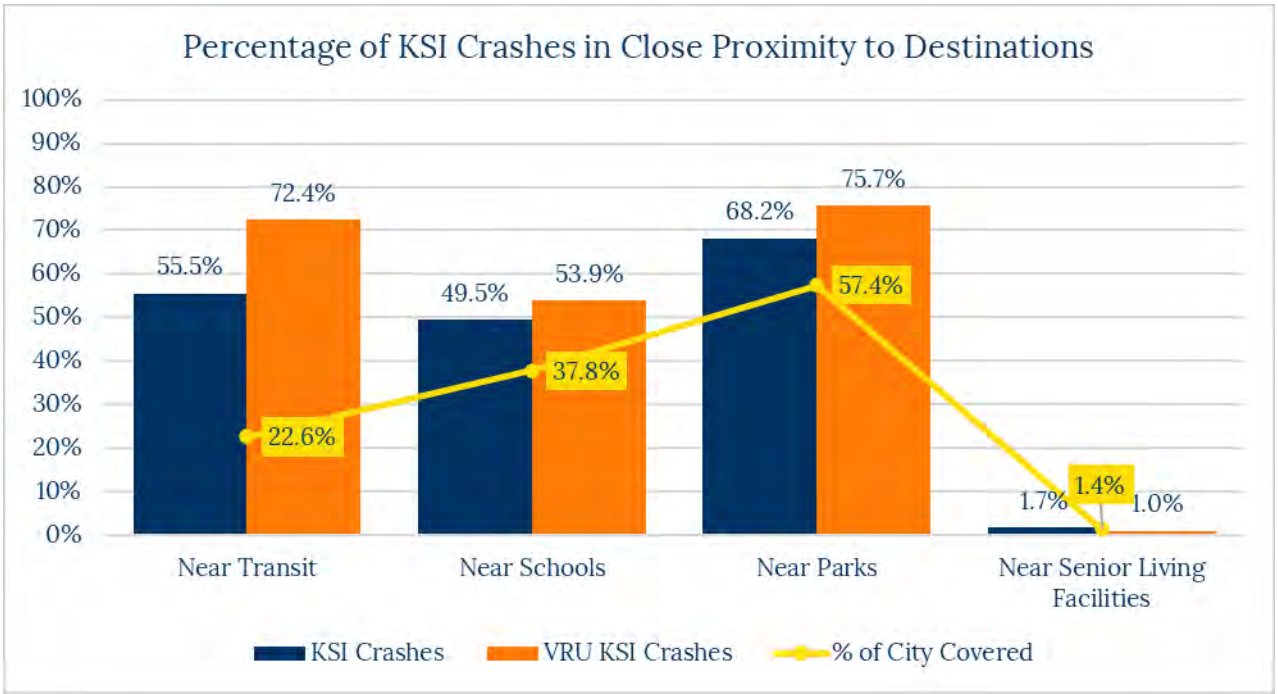


Figure 27: Percentage of KSI Crashes in Close Proximity to Destinations, 2019-2023

Table 34: Crashes in Close Proximity of Destinations, All Mode and VRU Crashes, 2019-2023

Destination	All Crashes				VRU Crashes				% of City Covered
	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	# of Crashes	% of Crashes	# of KSI Crashes	% of KSI Crashes	
Near Transit	38,969	56.5%	1,437	55.5%	1,055	72%	372	72.4%	22.6%
Near Schools	34,820	50.5%	1,281	49.5%	887	60.5%	277	53.9%	37.8%
Near Parks	47,232	68.5%	1,765	68.2%	1,184	80.8%	389	75.7%	57.4%
Near Senior Living Facilities	1,438	2.1%	45	1.7%	20	1.4%	5	1.0%	1.4%

High Injury Network

The development of a HIN is a key element of a safety plan because it identifies areas that have historically seen the greatest density and severity of crashes. This allows cities, counties, and metropolitan areas to prioritize investments in safety treatments. For the City of Fort Worth, mode-specific HINs have been developed to focus on crashes involving vulnerable road users (VRU), including pedestrians and bicyclists, motorcyclists, motor vehicles, and commercial motor vehicles (CMV). These maps can be found in Appendix D of this report.

This section of the report describes crash data sources, methodologies, and thresholds used for the development of the High Injury Networks.

The HIN development process involves developing crash density estimates along street corridors throughout the region, weighing them by crash severity, and then identifying the highest crash-risk sections for each mode. Both intersection and segment crashes were included in this evaluation, as the focus is on overall corridor conditions. The HIN aims to identify corridors that may warrant special attention. Identification of these streets helps a city prioritize investment in areas where crash history demonstrates serious problems and effectively communicates these priorities to community members.

Sliding Windows Analysis Methodology

A sliding windows analysis helps understand historical crash data throughout a transportation network and identify segments with the highest crashes, weighted by crash severity. The analysis determines the number and severity of crashes in a one-mile window on a roadway and shifts that window along the roadway 1/10 of a mile at a time. In this approach, the virtual window is

moved along each corridor, counting the number of crashes by density and severity by mode that occurred within each successive segment. An example of a sliding window analysis is shown in **Figure 28**.

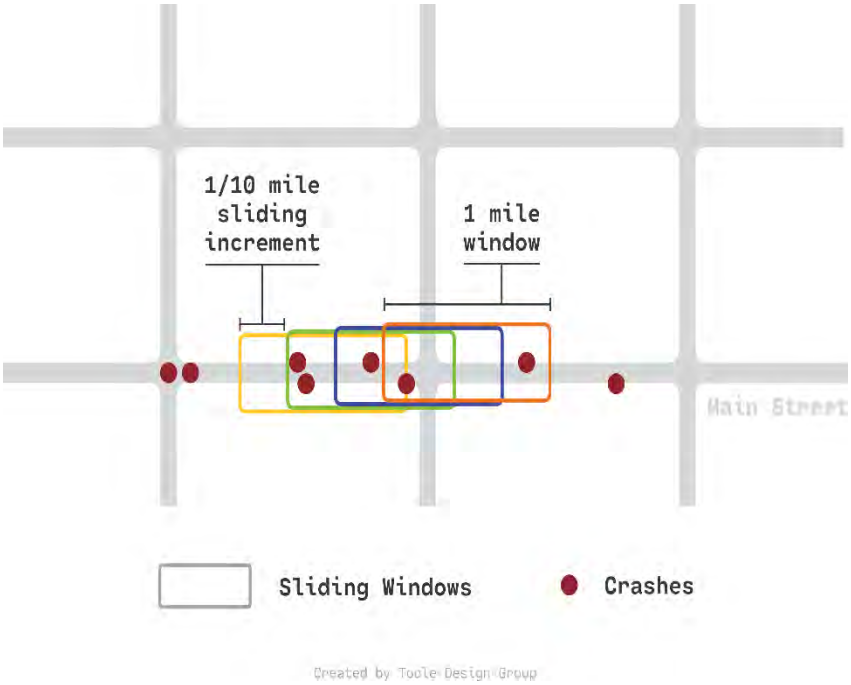


Figure 28. Example of the Sliding Window Analysis

The sliding windows score weights the most severe crashes more heavily than lower severity crashes. The analysis was conducted for each mode (bicycle, pedestrian, motorcycle, and motor vehicle), as well as CMV crashes. A crash was assigned a single mode based on the most vulnerable mode involved. For example, a crash between a motor vehicle and a bicyclist would be classified as a bicycle crash. For CMV crashes, any crash that is flagged as CMV-involved in CRIS (regardless of modes involved) was counted for that sliding windows analysis.

The score for each window was determined based on the frequency and severity of crashes by mode. Fatal injury (K) and suspected serious injury crashes (A) were weighted x3, suspected serious injury (B) crashes were weighted x2, and possible injury (C) were weighted x1; no apparent injury (O), and unknown injury (U) were weighted x0. Once the weights are established and applied to the crashes, the number of crashes is aggregated to each window, incorporating the crash severity weighting. For example, if a segment had 1 A crash, 1 B crash, 2 C crashes, and 5 O crashes, it would receive a score of 7, or(1x3) + (1x2) + (2x1) + (5x0).

High Injury Network Development

Development of the HIN is an iterative process and should emphasize that the key goal of the safety action plan is the elimination of fatal and serious injury crashes. The sliding windows analysis helps to achieve that goal by providing scores for all segments. The next step is to

examine those scores and determine the areas with the highest rates of injury. This is done using the following steps:

1. Map the sliding windows analysis results for each mode (as well as for commercial vehicles) individually.
2. For each mode, determine the threshold score required to be included in the HIN. This step eliminates streets that have a lower crash density, thereby prioritizing streets that have higher crash severities and frequencies.
3. With a HIN created for each mode, create an overall HIN, comprising any segment that is on one or more modal HIN.

The goal of the HIN threshold setting process is to independently settle on a sliding windows score for each mode, then identify key corridors where risk is highest, and create a network that covers a selective set of city streets but a relatively large share of crashes, with an emphasis on KSI crashes.

These scores differ by mode and location in some instances due to the differences in the number of crashes. For example, a score of 10 may be high for the pedestrian network, but relatively low for a motor vehicle network, as there are so many more motor vehicle crashes than pedestrian crashes. A segment that meets or exceeds the weighted crash score threshold noted for each mode, below, were included in mode-specific HIN and the overall HIN. The threshold scores used for the Fort Worth Safety Action Plan are listed below.

- Pedestrian: 5
- Bicycle: 4
- Motorcycle: 8
- Motor Vehicle: 50
- Commercial Motor Vehicle: 8

Comparing the fraction of crashes – especially KSI crashes – that are on the HIN against the fraction of roads that make up the HIN (by roadway centerline mileage) illustrates how a small subset of roads account for a disproportionate share of crashes, especially KSI crashes.

Mode	Percentage of Crashes on HIN		Percentage of Roadways that are HIN
	All	KSI	
Pedestrian	47.8%	50.3%	2.70%*
Bicycle	25.0%	46.9%	0.57%*
Motorcycle	21.1%	28.0%	1.03%
Motor Vehicle	44.0%	45.4%	4.35%
Commercial Motor Vehicle	36.8%	51.2%	1.68%
Overall	**50.8%**	**54.5%**	**6.30%**

* Excludes mileage of freeways/tollway roads.

Appendix A: Crash Data Preparation

Crash data for the five-year period of 2019-2023 was acquired from TxDOT's CRIS data portal. Crashes used for this analysis were all reportable crashes with the city attribute equal to Fort Worth. The crash, unit, person, and primary persons table were used for this analysis. Prior to the analysis, the person and primary person tables were combined, so any statistics that refer to persons refer to this combined dataset.

Severity

Crash level severity is assigned based on the most severe outcome to those involved, using the KABCO scale. For example, a crash where one person had a suspected minor injury (B), and another person had a possible injury (C), the overall crash would be assigned a severity of suspected minor injury (B). Severity was determined by first examining the severity for all persons involved in each crash, using their injury severity ID. For crashes that did not have any associated persons, information from the unit table was used. For these crashes, severity was determined using the columns that listed the count of each severity (death count, serious injury count, etc.), with the assigned severity being the most severe injury level with a value > 0. Note, for any crash where all severity counts were 0, the crash was assigned not injured (O).

Mode

Each crash was identified as involving or not involving the following modes:

- Pedestrian
- Bicyclist
- Motorcyclist
- Motor vehicle
- Commercial Motor Vehicle (CMV)

This was done using the criteria outlined in the Texas Strategic Highway Safety Plan[28] (SHSP). Motor vehicle-involved crashes weren't explicitly outlined in the SHSP but were flagged using the same logic as other modes, using the vehicle unit description of 'Motor Vehicle'.

[28] https://www.texasshsp.com/wp-content/uploads/2022/08/2022-2027-Texas-SHSP.pdf - Appendix D

Overall crash level mode is assigned based on the most vulnerable mode involved, using the order:

1. Pedestrian
2. Bicyclist
3. Motorcyclist
4. Motor vehicle

For example, if a crash involved a pedestrian and motor vehicle, the overall crash would be assigned a mode of pedestrian. VRU modes were considered as pedestrians and bicyclists. Note: when determining crash level mode, CMV crashes were not considered separate from motor vehicle crashes.

Crash Characteristics

Crash characteristics were determined using different person, unit, and crash level data, depending on the characteristic. The following characteristics were determined:

- **Type**
  - Intersection/intersection-related
  - Ran off road
  - Head-on
  - Work zone
  - Railroad grade-crossing
  - Young driver involved
  - Older driver involved
- **Behaviors**
  - Driving under the influence (DUI) (includes both alcohol and drugs)
  - Speeding
  - Lack of restraint
  - Distracted driving

See the SHSP for the full list of criteria used for each characteristic.

Spatial Adjustment

The CRIS data received was geolocated. For all crashes not geocoded to TxDOT on-system roads, their locations were used as they were received. For crashes that were geocoded to TxDOT on-system roadways, post-processing was performed to adjust their location. This was necessary because CRIS snaps all on-system crashes to the combined centerline of the roadway mainline. This means that there is not a way to spatially differentiate crashes that occurred on different sides of a divided highway, nor crashes that occurred on a frontage road from the mainline highway. This effect was more pronounced on one-way paired couplet highways, where the actual directional centerlines were two physically different roads but the combined centerline was the geographic median and ran through the middle of the block between the two roads.

To correct this, attributes from the CRIS crash data, as well as the attributes and spatial properties of the TxDOT roadway inventory, were used in combination. Crashes were subset using the on-system flag and identified as either mainline or frontage roads using the roadway part ID. To adjust the crash locations, roadways were subset from the overall TxDOT roadway inventory as well as identified as mainline or frontage based on record type. The cardinal direction of the roadway segment was also calculated, with the direction of travel being determined by the segment's roadbed identifier. Crashes were then associated in a one-to-many relationship with these roadway segments based on highway number (attributes present in both datasets) and as part of a search tolerance based off the roadway's width, except for one-way paired couplets, where the distance was based off the distance between the two couplets.

The CRIS data dictionary lists cardinal roadway direction as an attribute within the crash level dataset, however, that attribute was not present within the dataset acquired from the CRIS website. Instead, CRIS used vehicle direction of travel, although this information was not always present within the vehicle level data, and some multi-vehicle crashes had different vehicle directions. For any crashes not matched based on vehicle direction, it was attempted to interpret roadway direction based on directional elements within the street name reported in the crash, i.e., 'North', 'Northbound', 'NB', 'NBND', etc. Any crash (still matched on the previously described attribute and spatial criterion) with a difference between interpreted direction and roadway azimuth less than 45° for vehicle-based direction, and 90° for name-based direction (vehicle used a lower tolerance because vehicle directions were provided in 45° increments, i.e. northwest, southeast, etc., while name based directions were assumed in 90° increments, i.e. north, south,

etc.) was assigned to the closest point on the segment, relative to the original crash location. Using this methodology, approximately 75% of the potentially fixable on-system crashes were relocated.

Location Assignment

Crashes were assigned to roadways based on both spatial and attribute criteria. First, all crashes were joined to the closest road within 50 ft, but only if the street name reported in the crash data and street name of the roadway were similar (a Levenshtein distance of <= 10). This was to ensure that if a crash was physically close to multiple streets, it would be assigned to the one that it most likely occurred on. Any crash that was not assigned a road from the previous step was then assigned to the closest road within 50 ft, regardless of other criteria.

Crashes were assigned to intersections based on both spatial and attribute criteria. For this assignment, only crashes that were identified as intersection or intersection-related were considered. Crashes were joined to the closest intersection within 150 ft, but only when the roadway segment that was assigned in the previous step participated in the intersection (as determined by name). This requirement was used so that crashes were not assigned to adjacent, non-connected intersections.

Finally, overall location type was determined based on being an intersection crash or not. Intersection/intersection-related crashes were assigned as 'Intersection' and all other crashes were assigned as 'Segment'.

Appendix B: Spatial Data Consolidation

This analysis used North Central Texas Council of Governments (NCTCOG) centerlines as the basis for the analysis. This was chosen over the City of Fort Worth's centerlines, as the city's centerline data only contained geometry for streets within its jurisdictional boundary. In some locations, this left gaps on roadways that traversed in and out of the city, which would have caused issues when consolidating data from other sources where all roadways are included. This approach also helped account for edge effect, where roads that form part of a boundary may assigned to a neighboring city.

Like crashes, this regional network was then flagged as comprising the study area based on meeting any of the following criteria:

- NCTCOG data identified the source as "City of Fort Worth"
- > 50% of the segment's length was within a 30 ft buffer of the City of Fort Worth

Functional Classification

Functional classification came from several sources. For segments that were within the City of Fort Worth, the city's functional classification system was used. Segments outside the city were assigned to their equivalent City of Fort Worth classification based on a combination of the NCTCOG's regional and local authority's classifications.

Lane Count

Lane count data for the streets within the City of Fort Worth was available, but as part of a separate pavement dataset that did not have a linking ID back to the centerline dataset. The lane count from the pavement was conflated to the network.

Next, for areas outside the City of Fort Worth, lane counts were conflated from the TxDOT Roadway Inventory. The TxDOT roadway dataset had fully populated lane count data, although it did not have geometry to represent every centerline segment within the study area. Adjustments were made to account for locations where the roadways were represented differently between the two datasets. For example, the same road may be represented as one two-way segment in the TxDOT dataset and as two one-way segments in the NCTOG dataset. If the TxDOT lane

count had a value of four (two in each direction) and this was simply conflated over, it would give both NCTCOG segments a value of four, when in reality they should both have a value of two.

For any segments that were assigned a value from the TxDOT Roadway Inventory, OpenStreetMap (OSM) data was used. This was done in the same manner as with the TxDOT data, i.e., spatial conflation with adjustments to account for differences in data representation.

Finally, for any segments that were still unknown, they had their values filled based on the most commonly occurring values for the same functional classification and road name, except for residential roads. This is because local roads tend to not have values, and where they do have known values, there's a higher chance of that location being enough of an outlier to warrant collecting data. Any residential roads without a known value from one of the above sources was assigned a lane count of two.

Annual Average Daily Traffic (AADT)

AADT was not present in the NCTOG data. AADT was available in the TxDOT roadway inventory and was conflated onto the network. Like lane count, the TxDOT AADT data was fully populated within itself, but not did cover all roadway segments. Adjustments were made to ensure the final AADT values assigned correctly accounted for differences in data representation.

For segments without AADT, estimated AADT from Replica were used. Since these are modeled volumes, they were fully populated and able to fill in most of the remaining data gaps. The only gaps remaining were instances in which minor differences in segment geometry prevented a spatial match. For these, values were estimated based on the most common occurring values for segments of the same name and functional classification. Unlike lanes, residential streets were included in this stage, as most local roads had values from TxDOT or Replica, which reduced the impact of outlier observations.

Speed Limit

Speed limits came from several sources. For segments within the City of Fort Worth, data was available from the City of Fort Worth. Outside the city, speed limit coverage varied within the NCTOG data, although any known values that were present were incorporated into the network.

TxDOT data contained speed limit data, although it only had coverage for on-system roadways. This data was conflated onto the network to fill gaps. After this, OSM speed limit data was

conflated onto the network. Unlike lane count and AADT, no adjustments were needed to the speed limits, as the speed limit values were not affected by differences in data representation.

Any segments that were still unknown had their values filled based on the most commonly occurring values for segments of the same name and functional classification. Like lane counts, this process excluded residential streets due to potential outlier observation effects. Any residential road without a known value was assigned the regulatory default of 30 mph.

Intersection Control

Control was assigned to intersections from several data sources. First, the City of Fort Worth maintains a dataset of signalized intersections. This dataset represented overall intersections that were signalized, so they were simply assigned to the closest intersection location within 30 ft.

Next, was the city's traffic signal dataset. However, this dataset contained points for each traffic signal at an intersection, meaning that a single intersection had multiple points. To simplify this, traffic signals were grouped into clusters based on the name of the intersection they participated in, and the centroid of the cluster was obtained. With this, each cluster was represented by a single point, and was assigned to the closest intersection within 30 ft.

Finally, OSM data was used. This data contained both signalized and stop (all way only) controlled information. Again, the control information from this dataset was assigned to the closest intersection within 30 ft.

Appendix C: Crash Maps

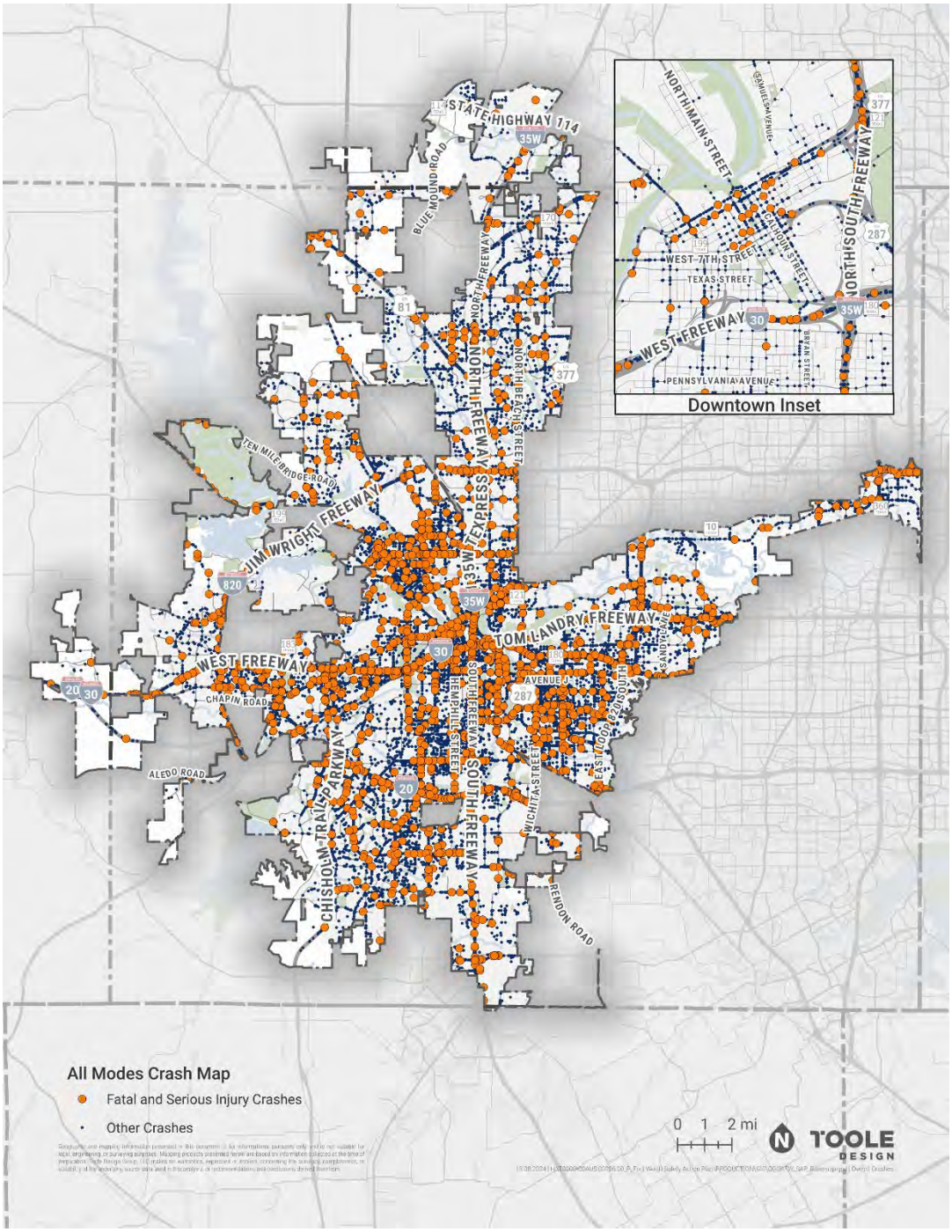


Figure 29: All Modes Crash Map

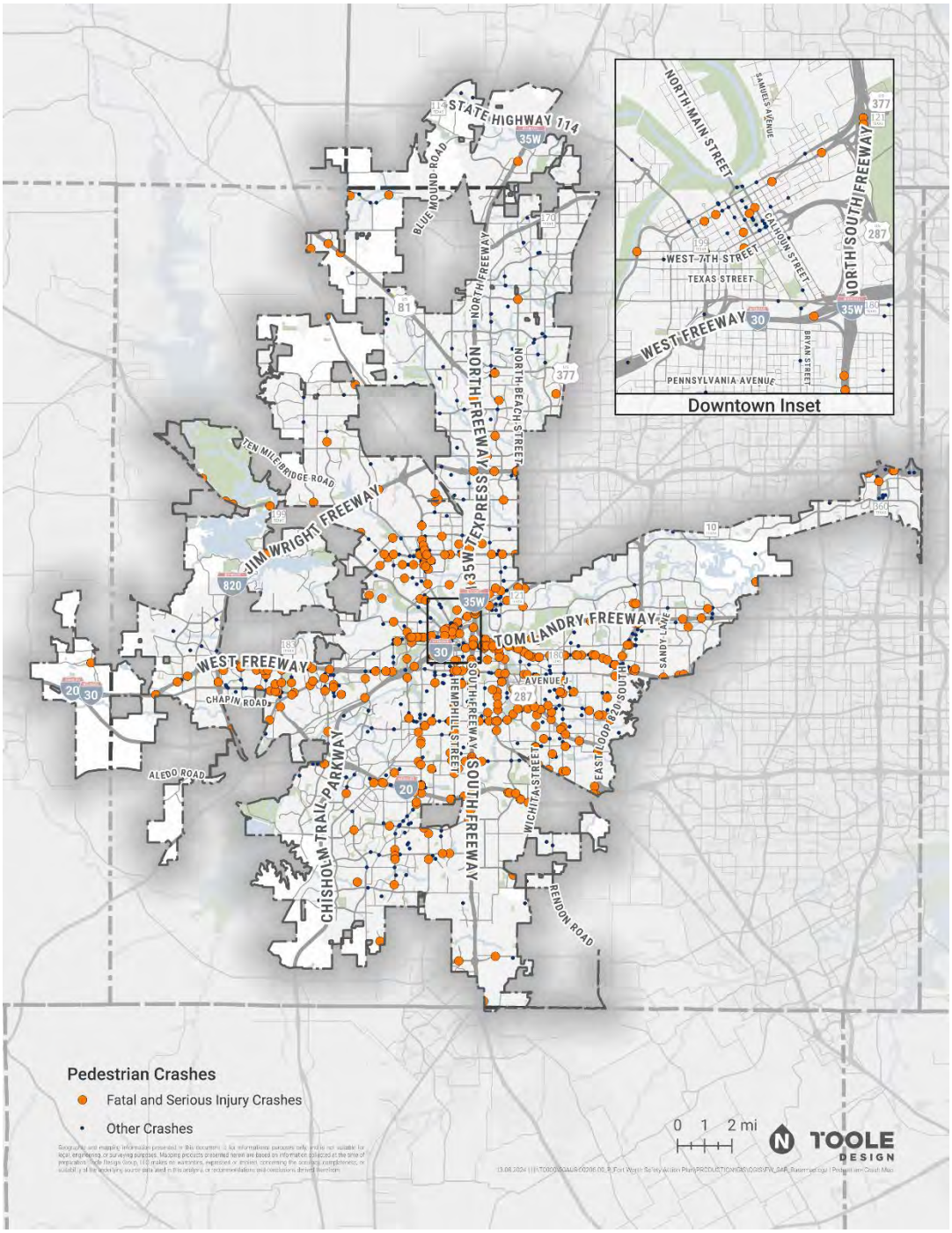


Figure 30: Pedestrian Crashes Map

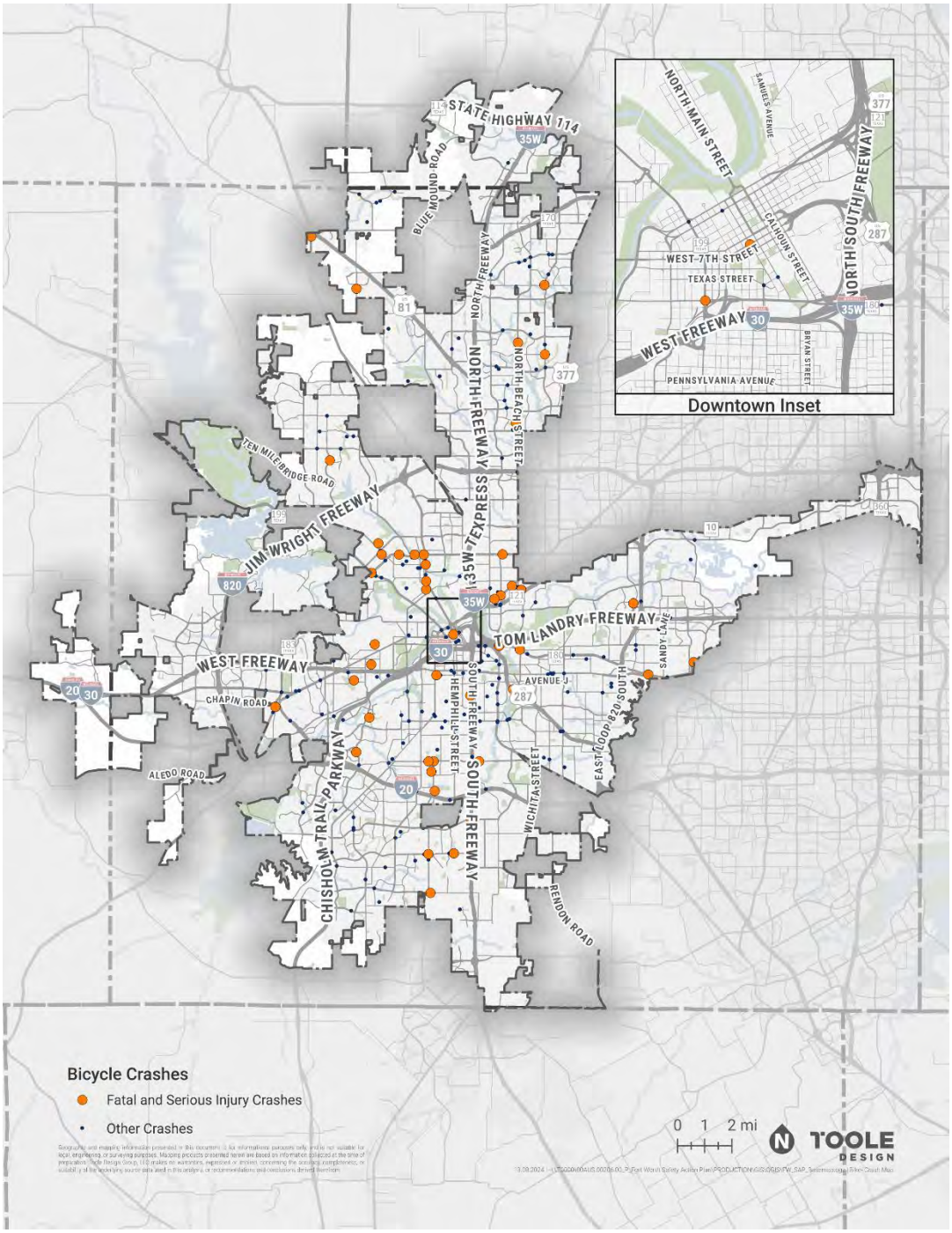


Figure 31: Bicycle Crashes Map

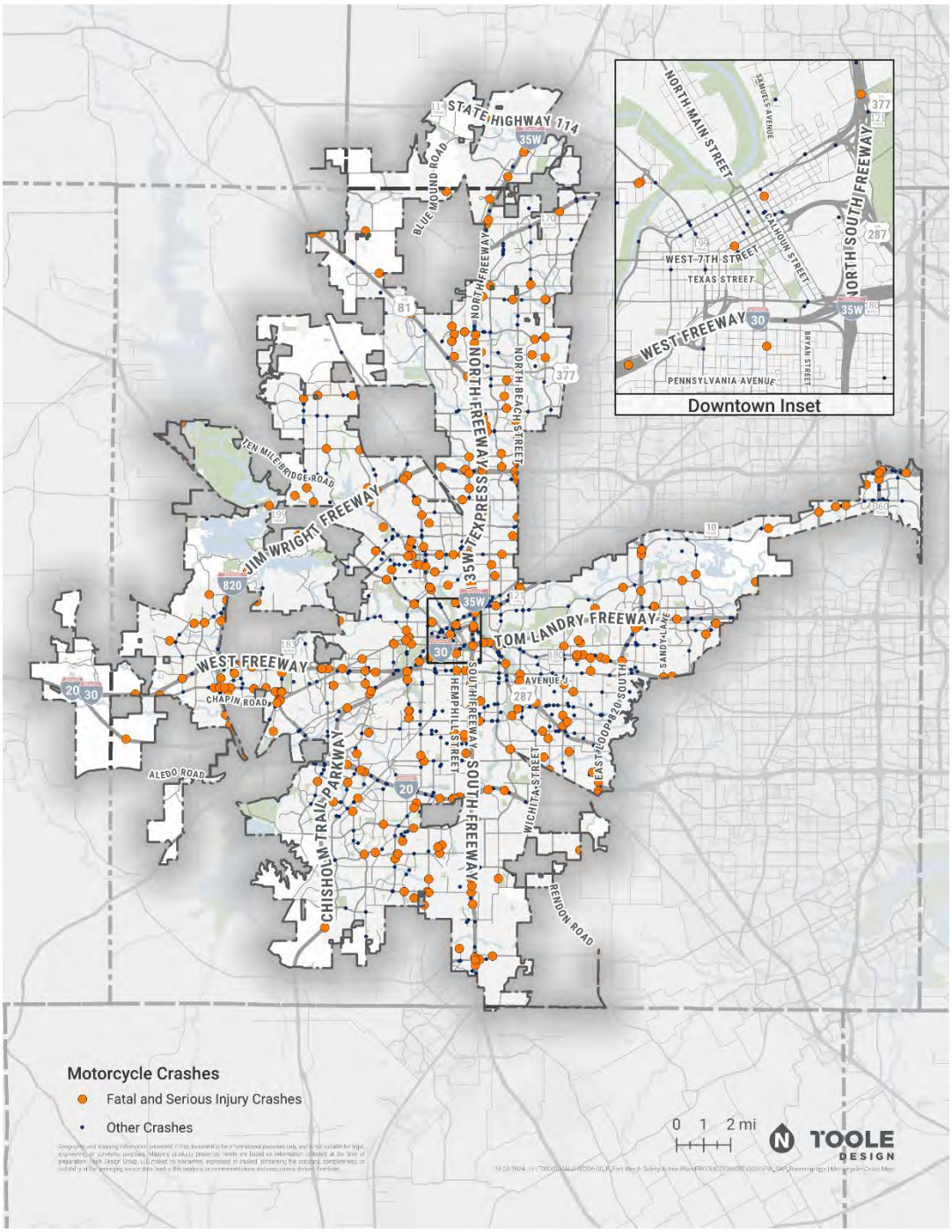


Figure 32: Motorcycle Crashes Map

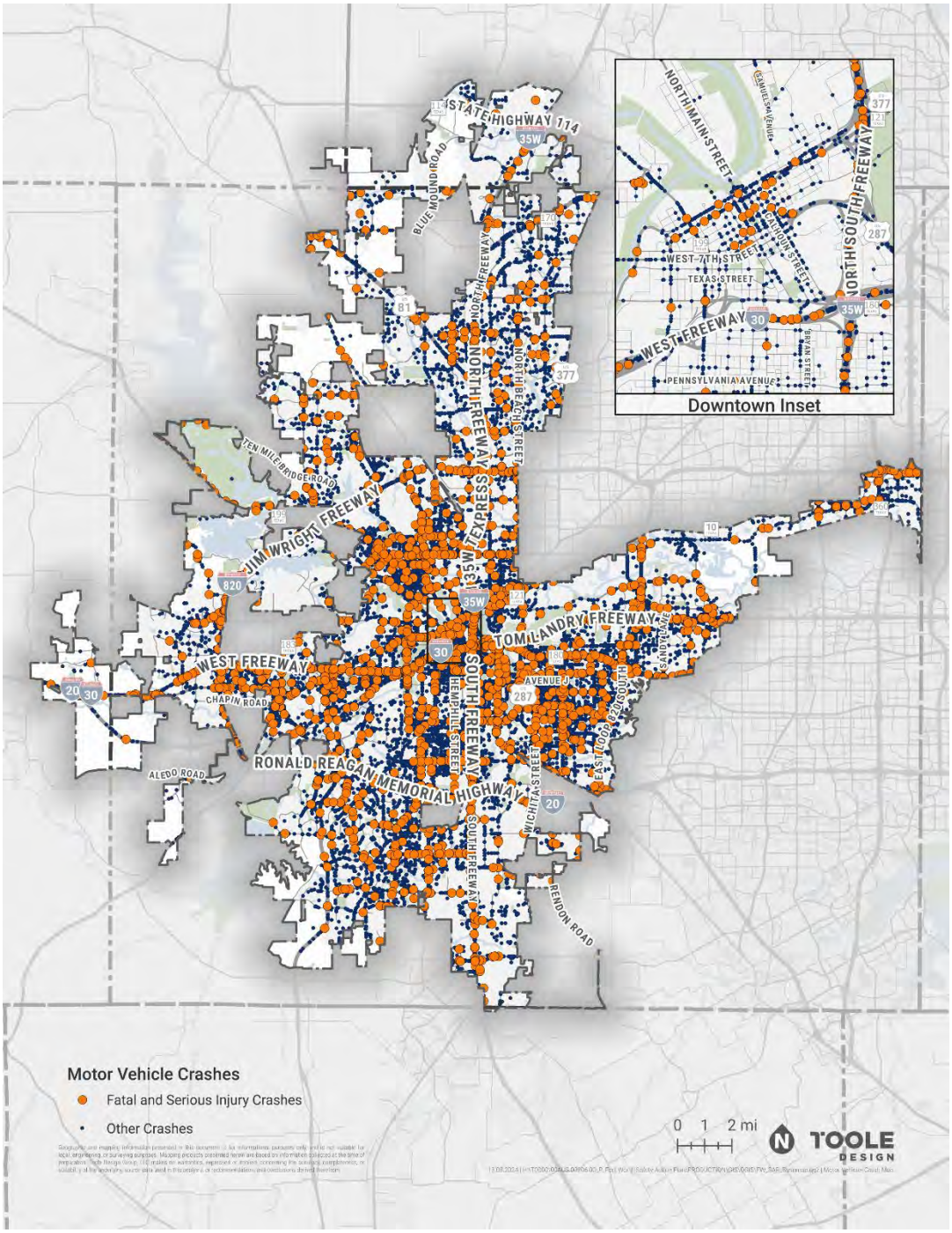


Figure 33: Motor Vehicle Crashes Map

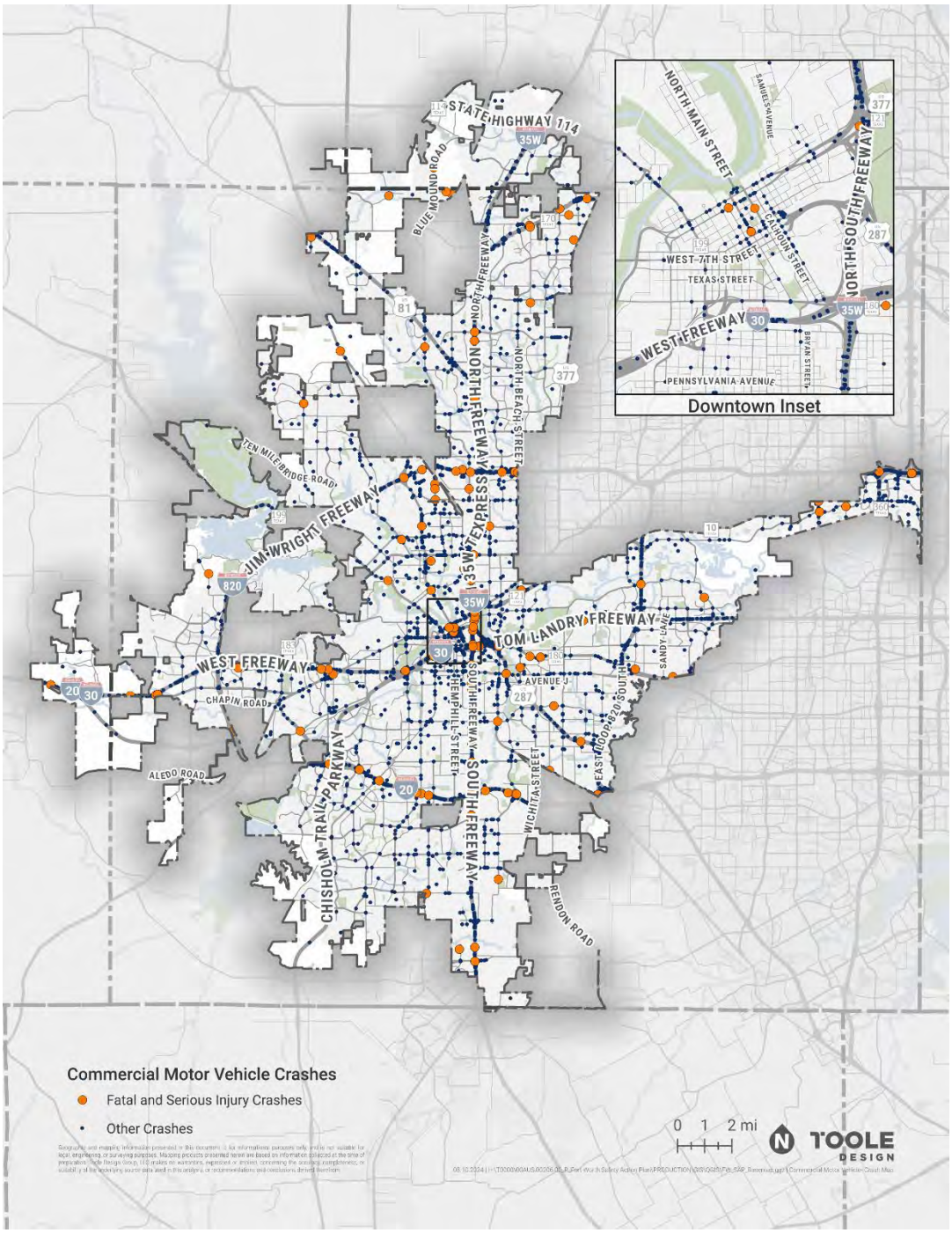


Figure 34: Commercial Motor Vehicle Crashes Map

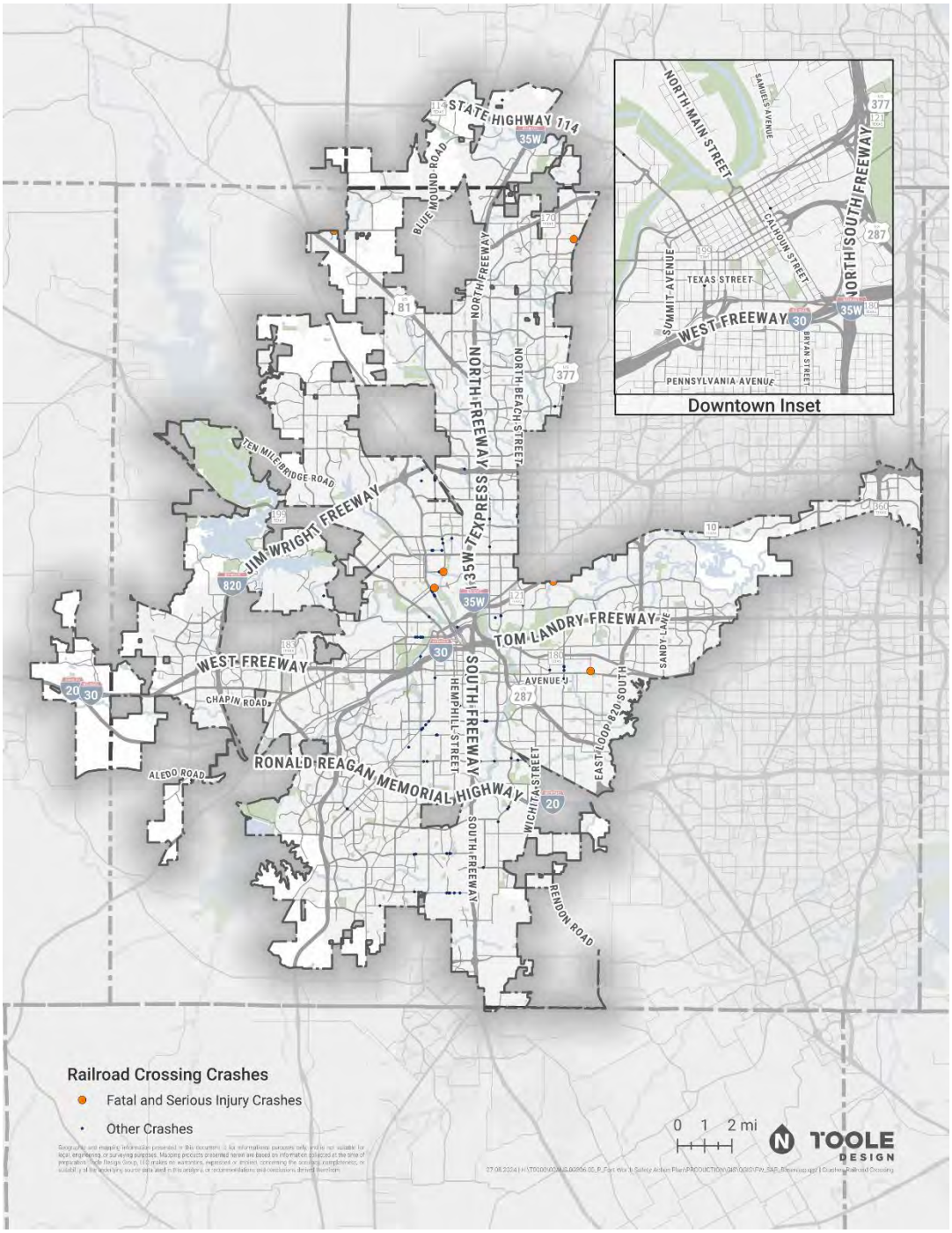


Figure 35: Railroad Crossing Crashes Map

Appendix D: HIN Maps

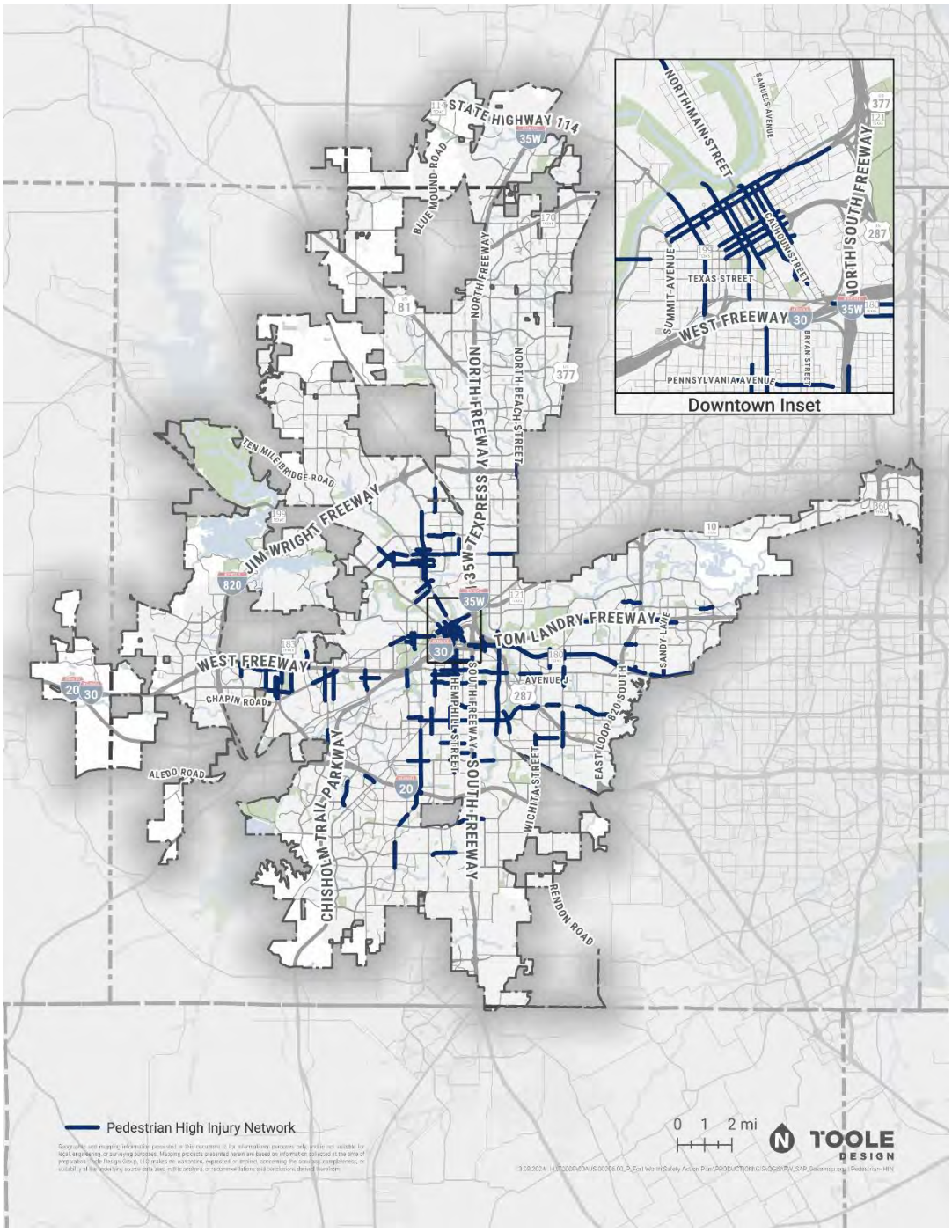


Figure 36. Pedestrian High Injury Network Map

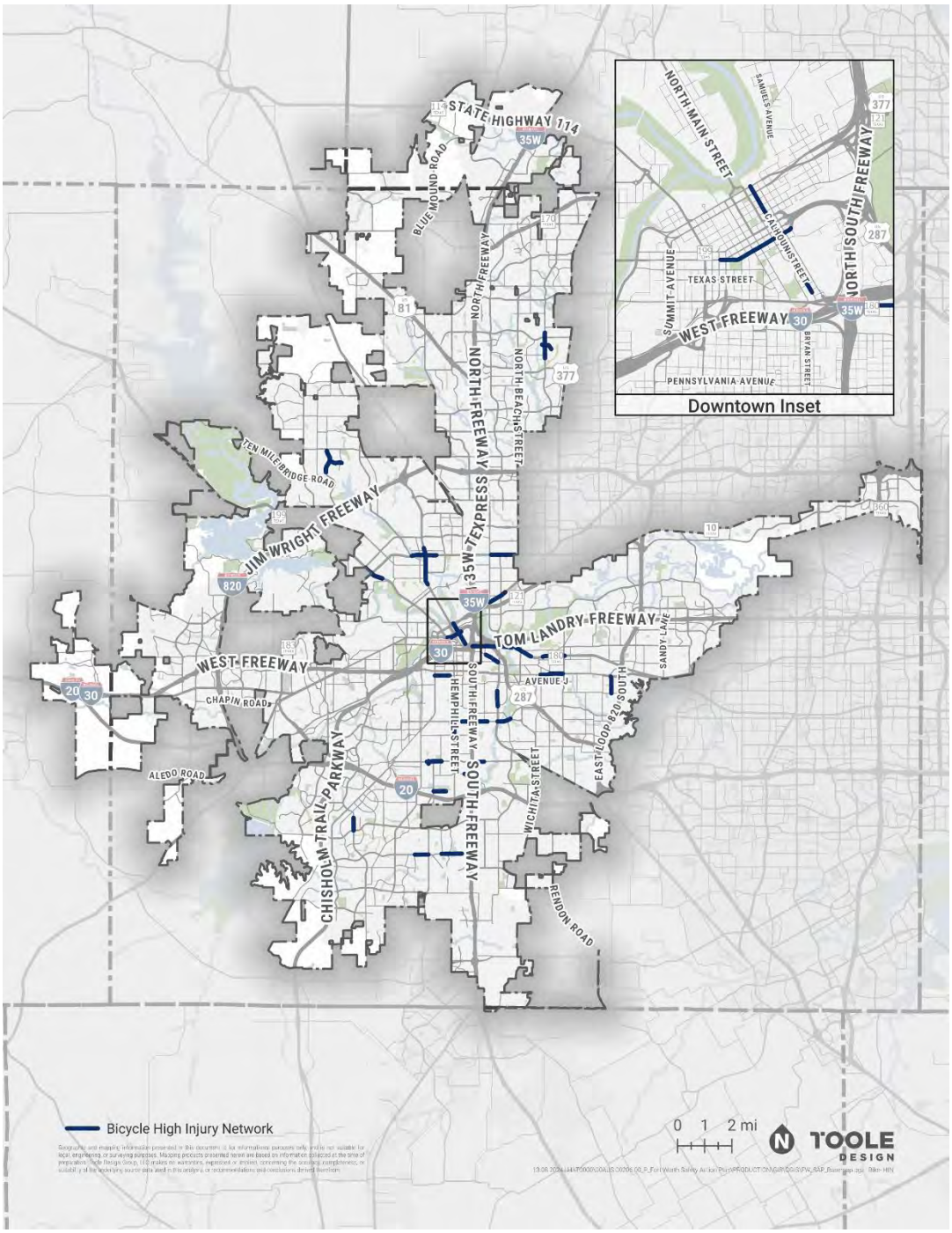


Figure 37. Bicycle High Injury Network Map

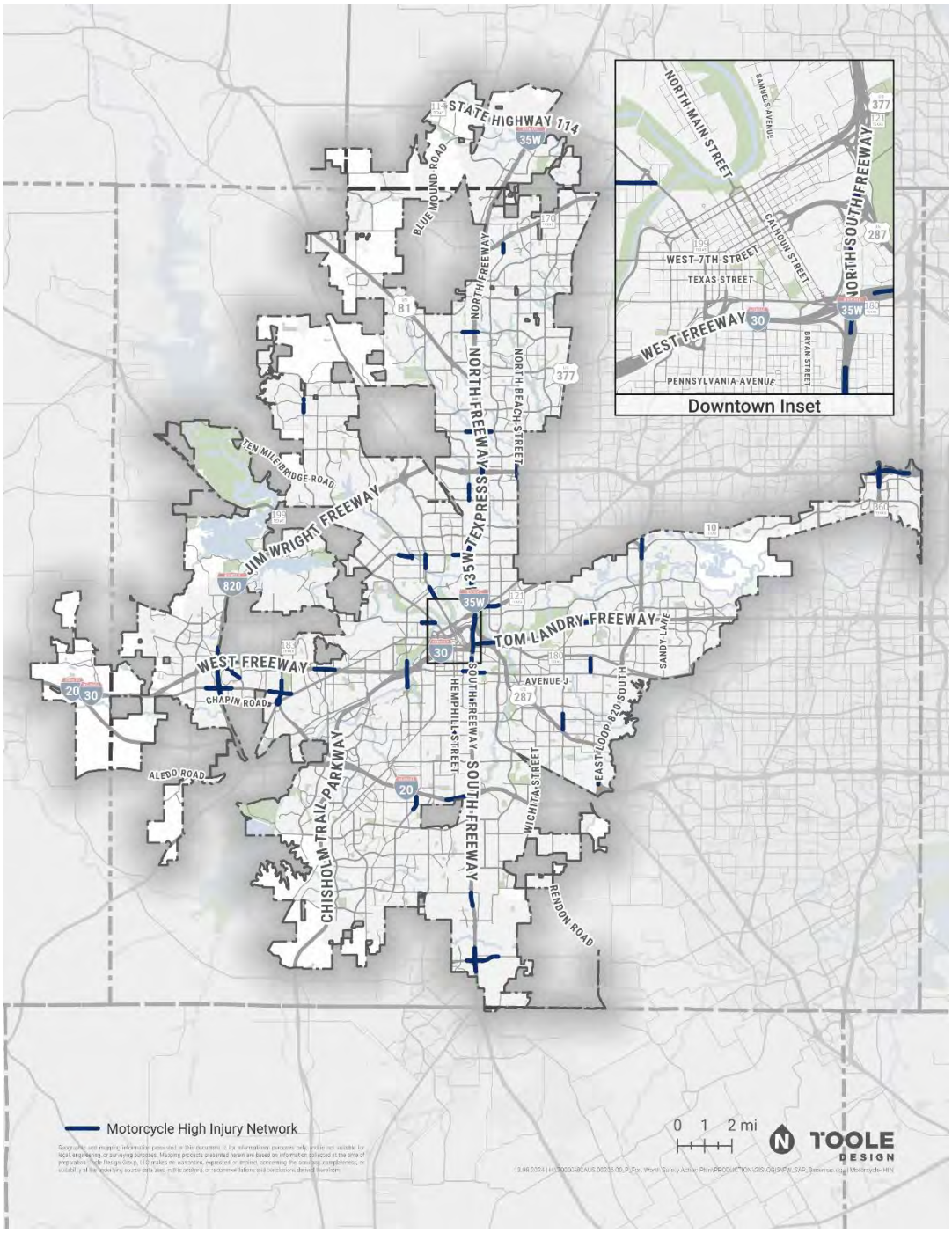


Figure 38. Motorcycle High Injury Network Map

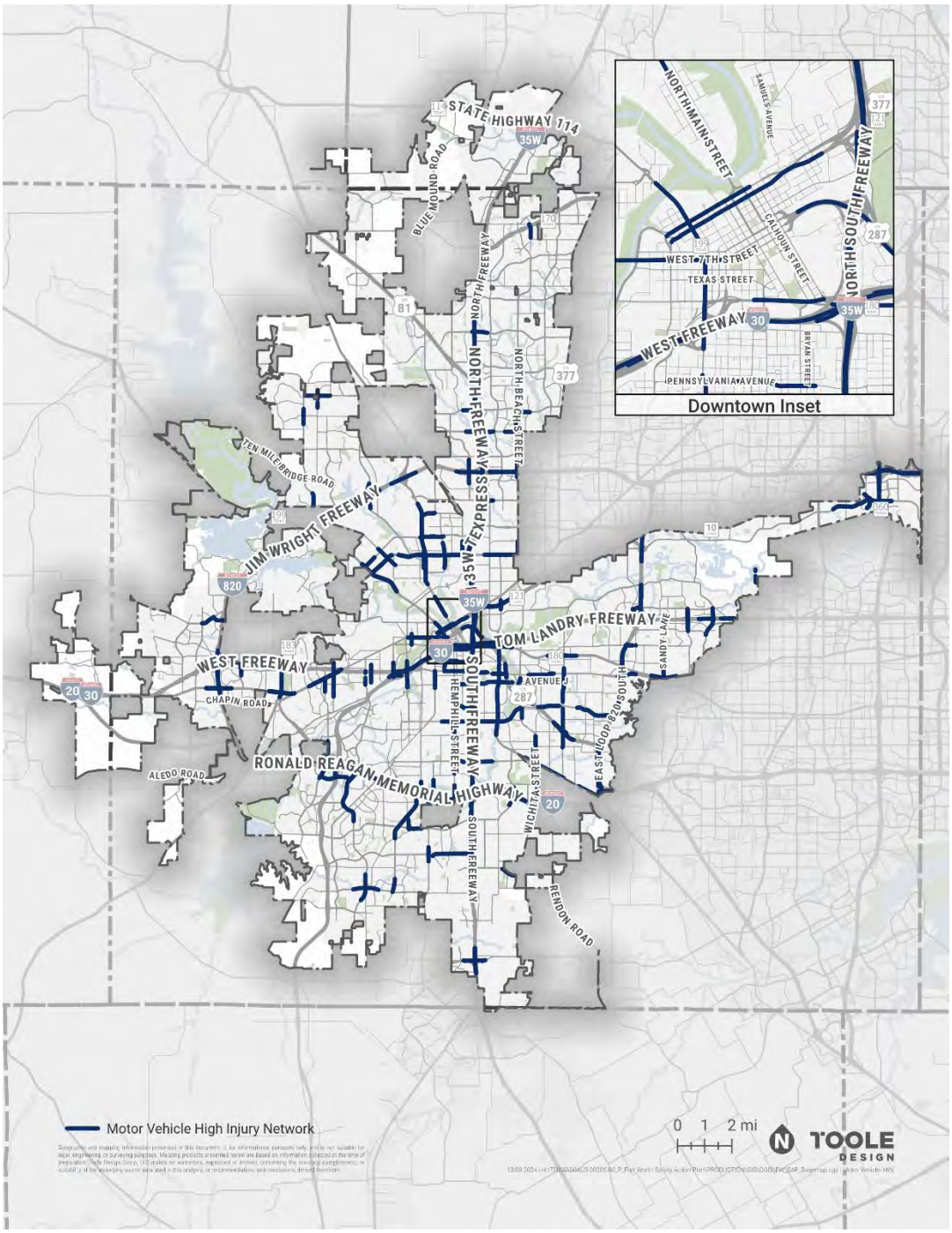


Figure 39. Motor Vehicle High Injury Network Map

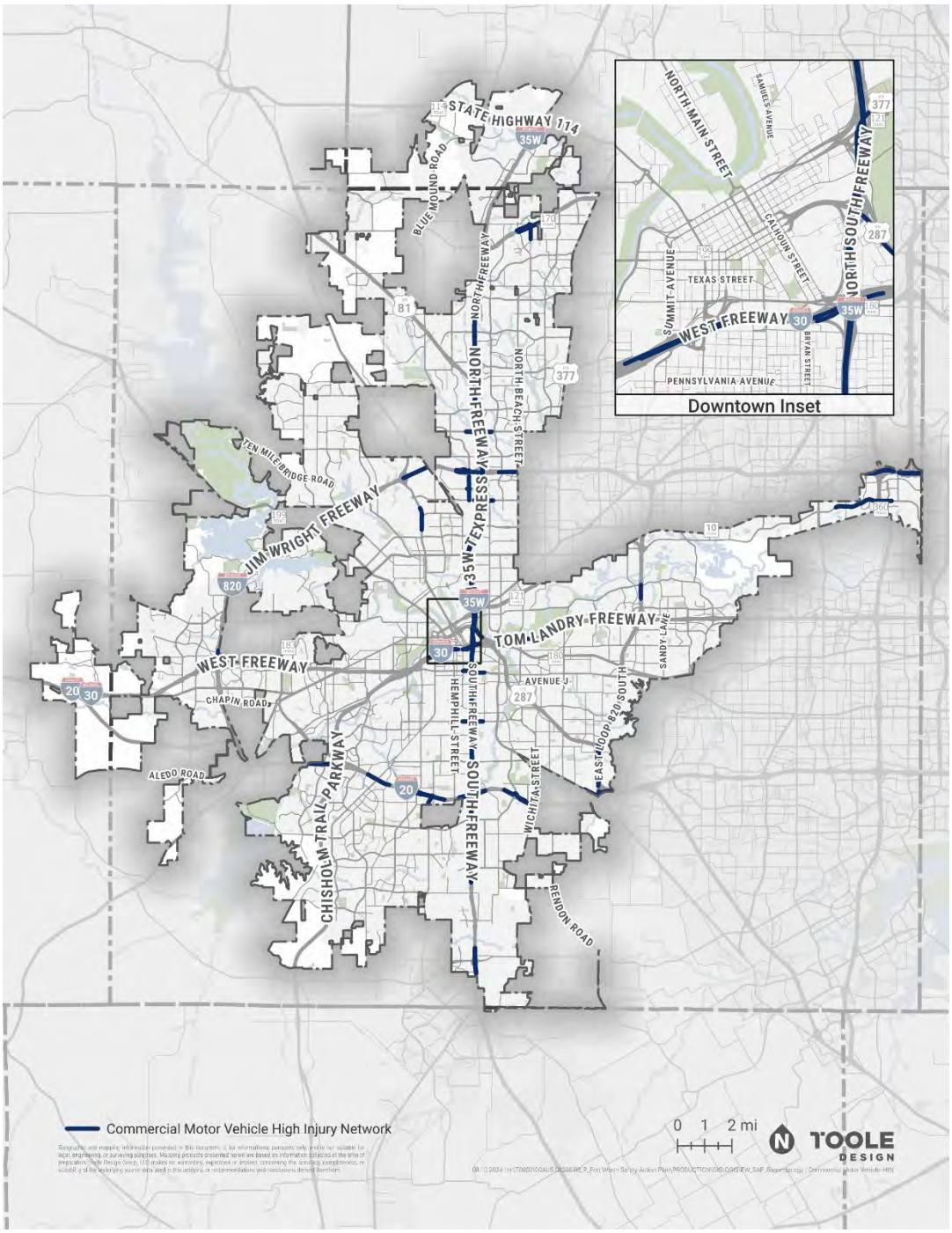


Figure 40. Commercial Motor Vehicle High Injury Network Map

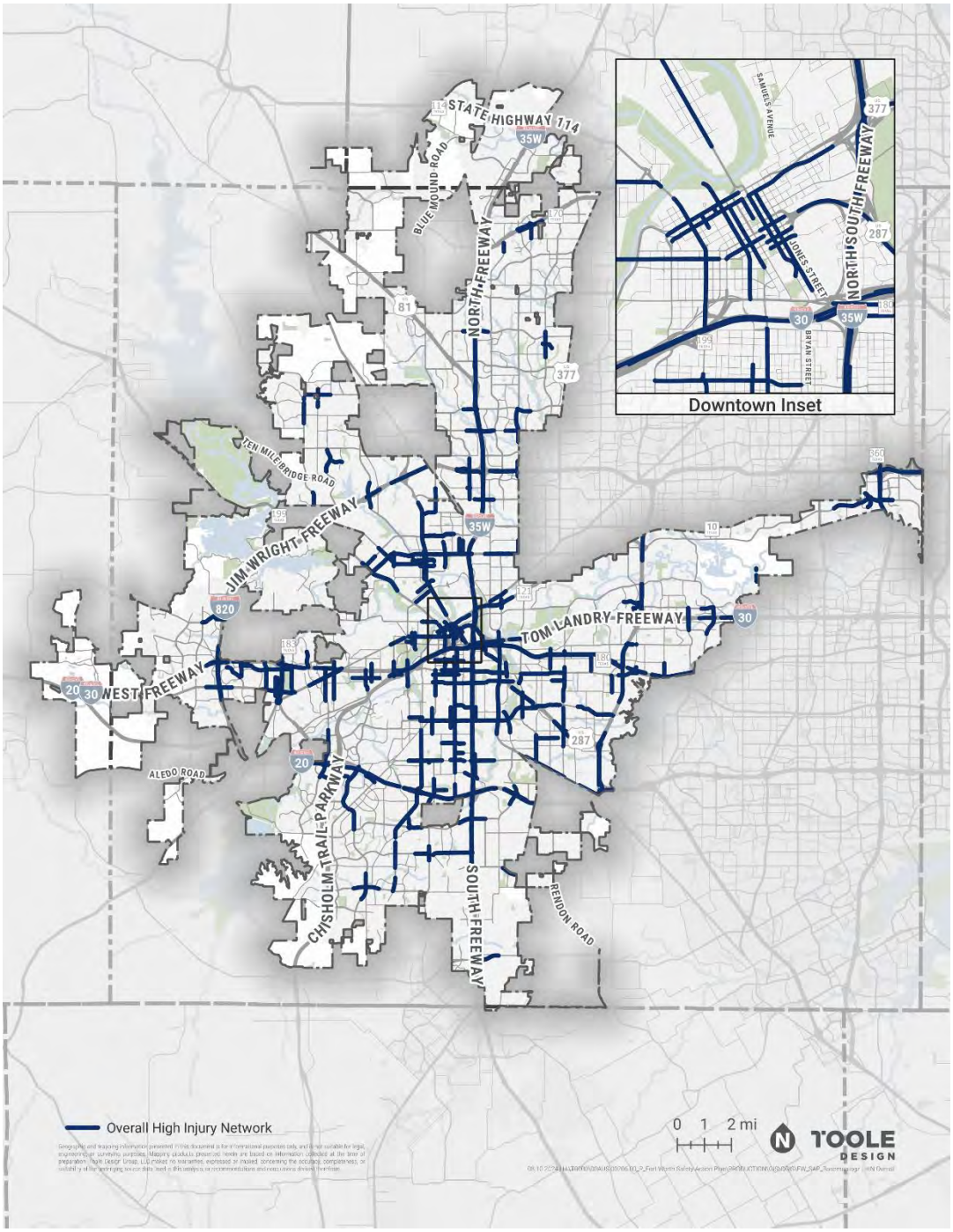


Figure 41. Overall High Injury Network Map

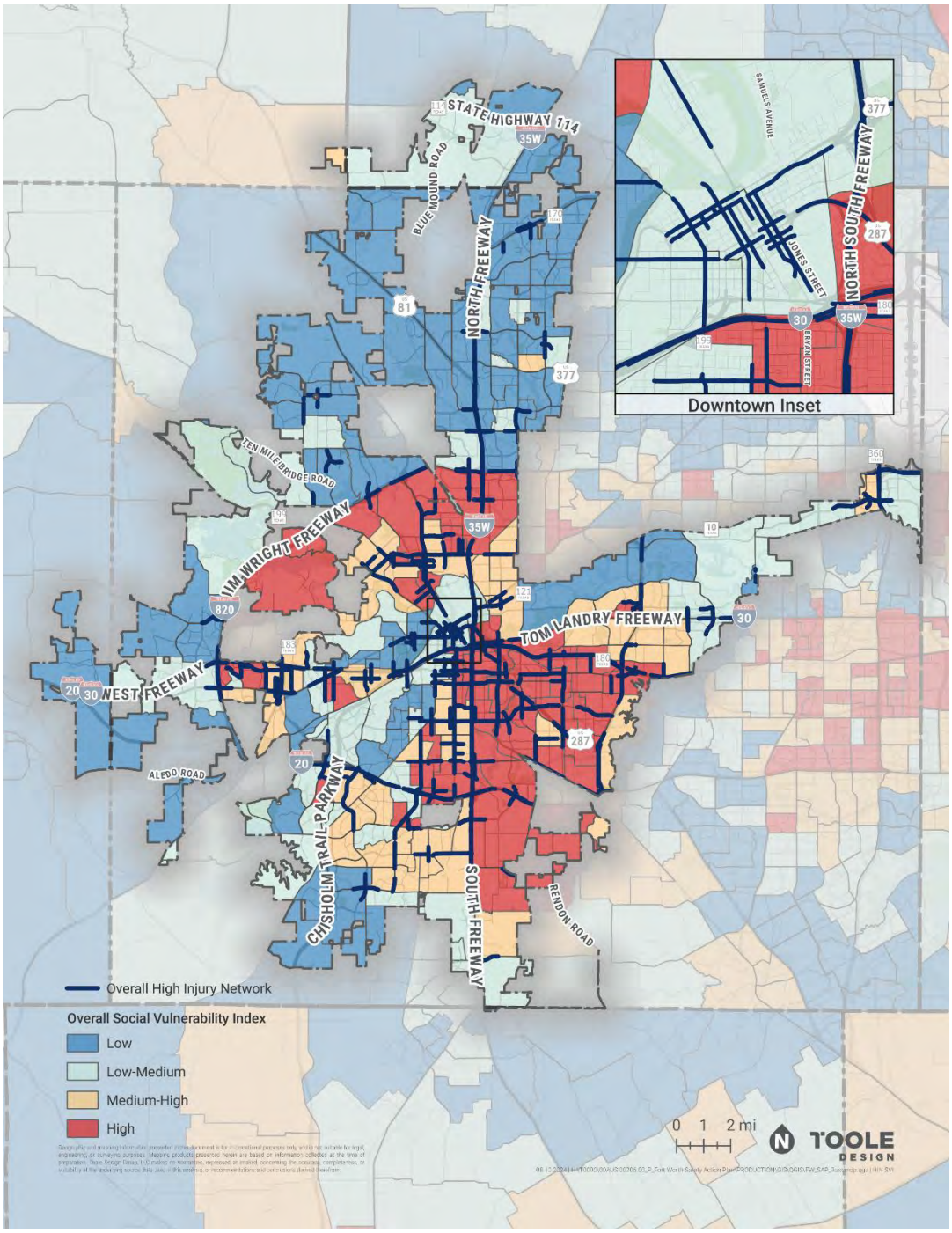


Figure 42: Overall HIN and the Social Vulnerability Index

Appendix E: Crash Rate and HIN

HIN developed in this study was based on the Sliding Windows Analysis which used the crash frequency to identify locations with high concentrations of crashes. Crash frequency or number of crashes was often used for network screening in safety studies as it can help identify locations that need the most improvement to reduce the number of crashes and eventually reach the goal of Vision Zero. Crash rate, which is the number of crashes normalized by traffic volume, is another measure that can be used to identify locations that may merit safety improvement. However, crash rate tends to be impacted by the change in traffic volume, and having a relatively low crash rate doesn't mean those locations are safe. For example, higher volume roadways with large numbers of crashes may have relatively low crash rates but they are exactly where safety improvements are particularly needed as many people depend on those roadways for their daily travel. The traditional way of calculating crash rate also often doesn't consider crash severity which is not consistent with the Safe System approach's principle of focusing on preventing fatal and serious injury crashes.

To take into consideration of crash rate and use it as a measure for project location prioritization, we followed the typical way of calculating crash rate per the following formula:

$$Crash\ Rate = \frac{\text{total number of crashes x } 100{,}000{,}000}{\text{AADT x } 365 \text{ x } 5 \text{ years x road way segment length}}$$

We then overlaid the roadway segments with medium to high crash rates based on Natural Breaks with the overall HIN map. The results are shown in **Figure 43**. The overall HIN overlaps with many roadway segments with higher crash rates. There are segments with medium or above crash rates that are not part of HIN as well as HIN segments with relatively low crash rates. Both the HIN results and the crash rate results, in combination with several other factors such as social vulnerability considerations, public input, overlap with existing projects, etc. will be used as metrics for project location prioritization. This can help make sure locations need the most safety improvement either due to a high number of crashes or a high crash rate will be accounted for.

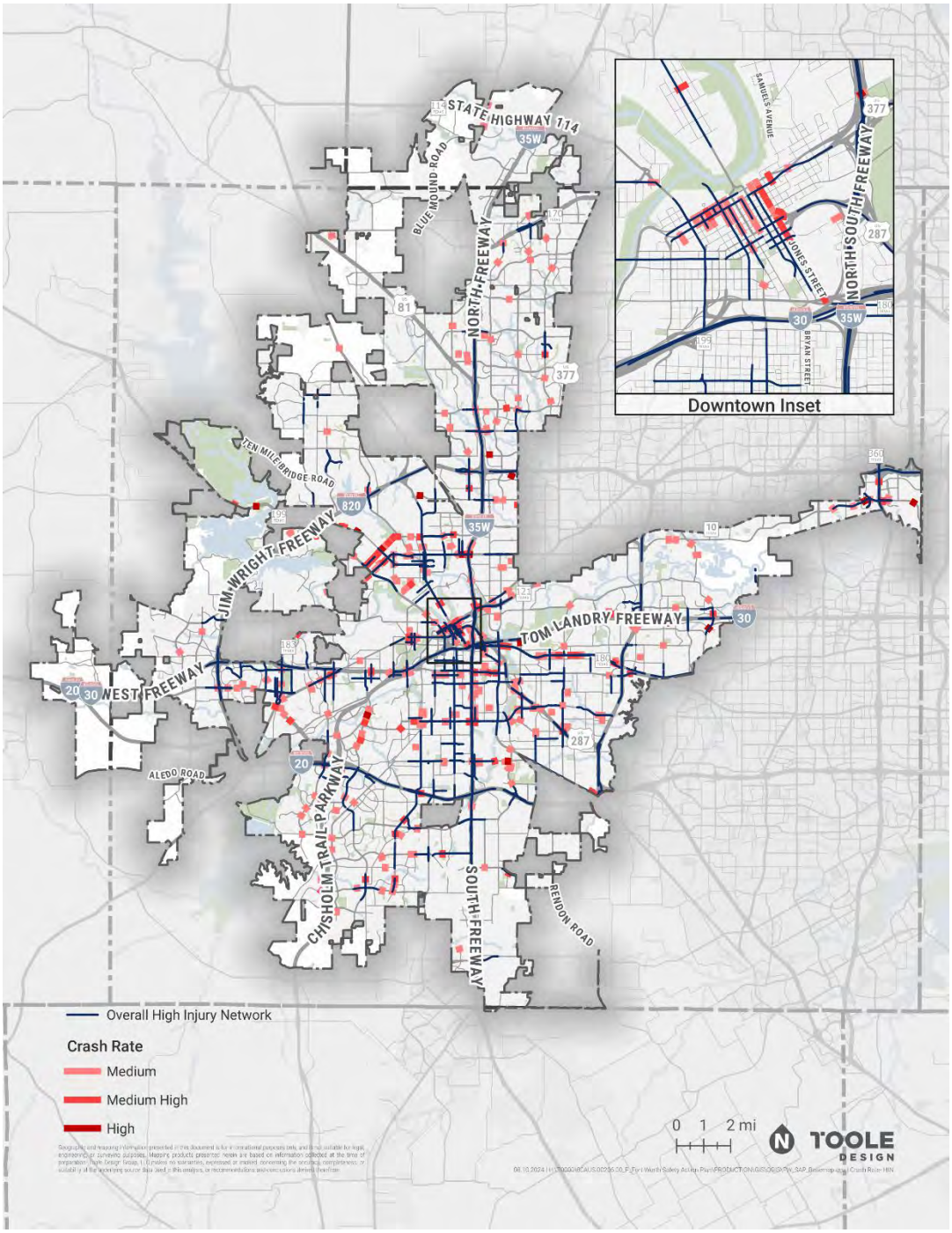
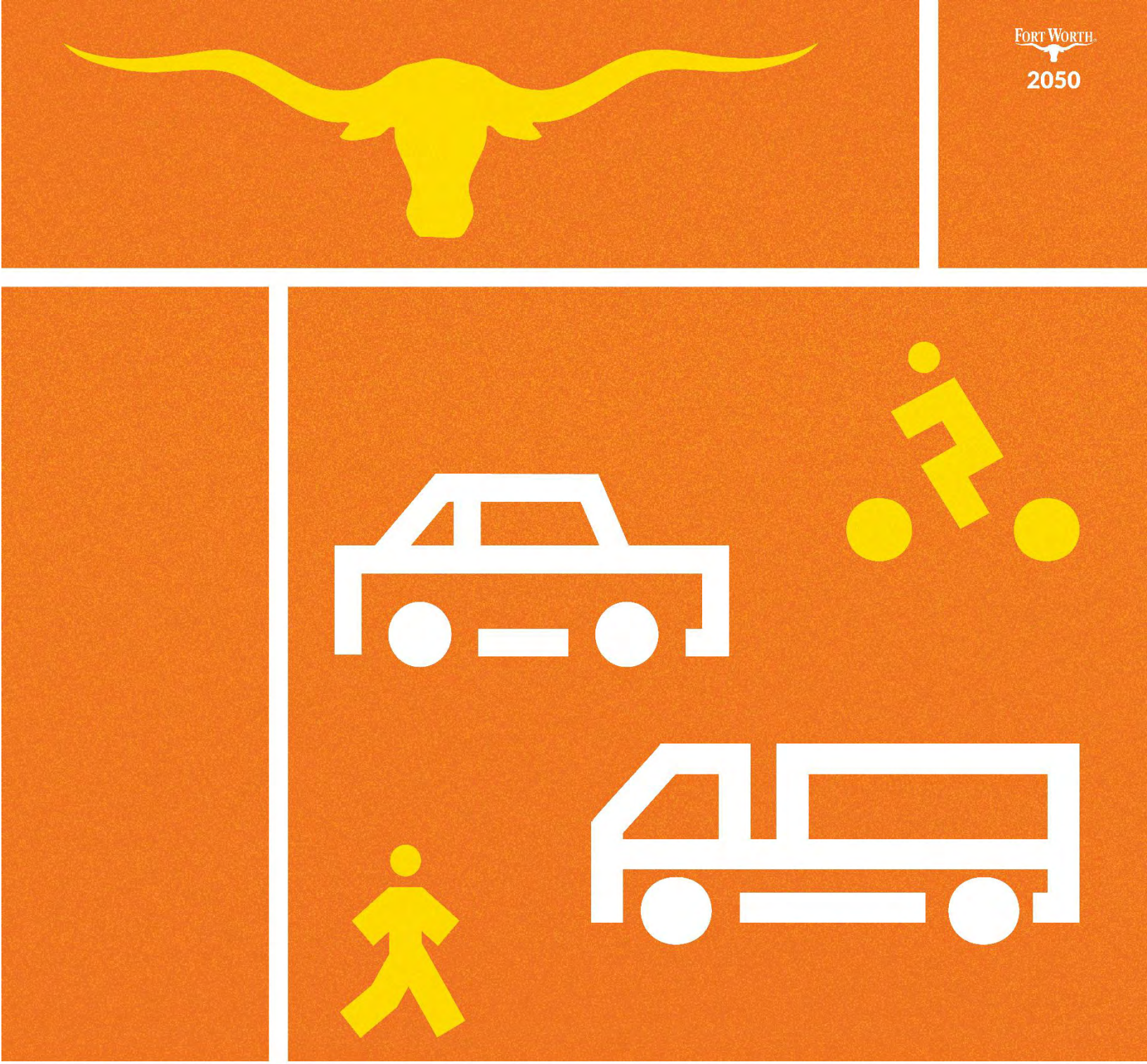


Figure 43: Overall HIN overlay with Segments with Medium to High Crash Rates



APPENDIX C
Engagement Summary Report

Table of Contents

Introduction 2
Project Website 3
Committee Meetings 3
Open Houses 4
Community Events 7
Surveys 13
What We Heard 14

Introduction

To develop a **Safety Action Plan (SAP)** that offers targeted strategies and solutions for addressing the safety challenges experienced by Fort Worth residents, the City conducted an extensive public and stakeholder engagement process. This ensured that community voices were heard and their feedback meaningfully informed the plan.

The SAP development process included a wide range of outreach and engagement efforts:

- **1 project website** that provided regular project updates, event announcements, and access to final deliverables
- **2 newsletters** to introduce the project and keep stakeholders informed of ongoing progress
- **3 rounds of open houses**, including:
    - In the first two rounds, one in-person open house in each of the 10 City Council districts
    - In the third round, one in-person and one virtual open house
- **5 rounds of advisory committee meetings**, each round including:
    - One meeting with the **Technical Advisory Committee (TAC)**
    - One meeting with the **Community Advisory Committee (CAC)**
- **14 informational meeting announcements** to publicize and encourage participation in open houses and committee meetings
- **26 community events** where staff engaged with residents to encourage participation in the project survey and gather feedback on safety conditions, challenges, and priorities
- **273 comment cards** submitted by community members at in-person events
- **1,100 online survey responses** collected from the public

All engagement opportunities were widely promoted through a variety of channels, including radio and news media, neighborhood association email lists, social media platforms, brochures, flyers, yard signs, and business cards featuring QR codes linking to project materials.

Project Website

The project website, hosted and maintained by the City, is available at https://safety-action-plan-cfw.hub.arcgis.com. It can also be accessed via the Master Transportation Plan (M1M) website at https://www.movingamillion.org.

The site provides comprehensive background information about the Safety Action Plan (SAP), including its key elements, the guiding Vision Zero principles, an interactive map showing five years of crash data, and a roadmap and schedule outlining the development process. A regularly updated section features announcements of upcoming engagement opportunities and the latest findings from the plan. Serving as a central hub for both the public and stakeholders, the website ensures access to up-to-date information related to the SAP and supports ongoing community involvement.

Committee Meetings

Fort Worth is home to a diverse array of voices—including residents, elected officials, businesses, community advocates, and service agencies. To ensure the Safety Action Plan reflects the city's unique contexts and needs, two advisory committees – Technical Advisory Committee and the Community Advisory Committee - were established. These committees, composed of community advocates and agency representatives, played a key role in guiding the planning process. Their responsibilities included:

- Shaping the plan's vision and purpose
- Reviewing preliminary findings and analyses
- Contributing to messaging strategies for community engagement
- Advising on the development of actionable strategies
- Providing input on ongoing planning efforts

Together, these advisory groups helped ensure that the plan is both strategic and community-informed.

Table 1. SAP Technical and Community Advisory Committee Members

Technical Advisory Committee	Community Advisory Committee
Chad Davis, Wise County	Mendes David, District 2
Chad Edwards, Trinity Metro	Isaac Manning, District 3
Cintia Ortiz, Parker County	Rusty Fuller, District 4
Dee Long, Tarrant County	Nakia Cole, District 5
Dillon Maroney, Tarrant County Precinct 4	Haylee Carr, District 6
French Thompson, BNSF	Ryan Smith, District 7
Greg Royster, Aviation (DFW International Airport)	Dr. Sharla Horton, District 8
Jeff Neal, North Central Texas COG	Austin James, District 9
John Polster, Denton County	Jacob Wurman, District 10
Kelly Johnson, NTTA	Dr. Erik Jones, District 11
Mary-Margaret Lemons, Fort Worth Housing Solutions	Matt Dufrene, Pedestrian and Bicycle Advisory Committee & Blue Zones
Matt Larseingue, BNSF	
Russell Laughlin, Developer (Hillwood)	
Myron Wilson, Fort Worth ISD	
Richard Gonzalez, TxDOT	
Russell Laughlin, Developer (Hillwood)	
Scott Hall, Tarrant County	
Tara Crawford, Trinity Metro	
Tim Huya, BNSF	
Travis Clegg, Developer (Peloton)	
Victor Vandergriff, Tarrant Regional Transportation Coalition	

During the development of the Safety Action Plan (SAP), five rounds of committee meetings were conducted. Each round included two separate meetings—one with each committee. Detailed meeting notes from these sessions are available from the City upon request.

Open Houses

Three rounds of Open Houses were conducted throughout the development of the Vision Zero Safety Action Plan (VZ SAP), held at the beginning, middle, and end of the planning process. All events were promoted approximately one month in advance through flyers, news releases, social media, yard signs and

the project website. At all rounds of open houses, at least one Spanish-speaking staff member was present to support any bilingual needs.

The first two rounds were held in coordination with the City's Master Transportation Plan—**Move a Million (M1M)**—while the third round was conducted independently for the VZ SAP. In total, over 300 participants engaged in the Open Houses, providing **273 comments** on VZ SAP. Detailed information related to these Open Houses, such as the boards, handouts, and sticky notes provided by the public, is available from the City upon request.

Open House Round 1

- **Date:** June 22 – June 29, 2024
- **Format:** In-person events featuring informational boards and interactive engagement activities, held at libraries or community centers
- **Number of Events:** 10 (one in each City District)
- **Purpose:**
    - Introduce the need for a Safety Action Plan in Fort Worth using high-level data
    - Explain the Vision Zero concept and the Safe System approach
    - Present initial goals of the VZ SAP and gather public input on transportation safety
- **Engagement Materials:**
    - Informational boards
    - Comment cards
    - Business cards with project website and online survey links

Open House Round 2

- **Date:** October 19 – October 26, 2024
- **Format:** In-person events at libraries, schools, or community centers, plus an online open house
- **Number of Events:** 10 in-person events (one per City District) and one online event
- **Purpose:**
    - Share findings from the existing conditions and safety analysis

  - Present the High Injury Network
  - Solicit feedback on potential safety improvement strategies
- **Engagement Materials:**
  - Informational boards
  - Comment cards
  - Project overview handout
  - Mapping activities
  - Paper survey
  - Project website and online survey links

Open House Round 3

- **Date:** April 9–10, 2025
- **Format:** One citywide in-person open house at the Hazel Harvey Peace Center, along with an online open house
- **Number of Events:** 2 (one in-person, one virtual)
- **Purpose:**
  - Present refined findings from the safety conditions analysis
  - Reintroduce the High Injury Network
  - Gather final feedback on proposed safety strategies
- **Engagement Materials:**
  - Informational boards
  - Comment cards
  - Project overview handout
  - Mapping activities
  - Paper survey
  - Project website and online survey links

Figure 1. Some Photos from Open Houses

Community Events

With support from City staff, the project team conducted outreach at **26 community events** to gather input for both the Vision Zero Safety Action Plan (SAP) and the concurrent *Moving a Million* planning effort. At each event, the team distributed traffic safety surveys, shared project information, and provided links to the Vision Zero website.

Community events were intentionally selected to engage a diverse cross-section of Fort Worth's population, with a focus on reaching historically underrepresented groups. Many events connected with

large numbers of **young people, people of color, transit-dependent individuals, non-English speakers**, and residents of **South and East Fort Worth**.

Participation levels varied by event. The most highly attended were the **Tarrant County Back to School Round-Up**, the **Tarrant County Harambee Festival**, and **ArtsGoggle**—each drawing well over 1,000 attendees and offering substantial exposure for the project.

Table 2. Community Events

Date	Event/Opportunity	Location	Address
Aug. 2	Tarrant County Back to School Round-Up	Tarrant County College South Campus	5301 Campus Dr Fort Worth, TX 76119
Aug. 17	Shine With Loving Kindness Festival	Hương Đạo Buddhist Temple	4717 East Rosedale St, Fort Worth, TX 76105
Aug. 24	SteerFW Civic Summit	Amphibian Stage	120 S Main St, Fort Worth, TX 76104
Aug. 29	Fort Worth Report: Future of Transportation in Tarrant County panel	Texas Wesleyan University	3165 E Rosedale St, Fort Worth, TX 76105
Sept. 12	District 10 Town Hall	Texas Motor Speedway	3545 Lone Star Cir, Fort Worth, TX 76177
Sept. 17	M1M booth at Texas Wesleyan University	Texas Wesleyan University	3165 E Rosedale St, Fort Worth, TX 76105
Sept. 19	M1M booth at Texas Wesleyan University	Texas Wesleyan University	3165 E Rosedale St, Fort Worth, TX 76105
Sept. 23	Polytechnic Neighborhood Association	Ridglea Hills Elementary School	6817 Cumberland Rd, Fort Worth, TX 76116
Sept. 25	M1M booth at Tarrant County College South Campus	Tarrant County College South Campus	5301 Campus Dr, Fort Worth, TX 76119
Sept. 26	M1M booth at Tarrant County College South Campus	Tarrant County College South Campus	5301 Campus Dr, Fort Worth, TX 76119
Oct. 1	National Night Out - Historic Southside Neighborhood Association	Glenwood Park	910 S Riverside Dr, Fort Worth, TX 76104
Oct. 1	National Night Out - Ventana HOA	Ventana Amenity Center	10327 Trail Ridge Dr, Fort Worth, TX 76126

Oct. 5	Tarrant County Harambee Festival	William M. McDonald YMCA	2701 Moresby St, Fort Worth, TX 76119
Oct. 14	Trinity Metro - Sierra Vista	Sierra Vista Transfer Center	1500 E Berry St, Fort Worth, TX 76119
Oct. 14	Trinity Metro - La Gran Plaza	La Gran Plaza Transfer Center	Town Ctr Rd, Fort Worth, TX 76115
Oct. 16	Trinity Metro - Central Station	Fort Worth Central Station	1001 Jones St, Fort Worth, TX 76102
Oct. 17	Trinity Metro - Dr. Dennis Dunkins	Dr. Dennis Dunkins Transit Center	4100 E Lancaster Ave, Fort Worth, TX 76103
Oct. 19	Harvest Community Fair	Turning Point Church	10700 Old Burleson Rd, Fort Worth, TX 76140
Oct. 19	ArtsGoggle	Near Southside (Magnolia Avenue)	607 W Magnolia Ave, Fort Worth, TX 76104

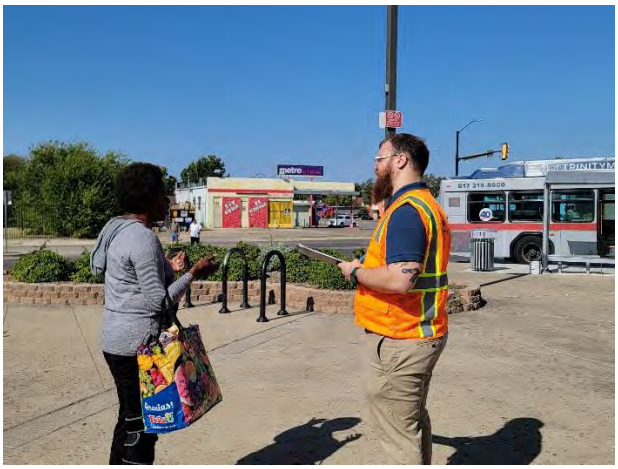


Figure 2. Trinity Metro Transfer Station Outreach

Figure 3. Tarrant County Harambee Festival

Figure 4. ArtsGoggle

Figure 5. National Night Out

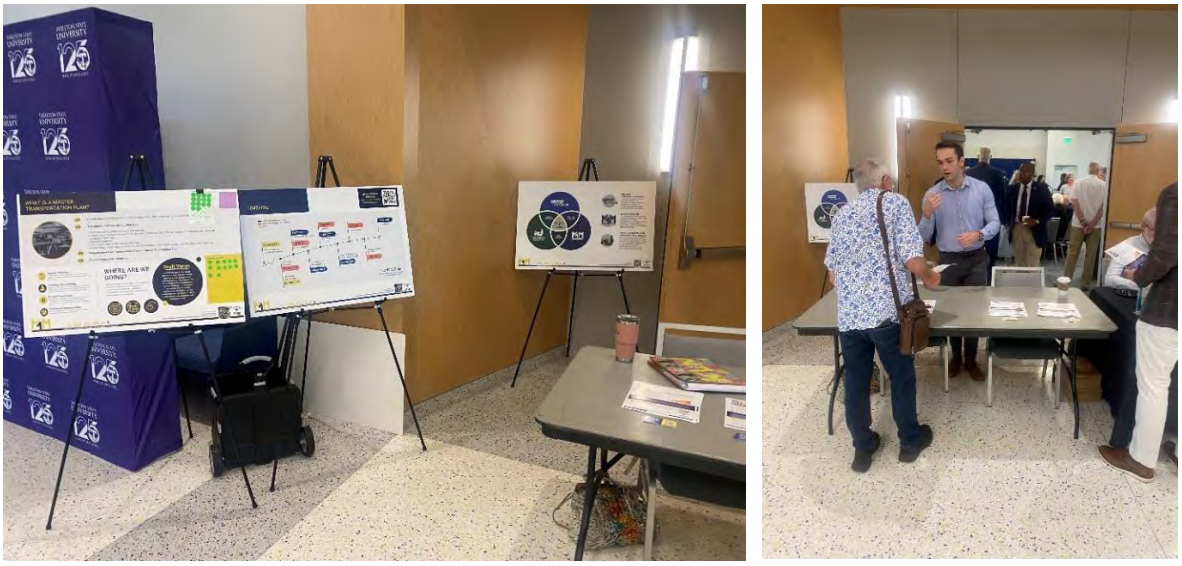


Figure 6. Texas Wesleyan University

Surveys

Online Survey

At the beginning of the project, an online survey developed using ESRI Survey 123 were administered to ask for the public's feedback on safety conditions in the City. The survey was developed in combination with M1M and was posted on the M1M project website. The survey was promoted and distributed via emails, newsletter, social media and engagement events. Some safety-related questions were asked as part of the online survey, besides optional demographic questions on zip code, age group, ethnicity, gender, and residence.

Below is a summary of the demographics of survey participants:

- Over 20% of respondents were aged 65 and older.
- Young adults (ages 25–34) made up nearly 14% of respondents.
- Nearly 70% of respondents identified as White or Caucasian.
- About 10% identified as Black or African American.
- Roughly 12% identified as Hispanic.
- A majority of respondents (56%) identified as women.
- About 43% identified as men.

Paper Survey

In addition to the online survey, the project team developed a brief paper-based version to distribute at community engagement events. A total of 267 paper surveys were collected. The responses were analyzed and integrated into the overall plan development process.

Traffic Safety Survey

Age: ZIP code:

What are Fort Worth's biggest traffic safety problems?

What are the most dangerous places in Fort Worth (for driving, biking, walking, etc.)?
You may list as many places as you want.

For a chance to win $100 grocery gift card, please share your email address.
The winner will be notified at the conclusion of the survey.

For more information, visit ***www.MovingAMillion.org*** and click on Safety Action Plan.

Encuesta de seguridad vial

Edad: Código postal:

Cuáles son los mayores problemas de seguridad vial de Fort Worth?

¿Cuáles son los lugares más peligrosos de Fort Worth (para conducir, ir en bici, caminar, etc.)?
Puede enumerar tantos lugares como desee.

Para tener la oportunidad de ganar una tarjeta regalo de $100 para el supermercado, comparta su dirección de correo electrónico. El ganador será notificado al final de la encuesta.

Para más información, visite ***www.MovingAMillion.org*** y empuje el Plan de Acción de Seguridad.

Figure 7. Short Paper Survey (English and Spanish)

What We Heard

Key findings from the engagement events and surveys are summarized below.

Travel Behavior and Safety Implications

- **High levels of car dependency**: More than 75% of respondents reported driving every day. This reliance on driving reinforces the need to design streets that reduce crash risks for motorists and better accommodate vulnerable users.
- **Low walking rates suggest safety or comfort barriers**: Over 50% of respondents reported they "Never" or "Almost Never" walk. While this may reflect land use patterns, it may also indicate perceived safety issues such as poor lighting, inadequate crossings, or sidewalk gaps.

- **Limited use of public transit and micromobility**: Low reported use of buses, trains, scooters, and wheelchairs suggests that safety concerns—whether real or perceived—may be deterring broader adoption of non-driving modes.

Infrastructure Satisfaction and Perceived Safety

- **Streets and sidewalks are a source of dissatisfaction**:
    - Over 40% of respondents were "Unhappy" or "Very Unhappy" with the condition of Fort Worth's roads.
    - More than one-third expressed dissatisfaction with sidewalks, highlighting concerns about safe walking conditions.
- **Mixed satisfaction with bicycle infrastructure**: A significant share of respondents selected "I don't know/this does not apply" when asked about bike paths, which may point to a lack of visibility or comfort with existing bike facilities.

Priorities for Safer Public Transit

When asked what would encourage greater use of public transit, respondents most frequently cited:

- **Access to more destinations**
- **Faster and more direct routes**
- **Increased service frequency**

While not safety-specific on the surface, these factors reflect a desire for more reliable and secure transit options that minimize exposure to unsafe conditions (e.g., long waits or walking in unsafe environments).

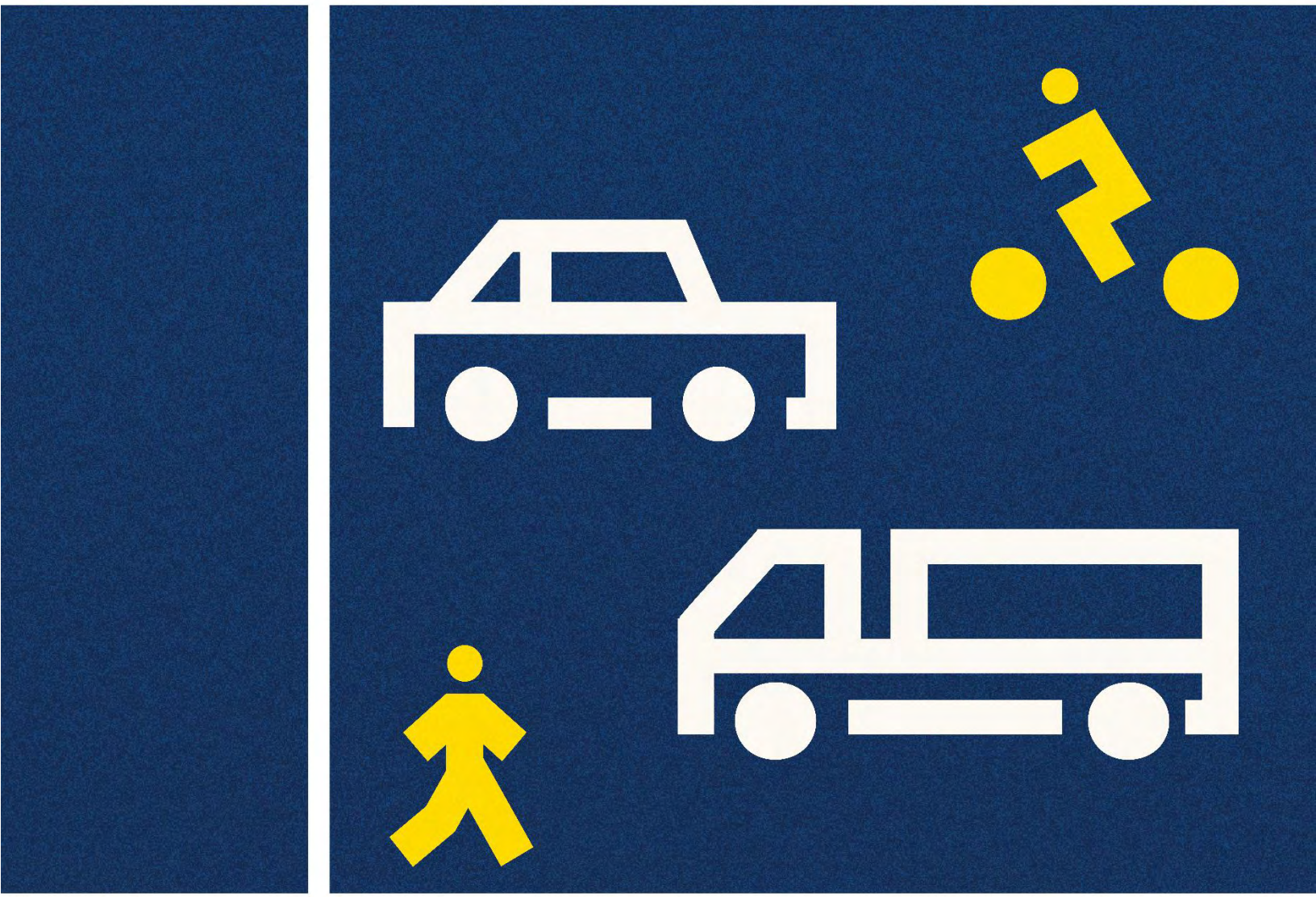
Demographic and Social Vulnerability Considerations

- **Older adults may be more vulnerable**: Over 20% of respondents were 65 or older, a population more susceptible to serious injury in the event of a crash—particularly as pedestrians.
- **Demographic skew may limit insight into underserved populations**: Nearly 70% of respondents identified as White/Caucasian, suggesting further outreach may be needed to fully capture safety concerns of BIPOC or transit-reliant communities who may face higher exposure to traffic violence.

Environmental and Systemic Safety Priorities

- **Environmental concerns are not top-of-mind**: Few respondents ranked eco-friendly transportation options as a top priority. While this doesn't directly signal safety concerns, it may reflect a broader need to frame active and sustainable modes in terms of health, safety, and community benefits.

FORT WORTH 2050



APPENDIX D
Safe Speed White Paper

List of Abbreviations

AADT Annual average daily traffic

FHWA	Federal Highway Administration
KSI	Killed or serious injury
mph	Miles per hour
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
RTZ	Road to Zero
SLS	Speed limit setting
SSC	Speed safety camera
TCD	Traffic control device
TxDOT	Texas Department of Transportation
USLIMITS2	United Stated Limits 2
VRU	Vulnerable road users

Table of Contents

List of Abbreviations i

Introduction 1

Data Findings 1

Literature Review 3

- Texas Department of Transportation Procedures for Establishing Speed Zones 3
- Texas Transportation Code Section 545 4
- City of Fort Worth Speed Ordinance 22-86 5
- FHWA Report to Congress on Guidance for the Setting of Speed Limits (2023) 5
- FHWA Safe System Approach for Speed Management 13
- National Association of City Transportation Officials City Limits 14

Case Studies 15

- City of Austin, Texas 16
- City of Seattle, Washington 17
- City of New York 17

Recommendations and Next Steps 18

Introduction

The Federal Highway Administration (FHWA) defines a speed limit as "the maximum lawful vehicle speed for a specific location." The purpose of a speed limit is to restrict traffic flow to a speed that is safe for the conditions. High rate of speed is a leading cause of traffic fatalities and injuries, making speed management essential for road safety. Research shows that the risk to pedestrians increases significantly as driver speed increases. According to the National Highway Traffic Safety Administration (NHTSA),[1] 13 percent of pedestrians will die or suffer a severe injury if hit by a vehicle traveling at 20 miles per hour (mph), 40 percent at 30 mph, and 73 percent at 40 mph. These statistics highlight the critical need for immediate and sustained efforts to manage speeds effectively and save lives.

Conventional approaches to setting speed limits typically result in high rates of speed that can be less safe for all users. Furthermore, many drivers default to traveling 5 to 10 mph above the posted speed limit. **Safe speed**, a key element of the Safe System Approach, represents an alternative paradigm for speed limits and speed management. The Safe System Approach is a globally recognized practice for reducing and eventually eliminating fatalities and serious injuries. The purpose of this White Paper is to provide the City of Fort Worth with a solid overview of the latest research and practices in setting speed limits within the U.S. and recommend the next steps in establishing safe speeds as part of the city's Vision Zero Safety Action Plan effort.

Data Findings

In Fort Worth, Texas, speeding is both a frequent occurrence and a significant contributor to severe injury crashes. Recent safety analysis from the State of Safety Report (2024) reveals that speeding was involved in 28.2 percent of all crashes and 35.8 percent of crashes resulting in killed or serious injuries (KSI). Higher speed greatly increases the frequency and severity of traffic crashes, resulting in a high rate of fatalities and serious injuries, especially among vulnerable road users (VRUs) as shown in **Figure 1.**

[1] National Highway Traffic Safety Administration. (2023). Pedestrian resource guide. https://www.trafficsafetymarketing.gov/sites/tsm.gov/files/2023-08/2023%20Pedestrian%20Resource%20Guide.pdf

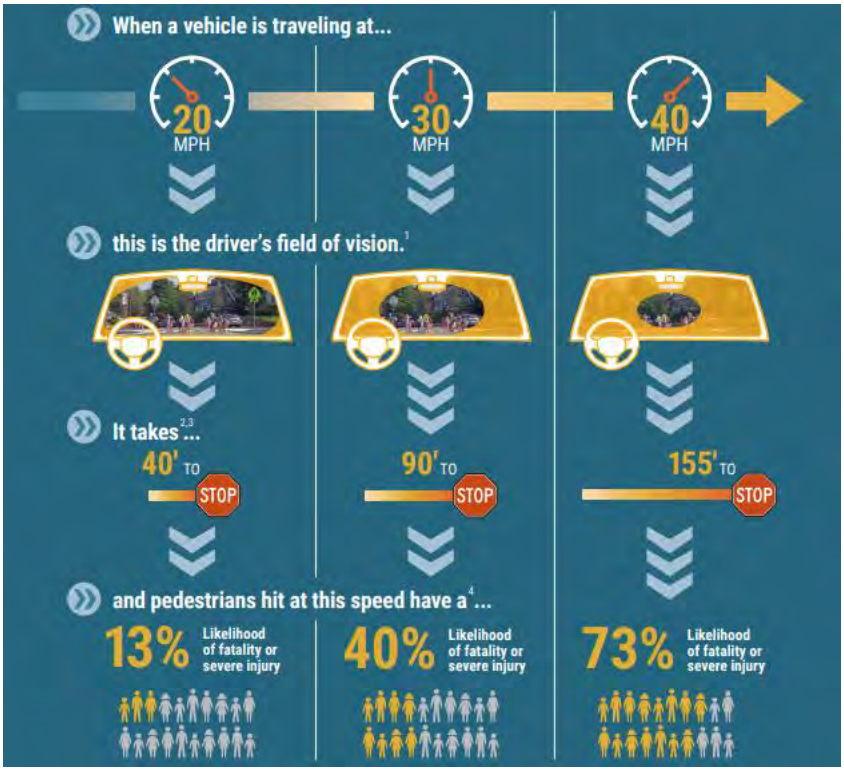


Figure 1: Different Speeds and their Impact (Graph source: Montgomery County Complete Street Design Guide. Original data source: NHTSA National Pedestrian Safety Month 2023 Resource Guide)

This link between speeding and severe outcomes highlights the urgent need for effective speed management across the city's road network. These alarming statistics underscore the urgency of implementing effective speed management strategies.

The crash data analysis also reveals that roadways with higher speed limits, higher functional classifications, and greater traffic volumes are overrepresented in KSI crashes. This is especially concerning on on-system roadways, which, despite making up a smaller percentage of total crashes, account for a larger proportion of severe outcomes. Addressing these high-risk areas with context-sensitive speed management strategies is essential for improving road safety and protecting the Fort Worth community.

The analysis provides valuable insights into the relationship between speed limits and crash outcomes. Roadways with speed limits of 35 mph and above are more likely to result in severe injuries. Lower-speed roadways (30 mph or less) account for a smaller proportion of severe outcomes, reinforcing the need for appropriate speed management on higher-speed roads. Roadways with a speed limit of 40 mph or less have a higher rate of VRU crashes due to higher exposure of VRU on these roadways but a lower proportion of VRU KSI crashes. Conversely,

roadways with a speed limit above 50 mph have a disproportionate share of VRU KSI crashes, highlighting the vulnerability of non-motorized users on faster roads.

Literature Review

The primary goal of this White Paper is to provide the city with a solid overview of the latest research and practices in setting safe speed limits and recommend the next steps for doing so on Fort Worth's roadway network. The project team reviewed and summarized the following documents:

- *Texas Department of Transportation Procedures for Establishing Speed Zones*
- *Texas Transportation Code Section 545.352*
- *City of Fort Worth Speed Ordinance 22-86*
- Federal Highway Administration (FHWA), *Guidance for the Setting of Speed Limits* (Report to Congress)
- FHWA, *Safe System Approach for Speed Management*
- National Association of City Transportation Officials (NACTO), *City Limits: Setting Safe Speed Limits on Urban Streets*

Texas Department of Transportation Procedures for Establishing Speed Zones

The TxDOT *Procedures for Establishing Speed Zones* contains guidance for setting speed limits on state-owned highways. In the absence of a city-approved, context-sensitive methodology for establishing speed limits, the City of Fort Worth uses TxDOT's procedures. The report recommends that speed limits should be based on spot speed studies, the 85th percentile operating speed, and the legal minimum and maximum speed.

The guide lays out types of speed zones, where the prima facie maximum speed limit should be altered from the statutory speed limit. According to TxDOT, the scope for a speed zone study includes calculating the 85th percentile, performing a crash study, creating strip maps, and conducting speed zone design. The guide also describes the appropriate authorities for speed zone approval on state highways.

In most cases, speed zones (including both statutory and posted speed limits) on state highways within cities should be established by city ordinance based on TxDOT's recommendations.

Typically, TxDOT conducts the necessary speed studies and advises the city on appropriate speed limit zoning, even for zones set by city ordinance. Cities with their own traffic engineering staff may also conduct speed studies on state-maintained highways and propose speed zoning changes. However, this process requires TxDOT to review and approve the city's recommendations. Within incorporated cities or towns, the Texas Transportation Commission has the power to adjust speed limits on highways within city limits or override speed limits established by city ordinances for those highways. TxDOT is responsible for conducting studies and providing recommendations to the city, which can then adopt the suggested speed zones through a city ordinance.

Key Takeaways: This procedure—which is not required for city-owned streets—requires data collection and case-by-case analysis. It is based on 85th percentile operating speed, which may result in higher speed limits than other methods.

Texas Transportation Code Section 545

Texas Transportation Code Section 545.352 sets prima facie speed limits based on the roadway context, unless a special hazard exists that requires a lower speed limit. The standard prima facie speed limits are:

- 30 miles per hour in an urban district on a street other than an alley
- 15 miles per hour in an alley
- 70 miles per hour on a highway numbered by the state or the United States outside an urban district, including farm-to-market or ranch-to-market roads
- 60 miles per hour on a highway outside an urban district that is not numbered by the state or the United States
- 60 miles per hour for school buses that have passed a commercial motor vehicle inspection and are on a highway numbered by the state or the United States, including farm-to-market roads
- 50 miles per hour for school buses that have not passed a commercial motor vehicle inspection or are traveling on a highway not numbered by the state or the United States
- 15 miles per hour on a beach
- 15 miles per hour on a county road adjacent to a public beach, if declared by the commissioners court of the county

Texas Transportation Code Section 545.356 grants municipalities the authority to alter prima facie speed limits. Specifically, it allows municipalities to declare speed limits as low as 25 miles per hour "if the governing body determines that the prima facie speed limit on the highway is unreasonable or unsafe." Doing so requires the municipality to report the number of traffic citations, warnings, and crashes each year in comparison with the two prior years.

Key takeaways: Texas Transportation Code grants authority to the City of Fort Worth to set speed limits as low as 25 miles per hour and does not require higher speed limits for collectors and arterials. However, the City needs to develop its own definition of "unreasonable or unsafe" to evaluate when the prima facie speed limits warrant a change.

City of Fort Worth Speed Ordinance 22-86

The City of Fort Worth Ordinance 22-86 defers to the Texas Transportation Code regarding prima facie speed limits. It follows the Texas Transportation Code to assume a public street or highway within the city urban district without a speed limit sign would assume a speed limit of 30 mph. It specifies some parks where the speed limits are reduced to 20 mph, and school zones with speed limits mostly at 20 mph but some have 25 or 30 mph. A list of freeways, frontage roads, and streets with dedicated speed limits were also provided, though it is unclear about the rationale behind these specified speed limit values.

Key takeaways: Since the current city ordinance follows largely the Texas Transportation Code for speed limit, it has to be revised to reflect any new speed methodology the City plans to adopt.

FHWA Report to Congress on Guidance for the Setting of Speed Limits (2023)

The FHWA report to Congress *Guidance for the Setting of Speed Limits*[2] synthesizes findings from National Cooperative Highway Research Program (NCHRP) Project 17-76, which explores methods for determining speed limits and their impact on road safety.

This report summarized six approaches used domestically and internationally to set speed limits:

1. **Operating Speed**: This approach uses the 85th percentile speed, with adjustments used to account for existing roadway geometry or crash experience. A review of 31 State

[2] Federal Highway Administration. (2012). *Guidance for the Setting of Speed Limits* (Report to Congress). U.S. Department of Transportation. https://highways.dot.gov/sites/fhwa.dot.gov/files/Report_to_Congress%20on_Guidance_for_the_Setting_of_Speed_Limits_0.pdf

Websites by the research team found that all 31 States use the operating speed approach. More than half of the States reviewed consider roadside development or land use, traffic condition or volume, sight distances, the maximum or minimum speed allowed in the State, as additional factors, while at least three States also consider alignment or crosssectional factors such as horizontal/vertical curves, lane width, and pavement width.

2. **Road Risk**: This approach is primarily used in Canada and New Zealand and determines the speed limit based on the risks associated with the physical design of the road and the expected traffic conditions. Essentially, the speed limits are set according to the function or classification of the roads, and then adjustments to the speed limit are made based on the relative risk introduced by road and roadside design features. Since this method may result in speed limits well below the 85th percentile speeds, additional enforcement may be needed if countermeasures to reduce operating speeds are not employed.
3. **Expert System**: This approach recommends a speed limit based on a computer algorithm that uses knowledge and inference procedures that simulate the judgment and behavior derived from knowledgeable people, i.e., the "experts." The first expert system approach was developed in the late 1980s by Australia, and currently USLIMITS2, a Web-based tool developed by FHWA, is used on a limited basis as an expert system in the United States.
4. **Injury Minimization/Safe System**: This approach sets speed limits based on collision types that are likely to occur, the resulting impact forces, and the human body's tolerance to withstand those forces. This approach is based on the scientific link between speed limits and serious crash prevention, placing a high priority on road safety. It is used in Australia, the Netherlands, and Sweden but is not commonly used in the United States. This may be due to lack of exposure to this method, or because the resulting low speed limits are not viewed as appropriate by some jurisdictions
5. **Citywide of Default**: This approach sets speed limits by government actions. The report discusses city efforts to set uniform speed limits for safety, such as a 20 mph speed limit on residential streets. States generally control statutory speed limits, and several U.S. cities have recently campaigned to gain the authority from their state legislatures to set lower citywide default speed limits. For example, Boston, Massachusetts; New York City, New York; and Seattle, Washington, now have the ability to set a 25 mph speed limit citywide. Portland, Oregon, has the authority to set residential streets at 20 mph. Other countries are also implementing citywide speed limits.

6. **Slow Zones**: This approach is a community-based program to set lower speed limits for specifically designated corridors or areas than the speed limits on surrounding roadways of the same type. For example, New York City has implemented a "Neighborhood Slow Zones Program" to reduce crash frequency and severity and to enhance quality of life by reducing cut-through traffic and traffic noise in residential neighborhoods. Within the 6 Slow Zone area, speed limits are reduced from 25 mph to 20 mph, and traffic calming treatments are added with the intention of changing driver behavior

Based on its review of existing speed limit setting practices and factors that were identified that influence operating speed and safety, NCHRP 17-76 developed the Speed Limit Setting (SLS)-Procedure. The SLS-Procedure is designed to apply a set of unique decision rules that consider both driver speed choice and safety to four collapsed Speed Limit Setting Groups (SLSGs): Limited-Access, Undeveloped, Developed, and Full-Access facilities based on roadway types and roadway contexts.

The measured operating speed is recommended as the starting point for selecting a posted speed limit using the SLS-Tool, the spreadsheet that accompanies the SLS-Procedure. The tool suggests a speed for a roadway segment based on existing conditions and crash experience, as illustrated in **Figure 2** Safety is evaluated using crash data, risk factors, and research linking geometric variables to crash frequency.

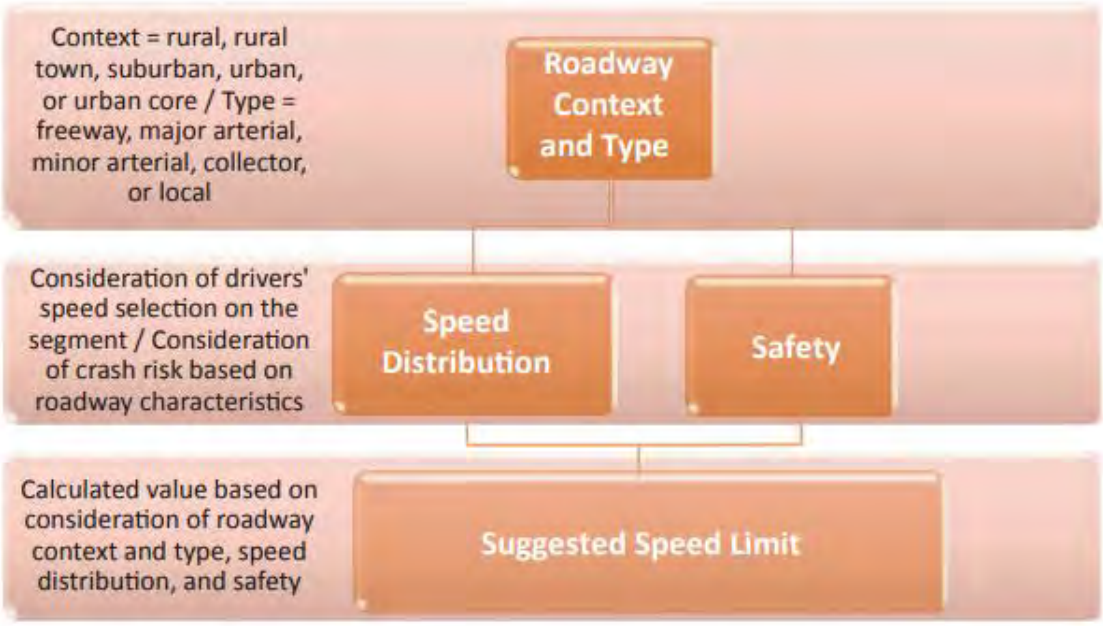


Figure 2: Overview of procedure to calculate suggested speed limit (NCHRP Research Report 966, 2023)

Step 1. Determine Roadway Context and Type

The SLS-Procedure starts with determining the roadway context and type. Roadway context includes **Rural, Rural Town, Suburban, Urban** and **Urban Core** and roadway type includes **Interstates/Freeways/Expressways, Principal Arterials, Minor Arterials, Collectors,** and **Locals**.

Based on the roadway context and type, the speed limiting setting group (SLSG) a facility belongs to can be identified using the table shown in Table 1. For facilities within the same SLSG, a similar decision process would be employed to determine the speed limit in the following steps.

Table 1: Suggested SLSGs based on roadway context and type

Context and Type	Rural	Rural Town	Suburban	Urban	Urban Core
Freeways	Limited-Access	Limited-Access	Limited-Access	Limited-Access	Limited-Access
Principal Arterial	Undeveloped	Developed	Developed	Developed	Full-Access
Minor Arterial	Undeveloped	Developed	Developed	Developed	Full-Access
Collector	Undeveloped	Full-Access	Developed	Full-Access	Full-Access
Local	Undeveloped	Full-Access	Full-Access	Full-Access	Full-Access

Step 2: Determine Speed Distribution and Crash Rate

For speed setting purposes within the SLS-Tool, the primary variables of interest related to speed are the 50th percentile and the 85th percentile speed, including:

- The 85th percentile speed rounded to the closest 5-mph increment (C85).
- The 85th percentile speed rounded down to the nearest 5-mph increment (RD85).
- The 50th percentile speed rounded to the closest 5-mph increment (C50).
- The 50th percentile speed rounded down to the nearest 5-mph increment (RD50).

Crashes are considered by comparing the crash rate [crashes/100 million vehicle miles (MVM)] for the segment with the crash rate for similar road sections in the jurisdiction or, if not available, with crash rates from the Highway Safety Information System (HSIS).

Step 3: Calculate the Suggested Speed Limit

Using the decision rules for each SLSG, suggested speed limit can be calculated based on other safety and other variables.

Speed Limit Setting Group: Limited-Access

Table 2 provides an overview of the variables along with the variable value that would trigger using C85, RD85, or C50.

Table 2: Overview of decision rules for Limited-Access SLSG

Variable	Closest 50th (C50)	Rounded Down 85th (RD85)	Closest 85th (C85)
Average interchange spacing (Inter_spac) expressed as length/number of interchanges in miles (mi) and annual average daily traffic (AADT) (two-way total) in vehicles per day (veh/d)	Inter_spac ≤ 0.5 mi and AADT ≥ 180,000 veh/d	0.5 mi < Inter_spac ≤ 1 mi and AADT ≥ 180,000 veh/d	All other cases
Mountainous terrain as determined by grade in percent and design speed in mph	{Not applicable, see criteria in other cells}	• Design speed ≥ 60 mph and grade > 4% • Design speed ≤ 55 mph and grade > 5%	All other cases
Outside shoulder width (SW) in feet	{Not applicable, see criteria in other cells}	SW < 8 ft	SW ≥ 8 ft
Inside shoulder width (ISW) in feet, number of lanes (N), and directional design-hour truck volume in trucks per hour (trk/hr)	{Not applicable, see criteria in other cells}	• Truck_vol > 250 trk/hr and ISW < 12 ft • Truck_vol ≤ 250 trk/hr, N ≥ 6, and ISW < 10 • Truck_vol ≤ 250 trk/hr, N < 6, and ISW < 4	All other cases
KABCO or KABC crash rate	High	Medium	Low

Speed Limit Setting Group: Undeveloped

Table 3 provides an overview of the variables along with the variable value that would trigger using either C85, RD85, or C50

Table 3: Overview of decision rules for Undeveloped area SLSG

Variable	Closest 50th (C50)	Rounded-Down 85th (RD85)	Closest 85th (C85)
Access points (non-residential driveways and intersections per mile)	• > 40 access points per mile (divided) • > 30 access points per mile (undivided)	• > 20 and ≤ 40 access points per mile (divided) • > 15 and ≤ 30 access points per mile (undivided)	• ≤ 20 access points per mile (divided) • ≤ 15 access points per mile (undivided)
Number of lanes, median type, AADT combination	{Not applicable, see criteria in other cells}	Four or more lanes with no median (undivided) and AADT > 2000 veh/d	• Four or more lanes with divided median • Two lanes with any median type • Four or more lanes with no median (undivided) and AADT ≤ 2000 veh/d • Any number of lanes/median type combination when AADT ≤ 2000
Lane width (LW)	LW ≤ 9 ft and AADT > 2000 veh/d	9 ft < LW < 11 ft and AADT > 2000 veh/d	• LW ≥ 11 ft and AADT > 2000 veh/d • Any lane width when AADT ≤ 2000
SW	SW < 2 ft and AADT > 2000 veh/d	2 ft ≤ SW < 6 ft and AADT > 2000 veh/d	• SW ≥ 6 ft and AADT > 2000 veh/d • Any SW when AADT ≤ 2000
KABCO or KABC crash rate	High	Medium	Low

Speed Limit Setting Group: Developed

Table 4: Overview of decision rules for Developed area SLSG.

Variable	Closest 50th (C50)	Rounded-Down 85th (RD85)	Closest 85th (C85)
Signal density	> 4 signals/mile	> 3 signals/mile	≤ 3 signals/mile
Access density	> 60 driveways/ unsignalized intersections per mile	> 40 and ≤ 60 driveways/ unsignalized intersections per mile	≤ 40 driveways/ unsignalized intersections per mile
Number of lanes/ median type [undivided, two-way left-turn lane (TWLTL), or divided]	{Not applicable, see criteria in other cells}	Four or more lanes with undivided median	• Four or more lanes with divided or TWLTL median • Fewer than four lanes with any median type
Bicyclist activity in motor vehicle lane, shoulder, or non-separated bike lane	High	{Not applicable, see criteria in other cells}	Not high
Bicyclist activity in separated bike lane	{Not applicable, see criteria in other cells}	High	Not high
Sidewalk presence/width (none, narrow, adequate, or wide), sidewalk buffer (present or not present), and pedestrian activity (high, some, or negligible)	See Table 8	See Table 8	See Table 8
On-street parking activity	High	{Not applicable, see criteria in other cells}	Not high
On-street parking type	Angle parking present for 40 percent or more of section	• Parallel parking permitted • Angle parking present for less than 40 percent of section	None
KABCO or KABC crash rate	High	Medium	Low

Table 5: Decision matrix for sidewalk presence/width, sidewalk buffer, and pedestrian activity combinations for Developed SLSG

Pedestrian Activity	Sidewalk Presence/Width	Sidewalk Buffer	Speed Percentage
High	Adequate	Not present	RD85
High	Adequate	Present	C85
High	Narrow	Not present	C50
High	Narrow	Present	RD85
High	None	Not applicable	C50
High	Wide	Not present	C85
High	Wide	Present	C85
Some	Adequate	Not present	RD85
Some	Adequate	Present	C85
Some	Narrow	Not present	C50
Some	Narrow	Present	RD85
Some	None	Not applicable	C50
Some	Wide	Not present	C85
Some	Wide	Present	C85
Negligible	Adequate	Not present	C85
Negligible	Adequate	Present	C85
Negligible	Narrow	Not present	C85
Negligible	Narrow	Present	C85
Negligible	None	Not applicable	RD85
Negligible	Wide	Not present	C85
Negligible	Wide	Present	C85
See text for additional discussion on sidewalk presence/width and sidewalk buffer characteristics.			

Speed Limit Setting Group: Full-Access

Table 6: Overview of decision rules for Full-Access SLSG

Variable	Rounded-Down 50th (RD50)	Closest 50th (C50)
Signal density	> 8 signals/mile	≤ 8 signals/mile
Access density	> 60 driveways/unsignalized intersections per mile	≤ 60 driveways/unsignalized intersections per mile
Bicyclist activity – in motor vehicle lane, shoulder, or non-separated bike lane	High	Not high
Bicyclist activity – in separated bike lane	High	Not high
Sidewalk presence/width (none, narrow, adequate, or wide), sidewalk buffer (present or not present), and pedestrian activity (high, some, or negligible)	See Table 10	See Table 10
On-street parking activity	High	Not high
On-street parking type	Angle parking present for 40 percent or more of section	• No parking present • Angle parking present for less than 40 percent of section
KABCO or KABC crash rate	High or Medium	Low

Table 7: Decision matrix for sidewalk presence/width, sidewalk buffer, and pedestrian activity combinations for Full-Access Speed Limit Setting Group.

Pedestrian Activity	Sidewalk Presence/Width	Sidewalk Buffer	Speed Percentage
High	Adequate	Not present	RD50
High	Adequate	Present	C50
High	Narrow	Not present	RD50
High	Narrow	Present	RD50
High	None	Not applicable	RD50
High	Wide	Not present	C50
High	Wide	Present	C50
Some	Adequate	Not present	RD50
Some	Adequate	Present	C50
Some	Narrow	Not present	RD50
Some	Narrow	Present	RD50
Some	None	Not applicable	RD50
Some	Wide	Not present	C50
Some	Wide	Present	C50
Negligible	Adequate	Not present	C50
Negligible	Adequate	Present	C50
Negligible	Narrow	Not present	C50
Negligible	Narrow	Present	C50
Negligible	None	Not applicable	C50
Negligible	Wide	Not present	C50
Negligible	Wide	Present	C50
See text for additional discussion on sidewalk presence/width and sidewalk buffer characteristics.			

However, there does not currently exist an accessible database of which specific locations or government entities are actively applying the SLS-Procedure and SLS-Tool in their processes for setting speed limits.

Key takeaways: This method relies on collecting multiple pieces of data, bases the recommended speed on operating speed (which may be in excess of what is safe), and requires case-by-case analysis.

FHWA Safe System Approach for Speed Management

The FHWA *Safe System Approach for Speed Management* report[3] (FHWA 2023) provides a comprehensive guide for practitioners to understand the critical role of speed management in enhancing traffic safety. The Safe System Approach is based on the understanding that human error is inevitable, but traffic fatalities and serious injuries are not.

[3] Federal Highway Administration. (2023). *Safe System Approach for Speed Management*. U.S. Department of Transportation https://highways.dot.gov/sites/fhwa.dot.gov/files/Safe_System_Approach_for_Speed_Management.pdf.

The Safe System Approach identifies setting speed limits as the basis of any speed management approach. Potential injury minimization speed limits, varying by road classification, identified by international researchers and road agencies are likely to prevent fatalities and serious injuries and are based on the principles of the Safe System Approach. Although studies have shown that lowering speed limits on higher-speed roadways has a greater impact on operating speed compared to lowering speed limits on lower-speed roadways, the latter can still result in safety benefits. As opposed to other speed management strategies, speed limit changes can be implemented quickly and widely throughout a roadway network. In this document, FHWA recommends the following when it comes to speed limits:

- Target speeds (the speeds at which people are expected to drive) should align with the specific road context to balance vehicle mobility with safety for pedestrians, cyclists, and transit users.
- When statutory speed limits do not suit a road's traffic or land use context, speed zones can be created, and speed limits set based on engineering studies that consider the local environment.
- While the ultimate goal is to align operating speeds with target speeds, incremental target speeds may be needed to gain public support.

The FHWA's *Safe System Approach for Speed Management* report highlights USLIMITS2, a web-based decision support tool developed by the FHWA, as a resource for determining safe speed limits. The tool helps agencies assess speed limits by considering factors such as roadway characteristics, traffic volume, crash history, and existing speeds. Using USLIMITS2 to set context-specific speed limits aligns with Safe System principles, creating a holistic, proactive, and shared responsibility for road safety. Using these strategies can result in safer roads and increased protection for all road users, particularly those who are most vulnerable.

Key takeaways: Like the SLS-Procedure, this method relies on collecting multiple pieces of data and requires case-by-case analysis.

National Association of City Transportation Officials City Limits

The NACTO report *City Limits: Setting Safe Speed Limits on Urban Streets* outlines an updated approach to setting speed limits within urban areas. The most prevalent speed limit-setting practice in the US is based on the 85th percentile of driver speeds, which typically leads to speed limits being adjusted to match observed speeds rather than the desired speed. City Limits

describes the issues associated with the conventional percentile-based speed limit approach (Chapter 1, page 18) and provides an alternative method for setting limits. The guidance focuses on urban streets and is not applicable on limited access roadways, rural roads, or very low-density streets with limited multimodal use.

Below is a summary of the guidance in City Limits for setting safe speeds and includes where in that document more detailed information and instructive visuals can be found.

City Limits details three primary tools for setting speed limits in urban areas (Chapter 2, page 28):

> **Default speed limits:** Setting default speed limits on many streets at once. This could be citywide or by street category (minor streets, collector streets, arterial streets, etc.) and help to create uniformity and predictability. (Chapter 2, page 46)
>
> **Slow zones:** Designate zones in sensitive areas. These areas tend to be near schools, parks, and downtowns that have a high density of vulnerable users. (Chapter 2, page 54)
>
> **Corridor speed limits:** Set corridor speed limits on high priority major streets using a Safe Speed Study as outlined in the document. (Chapter 3, page 58)

City Limits provides information about the use of these tools depending on a city's authority to set speed limits and examples of how these tools can be combined.

Refer to the Case Studies section below for examples of how US cities are utilizing these tools to set safer speeds.

Key takeaways: City Limits provides a policy-oriented approach for setting safe speeds based on research and best practices, with the flexibility to conduct more nuanced analysis and speed setting on individual corridors and locations.

Case Studies

Cities such as Austin, Texas; Seattle, Washington; and New York City, New York, have successfully applied the methods detailed in the Literature Review. NACTO's City Limits report offers additional case studies specific to setting speed limits for Cambridge and Portland (In Chapter 2, on page 36).

City of Austin, Texas

To build their case for lower speed limits, the Austin Transportation Department (ATD) conducted a multi-year engineering study that complies with state and federal guidelines. ATD diverged from the historic approach of using the observed 85th percentile speed as the primary input. ATD, however, determined their recommended speed limits based on the 50th percentile speed measured over several years for hundreds of residential streets throughout Austin as well as context-based data such as bicycle/pedestrian activity, adjacent land use, traffic controls, driveway density, and crash history.

In 2020, ATD presented recommendations to the City Council to pass an ordinance to limit downtown and neighborhood streets to 25 mph citywide. The ordinance also set speed limits on several urban core arterial streets. The ordinance also lowered speed limits on specific streets that were studied during the data collection phase.

In 2022, ATD overhauled its Transportation Criteria Manual (TCM). While the TCM does not establish speed limits, Section 3 establishes target speeds for city streets based on street classification, walking/biking activity level, and conflict level (see **Figure 3).** These target speeds shape design and operation decisions and therefore influence the posted speed limit.

	Street Context			
Street Level	High conflict density High activity	High conflict density Low activity	Low conflict density High activity	Low conflict density Low activity
Level 0	10 mph	10 mph	10 mph	10 mph
Level 1	20 mph or lower	20 mph	20 mph	20—25 mph
Level 2	20—25 mph	25 mph	25 mph	25—30 mph
Level 3	25—30 mph	30 mph	30 mph	30—35 mph
Level 4	30—35 mph	35 mph	35 mph	35—40 mph

Figure 3: City of Austin Target Speed

City of Seattle, Washington

Seattle has utilized two of the three tools outlined in City Limits: default speed limits and corridor speed limits. In pursuit of safer speeds across Seattle, the Department of Transportation (DOT) developed two documents; one describing significant historical events related to changing speed limits in Seattle and the other containing quantitative analysis to support lower speed limits. The second document cited the city's Vision Zero goal to end traffic deaths and serious injuries by 2030, the nature of its built environment, and trends in increased walking and biking as reasons Seattle needed lower, safer speed limits. The case Seattle DOT made to their City Council was compelling, and in November 2016 a new law was enacted that lowered the default speed limit from 25 to 20 mph on 1,250 miles of neighborhood streets and from 30 to 25 mph on 200 miles of arterials. Seattle DOT credits much of the movement's success to the data they were able to reference. A diverse range of stakeholders including the transportation director, a member of city council, a representative from the law department, the city traffic engineer, and a public engagement specialist were involved in the process.

Traffic fatalities in the City of Seattle decreased by 26 percent after the city implemented comprehensive, citywide speed management strategies and countermeasures inspired by Vision Zero.

City of New York

Slow zones and default speed limits are two tools New York City has used for setting safer speeds. The city has designated over two dozen neighborhoods as slow zones as part of its Neighborhood Slow Zones program. The program focuses on residential areas with low traffic volumes and limited through traffic, setting a 20 mph speed limit and introducing traffic calming measures.

In 2013, family members of traffic crash victims, City Council members, and local agencies joined forces to petition the state legislature for lower speed limits, but their efforts were unsuccessful. Advocacy of the community, the Mayor's office, and city agencies eventually paid off when in 2014 the state legislature passed a bill allowing the city to designate a citywide speed limit of 25 mph. To encourage compliance, New York City implemented cameras as part of its automated speed enforcement program. In areas with cameras, speeds dropped by an average of 60%, prompting the city to expand the program's active zones from 140 to 750.

Recommendations and Next Steps

The successes of cities like Austin, Seattle, and New York City indicate the effectiveness of the tools they have used that are detailed in NACTO's City Limits: default speed limits, slow zones, and corridor speed limits. For all three tools, the recommendations that City Limits makes for setting speed limits for improved safety are data-driven with the report citing studies that indicated safety benefits.

The default speed limit by street category section of City Limits, combined with the precedent developed by the City of Austin, may provide the City of Fort Worth with a streamlined framework for determining speed limits by street category and context. For determining the speed limit for the specific context of major street corridors, City Limits details how to develop a Safe Speed Study to serve as support for the speed limit that is ultimately recommended (Chapter 3, Page 58). Both the SLS-Procedure and USLimits2 are automated tools that rely on a series of inputs by the user. Assuming the user has the required input data readily available, these tools can be used in a matter of minutes. The Safe Speed Study process that NACTO provides requires the user to manually progress through a series of steps that ultimately assess both conflict density and activity level. A matrix (Chapter 3, Page 63) then provides a speed limit recommendation based on these factors. A common theme among the case studies provided here is the use of data to gain the support of decision-makers as well as the community and stakeholders.

After educating the appropriate parties on the recommended methods for determining safe speed limits through this report, Fort Worth should begin by prioritizing which of the three tools they would like to pursue. If City Council approval is necessary, Fort Worth could follow Austin's example of proposing both default speed limits and corridor speed limits starting with the most highly ranked streets on the High Injury Network.

FORT WORTH 2050

APPENDIX E
Truck Traffic Evaluation

Table of Contents

List of Figures 4

List of Acronyms 5

Introduction 6

Data Analysis 7

Truck-Involved Crashes 7
Freight Traffic Trips 9
Truck Traffic Origin-Destination (O-D) Analysis 11
Freight Trip Duration 15
Truck Parking 17

Literature Review 20

City of Fort Worth Master Thoroughfare Plan (2016) 20
USDOT National Freight Strategic Plan 21
FHWA Documents 22
National Research Reports 23
Texas Freight Mobility Plan 24
NCTCOG Mobility 2045 Update 25
NCTCOG Regional Freight Planning 26
TTI Performance Measure Summary - Dallas-Fort Worth-Arlington TX 27
100 Most Congested Texas Road Segments 2023 Executive Summary 27
Fort Worth Ordinance Chapter 22, Article IV 28

Freight Management: Goals, Strategies, and Case Study 31

Common Goals and Objectives Across FHWA and Related Documents 31
Truck Data Collection and Evaluation Methodologies 31
Strategies to Reduce Truck Traffic and Congestion 32
Integration of Freight Needs with Land Use Pattern 33
Addressing Future Truck Demand and Innovation in Methodologies 33

Freight Data Platforms 34

Freight Analysis Framework 34
Replica BigMobility Data Platform 35
NCTCOG Travel Demand Model 35
Comparison of Platforms 36
Takeaway 36

Innovative Technology Solutions 37

Case Studies 38
Case Studies and Recommendations on Truck Route and Restriction Rules 41
General Factors for Identifying and Designating Truck Routes 41
Case Studies 42
Considerations for Adding and Removing Truck Routes 43
Summary 47

List of Figures

Figure 1: Percentage of CMV and Large Truck Crashes, 2024 (Source: State of Safety Report).... 7

Figure 2 City of Fort Worth Freight Trips Count, 2023 (Source: Replica) 10

Figure 3 City of Fort Worth Freight Origins, 2023 (Source: Replica)..... 12

Figure 4 City of Fort Worth Freight Destinations, 2023 (Source: Replica)..... 13

Figure 5: City of Fort Worth Origin-Destination Pairs, 2023 (Source: Replica)..... 14

Figure 6 City of Fort Worth Freight Trip Duration per Minutes, 2024 (Source: Replica)..... 15

Figure 7: Short Trip Percentage on Roadways, 2024 (Source: Replica)..... 16

Figure 8 Truck Parking Facilities, 2020 (Source: TxDOT)..... 19

Figure 9: Vision Statement for the MTP, 2016..... 21

Figure 10: Current Fort Worth Truck Routes (Source: City of Fort Worth)..... 30

List of Acronyms

AID	Automated Incident Detection
ASCT	Adaptive Signal Control Technology
ATSPM	Advanced Traffic Signal Performance Measures
CoFW	City of Fort Worth
EIS	Environmental Impact Statement
FAF	Freight Analysis Framework
FHWA	Federal Highway Administration
GPS	Global Positioning System
ITS	Intelligent Transportation Systems
MTP	Master Thoroughfare Plan
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NCTCOG	North Central Texas Council of Governments
SAP	Safety Action Plan
TAFT	Transportation Analytical Forecasting Tool
TTI	Texas A&M Transportation Institute
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation

Introduction

The City of Fort Worth's commitment to improving the safety and efficiency of its transportation systems has led to the development of the Vision Zero Safety Action Plan (SAP). As revealed from analyzing crash data and hearing from the community, effective truck traffic management is essential for maintaining transportation infrastructure efficiency and safety. Existing truck traffic and crash patterns are examined and areas for potential improvement are identified. Additionally, it is important to align freight management strategies with broader citywide goals, such as reducing emissions, improving air quality, and supporting economic growth. Integrating these broader objectives will help freight management address current challenges and contribute to the city's long-term sustainability and prosperity.

By utilizing a range of data sources and reviewing relevant documents, the City's existing truck traffic pattern and related policies and programs are assessed. An alternative perspective on managing truck traffic, with an emphasis on harnessing future technologies to enhance the efficiency and effectiveness of the City's transportation infrastructure, are also provided.

Utilizing Data Sources: Employ the North Central Texas Council of Governments (NCTCOG) travel demand model and the Replica big mobility data platform to analyze truck demand and travel patterns in relation to land use. Texas Department of Transportation (TxDOT) crash data analysis findings from the State of Safety Report are also considered.

Review and Recommendations: Evaluate City ordinances, specifically Chapter 22, Article IV, and assess potential modifications, along with developing strategies to address truck traffic conflicts and educational and enforcement strategies. Develop recommendations on criteria for adding or removing routes from the truck route network and general factors in identifying Designated Truck Routes.

Innovative Technology Solutions: Review and develop recommendations on incorporating advanced traffic flow modeling driven by artificial intelligence and real-time data analytics to enhance understanding and management of truck traffic.

Data Analysis

The City of Fort Worth is a critical hub for freight and truck traffic due to its strategic location within major transportation corridors, including IH-35W, IH-20, and IH-30. This report provides an evaluation of truck-involved crashes, current freight traffic patterns, identifying the most congested roads, truck traffic duration, number of trips and key insights and recommendations for improving freight mobility and infrastructure.

Truck-Involved Crashes

Recent safety analysis from the State of Safety Report (2024), reveals that out of 68,936 total crashes from 2019 to 2023, 6,193 (9%) of those involved commercial motor vehicles (CMVs), and 5,943 (8.6%) of those involved large trucks. The data indicates that the City of Fort Worth has a significantly higher freight vehicle crash share among all crashes than the state average (6.9%/7.4%) or peer cities such as Dallas (7.7%/6.6%) or Houston (5.4%/4.9%). The results are summarized in **Figure 1**.

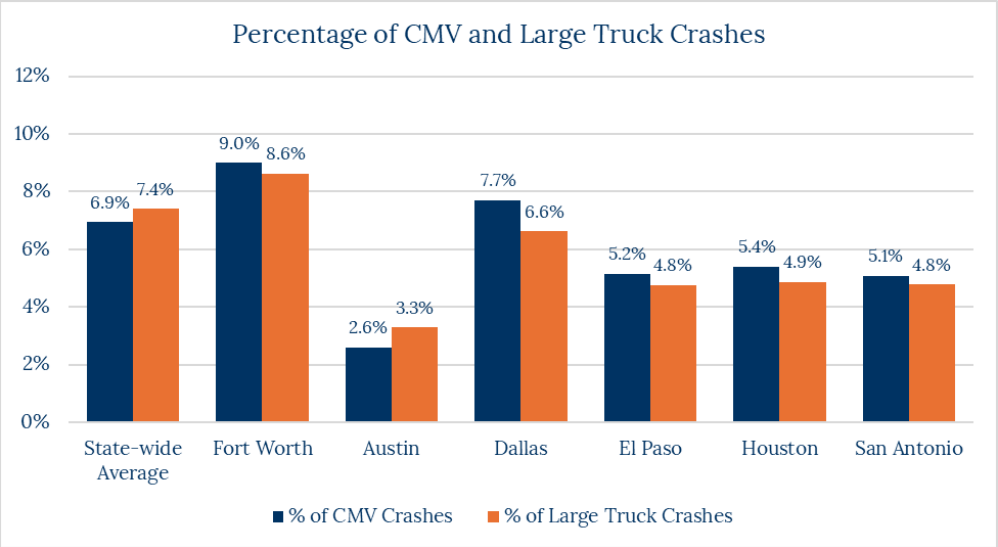


Figure 1: Percentage of CMV and Large Truck Crashes, 2024 (Source: State of Safety Report)

However, when compared to these other cities in terms of CMV or Large Truck crashes per million commercial vehicle miles traveled (VMT), Fort Worth is the second lowest, only higher than the City of Austin, as shown in Table 1.

The results depicted in Figure 1 and Table 1 in combination show that despite not having a higher large truck crash rate considering the amount of freight vehicle movements within the City, when compared to crashes involving other modes, large truck-involved crashes in Fort Worth have a higher share than that in the other cities and the statewide average. City of Fort Worth also has the highest share of Freight trips among all trips.

Table 1: CMV and Large Truck Crashes per Freight VMT

	Statewide Average	Fort Worth	Austin	Dallas	El Paso	Houston	San Antonio
Total Crashes	2,705,297	68,936	65,747	169,629	76,840	328,787	195,898
CMV Crashes	187,594	6,193	1,711	13,073	3,959	17,782	9,930
% of CMV-Involved Crashes	6.90%	9.00%	2.60%	7.70%	5.20%	5.40%	5.10%
Large Truck Crashes	200,215	5,943	2,160	11,239	3,656	16,018	9,362
% of Large Truck Crash	7.40%	8.60%	3.30%	6.60%	4.80%	4.90%	4.80%
Freight Trips[1]	4,622,536	229,307	160,270	328,578	106,784	609,195	250,383
% of Freight Trips among All Trips	3.95%	3.96%	2.72%	3.75%	3.27%	3.19%	3.14%
Average Freight Trip Miles[1]	23	36	31	37	25	21	33
Median Freight Trip Miles[1]	10	16	9	15	6	8	9
CMV Crashes per One Million Freight Trip VMT[2]	1,734	744	340	1,075	1,507	1,410	1,187
Large Truck Crashes per One Million Freight Trip VMT	1,851	714	429	924	1,392	1,270	1,119

Truck crashes, when they occur, can result in serious injuries and death, in addition to causing disruptions that delay truck travel. Even non-recurring or less severe crashes can still disrupt travel and create delays, impacting freight reliability, consumers, and businesses alike. This trend proposed the need for better freight safety analysis and freight traffic management in Fort Worth.

[1] Source: Replica. These are typical daily trips on a weekday from Replica. Freight trips were obtained by filtering down to commercial vehicle (freight) mode and intersecting with the city (trips that started, ended, or passed through the selected city); Replica confidence level to the total trip data - High Certainty, freight trip data - Medium Certainty

[2]Freight Trip VMT are calculated by multiplying freight trips with average miles

Freight Traffic Trips

The Replica Big Mobility data in **Figure 2**, reveals patterns of freight movement within Fort Worth. Freight trips are categorized into several trip ranges, each representing the volume of truck trips on specific corridors. Comparing what is shown in this Figure with the City's existing truck ordinance demonstrates that the ordinance does not capture all high freight volume corridors, as illustrated in Figure 2, and has not been updated to incorporate the latest information from the Texas Delivers 2050 – Texas Mobility Freight Plan.

High Freight Volume Corridors (6,501- 10,000 trips/day):

Certain corridors in Fort Worth, such as IH-30, which runs east to the west through the city and merges with IH-20 west of Fort Worth, along with its interchanges with the SW Loop 820, and segments of IH-35 W and its interchanges with NE Loop 820 and NW Loop 820, experience high freight traffic volumes, ranging between 6,501 and 10,000 trips/day. These routes are critical for city, state, and national logistics and supply chains, serving as primary arteries for freight transportation. While Fort Worth's truck routes include IH-30 from W Loop 820 interchange to the city boundary and IH-35 from N Loop 820 to IH-20, they do not capture all the high freight volume corridors such as IH-30 west of W Loop 820, IH-35W south of IH-20 and north of NE Loop 820, and US 287 in the northern part of the city.

Moderate Freight Volume Corridors (4,001-6,500 trips/day):

Corridors such as IH-20 W, portions of IH-30, and the west side of Loop 820 fall into the moderate freight volume category, with traffic ranging from 4,001 to 6,500 trips per day. Although these routes experience less congestion than primary corridors, they remain significant for regional and local freight distribution. Current Fort Worth truck routes do not capture moderate freight volume corridors including IH-20 from the IH-35W interchange to the US 183 interchange, and Loop 820 from the IH-20 interchange to the IH-35W interchange.

Lower Freight Volume Corridors (2,501- 4,000 trips/day):

Corridors including TX 183, TX 170, and major segments of IH-30, IH-20, and IH-35 W, have freight traffic counts between 2,501 and 4,000 trips per day, supporting less intensive freight trips, mostly specific industrial or commercial areas within the city. Among those corridors, TX 183 is captured in the Fort Worth truck routes. The remaining roads that do not fit into the three

categories with freight volume ranging from 306 to 2,500 trips per day are represented with the brighter colors on the map.

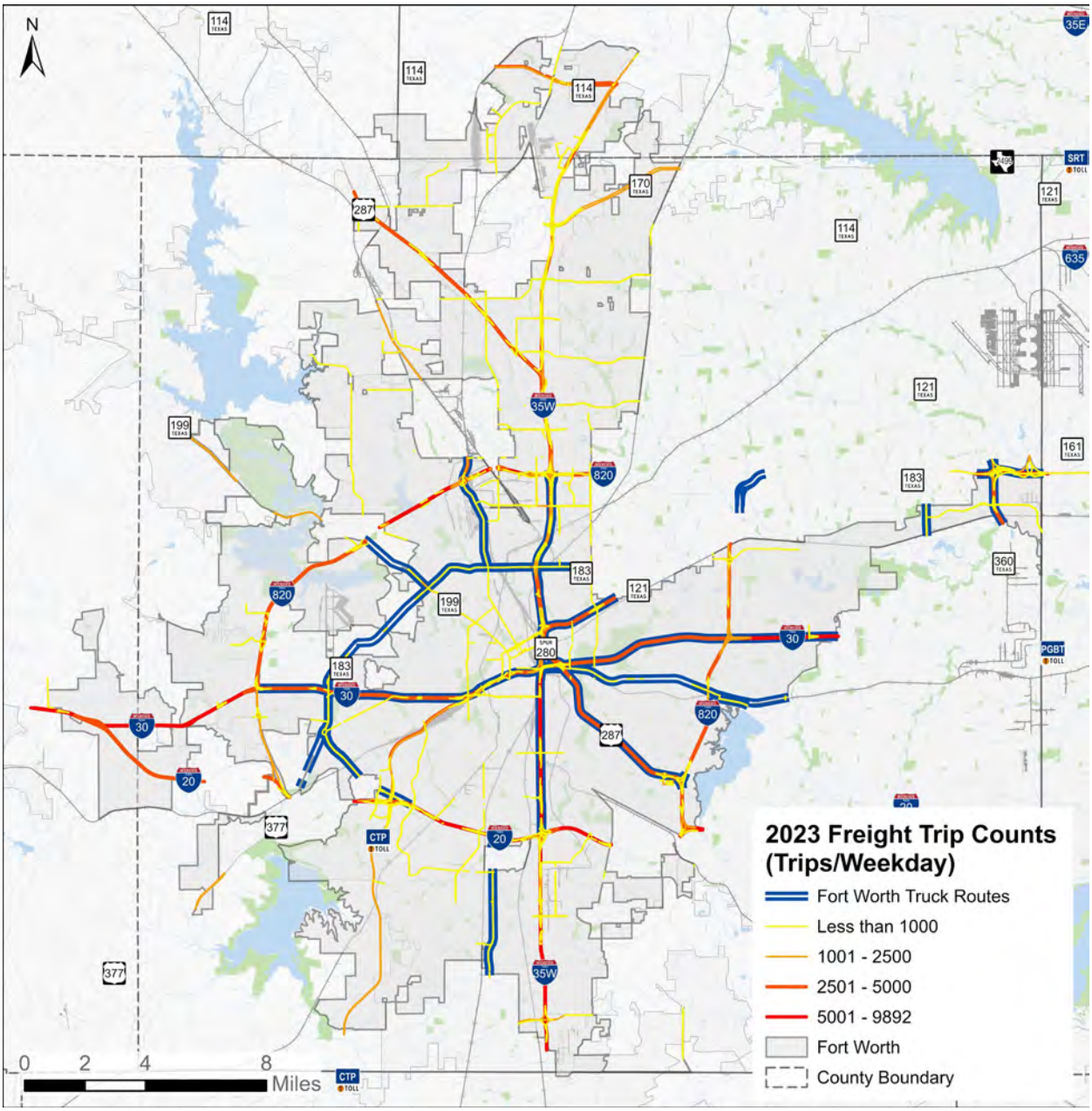


Figure 2 City of Fort Worth Freight Trips Count, 2023 (Source: Replica)

Truck Traffic Origin-Destination (O-D) Analysis

This report provides an O-D analysis of freight traffic movement within the city of Fort Worth, Texas, utilizing data from Replica Big Mobility Data Platform. The evaluation focuses on the travel pattern of freight trips across different regions and highlights the most significant routes used for freight trips and movements.

Figure 3 shows the origins of freight trips in the city. Most freight trips originate from the industrial and logistic zones located in the northern part of the city, particularly along IH-35W, US-287, and Loop 820. Key hubs include Fort Worth Alliance Airport and the surrounding warehouses and distribution centers, including those operated by Walmart and Verizon. Additionally, storage facilities, such as Amazon UTX7, near Fort Worth Meacham International Airport and railroads serve as important points of origin for freight movements. On the south side of the city, warehouses along IH-35W also produce a significant amount of freight trips, mostly food suppliers such as Tyson Foods and Ben E. Keith Foods.

Figure 4 shows freight trip destination areas in Fort Worth, revealing a similar pattern as the origin areas, where the industrial and logistic zones in the north side and south side of the city are receiving large volumes of inbound freight.

Replica also provides O-D pairs data. **Figure 5** presents the O-D pairs with more than 100 truck trips during a typical Thursday. According to the data, most trips happen between the industrial and logistic zones around the Fort Worth Alliance Airport in the north to the warehouses near Fort Worth Meacham International Airport. There is one major O-D link with nearly 600 trips per day from the FedEx facility in US-287 & Loop 820 interchange to the Alliance airport, and some trips from/to outside of Fort With city boundary, including areas near the Dallas-Fort Worth International Airport. Out of 6,200 recorded freight trips in Replica, 21% have origins outside of the city boundary but destinations within the City of Fort Worth,

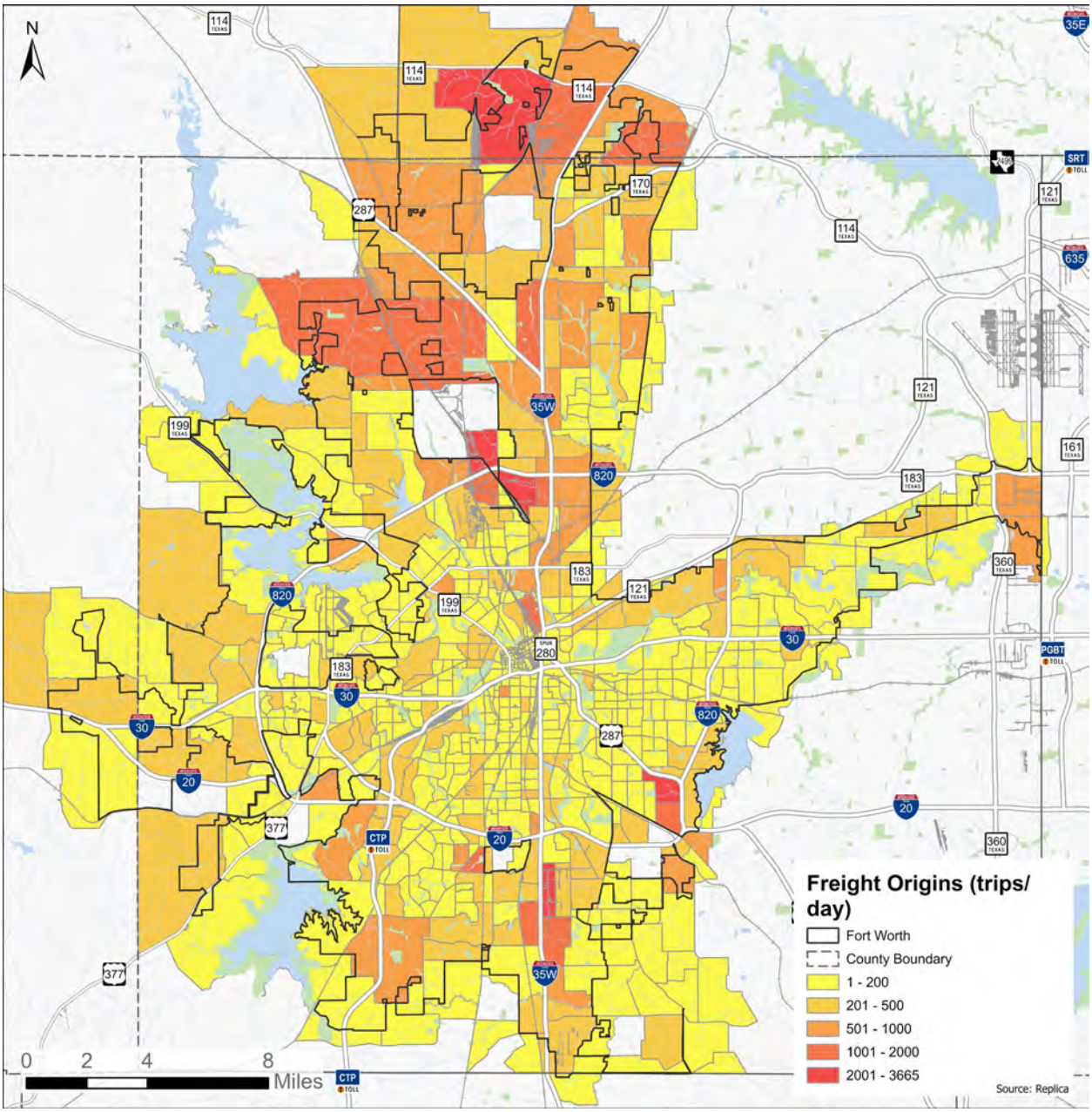


Figure 3 City of Fort Worth Freight Origins, 2023 (Source: Replica)

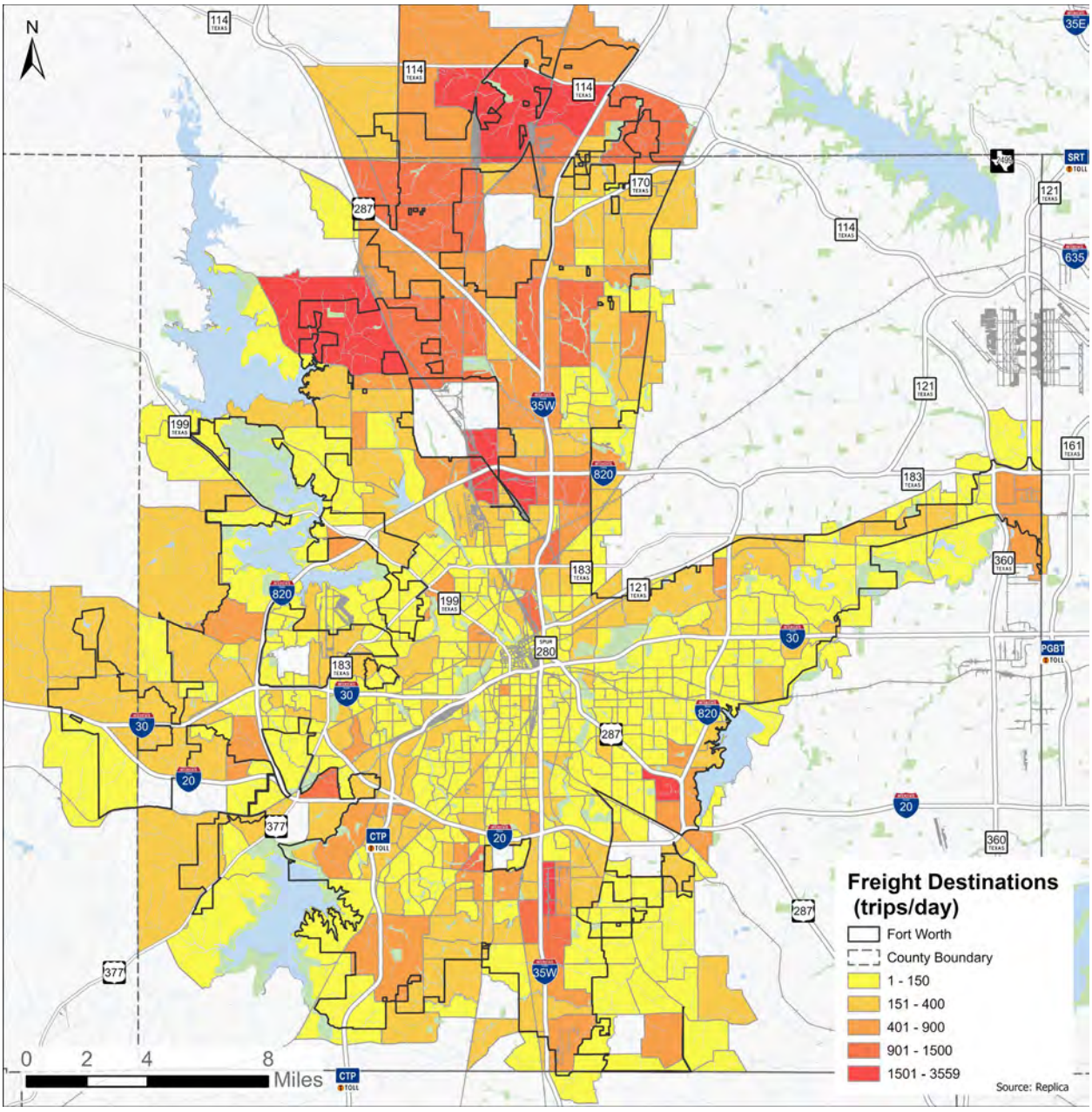


Figure 4 City of Fort Worth Freight Destinations, 2023 (Source: Replica)

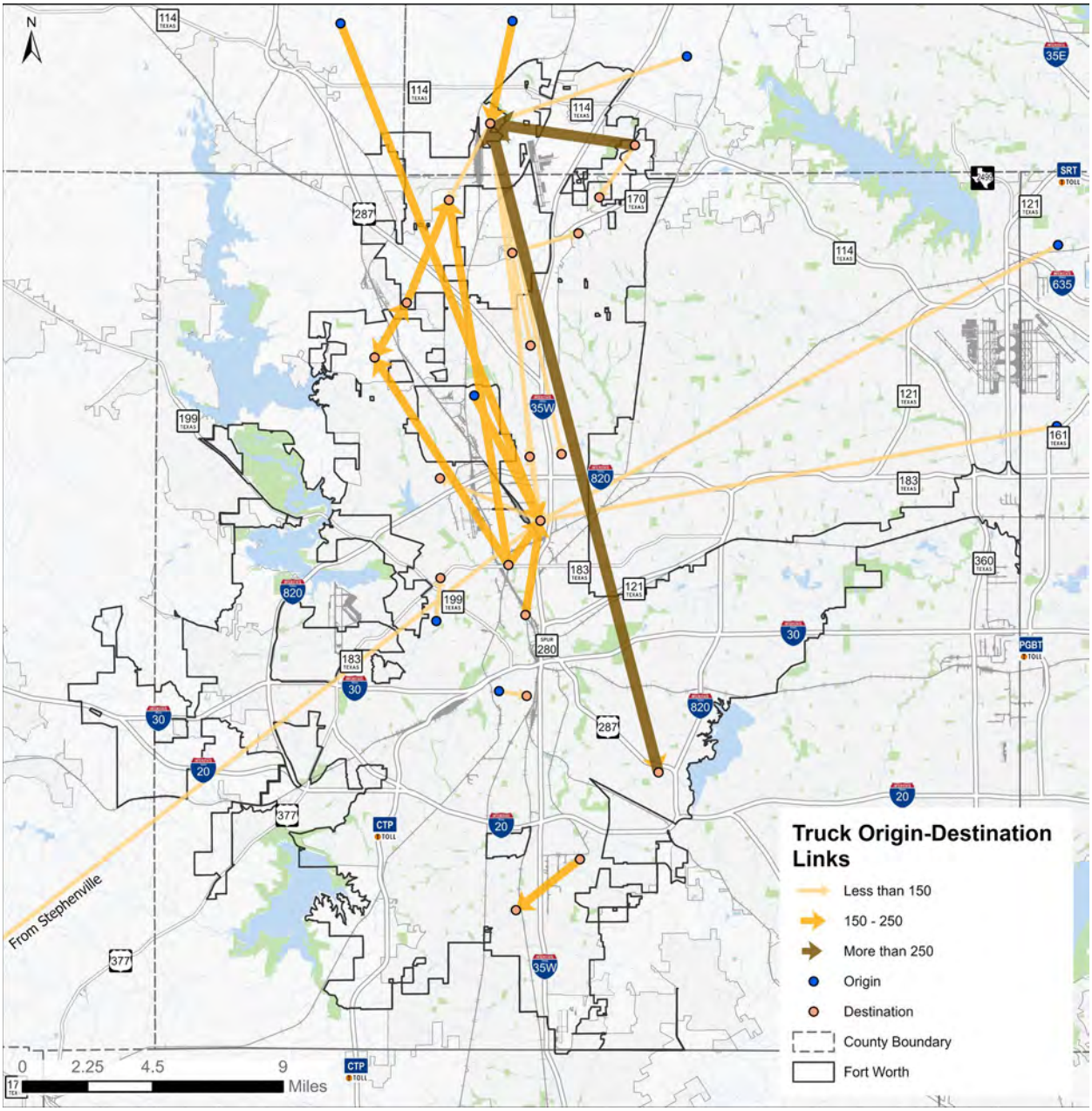


Figure 5: City of Fort Worth Origin-Destination Pairs, 2023 (Source: Replica)

Freight Trip Duration

In addition to traffic volumes, Replica data also provides information on the duration of freight trips within Fort Worth, as shown in **Figure 6**. Replica marks a medium confidence level to the data, as the data is collected from fleet management and telematic companies which can be limited. The data indicates that 40% of total freight trips fall within the 10-20 minutes or 20-40 minutes ranges. Short-distance freight trips (lasting less than 10 minutes) make up 31% of the total freight trips, and 13% of trips have durations between 40-80 minutes. Long-distance trips that take more than 80 minutes comprise 12% of total freight trips in Fort Worth. According to Replica data shown in **Figure 7**, most short trips with less than 20 minutes duration are on local roads instead of interstate and other major highways.

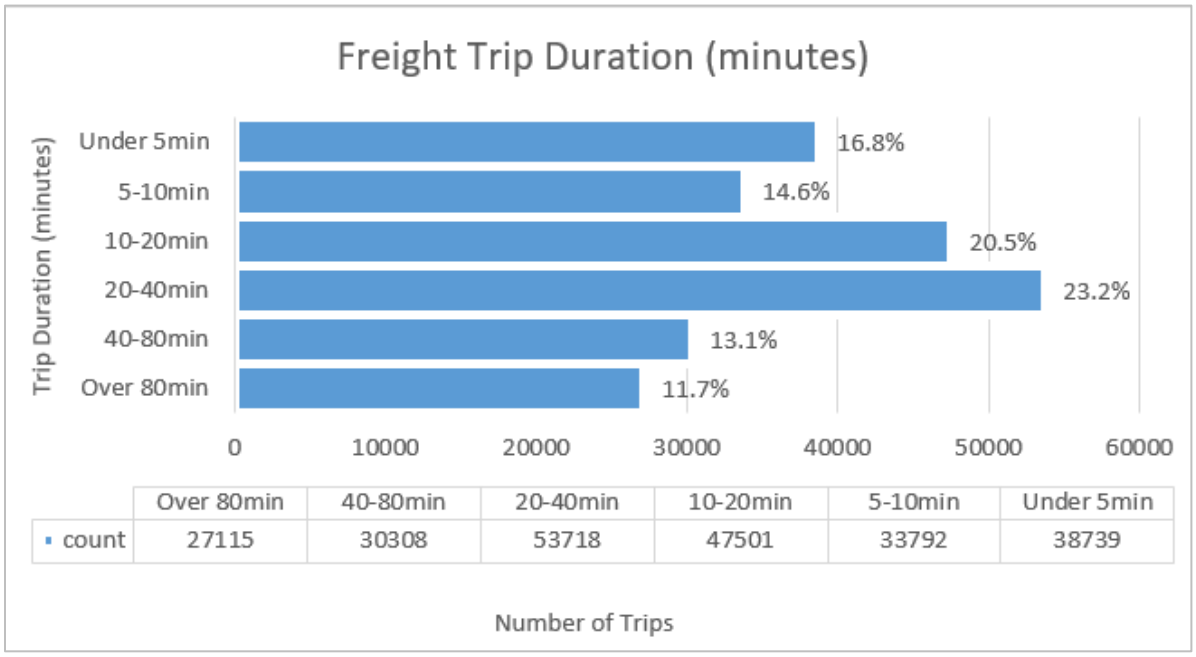


Figure 6: City of Fort Worth Freight Trip Duration per Minutes, 2024 (Source: Replica)

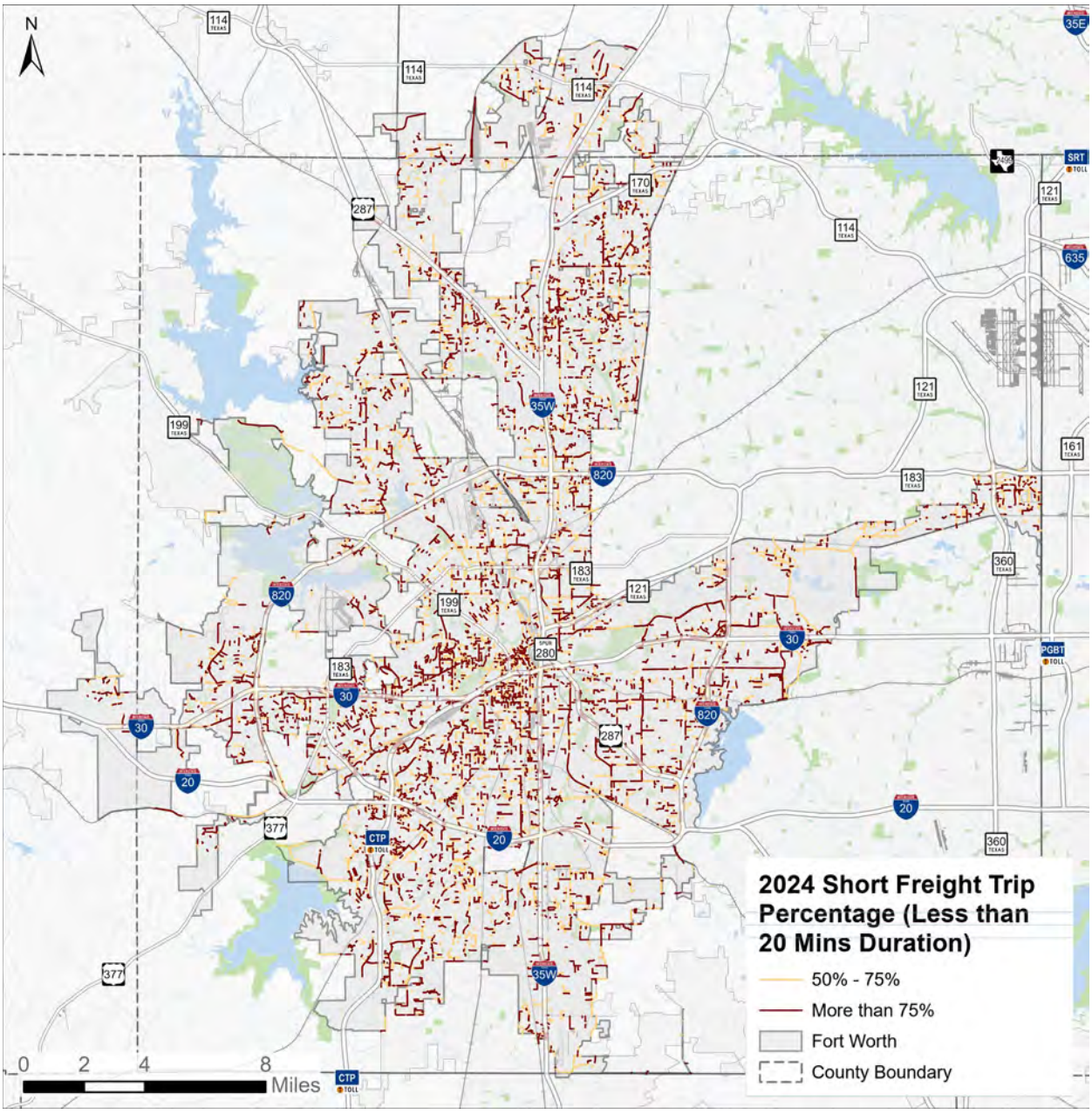


Figure 7: Short Trip Percentage on Roadways, 2024 (Source: Replica)

Truck Parking

According to the truck parking data from TxDOT's 2020 Texas Statewide Truck Parking Study, as shown in **Figure 8**, there are six private truck parking facilities within the City of Fort Worth boundary, four additional private truck parking facilities within a 1.5-mile buffer of the city boundary. Out of these 10 private parking facilities, five have less than 25 parking spots, three have 25-49 parking spots, one has 50-99 parking spots, and one has more than 100 parking spots. Four facilities along IH-35W are experiencing capacity issues as they are over capacity for more than 20 hours per day. No public truck parking facilities are found in or near the Fort Wort city boundary. There are around 10 publicly owned truck parking facilities in the Metroplex area, which include local travel information centers and county rest areas.

Key factors influencing parking demand include industrial activities such as distribution centers, warehousing, and manufacturing, that generate truck traffic, major highways with high truck volumes require truck stops and rest areas to accommodate long-haul drivers, local regulations, land use policies, as well as available parking infrastructure. In addition to short breaks such as eating, refueling, using bathrooms, drivers participating in interstate commerce are required to rest for a period of 8 hours after driving a maximum of 10 hours under the current federal HOS rules. These regulations resulted in a demand for long-term parking spaces, because long-haul drivers must complete a period of rest while en route to a destination. Taken together, these factors can result in complex demand patterns for truck parking along roadway segments. Stretches of a highway that are 8 to 10 hours from a key distribution center might be expected to have higher parking demand because the HOS rules will force drivers originating travel from that center to take an extended rest before resuming driving. Although these factors help determine the total demand for truck parking in an area (i.e., the latent demand), other factors help determine how that demand is distributed among the available parking locations (i.e., the demand choice). If one stretch of highway has a shortage of parking locations, demand that cannot be met on that stretch of highway will be met by parking locations on nearby stretches of highway.[3]

The Texas Statewide Truck Study used truck GPS to analyze truck parking demand.[4] Specifically, The GPS data collected by ATRI represents a sample of trucks on Texas roadways. Long-haul drivers and large carriers are more likely to be included than independent owner-operators or

[3] NCHRP Synthesis 317: Dealing with Truck Parking Demands. https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_317c3.pdf
4 Texas Truck Parking Study, TxDOT. https://ftp.txdot.gov/pub/txdot/move-texas-freight/studies/truck-parking/final-report.pdf

regional drivers. TxDOT truck data from throughout the state was compared against the volume of trucks in the ATRI data for the same period to estimate the percentage of trucks captured by the sample in various parts of the state. The resulting percentages were used to develop expansion factors. The study concluded that truck parking demand is typically highest overnight, and facilities often are at or over capacity during these hours. The time period with the greatest demand for truck parking, also known as the peak hour, was determined using truck GPS data. The statewide average peak hour for truck parking is from 1:00 a.m. to 2:00 a.m., although individual locations may have a different peak hour.

Some other states have used FHWA's Truck Parking Demand Estimation Tool to estimate the peak number of trucks requiring parking based on employment and industry data. A recent Truck Parking Study completed by the Connecticut Department of Transportation (CTDOT) utilized the FHWA methodology to estimate current (2019) and future (2040) perk hourly short-term and overnight parking demand along state routes with high truck use.[5] The calculated demand is a function of local data on traffic volumes, speeds and percentages of short- and long-haul, and FHWA default parameters for hours-of-service and peaking factors. The corridor level parking demand estimates were adjusted accordingly based on ATRI data and the truck parking supply inventory data.

5 Connecticut Truck Parking Study, CTDOT. https://www.transportation.gov/sites/dot.gov/files/2023-12/Truck-Parking-Study.pdf

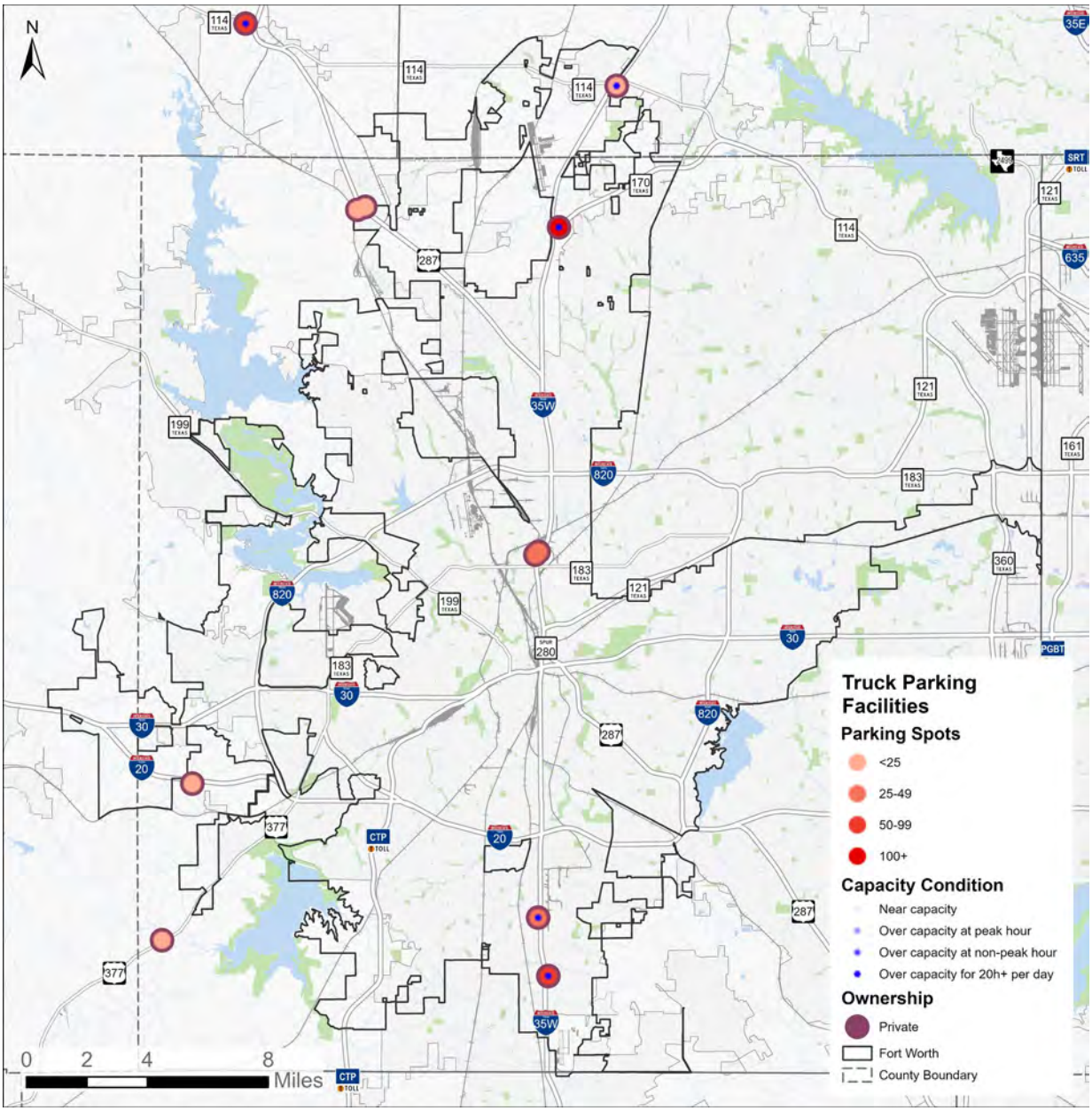


Figure 8 Truck Parking Facilities, 2020 (Source: TxDOT)

Literature Review

This section reviews literature relevant to freight and truck traffic management, focusing on key sources and guidelines from various entities. It begins with the City of Fort Worth's Master Thoroughfare Plan, which outlines a framework for developing and managing the city's transportation network, emphasizing multimodal and freight movement. The U.S. Department of Transportation (USDOT) National Freight Strategic Plan and Federal Highway Administration (FHWA) documents provide critical methodologies and best practices for freight management, including traffic monitoring, performance improvement, and land use integration. National Cooperative Highway Research Program (NCHRP) and National Cooperative Freight Research Program (NCFRP) reports offer additional strategies for assessing and managing freight flow and congestion. The review concludes with local regulations from Fort Worth Ordinance Chapter 22, Article IV, and practical case studies demonstrating successful freight and truck traffic management approaches. Together, these sources offer a well-rounded perspective on managing freight systems effectively.

City of Fort Worth Master Thoroughfare Plan (2016)

The City of Fort Worth's Master Thoroughfare Plan (MTP)[6] provides a framework for developing and managing the city's transportation network to accommodate current and future growth. The MTP emphasizes a multimodal network that supports freight efficiency while addressing community safety and growth. The MTP's structured approach categorizes streets based on land-use context and function, applying access management and design standards specific to large vehicles. The vision of the MTP is to provide a complete, connected, and context-sensitive transportation system that supports mobility, healthy living, and economic benefits. This vision is supported by three main goals: mobility, safety, and opportunity which are illustrated in **Figure 9**.

[6] City of Fort Worth, TX. (2016). Master Thoroughfare Plan. https://www.fortworthtexas.gov/files/assets/public/v/1/tpw/documents/mtp/mtp.pdf.

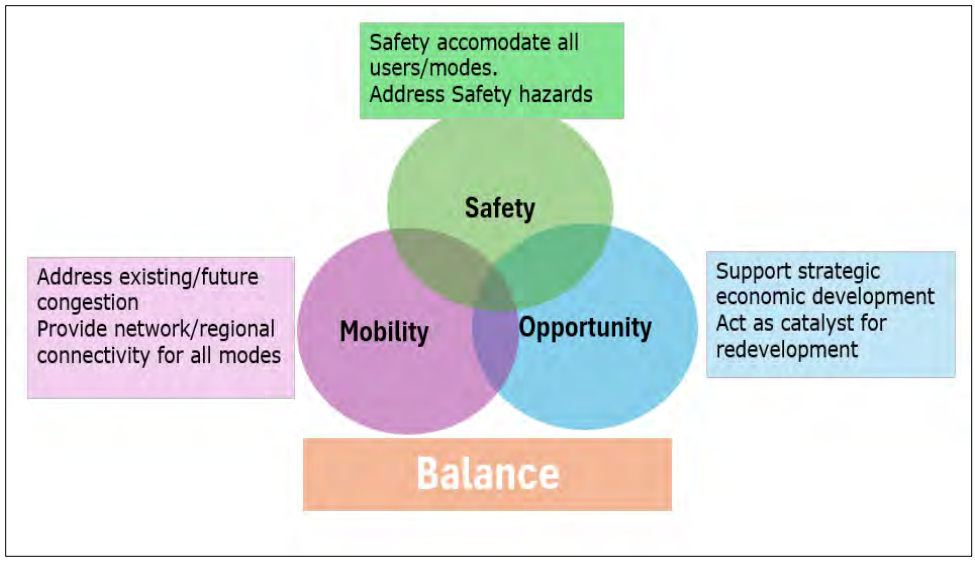


Figure 9: Vision Statement for the MTP, 2016

Takeaway:

- **Optimize Truck Routes Based on Land Use:** Identify designated truck routes that prioritize freight-heavy zones and divert traffic from residential and pedestrian areas. This adjustment reduces truck-pedestrian interactions, lowering crash risks.
- **Incorporate Freight-Specific Design Standards**: Adopt wider turn radii, truck loading zones, and appropriate lane widths along major freight corridors. Having these standards in place reduces crashes, particularly at intersections, as a result of safer navigation.
- **Preserve Right-of-Way for Future Freight Growth:** In areas expected to experience growth, reserve space along key freight corridors in advance. The purpose of this approach is to maintain flow and reduce incidents associated with congestion.
- **Coordinate with Regional Partners:** Collaborate with NCTCOG and TxDOT to align Fort Worth's truck routes with regional freight corridors. This will promote a cohesive and efficient regional network that minimizes unexpected detours and bottlenecks.

USDOT National Freight Strategic Plan

The USDOT National Freight Strategic Plan[7] provides national guidelines on infrastructure improvements, congestion reduction, and system reliability. It offers methods that apply locally

[7] U.S. Department of Transportation. (2016). National Freight Strategic Plan. https://www.transportation.gov/sites/dot.gov/files/2020-09/NFSP_fullplan_508_0.pdf.

in Fort Worth. The plan emphasizes using data-driven models and integrating land use with freight planning to promote safer and more efficient truck operations. Key recommendations include employing traffic simulation models and performance metrics to identify high-risk areas, which can help Fort Worth prioritize intersection optimization and adjust signal timing to reduce congestion and collision risks. Additionally, the plan encourages advanced data collection methods to inform policy development, aligning freight strategies with both local safety goals and broader regional needs.

Takeaway:

- **Use Simulation Models for Targeted Freight Planning**: Apply traffic simulation tools to assess where infrastructure changes, like additional turn lanes or extended green signals, could effectively reduce congestion and crash risk.
- **Develop Freight-Specific Performance Metrics**: Track truck delay times, incident rates, and corridor-level congestion to identify high-risk zones. These metrics provide a foundation for targeted safety interventions.
- **Integrating Freight and Land Use Planning**: Designate truck routes that align with Fort Worth's land-use plans, diverting trucks away from sensitive areas, such as school zones and pedestrian hubs.

FHWA Documents

FHWA documents provide critical insights into freight and truck traffic management, offering comprehensive strategies for monitoring traffic, forecasting demand, reducing bottlenecks, and enhancing reliability. Cities like Fort Worth can improve freight route efficiency and safety by leveraging these key areas. These documents include the FHWA Traffic Monitoring Guide[8], which provides essential guidelines for tracking and managing vehicle flow and applying performance metrics. The FHWA Freight and Land Use Travel Demand Evaluation[9] focuses on integrating freight considerations into land use planning to improve overall system efficiency and reduce congestion.

[8] Federal Highway Administration. (2022). Traffic Monitoring Guide (TMG) Final Report. https://www.fhwa.dot.gov/policyinformation/tmguide/2022_TMG_Final_Report.pdf.

[9] Federal Highway Administration. (2018). Freight and Land Use Travel Demand Evaluation. https://ops.fhwa.dot.gov/publications/fhwahop18073/fhwahop18073.pdf.

Additionally, the FHWA Methods to Improve Freight Highway Performance[10] details methodologies for addressing bottlenecks and enhancing the reliability of freight highways. Another significant report, the FHWA Freight Analysis Framework Commodity Flow Forecast Study[11], forecasts commodity flows to better understand future truck demand. Key findings from this study highlight substantial growth in freight tonnage, with a projected 40% increase by 2050, emphasizing the need for significant infrastructure investments, particularly in Texas. These documents collectively aim to enhance system performance and reliability, integrating freight considerations into planning and management practices, supporting Fort Worth's long-term infrastructure goals.

Takeaway:

- **Implement Real-Time Monitoring on Key Freight Corridors**: Track traffic volumes, crash data, and congestion trends to quickly identify and address problem areas.
- **Forecasting Demand to Guide Infrastructure Priorities**: Use freight forecasting to identify potential congestion points on Fort Worth's busiest routes, prioritizing investment to address anticipated growth.
- **Bottleneck Analysis for Targeted Improvements**: Analyze recurring congestion points and apply dynamic lanes or adjusted signals to reduce delays and incidents on high-risk segments.

National Research Reports

The National Cooperative Highway Research Program (NCHRP) and the National Cooperative Freight Research Program (NCFRP) reports provide valuable, data-driven strategies for assessing freight flow, evaluating traffic impacts, and managing congestion through innovative freight management approaches. These reports highlight technologies such as dynamic lane management and adaptive signal control, which are relevant for improving safety and flow on Fort Worth's high-traffic routes. Notable reports include NCHRP Report 739[12], which explores

[10] Federal Highway Administration. (2022). Methods to Improve Freight Highway Performance. https://ops.fhwa.dot.gov/publications/fhwahop22084/fhwahop22084.pdf.

[11] Federal Highway Administration. (2022). Freight Analysis Framework Commodity Flow Forecast Study. https://ops.fhwa.dot.gov/publications/fhwahop22037/fhwahop22037.pdf.

[12] National Cooperative Highway Research Program. (2010). NCHRP Report 739: Innovative Strategies for Managing Freight Traffic, and NCFRP Report 739: Innovative Strategies for Managing Freight Traffic. https://nap.nationalacademies.org/read/22659/chapter/1.

strategies for managing freight traffic and enhancing flow, and NCFRP Report 196, which offers insights into effective congestion management and freight solutions. Together, these resources equip Fort Worth with actionable methodologies to address congestion, reduce delays, and optimize freight movement.

Takeaway:

- **Adopt Dynamic Lane Management for Freight Routes**: Designate truck-only lanes or apply peak-hour lane adjustments to improve flow on freight corridors
- **Optimize Intersections for Truck Safety**: Redesign intersections on primary freight routes to accommodate large vehicles turning, reducing crash risks.
- **Applying Adaptive Signal Control**: Equip key intersections with adaptive signals to adjust timing based on real-time conditions, reducing delays and congestion related incidents.

Texas Freight Mobility Plan

The Texas Delivers 2050: The Texas Freight Mobility Plan, published in 2023, represents the most recent iteration of the state's long range freight transportation plan. The plan examines the key trends impacting good movement in Texas, including business and consumer practices, technology adoption, automated vehicles in Texas, energy, international trade, and natural and humanmade disruptions. A key outcome of Texas Delivers 2050 is the designation of the Texas Multimodal Freight Network (TMFN). The network consists of key roadways (the Texas Highway Freight Network [THFN]), railroads, pipelines, ports and waterways, airports and international border crossings. The multimodal network outlines the key corridors that facilitate the efficient and safe movement of goods in Texas and are most critical for focusing investment. At the federal level, the National Multimodal Freight Network (NMFN) includes highways, railways, waterways and pipelines, ports, airports, border crossings and intermodal facilities. The plan summarized the freight demand on Texas' multimodal system and discusses designation of the TMFN and the freight demand on that network and examines the roles of the TMFN network in supporting key Texas industries and supply chains. Following the TMFN designation process, the plan provides a high-level evaluation of the conditions and performance of the modes and discusses the issues and challenges affecting the current efficiency and safety of freight movements on the TMFN, covering areas of mobility, safety, asset management, and design. Finally, the plan provides a comprehensive set of strategies and recommendations to ensure the

state's economic competitiveness and reputation as a national freight and logistics hub is preserved and enhanced.

Takeaways:

- The Dallas-Fort Worth metroplex is prominent in almost all the industry cluster supply chain illustrations and has been identified as having the highest mobility, reliability, and safety needs from a freight perspective. Under the policy recommendations, the plan suggests partnerships between the state and local planning partners on strategies to address urban freight congestion and bottlenecks, and developing guidance for local partners on how to update complete streets policies to include the full range of passenger and freight modes.
- The plan also includes a key implementation action for TxDOT to **explore "bypass" routes, usage incentives, technology enhancements, and the role of land use in freight bottlenecks relief.**

NCTCOG Mobility 2045 Update

The Mobility 2045 Update, adopted in 2022, is NCTCOG's latest metropolitan transportation plan for the region. It proposed various projects, programs, and policies designed to achieve the plan's four goals of improving mobility, quality of life, system sustainability, and implementation. In its Appendix E, the plan provided freight transportation related policies and programs recommendations in four main action categories of economic growth and education, sustainability and air quality, collaboration and planning, and safety and efficiency.[13]

Takeaway:

- **Key policies** for freight transportation includes educating public and stakeholders about freight's role in economy, incorporating technological advancements, Improving safety and efficiency through innovation and facility development.

[13] NCTCOG. Mobility 2045 Update, Appendix E. https:// www.nctcog.org/getmedia/3e294f6e-8081-4612-8979-ea83c07494b1/E-Mobility-Options_1.pdf

- **Key freight programs** recommended include traffic data collection to build accurate travel model, networking planning and outreach activities to ensure the availability of transportation options, and the North Texas Multimodal Operations, Velocity, Efficiency, and Safety (NT MOVES) program to ensure adequate maintenance and enhance safety and reliability of the current freight transportation network.
- **Specific freight transportation performance measures** include vehicle classification counts, facility inventory updates, reduction in annual number of accidents, increased travel speeds for truck and non-truck traffic, improved Truck Travel Time Reliability, Increased number of truck parking locations, etc.

NCTCOG Regional Freight Planning

NCTCOG's regional freight planning team[14] has done significant work in building a prominent freight transportation network aligning with the metropolitan transportation plan and the transportation improvement programs. The team's work including analyzing freight and land use connection and mitigating environmental impact.

Takeaway:

- **Restrict truck idling:** Utilizing Electrified Parking Spaces (EPS) which provide power and climate control through window unit, driver's lounge with amenities, and on-board electric devices to allow drivers to turn off the main engine.
- **Freight-land use linkage:** Analyzing geographic distribution of freight facilities for strategic clustering, and ensuring land uses near freight developments are compatible, including truck parking, intermodal facilities, etc.

[14] NCTCOG, Freight. https://www.nctcog.org/trans/plan/freight

TTI Performance Measure Summary - Dallas-Fort Worth-Arlington TX

The Texas A&M Transportation Institute (TTI) Performance Measure Summary for the Dallas-Fort Worth-Arlington[15] area provides valuable mobility data from 2005 to 2022, highlighting persistent congestion that impacts freight and truck traffic This report identifies bottlenecks on key freight corridors, such as IH-35E in Dallas and IH-35W in Fort Worth, which have experienced increasing delays due to regional economic growth and higher freight demand. In 2022, truck delays rose by 15% over the previous year, now sitting 1% above pre-COVID levels, underscoring the growing concern over congestion's impact on freight movement. The summary also points out TxDOT's efforts to address these challenges through initiatives like the Texas Clear Lanes program, aimed at relieving major chokepoints in the transportation network.

Takeaway:

- **Focus on Targeted Congestion Relief Initiatives**: Apply the Texas Clear Lanes program to reduce bottlenecks on Fort Worth's IH-35W and IH-30 corridors, addressing delays that have exceeded pre-pandemic levels and supporting efficient freight movement.

100 Most Congested Texas Road Segments 2023 Executive Summary

The Technical Memorandum on the 100 Most Congested Texas Road Segments[16], prepared for TxDOT, provides an in-depth of critical congestion points across the state, emphasizes the economic and logistical impacts on freight and truck traffic. In the Dallas/Fort Worth region, high-congestion zones such as the IH-35W and IH-30 corridors in Fort Worth are highlighted for their significant delays, especially under rising freight demand and regional growth pressures. These corridors are critical for both regional and national freight movement, but persistent congestion drives up transportation costs, emissions, and delays in goods distribution. TxDOT's Texas Clear Lanes initiative is specifically designed to target these chokepoints, offering relief to improve freight efficiency, reduce costs, and support economic growth.

---

[15] Texas A&M Transportation Institute. (n.d.). Dallas-Fort Worth-Arlington, TX: Performance measure summary. Texas A&M Transportation Institute. https://static.tti.tamu.edu/tti.tamu.edu/documents/umr/congestion-data/urban-areas/dalla.pdf.

[16] Texas A&M Transportation Institute. (2023). Technical memorandum: 100 most congested Texas road segments 2023 executive summary. Texas A&M Transportation Institute. https://static.tti.tamu.edu/tti.tamu.edu/documents/TTI-2023-3.pdf.

Takeaway:

- **Prioritize Congestion Mitigation on Key Fort Worth Segments**: Congestion mitigation efforts should be prioritized along 100 more congested road segments, aimed at reducing transportation costs and improving freight mobility. Target congestion relief on IH-35W and IH-30 in Fort Worth to alleviate delays, lower transportation costs, and improve freight mobility

Fort Worth Ordinance Chapter 22, Article IV

The Fort Worth Ordinance Chapter 22, Article IV[17] outlines local regulations that significantly impact freight and truck traffic management within the city. To balance Fort Worth's rapid growth with the need to handle increased freight traffic effectively, these regulations are tailored to Fort Worth's unique position as a major transportation hub in North Texas. The ordinance includes guidelines on street designations and standards that directly influence freight movement and traffic management strategies. This aligns local planning with Fort Worth's broader transportation and economic goals. Key provisions include the following:

- **Designated Truck Routes:** Specific routes have been established to direct freight traffic through less congested areas, helping to maintain road quality in residential and sensitive zones. These routes, as shown in , are crafted with Fort Worth's distinctive urban layout in mind, aiming to minimize disruptions in key areas such as downtown and near cultural districts.
- **Traffic Management Standards:** The ordinance sets standards that govern freight operations, including restrictions on delivery times in high-traffic areas and guidelines for vehicle sizes on certain streets. These standards are developed with local traffic patterns in mind, promoting safety and efficiency on Fort Worth's roads.
- **Compliance Measurements:** The ordinance includes measures to maintain adherence to standards, with penalties for violations intended to discourage non-compliance. These measures are essential for maintaining smooth traffic flow, particularly in areas experiencing significant freight-related congestion.

[17] City of Fort Worth, Chapter 22: Motor Vehicles and Traffic, Article IV: Truck Traffic. https://codelibrary.amlegal.com/codes/ftworth/latest/ftworth_tx/0-0-0-24612#JD_Ch.22Art.IV

- **Technological Integration:** Recognizing Fort Worth's commitment to modernizing its infrastructure, the ordinance promotes the integration of advanced traffic management technologies, such as adaptive signal control and Global Positioning System (GPS)-based route optimization. These technologies are particularly beneficial in managing the city's complex freight traffic and reducing congestion in critical areas.
- **Economic Impact and Future-Proofing:** Fort Worth's role as a critical node in regional and national freight networks makes efficient freight management essential for the local economy. The ordinance supports this by facilitating timely deliveries and reducing transportation costs for businesses. Additionally, provisions for regular updates allow the ordinance to adapt to future changes in freight traffic patterns, including the expected rise in automated freight vehicles.

Takeaway:

While covering a wide range of truck traffic regulations, Fort Worth Ordinance Chapter 22, Article IV, could be amended to better align with the city's evolving goals of protecting health, safety, and welfare.

- **Truck route street designations** could be updated to reflect current freight needs and consider future freight volume growth.
- **Additional regulations of truck parking** (e.g. prohibiting commercial vehicles from parking in residential areas during certain hours), loading zone (designated curb space for loading and unloading), and driver rest period (mandatory rest break for truck drivers) could be incorporated into this ordinance.

An updated ordinance could effectively strengthen Fort Worth's freight transportation safety and efficiency. A few recommendations on truck ordinance revisions are provided later in this document.

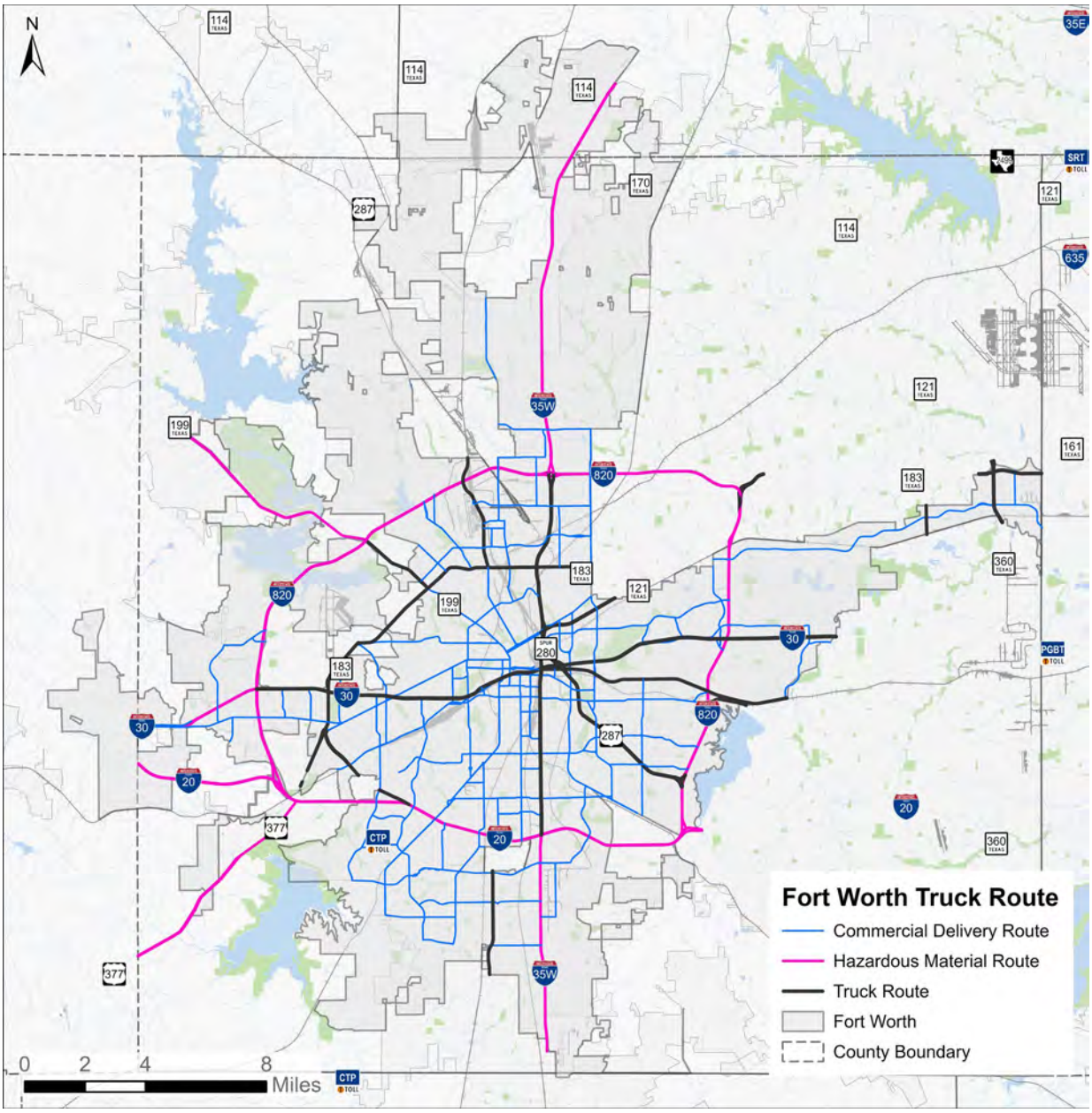


Figure 10: Current Fort Worth Truck Routes (Source: City of Fort Worth)

Freight Management: Goals, Strategies, and Case Study

This section explores the common goals and objectives derived from the reviewed literature, outlining methodologies and strategies for effective freight and truck traffic management. It integrates these findings with practical insights from the Seattle Transportation Plan to offer a comprehensive framework for improving freight systems.

Common Goals and Objectives Across FHWA and Related Documents

Across the reviewed documents, several common goals and objectives emerge, particularly focusing on freight and truck traffic management. For example:

- **Effective Freight Planning:** Aligning transportation infrastructure with the specific needs of freight-intensive areas while maintaining community livability, as highlighted in the FHWA Freight and Land Use Travel Demand Evaluation.
- **Safety Improvements**: A shared focus across documents on reducing crashes, injuries, and fatalities, such as FHWA Methods to Improve Freight Highway Performance.
- **Mobility and Reliability Enhancements**: Strategies to improve travel time reliability, reduce congestion, and manage bottlenecks are central themes, supported by USDOT National Freight Strategic Plan and other FHWA guidelines.
- **Environmental Impact Reduction:** Minimizing stops and idle time, improving fuel efficiency, and addressing congestion are emphasized in strategies from various reports, including the FHWA Methods to Improve Freight Highway Performance.

Truck Data Collection and Evaluation Methodologies

The reviewed documents also converge on methodologies for truck data collection and traffic evaluation:

- **Permanent and Short-Term Monitoring:** As detailed in the FHWA Traffic Monitoring Guide, these methods are critical for collecting continuous and periodic data on traffic volume, vehicle classification, and speed data.

- **Advanced Technologies and QA/QC:** In the 2022 FHWA Traffic Monitoring Guide, these elements emphasize the reliability of data collection and analysis, which is essential for making informed freight planning decisions.
- **Truck Platooning Research:** This research focuses on automated platooning, where trucks use coordinated driving systems to travel closely together, improving traffic flow, fuel efficiency, and safety. Data collection methods include field tests, simulations, and pilot programs to evaluate real-world impacts on Texas highways. [18]
- **Vehicle Classification Data:** FHWA uses methodologies to classify vehicle registration data according to their classification systems. This helps in analyzing transportation policies and technical aspects[19].
- **Freight Bottleneck Reporting:** States are provided with a guidebook to report truck freight bottlenecks. This involves collecting data on traffic congestion points and analyzing their impact on freight movement[20].
- **Research Partnerships:** FHWA collaborates with state transportation departments, local agencies, industries, and academia to conduct research on national significance issues. This partnership helps in gathering comprehensive data and evaluating the effectiveness of various transportation technologies[21].

Strategies to Reduce Truck Traffic and Congestion

Effective strategies to mitigate truck traffic and manage congestion are widely discussed across the literature:

- **Curb Management and Alley Usage:** These strategies are highlighted in the Final 50-Feet-of-Urban-Goods-Delivery report as practical approaches to reducing congestion in urban areas.

---

[18] U.S. Department of Transportation. (2021). Truck Platooning Final Report https://highways.dot.gov/media/2336

[19] Federal Highway Administration (FHA). (2021). Linking FHWA and NHTSA Vehicle Types and Deciphering Various Truck Weight Data: Methodology for Linking Vehicle Types. https://rosap.ntl.bts.gov/view/dot/63222

[20] U.S. Department of Transportation. (2018). Truck Freight Bottleneck Reporting Guidebook. https://ops.fhwa.dot.gov/freight/freight_analysis/perform_meas/index.htm

[21] U.S. Department of Transportation. (2021). Truck Platooning Final Report https://highways.dot.gov/research/publications/corporate/FHWA-HRT-20-071

- **Technological Solutions:** Real-time data and advanced technologies are frequently used to enhance efficiency and reduce delivery times in traffic management.

Integration of Freight Needs with Land Use Pattern

A key theme in the documents is the integration of freight needs with land use planning:

- **Freight-Generating Land Use:** Planning for freight-intensive areas is essential for managing future demand and verifying transportation networks, according to the FHWA Freight and Land Use Travel Demand Evaluation.

Addressing Future Truck Demand and Innovation in Methodologies

In the literature, an emphasis is placed on preparing for future truck demand and exploring innovative solutions:

- **Enhanced Freight Trip Generation Models:** Freight activity forecasting and planning are essential using the models discussed in the NCHRP and NCFRP reports.
- **Infrastructure Investment Needs:** In order to accommodate the projected growth in freight tonnage by 2050, the FHWA Freight Analysis Framework Commodity Flow Forecast Study recommends investing in infrastructure.

Freight Data Platforms

This section provides an overview of various freight data platforms, including the Freight Analysis Framework (FAF), Replica, and the NCTCOG travel demand models. These platforms are pivotal in transportation planning, offering insights into travel patterns and supporting infrastructure development and policy making. Traditional data collection methods have served as the backbone of traffic analysis for decades; however, innovative technology solutions are set to revolutionize the field, providing more accurate, real-time data that can significantly enhance the predictive power of travel demand models.

Freight Analysis Framework

The FAF[22] dataset offers comprehensive estimates of freight flows within the United States. Drawing from a variety of sources, including the Commodity Flow Survey and international trade data from the Census Bureau, FAF integrates data from sectors such as agriculture, extraction, utilities, construction, services, and more. This provides a holistic view of freight movements in major metropolitan areas. The dataset includes:

- **Base Year and Forecasts:** Data for the base year 2012, with forecasts every five years from 2020 to 2045. This helps assess long-term trends and planning.
- **Freight Flow Estimates:** Detailed estimates by tonnage, value, and ton-miles provide insights into the volume and economic significance of freight movements.
- **Commodity Insights:** Information on 42 different commodity types, offering a broad perspective on the variety of goods transported.

The strengths of the FAF lie in its comprehensive national coverage and its ability to provide detailed freight flow estimates. However, its periodic updates and lack of real-time data can limit its utility for immediate operational decisions. Recent updates have improved FAF's functionality by incorporating new data sources such as satellite imagery and real-time traffic sensors, and by adopting advanced forecasting models that better adapt to evolving trade patterns. FAF data has been effectively used in various projects to influence transportation planning and policy, demonstrating its value in understanding freight movement trends and guiding infrastructure investments.

[22] Freight Analysis Framework. https://www.bts.gov/faf/faf4

Replica BigMobility Data Platform

Replica's platform[23] is designed to support a wide range of analyses and operational monitoring by providing detailed and accurate mobility data. Its focus on freight and truck data includes metrics such as Annual Average Daily Traffic, Commercial Freight Trip Data, Network Link Volumes, and Hourly Volume Data. Replica's real-time data capabilities make it particularly valuable for understanding and managing commercial transportation patterns.

Replica's strengths lie in its real-time data provision and detailed traffic metrics, including disaggregated freight information. However, its data coverage might be limited to specific regions, potentially affecting its applicability in less covered areas. Recent enhancements to Replica include the integration of advanced data analytics through machine learning algorithms for improved trend prediction and an expanded geographic coverage to include additional regions and cities. Use cases demonstrate Replica's effectiveness in urban traffic management and infrastructure planning, where its data has been applied to optimize traffic signal timings and assess the impact of new developments.

NCTCOG Travel Demand Model

The NCTCOG[24] utilizes the Transportation Analytical Forecasting Tool (TAFT) within the TransCAD environment to project vehicle activities, including freight and truck traffic, in the Dallas-Fort Worth area. TAFT four-step process—Trip Generation, Trip Distribution, Mode Choice, and Roadway Assignment—provides a comprehensive approach to estimating travel patterns and demand across different scales.

The NCTCOG Transportation Department oversees TAFT's implementation and conducts regional planning studies, offering technical support to the Regional Transportation Council and its technical committees, which form the Metropolitan Planning Organization's policy-making entity.

In the realm of truck planning, NCTCOG tracks truck travel trends to guide project prioritization and infrastructure enhancements, critical for long-term planning. This involves assessing truck movements to gauge the impact of potential projects on goods movement. The organization also tackles key truck transportation challenges, including inadequate infrastructure, increasing

---

[23] The Replica Platform. The Replica Platform: A Holistic Picture of Mobility (replicahq.com)

[24] North Texas Council of Governments. (2023). 2023 Transportation Conformity. 2022 Transportation Conformity (nctcog.org).

congestion, stagnant productivity, air quality, and safety issues. The growth in trade, particularly following the North American Free Trade Agreement, has intensified truck traffic, underscoring the need for such detailed planning and predictive models.

TAFT incorporates adjustments for the Highway Performance Monitoring System, non-recurring congestion, and time-of-day variations to reflect an August weekday scenario, enhancing the model's precision in predicting vehicle miles traveled and other travel metrics for long-term planning. TAFT's strengths include its thorough modeling process and its ability to integrate real-time data with adjustments for factors such as non-recurring congestion. However, the model's computational demands and adjustments for specific scenarios may not always capture unique local conditions effectively. Recent updates to TAFT involve enhanced integration with real-time data from traffic sensors and GPS devices, as well as advanced scenario analysis capabilities to better evaluate potential projects and policy changes. These improvements have enhanced TAFT's accuracy for long-term planning and truck traffic analysis, supporting NCTCOG's efforts in infrastructure project prioritization and regional planning.

Comparison of Platforms

Freight Analysis Framework (FAF) offers national freight flow estimates, enabling Fort Worth to understand regional trends and identify high-volume corridors. This data helps inform safety-focused infrastructure measures, especially in areas with significant through-traffic.

Replica provides real-time data on congestion and hourly traffic volumes specific to Fort Worth. Monitoring these insights allows the city to make timely traffic management adjustments on key freight routes, reducing both congestion and crash risks.

TAFT (NCTCOG Travel Demand Model) is long-term forecasting and scenario analysis aid Fort Worth in anticipating future freight demand and prioritizing infrastructure planning. This model supports proactive safety measures by pinpointing corridors where truck traffic is projected to increase.

Takeaway

Freight Management: Use FAF for broad freight flow trends, Replica for real-time traffic management, and TAFT for long-term infrastructure planning, which allows for a well-rounded approach to truck safety and efficiency in Fort Worth's freight network.

Innovative Technology Solutions

Real-time analytics are increasingly important for modern traffic management systems. These systems use real-time data to dynamically monitor and manage traffic conditions, improving efficiency and safety. Intelligent Transportation Systems (ITS) play a critical role in enhancing traffic flow and reducing congestion. Key ITS components include:

- **Real-Time Traffic Monitoring:** This technology uses live data from various sources to provide real-time traffic updates and predictive analytics. It helps cities manage traffic conditions dynamically by offering insights into traffic flow, congestion, and incidents. Key platforms include Google's Waze and INRIX, which use crowd-sourced information to improve traffic management and planning.
- **Adaptive Signal Control Technology (ASCT):** ASCT adjusts traffic signal timings based on real-time traffic conditions. This optimization helps to enhance traffic flow, reduce delays, and improve overall efficiency at intersections. Technologies from vendors like Siemens and Econolite are commonly used to dynamically manage signal timings in response to current traffic patterns.
- **Automated Incident Detection (AID):** AID systems utilize sensors and cameras to automatically detect and respond to traffic incidents. This technology allows for quicker response to incidents, minimizing disruptions and improving traffic management. Vendors such as Transcore and Kapsch offer systems that enhance incident detection and response. TxDOT Fort Worth TMC would be responsible for automated incident detection along highway corridors, while Fort Worth could implement these systems on city-managed truck routes and high-traffic areas, enhancing localized incident response and management.
- **Signal Preemption and Prioritization:** These systems adjust traffic signals to prioritize certain types of vehicles, such as emergency vehicles or public transit. Signal preemption involves sensors or communication technologies that detect the approach of priority vehicles, changing signal phases to clear their path. This reduces delays for emergency services and public transit. Providers like Rekor and BlueHalo offer solutions in this area.
- **Advanced Traffic Signal Performance Measures (ATSPM):** ATSPM systems monitor and analyze traffic signal performance to assess their effectiveness and identify areas for improvement. They provide detailed insights into signal timing, vehicle delays, and

operational efficiency, helping agencies optimize signal operations. Vendors such as Miovision and NoTraffic offer ATSPM solutions that support traffic signal optimization and performance analysis.

- **Fort Worth's partnership with TxDOT's Fort Worth District** on the TSMO plan could enhance city managed ITS initiatives by providing access to regionally coordinated data and best practices. This collaboration would allow Fort Worth to align signal control and incident response strategies with regional plans, improving both traffic flow and safety on high-demand freight routes.

Case Studies

Real-Time Traffic Monitoring

In San Francisco, Waze's platform[25] was integrated into the city's traffic management system through the Waze Connected Citizens Program. This integration provided the city with real-time traffic data, enabling more effective congestion management and route optimization. The platform's crowd-sourced information helped San Francisco optimize traffic flow and respond to incidents more efficiently, contributing to a more responsive and adaptable traffic management system.

Expanding the use of Fort Worth's existing real-time traffic monitoring for truck traffic could provide better freight movement management. With Fort Worth's growing population and rising demands, the system could reduce congestion and enhance overall mobility within the city. This initiative would align with Fort Worth's objectives of improving transportation infrastructure and operational efficiency.

Adaptive Signal Control Systems

In Los Angeles, Siemens' adaptive signal control technology[26] was implemented to reduce travel times and improve overall traffic efficiency. The system adjusts traffic signal timings based on real-time traffic conditions, leading to smoother traffic flow and reduced delays. This adaptive

---

[25] Waze. (n.d.). Waze for cities: San Francisco case study. Waze Connected Citizens Program. https://www.waze.com/wiki/USA/Waze_for_Cities

[26] Siemens Mobility. (n.d.). Los Angeles adaptive traffic signal control case study. Siemens Mobility. https://new.siemens.com/global/en/products/mobility.html

approach has been crucial in managing the city's heavy traffic, including areas with significant truck traffic.

While being utilized in the Alliance Area, implementing adaptive signal control technology in other regions of Fort Worth could optimize traffic signal timings especially along routes frequently used by trucks. This would help reduce congestion during peak hours and improve the efficiency of truck traffic, supporting Fort Worth's transportation goals.

Automated Incident Detection

In New York City, Transcore's AID systems[27] have been deployed to enhance the city's incident detection and response capabilities. These systems use sensors and cameras to monitor traffic in real time, allowing for quick identification and management of traffic incidents, including those involving trucks.

For Fort Worth, adopting systems like Transcore's AID systems could significantly improve the city's ability to manage traffic incidents, particularly those involving trucks. Quick detection and response could help reduce the impact of accidents on major truck routes, supporting smoother traffic operations and enhanced safety.

Signal Preemption and Prioritization Systems

Rekor's signal preemption solutions[28] have been implemented to prioritize emergency vehicles, ensuring they can navigate through intersections quickly and safely. This system detects approaching emergency vehicles and adjusts traffic signals accordingly, which is especially useful in areas with heavy truck traffic. The NCTCOG has announced traffic signal technology system partnerships to help trucks move more efficiently through some of the region's key freight corridors. The City of Fort Worth, along with other cities in the region and Dallas Fort Worth International Airport, is helping to deploy a Freight Signal Optimization Program across more than 500 traffic signals in their jurisdictions. This technology could be further utilized to enhance emergency response times, particularly in areas with high truck traffic. This could be critical in reducing delays during emergencies and improving public safety in truck-heavy corridors.

---

[27] Transcore. (n.d.). New York City automated incident detection case study. Transcore Traffic Management Solutions. https://transcore.com/

[28] Rekor Systems. (n.d.). Traffic Solutions: Signal Preemption case study. Rekor Systems. https://rekor.ai/traffic-solutions

ATSPM

Miovision's ATSPM solutions[29] are used in various cities to optimize traffic signal timings and reduce delays by providing comprehensive performance analysis. These systems offer detailed insights into signal operations, which is particularly valuable in managing truck traffic.

Fort Worth could expand the use of ATSPM under the Transportation Systems Management and Operations (TSMO) policy to optimize traffic signals along key truck routes, reducing delays and improving traffic flow. This could be especially beneficial in managing the city's growing truck traffic.

[29] Miovision. (n.d.). case studies: ATSPM. Miovision. https://miovision.com/case-studies

Case Studies and Recommendations on Truck Route and Restriction Rules

As requested by the project management team, guidelines and case studies are reviewed specifically on truck route and restriction rules, including criteria for adding/removing truck routes and designation of no-trucking routes.

General Factors for Identifying and Designating Truck Routes

State and local agencies can designate truck routes or prohibit all trucks, or trucks of particular size or weights, from using roads that are not part of the National Network. General factors for identifying and designating truck routes include:[30]

- Truck Characteristics
    - Design vehicle dimensions and turning performance
    - Existing and anticipated usage by oversize/overweight vehicles
- Roadway Network Characteristics
    - Functional classification
    - Network constraints
    - Position of roadway in transportation network and connectivity needs
    - Available alternative routes
- Roadway facility characteristics
    - Lane Width
    - Shoulder width (e.g., TxDOT manual suggests 12-ft width for route utilized by large trucks.31)
    - Traffic-signal spacing

[30] Design and Access Management Guidelines for Truck Routes: Planning and Design Guide (2020). Chapter 3 - Planning for Truck Routes and Other Related Considerations | Design and Access Management Guidelines for Truck Routes: Planning and Design Guide | The National Academies Press

[31] TxDOT Roadway Design Manual (2022). https://ftp.txdot.gov/pub/txdot/crossroads/des/documents/roadway-and-hydraulics-design/rdw-may-2022.pdf

  - Driveway density and design
  - Median treatment and related features
  - Auxiliary lanes
  - Presence of bicycle facility
  - Height/Weight restrictions (e.g., TxDOT set routes with vertical clearance lower than 14' not for truck; . TxDOT indicated in the manual that more than standard connection (driveway) spacing distance [200 ft for under 30 mph, 425 ft for more than 50 mph] is needed for truck traffic.32)
- Land-use and environmental characteristics
  - Land use immediately adjacent to roadway
  - Location relative to land uses generate truck movements
  - Location relative to environmentally sensitive areas
- Operational and safety characteristics
  - Traffic and truck volume and congestion levels
  - Pedestrian and bicycle volume
  - Traffic speed
  - Split between through traffic vs local traffic

Case Studies

The City of Cambridge is committed to reducing the adverse impacts of truck noise and vibrations on residents while ensuring the continued delivery of goods and services to businesses and residences in the city.

Key criteria for a truck exclusion from a municipal way include, a suitable alternative route is available and one or more of the following:[33]

- There is at least 5% heavy commercial vehicles
- Heavy wheel loads will result in severe deterioration of the roadway

[32] TxDOT Access Management Manual (2011). Access Management Manual: Number, Location, and Spacing of Access Connections

[33] City of Cambridge. Truck Restricted Streets List. https://www.cambridgema.gov/traffic/sustainabletransportation/trucks/truckrestrictedstreetslist

- Land use is primarily residential and the municipality has requested exclusion only during hours of darkness.

Truck restriction (no truck/bus route) criteria of City of Washington D.C. are based on traffic volume, roadway characteristics, network connectivity, safety, functional classification, and stakeholder feedback.[34]

Legacy request-based truck and bus restrictions of Washington D.C included:

- Street must be functionally classified as local
- Street must not be a designated truck or bus route
- Observed trucks traffic must be 50% of that on truck routes and not related to construction/temporary cause
- Observed truck traffic must not be local deliveries

Current approaches that Washington D.C is taking includes:

- All streets with "local" functional classification to be through-truck restricted
- Only streets with a local functional classification to be through truck restricted, with exceptions for security, land use, or engineering characteristics

Considerations for Adding and Removing Truck Routes

To meet Fort Worth's evolving urban and residential needs, it is recommended that the city adopt clear criteria for adding or removing truck routes. Suggested criteria based on peer city practices and literature review include:

- **Traffic Volume and Impact Analysis**: Evaluate truck volume on each route using data from platforms like Replica and the NCTCOG Travel Demand Model. Specific thresholds for volume or road wear, as recommended by sources like FHWA's FAF, could be established to identify if truck traffic on certain roads is causing excessive wear, congestion, or conflicts with residential or pedestrian areas.
  Relevant references: FHWA's FAF or NCHRP studies detail volume-based impacts on roadways, providing quantitative thresholds for assessment.

[34] Truck Routes & Restrictions
https://www.mwcog.org/file.aspx?A=KTAL1uVnc%2FANC5MEedOjm7eB19fHWhRbI2xzGdQgyS4%3D

- **Industrial and Commercial Land Use Patterns**: Prioritize truck routes that align with industrial and commercial zones. Overlay designated truck routes on land use maps to confirm alignment with the most recent zoning changes. This is noted in Fort Worth's Master Thoroughfare Plan and FHWA guidelines that emphasize strategic alignment of freight routes with land use to avoid residential conflicts.
  Relevant references: Fort Worth's Master Thoroughfare Plan and FHWA guidelines on land use compatibility for freight routes support route alignment recommendations.
- **Safety and Crash Data**: Analyze crash data involving trucks to identify high-risk areas. Consider thresholds based on crash rates, such as a higher increase in truck-involved incidents on a given route, as suggested by studies from NCHRP reports on crash risk mitigation and adjust or remove truck routes in residential or pedestrian-heavy zones accordingly.
  Relevant references: NCHRP's crash risk analysis guidelines provide criteria for when to adjust or remove truck routes based on crash frequency and severity.
- **Resident Feedback**: Regularly collect and review resident input regarding truck traffic concerns, especially in residential neighborhoods. Integrate this feedback into truck route planning to reflect community needs.
  Relevant references: NCTCOG freight planning and public engagement guidelines outline best practices for incorporating public feedback in truck route planning.

Considerations for Designated No-Trucking Routes

To address resident concerns regarding truck traffic in certain neighborhoods, the city may consider designating specific roads as no-trucking routes. The following guidelines can help determine no-trucking zones:

- **Residential and Sensitive Areas**: Identify residential neighborhoods, school zones, and areas with high pedestrian activity where truck traffic should be minimized. Collaborate with NCTCOG's land use and mobility planning data to pinpoint sensitive areas, applying quantitative thresholds where feasible to assess no-trucking designations.
  Relevant references: NCTCOG land use data and FHWA safety studies for no-trucking zones in sensitive residential areas can guide data-based truck restrictions decisions.
- **Alternative Freight Corridors**: Designated no-trucking routes should be supported by accessible alternate truck routes that meet infrastructure and capacity needs, avoiding

residential disruption. This alignment minimizes rerouting impacts and encourages compliance.

Relevant references: Seattle Freight Master Plan's best practices for alternative freight corridors provide insights into managing rerouted freight traffic effectively.

- **Signage and Enforcement**: Install clear signage in no-trucking zones, indicating truck access restrictions. Coordinate with enforcement agencies to monitor compliance and respond to violations, encouraging adherence to no-trucking zones

  Relevant references: FHWA's guidelines on signage and enforcement in restricted zones.

Considerations for Infrastructure Support and Truck Parking Needs

Truck parking facilities are critical to supporting safe and legal truck parking in Fort Worth, reducing illegal parking in neighborhoods. Current truck parking availability along key freight corridors shows significant gaps. The following actions are recommended:

- **Mapping and Assessing Existing Truck Parking Facilities**: Utilize TxDOT's Texas Statewide Truck Parking Study to map existing facilities. Identify gaps through analysis, using thresholds from FHWA's Freight and Land Use guidelines on parking facility adequacy to assess parking availability in high-demand corridors.

  Relevant references: TxDOT's Truck Parking Study or FHWA guidelines support the assessment of truck parking adequacy along key freight routes.
- **Identifying High-Need Locations for New Truck Parking**: Based on current and forecasted freight volumes on major corridors like IH-35W and IH-30, pinpoint locations where additional truck parking facilities could alleviate pressure on existing sites. Consider locations close to industrial hubs, like Alliance Airport and South Fort Worth.

  Relevant references: Texas Statewide Analysis Model (SAM-V4) projections on future truck demand validate the need for expanded parking facilities in high-need areas.
- **Enhancing Parking Facility Capacity**: Collaborate with private parking providers along IH-35W, where multiple facilities are currently over capacity, to explore capacity expansion or the development of new facilities. Public-private partnerships could expand truck parking solutions across the city.

Relevant references: FHWA public-private partnership case studies illustrate successful collaborations for expanding parking capacity.

Incorporating Recommendations into City Ordinance

City Ordinance Chapter 22, Article IV could be amended to incorporate criteria for adding/removing truck routes and establishing designated no-trucking zones. Furthermore, this ordinance could include provisions for enforcing no-trucking routes and specifying truck parking locations to better manage truck traffic and alleviate community concerns.

Relevant references: FHWA's Freight and Land Use Travel Demand Evaluation and Freight Mobility and Safety Enhancement Guidelines emphasize the importance of clear criteria within city ordinances for truck management, supporting these proposed ordinance revisions.

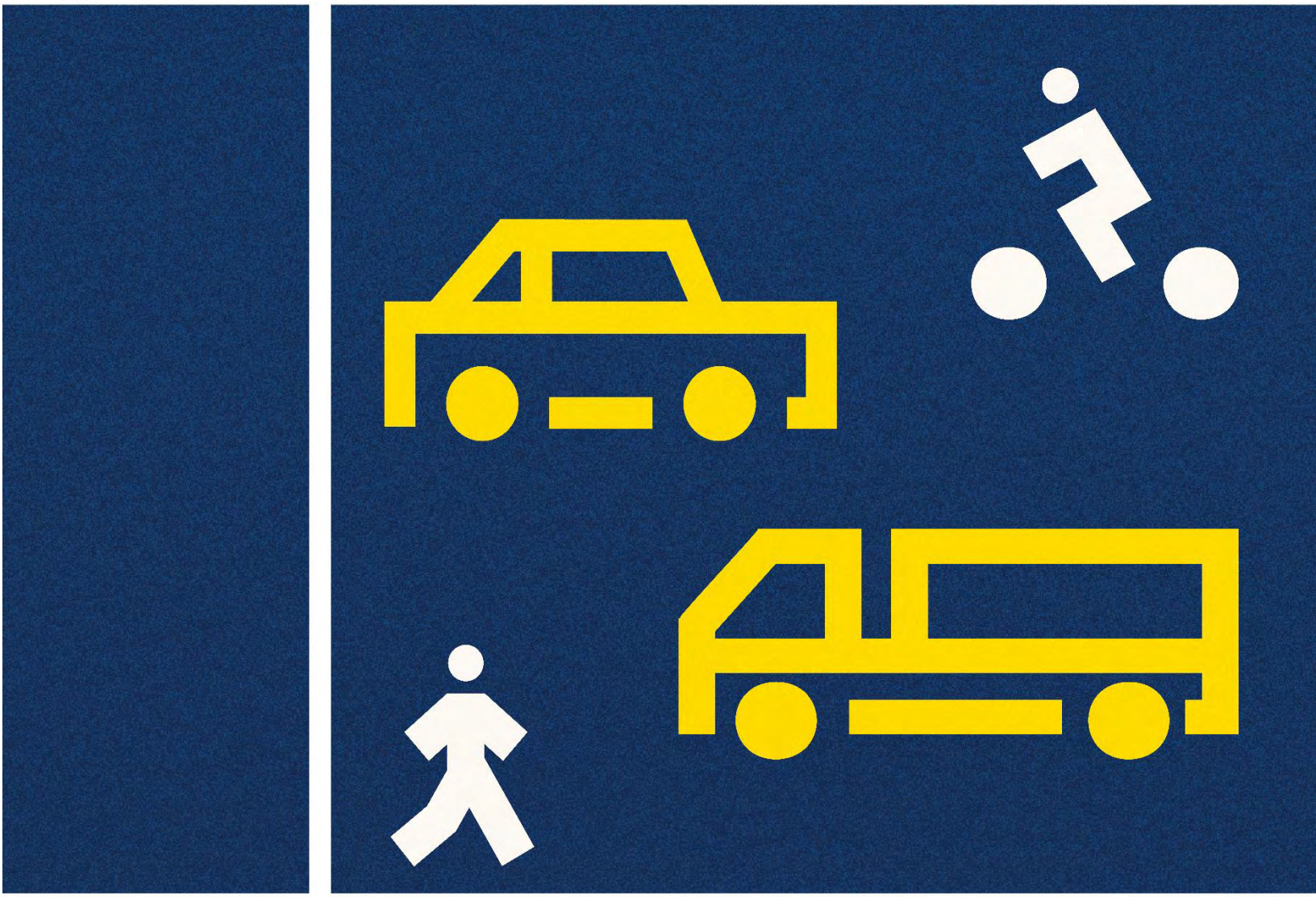
Summary

This truck traffic evaluation presents the current state of Fort Worth's freight movement, including crash data, trip volumes, origin-destination analysis, and trip duration, highlighting the high volume and relatively elevated crash rates of freight traffic within the city. Through reviewing city, federal, and industry literature and analyzing Fort Worth's existing truck traffic ordinance, this report identifies recommendations for improving truck traffic management and safety. It is important to note that, when developing actions and implementing some of the recommendations included in this report, the close coordination between City and other regional partners, such as TxDOT, counties, and NCTCOG is crucial for the success of the implementation.

Key recommendations include establishing criteria for adding and removing truck routes to better align freight movement with industrial growth and safety objectives. In addition, the implementation of designated no-trucking zones in residential and sensitive areas to respond to community concerns are recommended. Specific quantitative thresholds from federal and regional studies strengthen these recommendations, supporting data-backed decisions about route adjustments and parking expansions. Additionally, the report highlights strategies for technology-driven traffic management, such as adaptive signal control and automated incident detection, which can further support Fort Worth's goals for freight efficiency and safety.

By integrating these targeted recommendations with broader citywide goals like congestion reduction and environmental sustainability, Fort Worth can achieve a balanced approach to supporting freight needs while preserving residents' quality of life.

FORT WORTH 2050



APPENDIX F
Corridor and Intersection Prioritization

Table of Content

Corridor Prioritization 2

Intersection Prioritization 4

Corridor Prioritization

This section outlines the framework used to prioritize locations for implementing safety treatments and projects in the City of Fort Worth as part of the Vision Zero Safety Action Plan (VZ SAP). The framework is designed to support data-informed decision-making and guide the allocation of limited resources toward locations with the most critical safety needs—ultimately helping the City advance toward the goal of zero traffic fatalities and serious injuries.

The table below presents the proposed prioritization metrics, which are grouped into three broad categories:

1. **Crash history and roadway characteristics**
2. **Land use and contextual factors**
3. **Social Vulnerability considerations**

By incorporating metrics in these categories, the framework elevates roadways with a high incidence of historical crashes, physical characteristics linked to increased crash risk, proximity to key destinations, and locations within social vulnerability focus areas.

Table 1. Corridor Prioritization Framework

Category	Metric	Description	Weight	Score
Crash History and Roadway Characteristics	Segment located on HIN	Segment located on one or more mode-specific HINs	25%	• 5 points - segment is part of 3 or more mode-specific HINs • 3 points - segment is part of 2 mode-specific HINs • 1 point - segment is part of 1 mode-specific HIN
	High crash rate segments	Total number of crashes normalized by VMT	20%	Based on the comparison with all HIN corridors • 5 points – 5th quintile • 3 points – 4th quintile • 1 point – 3rd quintile
Land Use and Context	Destination Density (schools and parks)	Number of destinations within 0.25 mile	15%	Based on the number of destinations per mile • 5 points – 5th quintile • 4 points – 4th quintile • 3 points – 3rd quintile • 2 points – 2nd quintile • 1 point – 1st quintile

	Population Density	Population density within 0.25 miles - based on proportional area overlap	10%	Based on the highest quintile block group within 0.25 miles compared to other network segments • 5 points – 5th quintile • 4 points – 4th quintile • 3 points – 3rd quintile • 2 points – 2nd quintile • 1 point – 1st quintile
	Transit Stops	proximity (within 0.5 mile) to a transit stop	10%	• 5 points – Yes • 0 point - No
Social Vulnerability	Social Vulnerability Index	Roadway segments that are in communities with high overall social vulnerability	20%	• 5 points – High social vulnerability • 3 points – Medium-High social vulnerability
Total			100%	

Based on the prioritization framework, roadway segments were scored using the identified metrics to determine the top project locations. The highest-ranking locations were then selected for Road Safety Assessments (RSAs), which were conducted for the top 10 segments. These assessments helped identify site-specific safety issues and informed the selection of appropriate countermeasures. As a result, a set of capital infrastructure projects was developed to address safety concerns at the evaluated locations.

In developing these recommendations, the following factors were considered:

- **Infrastructure Needs** – For example, whether a location meets the signal warrant criteria for a new traffic signal
- **Capital Replacement** – Frequency of equipment failure and the need for system upgrades
- **Federal/State Legal Requirements** – Ensuring compliance with current design and operational standards
- **Service Deficiencies** – Opportunities to improve mobility and traffic operations, particularly through signal enhancements
- **Leverage Opportunities** – Coordination with existing plans and funding sources such as the Bond Program, Master Transportation Plan, HSIP, grants, and impact fees

For additional detail on the Road Safety Assessments and recommended improvements for specific corridors, please refer to **Appendix G – Corridor Road Safety Assessment**.

Intersection Prioritization

Similar to corridors, intersections were prioritized to identify High Injury Intersections (HIIs) in order to guide investment in targeted safety improvements where they are most needed.

The High Injury Intersection (HII) analysis began with a comprehensive review of all intersections within the City of Fort Worth and all intersection-related crashes. A detailed methodology for assigning crashes to specific intersections is provided in **Appendix B - State of Safety Report**.

Each intersection was assigned a severity-weighted score, calculated separately for five modes of travel:

- Pedestrian
- Bicyclist
- Motorcyclist
- Motor vehicle
- Commercial Motor Vehicle (CMV)

The following table summarizes the injury severity weights used in the scoring.

Table 2. Crash weighting by injury severity

Severity	Description	Weight
K	Fatal injury	3
A	Suspected serious injury	3
B	Suspected minor injury	2
C	Possible injury	1
O	Not injured	0

These modes and severity weights align with the methodology used in the High Injury Network (HIN) analysis and the descriptive statistics previously developed. For more on how modes were assigned to crashes, refer to **Appendix B - State of Safety Report.**

To classify intersections as part of a modal HII, modal scores were analyzed to determine a threshold (or cut-off) value. There is no fixed formula for setting these cut-off scores; rather, they were determined through a blend of data analysis and professional judgment. The goal was to identify intersections that account for a meaningful share of serious injury and fatal crashes without capturing too many locations, which would dilute the results. This process was conducted separately for each mode.

The final HII includes any intersection that met the cut-off for at least one mode. The table below summarizes the cut-off scores, the number of intersections identified, and the proportion of crashes those intersections represent

Table 3. HII by mode and their associated crashes

Mode	Cut-off	Intersections		Crashes included			
		Total	*Percentage*	*Total*		*Percentage*	
				All	*K/A*	*All*	*K/A*
Pedestrian	3	110	0.49%	194	94	48.38%	100%
Bicyclist	3	30	0.13%	33	28	20.25%	100%
Motorcyclist	3	124	0.55%	154	124	36.49%	100%
Motor vehicle	20	105	0.47%	4,732	156	18.83%	20.86%
CMV	3	38	0.17%	194	23	13.91%	100%
Overall *	**N/A**	**347**	**1.54%**	**7,320**	**416**	**29.12%**	**55.61%**

* Note: Overall values are not the sum of modal values. Intersections may appear on multiple modal HIIs, and individual crashes may involve multiple modes or be counted under different intersection classifications.

In addition to scoring intersections based on crash history, each intersection was evaluated for its relationship to the modal High Injury Networks (HINs). Intersections were flagged if they fell along an HIN segment for a given mode. For details on HIN development, refer to **Appendix B - State of Safety Report**.

It is important to note that an intersection's crash score or rank does not need to correlate directly with its presence on the HIN. For instance, a corridor may appear on the HIN due to high non-intersection crash volumes, even if the intersections themselves are not high-ranked. Nonetheless, such intersections remain critical for consideration in safety planning due to their network context.

FORT WORTH 2050

APPENDIX G
Corridor Road Safety Assessment

Table of Contents

Executive Summary 3

Introduction 5

Process and Methodology 7

Road Safety Assessment 7

Field Data Collection 7

Corridor Context Review 8

Crash Data Analysis 8

Countermeasure Recommendations 9

Countermeasure Selection 9

Crash Modification Factor 10

Countermeasure Selection Toolbox 10

Countermeasure Combination 11

Benefit-Cost Analysis 12

Corridor Recommendations 14

Corridor 1: Ellis Avenue 14

Corridor 2: Evans Avenue 29

Corridor 3: Mark IV Parkway 42

Corridor 4: NW 14th Street 53

Corridor 5: NW 26th Street 64

Corridor 6: Pennsylvania Avenue 75

Corridor 7: Beach Street 98

Corridor 8: Sharondale Street 14

Corridor 9: Sycamore School Road.....118

Corridor 10: W Seminary Drive 136

Executive Summary

A comprehensive road safety assessment was conducted for ten priority corridors, resulting in safety improvement recommendations supported by a benefit-cost analysis. These recommendations will help guide the City's future investments in safety enhancements, offering a roadmap to assess project costs, benefits, and implementation timelines. The study evaluates each corridor's existing conditions through fieldwork observations and analyzes crash history using data from 2019 to 2023.

The ten corridors studied in this project include the following:

1. Ellis Avenue from NW 21st Street to NW 28th Street
2. Evans Avenue from E Morningside Drive to E Berry Street
3. Mark IV Parkway from Meacham Boulevard to Cantrell Sansom Road
4. NW 14th Street from N Main Street to Gould Avenue
5. NW 26th Street from N Main Street to Angle Avenue
6. Pennsylvania Avenue from S Main Street to 8th Avenue
7. S Beach Street from Avenue H to Mitchell Boulevard
8. Sharondale Street from 6th Avenue to James Avenue
9. Sycamore School Road from South Freeway to W Everman Parkway
10. W Seminary Drive from 6th Avenue to Rector Avenue

Our recommendations to reduce crashes for all modes and enhance safety along the ten corridors are based on speed management, pedestrian/bicyclist safety, roadway departure, intersection, and crosscutting countermeasures. Each countermeasure is examined alongside a crash modification factor (CMF) and cost-benefit ratios. The table below summarizes the final cost-benefit ratio for each corridor, as well as overall.

Table 1: Cost/Benefit Summary

	Corridor	Cost	Benefit	Benefit/Cost
1	ELLIS AVE	$2,676,600	$57,280,000	22.78
2	EVANS AVE	$3,401,300	$18,840,000	5.54
3	MARK IV PKWY	$5,063,400	$92,480,000	18.26
4	NW 14TH ST	$1,373,000	$66,020,000	48.08
5	NW 26TH ST	$1,553,700	$10,400,000	6.69

6	PENNSYLVANIA AVE	$3,558,400	$109,940,000	30.90
7	S BEACH ST	$1,177,100	$20,060,000	17.04
8	SHARONDALE ST	$764,900	$16,880,000	22.07
9	SYCAMORE SCHOOL RD	$4,854,600	$128,960,000	26.56
10	W SEMINARY DR	$4,578,300	$164,000,000	35.82
	Overall	**$28,991,300**	**$684,860,000**	**23.62**

Introduction

As part of the Fort Worth Vision Zero Safety Action Plan (SAP), a data-driven prioritization was conducted to rank roadway segments on identified HINs based on crash history, roadway characteristics, land use, context, and social vulnerability considerations. This prioritization helps the City to better plan and allocate funding for safety improvements at the most needed locations. For details about the prioritization methodology, please refer to **Appendix F**.

Based on the prioritization results, the City identified 10 corridors, as shown in **Figure 1**, for a more detailed roadway safety assessment and capital project recommendations. These 10 corridors score among the top 15 and are often part of multiple modal HINs. Their extent, functional classification, and modal HIN are listed in **Table 2**.

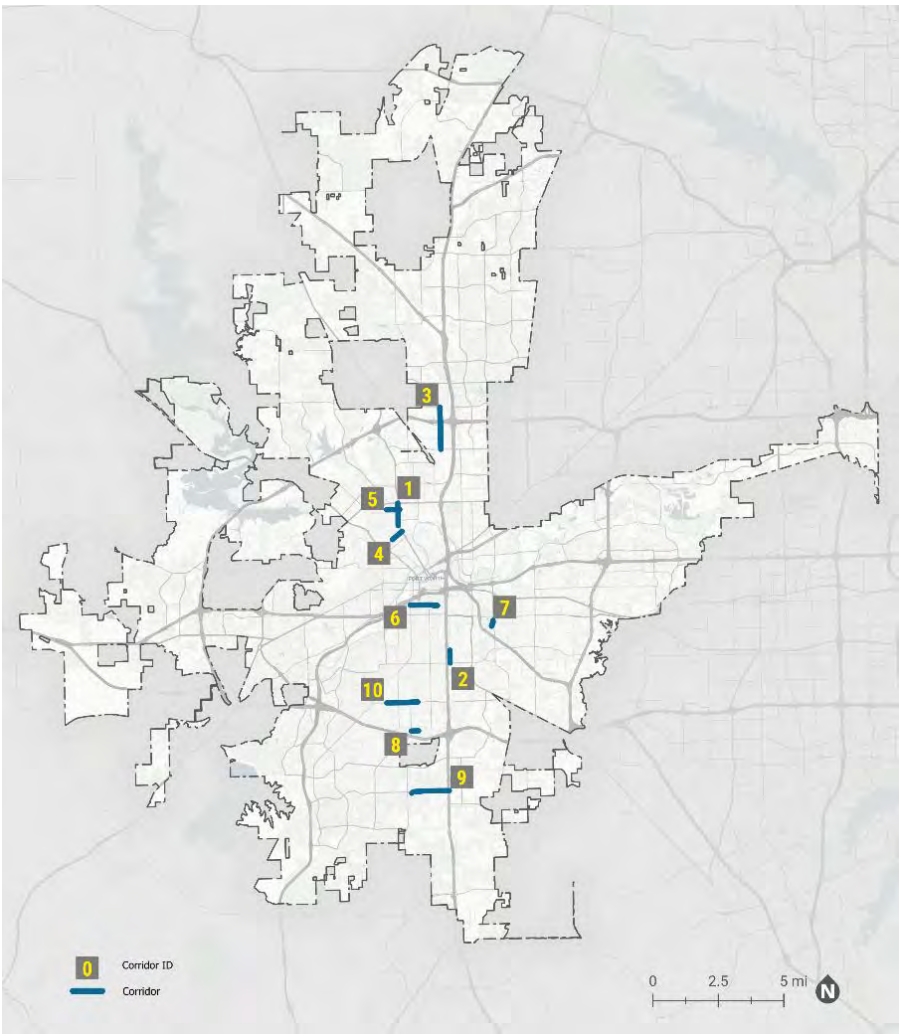


Figure 1: Road Safety Assessment Corridors

This report presents the safety assessment methods and analysis conducted on these high-crash corridors and provides recommendations to increase safety. This document will help guide the City's future investments in safety improvements, providing a roadmap to identify capital projects' costs, benefits, and implementation timelines.

Table 2: Safety Assessment Corridors

	Roadway	From	To	Functional Classification	HIN Mode
1	Ellis Ave	NW 21st St	NW 28th St	Residential	Pedestrian, Motor vehicle
2	Sharondale St	6th Ave	James Ave	Residential	Bicycle
3	NW 14th St	N Main St	Gould Ave	Residential	Pedestrian
4	S Beach St	Ave H	Mitchell Blvd	Major Arterial	Motor vehicle
5	Evans Ave	E Morningside Dr	E Berry St	Minor Arterial	Motor vehicle
6	NW 26th St	N Main St / Stockyards Blvd	Angle Ave / Refugio Ave	Residential	Pedestrian
7	Pennsylvania Ave	E Pennsylvania Ave / S Main St	8th Ave	Minor Arterial	Pedestrian, Motor vehicle
8	W Seminary Dr	6th Ave	Rector Ave	Major Arterial	Bicycle, Pedestrian
9	Mark Iv Pkwy	Meacham Blvd	Crossover Ramp	Major Arterial	Motor vehicle, Commercial motor vehicle, Motorcycle
10	Sycamore School Rd	South Fwy Sr Nb	W Everman Pkwy	Minor Arterial	Bicycle, Pedestrian, Motor vehicle

Process and Methodology

This section summarizes the process and methodology used to perform the safety assessment, develop safety improvement project recommendations, and analyze the expected benefits and costs of proposed improvements.

Road Safety Assessment

The road safety assessment for the 10 corridors included field data collection, corridor context review, and crash data analyses.

Field Data Collection

During the week of December 2nd, 2024, project team members conducted field observations of the corridors to collect data on their existing infrastructure, operations, and safety issues. These observations were performed on foot, with team members spending multiple hours examining each individual corridor and recording findings. This fieldwork helped the team to better understand the existing conditions of each corridor and to ensure recommendations of tailored safety countermeasures.

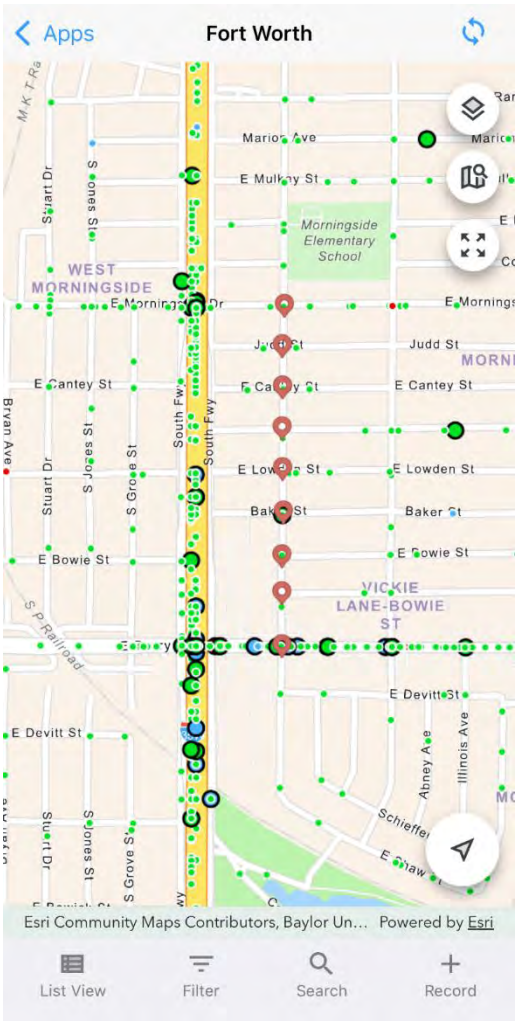


Figure 2: Fulcrum Survey Photos and Notes

The project team collected data via mobile devices (phones and iPads) using the Fulcrum survey app (**Figure 2**). This provided the ability to review crash data on the map and compare them to conditions observed in the field. Field notes and photos were also logged in Fulcrum to geo-tag observations to the correct locations. These notes helped inform the countermeasure selection process. In-depth field observations of each corridor are provided in the Corridor Recommendations sections.

Corridor Context Review

Based on field observations and desktop review, the project team examined the characterization of each corridor to establish a baseline roadway typology. Characteristics such as location, extent, surrounding land uses, roadway width, number of lanes, presence of bicycle and pedestrian infrastructure, and speed limit were considered. Relevant data such as AADT along the corridor were also collected. A review of existing plans and programs was performed to identify any proposed projects along the corridors that should be factored into the safety improvement recommendations. A summary graphic with each corridor's context is provided in the Corridor Recommendations sections.

Crash Data Analysis

The same crash data used to develop the Fort Worth State of Safety Report and the HIN were collected for each corridor. This included crashes identified as associated with each segment and intersections along the corridor. For methodology on how crashes are joined with roadway segments or intersections, please refer to **Appendix B: The State of Safety Report**.

The project team examined the number and distribution of crashes along the corridor, focusing on key attributes to help identify patterns of crashes as well as potential causes, including:

- Crash locations
- Crash mode
- Crash severity
- Crash collision manner
- Crash contributing factor
- Time of day
- Lighting conditions
- Speed limit

Crash locations were evaluated to determine whether they occurred mid-block or in the influence area of an intersection. The intersections where the most crashes occurred are illustrated with a heat map.

Crash modes, including motor vehicle, motorcycle, bicycle, and pedestrian were evaluated to inform mode-specific countermeasure selection.

Crashes in which a person was killed or seriously injured (KSI) were counted and compared to the total number of crashes to determine whether there were any significant differences in their occurrence.

Each corridor analysis summarizes the top manners in which crashes occurred. The collision manners include the direction of travel of each party as well as the direction from which the collision occurred.

The crash contributing factor describes why each crash happened. Contributing factors include, for example, when one party fails to control their speed, follows too closely, fails to yield the right of way, etc. The top five crash contributing factors are reported for each corridor.

Time of day crashes were examined. If a crash occurred at night, the presence or lack of artificial lighting was explored. If this appears to be a potential safety issue for the corridor, that is noted.

The speed limit along each corridor was also considered. If a corridor encompasses multiple speed limits, the crash density is calculated for each speed limit section to determine the correlation between speed and the number of crashes.

Countermeasure Recommendations

Countermeasure Selection

Based on field observations and crash data analysis, the project team identified countermeasures applicable corridor-wide as well as noted locations that require specific additional countermeasures. The selection of countermeasures was based on FHWA's Proven Safety Countermeasures initiative (PSCi)[1]. This system of countermeasures is categorized into five major areas, including

- Speed management
- Pedestrian/bicyclist
- Roadway departure
- Intersections
- Crosscutting measures

[1] https://highways.dot.gov/safety/proven-safety-countermeasures

However, some additional recommended countermeasures not from the PSCi have been provided in cases where they have the potential to provide a reasonable safety benefit for a corridor and its crash profile. Each proposed countermeasure is accompanied by a timeframe for completion to support project implementation.

Crash Modification Factor

A Crash Modification Factor (CMF) is provided for each proposed countermeasure. This helps to quantify the potential crash reduction and safety benefit of implementing the proposed countermeasure. CMF is a multiplicative factor that indicates the proportion of crashes that would be expected after implementing a countermeasure. CMFs with a value less than 1.0 indicate an expected decrease in crashes. CMFs greater than 1.0 indicate an expected increase in crashes.

CMFs are defined in Part D of the Highway Safety Manual (HSM), accessible online at the CMF Clearinghouse[2] provided by FHWA. TxDOT also provides pedestrian specific CMFs in the "Texas Pedestrian Safety Action Plan (PSAP) Countermeasures Background and Application Methodology[3]" This study utilizes countermeasures found in the Clearinghouse and TxDOT PSAP.

Countermeasure Selection Toolbox

Table 3 below provides a CMF for proposed countermeasures and the applicable crash type. It is important to note that a CMF is not always applicable to every crash type. In addition, a few countermeasures do not have an identified CMF, as those countermeasures have not been studied.

Table 3: Countermeasure Toolbox

Countermeasure	Crash Modification Factor	Crash Type
Neighborhood traffic circles	0.18	All
Install Shared-Use Path	0.25	Bike
Install Sidewalks	0.35	Pedestrian
Install Rectangular Rapid Flashing Beacon	0.40	Pedestrian
Install Bike Lanes	0.435	Bike

[2] https://cmfclearinghouse.fhwa.dot.gov/
[3] https://ftp.txdot.gov/pub/txdot/tpp/psap-countermeasures-methodology-memo.pdf

Install Buffered Bike Lanes	0.47	Bike
Install/Upgrade Safety Lighting	0.51	Night
Provide intersection illumination	0.62	Night
Install Raised Crosswalk	0.54	All
Install vertical separation for bike lanes	0.57	All
Install speed humps	0.60	All
Reconfigure Curb Ramps to meet ADA Standard	0.65	Pedestrian
Install Pedestrian Refuge Islands	0.68	Pedestrian
Implement full signalization at intersection	0.73	All
Channelized right turn skip striping	0.75	All
Install advance signal, stop, pedestrian or yield signs	0.75	All
Install hardened center line	0.75	All
Narrow Lanes	0.76	All
Convert TWLTL to raised median	0.77	All
Install Raised Protected Intersection	0.78	All
Intersection Left-Turn Striping	0.79	All
Install Pedestrian Hybrid Beacon/Intersection Control Beacon	0.85	Pedestrian
Install backplates with retroreflective borders	0.85	All
Implement leading pedestrian intervals	0.87	Pedestrian
Install Pedestrian Crosswalk (High-Visibility)	0.90	Pedestrian
Appropriately timed yellow change intervals	0.92	All
Modify Curb Geometrics	--	All
Install dynamic speed feedback signage	0.95	All
Install Stop Bar	--	All
Consolidate access points	--	All
"Install pedestrian signal heads	--	Pedestrian
Install Pedestrian Pushbutton"	--	Pedestrian
Install Detectable Warning Strips	--	Pedestrian

Countermeasure Combination

Often, a corridor or intersection will have several applicable countermeasures. In this case, a combined CMF is provided, calculated by multiplying together no more than three countermeasures of the same crash type. For example, **Table 4** demonstrates a location with

seven applicable countermeasures, where multiple countermeasures are applicable to the same crash type. For those countermeasures, a combined CMF is calculated and applied to crashes of that same type. Countermeasures with no applicable CMF do not count towards the maximum of three.

Table 4: Countermeasures Combination Example

Countermeasure	Crash Type	Original CMF	Combined CMF
A	All	0.65	0.23
B	All	0.35	
C	Pedestrian	0.87	0.24
D	Pedestrian	0.40	
E	Pedestrian	0.68	
F	Pedestrian	--	
G	Bike	0.47	0.47

Benefit-Cost Analysis

Benefit cost analysis compares the overall benefits of recommended improvements to a project's total cost over a specified time period. This benefit-cost ratio (B/C) is provided for each recommended improvement. Higher B/C ratios indicate higher potential returns for safety improvements. This analysis can assist the City's implementation decision-making.

The process of calculating the B/C ratio begins with the identification of a horizon year (typically a 20-year project life span). The benefit of a project is the monetized value of crashes[4] that would be prevented over the project's lifespan. The number of crashes prevented is computed assuming a consistent crash rate as traffic grows in the future without safety improvements. The crash modification factor is then applied to calculate future year crashes over the 20-year period with safety improvements. The cost is the total initial cost of the project, which includes the construction cost and an allowance for survey and engineering, and the maintenance cost over a 20-year project lifespan. The cost estimates were developed using bid tab data provided by the City. All costs are in present (2025) values.

To calculate the benefits, the following steps were taken:

[4] TxDOT crash costs by severity: https://ftp.txdot.gov/pub/txdot-info/trf/hsip/sii-calculator.xls

1. Prevention benefits were assigned to each type of crash (K, A, and B). These values were obtained from the TxDOT 2021 SII Calculator.
2. A crash rate per 100,000 roadway users was calculated for each type of crash from the number of crashes between 2019 and 2023 by using the number of crashes between 2019 and 2023 and dividing by the number of roadway users between 2019 and 2023 (Before Crashes/AADT/365/5) and then multiplied by 100,000.
3. The crash rate was then multiplied by the crash modification factor factors for applied countermeasures.
4. The new crash rate was then converted to crashes prevented in the build year (assumed 2025) with the following formula: ((Before Crashes Per 100,000 Users - Crashes Modified by CMF Applicable CMF Per 100,000 Users) * 2025 AADT * 365 / 100,000).
5. The crashes were then multiplied by their prevention benefit values to obtain a benefit value per year.
6. A benefit growth rate was then obtained by multiplying the inflation rate (assumed 3%) by the growth rate.
7. A present benefit value was then calculated by the annuity to present value formula.
8. Annual maintenance costs were calculated using the TxDOT HSIP.
9. For countermeasures with service lives less than 20 years, it was assumed that the full countermeasure installation cost would be incurred each time the service life expired (e.g. paint has a service life of 4 years, and it was assumed that the paint would be reinstalled each 4 years, for a total of 5 times in 20 years). Note that for countermeasures that are hard infrastructure and not in the HSIP, such as curb extensions, a service life of 25 years was assumed. It was further assumed that these costs would be evenly spread over the 20-year lifecycle to obtain an annual reinstallation cost.
10. The annual reinstallation cost was then added to the annual maintenance cost from the HSIP for each countermeasure to obtain a final annual maintenance cost.
11. A present annual maintenance cost was then calculated by the annuity to present value formula.
12. The present annual maintenance cost was added to the installation cost to obtain a present cost value.
13. The benefit/cost ratio was then obtained by dividing the present benefit value by the present cost value.

Corridor Recommendations

The following section of this report provides details on each corridor's existing conditions, crash history, and includes observations from field work, recommended improvements, and benefit-cost analysis results.

The numerical position assigned to each corridor is solely for identification purposes and doesn't represent priority. Each of the 10 corridors was treated with the same level of importance.

1. **Ellis Avenue** from NW 21st Street to NW 28th Street
2. **Evans Avenue** from E Morningside Drive to E Berry Street
3. **Mark IV Parkway** from Meacham Boulevard to Cantrell Sansom Road
4. **NW 14th Street** from N Main Street to Gould Avenue
5. **NW 26th Street** from N Main Street to Angle Avenue
6. **Pennsylvania Avenue** from S Main Street to 8th Avenue
7. **S Beach Street** from Avenue H to Mitchell Boulevard
8. **Sharondale Street** from 6th Avenue to James Avenue
9. **Sycamore School Road** from South Freeway to W Everman Parkway
10. **W Seminary Drive** from 6th Avenue to Rector Avenue

Corridor 1: Ellis Avenue

Ellis Avenue, running south to north between NW 21st Street to NW 28th Street is part of the Pedestrian High Injury Network (HIN) and the Motor Vehicle HIN.

Context

This corridor functions as a minor arterial and is lined with residential properties as well as commercial developments. Rodeo Park is located at the northern extent of the Ellis Avenue study area. All Saints Catholic School is located at the southern extent. The corridor is part of the Historic Stockyards District. The roadway is 0.86 miles in length and consists of four lanes, with unmarked parallel parking. The sidewalks on both sides of the roadway are mainly continuous for the entire length of the corridor. The speed limit is 30 mph. Every intersection on this corridor is stop-controlled: main, side street or all-way. The typical pavement width ranges from 52 to 58

feet, while the right-of-way width ranges from 80 to 86 feet. The Average Annual Daily Traffic (AADT) for this corridor is 2,530[5].

Crash History

From 2019 to 2023, 139 total crashes occurred on Ellis Avenue between NW 21st Street and NW 28th Street. About 47% of overall crashes occurred at dusk or at night, indicating the need for additional lighting on this corridor. Seventy-eight percent of the crashes occurred at intersections, making intersection-related recommendations a focus of this evaluation. There was one crash involving a bicycle, which was a KSI crash, and one crash involving a motorcycle. There were six crashes involving a pedestrian, one of which was a KSI crash. Overall, there were three severe injury crashes and 20 crashes that resulted in minor injuries.

Figure 3: Crash Map of the Ellis Avenue Corridor

Table 5 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. **Table 6** shows the top five contributing factors as noted in the crash reports of crashes on Ellis Avenue. **Table 7** summarizes the KSI crashes (three) that occurred on this corridor.

[5] 2019 TPP Statewide Traffic Count Map

Table 5: Ellis Avenue Intersection Related Crashes by Collision Manner

Intersection *(closest reported)*	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
NW 21st ST	5	---	---	---	5
NW 22nd ST	6	---	---	---	6
NW 23rd ST	1	3		2	6
NW 24th ST	9	3	2	1	15
W EXCHANGE AVE	1	6	1	---	8
NW 25th ST	12	4	2	4	22
NW 26th ST	5	---	---	4	9
NW 27th ST	2	---	---	---	2
NW 28th ST	53	4	3	4	64
(OTHER)	1	1	---	---	2
TOTAL	**95**	**21**	**8**	**15**	**139**

Table 6: Ellis Avenue Top 5 Contributing Factors

Contributing Factor	# of Crashes
Failed to Yield Right of Way – Stop Sign	46
Driver Inattention	31
None	15
Disregard Stop Sign Or Light	14
Failure to Control Speed	13

Table 7: Ellis Avenue KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
NW 25th ST	All Way Stop-Controlled	One Motor Vehicle; Going Straight (pedestrian crash)	Pedestrian Failed To Yield Right Of Way To Vehicle
NW 28th ST	Main (Ellis Ave) Stop-Controlled	Angle; Both Going Straight	Unsafe Speed; Failed To Yield Right Of Way – Stop Sign

NW 28th ST	Main (Ellis Ave) Stop-Controlled	One Motor Vehicle; Going Straight (bicycle crash)	Failed To Stop At Proper Place; Driver Inattention; Disregard Stop Sign Or Light

Field Observations and Recommendations

Corridor-Focused Recommendations

The following field observations and corresponding safety improvement recommendations were made along Ellis Avenue. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Speed Management

Ellis Avenue is striped for four lanes with unmarked on-street parking on either side of the road. The wide road design, especially at times of low traffic or on segments without parked vehicles, encourages higher travel speeds.

- It is recommended that the corridor be right-sized based on the Stockyards Transportation Study prepared for the City of Forth Worth in September 2023
- It is recommended that the road be narrowed from a four-lane to three-lane cross-section with formalized buffered on-street parking on either side.
- Curb extensions and lighting improvements are recommended at intersections to help formalize on-street parking, shorten crossing distance, and improve pedestrian visibility.
- In the short term, in the absence of a road diet, it is recommended that speed feedback signs be installed to discourage speeding.

Pedestrian Facilities

There is a mid-block crosswalk between NW 21st St and NW 22nd St at the Boys & Girls Club and All Saints Catholic School that is signed as a school crosswalk with high visibility markings. However, the crossing is missing curb ramps and a connection to the existing sidewalk on the street's eastern side, where the Boys & Girls Club is located.

- It is recommended to install new curb ramps at this crossing.
- Along with the recommended right-sizing of the street, curb extensions and a median refuge island with in-street pedestrian crossing sign should be constructed to shorten pedestrian crossing distance.

It appears there is street-level lighting at this crossing; However, upgrades to lighting conditions are recommended in the Stockyards Transportation Study. There is a midblock crosswalk about 225 feet south of the NW 28th Street intersection (see **Figure 4**).

- Recommend removing this crosswalk since it is close to the intersection and does not have compliant ramps or connections to the existing sidewalk.

Figure 4: Midblock Crosswalk at Boys & Girls Club and All Saints, Missing Curb Ramp (left); Midblock Crosswalk about 225 ft South of NW 28th Street intersection (right)

Sidewalks on both sides of the corridor are narrow and intermittent gaps of sidewalk connectivity were observed.

- It is recommended that the sidewalks are widened and to construct sidewalk where gaps exist along Ellis Avenue.
- It is recommended to reconstruct non-compliant pedestrian facilities including sidewalks and curb ramps in alignment with the Americans with Disabilities Act (ADA).

Bicycle Facilities

Ellis Avenue is designated as a bike route; however, no bicycle facilities were observed. In order to ensure bicycle safety along the corridor,

- The proposed right-sizing of Ellis Avenue is expected to improve Bicycle Level of Traffic Stress (LTS), per the Stockyards Transportation Study despite not including dedicated and protected bicycle lanes.

- The cross-section of the proposed lane reconfiguration can be repurposed to add protected bicycle lanes, but this was not supported by the public, per the Stockyards Transportation Study. Conversely, the roadway can be narrowed, and the bike lanes can be sidewalk-level, or the sidewalks can be widened to create a shared-use path.

Other

From the Stockyards Transportation Study, it is recommended to implement metered parking for all permitted on-street parking on Ellis Avenue between 26th Street and 23rd Street.

Intersection-Focused Recommendations

The following observations and recommendations were made at specific intersections along Ellis Avenue.

NW 21st Street

This is an all way stop-controlled intersection with ramps on all corners for existing sidewalks. All Saints Catholic School is located on the intersection's southwest corner and the Boys & Girls Club on the southeast corner.

Table 8: NW 21st Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant. Curb ramps are angled toward intersection traffic. **Recommendation:** Reconstruct or repair existing curb ramps.
Crosswalk	**Issue:** Crosswalks are unmarked. Stop bars are faded. **Recommendation:** Install new high-visibility crosswalks on all legs of the intersection. Remark existing stop bars.
Other Crossing Characteristics	**Issue:** There are long crossing distances. There is insufficient lighting at this intersection. **Recommendation:** Install curb extensions on all corners. Install median crossing island on Ellis Ave. Install school crossing signs with downward pointing arrows. Install/upgrade lighting.

NW 22nd Street

This is a side stop-controlled intersection with ramps on three corners for existing sidewalks. A post office is located on the intersection's southeast corner and a fire station is located on the northeast corner

Table 9: NW 22nd Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant. Curb ramps are angled toward intersection traffic. There is no curb ramp or sidewalk on the northeast corner. **Recommendation:** Reconstruct or repair existing curb ramps. Install new curb ramp on northeast corner of intersection.
Crosswalk	**Issue:** Crosswalks are unmarked. Stop bars at controlled crossing are faded. **Recommendation:** Install new high-visibility crosswalks on eastern and western leg across NW 22nd St. Mark new stop bars.
Other Crossing Characteristics	**Issue:** There are long crossing distances. **Recommendation:** Install curb extensions on NW 22nd St for crosswalks.
Sidewalk	**Issue:** There is no sidewalk on the northeast corner of the intersection. **Recommendation:** Install a sidewalk on the east side of Ellis Ave from NW 22nd St and connect to existing sidewalk to the north.

NW 23rd Street

This is an all way stop-controlled intersection with commercial uses on three of the corners.

Table 10: NW 23rd Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant or are missing. Curb ramps are angled toward intersection traffic. **Recommendation:** Reconstruct or repair existing curb ramps. Install new curb ramp on northeast corner of intersection.
Crosswalk	**Issue:** Crosswalks are unmarked. Stop bars are faded or missing. **Recommendation:** Install new high-visibility crosswalks on all legs of the intersection. Remark existing stop bars.
Other Crossing Characteristics	**Issue:** There are long crossing distances. There is a crest curve for southbound traffic at this intersection.

	Recommendation: Install curb extensions on all corners.
Sidewalk	**Issue:** There is no sidewalk on the southwest corner of the intersection. **Recommendation:** Install new sidewalk on the west side of Ellis Ave from NW 23rd St and connect to existing sidewalk to the south. Reconstruct sidewalk on northeast corner of intersection.
Access Management	**Issue:** The northeast corner of the intersection has a vacant building with parking at the intersection. **Recommendation:** Recommend eliminating parking at intersection if property gets redeveloped.
Lighting	Improve lighting to increase visibility (Stockyard Transportation Study).
Wayfinding	Install uniform parking wayfinding signage (Stockyard Transportation Study)

NW 24th Street

This is a side stop-controlled intersection with sidewalks on all approaches. All corners of the intersection have commercial uses or are used for parking. All approaches appear to be used for on-street parking, on both sides of the street.

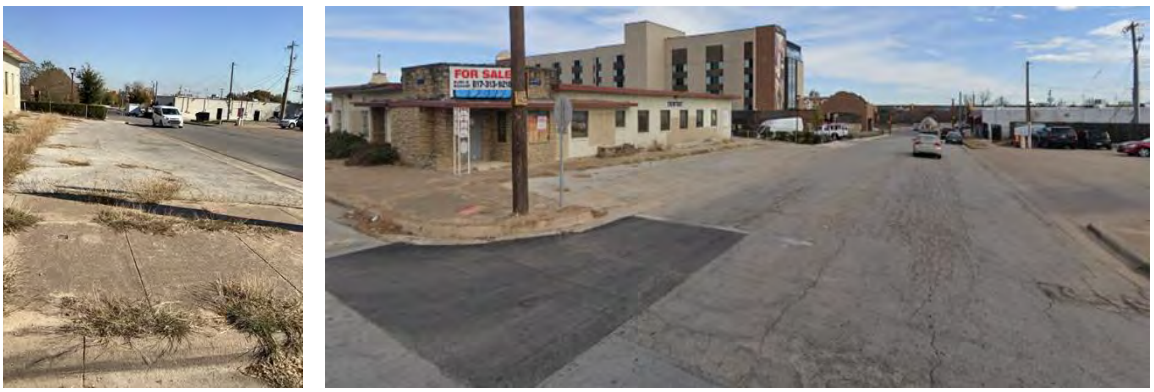


Figure 5: Parking lot at northeast corner of intersection

The on-street parking is not striped as such. There is some signage for the parking limits, mainly on the northern and eastern legs of this intersection.

Table 11: NW 24th Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant. **Recommendation:** Reconstruct and widen existing curb ramps. Widen standing space to improve comfort and safety of pedestrians waiting to cross.

Crosswalk	**Issue:** Crosswalks are unmarked. No stop bar at controlled crossing. **Recommendation:** Mark crosswalks on eastern and western side of intersection. Mark stop bars on NW 24th St.
Other Crossing Characteristics	**Issue:** There are long crossing distances. Parked cars obstruct sight lines. Crossing may be difficult to see or anticipate due to roadway curvature. There is insufficient lighting. **Recommendation:** Install curb extensions on all corners. Restrict parking at/near intersection. Install advance pedestrian warning signs. Study intersection for all-way STOP control, if warranted. If stop sign is warranted, install crosswalks across Ellis Ave at this intersection. Install/upgrade lighting.
Sidewalk	**Issue:** Sidewalks lack sufficient buffer and are narrow. Sidewalk on northwest corner is limited by retaining wall. **Recommendation:** Narrow travel lanes to create buffer on street (utilizing paint, bollards, etc.). Widen sidewalk.
Lighting	Improve lighting to increase visibility (Stockyards Transportation Study)

West Exchange Avenue

This is an all way stop-controlled intersection with sidewalks on all approaches. All corners of the intersection have commercial uses. Sidewalks are located at the back of curb and are constrained by buildings and utilities. All approaches appear to be used for on-street parking, on both sides of the street. The on-street parking is not striped as such. This intersection is in the Historic Stockyards District. There was a pedestrian non-KSI crash at this intersection.

Table 12: West Exchange Avenue Intersection Recommendations

Category	Issues & Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant and are not aligned with crossing. **Recommendation:** Reconstruct or repair existing curb ramps. Widen crosswalk or assess curb ramps for improved alignment.
Crosswalk	**Issue:** Crosswalk markings and stop bars are faded. **Recommendation:** Remark crosswalks on all approaches as high visibility. Remark existing stop bars on all approaches.
Lighting	Improve lighting to increase visibility (Stockyards Transportation Study)
Traffic Calming	Construct bulb-outs (Stockyards Transportation Study)

NW 25th Street

This is an all way stop-controlled intersection with sidewalks on all approaches. Two of the four corners of the intersection are parking lots. The northwest corner belongs to the Fort Worth Police Department. All approaches appear to be used for on-street parking, on both sides of the street. The on-street parking is not striped as such. There was a fatal crash at this intersection.

Table 13: NW 25th Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant and are angled toward intersection traffic. **Recommendation:** Reconstruct existing curb ramps.
Crosswalk	**Issue:** Crosswalks are unmarked. Stop bars are faded. Vehicles are stopping past stop signs and encroaching into crosswalk area. **Recommendation:** Mark high-visibility crosswalks. Remark existing stop bars on all approaches.
Other Crossing Characteristics	**Issue:** There are long crossing distances. Parked cars obstruct sight lines. **Recommendation:** Install curb extensions. Restrict parking in advance of crosswalk.
Sidewalk	**Issue:** Sidewalks are available at all legs but are overgrown, cracking, and narrow. **Recommendation:** Reconstruct wider sidewalks. Reconstruct driveways with level sidewalks. Extend sidewalk from this intersection to the north to connect to the Trinity Trails System on the east side of Ellis Ave.
Lighting	Improve lighting to increase visibility (Stockyards Transportation Study)

NW 26th Street

This is an all way stop-controlled intersection. This intersection is above Marine Creek and the sidewalks here tie into the Trinity Trails Systems. This intersection is a bridge structure running between 200 and300 feet north and south of this intersection.

Table 14: NW 26th Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps do not appear to be ADA compliant but are limited by bridge structure. **Recommendation:** Reconstruct or repair existing curb ramps.

Crosswalk	**Issue:** Crosswalks across Ellis Ave are unmarked. Crosswalks across NW 26th St are faded, eastern crosswalk is skewed. Stop bars are missing on Ellis Ave. **Recommendation:** Mark new high-visibility crosswalks and remark existing crosswalks as high visibility and with better alignments. Mark new stop bars and remark existing stop bars.
Other Crossing Characteristics	**Issue:** There are long crossing distances. There is insufficient lighting at this intersection. The Fort Worth Branch Trail crosses diagonally from northwest to southeast, creating a two-stage crossing **Recommendation**: Install curb extensions, particularly on southwest curb. Install median crossing island on southern leg. Install/upgrade lighting. Consider treatments appropriate for trail crossings.
Sidewalk	**Issue:** Sidewalks lack sufficient buffer and have too much cross-slope. There is excessive vegetation on northeast corner of intersection that is blocking the sidewalk. Where the Fort Worth Branch Trail meets the sidewalk to become a sidepath on the northwest and southeast side, it is narrow (~7ft) and does not support shared operations. **Recommendation:** Remove obstructions on the northeast corner and construct a sidewalk on the east side to tie to existing sidewalk to the north.
Wayfinding	Install uniform parking wayfinding signage (Stockyard Transportation Study)

NW 27th Street

This is a side stop-controlled intersection with three legs and few sidewalks. The left side of this intersection is Rodeo Park. It appears that vehicles use both sides of NW 27th Street for on-street parking. The on-street parking is not striped as such.

Table 15: NW 27th Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue:** Curb ramps are missing. **Recommendation:** Install new curb ramps.
Crosswalk	**Issue:** Crosswalk is unmarked. No stop bar at controlled crossing. There is uneven pavement at this intersection. **Recommendation:** Convert this intersection to a STOP controlled intersection. Mark high-visibility crosswalks on all approaches. Mark new stop bars on all approaches. Resurface the crosswalk area.

Other Crossing Characteristics	**Issue:** There are long crossing distances. There is a desired path on the left side of Ellis Ave to the existing Trinity Trails System. **Recommendation:** Convert this intersection to a STOP controlled intersection. Install curb extensions to shorten crossing distance and improve pedestrian visibility. Create an additional trail head here. Consider treatments appropriate for trail crossings – such as raised, protected intersection.
Sidewalk	**Issue:** No sidewalk on the left side of Ellis Ave and no sidewalk on the southeast corner of this intersection. Existing sidewalks appear near and are overgrown. **Recommendation:** Install new sidewalks and reconstruct existing sidewalk.

NW 28th Street

There was a fatal crash at this intersection, where Ellis Avenue is stop-controlled and NW 28th Street is not. There is a signal nearby at Main Street at NW 28th Street. There are existing sidewalks on all approaches.

Table 16: NW 28th Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue:** Curb ramps lead to NW 28th St, no crosswalk. **Recommendation:** Remove curb ramps on east side crossing NW 28th St since there is not crosswalk here. Install curb ramps on west side.
Crosswalk	**Issue:** Crosswalks are unmarked across Ellis Ave. Stop bars on Ellis Ave are faded. **Recommendation:** Install new high-visibility crosswalks. Remark existing stop bars. Install mid-block crossing across NW 28th St on the west side of the intersection.
Other Crossing Characteristics	**Issue:** There are long crossing distances. South leg of intersection is unnecessarily wide. Insufficient pedestrian lighting. **Recommendation:** Install curb extensions to shorten crossing distance and improve pedestrian visibility. Install median pedestrian refuge island on NW 28th St for mid-block crossing. Install or upgrade lighting.
Wayfinding	Install uniform parking wayfinding signage (Stockyard Transportation Study)

Recommendation Implementation Table

Table 17 below summarizes the corridor and intersection recommendations to reduce crashes for all modes and enhance safety along the Ellis Avenue corridor. Each recommendation has an estimated applicable CMF and timeframe that accounts for whether the recommendation is an

ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project based on feasibility, crash reduction benefit, and cost. Costs are based on TxDOT Bid Averages in the fall of 2024 and unit prices provided by the City of Fort Worth.

Table 17: Recommended Countermeasures for Ellis Avenue Corridor[6]

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost (Construction)
Short (1-3 years)	Intersection	Install/refresh high-visibility crosswalks	0.6	$29,568.00
	Intersection	Install advance signal, stop or yield signs	0.75	$400.00
	Intersection	Install Stop Bar	0.33	$1,860.00
	Segment	Narrow Lanes	0.76	$4,140.00
Medium (3-5 years)	Intersection	Install Curb Extension	--	$300,000
	Intersection	Install median pedestrian refuge	0.44	$8,200
	Intersection	Reconfigure Ramps to meet ADA Standard	--	$108,500.00
	Intersection	Provide intersection illumination	0.62	$45,000
	Segment	Install Buffered Bike Lanes	0.47	$232,630.00
	Segment	Install Additional Lighting	0.58	$559,786.50
	Segment	Install Continuous Sidewalk	0.35	$257,321.50
Long (5+ years)	Intersection	Install Raised Protected Intersection	0.78	$70,000.00
				$1,384,776.00

Benefit-Cost Analysis

The estimated benefit-cost ratio for Ellis Avenue is 21.48 (**Table 18**). **Table 19** summarizes the estimated improvement costs by type, and **Table 20** summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 18: Ellis Avenue Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$57,280,000	$2,676,600	22.78

Table 19: Cost Results for Ellis Avenue Corridor

[6] Note that the intersection of NW 26th Street and Ellis Avenue is accounted for in both corridors' benefit/cost.

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install/refresh high-visibility crosswalks	$16.00/FT	1,848	4	$29,568.00	$7,392.00
Install advance signal, stop or yield signs	$100.00	4	6	$400.00	$60.00
Install median pedestrian refuge	$4,100.00	2	25	$8,200.00	-
Curb extension	$10,000.00	30	25	$300,000	-
Reconfigure ramps to meet ADA Standard	$3,500.00	31	25	$108,500.00	-
Install additional lighting	$186,595.50	3	15	$559,786.50	$28,289.00
Install continuous sidewalks	$134.86/FT	1,908	10	$257,321.50	$25,732.00
Install Stop Bar	$60.00	31	4	$1,860.00	$465.00
Raised Intersection	$70,000.00	1	25	$70,000.00	-
Narrow Lanes	$27.60/20 LF	150	25	$4,140.00	-
Provide intersection illumination[7]	$11,250	4	15	$45,000.00	$2,650.00
Total				$1,384,776.00	$64,588.00
			Lifecycle Cost (20 years)	**$2,676,600**	

Table 20: Benefit Results for Ellis Avenue Corridor

Crash Severity	Prevention Benefit	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0	$0
A – Severe Injury	$3,700,000	12	$37,000,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	39	$20,280,000
		Total Benefit:	**$57,280,000**

[7] Unit cost for illumination was provided in the Stockyards Transportation Study

Corridor 2: Evans Avenue

Evans Avenue runs north to south between E Morningside Drive and E Berry Street. It is on the Motor Vehicle HIN.

Context

Evans Avenue functions as a minor arterial and is lined with residential properties as well as medium commercial developments. Morningside Elementary School is located north of these locations on Evans Avenue. The roadway consists of four lanes and is approximately 0.5 miles in length. There are continuous sidewalks on both sides of the roadway for the entire length of the corridor. A Trinity Metro bus route runs near this corridor. The speed limit is 30 mph. The typical pavement width ranges from 45 to 48 feet, while the right-of-way width is approximately 80 feet. The Average Annual Daily Traffic (AADT) for this corridor is 5,034, according to the 2019 TxDOT count. A project to convert E Berry St at I-35W from a four-lane undivided roadway with a center lane to a divided roadway, although not on this corridor, may impact the corridor; it is the next intersection west on E Berry Street from Evans Avenue.

Crash History

A crash data analysis was performed for the Evans Avenue corridor to understand the contributing factors and identify focus areas for countermeasures.

From 2019 to 2023, 94 total crashes occurred on Evans Avenue between E Morningside Drive and E Berry Street. About 33% of overall crashes occurred in limited lighting conditions, demonstrating the need for additional lighting on this corridor. Eighty percent of the crashes occurred at intersections, making intersection-related recommendations a focus of this evaluation. There was one fatal crash reported on the corridor, occurring at the intersection of Evans Avenue with Baker Street. There were two crashes involving pedestrians, one occurring at E Bowie Street when a vehicle was turning right, and the other near Baker Street when a vehicle was going straight. Overall, there was one fatal crash, one severe injury crash, and 13 crashes resulting in minor injuries.

Figure 6 shows the spatial distribution of crashes along the Evans Avenue corridor. Table 20 shows the summary of the crash data by collision manner for the Evans Avenue corridor. Table 21 shows the top five contributing factors as noted in the crash reports for Evans Avenue. Table 22 summarizes the KSI crashes (two) that occurred on this corridor.

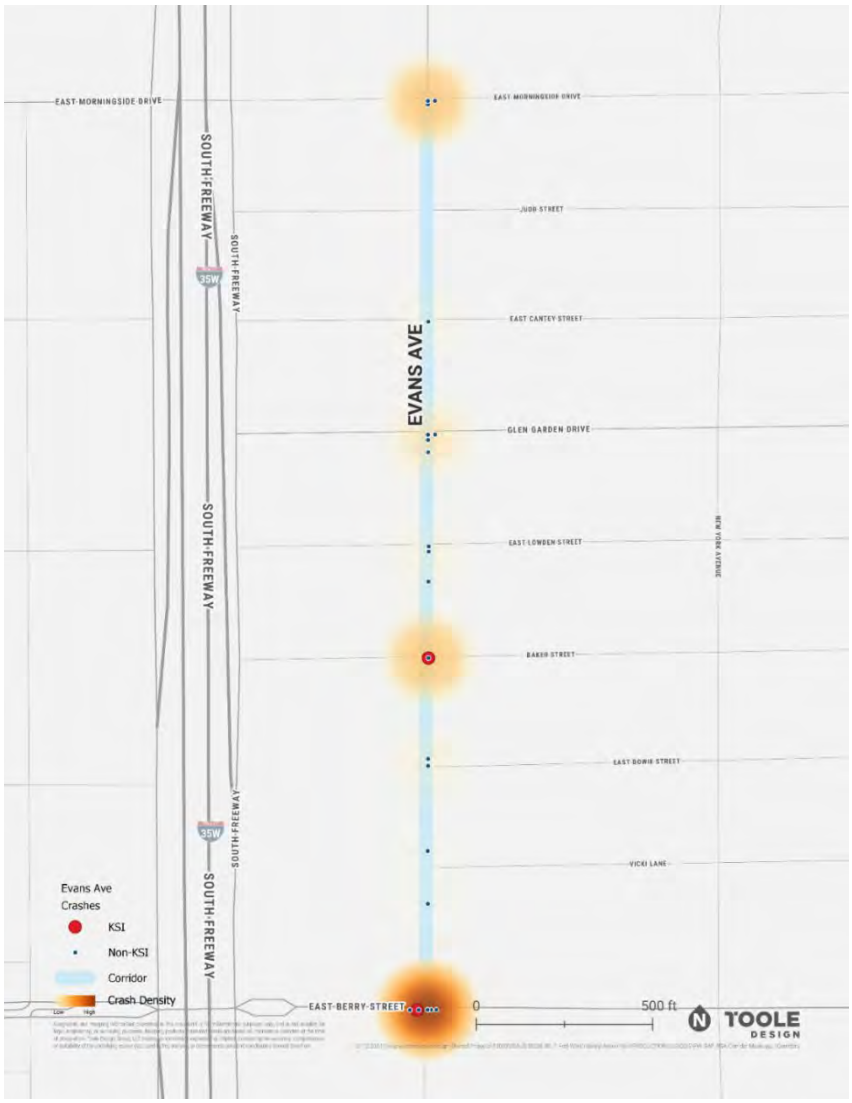


Figure 6: Crash Map of the Evans Avenue Corridor

Table 20: Evans Avenue Intersection Related Crashes by Collision Manner

Intersection *(closest reported)*	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Intersection Total
E BERRY ST	12	2	15	21	50
VICKI LN	---	2	---	---	2

E BOWIE ST	---	1	1	1	3
BAKER ST	5	2	6	1	14
E LOWDEN ST	2	1	---	---	3
GLEN GARDEN DR	3	2	1	---	6
E CANTEY ST	1	1	---	---	2
JUDD ST	---	---	---	---	0
E MORNINGSIDE DR	9	1	3	1	14
TOTAL	**32**	**12**	**26**	**24**	**94**

Table 21: Evans Avenue Top 5 Contributing Factors

Contributing Factors	Number of crashes
Driver Inattention	27
Failed To Yield Right Of Way – Turning Left	13
Failed To Control Speed	13
None	11
Disregard Stop And Go Signal	9

Table 22: Evans Avenue KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factor
E BERRY ST	Signalized	Same Direction; Both Going Straight-Rear End	Had Been Drinking; Driver Inattention
BAKER ST	Side Stop-Controlled	Angle; Both Going Straight (fatality)	Disregard Stop And Go Signal

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to better understand the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along Evans Avenue. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Speed Management

Traffic volumes on the corridor were observed to be relatively low, and travel speeds appeared to exceed the speed limit. Based on these observations, the corridor appeared to be designed to accommodate higher volumes, and, in the absence of that, the corridor fosters faster travel speeds.

- To better manage speeds along the corridor, it is recommended that the corridor be studied for a road diet. If the road is converted from a four-lane to a three-lane cross-section, the reserved right-of-way can be used for improved bicycle and pedestrian facilities.

Bicycle Facilities

It was observed that there are no bicycle facilities on Evans Avenue. To ensure bicycle safety along the corridor,

- It is recommended that buffered bicycle lanes be installed. The extra right-of-way from a potential road diet can be repurposed into directional bike lanes with vertical delineation. Conversely, the roadway can be narrowed, and the bike lanes can be sidewalk-level, or the sidewalks can be widened to create a shared use path (see pedestrian facilities recommendations).

Pedestrian Facilities

There were few observed opportunities for pedestrians to cross Evans Avenue, except at signalized intersections. Evans Avenue is four lanes wide and with observed travel speeds, the corridor is generally unsafe for pedestrians to cross between signalized intersections without additional improvements. With the recommended road diet, opportunities can be created for mid-block crosswalks at minor stop-controlled intersections. These improvements can include curb extensions, pedestrian refuge islands, rectangular rapid flashing beacons (RRFBs), and pedestrian hybrid beacons (PHBs). Existing sidewalks are narrow, and it is recommended to widen them. With the road diet, an 8- to 10-foot-wide shared use path could be built on the western side of Evans Avenue. The shared use path would preclude the need to add directional bike lanes on the roadway, as it would serve both cyclists and pedestrians.

Intersection-Focused Recommendations

The following observations were made at specific intersections along Evans Avenue:

East Morningside Drive

This is a signalized intersection with crosswalks and ramps on all corners. There are no bicycle facilities at this intersection. There is a slope difference between East Morningside Drive and Evans Avenue that causes some cars to "bottom out" on the western leg of the intersection.

Table 23: East Morningside Drive Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps on west side of intersection do not appear to be ADA compliant. Curb ramps are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings and stop bars are faded. **Recommendation**: Remark existing crosswalks and stop bars.
Other Crossing Characteristics	**Issue:** There are long crossing distances. Evans Avenue is wide with two lanes and two parking lanes. Pedestrian signals are not in auto recall. APS/audio signal missing or inaudible. Pedestrian push buttons are difficult to access and far from the curb ramps. Pedestrian push button on southwest corner is damaged/missing. **Recommendation**: Install curb extensions on Evans Avenue to formalize parking and shorten crossing distance. Put pedestrian signal on auto recall. Implement LPI. Relocate and upgrade or repair pedestrian pushbuttons.
Sidewalk	**Issue**: Sidewalk heading west on East Morningside Drive appears to be narrow (<4 ft wide). Sidewalk is overgrown. Recommendation: Reconstruct or repair sidewalk. Schedule maintenance to cut grass.
Bicycle Facility	**Issue**: There are bike arrows / sharrows on East Morningside Drive. **Recommendation**: Install standard bike lane on East Morningside Drive.
Speed Management	**Issue**: Driver speeds appear to exceed speed limit. Street designed for higher speeds. **Recommendation**: Study for road diet. Install traffic calming measures on East Morningside Drive such as roundabout, speed humps, chicanes, pinch points, and/or narrow travel lanes (may require additional study).

Figure 7: Faded markings and slope difference between pavement of both roads (left); overgrown sidewalk (right)

Judd Street

This is a side stop-controlled intersection with ramps on all corners for existing sidewalks. There are no bicycle facilities at this intersection.

Table 24: Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramp on southeast corner of intersection appears to not be ADA compliant. Curb ramps are angled toward intersection traffic. Curb ramps on north side of intersection are overgrown with grass and appear to conflict debris. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: No crosswalk markings on any leg of intersection. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks on eastern and western leg across Judd St. Mark new stop bar.

Figure 8: Overgrown Curb Ramp

East Cantey Street

This is a side stop-controlled intersection with compliant ramps on all corners for existing sidewalks.

Table 25: East Cantey Street Intersection Recommendations

Category	Issue & Recommendation
Crosswalk	**Issue**: No crosswalk markings on any leg of intersection. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks on eastern and western leg across East Cantey St. Mark new stop bar.
Sidewalk	**Issue**: Sidewalks are on both sides of both streets except for the south side of the eastern leg on East Cantey Street. Sidewalks appear narrow in some locations **Recommendation**: Install new sidewalk on the south side of East Cantey St on the eastern leg of this intersection.

Figure 9: Sidewalk Ends

Glen Garden Drive

This is a side-stop intersection with ramps for crossing the side street at all four corners.

Table 26: Glen Garden Drive Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossing. **Recommendation**: Mark crosswalks on eastern and western side of intersection. Mark stop bars at stop controlled approaches.
Sidewalk	**Issue**: Sidewalks seem to be narrow (<4 ft wide). Sidewalk is overgrown. **Recommendation**: Reconstruct sidewalks to be wider. Schedule maintenance to cut grass.

East Lowden Street

This is a side-stop intersection with ramps for crossing the side street at all four corners

Table 27: East Lowden Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are not aligned with crossing. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossing. Recommendation: Mark crosswalks on eastern and western side of intersection. Mark stop bars at stop-controlled approaches.
Sidewalk	**Issue**: Sidewalks seem to be narrow (<4 ft wide). No continuous sidewalk on East Lowden St. **Recommendation**: Reconstruct sidewalks to be wider on Evans Ave. Determine which east-west sidewalk connections should be prioritized to complete connections.

Baker Street

As noted on the corridor's crash map (Figure 6), there is a concentration of crashes that occur at this intersection, including one fatal crash.

Table 28: Baker Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossing. **Recommendation**: Mark high-visibility crosswalks on eastern and western side of intersection. Mark stop bars at stop-controlled approaches.
Other Crossing Characteristics	**Issue**: Both approaches of Baker Street are wide with on street parking. There is also insufficient pedestrian lighting. **Recommendation**: Install curb extensions at intersection to shorten crossing distance across Baker St. Install/upgrade lighting.
Sidewalk	**Issue**: No sidewalk on northeast corner. Existing sidewalk on western side is at back of curb. **Recommendation**: Install new sidewalk on northeast corner of intersection on Baker St to connect to existing sidewalk. Consider reconstructing sidewalk along Evans Avenue with a buffer.

East Bowie Street

This is a T-shaped side-stop intersection with sidewalks along both roadways.

Table 29: East Bowie Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are angled toward intersection traffic. Curb ramp on northeast corner is pointed toward Evans Avenue without a marked crosswalk. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk across East Bowie Street is unmarked. No stop bar at controlled crossing. **Recommendation**: Mark high-visibility crosswalk on eastern side of intersection. Mark new stop bar on East Bowie St.
Sidewalk	**Issue**: Existing sidewalk on western side is at back of curb. **Recommendation**: Reconstruct/widen sidewalk on eastern side to and maintain buffer from roadway. Connect to the existing wider sidewalk on the northeast side.

Vicki Lane

This is a T-shaped side-stop intersection with sidewalks along both roadways.

Table 30: Vicki Lane Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk is unmarked. No stop bar at controlled crossing. **Recommendation**: Mark high-visibility crosswalk on eastern side of intersection. Mark new stop bar on Vicki Ln.
Sidewalk	**Issue**: Existing sidewalk on western side is at back of curb. **Recommendation**: Reconstruct/widen sidewalk on eastern side.

East Berry Street

There was a fatal crash at this intersection. This is a signalized intersection with crosswalks, ramps, stop bars and accessible pedestrian push buttons on all corners. Pedestrian signals are on auto call for Evans Avenue, but not for East Berry Street. There are no bicycle facilities at this intersection.

Table 31: East Berry Street Intersection Recommendations

Category	Issue & Recommendation
Curb Ramp	**Issue**: Curb ramp on west side of intersection is not aligned with crossing. **Recommendation**: Recommend widening the curb ramp to align with crosswalk.
Crosswalk	**Issue**: Stop bars are faded. **Recommendation**: Remark existing stop bars.
Access Management	**Issue**: Multiple driveways near intersection increase potential for conflict between motor vehicles and pedestrians/bicyclists. **Recommendation**: Consider consolidating driveways near intersection.

Figure 10: Driveway entrance at intersection

Recommendation Implementation Table

Table 32 below summarizes the full list of corridor and intersection recommendations offered to reduce crashes for all modes and enhance the safety along the Evans Avenue corridor. Each recommendation has an estimated applicable CMF and timeframe, which accounts for whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term projects, based on feasibility, crash reduction benefit and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth.

Table 32: Recommended countermeasures for Evans Avenue corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost (Construction)
Short (1-3 years)	Intersection	Install/refresh high-visibility crosswalks	0.6	$23,760.00
	Intersection	Install Stop Bar	--	$780.00
	Intersection	Install Buffered Bike Lanes	0.47	$132,545.00
Medium (3-5 years)	Intersection	Curb extension	--	$80,000.00
	Intersection	Reconfigure ramps to meet ADA Standard	--	$182,000.00
	Segment	Install additional lighting	0.58	$5,331.30
	Segment	Install continuous sidewalks	0.35	$726,245.43
	Intersection	Install pedestrian push button	--	$1,790.00
				Total: $1,152,451.73

Benefit-Cost Analysis

The estimated benefit-cost ratio for Evans Avenue is 5.54 (Table 33).

Table 34 summarizes the estimated improvement costs by type and Table 35 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 33: Evans Avenue Corridor – Final Cost-Benefit Ratio

Benefit Results	Cost Results	Final Benefit / Cost Ratio
$18,840,000	$3,401,300	5.54

Table 34: Cost Results for Evans Avenue Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install/refresh high-visibility crosswalks	$16.00/LF	1,485	4	$23,760.00	$5,940.00
Install Stop Bar	$30.00	26	4	$780.00	$195.00
Install Bike Lanes	$541.00/50 LF	130	4	$132,545.00	-
Curb extension	$10,000.00	8	25	$80,000.00	$33,136.25
Reconfigure ramps to meet ADA Standard	$3,500.00	28	25	$182,000.00	-
Install additional lighting	$5,331.30	1	15	$5,331.30	-
Install continuous sidewalks	$134.86/LF	5,385	10	$726,245.43	$366.57
Install pedestrian push button	$447.50	4	10	$1,790.00	$72,624.54
Total				$1,152,451.73	$112,441.36
				Lifecycle Cost (20 years)	**$3,401,300**

Table 35: Benefit Results for Evans Avenue Corridor

Crash Severity	Prevention Benefit*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	1	$3,700,000
A – Severe Injury	$3,700,000	1	$3,700,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	22	$11,440,000
		Total Benefit:	**$18,840,000**

Corridor 3: Mark IV Parkway

Mark IV Parkway runs south to north between Meacham Boulevard and Cantrell Sansom Road. It is on the Motor Vehicle High Injury Network (HIN), Commercial Motor Vehicle HIN and Motorcycle HIN.

Context

Mark IV Parkway functions as a major arterial and is lined with industrial uses. The United States Postal Service (USPS) has a distribution center on the southeastern end of the corridor. FedEx Freight operates on this road, and both DHL and Amazon have distribution centers at the corridor's northern end. The roadway consists of four to six lanes, with a grass median with curb breaks at major driveways. The median changes in width with mostly unmarked left turn lanes. The intersection at Loop Road is eight lanes, with a decorative stamped concrete median and islands. The corridor is approximately 1.61 miles in length. There are few, if any, sidewalks present, though there are sidewalks on both sides north of I-820. The intersection at Cantrell Sansom Road is a two-lane roundabout. The speed limit on the corridor is 40 mph. The typical pavement width, outer curb to outer curb including median width, ranges from 82 to 98 feet, while the right-of-way width is approximately 120-124 feet. The Average Annual Daily Traffic (AADT) for this corridor is 10,668, according to the 2022 TPP Statewide Traffic Count Map. The intersection at Meacham Boulevard is part of the 2022 Bond Design Meacham Boulevard Phase II (West) project. This will convert the existing two-lane undivided roadway to a four-lane divided roadway from I-35W to Blue Mound Road.

Crash History

A crash data analysis was performed for the Mark IV Parkway corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 208 total crashes occurred on Mark IV Parkway between Meacham Boulevard and Cantrell Sansom Road. About 18% of overall crashes involved a commercial vehicle and about 81% of those crashes occurred at intersections. Two-thirds of the overall crashes occurred at intersections, making intersection-related recommendations a focus of this evaluation. There were four crashes involving a motorcycle, all resulted in serious injuries and one resulted in a fatality. This fatal crash occurred

near Cantrell Sansom Road. There was one crash involving a pedestrian. Overall, there was one fatal crash, four severe injury crashes, and 23 crashes that resulted in minor injuries.

Figure 11 shows the spatial distribution of crashes in the Mark IV Parkway corridor. Table 36 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. Table 37 shows the top five contributing factors as noted in the crash reports on Mark IV Parkway. Table 38 summarizes the KSI crashes (five) that occurred on this corridor.

Most of the reported KSI crashes occurred while vehicles were going straight.

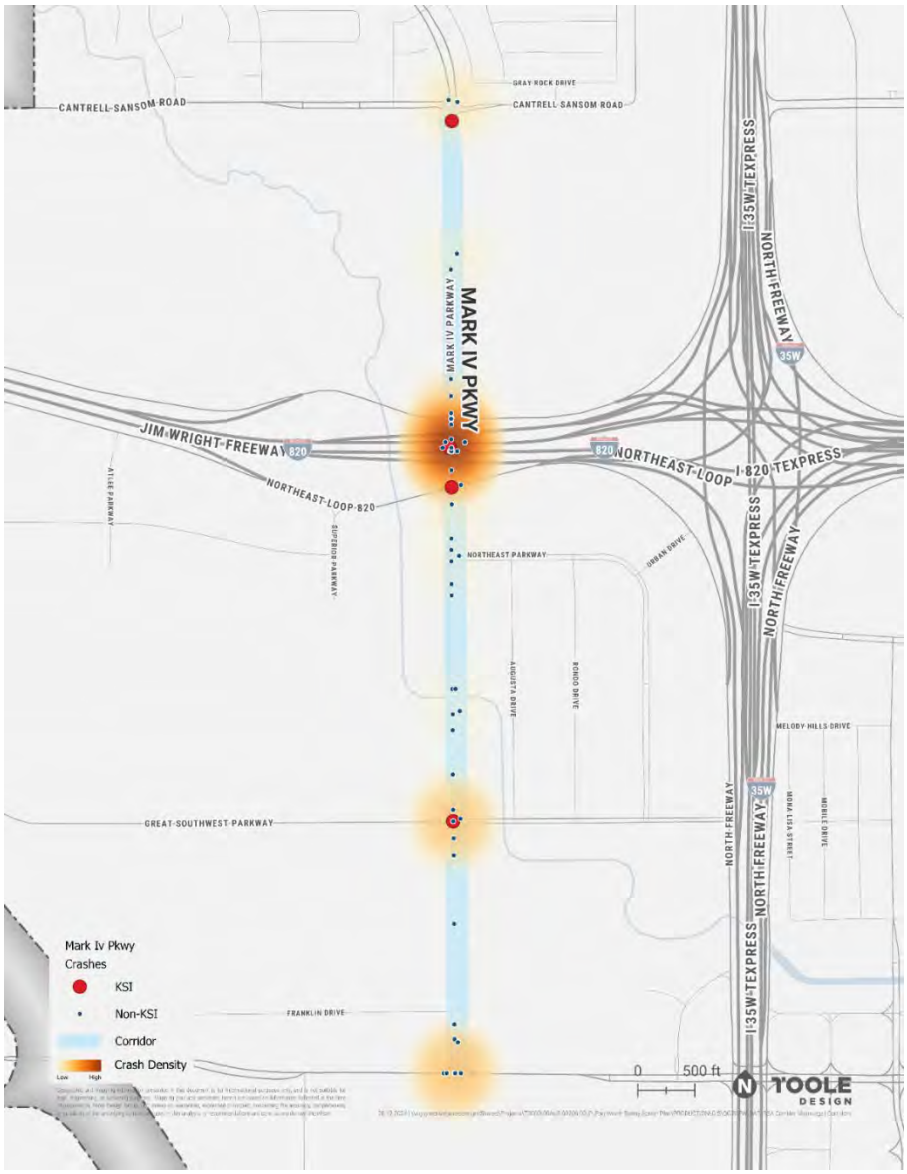


Figure 11: Crash map of the Mark IV Parkway corridor

Table 36: Mark IV Pkwy Collision Manner

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Intersection Total
MEACHAM BLVD	1	5	4	23	33
FRANKIN DR	1	1	---	---	2
GREAT SW PKWY	17	3	4	5	29
PROVIDENCE DR	---	---	---	2	2
NORTHEAST PKWY	---	2	1	5	8
NE LOOP 820 SERVICE RD	19	3	63	28	113
CANTRELL SANSOM RD	2	7	---	9	18
(OTHER / UNKNOWN)	2	---	1	---	3
TOTAL	**42**	**21**	**73**	**72**	**208**

Table 37: Mark IV Pkwy Top 5 Contributing Factors

Contributing Factors	Number of Crashes
Driver Inattention	48
Failed To Yield Right Of Way – Turning Left	42
None	34
Failure To Control Speed	28
Other	16

Table 38: Mark IV Parkway KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factor
GREAT SOUTHWEST PKWY	Side Stop-Controlled	Angle; Both Going Straight (motorcycle crash)	Other
GREAT SOUTHWEST PWKY	Side Stop-Controlled	Opposite Direction; One Straight-One Left Turn (motorcycle crash)	Failed To Yield Right Of Way – Turning Left
NE LOOP 820 SERVICE RD	Signalized	One Motor Vehicle; Going Straight (motorcycle crash)	None- hit fixed object

NE LOOP 820 SERVICE RD	Signalized	One Motor Vehicle; Going Straight	Driver Inattention- hit fixed object
CANTRELL SANSOM RD	Roundabout	One Motor Vehicle; Going Straight (motorcycle, fatality)	Speeding – Overlimit; Driver Inattention – hit fixed object

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

This corridor sees heavy industrial uses, with multiple distribution centers including USPS, Amazon, DHL and FedEx. These generate significant truck volumes and minimal pedestrian and bicycle volumes. Most freight vehicles were observed to exit properties along the corridor and head north toward the freeway.

Access Management

Driveway and street crossings were observed to be unsafe given the high speeds and high truck volume. Failure to yield was a contributing factor to one of the KSI crashes on this corridor.

- It is recommended to study access points and consider signalization to limit turning movements. Given the wide medians along this corridor, positive offset left turn lanes should be considered to improve visibility at unsignalized access points. Left turn acceleration lanes can also be added along the corridor to account for speed differential between entering traffic and through traffic and allow for trucks to accelerate before entering the travel lanes.
- There are some raised pavement markers (RPMs) present at turn bays, however, it is recommended to replace these and add both turn lane striping and signage to improve visibility.

Intersection-Focused Recommendations

The following observations were made at specific intersections along Mark IV Parkway:

Meacham Boulevard

This is a signalized intersection. The USPS has a distribution center on the northeast corner of this intersection. There are only sidewalks to the first driveways, between 100 to 250 feet from the intersection. There are pedestrian bush buttons and pedestrian signal heads for a crosswalk across Mark IV Parkway.

Table 39: Meacham Boulevard Intersection Recommendations

Category	Issue & Recommendation
Curb ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Existing substandard curb ramps on northeast and northwest corners. Trucks run over northwest corner. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings are faded. Stop bar is faded. **Recommendation**: Remark existing high-visibility crosswalk across Mark IV Parkway. Remark existing stop bar.
Other Crossing Characteristics	**Issue**: There is insufficient space for pedestrians because the existing median blocks the crosswalk. There is insufficient lighting. Pedestrian signal is not on auto recall. Pedestrian pushbuttons are difficult to access. APS/audio signal missing or inaudible. **Recommendation**: Reconstruct median nose as a median crossing island. Install/upgrade lighting. Implement LPI. Relocate pedestrian pushbutton.
Sidewalk	**Issue**: Sidewalks are narrow and do not provide enough space for pedestrians waiting. **Recommendation**: Widen sidewalks at intersection.

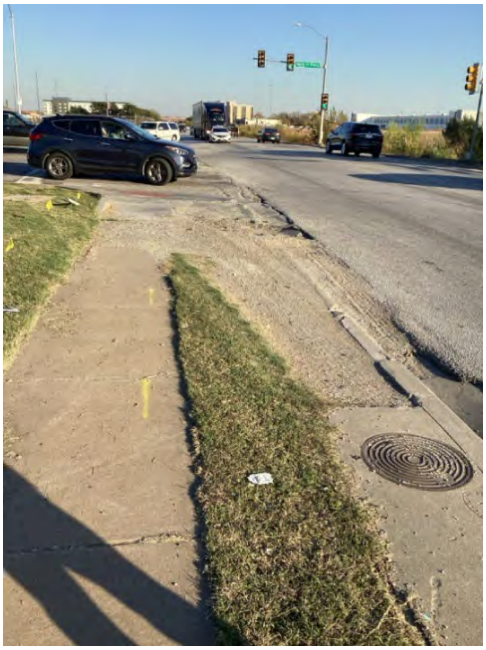


Figure 12: Northwest corner of intersection, tire tracks indicate vehicles are driving over existing curb ramp and corner (left); view of crosswalk, median blocks crosswalk- no refuge (right)

Franklin Drive

This is a side stop-controlled intersection. This driveway serves as a controlled, gated entry to the USPS distribution center on the east and serves multiple businesses on the west. There are no sidewalks on Franklin Drive or Mark IV Parkway at this location. Adding a sidewalk or shared use path on the west side of Mark IV Parkway would be challenging for several reasons including the presence of large trees, utilities, drainage, and a slight grade change behind curb and gutter.

Table 40: Franklin Drive Intersection Recommendations

Category	Issue & Recommendation
Other Crossing Characteristics	**Recommendation**: Replace RPMs present at the left turn lane into the USPS driveway and add turn lane striping and signage. Add a stop bar on Franklin Drive.

Great SW Parkway

This is a side stop-controlled intersection. To the west is the FedEx freight distribution center and to the east are smaller industrial plots. There is a sidewalk on the intersection's northwest corner. This sidewalk ends at the bridge over Little Fossil Creek. Remark existing stop bars and install new stop bars on Mark IV Parkway at signal. Sight distance is sufficient at this intersection and

the intersection is already laid out for a four-way stop or signalized condition. Median is present on all four approaches. Local business owner reported high number of crashes occurring when cars turn from Great SW Parkway onto Mark IV Parkway.

Table 41: Great SW Parkway Intersection Recommendations

Category	Issue & Recommendation
Other Crossing Characteristics	**Issue:** Heavy truck volumes from all directions and presence of some pedestrian infrastructure **Recommendation**: study feasibility of signalizing this intersection and accommodate U-turn movements. Install pedestrian pushbuttons and signals with the new signal.
Sidewalk	**Issue:** There is a sidewalk further east on the south side of Great SW Parkway but not at the intersection, making it difficult for pedestrians to cross. **Recommendation:** Install new sidewalk on Great SW Parkway to intersection. Install shared-use path on Mark IV Parkway to intersection.
Crosswalk	Install new high-visibility crosswalks and ADA compliant ramps for all corners and legs of intersection

Providence Drive

This is a side stop-controlled intersection, just past the bridge over Little Fossil Creek. This bridge has a flood gauge and is equipped with warning signs and flashers that warns users not to enter the area when flooded. The median noses at this intersection are tapered to accommodate larger vehicles turning in or out, but there is no formal left turn lane onto Providence Drive. This section of Mark IV Parkway has high speed traffic, freight vehicles, and minimal sidewalk connectivity. Providence Drive serves industrial uses and has a sidewalk on the north side. There is a sidewalk on the west side of Mark IV Parkway that ends at the bridge over Little Fossil Creek. There is an existing stop bar on Providence Drive and curb ramps for this crossing but no crosswalk.

Table 42: Providence Drive Intersection Recommendations

Category	Issue & Recommendation
Sidewalk	**Issue:** Sidewalk provided along bridge across creek t north of intersection is adjacent to travel lanes with no provided buffer. **Recommendation:** Install 5’ minimum sidewalk with buffer along bridge, vehicular travel lanes may be shifted

Northeast Parkway

This is a side stop-controlled intersection, with Northeast Parkway serving as the eastern leg of this intersection. Northeast Parkway exists to the west and stops at Superior Parkway before Little Fossil Creek. At the intersection on Mark IV Parkway, it appears the western leg of the intersection is gravel.

Table 43: Northeast Parkway Intersection Recommendations

Category	Issue & Recommendation
Other Crossing Characteristics	**Recommendation**: Replace RPMs present at the left turn lane onto Northeast Parkway and add turn lane striping and signage. Install stop bar on Northeast Parkway.
Sidewalks	**Issue:** There are no sidewalks present **Recommendation: I**nstall a new shared-use path on the eastern side of Mark IV Parkway to cross at Northeast Parkway
Crosswalk	**Issue:** No crosswalk present Recommendation: Install new, ADA compliant curb ramps and high-visibility crosswalks

NE Loop 820 Service Road

This is a signalized intersection. Half of all the crashes on the Mark IV Parkway corridor occurred at this intersection, as most vehicles enter or exit I-820.

Table 44: NE Loop 820 Service Road Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	
Crosswalk	**Issue:** Crosswalk markings, across southern and western leg, are not high-visibility. Southwest corner slip lane is missing crosswalk, but there is no sidewalk to the immediate south. **Recommendation:** Remark existing crosswalks with high-visibility markings.
Other Crossing Characteristics	**Issue:** There is long crossing distance on the southern leg crosswalk. NE Loop 820 Service Rd is only eastbound, so there are no left turns heading southbound on Mark IV Parkway. Sidewalks are vulnerable to traffic, essentially walking on a raised median with no separation from traffic.

	Recommendation: Extend median for a pedestrian refuge to the southern leg crosswalk, like there is north of I-820. Implement LPI. Consider narrowing U-turn slip lane to provide additional buffer for pedestrians.

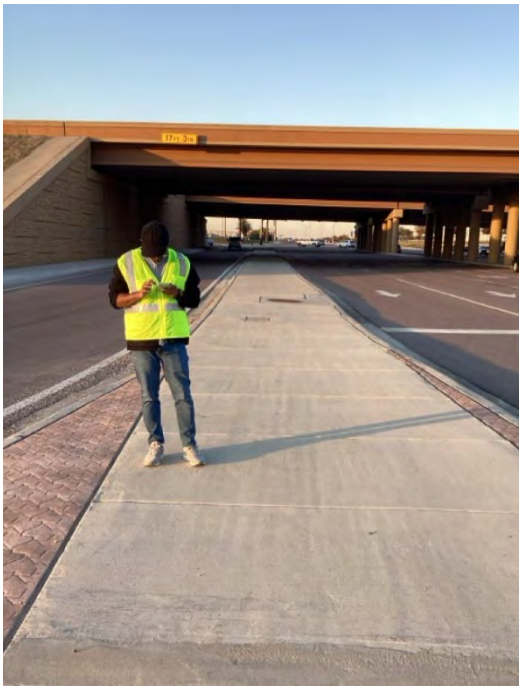


Figure 13: Sidewalk under I-820

Recommendation Implementation Table

Table 45 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the Mark IV Parkway corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term projects, based on feasibility, crash reduction benefit and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth.

Table 45: Recommended countermeasures for Mark IV Parkway corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install/refresh high-visibility crosswalks	0.6	$5,344.00
	Intersection	Install Stop Bar	--	$420.00

	Segment	Install Left Turn Lane Striping	0.79	$2,910.00
Medium (3-5 years)	Intersection	Install median pedestrian refuge	0.44	$8,200.00
	Intersection	Reconfigure ramps to meet ADA Standard	--	$21,000.00
	Segment	Install additional lighting	0.58	$10,662.60
	Intersection	Install Pedestrian Pushbutton	--	$2,872.00
	Segment	Install continuous sidewalks	0.35	$67,432.26
Long (5+ years)	Intersection	Implement full signalization at intersection	.35 - .73	$150,000.00
	Segment	Install Shared Use Path	0.35	$1,406,636.93
$1,675,477.79				

Benefit-Cost Analysis

The estimated cost-benefit result for Mark IV Parkway is 18.26 (Table 46).

Table 47 summarizes the estimated improvement costs by type and Table 48 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 46: Mark IV Parkway Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$92,480,000	$5,063,400	18.26

Table 47: Cost Results for Mark IV Parkway Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install/refresh high-visibility crosswalks	$16	334	4	$5,344.00	$1,336.00
Install Stop Bar	$30	14	4	$420.00	$105.00
Install Left Turn Lane Striping	$291/50 LF	10	4	$2,910.00	$727.50
Install median pedestrian refuge	$4,100	2	25	$8,200.00	-
Reconfigure ramps to meet ADA Standard	$3,500	6	25	$21,000.00	-

Install additional lighting	$5,331.30	2	15	$10,662.60	$633.13
Install Pedestrian Pushbutton	$1,436	2	10	$2,872.00	$287.20
Install continuous sidewalks	$134.86	500	10	$67,432.26	$6,743.23
Implement full signalization at intersection	$150,000	1	10	$150,000.00	$18,900.00
Install Shared Use Path	$269.73	5,215	10	$1,406,636.93	$140,663.69
Total				$169,395.75	$1,675,477.79
Lifecycle Cost (20 years)					$5,063,400

Table 48: Benefit Results for Mark IV Parkway Corridor

Crash Severity	Prevention Benefit[1]*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	2	$7,400,000
A – Severe Injury	$3,700,000	14	$51,800,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	64	$33,280,000
Total Benefit:			**$92,480,000**

[1] Cost obtained from TxDOT 2021 SII Calculator

Corridor 4: NW 14th Street

NW 14th Street runs northeast to southwest between N Main Street and Gould Avenue. It is on the Pedestrian HIN.

Context

NW 14th Street functions as a residential street with commercial use near the northeastern section of the corridor. Rufino Mendoza Elementary School is to the southwest end of the corridor. The roadway consists of two lanes, with unmarked on street parking. The corridor is approximately 0.49 miles in length. There are sidewalks present on both sides, but they are not continuous along the full length of the corridor. The speed limit is 30 mph. The typical pavement width ranges from 28 to 34 feet, while the right-of-way width is approximately 60-80 feet. The Average Annual Daily Traffic (AADT) for this corridor is 314, according to 2023 Replica Model Data.

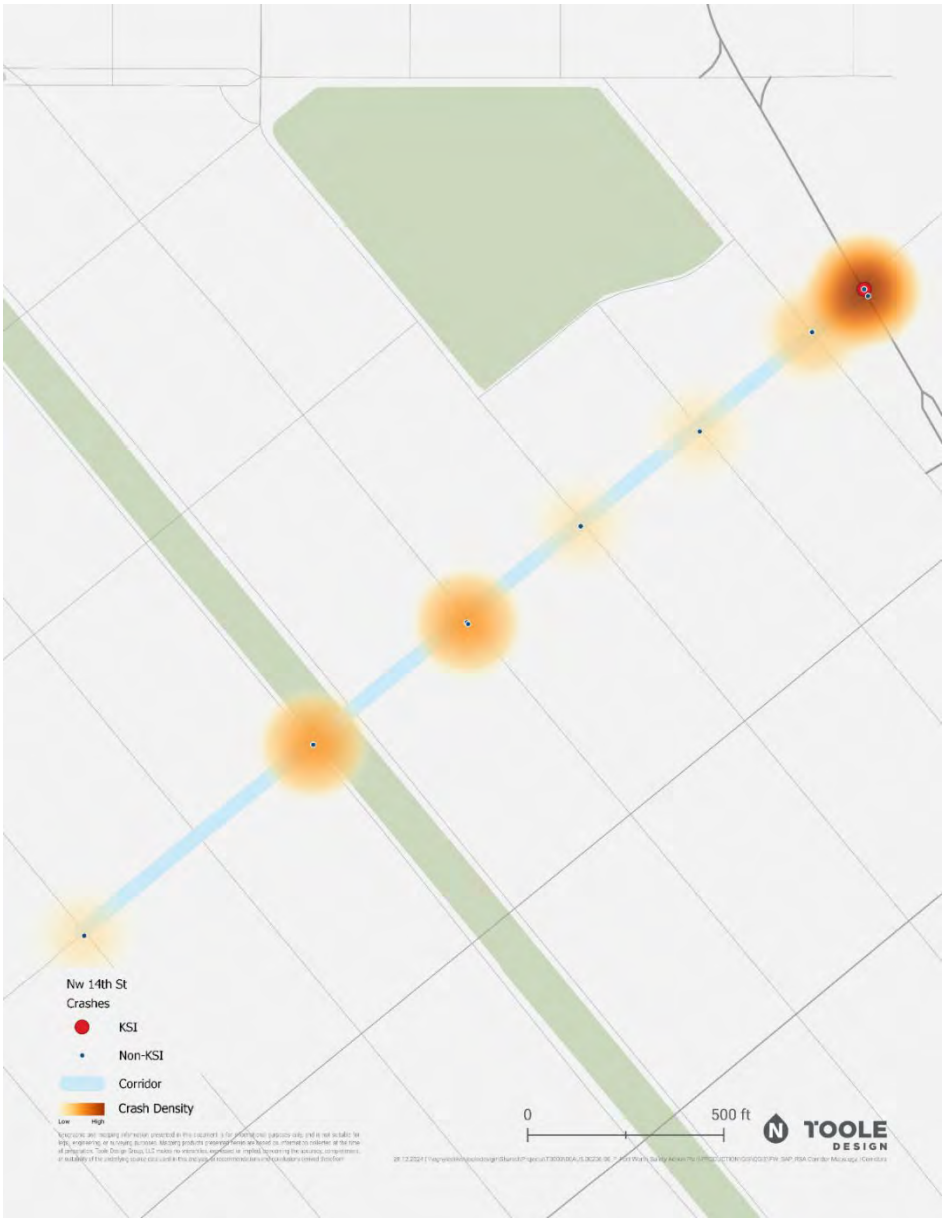


Figure 14: Crash map of the NW 14th Street corridor

Crash History

A crash data analysis was performed for the NW 14th Street corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 21 total crashes occurred on NW 14th Street from N Main Street to Gould Avenue. Despite the low total number of crashes, about a quarter resulted in severe injury or minor injury. Eighty-six percent of crashes occurred at intersections, making intersection-related recommendations a focus of this evaluation. There were two crashes involving a pedestrian, both at N Main Street and both classified as a KSI crash. Both KSI crashes happened at night in dark lighting conditions demonstrating the need for additional lighting to improve pedestrian visibility on this corridor.

Figure 14 shows the spatial distribution of crashes in the NW 14th Street corridor. Table 49 shows the summary of the crash data by collision manner for the NW 14th Street corridor. Table 50 shows the top five contributing factors as noted in the crash reports on NW 14th Street. Table 51 summarizes the KSI crashes (two) that occurred on this corridor.

Table 49: NW 14th Street Collision Manner, if noted

Intersection *(Closest reported)*	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
N MAIN ST	3	3	---	1	7
ELLIS AVE	2	---	---	---	2
N HOUSTON ST	---	2	---	---	2
CLINTON AVE	1	---	---	---	1
LEE AVE	2	1	---	1	4
CIRCLE PARK BLVD	4	---	---	---	4
LINCOLN AVE	---	---	---	---	0
GOULD AVE	---	---	1	---	1
TOTAL	**12**	**6**	**1**	**2**	**21**

Table 50: NW 14th Street Top 5 Contributing Factors

Contributing Factor	Number of Crashes
Failed To Yield Right Of Way – Stop Sign	7
Driver Inattention*	6
None	3

Faulty Evasive Action	3
Failed To Control Speed	2

Table 51: NW 14th Street KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
N MAIN ST	Main (NW 14th St) Stop-Controlled	One Motor Vehicle; Going Straight (pedestrian crash)	Driver Inattention; Failed To Yield Right Of Way – To Pedestrian
N MAIN ST	Main (NW 14th St) Stop-Controlled	One Motor Vehicle; Going Straight (pedestrian crash)	Driver Inattention; Pedestrian Failed To Yield Right Of Way To Vehicle; Intoxicated - Alcohol

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along 14th Street. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Most intersections along 14th Street are stop controlled, but intersecting approaches do not have to stop.

- It is recommended to study intersections along the corridor for all-way stop control.

Lanes are not clearly marked, due to the residential street. For wider intersections like those present at Circle Park Blvd or Clinton Ave, sign and mark for on street parking to narrow the travel lanes to encourage slower speeds.

Pedestrian Facilities

While sidewalks are present on both sides of 14th Street, they are not continuous for the full length of the corridor. The sidewalks are narrow and overgrown in many places.

- It is recommended to widen the existing sidewalk, fill sidewalk gaps, and remove or relocate obstacles, like utilities and landscaping.

- It is recommended to daylight intersections to improve pedestrian visibility by restricting parking in advance of marked crosswalks. This can be achieved either through paint or by installing curb extensions at intersections.

Bicycle Facilities

14th Street is a designated as a bike route, however, no bicycle facilities were observed. Because of the surrounding residential land use, observed low speed along the corridor, and presence of on-street parking,

- It is recommended to treat the corridor as a bike boulevard and install sharrow pavement markings.

Intersection-Focused Recommendations

The following observations were made at specific intersections along NW 14th Street:

N Main Street

This is a main stop-controlled intersection, so only NW 14th Street has stop signs. There is a Trinity Metro bus stop on the southeast and northwest corners of this intersection. This intersection falls between two signalized intersections on N Main Street and is within walking distance of MG Ellis Park and Marine Park as well as MG Ellis Elementary School. The crosswalk on the intersection's northern side is signed as a school crossing. Both of KSI crashes on the NW 14th Street corridor occurred at this intersection and involved a pedestrian. Based on the proximity to the school and other signals on this corridor, it is recommended to study this intersection for full signalization.

Table 52: N Main Street Intersection Recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not aligned with crossing. Missing curb ramps for southern leg. **Recommendation**: Reconstruct existing curb ramps. Install new curb ramps for proposed crosswalk across the southern leg.
Crosswalk	**Issue**: Crossing across southern leg is unmarked. **Recommendation**: Install new high-visibility crosswalk across the southern leg to match existing crosswalks.
Other Crossing Characteristics	**Issue**: There is long crossing distance across the western leg, almost 50 ft to cross two lanes. There is parking that blocks the sidewalk. There is insufficient lighting.

	Recommendation: Install curb extensions at this crosswalk and narrowing the lanes to match the neighborhood street width of the rest of the corridor. Regrade and delineate sidewalk and driveways to keep a clear pedestrian route. Install/upgrade lighting.

Ellis Avenue

This is a main stop-controlled intersection, so only NW 14th Street has stop signs. This intersection is approximately 160 feet, stop sign to stop sign, from the N Main Street intersection. Ellis Avenue is a parallel route to N Main Street. It is recommended to study the intersection for all way stop-control, especially given the proximity to the N Main Street intersection. There is a sidewalk on all approaches.

Table 53: Ellis Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant or are missing. **Recommendation**: Reconstruct or repair existing curb ramps. Install new curb ramps on northeast corner and for crossing of Ellis Ave.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars.
Other Crossing Characteristics	**Issue**: There is long crossing distance across Ellis Ave. There is insufficient lighting. There is parking that blocks the sidewalk. **Recommendation**: Install curb extensions on all corners. Limit parking at the intersection. Install/upgrade lighting. Regrade and delineate sidewalk and driveways to keep a clear pedestrian route.
Sidewalk	**Issue**: Sidewalk on northeast corner and heading north on Ellis Ave is overgrown with grass. **Recommendation**: Reconstruct or repair sidewalk.

N Houston Street

This is side stop-controlled intersection. There is a sidewalk on both sides of NW 14th Street and to the south on both sides of N Houston Street.

Table 54: N Houston Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are present on all four sides, but only the south side has ramps in two directions. There are no

	ramps on the opposite to complete the crossing. There is a utility pole and landscaping that may be impacted if curb ramps are reconstructed. **Recommendation**: Reconstruct or repair existing curb ramp. Relocate or remove obstacle in order to construct new curb ramps.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars on N Houston St.
Other Crossing Characteristics	**Issue**: There is insufficient lighting. **Recommendation**: Install/upgrade lighting.

Clinton Avenue

This is a main stop-controlled intersection, so only NW 14th Street has stop signs. There is a sidewalk on both sides of Clinton Avenue up to this intersection. The sidewalks continue to the north and connect to Marine Park. However, there is a sidewalk gap on NW 14th Street.

Table 55: Clinton Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Missing curb ramps on NW 14th St. Curb ramps only accommodate pedestrians along Clinton Ave. **Recommendation**: Install curb ramps to cross Clinton Ave on southeast leg.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars on NW 14th St.
Sidewalk	**Issue**: There are no sidewalks on either side of NW 14th St at this intersection. **Recommendation**: Install new sidewalk along NW 14th St to connect to existing sidewalks, both sides.

Lee Avenue

This is a main stop-controlled intersection, so only NW 14th Street has stop signs.

Table 56: Lee Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Existing curb ramps only on western leg of intersection. **Recommendation**: Install new curb ramps for other legs.

Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bar.
Other Crossing Characteristics	**Issue**: There is concern about drivers not yielding. There is insufficient lighting. **Recommendation**: Restrict parking in advance of crosswalk. Install/upgrade lighting.
Sidewalk	**Issue**: There are no sidewalks on either side of NW 14th St at this intersection, to the northeast. There is sidewalk on Lee Ave but not necessarily to the intersection. **Recommendation**: Install new sidewalk along NW 14th St to connect to existing sidewalks, both sides. Install new sidewalk on Lee Ave to connect to existing sidewalk and to intersection.

Circle Park Boulevard

This is a main stop-controlled intersection, so only NW 14th Street has stop signs. This street consists of two one-way pairs, which leaves large intersections for turning vehicles. To the north, Circle Park Boulevard leads to Circle Park, Northside Library, and JP Elder Middle School and to Oakwood Cemetery to the south.

Table 57: Circle Park Boulevard Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Ramps are only for crossing NW 14th St not Circle Park Blvd. **Recommendation**: Install new curb ramps for crossing Circle Park Blvd.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalk. Mark new stop bar.
Other Crossing Characteristics	**Issue**: There is long crossing distance, about 160 ft to cross Circle Park Blvd. Because of the one-way pairs of Circle Park Blvd, there is concern about driver turning movements and speeds since drivers do not have to stop. There is insufficient lighting. **Recommendation**: Install curb extensions and median crossing island to shorten crossing distance and provide pedestrian refuge. Install RRFB for crosswalks across Circle Park Blvd. Install advanced pedestrian warning signs. Remove obstacle or widen standing space to improve comfort and safety of pedestrians waiting to cross. Install/upgrade lighting. Study the intersection control here – all way stop or roundabout. Constrain intersection width, restrict turning radii.
Sidewalk	**Issue**: No sidewalk within intersection (crossing Circle Park Blvd). **Recommendation**: Provide separated, accessible route across intersection.

Speed Management	**Issue**: Observed driver speeds appear to exceed speed limits. **Recommendation**: Install speed feedback signs. Install traffic calming measures such as roundabout, speed humps, chicanes, pinch points or narrow travel lanes (may require additional study).

Lincoln Avenue

This is a main stop-controlled intersection, so only NW 14th Street has stop signs.

Table 58: Lincoln Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Missing curb ramps. There is a utility conflict (catch basin and utility pole) on the southwest corner. **Recommendation**: Install new curb ramp on southeast corner and across western leg, if feasible.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalk. Mark new stop bar.
Sidewalk	**Issue**: There is a sidewalk gap on the south side of NW 14th St here and a sidewalk gap on the northeast side of Lincoln Ave. **Recommendation**: Install new sidewalk to connect to existing sidewalks.

Gould Avenue

This is an all way stop-controlled intersection. Rufino Mendoza Elementary School is on the southwest corner of this intersection.

Table 59: Gould Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Missing curb ramps for some crossings. **Recommendation**: Reconstruct or repair existing curb ramps. Install new curb ramps.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. Existing stop bars are faded and too close to crosswalk. **Recommendation**: Install new high-visibility crosswalks on two legs. Mark new stop bars. Remark existing stop bars at least 4 feet from crosswalk.

Other Crossing Characteristics	**Issue**: There is long crossing distance across Gould Ave. Parked cars obstruct sight lines. **Recommendation**: Install curb extensions. Install school crossing signs with downward pointing arrows. Restrict parking close to intersection.

Recommendation Implementation Table

Table 60 below summarizes the full list of corridor and intersection recommendations offered to reduce crashes for all modes and enhance the safety along the NW 14th Street corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project, based on feasibility, crash reduction benefit, and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth.

Table 60: Recommended countermeasures for NW 14th Street corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Segment	Install dynamic speed feedback signage	0.95	$6,000.00
	Intersection	Install/refresh high-visibility crosswalks	0.6	$24,480.00
	Intersection	Install advance signal, stop or yield signs	0.75	$400.00
	Intersection	Install Stop Bar	--	$450.00
Medium (3-5 years)	Intersection	Install median pedestrian refuge	0.44	$16,400.00
	Intersection	Curb extension	--	$100,000.00
	Intersection	Reconfigure ramps to meet ADA Standard	--	$105,000.00
	Segment	Install additional lighting	0.58	$31,987.80
	Segment	Install continuous sidewalks	0.35	$305,468.13
$590,185.93				

Benefit-Cost Analysis

The estimated cost-benefit result for NW 14th Street is 48.08 (Table 61).

Table 62 summarizes the estimated improvement costs by type and Table 63 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 61: NW 14th Street Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$66,020,000	$1,373,000	48.08

Table 62: Cost Results for NW 14th Street Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install dynamic speed feedback signage	$3,000.00	2	10	$6,000.00	$600.00
Install/refresh high-visibility crosswalks	$16.00	1530	4	$24,480.00	$6,120.00
Install advance signal, stop or yield signs	$100.00	4	6	$400.00	$60.00
Install Stop Bar	$30.00	15	4	$450.00	$112.50
Install median pedestrian refuge	$4,100.00	4	25	$16,400.00	-
Curb extension	$10,000.00	10	25	$100,000.00	-
Reconfigure ramps to meet ADA Standard	$3,500.00	30	25	$105,000.00	-
Install additional lighting	$5,331.30	6	15	$31,987.80	$1,699.39
Install continuous sidewalks	$134.86	2265	10	$305,468.13	$30,546.81
			Total	$590,185.93	$39,138.70
				Lifecycle Cost (20 years)	**$1,373,000**

Table 62: Benefit Results for NW 14th Street Corridor

Crash Severity	Prevention Benefit	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0	$0
A – Severe Injury	$3,700,000	17	$62,900,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	6	$3,120,000
Total Benefit:			**$66,020,000**

Corridor 5: NW 26th Street

NW 26th Street runs east to west between N Main Street to Angle Avenue. It is on the Pedestrian HIN.

Context

NW 26th Street functions as a residential street with commercial use at the eastern end. This corridor intersects with Ellis Avenue at Rodeo Park and ends in the Historic Stockyards District. The roadway consists of two lanes, and has unmarked, on-street parking. The corridor is approximately 0.50 miles in length. There are intermittent sidewalks present on both sides. The speed limit on the corridor is 30 mph. The typical pavement width ranges from 26 feet in residential area (two lanes) to 48 feet in commercial area (four lanes), while the right-of-way width is approximately 68 feet. The Average Annual Daily Traffic (AADT) for this corridor is 192, according to 2023 Replica Model Data.

Crash History

A crash data analysis was performed for the NW 26th Street corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 43 total crashes occurred on NW 26th Street from N Main Street to Angle Avenue. About half of the overall crashes occurred at dusk or at night demonstrating the need for additional lighting on the corridor. Eighty-one percent of those crashes occurred at intersections, making intersection-related recommendations a focus of this evaluation. There was one crash involving a bicycle which occurred at N Main Street. There were two crashes involving a motorcycle at Lee Avenue and Main Street. There were six crashes involving a pedestrian, five of which occurred at N Main Street. Most occurred due to driver inattention and the failure to yield right of way to the pedestrian. Most happened when vehicles were turning left. Overall, there were no fatal or severe injury crashes; five crashes resulted in minor injuries.

Figure 15 shows the spatial distribution of crashes in the NW 26th Street corridor.

Figure 15: Crash map of the NW 26th Street corridor

Table 63 shows the summary of the crash data by collision manner for the NW 26th Street corridor. Table 64 shows the top five contributing factors as noted in the crash reports of crashes on NW 26th Street. There were no KSI crashes reported on this corridor.

Table 63: NW 26th Street Collision Manner, if noted[1]

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
N MAIN ST	7	8	3	10	28
ELLIS AVE	5	---	---	1	6
N HOUSTON ST	---	2	---	---	2
CLINTON AVE	2	---	---	3	5
ROSS AVE	---	---	---	---	0
LEE AVE	---	1	---	---	1
PROSPECT AVE	1	---	---	---	1
ANGLE AVE	---	---	---	---	0
TOTAL	**15**	**11**	**3**	**14**	**43**

Table 64: NW 26th Street contributing factors, if noted

Contributing Factor	Number of Crashes
Driver Inattention	13
Failed To Control Speed	9
Failed To Yield Right Of Way – Stop Sign	5
None	4
Disregard Stop Sign Or Light	4

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to gain a better understanding of the existing operations and barriers. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along 26th Street. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

[1] Crashes reported at Main St may have also been labeled as Stockyards Blvd when reported

Pedestrian Facilities

There are sidewalks on both sides of the corridor but there are significant gaps.

- It is recommended that a new sidewalk be constructed to fill in the gaps along the corridor.
- Crosswalks are recommended at each stop-controlled intersection.

Bicycle Facilities

There is bicycle signage along 26th Street, however, no bicycle facilities were observed along the corridor. Given the connection to the Trinity Trails System at Ellis Avenue and the residential use along the corridor,

- It recommended to treat the corridor as a bike boulevard and install sharrow pavement markings.

Intersection-Focused Recommendations

The following observations were made at specific intersections along NW 26th Street.

N Main Street

This is a signalized intersection. The eastern leg of this intersection is Stockyards Boulevard, part of the Historic Stockyards District. All legs of the intersection have adequate crosswalks. Stop bars are present and are spaced adequately from the crosswalks. On the eastern leg there are channelized turn lanes with islands, crosswalks, and pedestrian push buttons.

Table 65: N Main Street Intersection Recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps do not appear to be ADA compliant. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings are faded. Crosswalk surface uplifted. Stop bar at controlled crossing are faded. **Recommendation**: Repave crosswalk surface area and remark existing crosswalks. Remark existing stop bars.
Other Crossing Characteristics	**Issue**: Pedestrian push buttons are difficult to access. Pedestrian signal not on auto recall. Insufficient space for pedestrians waiting to cross due to obstacle (fire hydrant within pedestrian walkway on northeast corner island) or narrow sidewalk (northwest corner has mast arm and pillar within curb ramps).

	Recommendation: Implement LPI. Relocate fire hydrant, mast arm and pillar and widen standing space to improve comfort and safety of pedestrians waiting to cross. Consider widening islands on east side to shorten crossing distance as well. Install curb extensions on west side to shorten crossing distance and provide more waiting space for pedestrians. Curb extensions will help formalize the on street parking on the western leg of the intersection.

Ellis Avenue

This is an all way stop-controlled intersection. This intersection is above Marine Creek and the sidewalks here tie into the Trinity Trails Systems. This intersection is a bridge structure running about 200-300 ft north and south of this intersection[2].

Table 66: Ellis Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant but are limited by bridge structure. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks across Ellis Ave are unmarked. Crosswalks across NW 26th St are faded, eastern crosswalk is skewed. Stop bars are missing on Ellis Ave. **Recommendation**: Mark new high-visibility crosswalks and remark existing crosswalks as high visibility and better alignment. Mark new stop bars and remark existing stop bars.
Other Crossing Characteristics	**Issue**: There are long crossing distances. There is insufficient lighting. **Recommendation**: Install curb extensions, particularly on southwest curb. Install median crossing island on southern leg. Install/upgrade lighting. Consider treatments appropriate for trail crossings.
Sidewalk	**Issue**: Sidewalks lack sufficient buffer and have too much cross-slope. There is excessive vegetation on northeast corner of intersection that is blocking the sidewalk. **Recommendation**: Remove obstructions on the northeast corner and construct a sidewalk on the east side to tie to existing sidewalk to the north.

N Houston Street

This is a side stop-controlled intersection. The northern leg of this intersection is a driveway to a parking lot for the Rodeo Park fields and trail system. There are ramps present on all corners. The ramps on the north side are isolated and do not connect to any sidewalks.

[2] This intersection is also on the Ellis Avenue corridor

Table 67: N Houston Street Intersection Recommendations

Category	Issues and Recommendations
Crosswalk	**Issue**: Crossing is unmarked. Stop bar is unmarked. **Recommendation**: Mark new high-visibility crosswalk. Install mid-block crosswalk to cross NW 26th St. Mark new stop bar on N Houston St and park driveway.
Sidewalk	**Issue**: There is a sidewalk gap on the north side of NW 26th St at this intersection. There is a parallel route using the trail system in Rodeo Park. It would be challenging to build and provide an accessible route on the north side within this block. **Recommendation**: Install sidewalk from ramps at intersection up park driveway to trail system. Install new sidewalk on north side of NW 26th St, if feasible. Consider narrowing travel lanes to accommodate sidewalk width.

Clinton Avenue

This is a main stop-controlled intersection, so only NW 26th Street has stop signs.

Table 68: Clinton Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Missing curb ramp on southeast corner. **Recommendation**: Install new curb ramp.
Crosswalk	**Issue**: Crosswalk is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks on NW 26th St. Mark new stop bars on NW 26th St.
Other Crossing Characteristics	**Issue**: There is long crossing distance and concern about driver yielding. There is insufficient lighting. **Recommendation**: Install curb extensions to shorten crossing distance and prevent parking at intersection. Study intersection for STOP control and consider converting to an all way stop. Install/upgrade lighting.
Sidewalk	**Issue**: Sidewalk on southeast corner is overgrown. There is a sidewalk gap on both sides of NW 26th St to the east. Sidewalks are narrow and do not provide enough space for pedestrians. **Recommendation**: Reconstruct narrow, overgrown sidewalk on the south side of NW 26th St and construct new sidewalk to fill sidewalk gap and connect to existing sidewalk toward N Houston St. Consider narrowing travel lanes to accommodate sidewalk width. Widen sidewalks.

Speed Management	**Issue**: Starting at this intersection heading westbound, there is a steep uphill that may encourage speeding. Observed driver speeds appear to exceed speed limit. **Recommendation**: Consider traffic calming elements and advanced warning signs for crosswalks and stop signs.

Ross Avenue

This is a main stop-controlled intersection, so only NW 26th Street has stop signs. There are sidewalks present on both sides of Ross Avenue and on both sides of NW 26th Street on the eastern leg of this intersection.

Table 69: Ross Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. There are steep grades on all approaches. **Recommendation**: Reconstruct or repair existing curb ramps to accommodate ADA and manage slope challenges.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks across NW 26th St. Mark new stop bars.
Other Crossing Characteristics	**Issue**: There are steep grades on all approaches that may encourage speeding or lack of yielding to drivers and pedestrians. Northbound traffic on Ross Ave are coming over a hill downhill and do not have to stop at this intersection. There is insufficient lighting. **Recommendation**: Consider traffic calming elements and advanced warning signs for crosswalks and stop signs. Study intersection for STOP control and consider converting to an all way stop. Install/upgrade lighting, add additional lighting on northwest corner of intersection.
Sidewalk	**Issue**: There is a sidewalk gap on NW 26th St on the western leg of this intersection. Existing sidewalks at this intersection have too much cross slope. **Recommendation**: Install new sidewalks on NW 26th St to fill sidewalk gap. Regrade existing sidewalks.

Lee Avenue

This is a main stop-controlled intersection, so only NW 26th Street has stop signs. There is only sidewalk: on the east side of Lee Avenue heading south.

Table 70: Lee Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Existing curb ramp on southeast corner does not appear to be ADA compliant. Missing curb ramps on remaining corners. **Recommendation**: Reconstruct curb ramp on southeast corner. Construct new curb ramps on other three corners.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalk. Mark new stop bars.
Other Crossing Characteristics	**Issue**: There are steep grades on all approaches that have poor sight lines of this intersection. Crossing may be difficult for drivers to see or anticipate due to roadway curvature. Runway crest on southbound and westbound approaches obstruct view of intersection. **Recommendation**: Study intersection for STOP control and consider converting to an all way stop. Install advance yield or stop markings and signs in advance of crosswalks.
Sidewalk	**Issue**: There is a sidewalk gap on NW 26th St at this intersection. Grade on northwest corner of intersection presents challenge for installing sidewalk. Existing sidewalk appears narrow, about 3 ft wide. **Recommendation**: Install new sidewalks on NW 26th St to fill sidewalk gap. Reconstruct existing sidewalk to be wider.

Prospect Avenue

This is a main stop-controlled intersection, so only NW 26th Street has stop signs.

Table 71: Prospect Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Existing curb ramp on northeast corner is not aligned with crossing. Other corners do not have curb ramps. **Recommendation**: Reconstruct existing curb ramp. Install new curb ramps.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars.

Other Crossing Characteristics	**Issue**: Crossing may be difficult for drivers to see or anticipate due to roadway curvature. There is insufficient lighting. **Recommendation**: Restrict parking in advance of crosswalk. Study intersection for STOP control and consider converting to an all way stop. Install advance yield or stop markings and signs in advance of crosswalk. Install/upgrade lighting.
Sidewalk	**Issue**: There is a sidewalk gap on NW 26th St at this intersection. **Recommendation**: Install new sidewalks on NW 26th St to fill sidewalk gap.

Angle Avenue

This is a main stop-controlled intersection, so only NW 26th Street has stop signs. Angle Avenue diverges and becomes Refugio Avenue. There is a sidewalk on the southeast corner at this intersection.

Table 72: Angle Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Existing curb ramp on southeast corner is not fully ADA compliant. Other corners do not have curb ramps. **Recommendation**: Reconstruct or repair existing curb ramp. Install new curb ramps.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars.
Sidewalk	**Issue**: There is a sidewalk gap on NW 26th St at this intersection. **Recommendation**: Install new sidewalks on NW 26th St to fill sidewalk gap.

Recommendation Implementation Table

Table 73 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the NW 26th Street corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project, based on feasibility, crash reduction benefit and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth.

Note: The intersection of NW 26th Street and Ellis Avenue is accounted for in both corridors' benefit/cost analysis.

Table 73: Recommended countermeasures for NW 26th Street corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install/refresh high-visibility crosswalks	0.6	$21,760.00
	Intersection	Install advance signal, stop or yield signs	0.75	$2,000.00
	Intersection	Install Stop Bar	--	$750.00
Medium (3-5 years)	Intersection	Relocate Fire Hydrant and Mast Arm	--	$25,000.00
	Intersection	Install median pedestrian refuge	0.44	$4,100.00
	Intersection	Curb extension	--	$100,000.00
	Intersection	Reconfigure ramps to meet ADA Standard	--	$87,500.00
	Segment	Install additional lighting	0.58	$93,297.75
	Segment	Install continuous sidewalks	0.35	$335,138.33
				$669,546.08

Benefit-Cost Analysis

The estimated cost-benefit result for NW 26th Street is 6.69 (Table 74). Table 75 summarizes the estimated improvement costs by type and Table 76 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 74: NW 26th Street Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$10,400,000	$1,553,700	6.69

Table 75: Cost Results for NW 26th Street Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install/refresh high-visibility crosswalks	$16	1360	4	$21,760.00	$5,440.00
Install advance signal, stop or yield signs	$100	20	6	$2,000.00	$300.00

Install Stop Bar	$30	25	4	$750.00	$187.50
Relocate Fire Hydrant and Mast Arm	$25,000	1	25	$25,000.00	$-
Install median pedestrian refuge	$4,100	1	25	$4,100.00	$-
Curb extension	$10,000	10	25	$100,000.00	$-
Reconfigure ramps to meet ADA Standard	$3,500	25	25	$87,500.00	$-
Install additional lighting	$186,595.50/MI	0.50 MI	15	$93,297.75	$4,764.89
Install continuous sidewalks	$134.86	2485	10	$335,138.33	$33,513.83
			Total	$44,206.22	$669,546.08
				Lifecycle Cost (20 years)	**$1,553,700**

Table 76: Benefit Results for NW 26th Street Corridor

Crash Severity	Prevention Benefit*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0.00	$0
A – Severe Injury	$3,700,000	0.00	$0
B – Non-Incapacitating or Suspected Minor Injury	$520,000	20.00	$10,400,000
		Total Benefit:	**$10,400,000**

Corridor 6: Pennsylvania Avenue

Pennsylvania Avenue runs east to west between S Main Street and 8th Avenue. It is on the Pedestrian HIN and Motor Vehicle HIN.

Context

Pennsylvania Avenue functions as a minor arterial with mostly commercial uses. There is a large medical campus that includes Cook Children's Medical Center and Harris Methodist Hospital at the corridor's western end. The roadway consists of three to five lanes with marked on-street parking at the eastern end. The corridor is a designated bike route and there are directional bike lanes present for much of its length, though these are intermittent. There are continuous sidewalks present on both sides of the road. A Trinity Metro bus route runs on this corridor. The corridor is approximately 1.04 miles in length. The speed limit is 35 mph. The typical pavement width ranges from 50 to 60 feet, while the right-of-way width is approximately 80 to 84 feet. The Average Annual Daily Traffic (AADT) for this corridor is 12,250, according to the 2023 NCTCOG Travel Demand Model.

Crash History

A crash data analysis was performed for the Pennsylvania Avenue corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 124 total crashes occurred on Pennsylvania Avenue between S Main Street and 8th Avenue. Forty-eight percent of the crashes occurred at intersections, making both intersection-related recommendations and corridor-focused recommendations focuses of this evaluation. Four crashes involved a pedestrian, two of which occurred at S Jennings Street when vehicles were turning left. Overall, there were no fatal crashes, there were four severe injury crashes, and 24 crashes that resulted in in minor injuries.

Figure 16 shows the spatial distribution of crashes in the Pennsylvania Avenue corridor. Table 77 shows the summary of the crash data by collision manner for the Pennsylvania Avenue corridor. Table 78 shows the top five contributing factors as noted in the crash reports on Pennsylvania Avenue. Tables 79 summarizes the KSI crashes (four) that occurred on this corridor.

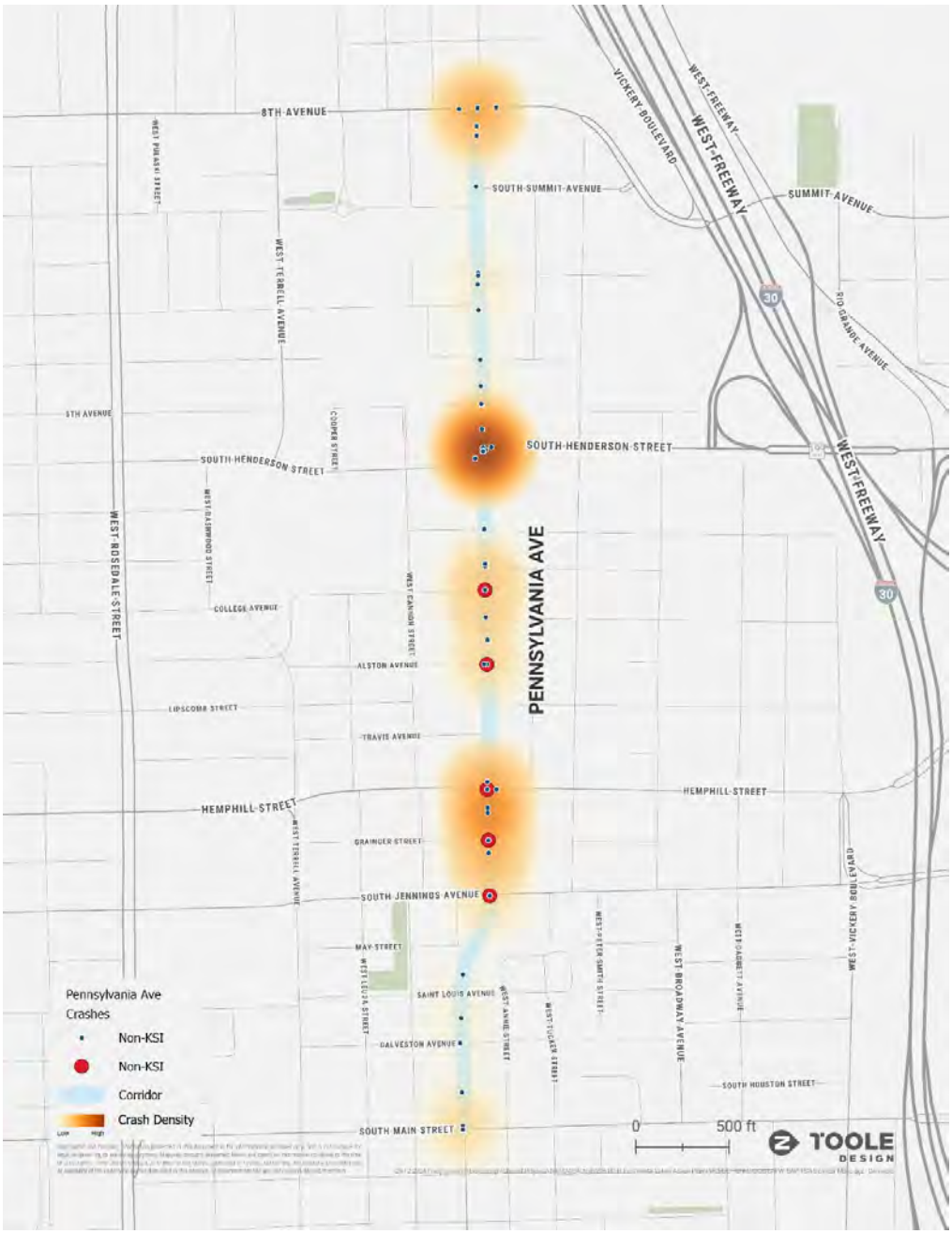


Figure 16: Crash map of the Pennsylvania Avenue corridor

Table 77 – Pennsylvania Avenue Collision Manner, if noted

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Other	Same Direction	Total
S MAIN ST	5	1	---	---	1	7
GALVESTON AVE	1	1	---	---	---	2
ST LOUIS ST	---	1	---	---	---	1
S JENNINGS ST	3	2	1	---	---	6
GRAINGER ST	---	---	---	---	---	0
HEMPHILL ST	10	1	3	---	3	17
TRAVIS AVE	---	---	---	---	---	0
LIPSCOMB ST	---	---	---	---	---	0
ALSTON AVE	5	---	---	1	1	7
COLLEGE AVE (N + S)	7	---	1	---	1	9
FULTON ST	---	1	---	---	1	2
S ADAMS ST	1	---	---	---	---	1
S HENDERSON ST	7	---	18	---	18	43
5th AVE	---	---	1	---	---	1
S LAKE ST	---	1	---	---	---	1
6th AVE	---	1	---	---	---	1
S BALLINGER ST	---	1	1	---	---	2
7th AVE	---	---	---	---	---	0
S SUMMIT AVE	1	---	---	---	2	3
8th AVE	4	1	9	---	5	19
(UNKNOWN)	1	---	1	---	---	2
TOTAL	**45**	**11**	**35**	**1**	**32**	**124**

Table 78: Pennsylvania Avenue Top 5 Contributing Factors

Contributing Factor	# of Crashes
Driver Inattention	30
Failed To Yield Right Of Way – Turning Left	25
Other	17
Disregard Stop And Go Signal	17
None	15

Table 79 – Pennsylvania Avenue KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
S JENNINGS ST	Signalized	One Motor Vehicle; Turning Left (pedestrian crash)	None
HEMPHILL ST	Signalized	Angle; Both Going Straight	Failed To Stop At Proper Place; Failed To Control Speed
ALSTON AVE	Side Stop-Controlled	Angle; One Straight-One Left Turn	Failed To Yield Right Of Way – Stop Sign
COLLEGE AVE (N + S)	Side Stop-Controlled	Angle; One Straight-One Left Turn	Failed To Yield Right Of Way – Stop Sign

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along Pennsylvania Avenue. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

This corridor is in a dense area with intermittent directional bikes lanes but continuous sidewalks. It also has a Trinity Metro bus route. There are north-south bus routes that intersect with this corridor, as well. Corridor recommendations focus on improving transit, pedestrian, and bicyclist accommodations.

Road Diet and Access Management

It is recommended that the corridor be studied for a road diet, to reduce it to a three-lane section between S Henderson Street and 8th Ave. The need for maintaining on-street parking along the corridor should also be considered. The removal of a travel lane or on-street parking would create space for bicycle facilities and amenities like bus stops. For remaining parking, it should be reconfigured as to not obstruct pedestrians and cyclists.

As part of the corridor study, property access should also be assessed to reduce turning conflicts. Driveway consolidation or turn restrictions should be implemented where necessary. Where driveways can be converted to right-in-right-out, raised medians can be installed to restrict traffic and calm traffic.

Pedestrian Facilities

It is recommended to reconstruct driveways so that sidewalks remain level, which establishes pedestrian right of way.

Many of the intersecting streets create T-intersections and do not have marked crosswalks across Pennsylvania Avenue.

- It is recommended to study the corridor for mid-block crossing opportunities at regular intervals with a focus on bus stop locations.
- Bus stop locations should also be evaluated for relocation or consolidation so that they are located adjacent to crosswalks and in areas where there is ample right-of-way for bus stop amenities.

There are multiple crosswalks along Pennsylvania Ave in front of the medical centers, between 5th Ave and 7th Ave.

- It is recommended to create an accessible pedestrian route to these crosswalks, across driveways, and to the parking deck access points. These crossings should be marked with high visibility paint and appropriate signage so that drivers yield to pedestrians.

Bicycle Facilities

Intermittent directional bikes lanes were observed east of the corridor limits at South Freeway and end at the S Henderson Street intersection. Between these two, bicycle facilities transition between bike lanes and sharrow. The bike lanes are often adjacent to on-street parking.

- To ensure bicycle safety along the corridor, it is recommended that buffered bicycle lanes be installed along the corridor; buffered by on-street parking is preferred. Directional bike lanes should have high visibility intersection crossing and driveway crossing markings and appropriate signage.

- Where bus stops exist along the directional bike lanes, it is recommended to construct floating bus stops with appropriate pavement markings and signage to better manage pedestrians crossing the bike lane.

Intersection-Focused Recommendations

The following observations were made at specific intersections along Pennsylvania Avenue:

S Main Street

This is a signalized intersection. There are sidewalks and bike lanes on all approaches. There are curb extensions at the intersection to shorten crossing distances and to delineate marked, on-street parking on all legs of the intersection. All pedestrian signals are visible, and all pedestrian buttons are easily accessible with audible feedback.

Table 80 – S Main St Intersection Recommendations

Category	Issues and Recommendations
Crosswalk	**Issue**: Crosswalks are red-brown brick bordered by gray brick. Crosswalk markings are not high visibility. **Recommendation**: Remark existing crosswalk with high-visibility markings.
Other Crossing Characteristics	**Issue**: Signal timing results in relatively long delays for pedestrians. Pedestrian signal not on auto recall. **Recommendation**: Implement LPI. Put pedestrian signal on auto recall.

Galveston Avenue

This is a side stop-controlled intersection. There are sidewalks on all approaches and directional bike lanes adjacent to on-street parking on Pennsylvania Avenue. There are curb extensions on the southern side of the intersection to delineate marked, on-street parking.

Table 81: Galveston Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps not aligned with crossing and are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps on north side of intersection. Reset tactile paves to match direction of crossing.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing, north leg. **Recommendation**: Install new high-visibility crosswalks on north and south leg of intersection. Mark new stop bar on north leg.

Other Crossing Characteristics	**Issue**: Parked cars obstruct sight lines. Currently there is paint on the northern corners. **Recommendation**: Install curb extensions on north side of intersection.

St Louis Avenue

This is a side stop-controlled intersection. There are sidewalks on all approaches, except northeast side of St Louis Avenue. There are directional bike lanes adjacent to on-street parking on Pennsylvania Avenue. There is a mid-block crosswalk on the western side of this intersection.

Table 82: St Louis Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are not aligned with crossing. Curb ramp on southwest corner does not face existing crossing markings. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crossings on north and south side of intersection across St Louis Ave are unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalks on north and south legs. Mark stop bars on St Louis Ave.
Other Crossing Characteristics	**Issue**: There is long crossing distance and concern about drivers yielding for the mid-block crossing. On-street parking is delineated by paint. There is insufficient lighting. **Recommendation**: Install curb extensions for mid-block crossing on west side of intersection. Install RRFB for mid-block crossing. Install curb extensions on other corners to delineate on-street parking. Install/upgrade lighting.

S Jennings Street

This is a signalized intersection. There are sidewalks on all approaches. There are directional bike lanes that transition to sharrow conditions for right-turn lanes on the Pennsylvania Avenue approach. There are sharrows on the southern leg and directional bike lanes on the northern leg. There is some on-street parking near this intersection.

There was a KSI crash at this intersection.

Table 83: S Jennings Street Intersection Recommendations

Category	Issues and Recommendations
Other Crossing Characteristics	**Issue**: There is long crossing distance. There is concern about driver speeds and turning movements. Pedestrian signal is not on auto recall. Audible pedestrian announcement was malfunctioning on southwest corner pushbutton. **Recommendation**: Install curb extensions to shorten crossing distances and formalize on-street parking. Put pedestrian signals on auto recall.
Sidewalk	**Issue**: Sidewalk on northwest and southwest corners are narrow, less than 4 feet wide. **Recommendation**: Widen sidewalks on approach to intersection, install buffer from roadway.
Bicycle Facility	**Issue**: Bicycle facility does not provide enough separation from traffic. **Recommendation**: Install buffered bike lane, paint separation. Bikes must remain protected through right turn lanes. Recommend installing bike box to advance bikes ahead of vehicles at this intersection.
Access Management	**Issue**: Driveway access points are close to intersection that increase potential for conflict between motor vehicle drivers and pedestrians or bicyclists. **Recommendation**: Consolidate driveways or move access further from intersection.

Grainger Street

This is a side stop-controlled intersection. Grainger Street is the southern leg of the intersection. The northern leg is a gated driveway for Tarrant County Academy of Medicine. There are sidewalks on all approaches and directional bike lanes on Pennsylvania Avenue adjacent to on-street parking.

Table 84: Grainger Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Missing curb ramps at northern driveway, sidewalk is flush with driveway. **Recommendation**: Install detectable warning surfaces.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install high-visibility crosswalk. Mark new stop bar.
Other Crossing Characteristics	**Issue**: Parking may obstruct sight lines.

	Recommendation: Install curb extensions on the south side of Pennsylvania Ave at Grainger St to formalize parking.
Sidewalk	**Issue**: Sidewalk is too narrow, pinch point, on southeast corner due to a wooden retaining wall. **Recommendation**: Reconstruct or widen sidewalk using curb extension space.

Hemphill Street

This is a signalized intersection. There are sidewalks and directional bike lanes on all approaches. The bike lanes are adjacent to on-street parking or drop at the turn lanes. It is recommended to provide separation from turn lanes and parking lanes. Push buttons with sound are present on all four crosswalks. There is a bus shelter on the southeast corner of this intersection. There was a KSI crash at this intersection.

Table 85: Hemphill Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are not aligned with crossing. North side curb ramps are not aligned with crosswalk. There is only one ramp provided to cross to the south. East side ramp is missing and there is a right only lane that makes it difficult to cross. **Recommendation**: Widen crosswalk or assess curb ramps for improved alignment. Construct new curb ramps.
Other Crossing Characteristics	**Issue**: There is concern about drivers yielding. Pedestrian signal activates at same time as left turn vehicles (from Hemphill St onto Pennsylvania Ave). **Recommendation**: Implement LPI. Install curb extensions to delineate on-street parking and provide more waiting space for pedestrians.
Sidewalk	**Issue**: Sidewalk on northeast corner is narrow due to building face and mast arms and pedestal pole in middle of sidewalk. **Recommendation**: Widen sidewalk and relocate obstructions.

Travis Avenue

This is a side stop-controlled intersection. Travis Avenue is the southern leg of the intersection. The northern leg is a driveway to a parking lot.

Table 86: Travis Avenue Intersection Recommendations

Category	Issues and Recommendations
Bike Facilities	**Issue**: The bike lanes are adjacent to on-street parking or paint buffered from curb **Recommendation**: Install buffered bike lanes, using paint to separate parking from the travel lane.
Other Crossing Characteristics	**Issue**: The crossing here is unmarked. There is no stop bar at the controlled crossing **Recommendation**: install a new, high-visibility crosswalk. Install new stop bar
Crosswalk	**Issue**: The surface of the crossing is uneven. **Recommendation**: Repave crosswalk, install high-visibility crosswalk striping.

Lipscomb Street

This is a side stop-controlled intersection. Travis Avenue is the northern leg of the intersection. The southern leg is a gated driveway to a parking lot. There are sidewalks on all approaches. There are directional bike lanes on Pennsylvania Avenue.

Table 87: Lipscomb Street Intersection Recommendations

Category	Issues and Recommendations
Bike Facilities	**Issue**: The bike lanes are adjacent to on-street parking or paint buffered from curb **Recommendation**: Install buffered bike lanes, using paint to separate parking from the travel lane.
Other Crossing Characteristics	**Issue**: The crossing here is unmarked. There is no stop bar at the controlled crossing **Recommendation**: install a new, high-visibility crosswalk. Install new stop bar
Crosswalk	**Issue**: The surface of the crossing is uneven. **Recommendation**: Repave crosswalk, install high-visibility crosswalk striping.
Curb Ramps	**Issue:** The curb ramps here do not appear to be ADA compliant. The curb on the northeastern corner has a large radius. **Recommendation**: Reconstruct or repair the existing curb ramps and to decrease the northeast corner curb radius.

Alston Avenue

This is a side stop-controlled intersection. Alston Avenue is the southern leg of the intersection. The northern leg is a driveway to a parking lot. There are sidewalks on all approaches. There are

directional bike lanes on Pennsylvania Ave. The bike lanes are adjacent to on-street parking. There was a KSI crash at this intersection.

Table 88: Alston Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant and are not aligned with crossing. **Recommendation**: Reconstruct or repair existing curb ramps. Widen crosswalk or assess curb ramps for improved alignment.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalk. Mark new stop bar.
Other Crossing Characteristics	**Issue**: Observed pedestrians crossing to the parking lot on north side of intersection from the south side. There is long crossing distance. Parked cars obstruct sight lines. **Recommendation**: Install mid-block crossing with median crossing island and appropriate crossing signage. Install curb extensions to delineate on-street parking and provide more space for pedestrians to wait to cross.
Sidewalk	**Issue**: Sidewalk is uplifted or cracked, particularly on southwest side of intersection. **Recommendation**: Reconstruct or repair sidewalk.

College Avenue

This is a side stop-controlled intersection with offset northern and southern legs (College Avenue). The southern leg of College Avenue is very wide, about 50 feet. There are sidewalks on all approaches. There are directional bike lanes on Pennsylvania Ave. The bike lanes are adjacent to on-street parking. There was a KSI crash at this intersection.

Table 89: College Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are not aligned with direction of crossing. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crossing is unmarked (north and south legs). Stop bar at controlled crossing is faded (north and south legs). **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars.

Other Crossing Characteristics	**Issue**: Parking obstructs view of crossing. **Recommendation**: Install curb extensions to delineate on-street parking and shorten crossing distance on College Ave.
Sidewalk Bicycle Facility	**Issue**: Bike lane on northern side of intersection is in conflict with pull in parking spaces (see Figure 2). Sidewalk shifts around parking here and is narrow. **Recommendation**: Reconsider parking layout on this corner and remove conflict with pedestrians and bicyclists. Reconstruct wider sidewalk/pedestrian route for a more direct route.

Figure 17: Westbound directional bike lane and pull-in parking conflict

Fulton Street

This is a side stop-controlled intersection. Fulton Street is the northern leg of the intersection. There is no southern leg. There are sidewalks on all approaches. There are directional bike lanes on Pennsylvania Ave. The bike lanes are adjacent to on-street parking. It is recommended to study intersection control to determine the benefit of limiting Fulton Street to be right-in, right-out only.

Table 90: Fulton Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are not aligned with direction of crossing. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crossing is unmarked. No stop bar at controlled crossing. **Recommendation**: Install new high-visibility crosswalk. Mark new stop bar.
Other Crossing Characteristics	**Issue**: Parking obstructs view of crossing. There is insufficient lighting. **Recommendation**: Install curb extensions to delineate on-street parking. Install/upgrade lighting.

S Adams Street

This is a side stop-controlled intersection. The southern leg of S Adams Street is very wide, about 50 feet, and leads to Trimble Technical High School. It is recommended to widen sidewalks on S Adams Street to better accommodate pedestrians. There are sidewalks on all approaches. The sidewalk on the intersection's southeast corner runs along the building face in front of parked cars. It is recommended to adjust parking to on-street instead and to widen the existing sidewalk on the southeast corner. There are directional bike lanes on Pennsylvania Avenue. The bike lanes are adjacent to on-street parking.

Table 91: S Adams Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are missing. Existing ramps are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps. Widen crosswalk or assess curb ramp for improved alignment. Install new curb ramps.
Crosswalk	**Issue**: Crossings are unmarked. No stop bars at controlled crossing.

	Recommendation: Install new high-visibility crosswalks. Mark new stop bars.
Other Crossing Characteristics	**Issue**: There is concern about drivers not yielding. Parking obstructs view of crossing. There is insufficient lighting. **Recommendation**: Install curb extensions to delineate on-street parking and to shorten crossing distance. Install mid-block crosswalk across Pennsylvania Avenue with RRFB and pedestrian crossing signs with downward pointing arrows. Install advance warning signs. Restrict parking in advance of crosswalk. Install/upgrade lighting.

S Henderson Street

S Henderson Street makes an S-curve approach to this signalized intersection. Because of the curve, the crosswalks on the north and south sides are skewed. S Henderson Street has slip lanes for right-turn movements. There are sidewalks present on all approaches. The westbound directional bike lane drops at this intersection; no bike facilities are available west of this intersection. At this intersection the cross-section converts from one travel lane in each direction, with a center turn lane and directional bike facilities to two travel lanes in each direction, a center turn lane, and no bicycle facilities.

Table 92: S Henderson Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are not aligned with direction of crossing. **Recommendation**: Reconstruct or repair existing curb ramps.
Other Crossing Characteristics	**Issue**: There is concern about turning movements and about multiple threat conditions. Vehicles are traveling fast on the slip lanes and conflict with pedestrians crossing. Pedestrian signal not on auto recall. Signals are only on recall for crossing Pennsylvania Ave, not S Henderson St. APS/audio signal missing or inaudible. Pedestrian pushbutton is difficult to access. **Recommendation**: Implement LPI. Install curb radius reduction. Remove slip lane on northwest corner and bring right turn lane up to intersection. Consider removing southbound right turn slip lane. Put pedestrian signal on auto recall. Upgrade or repair pedestrian signal. Relocate pedestrian pushbutton.
Sidewalk	**Issue**: Sidewalk lacks sufficient buffer. **Recommendation**: Reconstruct sidewalk to widen or install buffer from roadway.

Bicycle Facility	**Issue**: Bicycle facilities end at this intersection. **Recommendation**: Adjust width of travel lanes and need for center turn lane toa separated bike lane.

5th Avenue

This is a side stop-controlled intersection. 5th Avenue is the southern leg of the intersection. The northern leg is a driveway to a parking lot. There are sidewalks on all approaches. There is a mid-block crossing of Pennsylvania Avenue at this intersection.

Table 93: 5th Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are not aligned with direction of crossing. Ramp on southeast corner directs pedestrians out into intersection. Missing curb ramp on north side of intersection at mid-block crosswalk. **Recommendation**: Reconstruct or repair existing curb ramps. Widen crosswalk or assess curb ramps for improvement alignment. Remove obstacles and install new curb ramp on north side for mid-block crosswalk.
Crosswalk	**Issue**: No yield bar at mid-block crossing. Crosswalk missing on south leg **Recommendation**: Mark new yield bar. Install high-visibility crosswalk on south leg of intersection.
Other Crossing Characteristics	**Issue**: There is concern about lack of driver yielding. Existing RRFB is activated by detection only and detection does not seem to be working. There is insufficient lighting. **Recommendation**: Install median crossing island. Install in-street pedestrian crossing sign. Install advance yield or stop markings and signage. Upgrade RRFB with push buttons. Install/upgrade lighting.
Sidewalk	**Issue:** Sidewalks lack sufficient buffer. **Recommendation**: Reconstruct sidewalk to widen or install buffer from roadway.

Figure 18: Existing mid-block crosswalk, activated by detection only

S Lake Street

This is a side stop-controlled intersection. The southern leg is a one-way exit. The northern leg is slightly offset and has some on-street parking. There is a bus shelter on the southern side of Pennsylvania Ave between 5th Avenue and S Lake Street. There is not enough sidewalk in front of this bus shelter. It is recommended to narrow and shift lanes and construct a floating bus stop to allow enough space for pedestrians to wait and walk. Amenities for the bus stop on the northern side of Pennsylvania Avenue are also recommended; currently there is only a bench and small sign. There is a mid-block crosswalk across Pennsylvania Avenue at this intersection.

Table 94: S Lake Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Missing curb ramp on south side of intersection at mid-block crosswalk. **Recommendation**: Reconstruct or repair existing curb ramps. Install new curb ramp on south side for mid-block crosswalk.
Crosswalk	**Issue**: Crosswalks across S Lake St are unmarked. Mid-block crosswalk markings are faded. No yield bar at mid-block crossing.

	Recommendation: Install new high-visibility crosswalks. Remark existing crosswalk with high-visibility markings. Mark new yield bar.
Other Crossing Characteristics	**Issue**: Five lane typical section creates long crossing distance for mid-block crossing. Turn lane is unused at this intersection. Crossing lacks appropriate crossing signage. Existing pedestrian crossing signs at northeast corner are damaged. **Recommendation**: Install median crossing island. Install in-street pedestrian crossing sign. Replace existing crossing signs.

6th Avenue

This is a signalized intersection. The southern leg is the entrance to Texas Health and Cook Children's.

Table 95: 6th Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings faded and not high visibility. Stop bars at controlled crossing is faded. **Recommendation**: Remark existing crosswalk with high-visibility markings. Remark existing stop bars.
Other Crossing Characteristics	**Issue**: Pedestrian push button instructions are faded on signs. There is long crossing distance. Signage for medical center overhangs Pennsylvania Ave and may distract drivers from paying attention to pedestrians. **Recommendation**: Implement LPI. Put pedestrian signals on auto recall. Install new signs for pedestrian push buttons. Add pedestrian refuge island.

S Ballinger Street

This is a side stop-controlled intersection. The northern leg is S Ballinger Street. The southern leg is gated access to the Texas Health Medical Labs. This intersection is a little over 100 feet from the 6th Ave signalized intersection. Some freight traffic was observed turning onto S Ballinger Street. Danone has a production site at the end of this street.

Table 96: S Ballinger Street Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant or aligned with crossing. Missing curb ramp on south side of intersection. **Recommendation**: Reconstruct or repair existing curb ramps. Consider realignment of existing curb ramps on north side for improved alignment with crosswalks. Install new curb ramps on south side.
Crosswalk	**Issue**: Crosswalk is across S Ballinger is unmarked. Existing crosswalks are not high visible markings. **Recommendation**: Install new high-visibility crosswalks. Remark existing crosswalk with high-visibility markings.
Other Crossing Characteristics	**Issue**: Five lane typical section creates long crossing distance for mid-block crossing. Crossing may be difficult for drivers to anticipate. There is insufficient lighting at the crossings. **Recommendation**: Install median crossing island. Install in-street pedestrian crossing sign. Install advance pedestrian warning signs. Install/upgrade lighting.
Sidewalk	**Issue**: Sidewalks are narrow and lack buffer on northwest corner of intersection. **Recommendation**: Reconstruct sidewalk to wider or install buffer from roadway.

7th Avenue and S Summit Avenue

7th Avenue is a signalized intersection. S Summit Avenue is a side stop-controlled intersection. This intersection is 25 feet from the 7th Ave signalized intersection. S Summit Avenue is a low volume four-lane road serving some freight traffic.

Table 97: 7th Avenue & S Summit Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps do not appear to be ADA compliant or aligned with crossing. Missing curb ramp on south side of intersection. **Recommendation**: Reconstruct or repair existing curb ramps. Consider realignment of existing curb ramps on north side for improved alignment with crosswalks. Install new curb ramps on south side.
Crosswalk	**Issue**: Crosswalk is across S Summit Ave is unmarked. There is no crosswalk on the western side of 7th Ave across Pennsylvania Ave because of the gas station's driveway.

	Recommendation: Install new high-visibility crosswalks. Remark existing crosswalk with high-visibility markings.
Other Crossing Characteristics	**Issue**: There is long crossing distance and intersection distance given the proximities of these two streets and wide access for gas station. There is concern about lack of driver yielding. No pedestrian signal. Pedestrian signal not on auto recall. **Recommendation**: Install curb radius reduction on northside, may require modeling freight turning movements. Evaluate pedestrian crossing time. Implement LPI. Put pedestrian signal on auto recall.
Sidewalk	**Issue**: Sidewalks lack sufficient buffer. Sidewalks to the northeast of the intersection are narrow and feature not buffer. Buffer may not be feasible or be limited due to obstructions. **Recommendation**: Reconstruct sidewalk to wider or install buffer from roadway.
Access Management	**Issue**: Gas station on northeast side of these intersections features multiple wide access points. There multiple driveways increase potential conflict between motor vehicle drivers and pedestrians/bicyclists. **Recommendation**: Consolidate driveways and provide an accessible pedestrian route.

8th Avenue

This is a signalized intersection. There is a bus shelter on the north side of Pennsylvania Avenue between S Summit and 8th Avenues. It is recommended to improve the bus stop on the south side of Pennsylvania Avenue. There is no existing crosswalk or pedestrian crossing movement permitted on the south side of this intersection across 8th Avenue.

Table 98: 8th Avenue Intersection Recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Missing curb ramp on southwest corner. Curb ramps on northwest corner are narrow and appear to not be ADA compliant. Pedestrian signal pole and power pole limit ramp adjustment on this corner. **Recommendation**: Install new curb ramp on southwest corner. Consider relocating poles and reconstructing ramp on northwest corner.
Crosswalk	**Issue**: Crosswalk is unmarked on west side of intersection. Existing crosswalk marking on north side and stop bar are faded. There are no yield markings for the right turn slip lane.

	Recommendation: Install new high-visibility crosswalks. Remark existing crosswalk with high-visibility markings. Remark stop bar. Install new yield markings for slip lane.
Other Crossing Characteristics	**Issue**: There is long crossing distance and concern about lack of driver yielding. Right slip turb lane allows for high-speed turning. There is insufficient space for pedestrians waiting to cross due to obstacles and narrow sidewalks. Signal timing results in relatively long delays for pedestrians. Long queues were observed for southbound lefts onto Pennsylvania Ave, which may cause risky behavior endangering pedestrians crossing on the eastern crosswalk. There is inadequate crossing time for east-west pedestrian movements. Pedestrian pushbuttons are difficult to access. **Recommendation**: Prohibit Right Turn On Red. Install curb radius reduction or alternative design of right turn slip lane. Remove obstacle or widen standing space to improve comfort or safety or pedestrians waiting to cross. Put pedestrian signals on auto recall. Implement LPI. Consider full signal retiming.
Sidewalk	**Issue**: Sidewalk on raised island on southeast corner are narrow. Sidewalks on northwest corner are narrow and have moderate cross slopes. They also have some tire marks. **Recommendation**: Reconstruct sidewalk to wider or install buffer from roadway.
Speed Management	**Issue**: When traffic is dense, vehicles move along 8th Ave at normal speeds. However, when less traffic is present higher speeds were observed. **Recommendation**: Dependent on traffic volumes, study road for road diet.
Access Management	**Issue**: The southwest corner of the intersection has driveway access in/at the intersection. This creates risk for motorists as well as pedestrians. **Recommendation**: Consider relocating access to Pennsylvania Ave only instead.

Recommendation Implementation Table

Table 99 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the Pennsylvania Avenue corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term projects, based on feasibility, crash reduction benefit, and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth.

Table 99: Recommended countermeasures for Pennsylvania Avenue corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Implementation Cost
Short (1-3 years)	Intersection	Install Detectable Warning Strips	--	$1,000.00
	Intersection	Install Rectangular Rapid Flashing Beacon	0.40	$60,044.00
	Intersection	Implement leading pedestrian intervals	0.87	$26,880.00
	Intersection	Install Pedestrian Signs	--	$114,288.51
	Intersection	Install advance signal, stop or yield signs	0.75	$40,000.00
	Intersection	Install Yield Bar	--	$300,000.00
	Intersection	Install Stop Bar	--	$1,200.00
	Intersection	Install/refresh high-visibility crosswalks	0.90	$53,313.00
Medium (3-5 years)	Segment	Consolidate access points	--	$100.00
	Segment	Install additional lighting	0.51	$1,700.00
	Segment	Install buffered bike lanes	0.47	$270,500.00
	Segment	Install continuous sidewalks	0.35	$233,315.62
	Intersection	Modify Curb Geometrics	--	$24,930.00
	Intersection	Install median pedestrian refuge	0.68	$5,744.00
	Intersection	Install Pedestrian Pushbutton	--	$1,500.00
	Intersection	Install pedestrian signal heads	--	$570.00
	Intersection	Reconfigure ramps to meet ADA Standard	0.65	$24,160.00
Long (5+ years)	Intersection	Remove Slip Lane	--	$231,000.00
				Total: $1,390,245.13

Benefit-Cost Analysis

The estimated cost-benefit result for Pennsylvania Avenue is 30.90 (Table 100). Table 101 summarizes the estimated improvement costs by type and Table 102 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 100: Pennsylvania Avenue Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$109,940,000	$3,558,400	30.90

Table 101: Cost Results for Pennsylvania Avenue Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install Detectable Warning Strips	$500.00	2.00	25	-	$1,000.00
Install Rectangular Rapid Flashing Beacon	$15,011.00	4.00	10	$7,304.40	$60,044.00
Consolidate access points	$6,720.00	4.00	25	-	$26,880.00
Remove Slip Lane	$1,852,000.00	0.06	25	-	$114,288.51
Install Curb Radius Reduction	$10,000.00	4.00	25	-	$40,000.00
Curb Extension	$10,000.00	30.00	25	-	$300,000.00
Implement leading pedestrian intervals	$200.00	6.00	10	$120.00	$1,200.00
Install additional lighting	$5,331.30	10.00	15	$2,765.65	$53,313.00
Install Pedestrian Signs	$100.00	1.00	6	$15.00	$100.00
Install advance signal, stop or yield signs	$100.00	17.00	6	$255.00	$1,700.00
Install buffered bike lanes	$270,500.00	1.00	4	$67,625.00	$270,500.00
Install continuous sidewalks	$134.86	1730.00	10	$23,331.56	$233,315.62
Install Yield Bar	$30.00	11.00	4	$82.50	$330.00
Install median pedestrian refuge	$4,100.00	6.00	25	-	$24,600.00

Install Pedestrian Pushbutton	$1,436.00	4.00	10	$574.40	$5,744.00
Install pedestrian signal heads	$1,500.00	1.00	10	$150.00	$1,500.00
Install Stop Bar	$30.00	19.00	4	$142.50	$570.00
Install/refresh high-visibility crosswalks	$16.00	1510.00	4	$6,040.00	$24,160.00
Reconfigure ramps to meet ADA Standard	$3,500.00	66.00	25	-	$231,000.00
			Total	$108,406.01	$1,390,245.13
				Lifecycle Cost (20 years)	**$3,558,400**

Table 102: Benefit Results for Pennsylvania Avenue Corridor

Crash Severity	Prevention Benefit[3]*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0	$0
A – Severe Injury	$3,700,000	21	$77,700,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	62	$32,240,000
		Total Benefit:	**$109,940,000**

[3] Cost obtained from TxDOT 2021 SII Calculator

Corridor 7: S Beach Street

S Beach Street runs north to south between Avenue H and Mitchell Boulevard. It is on the Motor Vehicle HIN.

Context

S Beach Street functions as a major arterial corridor. Sycamore Park and Polytechnic Senior High School are located just north of this study area. The roadway consists of four to five lanes with a median between Avenue I and Mitchell Blvd. There are continuous sidewalks present on both sides of the road. The corridor is approximately 0.22 miles in length. The speed limit on the corridor is 40 mph. It is signed as a commercial delivery route. The typical pavement width ranges from 62 to 83 feet (including median width), while the right-of-way width is approximately 92 to 115 feet. The Average Annual Daily Traffic (AADT) for this corridor is 10,088, according to the 2022 TPP Statewide Traffic Count Map.

Crash History

A crash data analysis was performed for the S Beach Street corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 66 total crashes occurred on S Beach Street between Avenue H and Mitchell Boulevard. About 32% of crashes occurred at dusk or night. There was one crash involving a motorcycle which was a KSI crash. There was one fatal crash that happened at Mitchell Boulevard.

Figure 19 shows the spatial distribution of crashes in the S Beach Street corridor. Table 103 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. Table 104 shows the top five contributing factors as noted in the crash reports for Ellis Avenue. Table 105 summarizes the KSI crashes (three) that occurred on this corridor.

Table 103: S Beach Street Collision Manner, if noted

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
AVENUE H	---	1	1	1	3
AVENUE I	1	---	---	---	1
AVENUE J	3	---	4	---	7
MITCHELL BLVD	15	1	1	7	24

(OTHER / UNKNOWN)	9	---	17	5	31
TOTAL	**28**	**2**	**23**	**13**	**66**

Table 104: S Beach Street Top 5 Contributing Factors

Contributing Factor	Number of Crashes
Driver Inattention	13
Disregard Stop And Go Signal	13
None	12
Failed To Control Speed	12
Failed To Yield Right Of Way – Turning Left	9

Table 105: S Beach Street KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
MITCHELL BLVD	Signalized	Angle; One Straight-One Left Turn (motorcycle crash)	None
MITCHELL BLVD	Signalized	Angle; One Straight-One Left Turn (fatal crash)	Disregard Stop And Go Signal; Speeding – Overlimit
MITCHELL BLVD	Signalized	Same Direction; One Straight-One Stopped	Distraction In Vehicle; Failed To Control Speed

Figure 19: Crash map of the S Beach Street corridor

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along Beach Street. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Speed Management

S Beach Street is striped for four lanes with unmarked on-street parking on either side of the road. The wide road design, especially at times of low traffic, encourages higher travel speeds. Very few cars street parked on the corridor.

- It is recommended that the corridor be studied for a road diet, narrowing the cross-section from four lanes to three, with protected bike lanes either side.
- If necessary, there is space for a parking lane as well, although it is recommended that the space be used for sidewalk buffer.
- Curb extensions and/or median refuge islands are recommended at key crossing locations and stop-controlled intersections to help shorten crossing distance and improve pedestrian visibility.
- In the short term, in the absence of a road diet, it is recommended that speed feedback signs be installed to discourage speeding.

Pedestrian Facilities

Pedestrians currently need to cross four lanes of traffic without refuge.

- It is recommended to install curb extensions and a median refuge island with in-street pedestrian crossing sign at key crossing locations.

There are few opportunities to cross S Beach Street, except at signalized intersections. With the recommended road diet, there will be more opportunities for mid-block crosswalks as well as at intersections.

Sidewalks along the corridor frequently lack buffer between the road and the sidewalk. With the width of the street, it is feasible to bring in the curb and provide buffer.

Figure 20: Wide roadway and sidewalk without buffer

Bicycle Facilities

The route is a designated bike route, however, bicycle facilities did not exist along S Beach Street. To ensure bicycle safety along the corridor,

- It is recommended that buffered bicycle lanes be installed along the corridor. The extra right-of-way from a potential road diet can be repurposed into directional bike lanes with vertical delineation. Conversely, the roadway can be narrowed, and the bike lanes can be sidewalk-level or the sidewalks can be widened to create a shared use path.

Intersection-Focused Recommendations

The following observations were made at specific intersections along S Beach Street:

Avenue H

This is a side stop-controlled intersection. There are curb ramps on all corners except the northwest corner. All four corners are single-family homes.

Table 106: Avenue H intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Existing curb ramps are ADA compliant. There is no curb ramp in the northwest corner. **Recommendation**: Install curb ramp on the northwest corner. Install directional ramps to cross S Beach Street.
Crosswalk	**Issue**: Crosswalks are unmarked. Stop bars are unmarked. **Recommendation**: Install new high-visibility crosswalks on all legs of the intersection. Mark stop bars on the controlled legs.
Other Crossing Characteristics	**Issue**: There is no safe way to cross S Beach Street from Avenue H. **Recommendation**: Install median crossing island on S Beach Street.
Sidewalk	**Issue**: The sidewalk along S Beach Street on the northwest corner lacks buffer from the roadway. There are no sidewalks along Avenue H west of the intersection. **Recommendation**: Narrow the roadway to provide buffer for sidewalk. Construct sidewalks along Avenue H.

Avenue I

This is a side stop-controlled tee intersection. There are curb ramps on both corners. There is a single-family home on the northeast corner, an apartment building on the southeast corner, and a medical center on the west edge of the intersection.

Table 107: Avenue I intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Existing curb ramps are ADA compliant. There are no receiving ramps on the east side of the road. There isn't a directional ramp for the crossing across Avenue I. **Recommendation**: Install receiving curb ramps. Install directional ramps to cross Avenue I.
Crosswalk	**Issue**: Crosswalks are unmarked. Stop bars are unmarked. **Recommendation**: Install new high-visibility crosswalks on all legs of the intersection. Mark stop bars on the controlled leg.
Other Crossing Characteristics	**Issue**: There is no safe way to cross S Beach Street from Avenue I. **Recommendation:** Install median crossing island on S Beach Street.

Sidewalk	**Issue:** The sidewalk along S Beach Street on the northeast corner lacks buffer from the roadway. There is some vegetation growing on the sidewalk in the northeast corner. **Recommendation:** Narrow the roadway to provide buffer for sidewalk. Clean vegetation from sidewalk.

Avenue J

This is a signalized intersection. There are curb ramps on the northwest and northeast corners. There is an apartment building on the northeast corner, the Uplift Meridian Preparatory Academy is on the southeast corner, a used car dealership on the southwest corner, and a medical center on the northwest corner.

Figure 21: Long vehicle queue spills over into the roadway for school pick-up ©Google, Inc.

Figure 22: Transmission pole blocking the sidewalk

Table 108: Avenue J intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There are curb ramps on the northwest and northeast corners. The curb ramp on the northeast corner is ADA compliant, although it points toward the center of the intersection. The curb ramp on the northwest corner is not ADA compliant. **Recommendation:** Replace northwest corner curb ramp. Consider replacing northeast corner diagonal curb ramp with directional ramps. Install curb ramps where they are missing on the southern corners and to cross the southwest corner slip lane.
Crosswalk	Issue: Crosswalks are unmarked on the north, south, and east legs. **Recommendation:** Install new high-visibility crosswalks on north south and east legs. Install new high-visibility crosswalks across slip lanes if they are to remain.
Other Crossing Characteristics	**Issue**: Pedestrian signals are not on auto recall on Beach Street crossings. Crossings are very wide. Vehicles move very fast and do not yield in the right turn slip lanes. **Recommendation:** Place pedestrian signals on auto recall. Install median islands on Beach Street. Remove right turn slip lanes. If infeasible, adjust geometry to control speeds.
Sidewalk	**Issue**: There is no sidewalk on the southwest corner. The sidewalk on the southeast corner is obstructed by a transmission pole. **Recommendation:** Construct sidewalk on the southwest corner. Relocate transmission pole and reconstruct sidewalk. If relocation is not feasible, reconstruct the sidewalk to avoid the transmission pole.
Access Management	**Issue**: The Uplift Meridian Preparatory Academy is not served by pedestrian routes and only allows motor vehicles to access through the gates, leading to long vehicle queues that back up into the roadway. **Recommendation:** Work with the school to allow pedestrian access to drop-offs and pick-ups. Install RRFB, pedestrian refuge island, curb ramps, and other crossing treatments to facilitate a direct mid-block crossing from the new apartment building on Avenue J to the school.

Mitchell Boulevard

This is a signalized T intersection. There are curb ramps at all corners of the intersection, except the southwest corner. There is a used car dealership on the northeast corner, a catholic church on the southeast corner, and a car service shop and convenience store on the western edge.

Figure 23: Pedestrians forced to walk in the grass

There have been three KSI crashes at this intersection, one of which was fatal.

Figure 24: Memorial to Sharon Haley, who was fatally injured in a crash at this intersection in 2019

Table 109: Mitchell Boulevard intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue:** There is no curb ramp on the southwest corner of the intersection. **Recommendation:** Install curb ramp.
Crosswalk	**Issue:** Crosswalks are unmarked on the south leg. **Recommendation:** Install new high-visibility crosswalks on the south leg.
Other Crossing Characteristics	**Issue:** Long crossing distances. **Recommendation:** Install median crossing islands where feasible.
Sidewalk	**Issue:** There is no sidewalk on the southeast corner or the west side of the intersection **Recommendation:** Construct sidewalk on the southeast corner and west side.
Access Management	**Issue:** There are multiple driveways near the intersection. **Recommendation:** Consolidate driveways.

Recommendation Implementation Table

Table 110 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the S Beach Street corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term projects, based on feasibility, crash reduction benefit, and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth. Construction, engineering, and contingency are included in these costs. All assumptions are detailed in the Toolkit.

Table 110: Recommended countermeasures for S Beach Street corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install Rectangular Rapid Flashing Beacon	0.40	$30,022.00
	Segment	Install dynamic speed feedback signage	0.95	$400.00
	Intersection	Install Stop Bar	--	$240.00
	Intersection	Install/refresh high-visibility crosswalks	0.90	$14,656.00
Medium	Segment	Consolidate access points	--	$20,160.00

(3-5 years)	Intersection	Modify curb geometrics	--	$100,000.00
	Segment	Install buffered bike lanes	0.47	$57,225.09
	Segment	Install sidewalks	0.35	$128,121.29
	Intersection	Install median pedestrian refuge islands	0.68	$28,700.00
	Intersection	Reconfigure curb ramps to meet ADA Standard	0.65	$77,000.00
				Total: $456,524.39

Benefit-Cost Analysis

The estimated cost-benefit result for S Beach Street is 17.04 (Table 111). Table 112 summarizes the estimated improvement costs by type and Table 113 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 111: S Beach Street Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$20,060,000	$1,177,100	17.04

Table 112: Cost Results for S Beach Street Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Install Rectangular Rapid Flashing Beacon	$15,011	2.00	10	$30,022.00	$4,302.20
Consolidate access points	$6,720	3.00	25	$20,160.00	-
Curb extension	$10,000	10.00	25	$100,000.00	-
Install buffered bike lanes	$270,500	0.21	4	$57,225.09	$14,306.27
Install continuous sidewalks	$134.86	950.00	10	$128,121.29	$12,812.13
Install median pedestrian refuge	$4,100	7.00	25	$28,700.00	-
Install dynamic speed feedback signage	$200	2.00	10	$400.00	$600.00
Install Stop Bar	$30	8.00	4	$240.00	$60.00

Install/refresh high-visibility crosswalks	$16	916.00	4	$14,656.00	$3,664.00
Reconfigure ramps to meet ADA Standard	$3,500	22.00	25	$77,000.00	-
			Total	$456,524.39	$35,744.60
				Lifecycle Cost (20 years)	**$1,177,100**

Table 113: Benefit Results for S Beach Street Corridor

Crash Severity	Prevention Benefit	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0	$0
A – Severe Injury	$3,700,000	5	$18,500,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	3	$1,560,000
		Total Benefit:	**$20,060,000**

Corridor 8: Sharondale Street

Sharondale Street runs east to west between 6th Avenue and James Avenue. It is on the Bicycle HIN.

Context

Sharondale Street functions as a residential corridor. The roadway consists of two lanes with unmarked on-street parking on both sides. There are no sidewalks present. The corridor is approximately 0.28 miles in length. There is no posted speed limit on Sharondale Street. The typical pavement width ranges from 26 to 28 feet, while the right-of-way width is approximately 50 feet.

Crash History

A crash data analysis was performed for the Sharondale Street corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019-2023, 22 total crashes occurred on Sharondale Street between 6th Avenue and James Avenue. About 32% of crashes occurred at dusk or night. There were two crashes involving a bicycle, one was a KSI crash which occurred at Hampsted St.

Figure 25 shows the spatial distribution of crashes in the Sharondale Street corridor. Table 114 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. Table 115 shows the top five contributing factors as noted in the crash reports of crashes on Ellis Avenue. Table 116 summarizes the KSI crashes (two) that occurred on this corridor.

Table 114: Sharondale Street Collision Manner, if noted

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
6th AVENUE	1	---	---	---	1
EDNEY ST	---	1	---	1	2
HAMSTED ST	1	3	---	---	4
JAMES AVE	4	2	1	8	15
TOTAL	**6**	**6**	**1**	**9**	**22**

Table 115: Sharondale Street Top 5 Contributing Factors

Contributing Factor	Number of Crashes
None	7
Driver Inattention	5
Other	3
Failed To Control Speed	3
Failed To Yield Right Of Way – Stop Sign	2

Table 116: Sharondale Street KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
HAMPSTED ST	Side Stop-Controlled	One Motor Vehicle; Going Straight (bicycle crash)	Other; Impaired Visibility
JAMES AVE	Main (Sharondale St) Stop-Controlled	Opposite Direction; Both Going Straight	Other

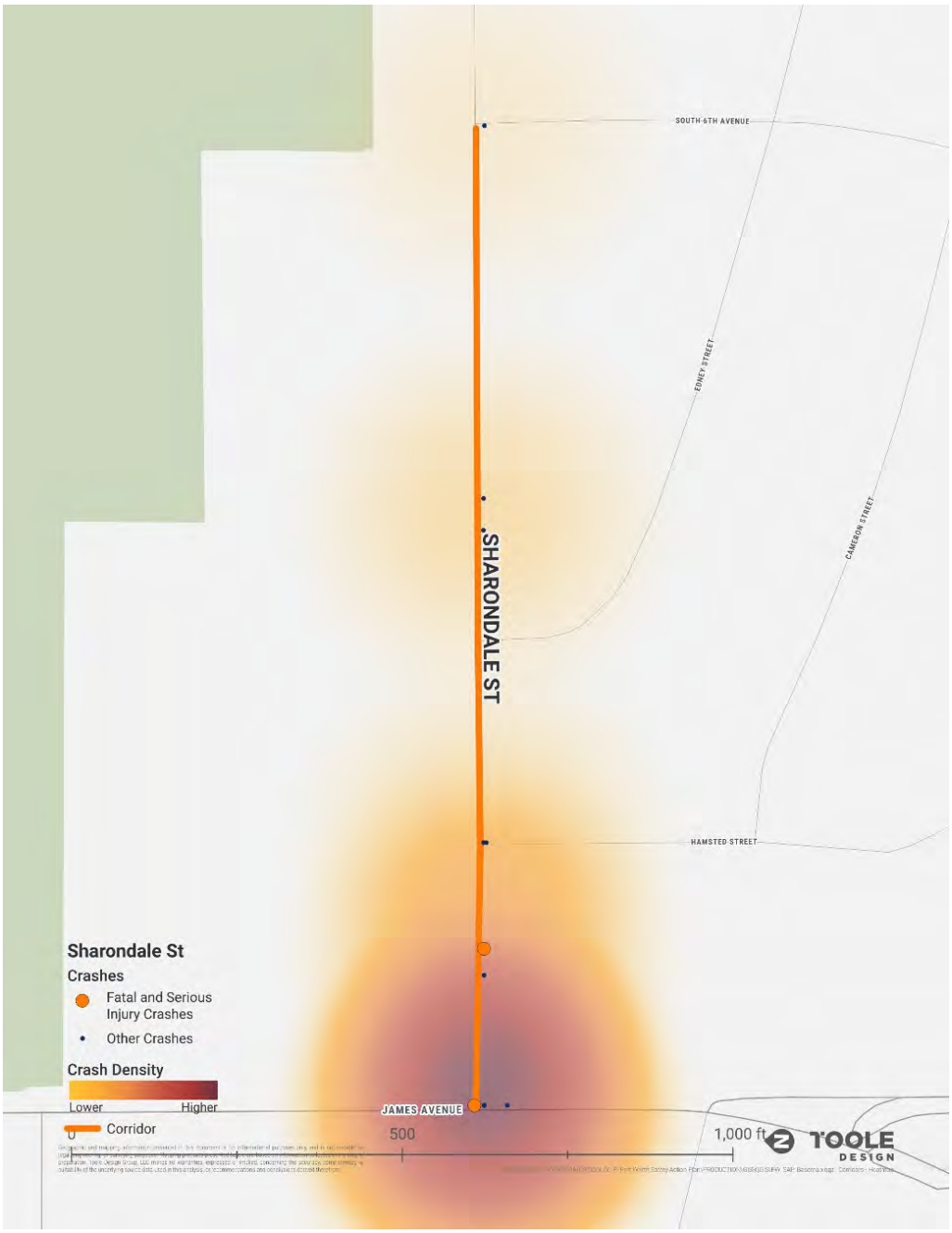


Figure 25: Crash map of the Sharondale Street corridor

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along Sharondale Street. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

There is no posted speed limit along Sharondale Street.

There is a moderate amount of parallel parking along the corridor.

Pedestrian Facilities

There were no sidewalks observed along Sharondale Street. Poor sight lines caused by on-street parking create conditions that may decrease the likelihood of motorists yielding to pedestrians.

- To improve pedestrian connectivity, it is recommended that sidewalks be constructed on both sides of the street.
- It is recommended that traffic calming measures, such as bump outs and curb extensions, be added at corners and other pedestrian crossings, to improve pedestrian visibility and vehicle sight lines. These curb extensions will also formalize designated on-street parking areas and provide a visual narrowing of the street to calm traffic.

Bicycle Facilities

Because of the surrounding residential land use, observed low speed along the corridor, and presence of on-street parking, it is recommended to treat the corridor as a bike boulevard and install sharrow pavement markings.

Figure 26: View down Sharondale Street, showing wide, clear space and vehicles obstructing sight lines

Intersection-Focused Recommendations

The following observations were made at specific intersections along Sharondale Street:

6th Avenue

This is an all way stop-controlled tee intersection with no sidewalks or ramps. There are single-family houses on each of the southern corners and along the northern edge.

Table 117: 6th Avenue intersection recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are not present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue:** Crosswalks are unmarked. Stop bars are faded or missing. **Recommendation**: Install stop bars. Assess need for high-visibility crosswalks as needed to facilitate crossings and encourage motor vehicle yielding
Other Crossing Characteristics	**Issue:** There is concern about lack of driver yielding. Parked cars obstruct sight lines. **Recommendation**: Install curb extensions on all corners. Restrict parking in advance of crosswalk

Edney Street

This is a side stop-controlled T intersection with no sidewalks or ramps. There are single-family houses on each of the southern corners and along the northern edge.

Table 118: Edney Street intersection recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are not present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. Stop bar for Edney Street is faded or missing. **Recommendation**: Install stop bar on Edney Street. Assess need for high-visibility crosswalks as needed to facilitate crossings and encourage motor vehicle yielding
Other Crossing Characteristics	**Issue**: There is concern about lack of driver yielding. Parked cars obstruct sight lines. **Recommendation**: Install curb extensions on all corners. Restrict parking in advance of crosswalk. Study intersection for all-way stop.
Sidewalk	**Issue**: Sidewalks exist along Edney Street, but do not extend to the intersection. **Recommendation**: Extend sidewalks and add curb ramps.

Hamsted Street

This is a side stop-controlled tee intersection with no sidewalks or ramps. There are single-family houses on each of the southern corners and along the northern edge. There was a KSI crash at this intersection.

Table 119: Hamsted Street intersection recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are not present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. Stop bar for Hamsted Street is faded or missing. **Recommendation**: Install stop bar on Hamsted Street. Assess need for high-visibility crosswalks as needed to facilitate crossings and encourage motor vehicle yielding
Other Crossing Characteristics	**Issue**: There is concern about lack of driver yielding. Parked cars obstruct sight lines. **Recommendation**: Install curb extensions on all corners. Restrict parking in advance of crosswalk. Study intersection for all-way stop.

James Avenue

This is a main (Sharondale St) stop-controlled T intersection with sidewalks and ramps along James Avenue. There are single-family houses on each of the eastern corners and the Kingdom Hall of Jehovah's Witnesses on the eastern edge. There was a KSI crash at this intersection.

Table 120: James Ave intersection recommendations

Category	Issues and Recommendations
Curb Ramp	**Issue**: Curb ramps are not present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. Stop bar for Sharondale Street is faded or missing. **Recommendation**: Install stop bar on Sharondale Street. Install high-visibility crosswalk across Sharondale Street on the east leg.
Other Crossing Characteristics	**Issue**: There is concern about lack of driver yielding. Parked cars obstruct sight lines.

	Recommendation: Install curb extensions corners on east leg. Restrict parking in advance of crosswalk.
Sidewalks	**Issue**: Sidewalks on James Ave lack sufficient buffer from roadway. **Recommendation**: Reconstruct sidewalks to provide buffer or narrow roadway to add buffer.

Recommendation Implementation Table

Table 121 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the Sharondale Street corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project, based on feasibility, crash reduction benefit and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth. Construction, engineering, and contingency are included in these costs. All assumptions are detailed in the Toolkit.

Table 121: Recommended countermeasures for Sharondale Street corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install Pedestrian Crosswalk (High-Visibility)	0.9	$1,920.00
	Intersection	Install Stop Bar	--	$180.00
Medium (3-5 years)	Segment	Install Sidewalks	0.35	$194,737.84
	Intersection	Reconfigure Curb Ramps to meet ADA Standard	0.65	$28,000.00
	Intersection	Modify Curb Geometrics	--	$140,000.00
				Total: $364.837.84

Benefit-Cost Analysis

The estimated cost-benefit result for Sharondale Street is 22.07 (Table 122).

Table 123 summarizes the estimated improvement costs by type and Table 124 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 122: Sharondale Street Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$16,880,000	$764,900	22.07

Table 123: Cost Results for Sharondale Street Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Curb extension	$10,000	14	25	$140,000.00	-
Install continuous sidewalks	$134.86 / LF	1444 LF	10	$194,737.84	$19,473.78
Install Stop Bar	$30	6	4	$180.00	$45.00
Install/refresh high-visibility crosswalks	$16 / LF	120 LF	4	$1,920.00	$480.00
Reconfigure ramps to meet ADA Standard	$3,500	8	25	$28,000.00	-
Total				$364.837.84	$19,998.78
				Lifecycle Cost (20 years)	**$3,558,400**

Table 124: Benefit Results for Sharondale Street Corridor

Crash Severity	Prevention Benefit[1]*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	0	$0
A – Severe Injury	$3,700,000	4	$14,800,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	4	$2,080,000
		Total Benefit:	**$16,880,000**

[1] Cost obtained from TxDOT 2021 SII Calculator

Corridor 9: Sycamore School Road

Sycamore School Road runs east to west between South Freeway and W Everman Parkway. It is on the Bicycle HIN, Pedestrian HIN, and Motor Vehicle HIN.

Context

Sycamore School Road functions as a residential, minor arterial corridor. Hallmark Park is located mid-way on this corridor between the bridge over Sycamore Creek and an at-grade railroad crossing. There is some commercial use as well as residential use. The roadway consists of four lanes. There is a sidewalk on the south side that runs approximately to the Creek, and another sidewalk on the north side that starts at Hemphill Street and runs to W Everman Parkway. This corridor is signed as a commercial delivery route. The corridor is approximately 1.4 miles in length. The speed limit on the corridor is 35 mph. The typical pavement width ranges from 40 to 42 feet. The Average Annual Daily Traffic (AADT) for this corridor is 16,016, according to the 2022 TPP Statewide Traffic Count Map. There is a potential project on Hemphill Street from W Risinger Road to Sycamore School Road to design and construct a four-lane divided arterial. This intersection is already signalized with turn lanes and a four-lane approach on Hemphill Street.

Crash History

A crash data analysis was performed for the Sycamore School Road corridor to understand the contributing factors and identify focus areas for countermeasures. From 2019 to 2023, 292 crashes occurred on Sycamore School Road between South Freeway and W Everman Parkway. About 32% of crashes occurred at dusk or night. There were two crashes involving a bicycle, one resulted in a fatality which occurred at Hemphill Street. There were three crashes involving a motorcycle, two of which were KSI crashes. There were four crashes involving a pedestrian, two of which were KSI crashes. There were three fatalities on this corridor: one at Sheridan Road, one at Trimble Drive, and one occurring at Hemphill Street.

Figure 27 shows the spatial distribution of crashes in the Sycamore School Road corridor. Table 125 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. Table 126 shows the top five contributing factors as noted in the crash reports of crashes on Ellis Avenue. Table 127 summarizes the KSI crashes (10) that occurred on this corridor.

Table 125: Sycamore School Road Collision Manner, if noted

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Same Direction	Total
SOUTH FWY	7	3	9	---	22
SHERIDAN RD	12	3	10	1	10
CHANTILLY LN	1	---	---	---	3
REGENCY LN	2	---	2	---	---
ROCKDALE RD	6	1	6	---	5
COLFAX LN	2	---	---	---	4
NATALIE DR	1	---	3	---	1
TRIMBLE DR	3	---	7	---	7
SWEET SPARROW DR	---	---	---	---	---
HEMPHILL ST	13	8	14	1	25
PEBBLEFORD RD	---	---	---	---	1
ROMNEY RD	1	---	2	---	---
WILLOW GLEN CIR	2	---	1	---	3
CAMELOT RD	4	5	29	---	15
MARLBOROUGH DR	---	---	1	---	3
GLADEWATER DR	1	1	---	---	1
NOVELLA DR	---	1	---	---	4
W EVERMAN PKWY	7	5	4	---	7
(OTHER)	---	1	---	---	1
TOTAL	**62**	**28**	**88**	**2**	**112**

Table 126: Sycamore School Road Top 5 Contributing Factors, if noted.

Contributing Factor	Number of Crashes
Driver Inattention*	83
Failed To Control Speed*	59
None*	52
Failed To Yield Right Of Way – Turning Left*	46
Other*	18

Table 127: Sycamore School Road KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
SOUTH FWY	Signalized	One Motor Vehicle; Going Straight (motorcycle crash)	Failed To Control Speed – hit fixed object
SHERIDAN RD	Signalized	Same Direction; One Straight-One Left Turn (fatality) Angle; Both Going Straight	Failed To Yield Right Of Way – Turning Left Failed To Control Speed
ROCKDALE RD	Signalized	Opposite Direction; One Straight-One Left Turn	Failed To Yield Right Of Way – Turning Left
NATALIE DR	Side Stop-Controlled	Opposite Direction; Both Going Straight	Wrong Side – Not Passing; Driver Inattention
TRIMBLE DR	Side Stop-Controlled	Opposite Direction; Both Going Straight (fatality)	Wrong Side – Not Passing
HEMPHILL ST	Signalized	One Motor Vehicle; Going Straight (pedestrian crash) Opposite Direction; One Straight-One Left Turn One Motor Vehicle; Going Straight (bicycle crash, fatality)	Failed To Pass To Right Safely; Changed Lane When Unsafe; Failed To Control Speed Failed To Yield Right Of Way – Turning Left Pedestrian Failed To Yield Right Of Way To Vehicle
CAMELOT RD	Signalized	Opposite Direction; One Straight-One Left Turn One Motor Vehicle; Going Straight (pedestrian crash)	Failed To Yield Right Of Way – Turning Left None
MARLBOROUGH DR	Side Stop-Controlled	Opposite Direction; One Straight-One Left Turn (motorcycle crash)	Failed To Yield Right Of Way – Turning Left; Speeding – (Overlimit); Other
GLADEWATER DR	Side Stop-Controlled	One Motor Vehicle; Going Straight	Driver Inattention – hit fixed object

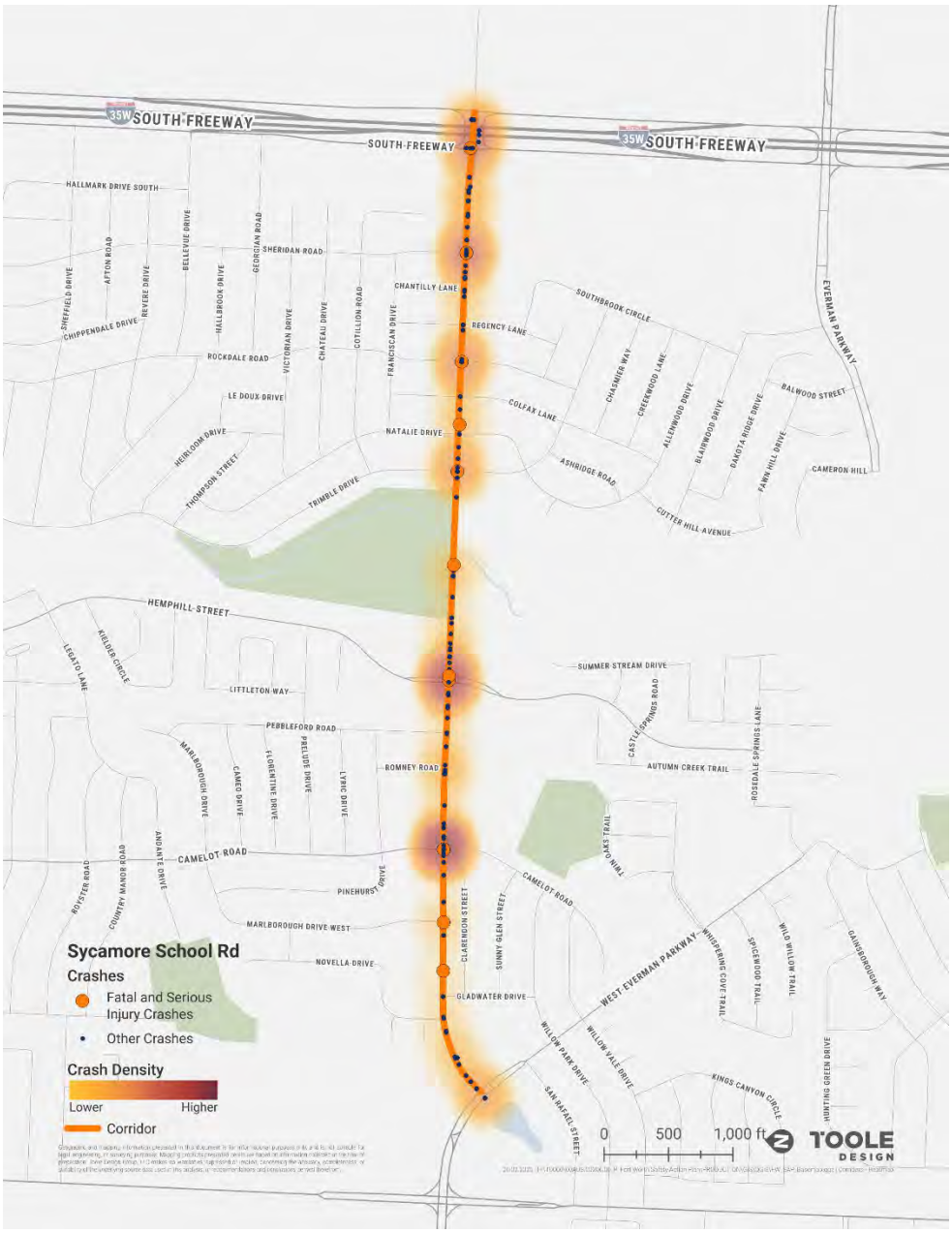


Figure 27: Crash map of the Sycamore School Rd corridor

Field Observations and Recommendations

In November 2024, project team members conducted in-field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along Sycamore School Road. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Speed Management

Sycamore School Road is striped for four lanes. The wide road design, especially at times of low traffic volume, encourages higher travel speeds.

- It is recommended that the corridor be studied for a road diet. It is recommended that the road be narrowed from a four-lane to three-lane cross-section.
- In the short term, in the absence of a road diet, it is recommended that speed feedback signs be installed to discourage speeding.

Pedestrian Facilities

Intermittent gaps of sidewalk connectivity were observed along the corridor.

- It is recommended that gaps in the sidewalk be filled. A road diet will allow for increased sidewalk width and increased buffer space, as well as planted buffers and street trees.

Bicycle Facilities

Sycamore School Road is not designated as a bike route; however, increased bicycle connectivity can be achieved by widening one of the sidewalks to accommodate a shared use path, if desired. This would be feasible with the extra right-of-way remaining after a road diet.

Intersection-Focused Recommendations

The following observations were made at specific intersections along Sycamore School Road:

South Freeway

This is a signalized interchange with the South Freeway frontage roads. There is a strip mall on the northwest corner and a gas station on the southwest corner.

There has been a KSI crash at this intersection.

Table 128: South Freeway intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps do not appear to be ADA compliant. Curb ramps are angled toward intersection traffic.

	Recommendation: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings are faded **Recommendation**: Install new high-visibility crosswalks on all legs of the intersection. Use bonding agents to increase durability.
Other Crossing Characteristics	**Issue**: Pedestrian signal is not on auto recall. Audible warnings are beeps only and not PROWAG compliant. Pedestrian button on the southeast corner is located too far away from curb ramps. **Recommendation**: Place pedestrian signal on auto recall. Relocate southeast corner pedestrian button.
Sidewalks	**Issue**: There is no sidewalk along the north side of Sycamore School Road or along South Freeway. Sidewalk under the I-35W freeway ramp is in poor condition. **Recommendation**: Install sidewalk along the north side of Sycamore School Road and South Freeway. Repair sidewalk under the I-35W to increase pedestrian comfort.

Sheridan Road

This is a signalized intersection with ramps on all corners. There are single-family homes on the north corners and commercial uses on the south corners.

There has been a KSI crash at this intersection, which was fatal.

Table 129: Sheridan Road intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramp on southeast corner is angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk markings are present on all approaches except the north approach. Crosswalk markings and stop bar are faded on the south approach. Crosswalk markings are not high-visibility. **Recommendation**: Install new high-visibility crosswalks on all legs of the intersection.
Other Crossing Characteristics	**Issue**: Audio signal is missing from one actuator on the northeast corner. Pedestrian buttons are difficult to access on the southeastern corner. Pedestrian signal head for southbound pedestrian traffic on the southwestern corner is somewhat obstructed by utility poles.

	Recommendation: Implement LPI. Relocate pedestrian signal or remove obstacle on southwest corner. Relocate pedestrian buttons on the southeast corner. Repair audio signal on northeast corner.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Chantilly Lane

This is a side stop-controlled tee intersection with no ramps. The crossings here are unmarked. There are single family homes on the north corners and Estates Healthcare and Rehabilitation Center is along the south edge.

Regency Lane

This is a side stop-controlled intersection with curb ramps on the south side only. There are single family homes on all four corners.

Table 130: Regency Lane intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps on south side are angled toward intersection traffic. **Recommendation**: Reconstruct or repair existing curb ramps. Construct curb ramps in conjunction with north sidewalk.
Crosswalk	**Issue**: No stop bars on side streets. Crossings are unmarked. **Recommendation**: Mark new stop bars. Repave crosswalk surface area. Mark crosswalks.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Rockdale Road

This is a signalized intersection with curb ramps on all but the northwest corner. The crossings are marked with high-visibility markings on the south and east leg and unmarked on the north and west sides. There are single-family homes on all four corners. There has been a KSI crash at this intersection.

Table 131: Rockdale Road intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps are angled toward intersection traffic. Curb ramp on southwest corner is obstructed by an electric pole. **Recommendation**: Reconstruct or repair existing curb ramps. Relocate electric pole on southwest corner. Construct curb ramps in conjunction with north sidewalk.
Crosswalk	**Issue**: Crosswalk markings are present on east and south leg. Crosswalk markings on the south leg are in poor condition. Crossing surface on the south leg is in poor condition. **Recommendation**: Install new high-visibility crosswalks on north, south, and west legs. Repave crosswalk surface area on south leg. Remark stop bar on south leg.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Colfax Lane

This is a side stop-controlled intersection with curb ramps on the south corners. The crossings are unmarked. There are single family homes on all four corners.

Table 132: Colfax Lane intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps are angled toward intersection traffic. Curb ramp on southwest corner is obstructed by an electric pole. **Recommendation**: Reconstruct or repair existing curb ramps. Relocate electric pole on southwest corner. Construct curb ramps in conjunction with north sidewalk.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossings. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars on side street approaches.
Other Crossing Characteristics	**Issue**: Power pole in the middle of sidewalk/ramp on the southwest corner. **Recommendation**: Relocate power pole.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Natalie Drive

This is a side stop-controlled intersection with curb ramps on the south corners. The crossings are unmarked. There are single family homes on all four corners. There has been a KSI crash at this intersection.

Table 133: Natalie Drive intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps are angled toward intersection traffic. Curb ramp on southwest corner is obstructed by an electric pole. **Recommendation**: Reconstruct or repair existing curb ramps. Relocate electric pole on southwest corner. Construct curb ramps in conjunction with north sidewalk.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossings. **Recommendation**: Install new high-visibility crosswalks. Mark new stop bars on side street approaches.
Other Crossing Characteristics	**Issue**: Power pole in the middle of sidewalk/ramp on the southwest corner. **Recommendation**: Relocate power pole.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Trimble Drive

This is a side stop-controlled intersection with curb ramps on the south corners. The crossings are unmarked. There are single family homes on all four corners.

Table 134: Trimble Drive intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps are angled toward intersection traffic. Curb ramp on southwest corner is obstructed by an electric pole. **Recommendation**: Reconstruct or repair existing curb ramps. Relocate electric pole on southwest corner. Construct curb ramps in conjunction with north sidewalk.
Crosswalk	**Issue**: Crosswalks are unmarked. No stop bar at controlled crossings.

	Recommendation: Install new high-visibility crosswalks. Mark new stop bars on side street approaches.
Other Crossing Characteristics	**Issue**: Power pole in the middle of sidewalk/ramp on the southwest corner. **Recommendation**: Relocate power pole.
Sidewalks	**Issue**: Missing sidewalk on the north side of the intersection. **Recommendation**: Install sidewalk along the north side of Sycamore School Road.

Railroad Crossing

This is a gate-controlled railroad crossing. There are no sidewalks or ramps. There has been a KSI crash at this intersection.

Table 135: Railroad crossing recommendations

Category	Issues and Recommendations
Other Crossing Characteristics	**Issue**: No pedestrian crossing of train tracks. **Recommendation**: Continue sidewalk through level crossing. Include detectable warning surfaces per PROWAG.
Sidewalks	**Issue**: Missing sidewalk on both sides. **Recommendation**: Install sidewalks.

Hemphill Street

This is a signalized intersection. There are curb ramps on all four corners. Hemphill Street is on Fort Worth's bond project list as a Tier 2 bond project. This plan calls for conversion to a four-lane divided arterial. Care will need to be taken to improve safety at this intersection. There have been two KSI crashes at this intersection, one of which was fatal.

Figure 28: Desire path through median on south side of intersection.

Table 136: Hemphill Street intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps not aligned with crosswalks, specifically the south leg crossing and the northeast corner. **Recommendation**: Reconstruct or repair existing curb ramps. Construct curb ramps in line with south leg crossing.
Crosswalk	**Issue**: South leg crosswalk is unmarked **Recommendation**: Install new high-visibility crosswalk on south leg.
Other Crossing Characteristics	**Issue**: Pedestrian signal not on auto recall. **Recommendation**: Put pedestrian signal on auto recall.
Sidewalk	**Issue**: No sidewalk on the south side of the road. Gap in northeast sidewalk. **Recommendation**: Install sidewalk.

Pebbleford Road

This is a side stop-controlled T intersection. There are curb ramps on both corners.

Table 137: Pebbleford Road intersection recommendations

Category	Issues and Recommendations
Crosswalk	**Issue**: Crossing is unmarked. There is no stop bar at controlled crossing. **Recommendation**: Mark new stop bar.
Sidewalk	**Issue**: Sidewalk lacks sufficient buffer on the south side. **Recommendation**: Reconstruct sidewalk to widen buffer from roadway.

Romney Road

This is a side stop-controlled tee intersection. There are curb ramps on both corners.

Table 138: Romney Road intersection recommendations

Category	Issues and Recommendations
Crosswalk	**Issue**: Crossing is unmarked. There is no stop bar at controlled crossing. **Recommendation**: Mark new stop bar.
Sidewalk	**Issue**: Sidewalk lacks sufficient buffer on the south side. **Recommendation**: Reconstruct sidewalk to widen buffer from roadway.

Driveway Entrance to Strip Mall

This is a driveway entrance to the strip mall with Jonathan's Stop N' Save. The driveway is extremely wide. It is recommended to narrow the driveway entrance to shorten pedestrian crossing.

Camelot Road

This is a signalized intersection. There are curb ramps on the northern corners. The Lifeline Church is on the northwest corner, Jimmy's Food Mart is on the northeast corner, and there are single-family homes on the southern corners. This is a crossing point for the Kreative Kids Preparatory Academy. There have been two KSI crashes at this intersection.

Figure 29: Inaccessible pedestrian push button on the southwest corner

Table 139: Camelot Road intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps not aligned with crosswalks. Curb ramps are not ADA compliant. No curb ramps on the southern corners. **Recommendation**: Reconstruct or repair existing curb ramps. Construct curb ramps with south sidewalk.
Crosswalk	**Issue**: North and south leg crosswalks are unmarked, east leg crossing is prohibited. **Recommendation**: Remove crossing restriction on east leg. Install new high-visibility crosswalks on north, south, and east legs.
Other Crossing Characteristics	**Issue**: Short crossing time. Inaccessible pedestrian push buttons on southern corners. Concerns with driver turning movements and lack of driver yielding. APS audio signal is missing. **Recommendation**: Evaluate pedestrian crossing time. Relocate pedestrian push buttons to be accessible. Put pedestrian signal on auto recall. Add APS audio signal. Install advance pedestrian warning signs as well as school crossing signs with downward pointing arrows.
Sidewalk	**Issue**: No sidewalk on the south side of the road. **Recommendation**: Install sidewalk.
Speed Management	**Issue**: High speeds along this stretch of the corridor. **Recommendation**: Install speed feedback signs. Reduce speed limit (may require further study).

Marlborough Road W

This is a side stop-controlled T intersection. There are curb ramps on all corners. There are single-family homes on both corners and along the south edge. There has been a KSI crash at this intersection.

Table 140: Marlborough Drive W intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are only aligned east and west and do not facilitate crossing Sycamore School Road. **Recommendation**: Reconstruct existing curb ramps to include south direction. Install south side curb ramps in conjunction with south sidewalk.
Sidewalk	**Issue**: No sidewalk on the south side of the road. No sidewalks along Marlborough Drive W. **Recommendation**: Install sidewalks.

Gladewater Drive

This is a side stop-controlled T intersection. There are no curb ramps. There are single-family homes on both corners and along the north edge. There has been a KSI crash at this intersection.

Table 141: Gladewater Drive intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: No curb ramps. **Recommendation**: Install curb ramps in conjunction with new sidewalk on south side.
Other Crossing Characteristics	**Issue**: No crosswalk markings across Gladewater Drive. Likely not a suitable candidate for crossing Sycamore School Drive. **Recommendation**: Install crosswalk markings and stop bar on Gladewater Drive.
Sidewalk	**Issue**: No sidewalk on the south side of the road. No sidewalks along Gladewater Drive. Obstructions are currently present that may make installation not feasible. **Recommendation**: Install sidewalks. Remove or relocate obstructions that present obstacles to sidewalk installation (if necessary).

Novella Drive

This is a side stop-controlled T intersection. There are curb ramps on both corners. There are single-family homes on both corners and a vacant lot on the southern edge.

Table 142: Novella Drive intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are compliant with ADA. There are drainage issues with the curb ramps. **Recommendation**: Improve drainage from base of the curb ramp.
Other Crossing Characteristics	**Issue**: No stop bar on Novella Drive. **Recommendation**: Install stop bar on Novella Drive.

W Everman Parkway

This is a signalized T intersection. There are curb ramps on each corner.

Table 143: W Everman Parkway intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant. Curb ramps that serve crossing W Everman Parkway may not be legally used to cross W Everman Parkway. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: There is currently a high visibility crosswalk present across Sycamore School Road on the northeast leg of the intersection. Currently crossing movements are allowed across W Everman Parkway on the northwest leg of the intersection are banned by signage, despite curb ramps into the roadway. Issue: Crossing movements are allowed across W Everman Parkway on the southeast leg, however no crosswalks or curb ramps are provided. **Recommendation**: Consider marking both the northwest and southeast leg (crossing W Everman Parkway) with high visibility crossing markings. At a minimum, the northwest leg should be marked with high visibility crossing markings and the no crossing signs should be moved to the southeast leg.
Other Crossing Characteristics	**Issue**: Existing pedestrian movement across Sycamore School Road is long and adequate time is not provided for crossing. Pedestrian push button switch on north side of the intersection is far away from the cross-section and may be difficult to access. No safe crossing currently available for West Everman Parkway

	at this intersection. The nearest crossing opportunity is at Crowley Road, a quarter mile away. **Recommendation**: Increase pedestrian crossing time. Review signal timing to allow for more frequent crossing opportunities. Consider installation of median pedestrian Island. Install protected pedestrian crossings at the intersection for crossing West Everman Parkway, as well as associated signalization and other infrastructure
Sidewalk	**Issue**: Adequate sidewalks are available on the northeast corner of the intersection, although there are some obstructions due to electrical box and parking design. Sidewalks on the southeast corner are slightly deteriorated and somewhat overgrown. **Recommendation**: Reconstruct or repair sidewalks.
Access Management	**Issue**: There are multiple driveways accessing the gas station on the southeast corner, creating multiple conflicts for pedestrians and other users in the intersection area. **Recommendation**: Consolidate driveways.

Recommendation Implementation Table

Table 144 below summarizes the full list of Corridor and Intersection recommendations to reduce crashes for all modes and enhance the safety along the Sycamore School Road corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project, based on feasibility, crash reduction benefit and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth. Construction, engineering, and contingency are included in these costs. All assumptions are detailed in the Toolkit.

Table 144: Recommended countermeasures for Sycamore School Road corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install advance signal, stop, pedestrian or yield signs	0.75	$800.00
	Intersection	Install Detectable Warning Strips	--	$2,000.00

	Segment	Install dynamic speed feedback signage	0.95	$30,000.00
	Intersection	Implement leading pedestrian intervals	0.87	$200.00
	Intersection	Install Stop Bar	--	$480.00
	Intersection	Install Pedestrian Crosswalk (High-Visibility)	0.90	$25,680.00
	Segment	Consolidate access points	--	$20,160.00
Medium (3-5 years)	Intersection	Install Pedestrian Refuge Islands	0.68	$4,100.00
	Intersection	Install pedestrian signal heads | Install Pedestrian Pushbutton	--	$17,360.00
	Segment	Install Sidewalks	0.35	$1,424,843.64
	Intersection	Reconfigure Curb Ramps to meet ADA Standard	0.65	$248,500.00
				Total: $1,774,323.64

Benefit-Cost Analysis

The estimated cost-benefit result for Sycamore School Road is 26.56 (Table 145).Table 146 summarizes the estimated improvement costs by type and Table 147 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 145: Sycamore School Road Corridor – Final Cost-Benefit Ratio

Benefits	Costs	Final Benefit / Cost Ratio
$128,960,000	$4,854,600	26.56

Table 146: Cost Results for Sycamore School Road Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost

Implement leading pedestrian intervals	$200	1	10	$200.00	$20.00
Install advance signal, stop or yield signs	$100	8	4	$800.00	$200.00
Install Detectable Warning Strips	$500	4	25	$2,000.00	-
Install dynamic speed feedback signage	$3,000	10	10	$30,000.00	$3,000.00
Install Pedestrian Signs	$100	2	6	$200.00	$30.00
Install Stop Bar	$30	16	4	$480.00	$120.00
Install/refresh high-visibility crosswalks	$16 / LF	1,605 LF		$25,680.00	$6,420.00
Consolidate access points	$6,720	3	25	$20,160.00	-
Install continuous sidewalks	$134.86 / LF	10,565 LF	10	$1,424,843.64	$142,484.36
Install median pedestrian refuge	$4,100	1	25	$4,100.00	-
Install Pedestrian Pushbutton	$1,436	10	10	$14,360.00	$1,436.00
Install pedestrian signal heads	$1,500	2	10	$3,000.00	$300.00
Reconfigure ramps to meet ADA Standard	$3,500	71	25	$248,500.00	-
Total				$1,744,323.64	$154,010.36
				Lifecycle Cost (20 years)	**$4,854,600**

Table 147: Benefit Results for Sycamore School Road Corridor

Crash Severity	Prevention Benefit[2]*	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	5	$18,500,000
A – Severe Injury	$3,700,000	21	$77,700,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	63	$32,760,000
Total Benefit:			**$128,960,000**

[2] Cost obtained from TxDOT 2021 SII Calculator

Corridor 10: W Seminary Drive

W Seminary Drive runs east to west between 6th Avenue and Rector Avenue. It is on the Pedestrian HIN and Bicycle HIN.

Context

W Seminary Drive functions as a residential, major arterial corridor. Rosemont Middle School, Rosemont Park, and Southwestern Baptist Theological Seminary are located on the eastern end of this corridor. There is an at-grade railroad crossing between William Fleming Court and Frazier Avenue. The roadway consists of four travel lanes and a fifth lane that serves as a center turn lane or median. There are mostly continuous sidewalks on both sides of the road. A Trinity Metro bus route runs on this corridor. The corridor is approximately 1.18 miles in length. The speed limit on the corridor is 35 mph. The typical pavement width, including medians, ranges from 58 to 70 feet. The Average Annual Daily Traffic (AADT) for this corridor is 12,770 (west of McCart Ave) and 13,948 (just west of 6th Ave), according to the 2022 TPP Statewide Traffic Count Map.

Crash History

A crash data analysis was performed for the W Seminary Drive corridor to understand the contributing factors to crashes and identify focus areas for countermeasures. From 2019 to 2023, 176 crashes occurred on W Seminary Drive between 6th Avenue and Rector Avenue. About 32% of crashes occurred at dusk or night. There were two crashes involving a bicycle, both of which were KSI crashes. There were five crashes involving a motorcycle, one of which was a KSI crash. There were three crashes involving a pedestrian, one of which resulted in a fatality. There were two fatalities on this corridor, one at Sandage Avenue and one at McCart Avenue.

Figure 30 shows the spatial distribution of crashes in the Sycamore School Road corridor. Table 148 shows the summary of the crash data by collision manner for the Ellis Avenue corridor. Table 149 shows the top five contributing factors as noted in the crash reports of crashes on Ellis Avenue. Table 150 summarizes the KSI crashes (11) that occurred on this corridor.

Table 148: W Seminary Drive Collision Manner, if noted

Intersection (*Closest reported*)	Angle Crash	One Motor Vehicle	Opposite Direction	Other	Same Direction	Total
6th AVE	2	3	2	---	3	10

JAMES AVE/ 8th AVE	12	10	8	---	15	45
WILLIAM FLEMING CT	6	3	2	---	6	17
FRAZIER AVE	5	2	2	2	2	13
WAYSIDE AVE	3	---	---	---	1	4
MCCART AVE	11	5	6	---	22	44
SANDAGE AVE	2	1	2	1	2	8
MERIDA AVE	3	1	2	---	---	6
LUBBOCK AVE (N + S)	3	4	2	1	---	10
WAITS AVE	2	1	---	---	---	**3**
GREENE AVE	---	2	---	---	---	**2**
COCKRELL AVE	2	2	---	---	---	**4**
RECTOR AVE	---	---	---	---	---	
(OTHER)	---	7	---	1	2	**10**
TOTAL	**51**	**41**	**26**	**5**	**53**	**176**

Table 149: W Seminary Drive Top 5 Contributing Factors

Contributing Factor	Number of Crashes
Driver Inattention	43
Failed To Control Speed	43
None	29
Other	15
Failed To Yield Right OF Way – Turning Left	14

Table 150: W Seminary Driver KSI Crashes Summary

Intersection	Intersection Type	Collision Manner	Contributing Factors
6th AVE	Signalized	Opposite Direction; One Straight-One Left Turn Angle; Both Going Straight	Failed To Yield Right Of Way – Turning Left; Unsafe Speed Disregard Stop Sign Or Light; Fleeing or Evading Police
JAMES AVE / 8th AVE	Signalized	One Motor Vehicle; Going Straight (bicycle)	None
WILLIAM FLEMING CT	Signalized	Angle; Both Going Straight	Disregard Stop Sign Or Light

		One Motor Vehicle; Turning Left (bicycle)	Disregard Stop And Go Signal; Failed To Control Speed
FRAZIER AVE	Side Stop-Controlled	One Motor Vehicle; Going Straight Opposite Direction; One Straight-One Left Turn (motorcycle)	None – hit fixed object Drove Without Headlights
MCCART AVE	Signalized	Same Direction; One Straight-One Stopped Angle; Both Going Straight (fatality)	Driver Inattention; Failed To Control Speed Disregard Stop And Go Signal; Driver Inattention
SANDAGE AVE	Side Stop-Controlled	One Motor Vehicle; Going Straight (pedestrian, fatality)	None
WAITS AVE	Side Stop-Controlled	Angle; Both Going Straight	None

Figure 30: Crash map of the W Seminary Dr corridor

Field Observations and Recommendations

In November 2024, project team members conducted field observations of the corridor to obtain a better understanding of the existing operations and challenges. These observations are grouped into two categories: corridor-focused and intersection-focused.

Corridor-Focused Recommendations

The following field observations were made along West Seminary Drive. These observations pertain to the entirety of the corridor and are not segment-specific, unless otherwise noted.

Speed Management

W Seminary Drive is striped for four lanes with a center median between 6th Avenue and William Fleming Court and striped for five lanes between William Fleming Court and Rector Avenue. The wide road design, especially at times of low traffic, encourages higher travel speeds. With the low traffic volume experienced along this road,

- It is recommended that the corridor be studied for a road diet.
- It is recommended that the road be narrowed from a four-lane with median/five-lane to a three-lane cross-section.
- In the short term, in the absence of a road diet, it is recommended that speed feedback signs be installed to discourage speeding.

Pedestrian Facilities

There were a few mid-block crossings connecting Rosemont Elementary School and Rosemont Middle School to Rosemont Park. These crossings are long, despite having a refuge island in the middle.

- It is recommended to narrow the travel lanes and provide curb extensions to facilitate safer crossing for students. The western crossing also lacks curb ramps, which present a barrier to disabled pedestrians, and pavement markings. These crossings are discussed in depth in the intersection recommendations.
- Intermittent gaps of sidewalk connectivity were observed along the corridor. It is recommended that sidewalks are connected where there are gaps. A road diet will allow for increased sidewalk width and increased buffer space, as well as planted buffers and street trees.

Bicycle Facilities

W Seminary Drive is designated as a bike route; however, there are no bicycle facilities along the corridor. To ensure bicycle safety along the corridor,

- It is recommended that buffered bicycle lanes be installed along the corridor. The extra right-of-way from a potential road diet can be repurposed into directional bike lanes. Conversely, the roadway can be narrowed and the bike lanes can be sidewalk-level or the sidewalks can be widened to create a shared use path.

Intersection-Focused Recommendations

The following observations were made at specific intersections along W Seminary Drive:

6th Avenue

This is a signalized intersection. There are curb ramps on all corners. Rosemont Park is on the northwest corner and Rosemont Elementary School is on the southwest corner. There are single-family homes on the northeast and southeast corners. There have been two KSI crashes at this intersection.

Table 151: 6th Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalk is unmarked on north, east, and south legs of the intersection. **Recommendation**: Install new high-visibility crosswalks on north, east, and south legs of the intersection.
Other Crossing Characteristics	**Issue**: Wide north leg of intersection. Seminary Drive crossing is extremely long. Pedestrian pushbuttons are not accessible. Pedestrian signals are not on auto-recall. **Recommendation**: Install curb extensions and remove right turn lane on north leg. Narrow lanes on Seminary Drive. Relocate pedestrian pushbuttons. Place pedestrian signals on auto-recall and implement LPI.
Sidewalk	**Issue**: Northeast sidewalk is missing along 6th Avenue. Northeast sidewalk along W Seminary Drive is overgrown and too narrow. **Recommendation**: Install new sidewalk along 6th Avenue. Reconstruct sidewalk along W Seminary Drive.

Midblock Crossing in Front of Rosemont Middle School

There is a midblock RRFB that serves the crossing between Rosemont Middle School and Rosemont Park. The travel lanes on W Seminary Drive are very wide, and thus create long crossings. It is recommended to narrow the travel lanes and install bump outs to shorten the crossing.

Planned Midblock Crossing in Front of Rosemont Middle School

This is a sidewalk that is set up for a future midblock crossing between Rosemont Middle School and the tennis courts at Rosemont Park. It is recommended to implement an RRFB with curb ramps and striping similar to the existing midblock crossing.

Figure 31: Midblock crossing of W Seminary Drive without curb ramps or markings

James Avenue / 8th Avenue

This is a signalized intersection. There are curb ramps at all corners. Rosemont Middle School is on the southeast corner and Rosemont Park is on the northeast corner. The Southwestern Baptist Theological Seminary is on the northwest and southwest corners. There has been a KSI crash at this intersection.

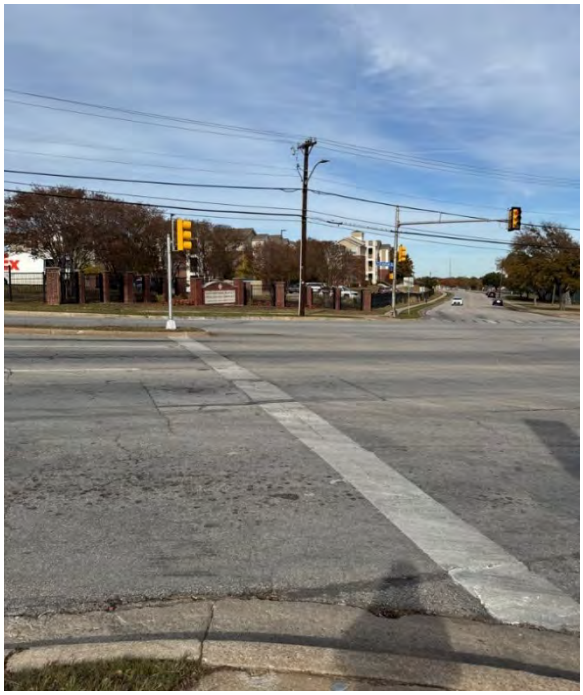


Figure 32: Long crossing across W Seminary Drive on the East Leg of Intersection.

Table 152: James Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are marked on all sides except the east leg. Crosswalk markings are faded on other legs. **Recommendation**: Install new high-visibility crosswalks on all legs of the intersection.
Other Crossing Characteristics	**Issue**: Long crossing distances. Insufficient space for pedestrians waiting to cross at northeast corner due to disconnected sidewalk. Insufficient lighting. Pedestrian signal not on auto recall. **Recommendation**: Install median crossing island. Connect sidewalk between ramps on the northeast corner. Relocate ramp crossing 8th Avenue on the northeast corner. Improve lighting for pedestrian crossings. Place pedestrian signal on auto recall.
Sidewalk	**Issue**: Narrow sidewalk on west side of James Avenue, north side of W Seminary Drive east of 8th Avenue, and south side of W Seminary Drive west of James Avenue. **Recommendation**: Widen sidewalks in these areas.

William Fleming Court

This is a signalized intersection. There are curb ramps on all four corners. The Southwestern Baptist Theological Seminary living quarters are on the north side of the intersection and the Southwestern Baptist Theological Seminary classrooms are on the south side of the intersection. There is a pedestrian tunnel underneath the intersection that facilitates crossings.

There have been two KSI crashes at this intersection.

Figure 33: Pedestrian Tunnel Underneath W Seminary Drive

Table 153: William Fleming Court intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked on north, east, and south sides. South side median interrupts crosswalk. **Recommendation**: Install new high-visibility crosswalks on north and south sides. Install break in the median.
Other Crossing Characteristics	**Issue**: Long crossing distances. Crossing lacks appropriate signage. Inadequate crossing time. Pedestrian signal not on auto recall. Pedestrian tunnel features steep slopes. **Recommendation**: Install pedestrian crossing signs with downward pointing arrows. Implement LPI. Evaluate pedestrian crossing time. Put pedestrian signal on auto recall. Evaluate walkway slopes in pedestrian tunnel to ensure ADA compliance.
Sidewalk	**Issue**: Sidewalk on north side of W Seminary Drive east of William Fleming Court does not have buffer space and pedestrian access route is obstructed by electric poles. Sidewalk is obstructed by pedestrian signal on southwest corner. There is no sidewalk on north side of William Fleming Court. **Recommendation**: Remove or relocate obstructions. Install sidewalk along William Fleming Court.

Railroad Crossing

This is a railroad crossing.

Category	Issues and Recommendations
Sidewalks	**Issue**: The sidewalks on the approach are in disrepair and the crossing is not ADA compliant. **Recommendation**: repair the sidewalks and install ADA compliant crossing

Frazier Avenue

This a side stop-controlled intersection. There are curb ramps on all four corners. Church's Chicken is on the northeast corner, Carniceria El Paya is on the southeast corner, Jack in the Box is on the southwest corner, and State Inspection Auto Repair is on the northwest corner. There have been two KSI crashes at this intersection.

Figure 33: Bus Stop Bench Obstructing Sidewalk

Table 154: Frazier Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on north and south legs. Install stop bars on the north and south legs.
Sidewalk	**Issue**: Sidewalk on the north side of W Seminary Drive has significant uplifting and cracking. The bus stop bench on the southwest corner is obstructing the sidewalk. **Recommendation**: Repair damaged sidewalk. Relocate bus stop bench.
Access Management	**Issue**: Multiple driveways for businesses are located within close proximity of all corners of the intersection, presenting increased potential for conflict between motorists and other users. **Recommendation**: Consolidate driveways.

Wayside Avenue

This is a side stop-controlled intersection. There are curb ramps at each corner. There is an abandoned lot on the northeast corner, a strip mall on the southeast corner, Mariscos Aculpulco on the southwest corner, and a strip mall on the northwest corner.

Table 155: Wayside Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. **Recommendation**: Reconstruct or repair existing curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on north and south legs. Install stop bars on the north and south legs.
Access Management	**Issue**: Multiple driveways for businesses are located within close proximity of all corners of the intersection, presenting increased potential for conflict between motorists and other users. **Recommendation**: Consolidate driveways.

McCart Avenue

This is a signalized intersection. There are curb ramps at each corner. There is an auto shop on the northeast corner, gas stations on both of the southern corners, and a strip mall on the northwest corner.

There have been two KSI crashes at this intersection, one of which was fatal.

Table 156: McCart Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps are not ADA compliant and are misaligned from the crosswalks. There are obstructions present at the southwest corner. **Recommendation**: Reconstruct or repair existing curb ramps. Remove or relocate obstructions.
Crosswalk	**Issue**: Crosswalks are unmarked. The stop bars are faded. **Recommendation**: Install new high-visibility crosswalks on all legs. Install new stop bars on all legs.
Other Crossing Characteristics	**Issue**: There are long crossing distances. There are visual obstructions on the southwest corner. Push button signs are worn. Pedestrian signals are not on auto recall. Push buttons are not accessible on the northwest corner. Freight traffic turning right during conflicting phases take wide turns. **Recommendation**: Install median crossing islands. Evaluate signal timing to allow more crossing time for pedestrians. Remove or relocate visual obstructions. Replace push button signs. Place pedestrian signals on auto recall. Implement LPIs. Relocate pedestrian push buttons to be more accessible. Restrict right on red.
Sidewalk	**Issue**: Sidewalk lacks sufficient buffer. There are multiple obstacles on the north side of the intersection. **Recommendation**: Reconstruct sidewalk to provide sufficient buffer from roadway. Remove or relocate obstructions in sidewalk.
Access Management	**Issue**: Multiple driveways for businesses are located within close proximity of all corners of the intersection, presenting increased potential for conflict between motorists and other users. **Recommendation**: Consolidate driveways. Reconstruct driveways with level sidewalks to reinforce pedestrian right of way.

Sandage Avenue

This is a side stop-controlled intersection. There are no curb ramps. Tacos Chihuas is on the northeast corner, an ice house on the southeast corner, Panaderías Don Goyo on the southwest corner, and an empty lot on the northwest corner. There has been a KSI crash at this intersection, which was fatal.

Table 157: Sandage Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There are no curb ramps. **Recommendation**: Install ADA compliant curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on north and south legs. Install stop bars on the north and south legs.
Other Crossing Characteristics	**Issue**: Trees, utility poles, and market parking serve as visual obstructions for the crossing. **Recommendation**: Remove or relocate visual obstructions.
Sidewalks	**Issue**: Sidewalks are not present along W Seminary Drive on the southwest corner. Sidewalks are not present along Sandage Avenue. Existing sidewalks along W Seminary Drive are narrow and deteriorating. **Recommendation**: Construct new sidewalks where not present. Reconstruct and widen existing sidewalks.
Access Management	**Issue**: Multiple driveways for businesses are located within close proximity of all corners of the intersection, presenting increased potential for conflict between motorists and other users. **Recommendation**: Consolidate driveways.

Merida Avenue

This is a side stop-controlled intersection. There are no curb ramps. There is a commercial office building on the northwest corner and the remaining corners are single-family houses.

Table 158: Merida Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There are no curb ramps. **Recommendation**: Install ADA compliant curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs.

	Recommendation: Install new high-visibility crosswalks on north and south legs. Install stop bars on the north and south legs.
Other Crossing Characteristics	**Issue**: No safe opportunity to cross W Seminary Drive. **Recommendation**: Install median crossing island. Install RRFB. Upgrade lighting.
Sidewalks	**Issue**: Sidewalks are not present along the south side of W Seminary Drive. **Issue**: Sidewalks are not present along the north side of Merida Avenue. **Issue**: Existing sidewalks along W Seminary Drive are narrow and deteriorating. **Recommendation**: Construct new sidewalks where not present. Reconstruct and widen existing sidewalks.

Lubbock Avenue (N + S)

This is a side stop-controlled offset intersection. There is no through movement due to the offset nature of the intersection. There is a curb ramp in the southeast corner. There is a commercial office building on the northeast corner, a Savers Supermarket on the northwest corner, and single-family houses on the southern corners.

Table 159: Lubbock Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There is an ADA compliant curb ramp on the southeast corner, which points toward the center of the intersection. **Recommendation**: Install ADA compliant curb ramps on remaining corners. Consider adding directionality to the curb ramp on the southeast corner.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. The north leg is less residential and carries more traffic. **Recommendation**: Install new high-visibility crosswalks on north and south legs. Install stop bars on the north and south legs.
Other Crossing Characteristics	**Issue**: Lack of sufficient lighting. Crossing W Seminary Drive from the southwest corner would allow access to the supermarket. This is a primary crossing to access Alice Contreras Elementary School. **Recommendation**: Upgrade lighting. Install RRFB from the southwest corner. Install median island from the southwest corner. Install high-vis crosswalk markings across W Seminary Drive from the southwest corner.

Sidewalks	**Issue**: Sidewalks are wide with a paved furnishing zone on the northeast corner. There is no sidewalk along W Seminary Drive on the southwest corner. All other sidewalks are sufficient. **Recommendation**: Construct new sidewalks where not present.

Waits Avenue

This is a side stop-controlled T intersection. There are curb ramps on both corners. There are single-family homes on both corners and Savers Supermarket is on the northern edge. There has been a KSI crash at this intersection.

Table 160: Waits Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: Curb ramps on the south corners angle towards W Seminary Drive, however there are no crossing treatments and no receiving curb ramps. Curb ramps are not ADA compliant. There are drainage issues on the southeast curb ramp. **Recommendation**: Install additional directional curb ramps crossing Waits Avenue. Install new receiving curb ramps on the north edge. Repair or reconstruct existing curb ramps for ADA compliance. Ensure proper drainage for curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on east, west, and south legs. Install stop bar on south leg.
Other Crossing Characteristics	**Issue**: No safe opportunity to cross W Seminary Drive. **Recommendation**: Install median crossing islands. Install RRFBs. Upgrade lighting.
Sidewalks	**Issue**: Sidewalks are not present along the south side of W Seminary Drive. Existing sidewalks along north side of W Seminary Drive are narrow and deteriorating. **Recommendation**: Construct new sidewalks where not present. Reconstruct existing sidewalks on north side of W Seminary Drive.

Greene Avenue

This is a side stop-controlled T intersection. There are no curb ramps at this intersection. There are single-family homes on both corners and industrial uses on the north corner.

Table 161: Greene Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There are no curb ramps present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue:** Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on east, west, and south legs. Install stop bar on south leg.
Other Crossing Characteristics	**Issue:** No safe opportunity to cross W Seminary Drive. **Recommendation**: Install median crossing islands. Install RRFBs. Upgrade lighting. Install advanced yield or stop markings and "Yield/Stop Here to/for Pedestrians" signs.
Sidewalks	**Issue:** Sidewalks are cracked and heaved. Sidewalk along north edge of W Seminary Drive lacks buffer. **Recommendation**: Reconstruct damaged sidewalk. Reconstruct sidewalk to provide sufficient buffer.

Cockrell Avenue

This is a side stop-controlled T intersection. There are no curb ramps at this intersection. There are single-family homes on both corners and industrial uses on the north corner.

Table 162: Cockrell Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There are no curb ramps present. **Recommendation**: Install curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on south leg. Install stop bar on south leg.
Sidewalks	**Issue**: Sidewalks are cracked and heaved. Sidewalk along north edge of W Seminary Drive lacks buffer. **Recommendation**: Reconstruct damaged sidewalk. Reconstruct sidewalk to provide sufficient buffer.

Rector Avenue

This is a side stop-controlled T intersection. There is a curb ramp on the southwest corner only. There are single-family homes on both corners and industrial uses on the north corner.

Table 163: Rector Avenue intersection recommendations

Category	Issues and Recommendations
Curb ramp	**Issue**: There is a curb ramp on the southwest corner only, which is not ADA compliant. **Recommendation**: Install curb ramps.
Crosswalk	**Issue**: Crosswalks are unmarked. There are no stop bars on the controlled legs. **Recommendation**: Install new high-visibility crosswalks on east, west, and south legs. Install stop bar on south leg.
Other Crossing Characteristics	**Issue**: No safe opportunity to cross W Seminary Drive. **Recommendation**: Install median crossing islands. Install RRFBs. Upgrade lighting. Install advanced yield or stop markings and "Yield/Stop Here to/for Pedestrians" signs.
Sidewalks	**Issue**: Sidewalks are cracked and heaved. Sidewalk along north edge of W Seminary Drive lacks buffer. **Recommendation**: Reconstruct damaged sidewalk. Reconstruct sidewalk to provide sufficient buffer.

Recommendation Implementation Table

Table 164 below summarizes the full list of corridor and intersection recommendations to reduce crashes for all modes and enhance the safety along the W Seminary Drive corridor. Each recommendation has an estimated applicable CMF and timeframe that reflects whether the recommendation is an ideal Short- (1-3 years), Mid- (3-5 years), or Long- (5+ years) term project, based on feasibility, crash reduction benefit, and cost. Costs are based on TxDOT Bid Averages in fall of 2024 and unit prices provided by the City of Fort Worth. Construction, engineering, and contingency are included in these costs. All assumptions are detailed in the Toolkit.

Table 164: Recommended countermeasures for W Seminary Drive corridor

Timeframe	Location	Recommendation	Estimated CMF	Estimated Cost
Short (1-3 years)	Intersection	Install advance signal, stop, pedestrian or yield signs	0.75	$1,200.00

	Intersection	Install Rectangular Rapid Flashing Beacon	0.40	$180,132.00
	Segment	Install/Upgrade Safety Lighting	0.51	$117,288.60
	Segment	Install dynamic speed feedback signage	0.95	$30,000.00
	Intersection	Install Pedestrian Crosswalk (High-Visibility)	0.90	$39,072.00
	Segment	Narrow Lanes	0.76	$75,740.00
	Intersection	Implement leading pedestrian intervals	0.87	$600.00
	Intersection	Install Stop Bar	--	$960.00
Medium (3-5 years)	Intersection	Modify Curb Geometrics	--	$60,000.00
	Segment	Consolidate access points	--	$73,920.00
	Intersection	Install Pedestrian Refuge Islands	0.68	$65,600.00
	Intersection	Install pedestrian signal heads | Install Pedestrian Pushbutton	--	$11,488.00
	Segment	Install Sidewalks	0.35	$933,262.47
	Intersection	Reconfigure Curb Ramps to meet ADA Standard	0.65	$329,000.00
				Total: $1,918,263.07

Benefit-Cost Analysis

The estimated cost-benefit result for W Seminary Drive is 35.82 (Table 165). Table 166 summarizes the estimated improvement costs by type and Table 167 summarizes the benefits (dollars) resulting from the implementation of the proposed safety countermeasures.

Table 165: W Seminary Drive Corridor – Final Cost-Benefit Ratio

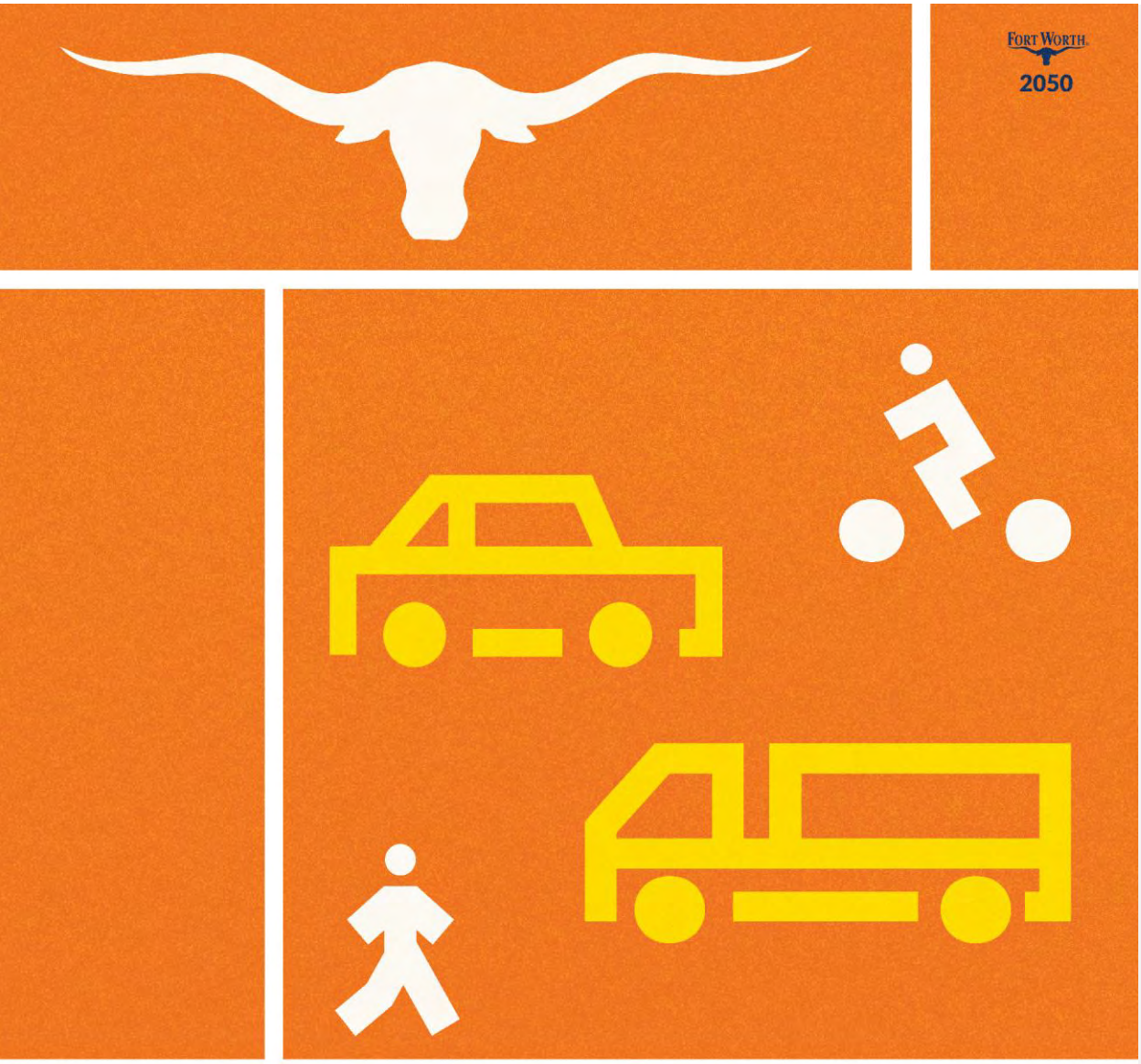
Benefits	Costs	Final Benefit / Cost Ratio
$164,000,000	$4,578,300	35.82

Table 166: Cost Results for W Seminary Drive Corridor

Improvement Type	Cost (Each)	Quantity	Service Life	Construction Cost	Annual Maintenance Cost
Implement leading pedestrian intervals	$200	3	10	$600.00	$60.00
Install advance signal, stop or yield signs	$100	8	6	$800.00	$120.00
Install dynamic speed feedback signage	$3,000	10	10	$30,000.00	$3,000.00
Install Pedestrian Signs	$100	4	6	$400.00	$60.00
Install Rectangular Rapid Flashing Beacon	$15,011	12	10	$180,132.00	$19,313.20
Install Stop Bar	$30	32	4	$960.00	$240.00
Install/refresh high-visibility crosswalks	$16	2,442	4	$39,072.00	$9,768.00
Narrow Lanes	$27.60 (20 LF)	140	25	$75,740.00	-
Consolidate access points	$6,720	11	25	$73,920.00	-
Curb extension	$10,000	6	25	$60,000.00	-
Install additional lighting	$5,331.30	22	15	$117,288.60	$5,964.43
Install continuous sidewalks	$134.86	6920	10	$933,262.47	$93,326.25
Install median pedestrian refuge	$4,100	16	25	$65,600.00	-
Install Pedestrian Pushbutton	$1,436	8	10	$11,488.00	$1,148.80
Reconfigure ramps to meet ADA Standard	$3,500	94	25	$329,000.00	-
			Total	$1,918,263.07	$133,000.68
				Lifecycle Cost (20 years)	**$4,578,300**

Table 167: Benefit Results for W Seminary Drive Corridor

Crash Severity	Prevention Benefit	# of Crashes Prevented	Total Benefit
K - Fatal	$3,700,000	10	$37,000,000
A – Severe Injury	$3,700,000	28	$103,600,000
B – Non-Incapacitating or Suspected Minor Injury	$520,000	45	$23,400,000
		Total Benefit:	**$164,000,000**



FORT WORTH 2050

APPENDIX H
Additional Action Strategies

Additional Strategies

The following action strategies were not prioritized by the Stakeholder Workshop participants but may still be relevant priorities for the city to include, either in an appendix to the SAP or in lieu of any of the strategies listed above in more detail.

Goal	Action	Category
Vision Zero: Paradigm Shift	Identify and address **transportation challenges for specific vulnerable user groups**, such as mature road users, school-age children, and people with disabilities to inform project development and design processes. Explore communications and engagement tools to better involve members of those and other marginalized communities in transportation safety decision-making.	Data Analysis
Vision Zero: Paradigm Shift	Develop **corridor scoping studies** focusing on safety for the High Injury Network to determine safer street designs and address frequent crash types, systemic risk factors, travel speeds, multimodal facilities, crossing frequencies and distances, and lighting.	Planning
Vision Zero: Paradigm Shift	Develop guidelines for planners and designers to **prioritize Vision Zero investments in communities of concern** (low-income communities, communities of color, immigrant communities, and communities with fewer transportation options). This should include capital projects, multimodal access, infrastructure maintenance, and safer street designs. Staff should explore best practices for actively involving marginalized communities in decision-making and establish a process of community design review for Vision Zero projects in those communities.	Planning
Vision Zero: Paradigm Shift	Evaluate and revise the City's guidelines and process for **addressing citizen safety requests** to become more proactive in safety interventions, streamline workflows for staff, and increase responsiveness and transparency to the community. Considerations should include: - Augmenting staff assigned to Transportation Management programs like neighborhood traffic calming, SRTS, and similar programs - Updating Neighborhood Traffic Calming guidelines to integrate contextual speed management (e.g., deemphasizing 85th percentile and evaluating land use and other contextual factors) - Developing guidelines for involving marginalized communities in safety improvement decision-making - Updating standard language, guidelines, and policy for assessing need and determining countermeasures - reduce time spent responding to declined requests - Addressing limited staff capacity for fielding requests submitted, processing the data, and responding to resident inquiries and requests	Traffic Calming

Safe Speeds	Update city standards based on best practices for **speed management,** including reduced lane widths, tighter corner radii, truck aprons where appropriate, and visual narrowing through street trees, on-street parking, and other treatments that reduce speeds while maintaining capacity and throughput.	Traffic Calming
Reduce Conflicts	**Adopt a Curbside Management Policy/Program** that provides guidelines for analyzing the demand and space available for roadside activities to prioritize safety, minimize curbside conflicts, and increase multimodal access. Curbside management efforts may include: - Collecting Data on Delivery Times and Patterns: Use sensors or surveys to track deliveries, optimizing curb space allocation and improving safety. - Designating Urban Loading Zones for Safe Deliveries: Allocate curb space in busy zones to streamline last-mile deliveries, reducing congestion-related safety hazards. - Piloting Staggered Delivery Schedules: Test staggered or off-peak delivery schedules with logistic partners to ease peak congestion, allowing safer delivery truck movement in densely populated areas. - Exploring no truck parking zones and times. - Encouraging new developments to have specified areas for service and delivery specific areas, including from alleyways.	Access Mgmt
Reduce Conflicts	Using the results of the Access Management Needs Assessment and the updated Access Management Policy, **identify capital projects** where elements like driveway closures, centerline and median treatments, and cross-access between land uses can be integrated into designs. Explore a **dedicated funding** source for implementation through public projects and incentives to private entities for both new build and retrofit projects.	Access Mgmt
Reduce Conflicts	Align broader transportation safety efforts with the City's **High-Water Warning System (HWWS**), which has identified approximately 400 locations where flood mitigation elements are being considered for implementation. Support the implementation of high-water warning flashing beacons, lighting, barriers, and emergency communications as planned and consider installing automated crossing arms. Align transportation safety efforts with hazard, disaster, and resilience planning and projects to explore stormwater management and similar efforts impacting roadway safety across the city.	Crossings
Reduce Conflicts	Use the Bicycle Level of Stress and Pedestrian Experience Index analyses from the City's Active Transportation Plan to **identify and prioritize active transportation infrastructure improvements** along the HIN and intersecting streets.	Data Analysis

Reduce Conflicts	**Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections:** - Backplates with retroreflective borders - Leading pedestrian intervals (LPIs) - Closing slip lanes where applicable/feasible - Restricting permissive left turns during pedestrian phase - Hardened centerlines - Reduce left-turn conflicts	Intersections
Reduce Conflicts	**Lighting and Visibility:** Upgrade, replace, or install lighting, prioritizing the HIN, major thoroughfares and truck routes, intersection approaches, and pedestrian crossings. Promote consistency in lighting at the corridor level, including both vehicle and pedestrian-scale lighting to increase visibility of VRUs and reduce conflicts between modes. Consider the use of solar lights to reduce installation costs and minimize underground utility congestion.	Lighting
Reduce Conflicts	**Downtown safety strategy:** Plan and implement district-wide multimodal infrastructure improvements with a specific focus on bicycle and pedestrian accessibility, speed reduction, and transit mobility. Address two segments on the bicycle HIN on Calhoun and 7th and focus on the safe movement of vehicle and CMV travel around the perimeter of Downtown. Engage developers to collaborate with the city and other agencies to address multimodal connectivity, mobility, and accessibility for employees working in and visitors to the area.	Traffic Calming
Reduce Conflicts	Proactively implement **safety conversions** (for example, 4-to-3 lane safety conversions) and **traffic calming spot treatments** (e.g., higher visibility signals, hardened centerlines, green markings, protected left turns, curb extensions, etc.) along the HIN where applicable. Consider coordinating with NCTCOG on the use of smart signals and other new technologies that help with freight traffic management and other mobility needs.	Traffic Calming
Policies & Programs	Adopt a city **ordinance banning the use of handheld mobile devices** while driving for all drivers citywide (current local law only addresses their use in school zones). Coordinate messaging and signage to alert drivers and promote enforcement efforts around school-zones and other 'speed zone' areas with high levels of pedestrian activity, such as parks and transit stops.	Distracted Driving
Policies & Programs	**Advocate for changes to state law to expand the use of automated safety cameras**, for example, in local context zones such as school zones or areas of high pedestrian activity. Analyze priority locations, such as school, park, and other safe speed zones, for automated speed and red-light running enforcement.	Enforcement

Policies & Programs	Deepen transportation staff's **partnership with Fort Worth law enforcement and emergency services**. Collaborative tactics may include: - Enhanced training for first responders related to safety priorities, equitable enforcement, and detailed reporting of crashes, particularly those involving people walking and bicycling, to inform future safety analyses and projects - Focused enforcement on leading factors in the City's most severe crashes – i.e., speeding, racing, distracted driving, red light/stop sign running, school and speed zone violations, and truck traffic - Establishing equitable zero tolerance policies and diversion or incentive programs to reduce and eliminate speeding and unsafe driver behavior	Enforcement
Policies & Programs	Develop an annual **Transportation Safety Improvement Program budget** to plan, design, implement, and maintain safety-focused infrastructure measures along the HIN and throughout the city. The Program should include capital, quick-build, and maintenance projects identified in this plan and subsequent analyses to support the City of Fort Worth's Vision Zero goals. Considering establishing a permanent, dedicated funding source for Vision Zero implementation and coordination	Funding
Policies & Programs	**Update the City's 2016 Complete Streets Policy** to align project review processes for public and private projects across agencies, strengthen collaboration and coordination between departments, identify specific performance measures, and define community engagement opportunities and strategies to involve marginalized voices in decision-making. Specific considerations should include: - Review and update of land use policies and development standards to prioritize the safety of all road users (e.g., block size, crosswalk spacing, access management requirements) - Consideration of policies that provide alternatives for primary access to schools on arterials or HIN for future school sites - Freight-specific design standards that provide for appropriate lane widths, turning radii, loading zones, and parking/rest facilities along major freight corridors - Vision Zero Quick Build Policy in order to streamline and expedite project delivery of low-cost infrastructure interventions and demonstration projects -Guidance for equitable traffic calming policies and resources	Guidelines

Commented [JS1]: See note above about removing action strategy related to quick-build improvements.