



CITY OF SAGINAW

COMPREHENSIVE SAFETY ACTION PLAN



DRAFT – JULY 2026

Prepared for



**CITY OF
SAGINAW**

Prepared by

Kimley»Horn

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CITY COUNCIL

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Paul Felegy.....	Mayor Pro Tem; Place 1
Nicky Lawson	Place 2
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Brack St. Clair	Place 4
Shawn Morrison.....	Place 5
Mary Copeland.....	Place 6

VISION ZERO TASK FORCE

Aleena Davis.....	Economic Development and Community Engagement
Brian Gil.....	Traffic Safety Advisory Board
Clayton Ray.....	Traffic Safety Advisory Board
Crystal Philip	Traffic Safety Advisory Board
Cook John	Saginaw Fire Department
Corey Smith.....	Public Services
Dwayne Jones	Eagle Mountain Saginaw ISD
James Crippen	Saginaw Police Department
Jarred Coursey.....	Public Works
Jimmy Burgdorg	Traffic Safety Advisory Board
Kevin Morales	Economic Development and Community Engagement
Kolby Jones.....	Traffic Safety Advisory Board
Pedro Zambrano	Economic Development and Community Engagement
Scott Craver.....	Saginaw Fire Department
Spring Irby	Traffic Safety Advisory Board
Trenton Tidwell, PE.....	City Engineer

KIMLEY-HORN

Pete Kelly, PE.....	Consultant Project Manager
Wesley Sprott, AICP	Project Planner
Monica Lucia, AICP, RSP ₁	Project Planner
Adolfo Gonzalez	Project Analyst
Lizbeth Juarez-Bartolo	Project Analyst
Laramie Terrell	Project Analyst
Leanne Nunez	Graphic Designer

The logo consists of four square icons arranged in a 2x2 grid. The top-left icon shows a person walking. The top-right icon shows a map of Texas with a star. The bottom-left icon shows a car. The bottom-right icon shows a person in a wheelchair.

SAGINAW COMPREHENSIVE SAFETY ACTION PLAN

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CHAPTER



1

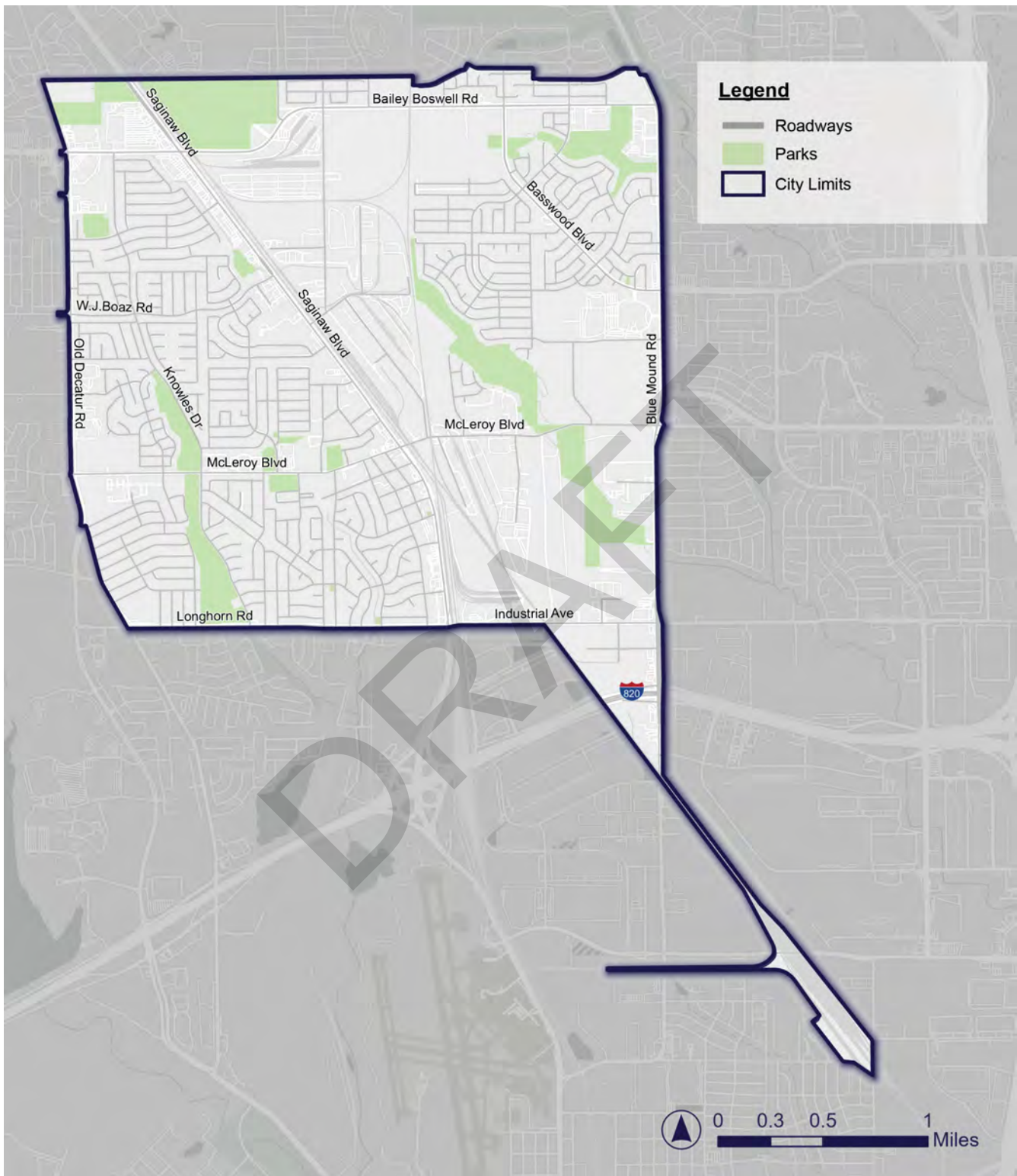
SAFETY IN SAGINAW

INTRODUCTION

The Saginaw Comprehensive Safety Action Plan (CSAP) was developed using a safety framework based on nationally recognized best practices and local input to help the City of Saginaw achieve the goal of zero traffic-related fatalities in the city. The principles used throughout the planning process to ensure proper alignment with community goals included the Safe System Approach, the Five E's of Safety, and Vision Zero. These principles were used to lay the foundation for the plan and facilitate effective implementation. The CSAP will assist City Staff and local partners in making informed decisions when identifying countermeasures and policy revisions that will improve traffic safety in Saginaw (**Figure 1**).



FIGURE 1. SAGINAW CITY LIMITS





SAFE SYSTEM APPROACH

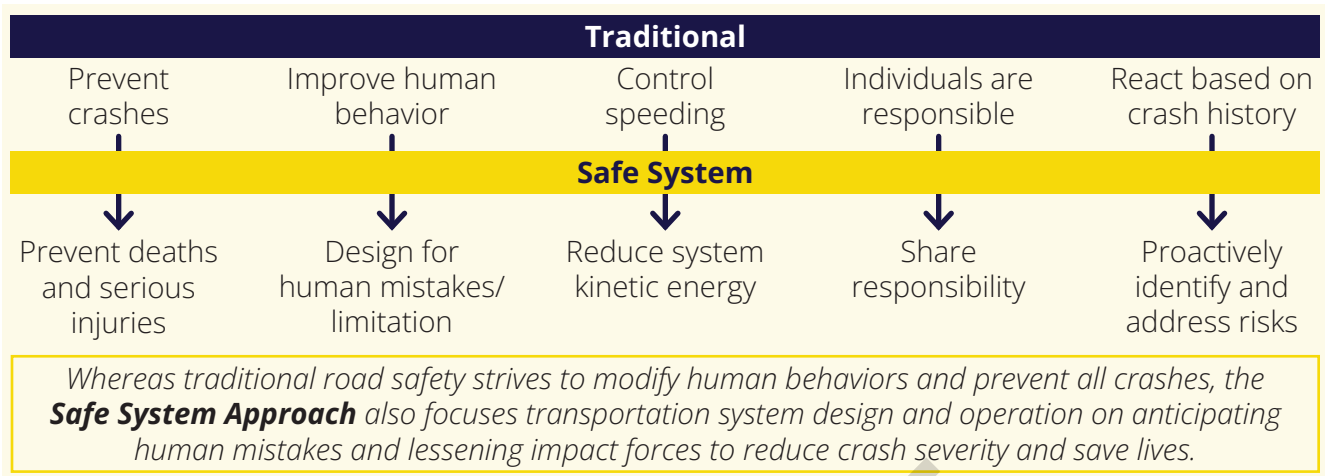
The Safe System Approach was pioneered in the 1990's by Swedish road safety expert, Claes Tingvall. The Safe System Approach is a framework and method by which this CSAP can be implemented. The six key principles that can be used to implement the elements of the Safe System Approach are as follows:



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



FIGURE 2. SAFE SYSTEM APPROACH VS. TRADITIONAL ROAD SAFETY PRACTICES



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



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



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



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



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



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



FIVE E'S OF SAFETY

Similar to how the Safe System Approach works, the Five E's of Safety are components of an integrated and comprehensive framework. While every community varies in its composition and understanding of safety, the Five E's can be applied at all levels to enhance the user experience and improve safety.



Engineering

Engineering projects and interventions supporting Vision Zero can be implemented through the built environment to improve safety. Calming traffic and improving safety for all users is the primary goal. Examples of proven engineering project enhancements include the implementation of safety countermeasures, or traffic calming measures that reduce speeding.



Education

Education can improve safety by raising awareness of transportation choices, highlighting the benefits of multimodal transportation, and demonstrating the proper way to utilize the system.



Evaluation

Evaluation can support both proactive and responsive measures. Understanding when, where, and why crashes allow us to respond to historical trends and adjust to improve future safety. Similarly, careful evaluation can help identify potential issues before they become more severe.



Enforcement

Enforcement can ensure that traffic laws and regulations are being followed by system users, while also ensuring that profiling does not occur. Enforcement can also target and prioritize problem behaviors like speeding and other dangerous behavior over minor infractions.



Encouraging

Encouraging the community to further their knowledge and understanding of safety principles can be fun and interactive. Events and activities can support and promote better behavior.



VISION ZERO

Vision Zero is a traffic safety initiative, pioneered in Europe, that enacts change through prioritizing the principles of safe road design, enforcement, education, and community engagement (**Figure 3**). This multifaceted approach works by combining traffic safety efforts to reduce traffic fatalities and severe injuries, eventually leading to **zero** traffic related fatalities or severe injuries. The Vision Zero initiative is similar to the Safe System approach because it recognizes and accounts for human error. Vision Zero traffic safety planning influences the design of road systems that mitigate the consequences of mistakes. Through the implementation of a holistic approach to crash related injury reduction communities can experience improvements in quality of life, safety, and mobility.

Vision Zero, unlike other methods, approaches traffic safety planning by creating a shift in how the community views traffic related fatalities and injuries. Vision Zero champions the view that there is a possibility of **eliminating all traffic related fatalities** and severe injuries – that these fatalities and severe injuries are not simply a byproduct of modern transportation networks. Vision Zero promotes the idea that there is a possibility of creating a safe and accessible transportation system for all; this community shift opens the opportunity to promote real change. Although the Vision Zero goal is ambitious, every step closer to the goal, every reduction in traffic related injury or fatality, has a tremendous positive impact on a community.

FIGURE 3. VISION ZERO VIEWPOINT



CHAPTER



2

PROCESS AND ENGAGEMENT

INTRODUCTION

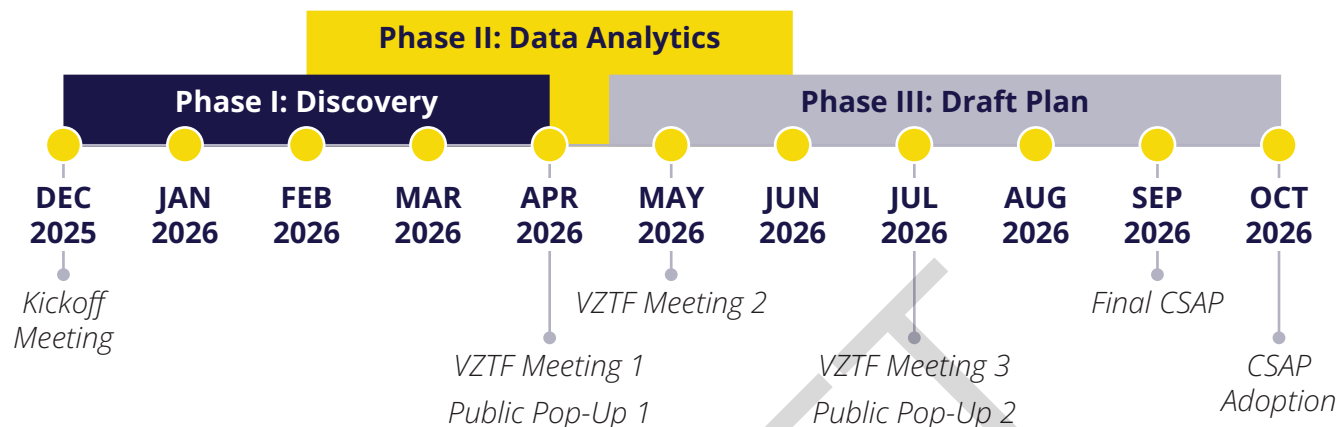
The following chapter outlines the project timeline that helped encourage timely and effective implementation of the Plan, as well as summarize the project phases and activities and meetings conducted throughout the process. As part of this project, the Vision Zero Task Force (VZTF) was created to guide the development of the CSAP. Community engagement efforts were key to collecting input from the Saginaw community.



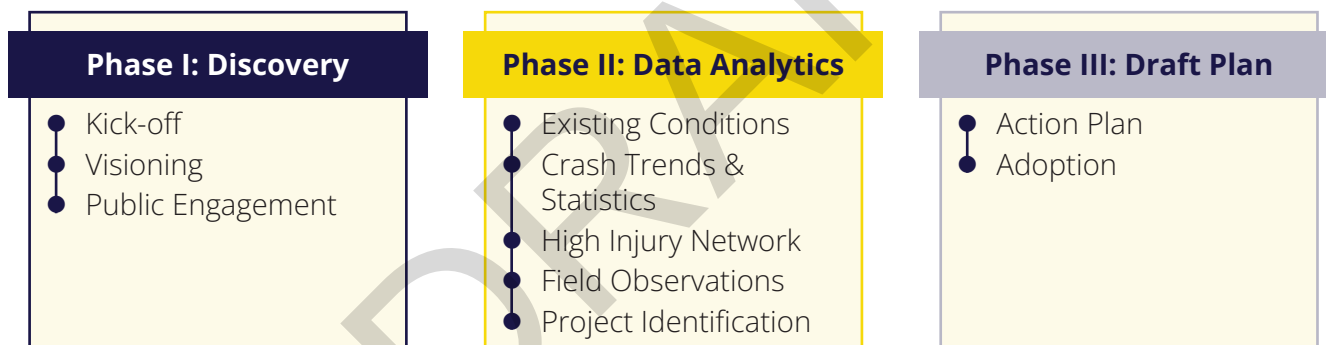
PROJECT TIMELINE

Kicking off in December 2025, the Saginaw CSAP was developed over the span of 11 months. The effort was led by the project team with guidance provided by City staff, the City Council, the VZTF, and the public. A timeline for the CSAP is presented in **Figure 4** below.

FIGURE 4. PROJECT TIMELINE



The planning process in the Saginaw CSAP was broken down in the three phases:



Discovery Phase: Establishing a strong foundation through discovery set the plan up for success. Before the first VZTF meeting, data was collected to ensure all necessary information was available for the analysis portion of the Saginaw CSAP. This phase established an understanding of the project, defined roles and responsibilities of the stakeholder committee, and established a mission statement. Similarly, a project website was launched to provide a platform for receiving feedback from the Saginaw community and boosting awareness of the project and upcoming public engagement events.

Data Analysis Phase: This phase of the project involved an in-depth analysis of crash data to better understand the state of traffic safety in the City of Saginaw. The Data Analysis Phase included various crash analyses and the creation of the High-Injury Network (HIN). Field observations, identification of countermeasures, and input from the VZTF and the public were also critical contributors and context to incorporate into this phase.

Plan Development: Results and key takeaways from the data analyses were used to develop an implementation plan aligned with the goals of the City of Saginaw in the Plan Development phase. The VZTF and public reviewed the initial plan and provided input on the direction of the Action Plan throughout this phase. Incorporating feedback from the public, the draft plan was finalized and formally adopted in October 2026.



VISION ZERO TASK FORCE

The VZTF was formed by a variety of stakeholders from City Staff, the Saginaw Traffic Safety Safety Advisory Board, community leaders, and other organizations in the City of Saginaw. Members of the VZTF serve as champions of the CSAP by providing key feedback at major milestones throughout the development of the plan (**Figure 5**). This stakeholder committee was established to provide guidance for the plan and ensure the safety needs of Saginaw's residents, business owners, and visitors are addressed. The VZTF was tasked with attending three progress meetings to set goals, assist in community engagement efforts, identify study corridors, and aid in the implementation of the plan.

FIGURE 5. VZTF MEETING ACTIVITIES



VISION ZERO TASK FORCE MEETINGS

- **Meeting 1** – April 1, 2026 | Kickoff, Existing Conditions, and High-Injury Network Results
- **Meeting 2** – May 7, 2026 | Guiding Principles and Policy
- **Meeting 3** – July 30, 2026 | Draft Plan Review & Annual Reporting

MISSION STATEMENT

Over the course of the VZTF meetings, members were tasked with a variety of activities which guided the plan including the selection of study corridors, HIN refinement, action matrix ideas specific to Saginaw, project prioritization, and development of the Mission Statement for the CSAP.

During the first work session with the VZTF, the Mission Statement was developed to express the plan's mission and outline its commitment to serving the community and stakeholders in the City of Saginaw.

"The City of Saginaw aims to prevent crashes and protect lives by creating safer, more efficient roadways with a focus on proactively mitigating areas of concern, prioritizing connectivity, involving the community, and implementing innovative infrastructure."

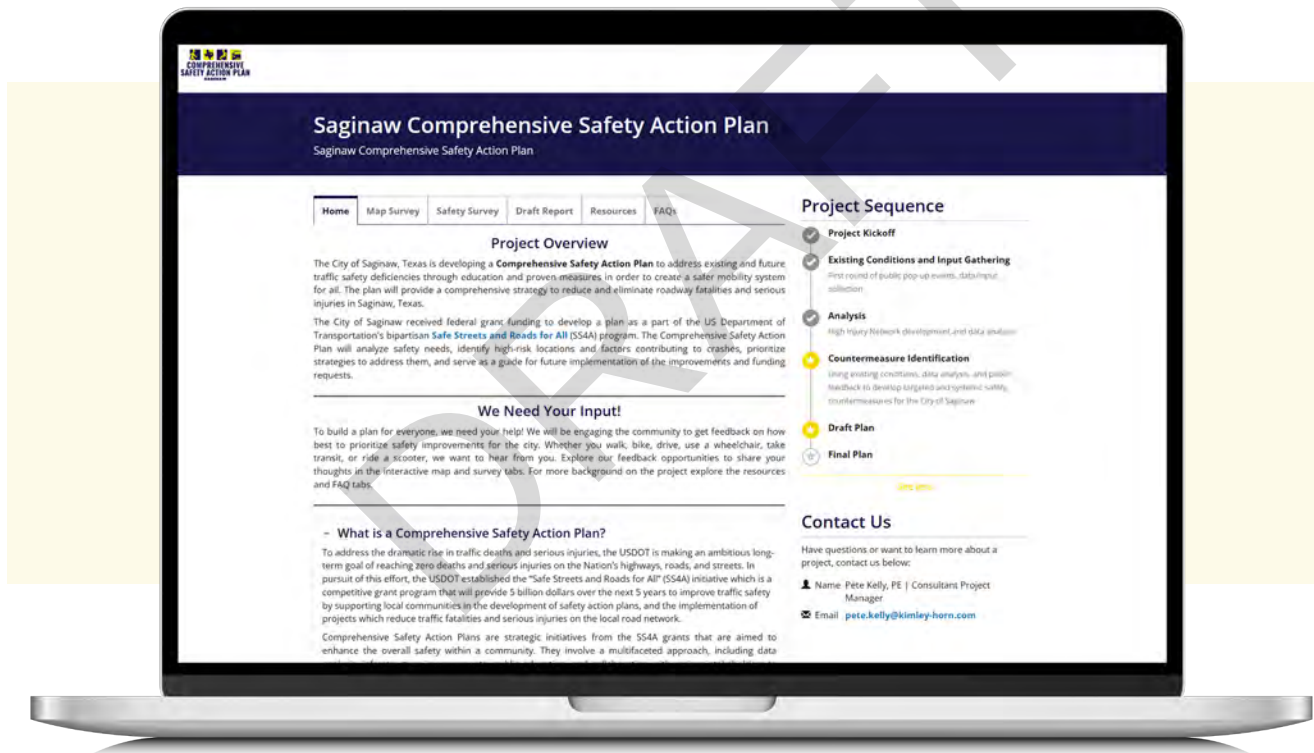


COMMUNITY ENGAGEMENT

Community engagement for the Saginaw CSAP included online opportunities, pop-up events, and the distribution of promotional materials such as project business cards and flyers. To ensure the plan addressed the safety concerns of all road users in Saginaw, residents, community leaders, and other key stakeholders were actively involved.

PROJECT WEBSITE

A dedicated project website was utilized throughout the plan's development, serving as a central online hub for information about the plan and community feedback surveys. Through the online surveys, Saginaw's residents had two online opportunities to share their thoughts on safety within the City using a form-based survey in addition to an interactive map survey. The project website also hosts the final plan for people to view and download. Additionally, the site included information about upcoming public events, frequently asked questions, links to helpful information, key dates, and contact information. This effort garnered valuable feedback from residents of Saginaw with 110 total unique contributions between the interactive map and form based survey.



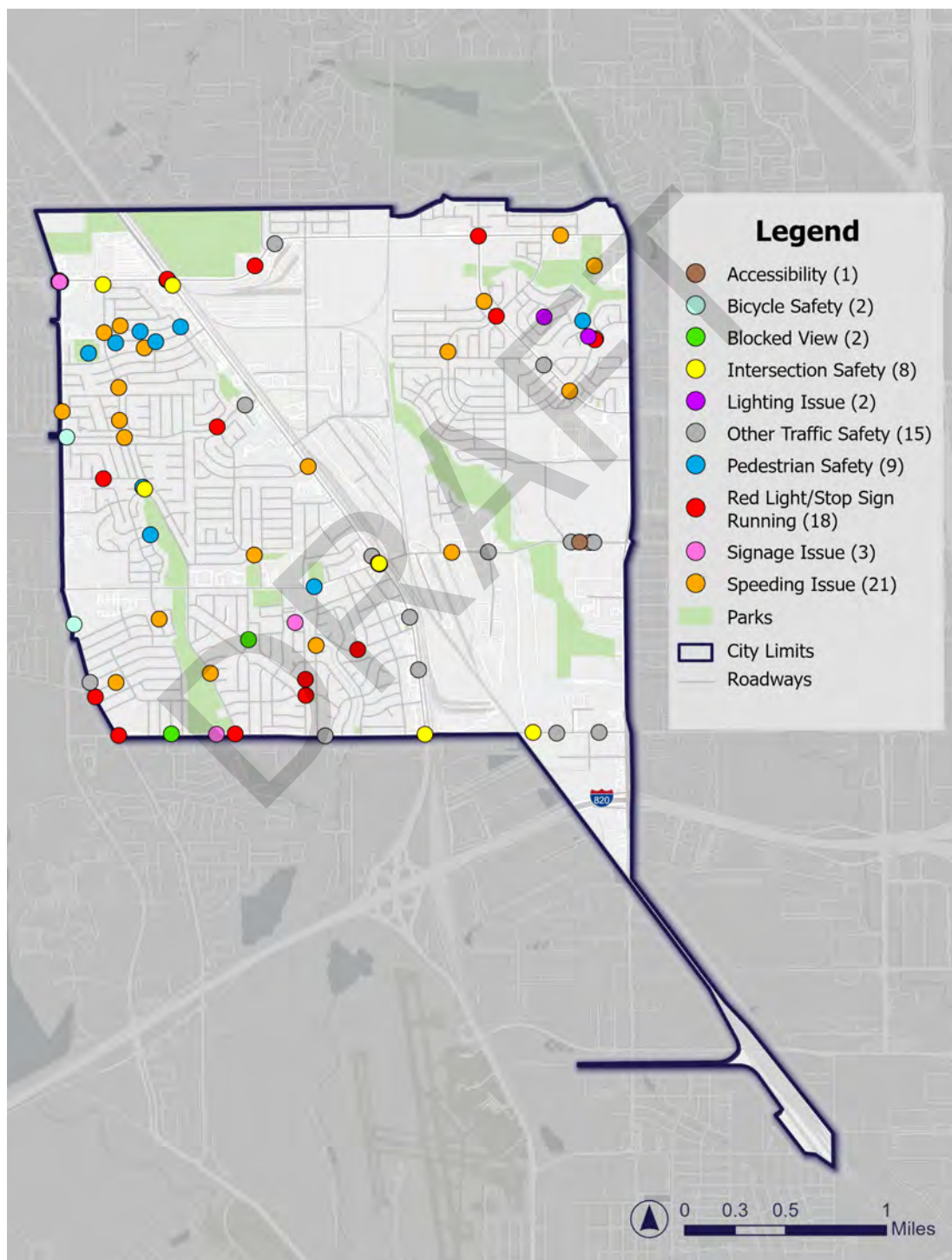
Saginaw CSAP Project Website



INTERACTIVE MAP SURVEY

Using an interactive map survey, Saginaw's residents provided feedback on locations they have safety concerns about in the City. Respondents had the ability to either place a new point on the map and leave a comment, or upvote a comment from another contributor. The interactive map survey had a total of 81 contributions. A map of all the comments received on the interactive map survey can be seen in **Figure 6**.

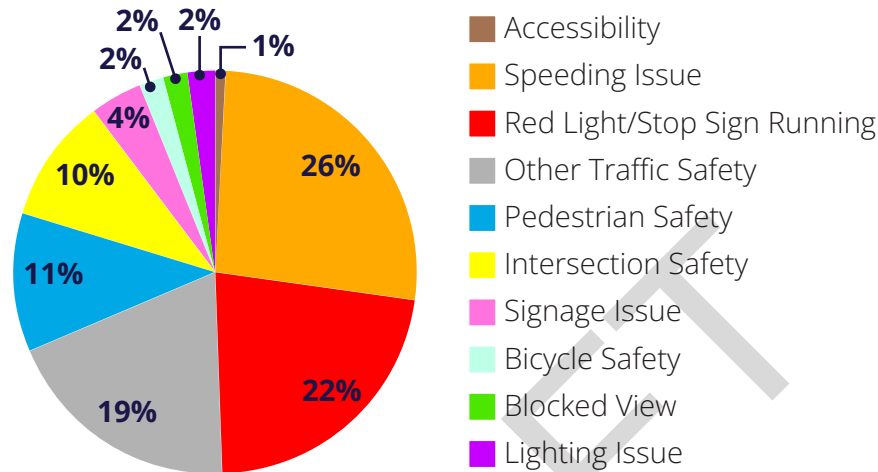
FIGURE 6. INTERACTIVE MAP SURVEY





The top safety concerns on the interactive map were speeding issues, red light/stop sign running, and other traffic safety (other does not include red light running, intersection safety, speeding or signage), as shown in **Figure 7**. Potholes and general road conditions were also reported consistently as an area of concern for drivers. This is reflective of the online survey, in which the top traffic safety concerns are pedestrian safety and bicycle safety, as well as additional and improved infrastructure to accommodate each mode.

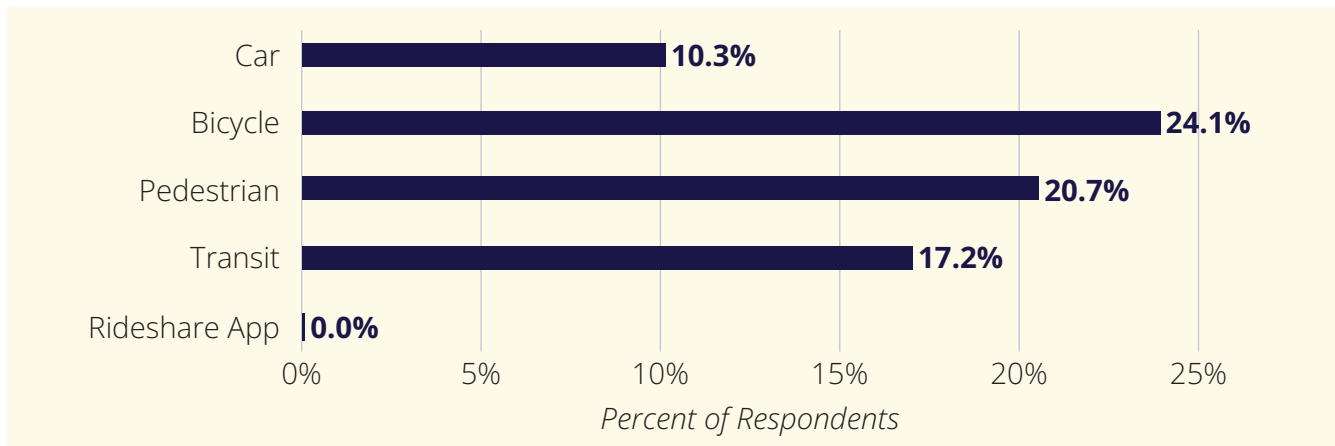
FIGURE 7. COMMENT TYPE BREAKDOWN



FORM-BASED SURVEY

A form-based survey was also provided to gather public opinion on safety concerns, transportation mode choices, and funding opinions. There was a total of 29 survey responses over the public engagement period. Of all respondents, 93% live in Saginaw while 14% stated they only worked in Saginaw. While traveling in a car was the most common response among respondents, 28% of respondents stated they “use the mode often, but do not always feel safe doing so.” Additionally, approximately 24% and 21% of respondents stated that they would cycle and walk more if they were safer, respectively (**Figure 8**). This indicates that there is a desire to use active transportation modes for travel by Saginaw’s residents, but they do not feel safe doing so due to current conditions.

FIGURE 8. MODE USAGE VS. SAFETY

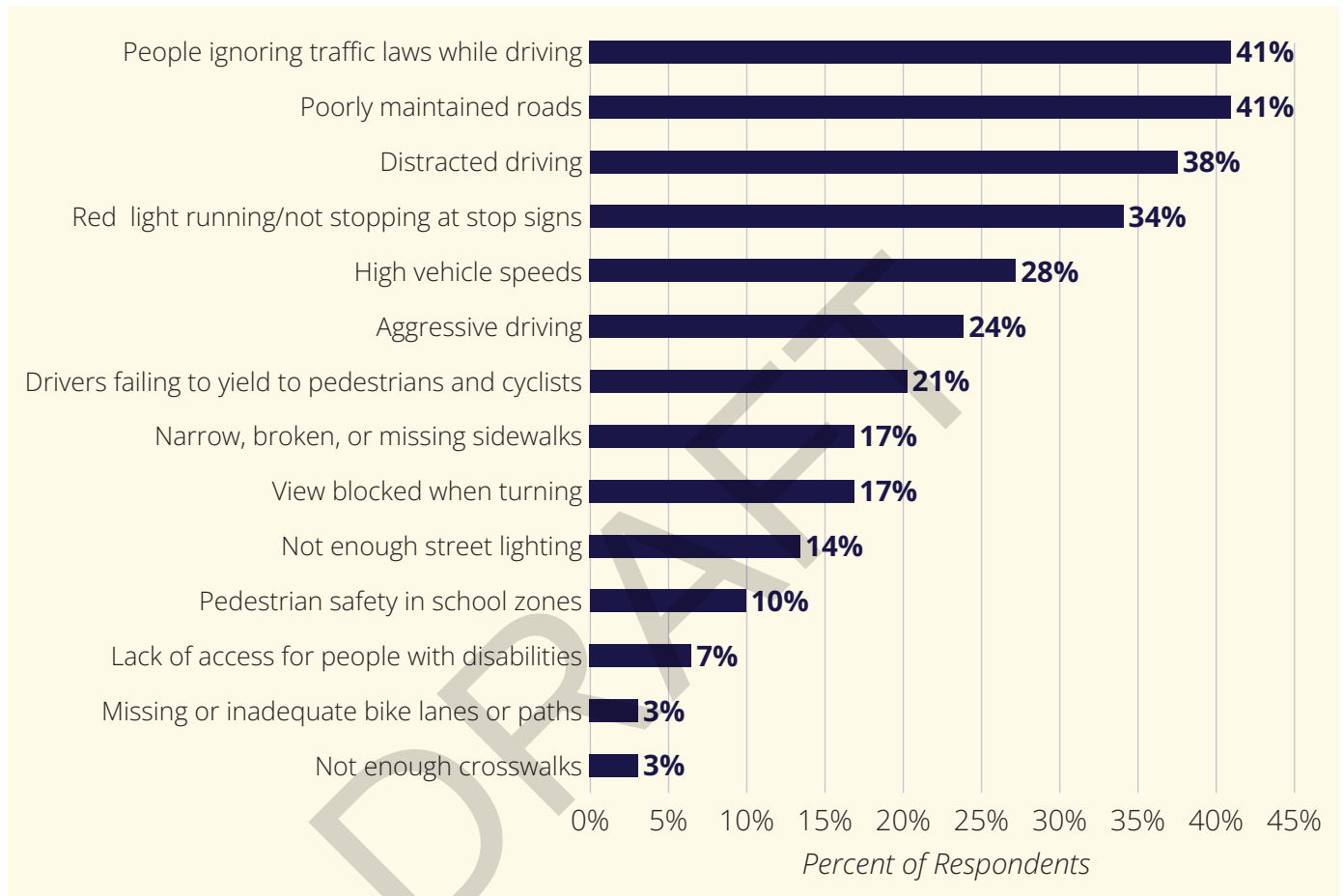


*37.9% of respondents stated this question was not applicable to them.



Furthermore, survey results showed that the top five safety concerns for residents in Saginaw were 'people ignoring traffic laws while driving', 'poorly maintained roads', 'distracted driving', 'red light or stop sign running', and 'high vehicle speeds', as shown in **Figure 9**. These results indicate residents' largest traffic safety concerns are related to distracted driving, intersection safety, speeding, and roadway maintenance.

FIGURE 9. RANKING OF SAFETY CONCERNS FOR RESPONDENTS



The survey also gathered public opinion regarding different policy and funding strategies. While respondents in general support investing in making walking and cycling safer through infrastructure improvements and education programs, 52% of respondents disagreed with 'reducing speed limits to slow down unsafe drivers.' In general, the survey shows that responders desire to make walking and cycling safer in the City and have concerns regarding intersection safety, distracted driving, and roadway maintenance.



POP-UP EVENTS

To extend the public outreach and awareness of the CSAP, the project team attended two public pop-up events held within the City of Saginaw. The pop-up events gave the community the opportunity to interact with the project team, understand the importance of safety in Saginaw, and provide their input on the state of traffic safety in the City and where safety concerns are present. These events were held in public settings with the intention to generate awareness about the CSAP.

SAGINAW FARMER'S MARKET (APRIL 2026)

The project team attended the Saginaw Farmer's Market on April 25, 2026, to raise awareness about the Saginaw CSAP and encourage residents to visit the project website and participate in the survey and interactive map survey. The event provided a valuable opportunity for community members to share input on traffic safety concerns and areas where they would like to see improvements in Saginaw. Residents who visited the booth were able to learn more about the project and offer insights that helped inform the plan's development.

At this event, the project team was able to interact with over 200 residents, handed out over 90 business cards, and collected feedback through a map activity and a prioritization activity.



Saginaw Farmers Market Logo

Through the prioritization activity, residents expressed the top two safety emphasis areas to be:



Distracted Driving

(15 votes)



Speed Related Crashes

(11 votes)

Furthermore, the map activity, resulted in the top comment being 'Red Light/Stop Sign running', 'Speeding Issues', and 'Other Traffic Safety' concerns (many included road conditions).



SAGINAW FARMER'S MARKET (JULY 2026)

The final pop-up of the project occurred on July 25th, 2026 during the Saginaw Farmers Market (Figure 10). The goal of this pop-up was to raise awareness of the draft plan and gather public opinion on different safety countermeasures recommended in the draft plan. Visitors at the Farmer's Market were shown eight example safety countermeasures and asked to answer how uncomfortable or comfortable they would feel about each.

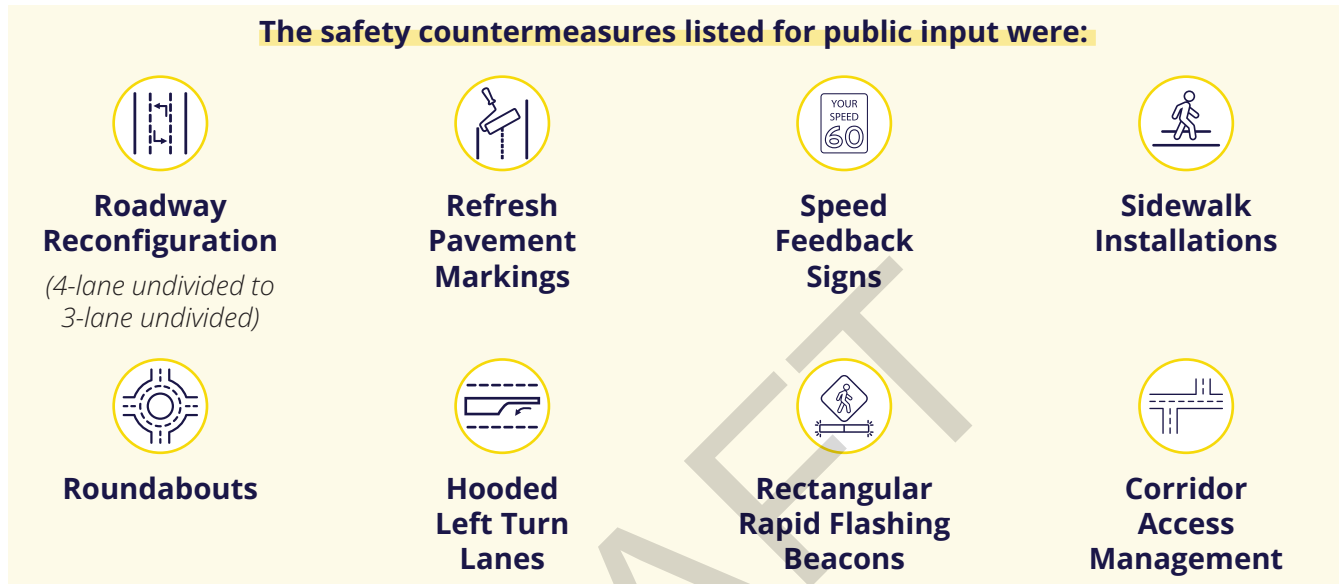


FIGURE 10. JULYPOP-UPEVENT



In general, participants felt neutral to comfortable with most of the safety countermeasures aside from hooded left-turn lanes and corridor access management. Hooded left-turn lanes received four votes from participants stating they would feel uncomfortable with this countermeasure while one voted they would be comfortable. For corridor access management, three votes were placed for feeling 'neutral' about the countermeasure while one vote was for 'uncomfortable.'

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SAGINAW



COMPREHENSIVE SAFETY ACTION PLAN

CHAPTER



3

EXISTING CONDITIONS AND CRASH HISTORY

INTRODUCTION

This chapter of the CSAP examines the existing transportation network, both roadways and pedestrian facilities, and crash history from the study period (2020–2024). This provides a foundational understanding of current needs and challenges facing Saginaw regarding transportation safety. Having a solid understanding of the state of the City is essential to ensuring future planning efforts are well informed and that proposed recommendations effectively address the needs of the City.



UNDERSTANDING SAFETY IN SAGINAW

A DATA-DRIVEN LOOK AT TRANSPORTATION, PEOPLE, AND SAFETY

The maps in this section combine roadway characteristics, transportation infrastructure, planned investments, and demographic information to provide a comprehensive view of transportation safety.



Roadway Network & Traffic Activity

How people move through Saginaw. These maps illustrate:

- Traffic volume patterns across the roadway network
- Roadway functional classifications
- Major travel corridors and thoroughfares
- Key east-west and north-south connections

Purpose: Understanding where traffic is concentrated helps provide context for safety needs and future improvements.



Walking & Biking Connections

How people travel beyond a vehicle. These maps illustrate:

- Sidewalk networks
- Trail connections
- Pedestrian crossing locations
- Connectivity opportunities throughout the City

Purpose: Evaluating active transportation infrastructure helps identify opportunities to improve accessibility and connectivity for all users.



Future Transportation Investments

Projects that will shape tomorrow's network. These maps illustrate:

- Planned roadway improvements
- Operational and intersection upgrades
- Reconstruction projects
- Long-range transportation investments

Purpose: Understanding future projects helps align safety recommendations with planned improvements.



Demographics & Safety

Who lives in Saginaw and how safety impacts different populations. These maps illustrate:

- Zero-car household concentrations
- Youth populations (17 years and younger)
- Older adult populations (65 years and older)
- Community age characteristics

Purpose: Helps identify vulnerable populations that are disproportionately impacted by fatal and severe injury crashes.



EXISTING CONDITIONS

TRAFFIC VOLUMES

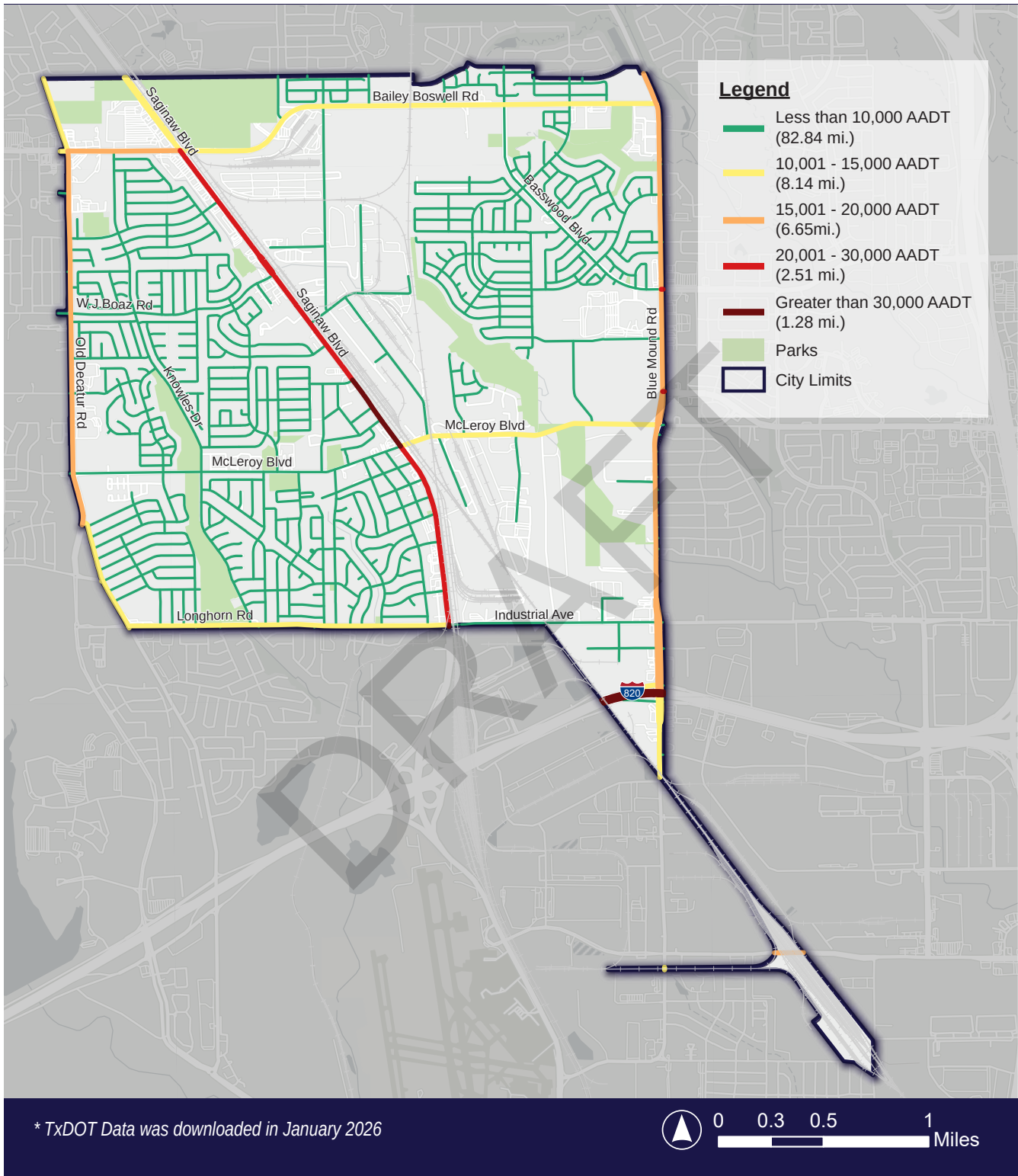
Roadway volumes provide insights into traffic patterns and roadway usage that may pose safety concerns. Understanding roadway volumes is important to better understand the context in which crashes have occurred and to develop appropriate countermeasures. Volume data was obtained through TxDOT to assign the annual average daily traffic (AADT) for roadways in Saginaw. **Table 1** shows the mileage and percentage of roadways in Saginaw by volumes, and **Exhibit 1** on page 16 shows a visual summary of roadway volumes in Saginaw. The dark red segments represent the highest volumes and green segments represent the lowest volumes. All the local roadways in Saginaw have an AADT of 10,000 or less, whereas Saginaw's major thoroughfares experienced higher AADTs. I-820 has the highest AADT greater than 30,000, and most of Saginaw Boulevard has an AADT of 20,001 and greater. Other major thoroughfares of Blue Mound Road and Old Decatur Road experience an AADT of 15,001–20,000.

TABLE 1. TRAFFIC VOLUME BREAKDOWN

Volume (AADT)	Mileage	Percent of Roads
Less than 10,000	82.84	81.68%
10,001–15,000	8.14	8.03%
15,001–20,000	6.65	6.56%
20,001–30,000	2.51	2.47%
Greater than 30,001	1.28	1.26%



EXHIBIT 1. ROADWAY TRAFFIC VOLUMES



Source: City of Saginaw, TxDOT*



FUNCTIONAL CLASSIFICATION

Roads in Saginaw are classified by their functional classification as seen in **Table 2**. Functional classifications were determined using TxDOT's assigned functional classification for roadways in Saginaw, as shown in **Exhibit 2** on page 18. Saginaw's major thoroughfares are classified as either minor arterials or other principal arterials. McLeroy Boulevard, Blue Mound Road, and most of Bailey Boswell Road are classified as minor arterials, and Saginaw Boulevard is classified as other principal arterial.

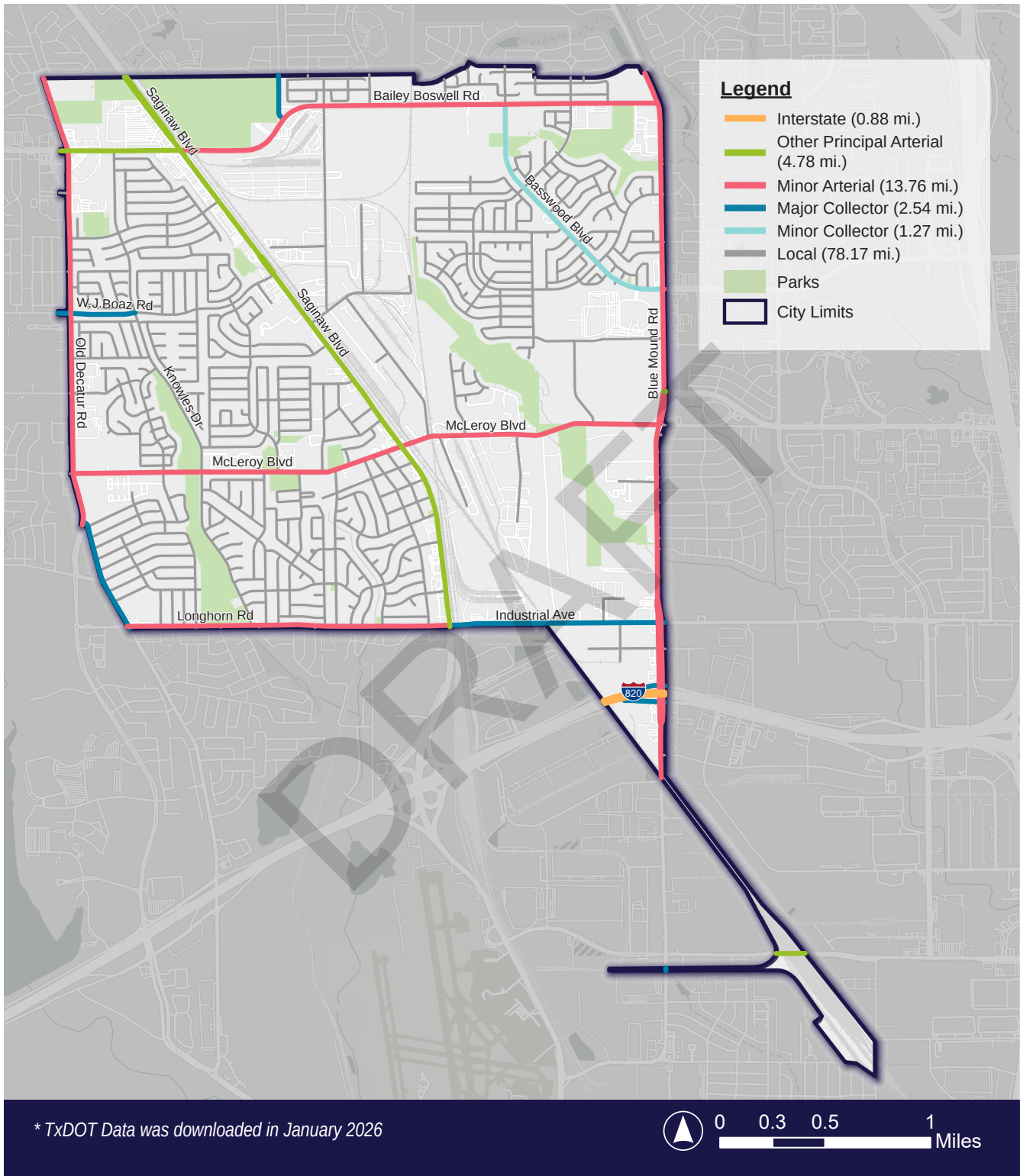
TABLE 2. ROADWAY CLASSIFICATIONS

Functional Class	Mileage	Percent of Roads
Interstate	0.88	0.87%
Other Principal Arterial	4.78	4.71%
Minor Arterial	13.76	13.57%
Major Collector	2.54	2.50%
Minor Collector	1.27	1.25%
Local	78.17	77.10%

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EXHIBIT 2. ROADWAY CLASSIFICATIONS



Source: City of Saginaw, TxDOT*



PEDESTRIAN AND BICYCLIST FACILITIES NETWORK

The active transportation facilities show where sidewalks and trails are in Saginaw. The City of Saginaw already has a robust sidewalk network, with just under 100 miles of sidewalk, primarily located along local roads. This is usually where residential uses are located and where active transportation is more prevalent. In addition to sidewalks, Saginaw also has just over 10 miles of trails located adjacent to the City's parks or along local roads. There are also two midblock crossing locations on Bailey Boswell Boulevard, a minor arterial. The midblock crossings are located near High Country Elementary School and Highland Middle School and is along a trail route that expands beyond Saginaw city limits.

Although there are good connections on the east and west side of Saginaw, there is a lack of east to west connection across Saginaw Boulevard.

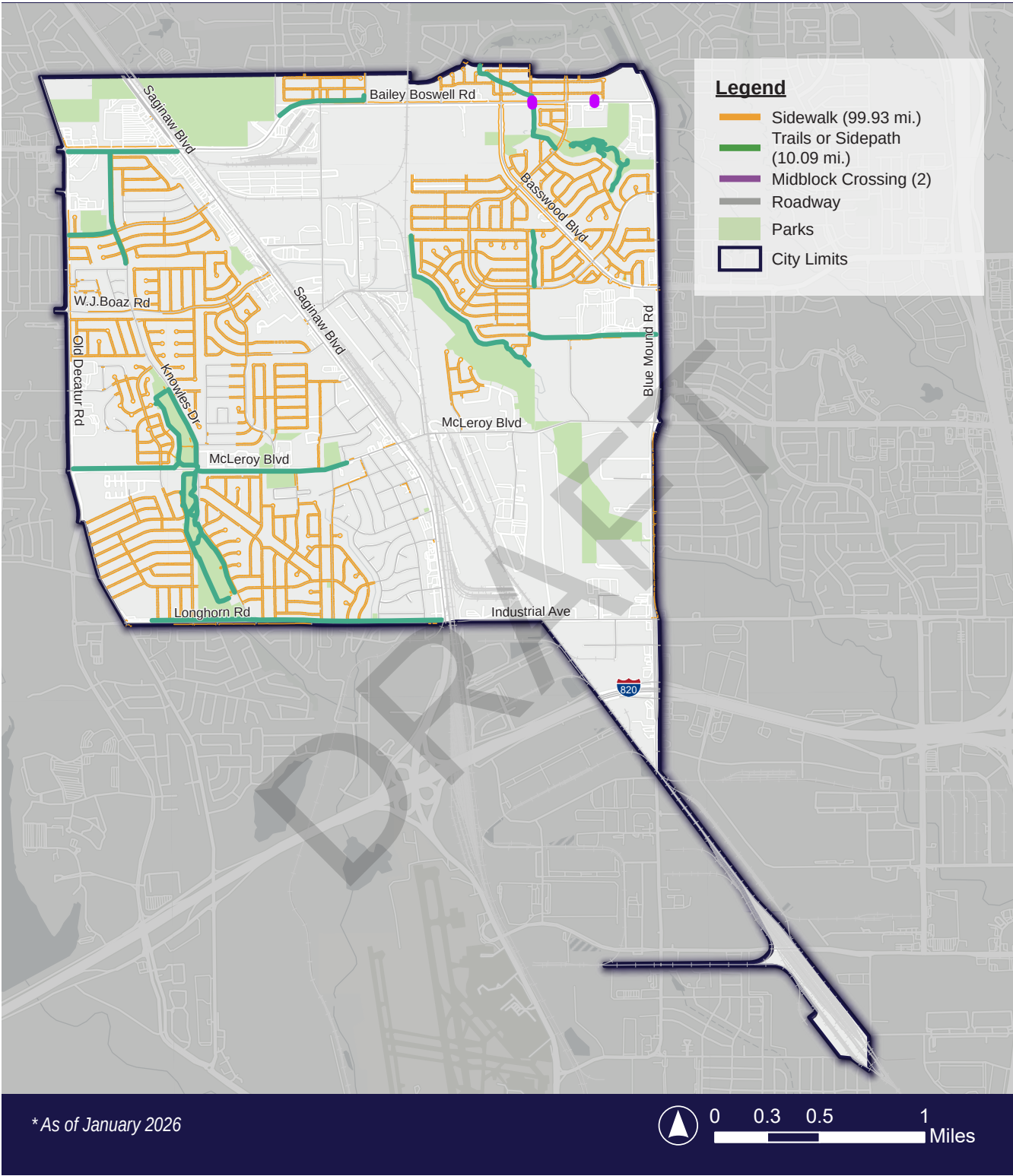
Table 3 shows the active transportation facilities and mileage, and **Exhibit 3** on page 20 displays their location throughout Saginaw.

TABLE 3. EXISTING PEDESTRIAN & BICYCLIST FACILITIES NETWORK

Facility Type	Miles	Percentage
Sidewalk	99.93	90.8%
Trail or Sidepath	10.03	9.2%



EXHIBIT 3. PEDESTRIAN & BICYCLIST FACILITIES



Source: City of Saginaw*



FUTURE ROADWAY PROJECTS

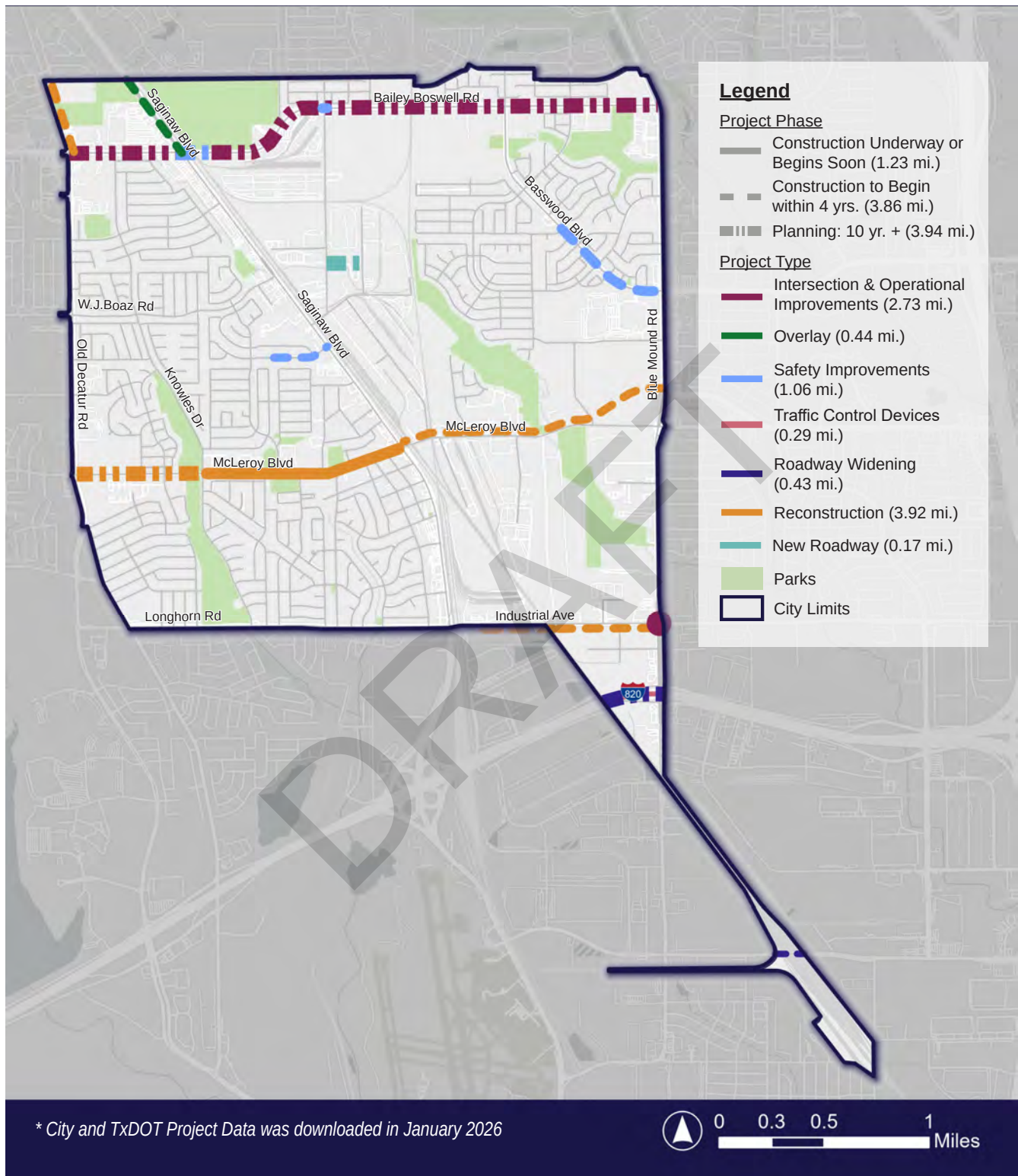
Saginaw and TxDOT have demonstrated a strong commitment to roadway improvements that enhance both efficiency and safety. Currently, multiple projects are planned, with Reconstruction representing the largest share at approximately 40%, followed closely by Intersection and Operational Improvements at 31%. These projects span various planning horizons with nearly 14% of projects underway or starting in 2026, and just over 20% are scheduled to begin within the next four years. The remaining projects are in long-term planning phases, targeted for completion over the next 10+ years. This extended timeline offers an advantage for this CSAP, as it allows new recommendations to be integrated and coordinated with the City and TxDOT's long-range advancements. Geographically, the majority of these improvements are on Saginaw's major arterials, with an emphasis on east-west connections.

Exhibit 4 on page 22 shows the different roadway projects and their phase.

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EXHIBIT 4. FUTURE ROADWAY PROJECTS



Source: City of Saginaw, TxDOT*



ZERO CAR HOUSEHOLDS

Zero-car households lack access to a personal vehicle and must rely on active transportation, transit, or alternative travel modes. To evaluate the relationship between vehicle ownership and traffic safety, **Exhibit 5** on page 24 utilizes CDC Social Vulnerability Index census tract data alongside fatal crash data from the 2020–2024 study period. On the map, individual fatal crashes are marked with an ‘X,’ while the census tracts demonstrated in different shades of pink to reflect the percentage of the population living in zero-car households.

To determine risk, each tract’s share of the total population was compared against its share of fatal crashes. **Table 4** compares the population percentage of zero-car households across census tracts to the distribution of fatal crashes experienced during the study period. A positive variance indicates that the category experienced a disproportionately higher percentage of fatal crashes compared to its population size. The data shows us that the tracts where 1.5% to 4.0% of the population live in zero-car households account for just 24.2% of the overall population, yet they sustained 44.4% of all fatal crashes during the study period. If fatal crash risk were distributed proportionally, these tracts would have experienced only 24.2% of the incidents. This demonstrates that areas with a 1.5% to 4.0% zero-car household concentration are experiencing a disproportionately higher rate of crash fatalities.

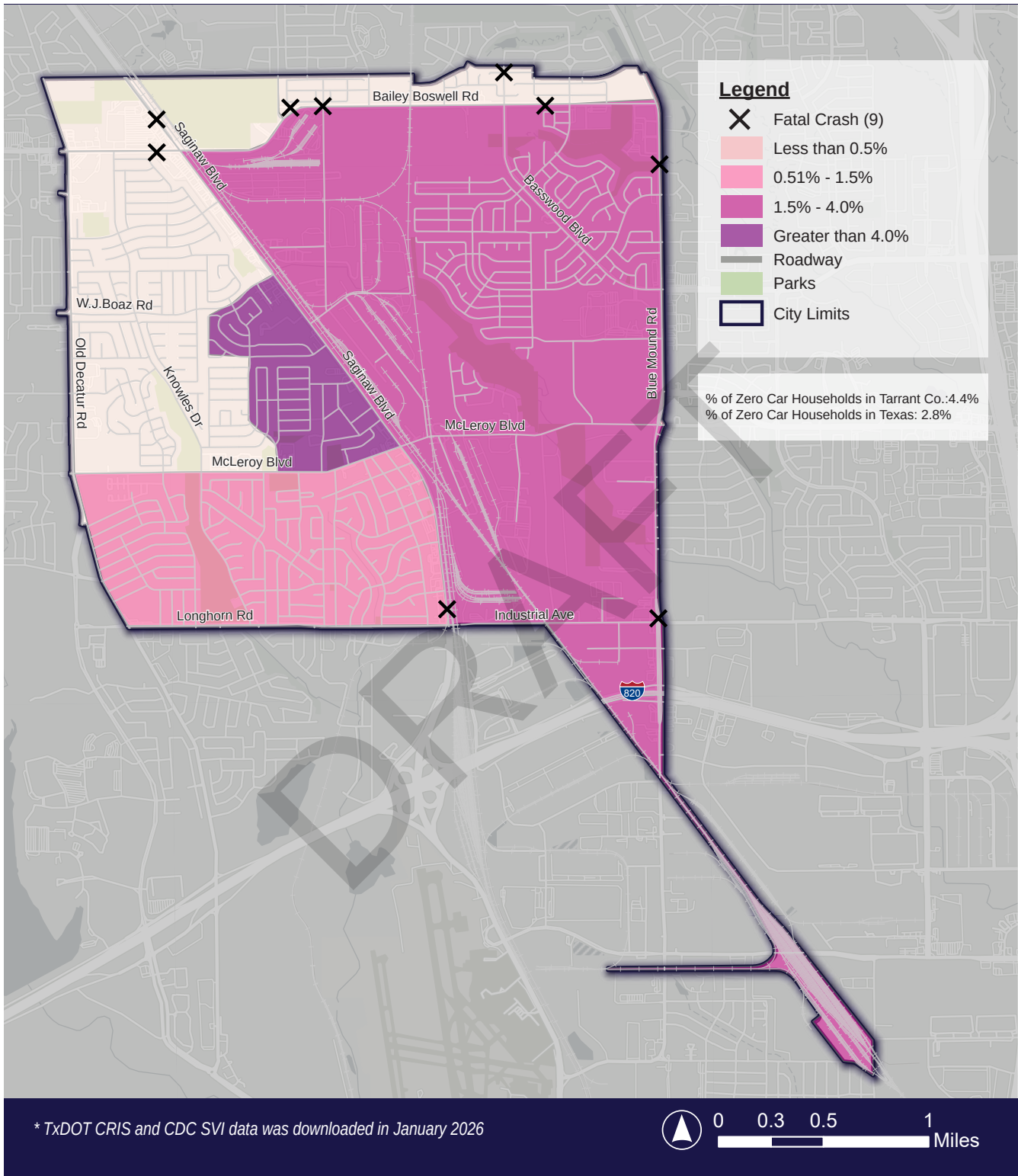
TABLE 4. PERCENT OF ZERO CAR HOUSEHOLDS VS. FATAL CRASHES

Category	Percent of Population	Percent of Fatal Crashes	Difference
Less than 0.5%	65.8%	55.6%	-10.2%
0.51%–1.5%	6.7%	0.0%	-6.7%
1.5%–4.0%	24.2%	44.4%	20.3%
Greater than 4.4%	3.4%	0.0%	-3.4%

**Population was pulled from Tarrant County Tracts that fell within Saginaw city limits. Some values may be skewed higher (SVI 2022).*



EXHIBIT 5. PERCENT OF ZERO CAR HOUSEHOLDS VS. FATAL CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024), CDC Social Vulnerability Index (2022)*



POPULATION 17 YEARS OLD & YOUNGER

The population of 17-year-olds and younger are evaluated as they are the newest drivers and the most inexperienced. These drivers may be more prone to mistakes due to their inexperience, or may have a higher concentration of children using the active transportation facilities. To evaluate the relationship between the youngest drivers and traffic safety, **Exhibit 6** on page 26 uses CDC Social Vulnerability Index census tract data and fatal crash data from the 2020–2024 study period. On the map, individual fatal crashes are marked with an 'X', and the census tracts are demonstrated in different shades of orange to reflect the population with the concentration of the population aged 17 years old and younger.

To determine risk, each tract's share of the total population was compared against its share of fatal crashes. **Table 5** compares the population percentage of population aged 17 years old and younger across census tracts to the distribution of fatal crashes experienced during the study period. A positive variance indicates that the category experienced a disproportionately higher percentage of fatal crashes compared to its population size. The data shows us that the tracts where 26.01% to 28.0% of the population are 17 years old and younger account for just 15.3% of the overall population, yet they sustained 55.6% of all fatal crashes during the study period. If fatal crash risk were distributed proportionally, these tracts would have experienced only 15.3% of the incidents.

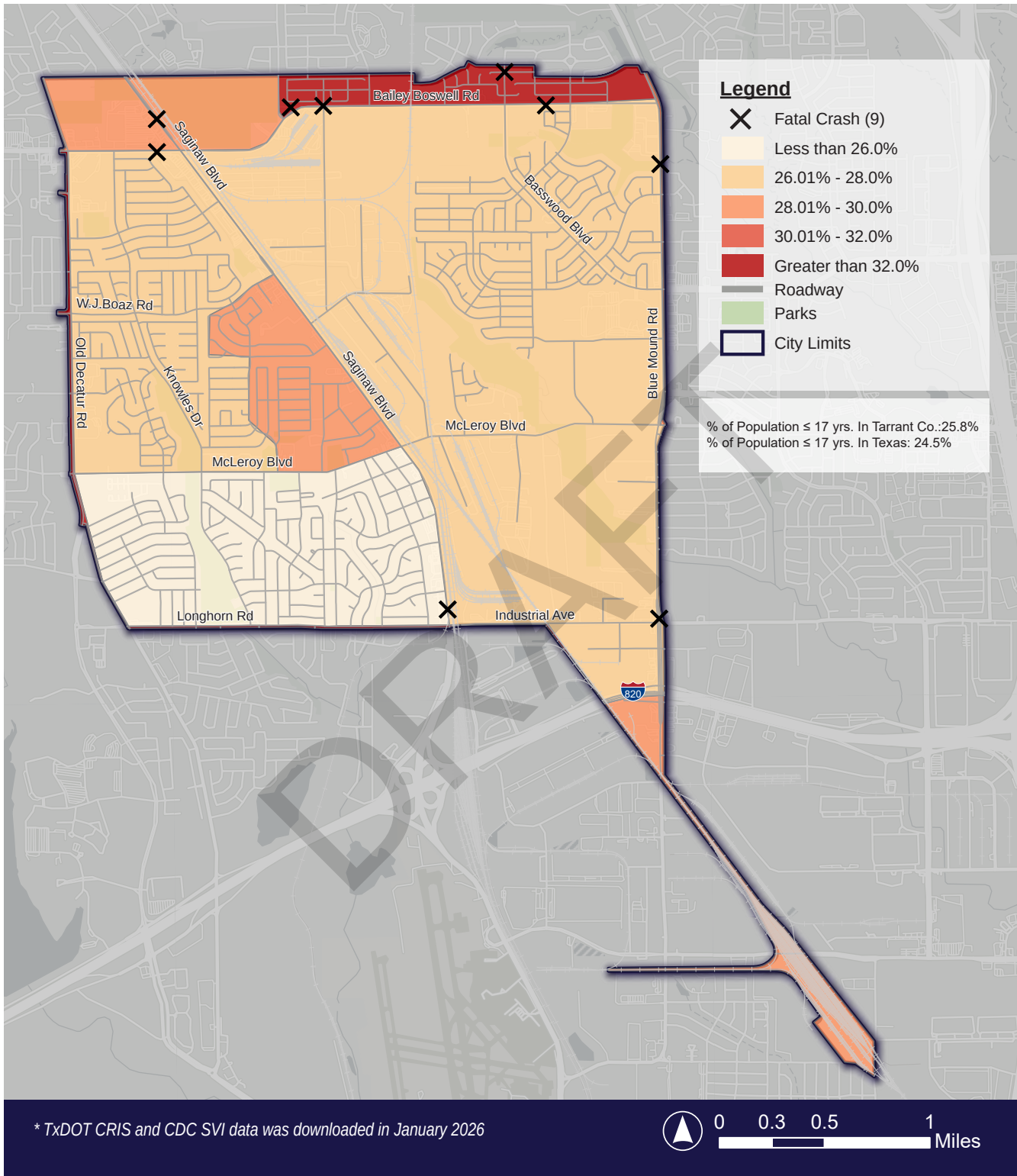
TABLE 5. PERCENT OF POPULATION 17 YEARS OLD & YOUNGER VS. FATAL CRASHES

Category	Percent of Population	Percent of Fatal Crashes	Difference
Less than 26%	6.7%	0.0%	-6.7%
26.01%–28.0%	15.3%	55.6%	40.2%
28.01%–30.0%	42.4%	11.1%	-31.3%
30.01%–32.0%	3.4%	0.0%	-3.4%
Greater than 32.0%	32.2%	33.3%	1.2%

**Population was pulled from Tarrant County Tracts that fell within Saginaw city limits. Some values may be skewed higher (SVI 2022).*



EXHIBIT 6. PERCENT OF POPULATION 17 YEARS OLD & YOUNGER VS. FATAL CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024), CDC Social Vulnerability Index (2022)*



POPULATION 65 YEARS & OLDER

On the opposite end of the scale are the population aged 65 years and older. This category have driven the longest amount of time, but may be have reduced reaction times. This category of population may be at higher risk as well where a crash severity may be increased due to their age and state of health. On active transportation facilities, these populations may have slower walking and biking speeds as well. To evaluate the relationship between the older drivers and traffic safety, **Exhibit 7** on page 28 uses CDC Social Vulnerability Index census tract data and fatal crash data from the 2020–2024 study period. On the map, individual fatal crashes are marked with an 'X', and the census tracts are demonstrated in different shades of purple to reflect the population with the concentration of the population aged 65 years old and older.

To determine risk, each tract's share of the total population was compared against its share of fatal crashes. **Table 6** compares the population percentage of population aged 65 years and older across census tracts to the distribution of fatal crashes experienced during the study period. A positive variance indicates that the category experienced a disproportionately higher percentage of fatal crashes compared to its population size. The data shows us that the tracts where more than 12.0% of the population are 65 years old and older account for just 15.5% of the overall population, yet they sustained 44.4% of all fatal crashes during the study period. If fatal crash risk were distributed proportionally, these tracts would have experienced only 15.5% of the crashes.

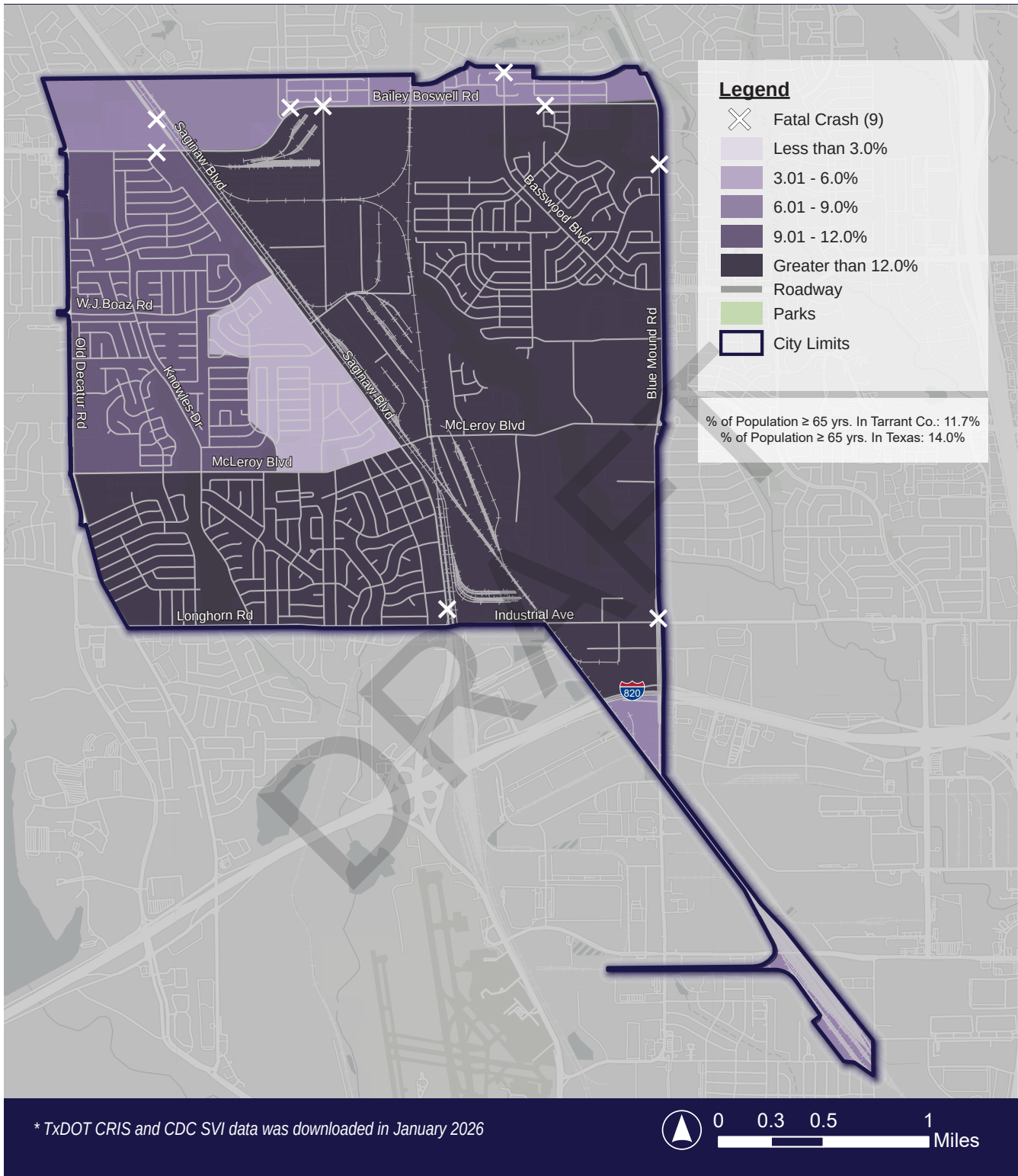
TABLE 6. PERCENT OF POPULATION 65 YEARS OLD & OLDER VS. FATAL CRASHES

Category	Percent of Population	Percent of Fatal Crashes	Difference
Less than 3%	9.8%	0.0%	-9.8%
3.01%–6.0%	23.4%	0.0%	-23.4%
6.01%–9.0%	44.8%	44.4%	-0.3%
9.01%–12.0%	6.5%	11.1%	4.6%
Greater than 12.0%	15.5%	44.4%	29.0%

**Population was pulled from Tarrant County Tracts that fell within Saginaw city limits. Some values may be skewed higher (SVI 2022).*



EXHIBIT 7. PERCENT OF POPULATION 65 YEARS OLD & OLDER VS. FATAL CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024), CDC Social Vulnerability Index (2022)*



MEDIAN AGE

The relationship between the median age of the population and fatal crashes was evaluated to capture contrasting risk factors. Areas with a lower median age may benefit from faster driver reaction times and a population less susceptible to severe injuries than older age groups. On the other hand, younger drivers are more likely to engage in unsafe driving practices, including traveling at higher speeds. To evaluate the relationship between the median age and traffic safety, **Exhibit 8** on page 30 uses CDC Social Vulnerability Index census tract data and fatal crash data from the 2020–2024 study period. On the map, individual fatal crashes are marked with an 'X', and the census tracts are demonstrated in different shades of blue to reflect the median age of the population within the census tracts.

To determine risk, each tract's share of the total population was compared against its share of fatal crashes. **Table 7** compares the population's median age across census tracts to the distribution of fatal crashes experienced during the study period. A positive variance indicates that the category experienced a disproportionately higher percentage of fatal crashes compared to its population size. The data shows us that the tracts where the median age is 32–33 years old and 34–36 years old account for 22.6% and 37.4%, respectively, of the overall population, yet sustained 33.3% and 55.6%, respectively, of all fatal crashes during the study period.

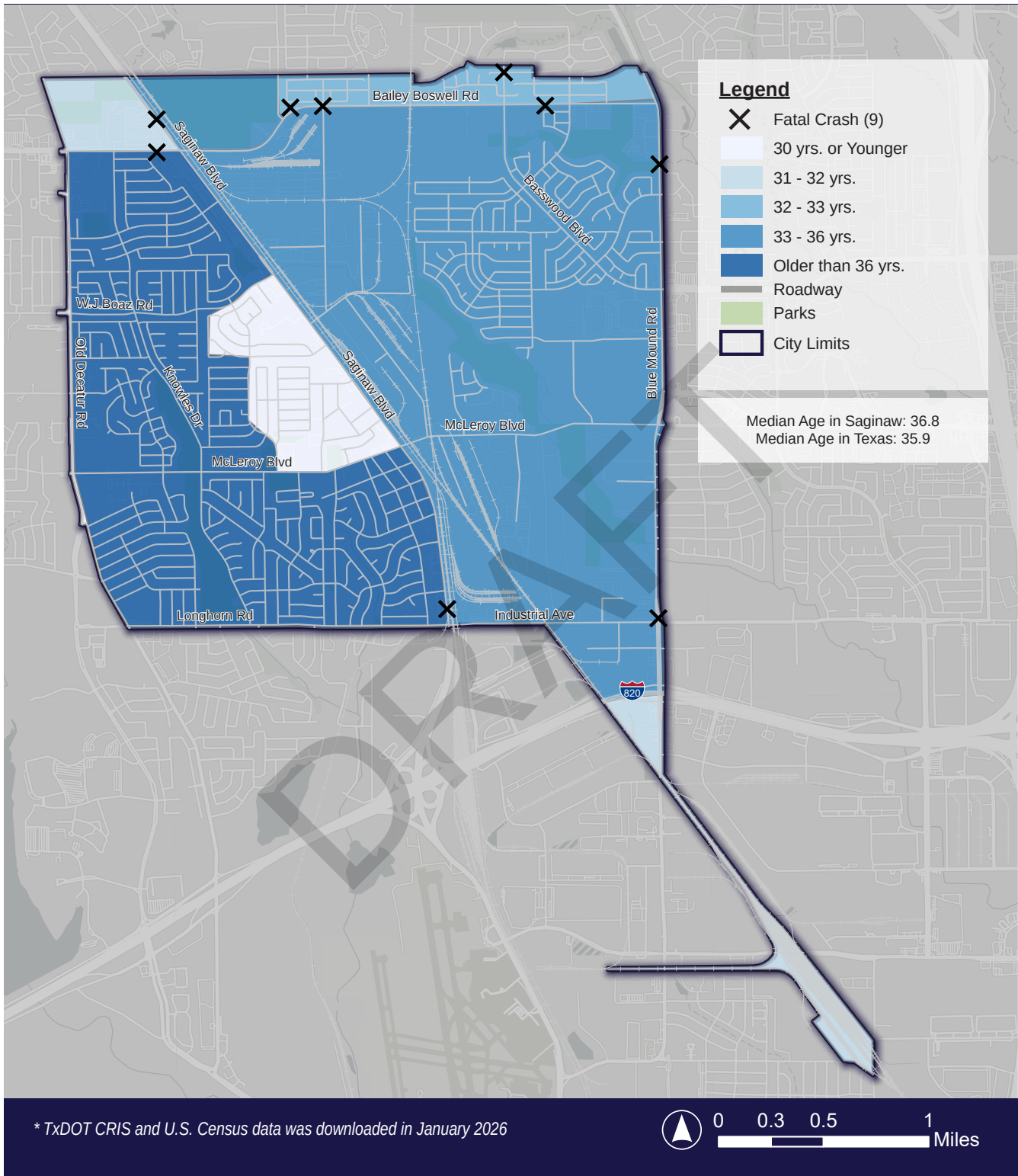
TABLE 7. MEDIAN AGE & OLDER VS. FATAL CRASHES

Category	Percent of Population	Percent of Fatal Crashes	Difference
30 years or younger	13.2%	0.0%	-13.2%
30–32 years	13.5%	0.0%	-13.5%
32–33 years	22.6%	33.3%	10.7%
34–36 years	37.4%	55.6%	18.1%
Older than 36 years	13.2%	11.1%	-2.1%

**Population was pulled from Tarrant County Tracts that fell within Saginaw city limits. Some values may be skewed higher (SVI 2022).*



EXHIBIT 8. MEDIAN AGE & OLDER VS. FATAL CRASHES



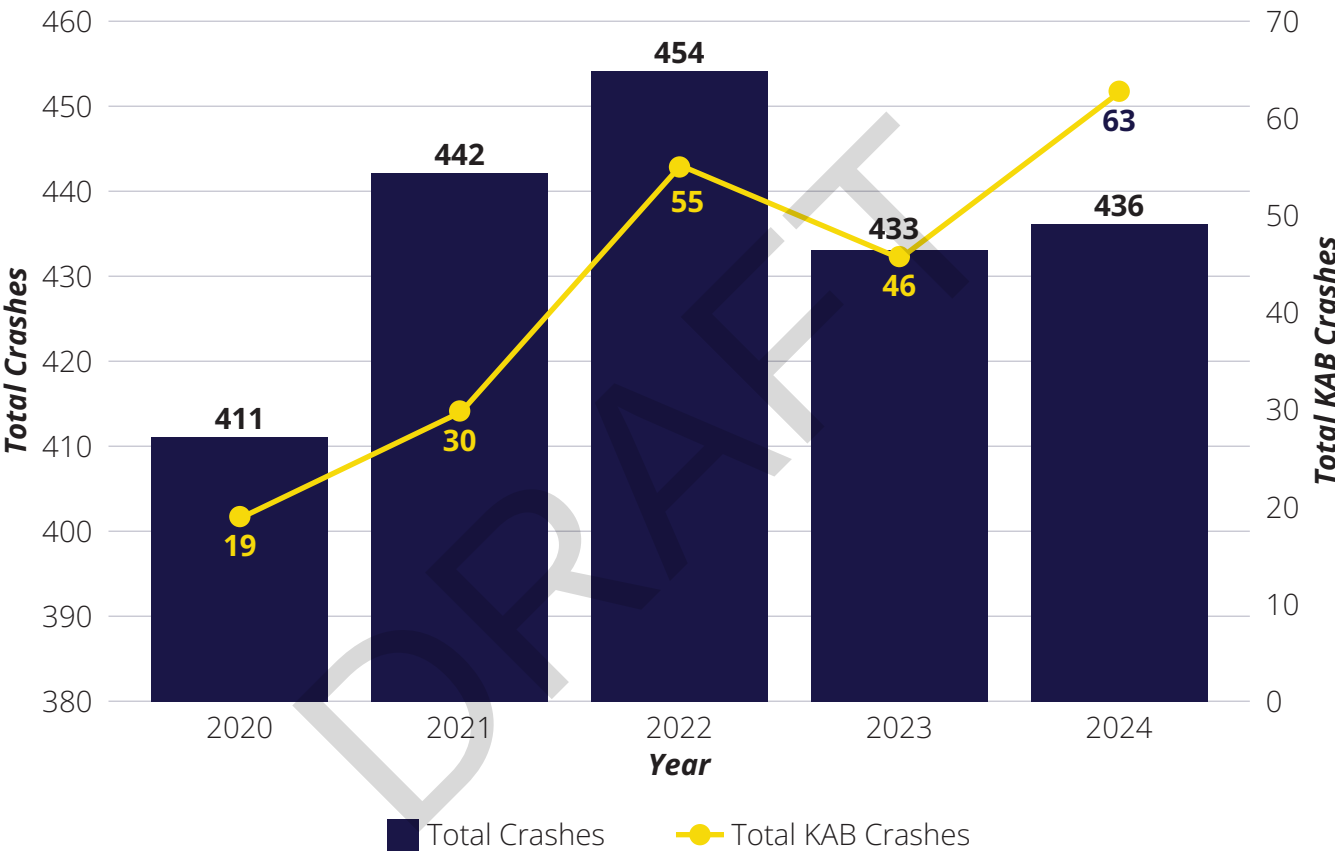
Source: City of Saginaw, TxDOT CRIS (2020–2024), U.S. Census (2020)*



STATE OF SAFETY IN SAGINAW

The crash history for the study period of 2020–2024 in Saginaw is a primary element of the CSAP. Crash data for the study period was obtained and analyzed from the Texas Department of Transportation’s Crash Records Information Systems (CRIS). The analysis provides a comprehensive look at the current state of road safety in Saginaw and serves as the foundation of the CSAP. In the 5-year study period, there were a total of 2,176 crashes reported within Saginaw city limits, with 213 of the crashes resulting in a fatality, serious injury, or possible injury. **Figure 11** shows the total crashes and the total KAB crashes that occurred within Saginaw city limits from 2020–2024.

FIGURE 11. TOTAL CRASH COUNT VS. KAB CRASHES PER YEAR





TOP CONTRIBUTING FACTORS

Contributing factors are the various reasons explaining why a crash occurred, such as distracted driving, speeding, or impairment. Identifying these factors is effective for safety planning by highlighting the specific issues that lead to a crash and how it should be addressed. For example, if an area has experienced many severe crashes due to drivers ignoring stop signs or red lights, safety efforts for the area should focus on preventing such future violations. The specific area's context in addition to the contributing factors The most common contributing factors in Saginaw are shown in **Table 8**.

TABLE 8. TOP CONTRIBUTING FACTORS

Top Contributing Factors	Total Crashes	Percent of Crashes	KAB Crashes	Percentage of KAB Crashes
Driver Inattention	652	29.96%	66	10.12%
Failed to Control Speed	464	21.32%	50	10.78%
Failed to Yield ROW – Turning Left	227	10.43%	23	10.13%
Changed Lane When Unsafe	133	6.11%	4	3.01%

TOP MANNERS OF COLLISION

Manners of collision describe how a crash occurred in terms of point of contact whereas contributing factors describe factors describing why a crash may have occurred. **Table 9** shows the top manners of collision in Saginaw from 2020–2024. The top manner of collision was 'Same Direction – One Straight – One Stopped' indicating two motor vehicles traveling in the same direction where one motor vehicle rear ends the other.

TABLE 9. TOP MANNERS OF COLLISION

Top Manner of Collision	Total Crashes	Percent of Crashes	KAB Crashes	Percentage of KAB Crashes
Same Direction – One Straight – One Stopped	442	20.31%	27	6.11%
Angle – Both Going Straight	280	12.87%	28	10.00%
Opposite Direction – One Straight – One Left Turn	252	11.58%	31	12.30%
One Motor Vehicle – Going Straight	237	10.89%	49	20.67%
Angle – One Straight – One Left Turn	223	10.25%	32	14.35%



CRASH DENSITY

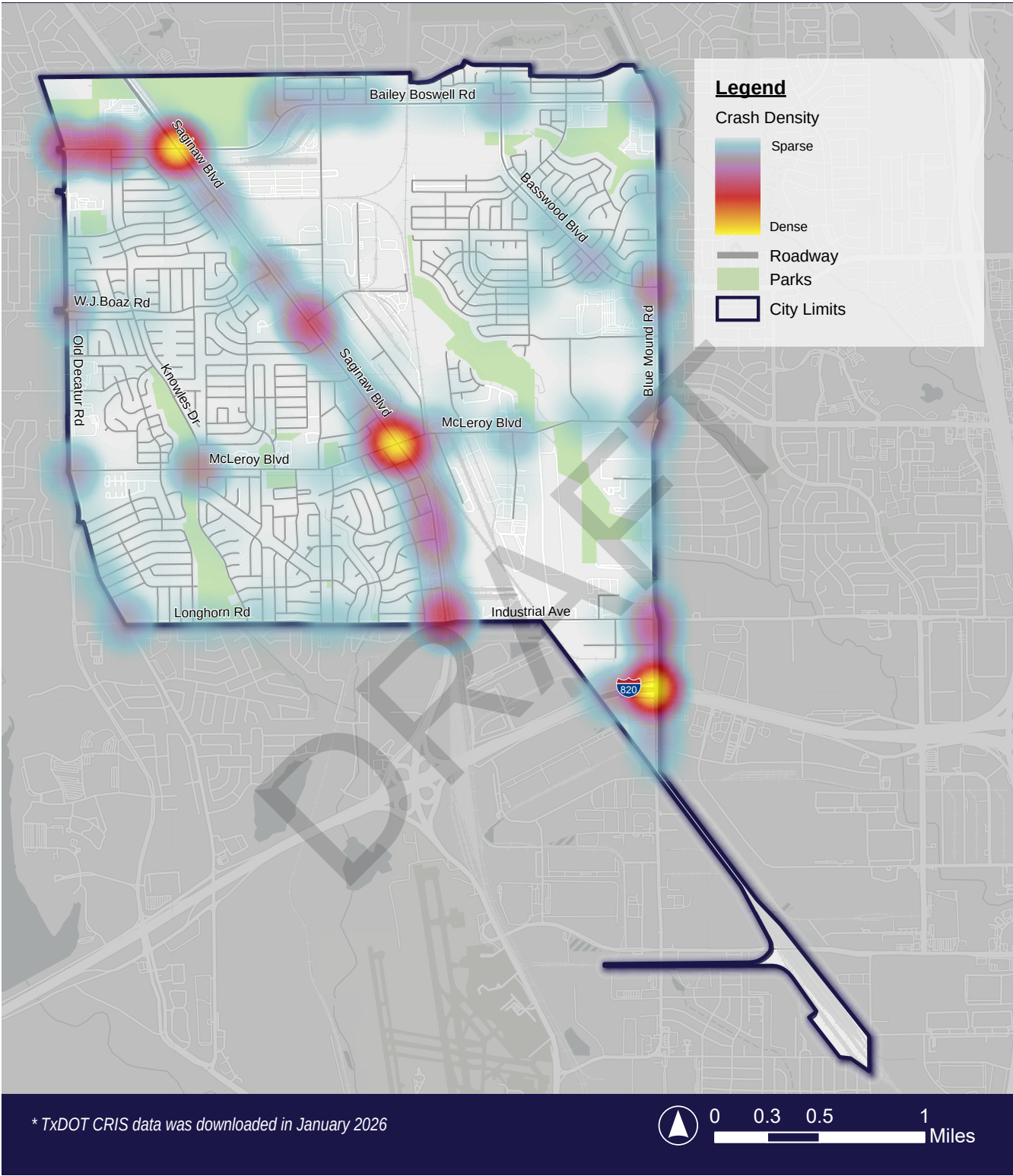
The crash heat map is created to show the density of crashes within Saginaw from the 2020–2024 study period, as seen in **Exhibit 9** on page 34. This map visually depicts the density of crash counts throughout Saginaw using a color gradient scale with the sparse incidents of crashes represented with a blue gradient and the densest incidents of crashes represented with a yellow gradient. The crash heat map does not account for traffic volumes, roadway configuration, speed limits, or other factors that may affect the frequency of crashes.

The three highest concentrations of crashes occurred at the intersection of Saginaw Boulevard and McLeroy Boulevard, Saginaw Boulevard and Bailey Boswell Road, and I-820 and Blue Mound Road. Area of relatively dense incidents of crashes occurred at the Old Decator and Bailey Boswell intersection, and across various intersections along Saginaw Boulevard. This is an expected trend as Saginaw Boulevard is one of the city's major thoroughfares that runs almost the entirety of the city, bisecting it from north to south. Additionally, Saginaw Boulevard and I-820 are expected to have the largest density of crashes due to their annual average daily traffic (AADT) of over 20,001 for majority of Saginaw Boulevard and over 30,000 for I-820 and Saginaw Boulevard north of the McLeroy Boulevard intersection.

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EXHIBIT 9. CRASH DENSITY



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



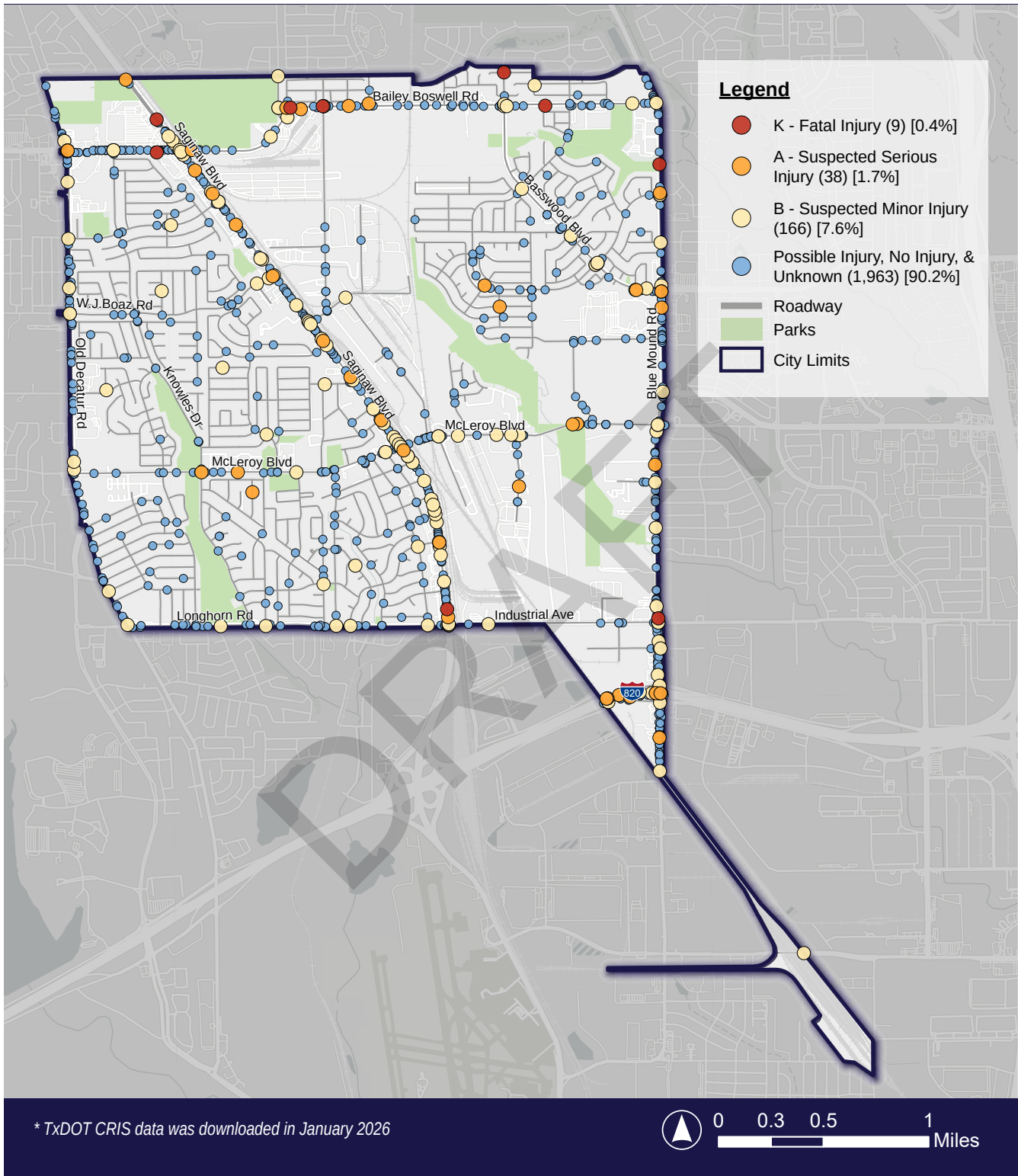
CRASH SEVERITY

Crashes recorded in CRIS are assigned a severity code of 'K' for a crash involving a fatal injury, 'A' for a crash involving a suspected serious injury, 'B' for a crash involving a suspected minor injury, 'C' for a crash involving a possible injury, or 'N' for a crash without reported injuries, or '99' for a crash with an unknown injury. Of the total 2,176 crashes, 9 crashes were classified as fatal (K), 38 crashes were classified as a suspected serious injury (A), 166 crashes were classified as a suspected minor injury (B), and the remaining 1,963 crashes were classified as either a possible injury (C), no injury (N), or unknown (99). As shown in **Exhibit 10** on page 36, most fatal and severe crashes occur on arterials in Saginaw, such as Bailey Boswell Road, Blue Mound Road, and Saginaw Boulevard. While the map shows all severity types of crashes occurring throughout the city, the location of the most severe crashes is a crucial part of understanding safety challenges in Saginaw. The main goal of the CSAP is to decrease the number of fatal and severe injury crashes (KAB crashes) therefore a map such as this one begins to highlight potential pain points for the City.

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EXHIBIT 10. CRASHES BY SEVERITY



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



TXDOT EMPHASIS AREAS

In 2022, the Traffic Safety Division of TxDOT and Department of Public Safety (DPS) updated the Texas Strategic Highway Safety Plan (SHSP) to coordinate the statewide efforts in reducing fatalities and injuries on state and local roadways. A part of this update focused on creating a Safe System, which puts the responsibility of severe crashes on the system rather than solely on human failure. The SHSP analyzed Texas crash data to identify the plan's emphasis areas, which address the crash types, user behaviors, and vehicle types that produce the most frequent and severe crashes. The following are the emphasis areas used for the evaluation of the crashes shown in **Figure 12**.

FIGURE 12. SAFETY EMPHASIS AREAS

Roadway and Lane Departures



Speed Related



Intersection Safety



Distracted Driving





FIGURE 12. SAFETY EMPHASIS AREAS (CONTINUED)

Occupant Protection



Vulnerable Road Users



Impaired Driving



Post-Crash Care





ROADWAY AND LANE DEPARTURES

A roadway or lane departure crash occurs when a vehicle departs from its intended lane of travel, crossing center or edge lines (**Figure 13**). During the study period, there were 223 crashes related to roadway and lane departures. Of the 223 total roadway and lane departure related crashes, 9 crashes resulted in a fatality, 11 crashes resulted in a suspected serious injury, 30 crashes resulted in a suspected minor injury. All 9 crashes that resulted in a fatal injury in Saginaw during the study period were a roadway or lane departure crash.

Exhibit 11 on page 40 displays the crash locations attributed to roadway and lane departure, and their severity, and **Table 10** summarizes the total and high injury crashes attributed to roadway and lane departure.

TABLE 10. ROADWAY & LANE DEPARTURE VS. ALL CRASHES IN SAGINAW

Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Roadway & Lane Departure Crashes	223	50	22.42%
All crashes	2,176	213	9.78%

FIGURE 13. VEHICLE ROADWAY OR LANE DEPARTURE





EXHIBIT 11. ROADWAY & LANE DEPARTURE CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



SPEED RELATED

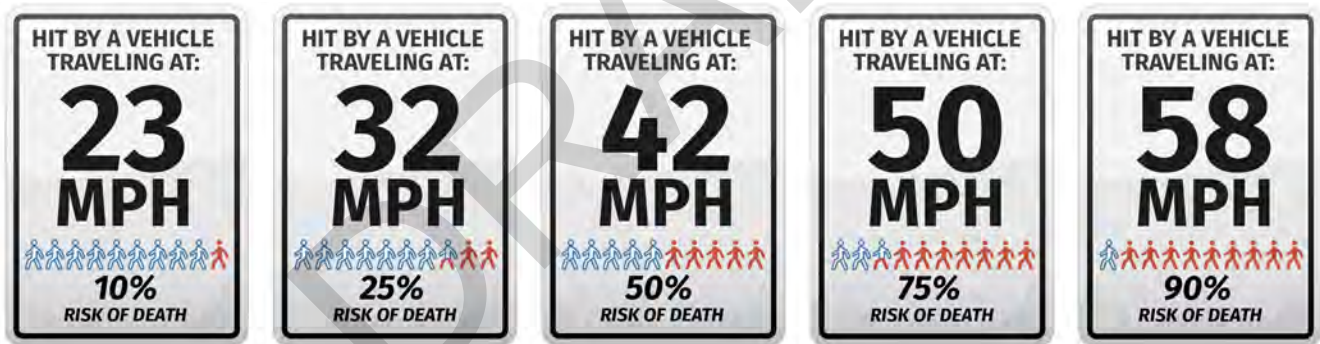
A speed related crash occurs when a driver exceeds the posted speed limit or drives too fast for conditions. Due to the exponential increase in energy, high speed crashes have an increased likelihood of fatalities and serious injuries. Speed related crashes resulting in a fatality or serious injury occurred mainly on arterial roads, such as Saginaw Boulevard and Blue Mound Road, and on Interstate-820. Exceeding the posted speed limit can increase the severity of injuries and fatality rate of all types of collisions, making unsafe speed a top emphasis area. Decreasing speeds will reduce the force of impact and increase the survival rate of collisions. Additionally, unsafe speeding has a large impact on the severity of crashes involving vulnerable road users, pedestrians and bicyclists. As speeds increase so does the risk of death for vulnerable road users as shown in **Figure 14**.

During the study period, 22.75% of all crashes were speed related. Over 10% of the speed related crashes resulted in a KAB. **Exhibit 12** on page 42 displays the location and severity of speed related crashes in Saginaw. **Table 11** summarizes the total and high injury, speed related crashes.

TABLE 11. SPEED RELATED VS. ALL CRASHES IN SAGINAW

Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Speed Related Crashes	495	61	12.32%
All Crashes	2,176	213	9.78%

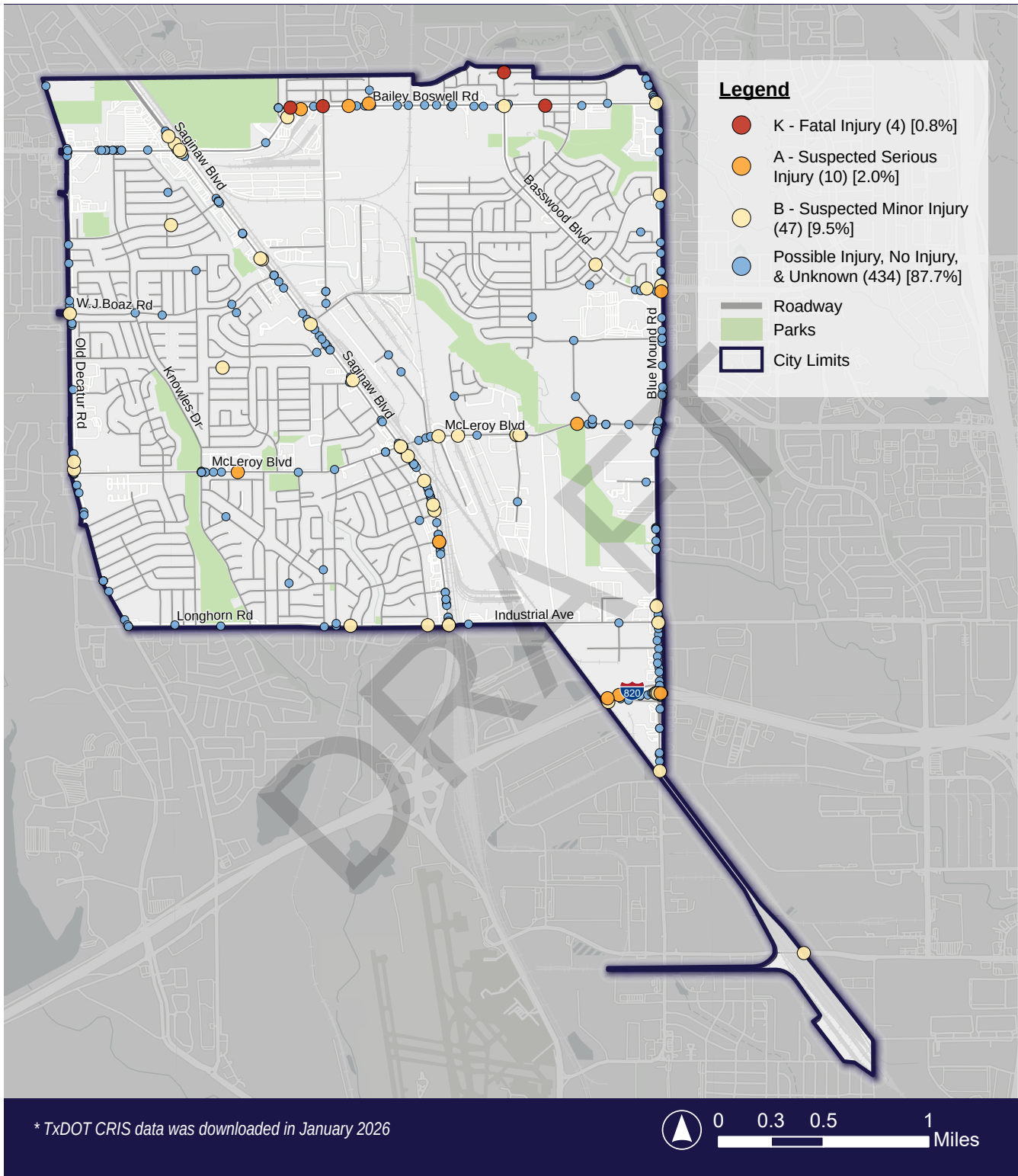
FIGURE 14. PEDESTRIAN RISK BY SPEED



Source: USDOT



EXHIBIT 12. SPEED RELATED CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



INTERSECTION SAFETY

Crashes within the ‘Intersection Safety’ category are defined as crashes that occurred within the boundaries of an intersection or in which the crash occurred on an approach to or exit from an intersection. Intersection related crashes are common due to the conflict points at signalized intersections, as seen in **Figure 15**, and unsignalized intersections. Intersection crashes can happen when drivers have poor visibility or traffic lights or stop signs, preventing them from reacting to oncoming traffic in time. **Table 12** below summarizes the total and high injury crashes that were classified as intersection related during the study period.

FIGURE 15. INTERSECTION TRAFFIC LIGHT



TABLE 12. INTERSECTION RELATED VS. ALL CRASHES IN SAGINAW

Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Intersection Related	1,113	111	9.97%
All crashes	2,176	213	9.78%

High Crash Intersections

Intersection related crashes are the most common contributing factors for crashes in Saginaw. During the study periods, there were 1,113 crashes, or approximately 51.1% of crashes, that occurred at an intersection or are intersection related.

Table 13 below displays the top 6 high crash intersections from 2020–2024. **Exhibit 13** on page 44 displays the locations and severity of intersection related crashes during the study period

TABLE 13. HIGH CRASH INTERSECTIONS

Intersection	Crash Count
IH 820 & FM 156	93
W. Bailey Boswell Rd. & BUS 287	74
W. McLeroy Blvd. & BUS 287	51
N. Knowles Dr. & W. Bailey Boswell Rd.	43
Longhorn Rd. & BUS 287	41
W. Bailey Boswell Rd. & N. Old Decatur Rd.	37



EXHIBIT 13. INTERSECTION RELATED CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



DISTRACTED DRIVING

Distracted driving occurs when there is anything that diverts the attention of the driver from the primary task of navigating the vehicle, like cell phone usage, as shown in **Figure 16**. Distracted driving reduces the ability of the driver to respond to other vehicles or to changing road conditions, creating a dangerous environment for themselves and others. Although research suggests distracted driving is common, it is difficult for it to be noticed and measured. When reporting distracted driving in crashes, any details about the nature of the distraction must be included in the narrative section of the report, which makes it difficult to analyze the trends of distracted driving.

In Saginaw, approximately one third of the total crashes during the study period were attributed to distracted driving. **Exhibit 14** on page 46 displays the location and severity of crashes caused by distracted driving, and **Table 14** below summarizes the total and high injury crashes during the study period that were attributed to distracted driving.

TABLE 14. DISTRACTED DRIVING VS. ALL CRASHES IN SAGINAW

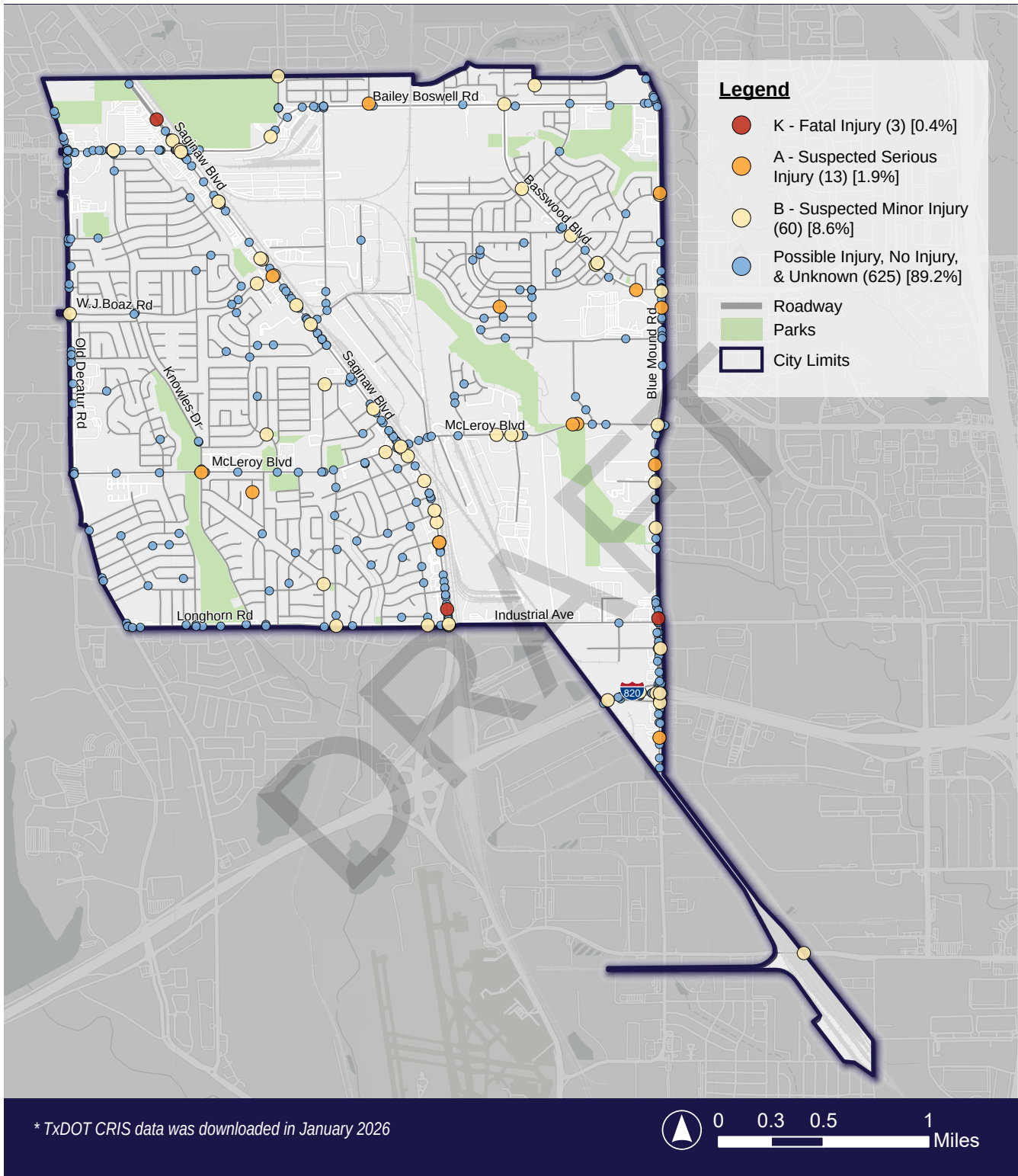
Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Distracted Driving	701	76	10.84%
All Crashes	2,176	213	9.78%

FIGURE 16. DISTRACTED DRIVING





EXHIBIT 14. DISTRACTED DRIVING CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



OCCUPANT PROTECTION

Occupant protection crashes are crashes involving people not wearing seatbelts. An incident is considered an occupant protection crash even when just one occupant of an involved vehicle is not wearing a seatbelt. Without wearing restraints, people involved in crashes have nothing to stop or limit the extent to which the force of the crash is transferred to their body, greatly increasing their chance of injury or fatality. Wearing a restraint in a vehicle is the most effective way to save a person's life or reduce their chance of injury, as shown in **Figure 17**.

In Saginaw, unrestrained persons were involved in only 1.29% of crashes during the study period, but over a third of those crashes resulted in a KAB. **Table 15** below summarizes total and high injury crashes classified as occupant protection related. The location and severity of the unrestrained persons crashes are displayed in **Exhibit 15** on page 48.

TABLE 15. OCCUPANT PROTECTION VS. ALL CRASHES IN SAGINAW

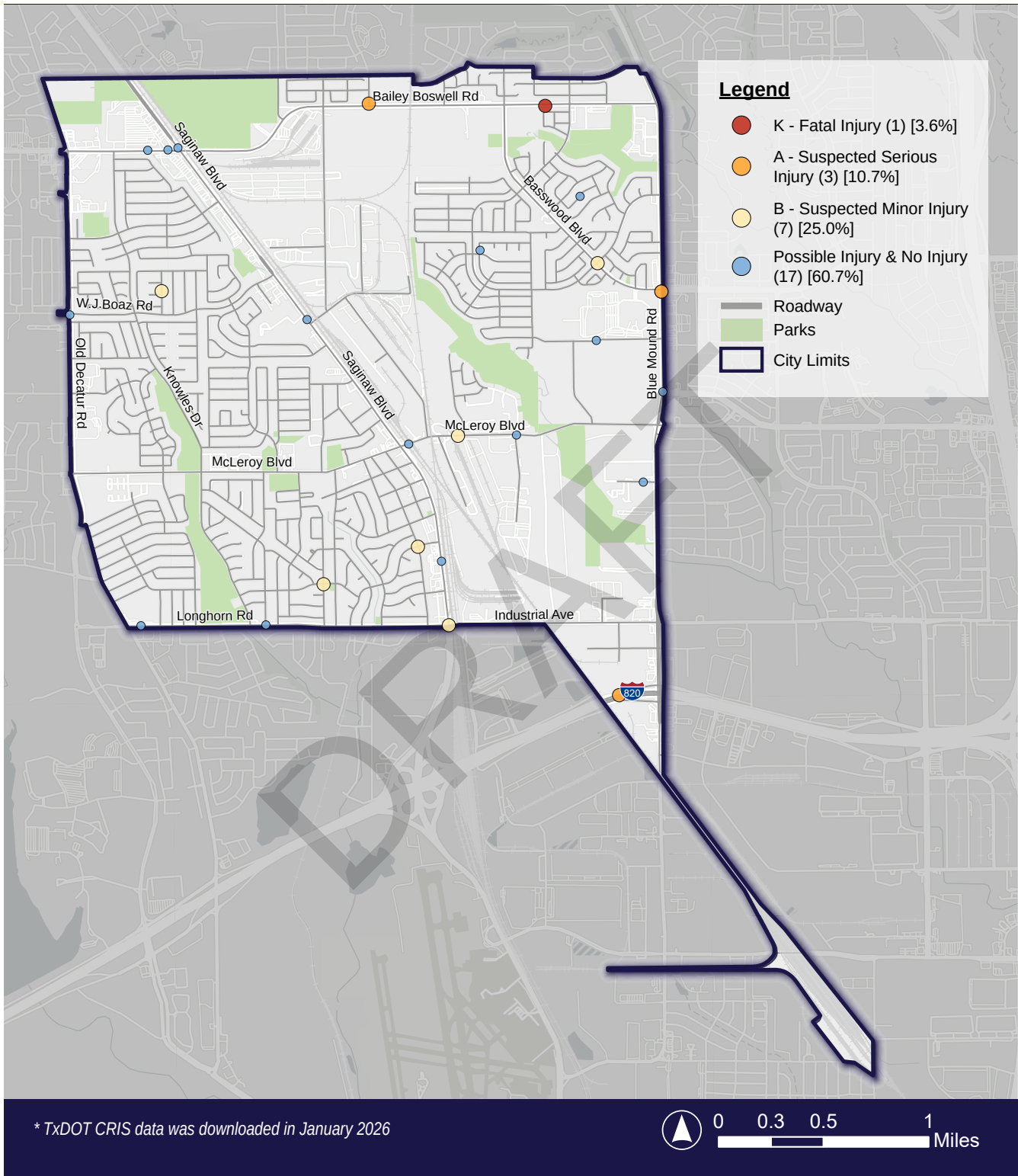
Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Occupant Protection	28	11	39.28%
All Crashes	2,176	213	9.78%

FIGURE 17. WOMAN WEARING OCCUPANT PROTECTION





EXHIBIT 15. CRASHES REGARDING OCCUPANT PROTECTION



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



VULNERABLE ROAD USERS

Vulnerable Road Users (VRUs) are defined as crashing involving pedestrians or bicyclists. An example of VRUs is shown in **Figure 18**. The severity and incidents of these crashes can be exacerbated if there is a lack of proper sidewalks, trails, or crossings that provide these users with safe opportunities to move apart from vehicular traffic. Distracted driving may pose an increased concern for VRUs.

During the 2020–2024 study period, Saginaw experienced 11 pedestrian crashes and 13 bicyclist crashes. Of the 11 pedestrian crashes, 5 crashes resulted in suspected serious injury (A) and 3 crashes resulted in suspected minor injury (B), totaling 72.8% of all pedestrian crashes resulting in a KAB. Of the 13 bicyclist crashes, 2 crashes resulted in suspected serious injury (A) and 4 crashes resulted in suspected minor injury (B), totaling 46.2% of all bicyclist crashes resulting in a KAB.

Table 16 below summarizes the total and high injury crashes involving vulnerable road users, and **Exhibit 16** on page 50 displays the crash locations and severity.

TABLE 16. VULNERABLE ROAD USER CRASHES VS. ALL CRASHES IN SAGINAW

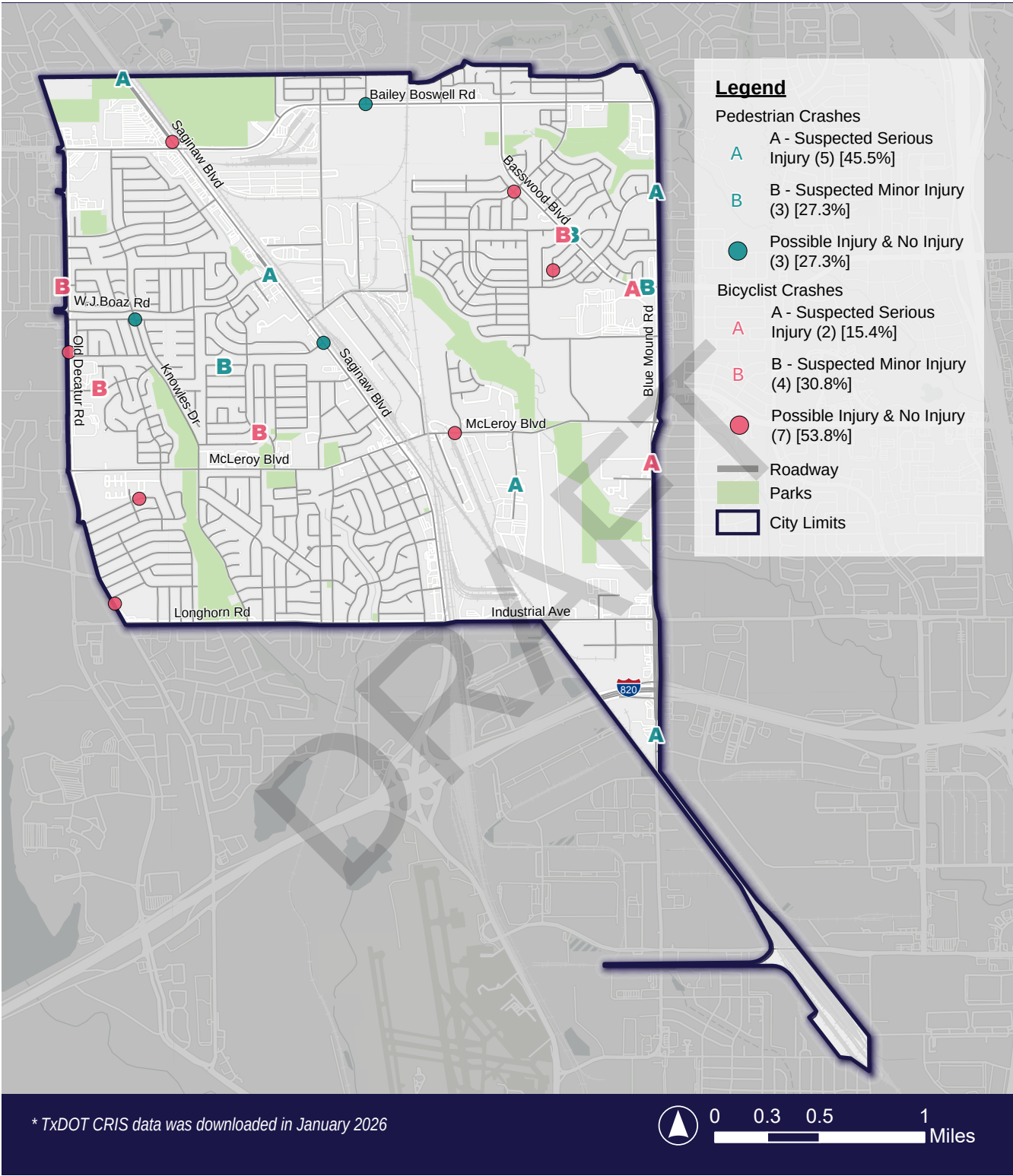
Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Pedestrian Crashes	11	8	72.72%
Bicyclist Crashes	13	6	46.15%
All Crashes	2,176	213	9.78%

FIGURE 18. VULNERABLE ROAD USER USING CROSSWALK





EXHIBIT 16. PEDESTRIAN & BICYCLIST CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



IMPAIRED DRIVING

A crash involving an impaired driver constitutes that the driver had been drinking, taking medicine, under the influence of alcohol, or under the influence of drugs (**Figure 19**). Impairment reduces the ability of the driver to make careful decisions and affects the driver's reaction time and ability to control the vehicle. The poor judgments begin when the impaired person chooses to operate a vehicle. Crashes involving these drivers are particularly severe due to the driver's inability to control the vehicle, which puts others on the road in danger. The person that is in the most danger, however, is themselves, as most of this crash type only involves the impaired driver's vehicle. Addressing these crash types requires the reduction of the instances of impaired driving.

Impaired driving crashes made up 3.77% of Saginaw crashes during the study period, and 26.83% of the impaired driving crashes were KABs. Although impaired driving crashes occurred on local roads as well, the impaired driving crashes that resulted in a KAB were located on the arterial roads. **Table 17** below summarizes the total and high injury crashes related to impaired driving in Saginaw, and **Exhibit 17** on page 52 displays the impaired driving crash locations in Saginaw.

TABLE 17. IMPAIRED DRIVING VS. ALL CRASHES IN SAGINAW

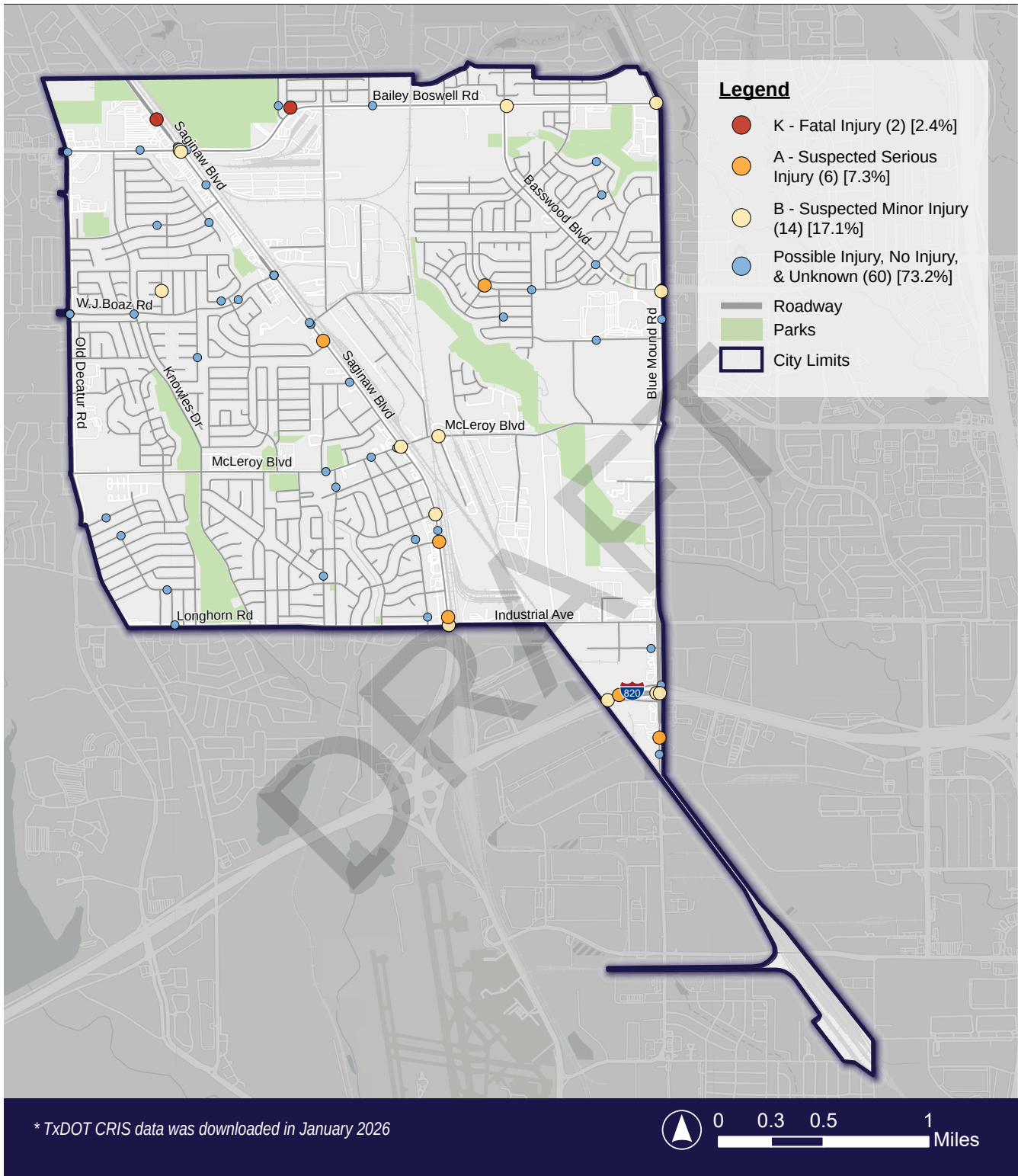
Crash Type	Total Crashes	High Injury Crashes (KABs)	Percent KABs
Impaired Driving Crashes	82	22	26.83%
All Crashes	2,176	213	9.78%

FIGURE 19. PERSON DRIVING IMPAIRED





EXHIBIT 17. IMPAIRED DRIVING CRASHES



Source: City of Saginaw, TxDOT CRIS (2020–2024)*



POST-CRASH CARE

Post-crash care is concerned with reducing the frequency of fatalities and injuries after a crash occurs. It is necessary to understand what resources would be needed to mitigate the occurrence of harm to people involved in a crash. Post-crash care covers first responders, trauma, and emergency medical services, crash investigations, traffic incident management, and justice (Figure 20). The concept encompasses immediate medical assistance and adjustments to road systems aimed at minimizing the severity of future crashes.

FIGURE 20. FIRE TRUCK AND POLICE PROVIDING POST-CRASH CARE



SOCIETAL COST OF CRASHES

An additional trend to understand the impact of crashes have on communities is the societal cost of crashes. Crashes of all severities ultimately cost money that span across multiple areas, such as medical costs, property damage, economic productivity impact, and quality of life. Societal cost is determined by assigning a monetary value to the impact of crashes by their severity. These costs are a blend of economic costs and the monetized value of impacts. The monetary values used in this analysis are from the updated 2024 Highway Safety Benefit-Cost Analysis Guide from the Federal Highway Administration (FHWA) Safety Program.

The total cost of crashes that occurred in Saginaw from 2020–2024 is just under \$356 million with fatal crashes making up approximately 40.45% of the total cost. The cost breakdown by severity is shown in Table 18.

TABLE 18. SOCIETAL COST OF CRASHES IN SAGINAW

Crash Severity	Societal Cost Per Crash *	Saginaw Crashes	Societal Cost of Crashes
K – Fatal Injury	\$15,988,000	9	\$143,892,000
A – Suspected Serious Injury	\$1,705,100	38	\$64,793,800
B – Suspected Minor Injury	\$384,000	166	\$63,744,000
C – Possible Injury	\$204,000	257	\$52,428,000
Non-injury and Unknown	\$18,100	1,706	\$30,878,600
Total Societal Cost of Crashes in Saginaw	-	-	\$355,736,400

* View the Updated Crash Costs for Highway Safety Analysis by the Highway Safety Improvement Program.

DRAFT



SAGINAW



COMPREHENSIVE SAFETY ACTION PLAN

CHAPTER



4

HIGH INJURY NETWORK

INTRODUCTION

This chapter introduces the High Injury Network (HIN), a data-driven decision-making tool used to support project selection and prioritization by identifying corridors with the highest concentrations of fatal and serious injury crashes. It outlines the HIN's significance, the methodology used to identify high-risk locations, and the resulting network.



HIGH INJURY NETWORK

A HIN consists of roads, intersections, or other transportation infrastructure with a higher-than-average rate of crashes resulting in injuries or fatalities. Using traffic crash data, the network is determined by considering factors such as crash frequency and severity. The HIN is intended to help Saginaw decision makers to prioritize future transportation projects and investments.

Identifying and prioritizing facilities within the HIN is meant to reduce fatal and severe crashes. Before safety countermeasures for the City can be identified, the HIN must be determined to aid in the decisions regarding roadway safety enhancements.



CRITICAL CRASH RATE

The Federal Highway Administration (FHWA) outlined methods to calculate crash rates to prioritize locations where safety improvements are most needed. As outlined in the Highway Safety Manual, the critical crash rate method identifies areas of high crash rates by comparing the observed crash rate of a road segment to the expected crash rate based on similar functional classification and traffic volumes. If the observed crash rate exceeds the expected crash rate, the roadway segment is considered to have a high critical crash rate and is considered for the HIN.

An ArcGIS Pro model was created to calculate the critical crash rate and provide supporting calculations for each roadway segment in the City. The model assigns crashes to an adjacent segment and performs the calculations in the order outlined by FHWA.



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

1. Assigning Date to Road Segments

Calculating the critical crash rate requires four data inputs: roadway functional classification, context, daily traffic volumes, and weighted crash counts. Crashes were assigned weights of 12 for fatal crashes, 5 for severe injury crashes, and 3 for minor injury crashes. This assignment ensured that areas with high injury cases were prioritized in the HIN development. Similarly, traffic volume and functional classifications were also assigned to the roadways during this step.

2. Calculate Variables of Critical Crash Rate

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

3. Calculate Critical Crash Rate Ratio

Once all variables are input, a ratio is calculated to identify segments experiencing higher-than-average rates of fatal, serious, and minor injury crashes (**Figure 21**). If the ratio is greater than 1.0, or the observed critical crash rate is higher than the critical crash rate, then the segment's crash history was higher than other road segments of similar function classification and context. Sections and intersections with a ratio of 1.0 or more were added to the HIN.

Exhibit 18 on page 58 provides a visual summary of the critical crash rate.

FIGURE 21. HIN DATA INPUTS

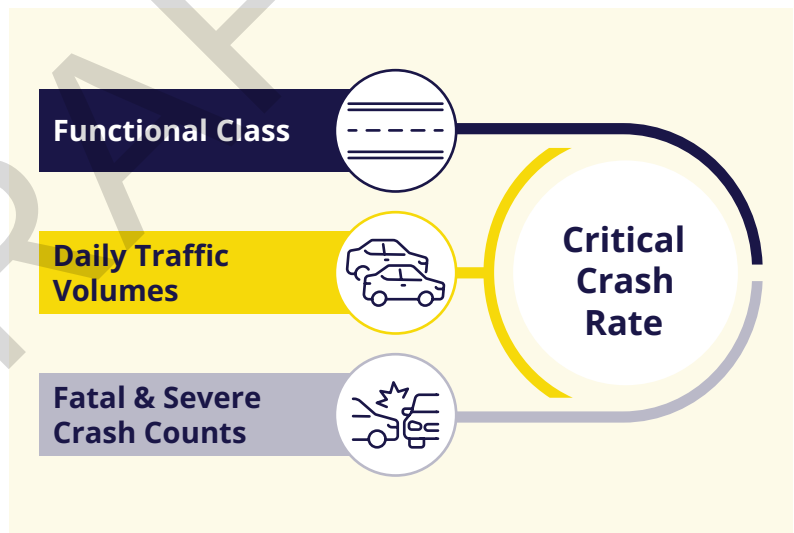
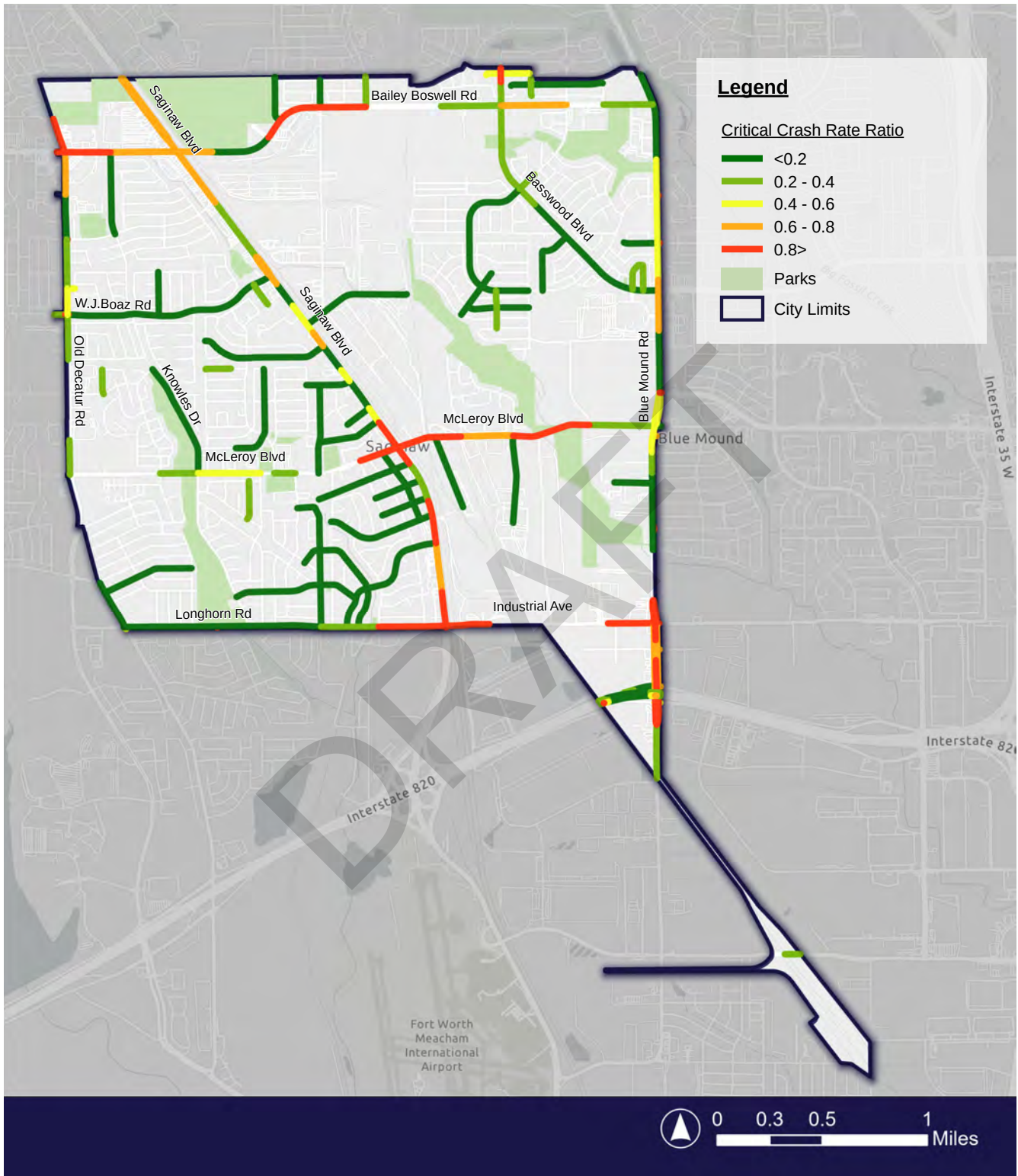




EXHIBIT 18. CRITICAL CRASH RATE RATIO RESULTS



Source: City of Saginaw, TxDOT*



HIGH INJURY NETWORK RESULTS

The HIN was created by selecting segments based on data-driven criteria and qualitative refinement of the model results. The goal of the HIN is to maximize the total number of vehicle-only KAB crashes and bicycle/pedestrian KAB crashes on the smallest percentage of City roads.

After the initial cleaning, the remaining segments were those with a KAB crash that occurred within the last five years and had a higher-than-expected crash rate. Not every segment experienced a KAB crash, however the influence area of crash typically bleeds over to adjacent segments. The gaps between high crash segments were filled to create coherent and continuous HIN segments.

After refining the calculated critical crash rates, the HIN for Saginaw was determined. The HIN consists of approximately 11.75 miles of the City's roadways while capturing 81.07% of the total crashes from the study period and 53.9% of KAB crashes from the study period. A summary of all segments included in the HIN is shown in **Table 19**, and a map of the City's High Injury Network is shown in **Exhibit 19** on page 60.

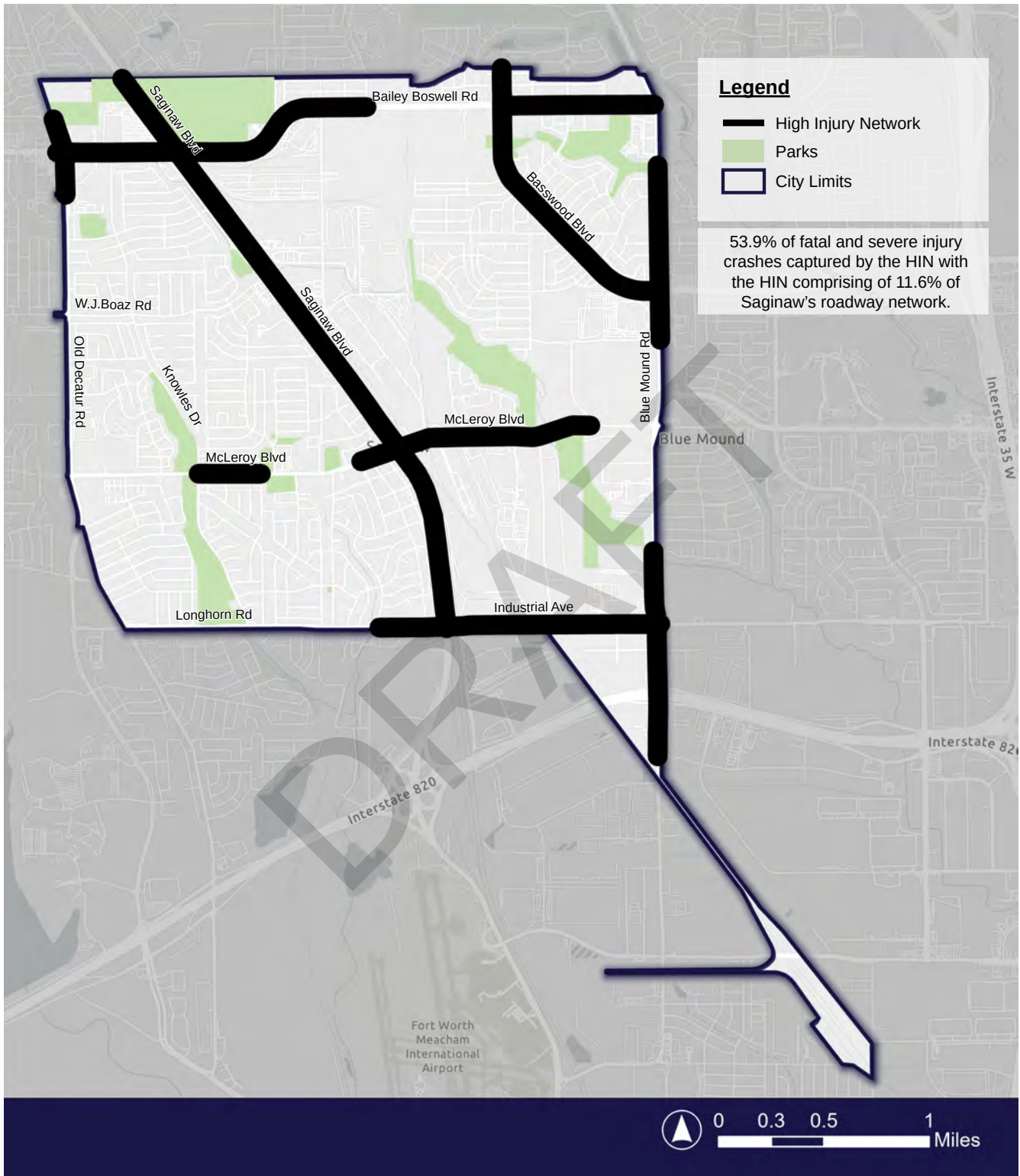
TABLE 19. HIN FACILITIES LIST

Corridor Name	From	To	Length (Miles)	Functional Class	K	A	B	Total
Saginaw Blvd	City Limits (north)	Longhorn Rd	3.10	Arterial	2	12	58	72
McLeroy Blvd	S Knowles Dr	Roberts Dr	0.30	Arterial	0	2	0	2
Old Decatur Rd	Saginaw Square Blvd	Bryson Ln	0.37	Arterial	0	1	5	6
W Bailey Boswell Rd	City Limits (west)	Comanche Springs Dr	1.55	Arterial	2	4	14	20
Black Ash Dr/ Basswood Blvd	City Limits (north)	Blue Mound Rd	1.45	Local/Collector	1	2	13	16
E Bailey Boswell Rd	Basswood Blvd	Blue Mound Rd	0.72	Arterial	1	0	5	6
Blue Mound Rd	Lazy Spur Blvd	Rough Rider Ln	0.83	Arterial	1	3	9	13
Blue Mound Rd	Independence Rd	Northeast Pkwy	0.98	Arterial	1	2	15	18
E Industrial Ave	Thompson Dr	City Limits (east)	1.34	Arterial	0	0	10	10
W McLeroy Blvd	Blue Bonnet St	Lavonne Ln	1.12	Arterial	0	2	17	19

K = Fatal A = Serious Injury B = Minor Injury



EXHIBIT 19. HIGH INJURY NETWORK



Source: City of Saginaw, TxDOT*

CHAPTER



5

COUNTERMEASURES & STUDY CORRIDORS

INTRODUCTION

This chapter highlights the countermeasures recommended to improve roadway safety within the community. A comprehensive list of strategies has been developed to address current and future safety concerns, as shown in **Table 20**. It is intended to serve as a tool that provides practical guidance when making road safety decisions. Accompanying the table, each countermeasure is explained in further detail, emphasizing its purpose and importance for implementation on Saginaw roadways. Additionally, in this chapter, the results of the safety audits on chosen study corridors are summarized. These field audits provided targeted safety countermeasures for specific corridors on the HIN.



SAFETY COUNTERMEASURE TOOLBOX

Countermeasures are physical interventions that Saginaw can use to make its roads safer. **Table 20** is the countermeasure toolbox, outlining the available countermeasures, with dots highlighting the critical safety emphasis area each is related to.

This chapter also introduces Crash Modification Factors (CMFs). If a CMF is less than 1, we can expect a reduction in crashes. Each countermeasure will have a CMF rating. These countermeasures can be implemented on any roads in Saginaw, but priority should be given to roads on the high-injury network discussed in **Chapter 4**.

TABLE 20. SAFETY COUNTERMEASURE TOOLBOX

Countermeasure	Lane Departures	Intersection Related	Unrestrained Persons	Impaired Driving	Speed Related	Distracted Driving	Bicycle & Pedestrian
20 MPH Speed Zones	-	-	✓	-	✓	-	✓
Appropriate Speed Limits	-	-	✓	-	✓	-	-
Bike Lanes	-	-	✓	✓	✓	✓	✓
Corridor Access Management	-	✓	-	-	-	-	-
Crosswalk Visibility Enhancements	-	✓	-	-	-	✓	✓
Curb Extensions	-	✓	-	-	✓	-	✓
Dedicated Left- and Right-Turn Lanes at Intersections	-	✓	-	-	-	-	-
Enhanced Delineation for Horizontal Curves	✓	-	-	-	✓	✓	-
Intersection Daylighting	-	✓	-	-	✓	✓	✓
Lighting	✓	✓	-	-	-	-	✓
Longitudinal Rumble Strips and Stripes on Two-Lane Roads	✓	-	✓	✓	✓	✓	-
Medians and Pedestrian Refuge Islands	-	-	✓	✓	✓	-	✓
Multi-use Trails	-	-	-	-	-	-	✓



TABLE 20. SAFETY COUNTERMEASURE TOOLBOX (CONTINUED)

Countermeasure	Lane Departures	Intersection Related	Unrestrained Persons	Impaired Driving	Speed Related	Distracted Driving	Bicycle & Pedestrian
Pedestrian Hybrid Beacons	-	-	-	-	✓	✓	✓
Raised Medians	✓	-	✓	✓	✓	-	-
Rectangular Rapid Flashing Beacons (RRFB)	-	✓	-	-	-	-	✓
Reduced Left-Turn Conflict Intersections	-	✓	-	-	-	-	-
Retroreflective Backplates	-	✓	-	✓	-	-	-
Roadway Reconfiguration	✓	✓	✓	-	✓	-	-
Roundabouts	-	✓	-	-	✓	-	-
Sidepaths	-	-	-	-	-	-	✓
Sidewalks	-	-	-	-	-	-	✓
Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections	-	✓	✓	-	✓	✓	-
Wider Edge Lines	✓	-	-	✓	-	-	-
Yellow Change Intervals	-	✓	-	-	✓	-	-



COUNTERMEASURES

20 MPH SPEED ZONES



Description

20 mph speed zones are suitable for low-traffic streets where drivers are likely to encounter pedestrians and cyclists (**Figure 22**).



Benefits

- 20 mph speed zones reduce the risk of serious injuries and fatal crashes, supporting Vision Zero initiatives
- A vehicle moving at 20 miles per hour has only a 5% likelihood of causing serious injury or death to a pedestrian if a collision occurs.



Implementation & Design Considerations

- Posted speed limits typically match the legislative statutory speed limit, but local authorities can establish non-statutory speed limits or create reduced speed zones.
- Non-statutory speed limits should be determined through an engineering study in accordance with the guidelines set by the Manual on Uniform Traffic Control Devices (MUTCD).

FIGURE 22. 20 MPH SPEED ZONES



Safety Emphasis Area:

- Unrestrained Persons
- Speed Related
- Bicycle & Pedestrian



APPROPRIATE SPEED LIMITS



Description

Speed limit signs comply with state law, but agencies and municipalities can set lower speed limits or designate reduced-speed zones (**Figure 23**). Roadway experts agree that speed control is one of the most significant ways to reduce fatal and serious injury crashes.



Benefits

- A driver going 30 miles per hour has a 20% chance of causing fatal or serious injury to a pedestrian. Reducing the speed limit by 10 miles per hour to 20 miles per hour decreases this risk to 8%.



Implementation & Design Considerations

- Useful for roadways with high pedestrian or active transportation volumes.
- Implementation is recommended in residential areas with roadways that experience significant speeding issues or speed related crashes.

FIGURE 23. APPROPRIATE SPEED LIMITS



CMF Value: 0.95 | **CMF ID:** [6885](#)

Crash Type: All

Safety Emphasis Area:

- Unrestrained Persons
- Speed Related



BIKE LANES



Description

A bike lane is a designated part of the road reserved for bicycles, typically marked with pavement signs or markings (**Figure 24**). These lanes provide a specific space for cyclists, enhancing safety by reducing interactions with vehicles. Additionally, they promote cycling as a preferred mode of transportation.



Benefits

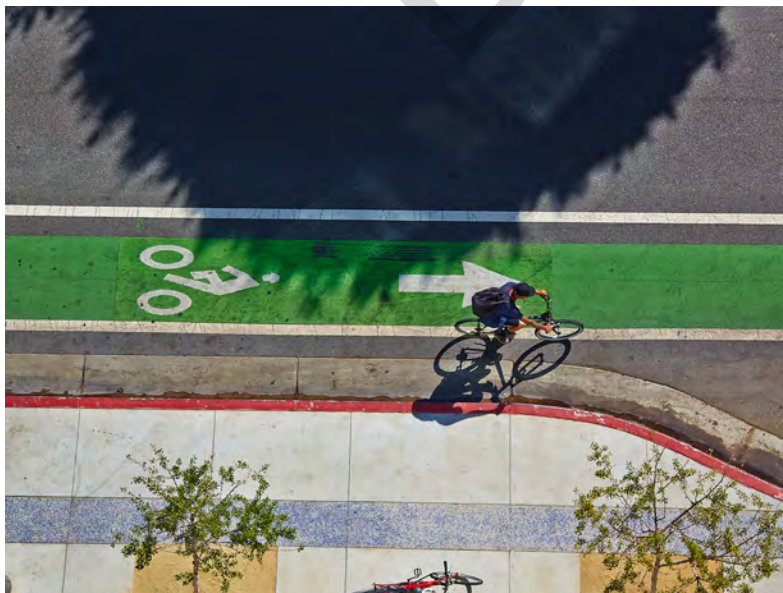
- In urban areas, bike lanes can decrease total crashes by as much as 49% on four-lane undivided collectors and local roads, or by 30% on two-lane undivided collectors and local roads (FHWA).
- Cyclists can continue riding at a comfortable speed, even as vehicular traffic slows down in adjacent lanes.
- Buffered bicycle lanes create extra space for passing between cyclists.



Implementation & Design Considerations

- Use FHWA's Bikeway Selection Guide and the Incorporating On-Road Bicycle Network into Resurfacing Projects to identify the best facility based on roadway and land-use context.
- Recommended on streets where the speed limit is 25–40 MPH, and traffic volumes are less than 9,000.
- Recommended to be 6 feet or larger in width.
- A solid white line, typically 6-8 inches wide, marks the boundary between the bicycle lane and the vehicle lane.
- The bike lane symbol and signage clarify the lane's purpose and help prevent illegal parking.
- When parking is nearby, expand the buffer width or add extra buffer space to lower the chance of door zone conflicts.
- The buffer may consist solely of two white lines or include crosshatching between them.

FIGURE 24. BIKE LANE



CMF Value: 0.468 | **CMF ID:** [11296](#)

Crash Type: Vehicle/Bicycle

Safety Emphasis Area:

- Unrestrained Persons
- Impaired Driving
- Speed Related
- Distracted Driving
- Bicycle & Pedestrian



CORRIDOR ACCESS MANAGEMENT



Description

Access management controls entry and exit points along a corridor through strategic roadway design, as shown in **Figure 25**. This includes intersections and driveways serving adjacent properties. Strategies include appropriate spacing of intersections and the installation of protected turn lanes. Driveways located too close to an intersection can create conflict points and increase the risk of crashes. However, closing, relocating, or condensing driveways can reduce fatal and injury crashes along arterials by 25%–31%.



Benefits

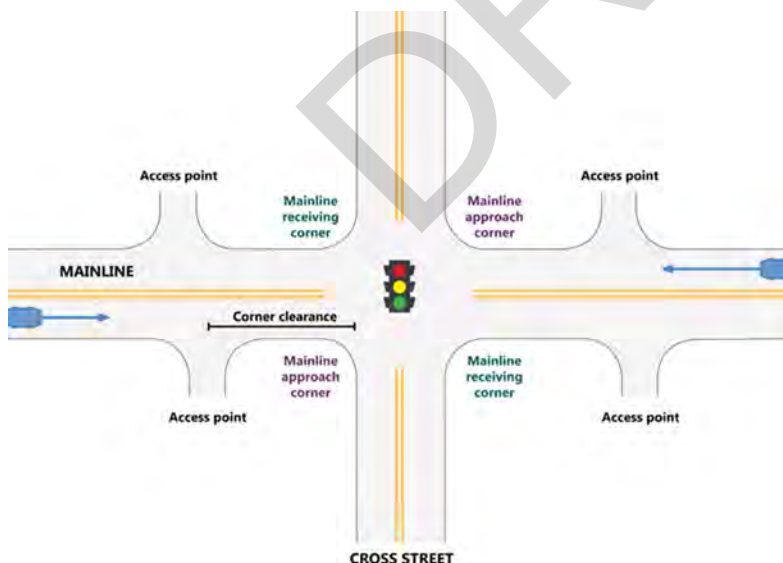
- When consolidating driveways to reduce the overall number of turning movements, it reduced the points of conflict.
- Narrower driveways allow for better sight distance, because drivers slow as they turn.
- Restricting left-turning movements with right-in/right-out tactics reduces potential conflicts.



Implementation & Design Considerations

- Most appropriate in areas with high pedestrian volumes, turning volumes, and access points.
- Commercial driveways should have crosswalks, particularly in busy pedestrian zones.
- Limit fragmentation of sidewalks; therefore, make sidewalks continuous across driveways.
- The driveway should be at least as wide as the width needed for entering and exiting vehicles.

FIGURE 25. CORRIDOR ACCESS MANAGEMENT



Source: FHWA



CMF Value: 0.93 | **CMF ID:** [442](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related



CROSSWALK VISIBILITY ENHANCEMENTS



Description

Enhanced crosswalk visibility measures include high-visibility markings, raised crosswalks, mid-block crossings, and elevated intersections (**Figure 26**). These markings utilize inlay or thermoplastic tape patterns that are easily seen by both drivers and pedestrians from afar. Improved lighting, with a focus on positive contrast, enhances pedestrian visibility by installing luminaries in forward positions. Additionally, better signage and pavement markings provide advanced warning to drivers of upcoming pedestrian crosswalks.



Benefits

- Help reduce vehicle speed.
- High-visibility crosswalks can reduce pedestrian injury crashes by 40%.
- Increase visibility of pedestrians as they enter the crosswalk.
- Functionality and accessibility are also improved when raised crosswalks and intersections are at-grade with connecting sidewalks.



Implementation & Design Considerations

- Most effective near schools and high pedestrian areas. Here, ladder crosswalks are preferred.
- Crosswalks only need to be marked if they are not level with the sidewalk; ADA-compliant ramps and detector strips are still necessary.
- For multi-lane roadway mid-block crossings with vehicle volumes exceeding 10,000, a marked crosswalk alone is typically insufficient, and traffic control is necessary.

FIGURE 26. CROSSWALK VISIBILITY ENHANCEMENTS



CMF Value: 0.732 | **CMF ID:** [8967](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related
- Distracted Driving
- Bicycle & Pedestrian



CURB EXTENSIONS



Description

Bulb-outs, or curb extensions, modify the curb line at intersections with paint, flexible delineators, or concrete to make the intersection physically and visually appear narrower and more pedestrian-friendly (**Figure 27**).



Benefits

- Reduces the distance pedestrians need to cross and promotes slower vehicle speeds.
- Creates opportunities for placemaking by providing space for public art across the extended area.



Implementation & Design Considerations

- Most effective in areas where lower speeds are desired and in areas with high pedestrian traffic.
- Can be easily constructed using low-cost materials such as paint, flex posts, and rubber speed cushions.

FIGURE 27. CURB EXTENSIONS



Source: pedbikeimages.org | Dan Burden



Safety Emphasis Area:

- Intersection Related
- Speed Related
- Bicycle & Pedestrian



DEDICATED LEFT- AND RIGHT-TURN LANES AT INTERSECTIONS



Description

Auxiliary turn lanes for right or left turns create space for vehicles to slow down or stop without disrupting the flow of traffic. They reduce delays and improve safety by physically separating vehicles turning from moving traffic. An example of dedicated left- and right-turn lanes at an intersection is shown in **Figure 28**.



Benefits

- Dedicated right turn lanes can reduce crashes by 14%–26%.
- Dedicated left- and right-turn lanes can reduce total crashes by up to 28% to 43% at two-way stop-controlled intersections.



Implementation & Design Considerations

- Most appropriate at intersections with high crash frequency due to abrupt stops from cars turning.
- Intersections with a high frequency of rear-end crashes.
- Consider offsetting auxiliary lanes to improve safety. Offsets increase sight distance for approaching vehicles that conflict with the turning movement.

FIGURE 28. DEDICATED LEFT- AND RIGHT-TURN LANES AT INTERSECTIONS



CMF Value: 0.72; 0.74; 0.86;
Offset: 0.644 | **CMF ID:** [260](#), [289](#),
[285](#), Offset: [6096](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related



ENHANCED DELINEATIONS FOR HORIZONTAL CURVES



Description

To help drivers navigate a curve safely, a variety of strategies can be used before and during the curve. Enhanced delineation for horizontal curves includes pavement markings, in-curve warning markings, retroreflective strips on signposts, and chevron signs like the ones displayed in **Figure 29**. These help catch the driver's attention, indicate where the curve is and which direction it takes, and help them maintain proper lane position.



Benefits

- Some enhanced delineation for horizontal curves can reduce fatal and injury crashes by up to 60%.
- Can enhance driver awareness and response in low-visibility conditions or inclement weather.



Implementation & Design Considerations

- One of the most effective measures is Sequential Dynamic Chevrons.
- Visibility can be further improved by upgrading to larger and reflective signs.

FIGURE 29. ENHANCED DELINEATION FOR HORIZONTAL CURVES



CMF Value: 0.75; 0.82 |
CMF ID: [2439](#), [2432](#)

Crash Type: Nighttime; Run off road

Safety Emphasis Area:

- Lane Departures
- Speed Related
- Distracted Driving



INTERSECTION DAYLIGHTING



Description

Intersection daylighting involves removing vehicle parking within 20–25 feet of an intersection to enhance visibility for drivers and make it easier to see pedestrians at crossings (**Figure 30**).



Benefits

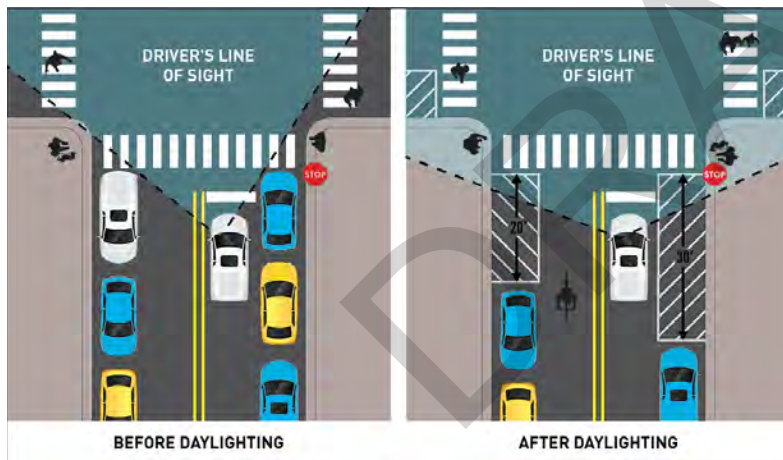
- Improves visibility of pedestrians, cyclists, and other drivers in approaching vehicles.
- This new space can allow for curb extensions and or bike racks.



Implementation & Design Considerations

- Intersection sight line standards should be determined by target speeds instead of 85th-percentile design speeds.
- Remove parking within 20–25 feet of intersection to daylight intersections.
- Recommended to position street trees 3 feet from the curb return and 5 feet from the nearest stop sign.
- Major intersections need to be well-lit to maintain pedestrian visibility.

FIGURE 30. INTERSECTION DAYLIGHTING



Source: SDOT



Safety Emphasis Area:

- Intersection Related
- Speed Related
- Distracted Driving
- Bicycle & Pedestrian



LIGHTING



Description

Quality lighting is crucial for enhancing roadway safety for all users. It not only improves safety but also offers personal security benefits for pedestrians and other non-vehicle users traveling along and across roads. Increased lighting can be added at intersections or along corridors. Lighting fixtures come in various forms, from functional LED lights at intersections to decorative fixtures (**Figure 31**).



Benefits

- Up to 28% of nighttime injury crashes on rural and urban highways can be reduced by increasing lighting.



Implementation & Design Considerations

- Unlit or poor lighted roadways
- Areas with high bicycle or pedestrian usage.
- Areas that would feel dark and unsafe for non-motorized traffic.

FIGURE 31. LIGHTING



CMF Value: 0.68 | **CMF ID:** [7776](#)

Crash Type: All

Safety Emphasis Area:

- Lane Departure
- Intersection Related
- Bicycle & Pedestrian



LONGITUDINAL RUMBLE STRIPS AND STRIPES ON TWO-LANE ROADS



Description

Longitudinal rumble strips are grooves or raised patterns milled into the roadway surface that alert the driver through vibration and sound if they begin to shift outside of their lane (**Figure 32**). The rumble strips are placed on the shoulder, edge, or near the centerline of an undivided roadway.



Benefits

- Can reduce head-on fatal and injury crashes by 44% to 64% on two-lane roads.
- Can lead to a 17% reduction of all crashes.



Implementation & Design Considerations

- Helpful in areas where a high contributing factor for crashes is failing to drive in a single lane.
- Useful on undivided, straight roadways with high posted speed limits.

FIGURE 32. LONGITUDINAL RUMBLE STRIPS AND STRIPES ON TWO-LANE ROADS



CMF Value: 0.66 | **CMF ID:** [138](#)

Crash Type: All

Safety Emphasis Area:

- Lane Departures
- Unrestrained Person
- Impaired Driving
- Speed Related
- Distracted Driving



MEDIANS AND PEDESTRIAN REFUGE ISLANDS



Description

There is a variety of median types in urban and suburban settings, including pavement markings, raised areas, or islands to separate motorized and non-motorized users (**Figure 33**). Some medians serve a dual purpose: separating opposing traffic and providing a refuge for pedestrians. Pedestrian refuge islands are medians that provide a safe place for pedestrians to pause when crossing busy roads. These median refuge islands enhance safety at both uncontrolled and controlled crossings, allow pedestrians to cross busy roadways in 2 stages, and enable them to proceed at a slower pace.



Benefits

- Medians with a marked crosswalk can reduce pedestrian crashes by 56%.
- Pedestrian refuge islands can reduce pedestrian crashes by 56%
- Using both medians and pedestrian refuges improves overall safety and accessibility for pedestrians.



Implementation & Design Considerations

- Consider the design needs of vehicles (passenger car, bus, or truck), and ensure that refuge space meets ADA requirements, with a recommended width of 4–8 feet.
- Can create these with low-cost materials like paint, flex posts, and rubber speed cushions.

FIGURE 33. MEDIAN AND PEDESTRIAN REFUGE ISLAND



Source: pedbikeimages.org | Dan Burden



CMF Value: 0.58 | **CMF ID:** [10985](#)

Crash Type: All

Safety Emphasis Area:

- Unrestrained Persons
- Impaired Driving
- Speed Related
- Bicycle & Pedestrian



MULTI-USE TRAILS



Description

Multi-use trails are paths designed for different types of non-motorized traffic (**Figure 34**). These trails offer a low-stress facility separate from motor vehicles for cyclists, pedestrians, and other active users.



Benefits

- Provides a facility for people of all ages and abilities to go.
- Promotes transportation benefits for functional, recreational, and tourism uses.



Implementation & Design Considerations

- Multi-use trails have a recommended 10' minimum width.
- For high-usage trails, recommend a minimum width of 12–14' and consider adding a center strip to promote safe delineation between users.

FIGURE 34. MULTI-USE TRAILS



Safety Emphasis Area:

- Bicycle and Pedestrian



PEDESTRIAN HYBRID BEACONS



Description

A pedestrian hybrid beacon (PHB) is a traffic control device that helps pedestrians cross higher-speed roads safely at midblock locations and uncontrolled intersections (**Figure 35**). The traffic device stays dark until a user activates it to cross. After activation, the signal transitions from yellow to red during the walk phase.



Benefits

- Implementation of PHBs can reduce pedestrian crashes by 55%.



Implementation & Design Considerations

- PHBs are great candidates for situations with three or more lanes to cross or when traffic volumes are above 9,000.
- Typically intended for installation at midblock locations, but can also be installed at intersections.
- Strongly recommended for all midblock and intersection crossings where the roadway speed limit is 40 mph or higher.
- When PHBs are unfamiliar to a community, agencies and other government departments should launch educational campaigns to ensure proper use.

FIGURE 35. PEDESTRIAN HYBRID BEACON



CMF Value: 0.453 | **CMF ID:** [9020](#)

Crash Type: Vehicle/Pedestrian

Safety Emphasis Area:

- Speed Related
- Distracted Driving
- Bicycle & Pedestrian



RAISED MEDIANS



Description

Raised medians' primary use is to separate opposing traffic (**Figure 36**). Additionally, raised medians provide storage space for left turn vehicles and provide access control to and from minor access driveways and intersections. While raised medians primarily intend to mitigate vehicle movements, they also present the distinct opportunity to provide pedestrian refuge areas to make crossing large roadways safer and more comfortable for pedestrians and bicyclists.



Benefits

- Medians significantly reduce the number of left turn crashes which are some of the most serious crashes
- Converting two-way left turn lanes to raised medians reduces vehicle crashes by an estimated 27%
- Increase throughput capacity on corridors and reduce delays.



Implementation & Design Considerations

- Utilized where it is desirable to control or restrict mid-block left turns and crossing maneuvers.
- High-speed limit roads without an established median.
- When determining the median width, consideration should be given to the demand for U-turn movements based on local access requirements.

FIGURE 36. RAISED MEDIANS



CMF Value: 0.29 | **CMF ID:** [2219](#)

Crash Type: All

Safety Emphasis Area:

- Lane Departures
- Unrestrained Persons
- Impaired Driving
- Speed Related



RECTANGULAR RAPID FLASHING BEACONS (RRFB)



Description

A rectangular rapid flashing beacon (RRFB) is a pedestrian-activated traffic control device placed at crosswalks to enhance visibility and warn drivers of crossing pedestrians (**Figure 37**). When turned on, the RRFB flashes lights rapidly in an alternating pattern, prompting drivers to yield to pedestrians crossing the street.



Benefits

- Increased visibility for active users when crossing the roadway.
- RRFBs can achieve motorist yielding rates up to 98% at marked crosswalks, regardless of varying speed limits, crossing distances, and lanes.



Implementation & Design Considerations

- Ideal for multi-lane intersections with speed limits under 40 mph and traffic volumes up to 15,000, depending on the number of lanes and posted speed.
- Should be placed at each end of the crosswalk. An RRFB should also be placed on the median if there is a pedestrian refuge island.
- RRFBs can be wired or powered by standalone solar panels.

FIGURE 37. RECTANGULAR RAPID FLASHING BEACON



Source: pedbikeimages.org | Michael Fredrick



CMF Value: 0.31 | **CMF ID:** [11158](#)

Crash Type: Vehicle/Pedestrian

Safety Emphasis Area:

- Intersection Related
- Bicycle & Pedestrian



REDUCED LEFT-TURN CONFLICT INTERSECTIONS



Description

To simplify drivers' decision-making and minimize the risk of severe crashes, such as head-on collisions, installing reduced-left-turn conflict intersections is a great option. These intersections are geometric designs that alter left-turn movements, typically by redirecting drivers to make a U-turn at a designated location (**Figure 38**).



Benefits

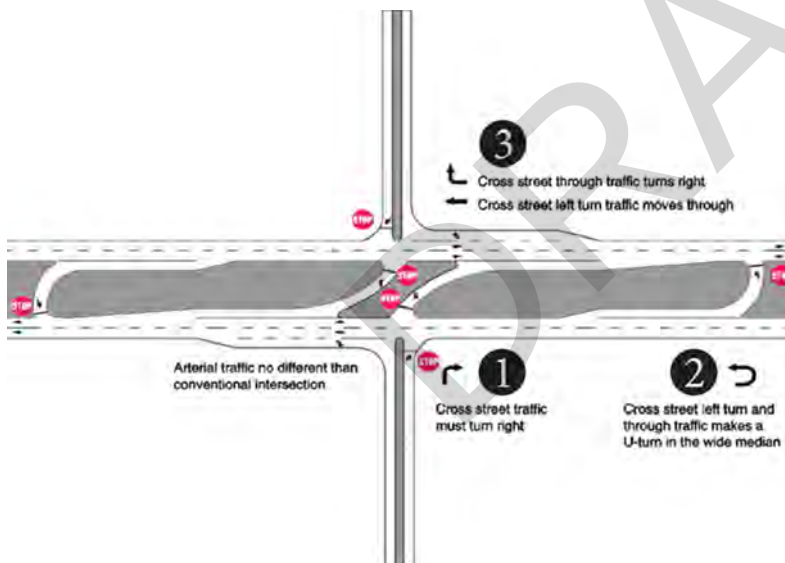
- This reduced-left-turn conflict, or RCUT intersection, has been shown to reduce fatal and injury crashes by up to 54%.



Implementation & Design Considerations

- Areas with a high percentage of angled crashes.

FIGURE 38. REDUCED LEFT-TURN CONFLICT INTERSECTIONS



Source: FHWA



CMF Value: 0.7029 | **CMF ID:** [10867](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related



RETROREFLECTIVE BACKPLATES



Description

A 1–3 inch yellow retroreflective border around a traffic signal is called a retroreflective backplate (**Figure 39**). By illuminating the border to increase contrast with the surrounding area, this additional design element improves the visibility of the traffic signal. These backplates lead to improvements in both daytime and night-time conditions.



Benefits

- Retroreflective backplates can reduce total crashes by 15%.



Implementation & Design Considerations

- Most appropriate when upgrading outdated traffic signals and at high-volume traffic intersections.

FIGURE 39. RETROREFLECTIVE BACKPLATES



CMF Value: 0.85 | **CMF ID:** [1410](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related
- Impaired Driving



ROADWAY RECONFIGURATION



Description

Roadway reconfiguration usually involves a lane reduction, such as converting an existing four-lane roadway to a three-lane roadway, as seen in **Figure 40**. This strategy can enhance safety, calm traffic, and make the roadway more accessible to all users, including pedestrians and cyclists. Implementing roadway reconfiguration can allow for more complete streets by adding bike lanes and sidewalks.



Benefits

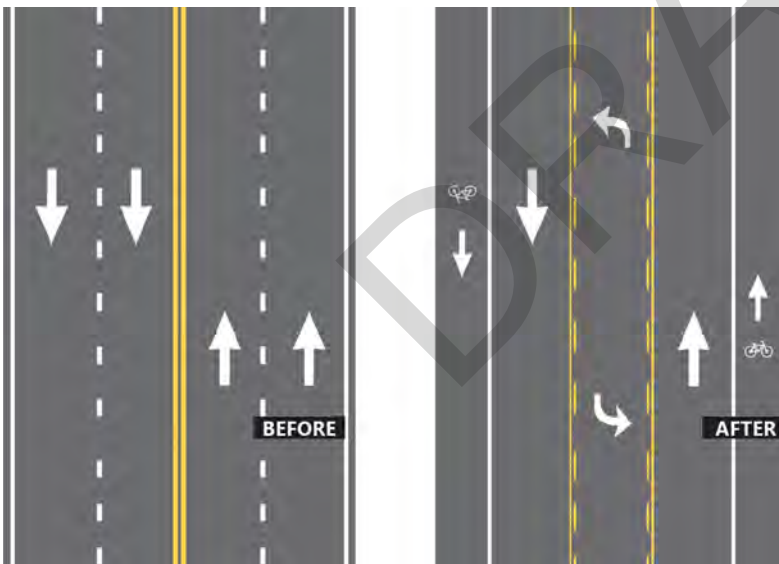
- Complete streets contribute to a higher quality of life.
- Total crashes can be reduced by up to 47% in four-lane to three-lane roadway conversions.



Implementation & Design Considerations

- Most effective at roadways with low traffic volumes and areas with high rates of active transportation.

FIGURE 40. ROADWAY RECONFIGURATION



Source: FHWA



CMF Value: 0.812 | **CMF ID:** [5554](#)

Crash Type: All

Safety Emphasis Area:

- Lane Departures
- Intersection Related
- Unrestrained Persons
- Speed Related



ROUNDBABOUTS



Description

A roundabout is a circular intersection where traffic moves continuously around a central island (**Figure 41**). Vehicles entering the roundabout yield to those already inside. Roundabouts help improve traffic flow. Compared to traditional intersections, they enhance overall safety due to fewer points of conflict, reduced vehicle speeds, and left turn crashes.



Benefits

- Installation of roundabouts can lead to a 78% to 82% reduction in fatal and injury crashes.



Implementation & Design Considerations

- Most effective where traffic flows are balanced on all approaches.
- Most effective in primarily residential areas where the daily vehicle volume on all approach legs of the intersection is less than 3,500, with speeds under 30 mph.
- Always mark where pedestrians should cross with crosswalks and consider larger crosswalk widths.
- If there are high pedestrian volumes, install Rapid Rectangular Flashing Beacons (RRFBs).

FIGURE 41. ROUNDBABOUTS



CMF Value: 0.22 | **CMF ID:** [226](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related
- Speed Related



SIDEPATHS



Description

Sidepaths accommodate both cyclists and pedestrians in both directions. They are separated from the roadways and are positioned either adjacent to or parallel to them (**Figure 42**).



Benefits

- Sidepaths create an environment where users of all ages and abilities feel comfortable engaging in their activities, something an on-street mobility option doesn't always provide.



Implementation & Design Considerations

- Recommended minimum width is 10' with 2' of clearance from nearby signposts or vertical elements.
- Recommended 5' minimum separation from roadway.
- Most effective application adjacent to roadways with traffic volumes over 4,000, unless speeds are over 40 MPH.

FIGURE 42. SIDEPATHS



Source: pedbikeimages.org | Dan Burden



Safety Emphasis Area:

- Bicycle and Pedestrian



SIDEWALKS



Description

Sidewalks are clearly designated paths beside roads intended for pedestrian use (**Figure 43**). They create a secure space separate from vehicle traffic, improving pedestrian safety by lowering the risk of vehicle collisions. Sidewalks encourage walking as a mode of transportation and provide accessible routes for all ages and abilities. Providing a buffered space for pedestrians increases their safety.



Benefits

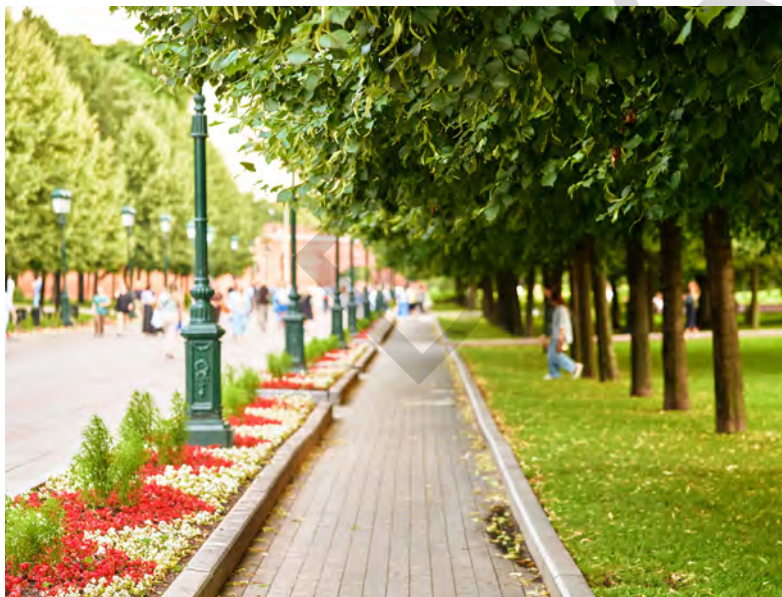
- Can reduce pedestrian-related crashes along active roadways by 89%.
- Can improve pedestrian comfort and boost walkability, particularly in mixed-use zones.
- Can help strengthen local communities and increase economic activity.



Implementation & Design Considerations

- Can be constructed with low-cost materials such as paint, flex posts, and rubber speed cushions.
- A width of 7 feet is recommended in high pedestrian-activity areas.
- Consider roadway width, traffic volumes, road speeds, drainage needs, impacts on street parking, slopes, and driveways.

FIGURE 43. SIDEWALKS



CMF Value: 0.598 | **CMF ID:** [11246](#)

Crash Type: Vehicle/Pedestrian

Safety Emphasis Area:

- Bicycle & Pedestrian



SYSTEMIC APPLICATION OF MULTIPLE LOW-COST COUNTERMEASURES AT STOP-CONTROLLED INTERSECTIONS



Description

This strategy to improve safety at stop-controlled intersections involves implementing a set of affordable measures, such as improved signage and pavement markings (**Figure 44**). This approach can increase driver awareness and recognition of intersections and potential conflicts.



Benefits

- Application of low-cost countermeasures at stop-controlled intersections can reduce fatal and injury crashes by 10% for all locations, intersection types, and areas.



Implementation & Design Considerations

- Best locations to implement low cost improvements are at stop-controlled intersection with signs and pavements that are missing or faded.

FIGURE 44. SYSTEMIC APPLICATION OF MULTIPLE LOW-COST COUNTERMEASURES AT STOP-CONTROLLED INTERSECTIONS



CMF Value: 0.853 | **CMF ID:** [8870](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related
- Unrestrained Persons Related
- Speed Related
- Distracted Driving



WIDER EDGE LINES



Description

Pavement markings placed along the outer edges of lanes to help drivers clearly identify the road's alignment ahead are called edge lines (**Figure 45**). Increasing the width of these lines from the standard 4 inches to 6 inches can enhance lane visibility and provide better guidance for drivers, especially in low-visibility conditions.



Benefits

- Wider edge lines can reduce fatal and injury crashes by 22% on more rural roadways.



Implementation & Design Considerations

- Best used on roadways with a high frequency of crashes involving running off the road and sideswiping.
- Implementation is recommended where no curb exists
- If edge lines currently exist but are faded, it is recommended to re-stripe with wider edge lines to increase visibility.

FIGURE 45. WIDER EDGE LINES



CMF Value: 0.635 | **CMF ID:** [4737](#)

Crash Type: All

Safety Emphasis Area:

- Lane Departures
- Impaired Driving



YELLOW CHANGE INTERVALS



Description

The yellow change interval indicates how long the yellow light stays on after the green light (**Figure 46**). Proper timing of this interval is essential for safety, as it allows drivers enough time to stop safely without accelerating through the yellow-to-red light transition. Running red lights is a leading cause of crashes and fatalities at intersections. Well-timed yellow clearance intervals help reduce crashes and lead to appropriate speed management at signalized intersections.



Benefits

- When a yellow change interval is timed properly, it can reduce red light running by 36–20%.



Implementation & Design Considerations

- Implementation should be considered at signalized intersections that currently experience a high rate of red-light running.

FIGURE 46. YELLOW CHANGE INTERVALS



CMF Value: 0.92 | **CMF ID:** [380](#)

Crash Type: All

Safety Emphasis Area:

- Intersection Related
- Speed Related



STUDY CORRIDORS & TARGETED RECOMMENDATIONS

As part of the CSAP, 5 miles of the City's HIN were selected for roadway safety audits (RSA). These audits are meant to identify targeted recommendations for the City to implement based on crash history and observed existing conditions. This section will summarize the existing conditions, crash history, corridor recommendations, and intersection recommendations for each study corridor.

STUDY CORRIDORS

From the City's High Injury Network, 6 segments were selected as study corridors and received a roadway safety audit. The locations of the chosen study corridors are shown in **Exhibit 20** on page 95. The RSAs will identify target recommendations that are meant to improve safety for all users in the City. **Table 21** lists the segments selected for further study.

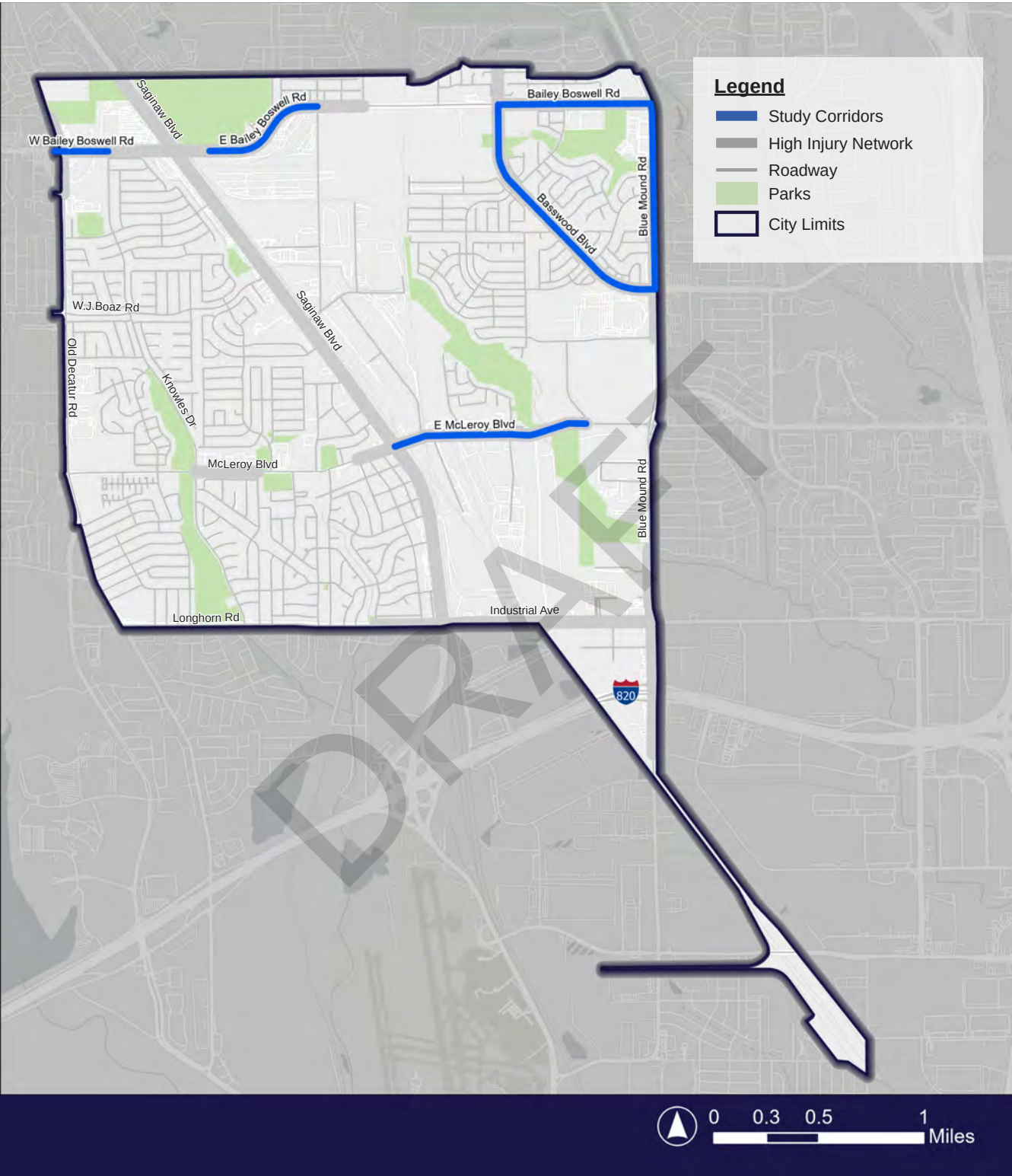
TABLE 21. STUDY CORRIDORS

Corridor Limits	Length (mi.)	Functional Class	Total Crashes	K	A	B
W. Bailey Boswell Rd. from Old Decatur Rd. to Knowles Dr.	0.25	Other Principal Arterial	115	0	1	6
E. Bailey Boswell Rd. from Millstone Rd. to Jarvis Rd.	0.60	Minor Arterial	37	1	1	4
E. Bailey Boswell Rd. from Basswood Blvd. to Blue Mound Rd.	0.73	Minor Arterial	41	1	0	5
Basswood Blvd. from Blue Mound Dr. to E. Bosswell Rd.	1.27	Minor Collector	68	0	1	11
Blue Mound Rd. from E. Bailey Boswell Rd. to Basswood Blvd.	0.90	Minor Arterial	60	1	1	8
E. McLeroy Blvd. from Saginaw Blvd. to Lavonne Ln.	0.93	Minor Arterial	112	0	2	15

K = Fatal A = Serious Injury B = Minor Injury



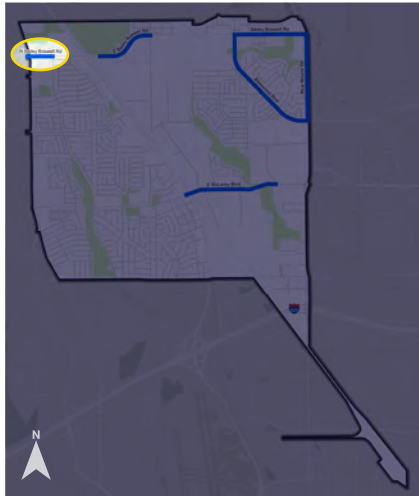
EXHIBIT 20. STUDY CORRIDORS



Source: City of Saginaw, TxDOT*



W. BAILEY BOSWELL ROAD | OLD DECATUR ROAD TO KNOWLES DRIVE



Context

The W. Bailey Boswell Road segment from Old Decatur Road to Knowles Drive is 0.25 miles long. Along this segment, the roadway is 6-lanes, divided with a speed limit of 35 MPH. The roadway is a principal arterial in the City and hosts several retail facilities, such as Kroger, Walmart, fast food businesses, and several medical offices. While the west end of the corridor is primarily commercial, Wayside Middle School is located on the corridor. Additionally, towards the east end of the corridor, residential properties begin to back up onto the corridor. While the corridor is short, it brings unique safety challenges due to the number of key destinations between two heavily used traffic signals.



Crash History

This segment of W. Bailey Boswell Road experienced

115

crashes during the study period (2021–2025)

0

fatal crashes (K)

1

suspected serious
injury crash (A)

6

suspected minor
injury crashes (B)

Top manners of collisions include 'Angle – Both Going Straight', 'Opposite Direction – One Straight – One Left Turn', 'Same Direction – One Straight – One Stopped' (Rear-end), 'Same Direction – Sideswipe' **which indicate issues at intersections**. These crash types usually occur at intersections because of unsafe turning movements and frequent stopping and going. Additionally, two of the top contributing factors on the corridor are 'Driver Inattention' and 'Failed to Yield Right of Way – Turning Left'.



Intersection Recommendations

Old Decatur Road

- Install high visibility crosswalks (all approaches)
- Install flashing yellow arrow signal
- Install retroreflective backplates
- Refresh Pavement Markings
- Upgrade curb ramp to be ADA-compliant, directional curb ramps (southeast corner of intersection)
- Upgrade intersection lighting
- Repair Sidewalk (southeast corner of intersection)
- Install “No U-Turn” signage on the median of the eastbound approach
- Install “No Right on Red” signage (northbound approach)
- Repair Signpost (southwest corner of intersection)

N. Knowles Drive

- Install high visibility crosswalks (all approaches)
- Install retroreflective backplates

Spot Recommendations

- Trim vegetation near the Ballard Family Dentistry driveway
- Install east- and westbound hooded left turn lanes at Wayside Middle School’s northeast driveway
- Install a left-turn storage lane for the median opening at Wayside Middle School’s northwest driveway

A summary of existing conditions and crash statistics for W. Bailey Boswell Road are in **Exhibit 21** on page 93. All recommendations are shown in **Exhibit 22** on page 94.



EXHIBIT 21. W. BAILEY BOSWELL ROAD SUMMARY SHEET

W. BAILEY BOSWELL ROAD

FROM OLD DECATUR ROAD TO KNOWLES DRIVE

EXISTING CONDITIONS

- Other Principal Arterial
- 6-lane divided
- Total Volume: 20,000
- 0.25 mile segment with several retail facilities
- Wayside Middle School located at the Old Decatur Rd. intersection

CRASH SUMMARY

- 115** Total Crashes
- 80** Intersection Related Crashes
- 0** Fatal Crashes
- 1** Suspected Serious Injury Crashes
- 6** Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

- Driver Inattention
35%
- Failed to Yield ROW – Turning Left
22%
- Changed Lane When Unsafe
14%
- Failed to Yield ROW – Stop Sign
14%

MANNERS OF COLLISION

- Opposite Direction – One Straight – One Left Turn
34%
- Angle – Both Going Straight
22%
- Same Direction – One Straight – One Stopped
18%
- Same Direction – Sideswipe
16%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users
(Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



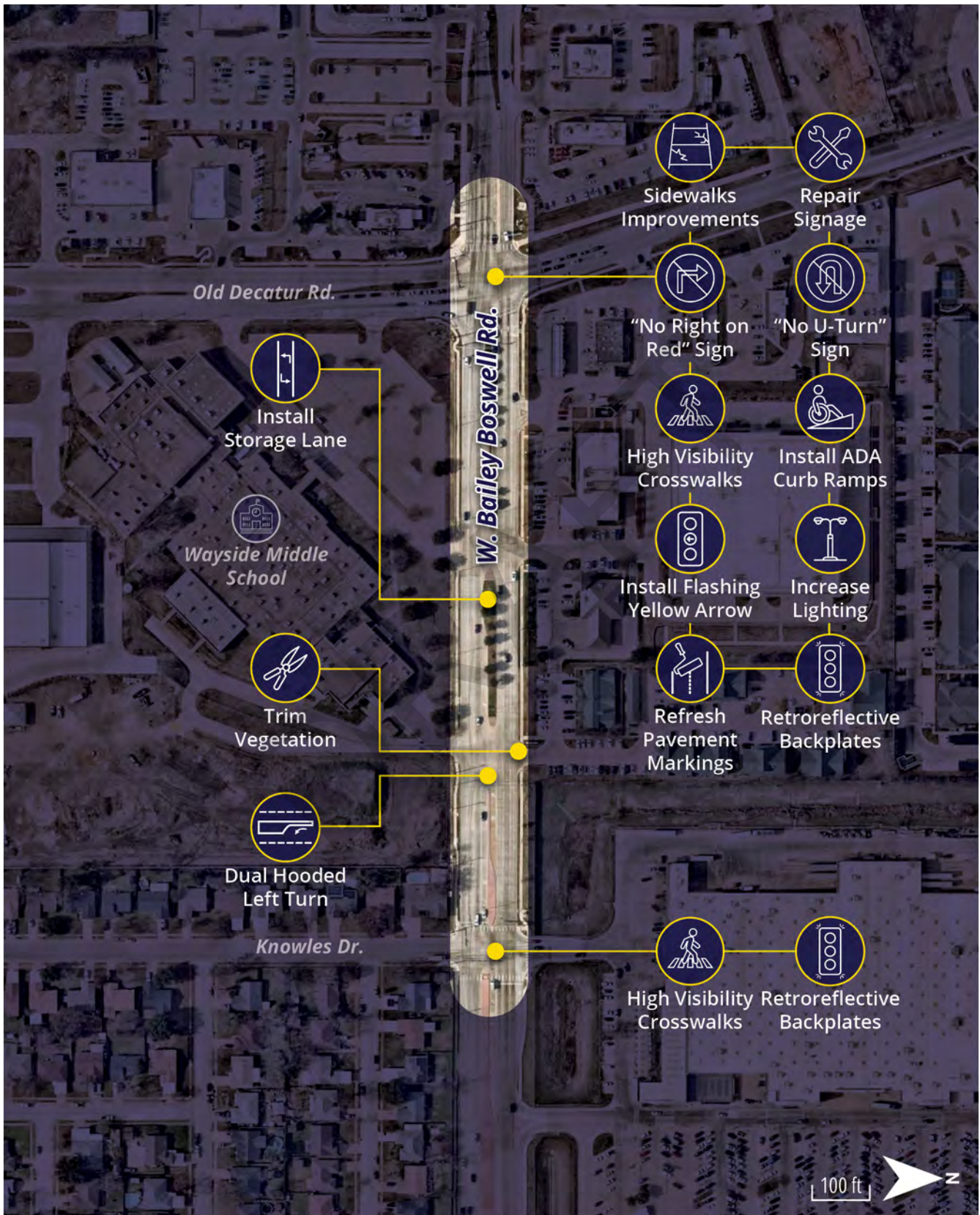
Distracted Driving



Occupant Protection
(No seatbelt Used)

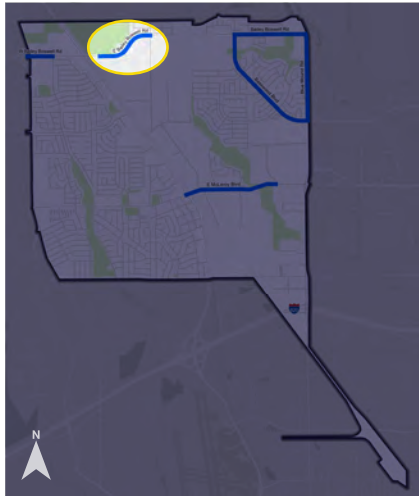


EXHIBIT 22. W. BAILEY BOSWELL ROAD RECOMMENDATIONS SHEET





E. BAILEY BOSWELL ROAD | MILLSTONE ROAD TO JARVIS ROAD



Context

The segment of E. Bailey Boswell Road from Millstone Road to Jarvis Road is 0.60 miles long. E. Bailey Boswell Road on this section is 6-lanes, divided with a speed limit of 40 MPH. Due to E. Bailey Boswell Road being the main east-west connector in northern Saginaw, it is categorized as a minor arterial in the City. This stretch of E. Bailey Boswell Road is unique due to the two very different land uses on it; north of the corridor is primarily residential while south of the corridor there are industrial businesses. While not within city limits, Elizabeth Lopez Hatley Elementary School, Comanche Springs Middle School, and Prairie Vista Middle School are in the residential area fronting the study corridor. This segment, like most of E. Bailey Boswell Road, has the challenge of balancing its need to efficiently carry traffic from east to west in the City while still serving a mostly residential area of Saginaw.



Crash History

This segment of E. Bailey Boswell Road experienced

37

crashes during the study period (2021–2025)

1

fatal crashes (K)

1

suspected serious
injury crash (A)

4

suspected minor
injury crashes (B)

Approximately 68% of all crashes on the corridor were intersection related, suggesting an issue with intersection safety on this corridor. In addition, the top four manners of collision for crashes on the corridor are primarily seen at intersections due to unsafe turning movements, misjudging gap distances, or frequent stopping and going; 30% of crashes were angle crashes, also known as T-bone crashes. In addition, there is an issue with unsafe speeding on this segment of E. Bailey Boswell Road because 17% of all crashes cited 'Failed to Control Speed' as a contributing factor.



Corridor & Segment Recommendations

- Refresh pavement markings
- Add more lane indicator markings
- Install Sidewalk on northside of the corridor (Millstone Rd. to 700' east of Millstone Rd.)

Intersection Recommendations

Millstone Road

- Install high visibility crosswalk (southbound approach)
- Install "Right Turn Only" signage on existing median (southbound approach)
- Stripe a hooded left-turn

Beltmill Parkway

- Install high visibility crosswalk (all approaches)

Wagley Robertson Road

- Install a westbound right-turn deceleration lane
- Upgrade pedestrian signal to be audible (northeast corner of intersection)
- Install high visibility crosswalk (southbound approach)

Jarvis Road

- Install traffic signal
- Decrease offset median noses
- Increase intersection lighting

Spot Recommendations

- Install eastbound and westbound speed feedback sign (400' east of Wagley Robertson Rd.)
- Trim vegetation (500' northeast of Wagley Robertson Rd.)

A summary of existing conditions and crash statistics for E. Bailey Boswell Road are in **Exhibit 23** on page 97. All recommendations are shown in **Exhibit 24** on page 98.



EXHIBIT 23. E. BAILEY BOSWELL ROAD (MILLSTONE ROAD TO JARVIS ROAD) SUMMARY SHEET

E. BAILEY BOSWELL ROAD

FROM MILLSTONE ROAD TO JARVIS ROAD

EXISTING CONDITIONS

- Minor Arterial
- 6-lane divided
- Total Volume: 14,000
- 0.60 mile segment of primarily residential in the northern portion, and primarily industrial in the southern portion

CRASH SUMMARY

- 37** Total Crashes
- 25** Intersection Related Crashes
- 1** Fatal Crash
- 1** Suspected Serious Injury Crashes
- 4** Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

Driver Inattention

35%

Failed to Control Speed

16%

Failed to Yield ROW – Stop Sign

14%

Failed to Yield ROW – Turning Left

14%

MANNERS OF COLLISION

Angle – Both Going Straight

27%

Same Direction – Sideswipe

19%

Opposite Direction – One Straight – One Left Turn

16%

Same Direction – Rear End

11%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users
(Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



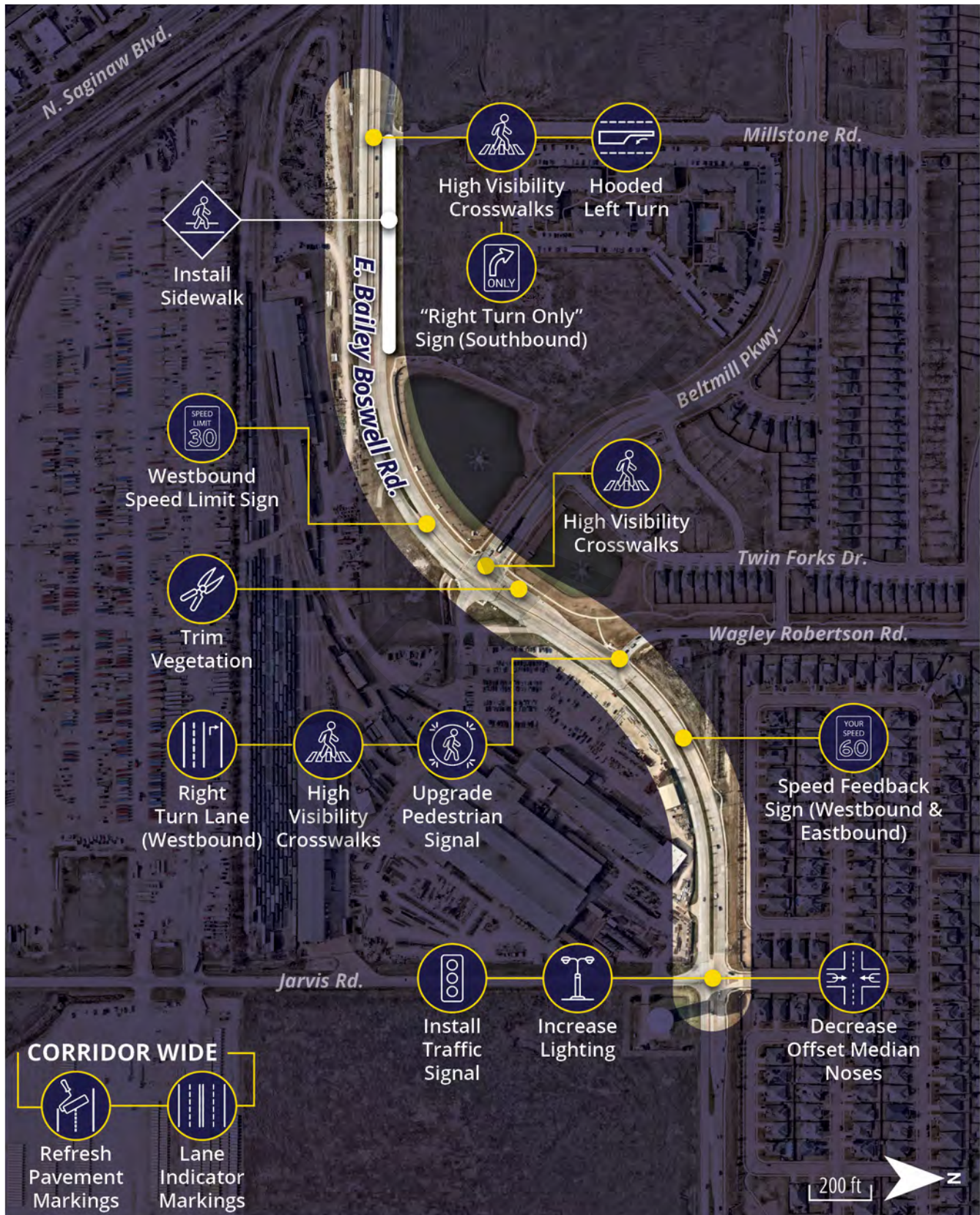
Distracted Driving



Occupant Protection
(No seatbelt Used)

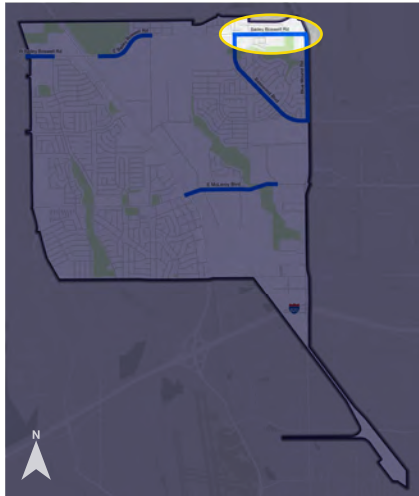


EXHIBIT 24. E. BAILEY BOSWELL ROAD (MILLSTONE ROAD TO JARVIS ROAD) RECOMMENDATIONS SHEET





E. BAILEY BOSWELL ROAD | BASSWOOD BOULEVARD TO BLUE MOUND ROAD



Context

E. Bailey Boswell Road from Basswood Boulevard to Blue Mound Road is 0.73 miles long and is the easternmost segment of Bailey Boswell Road to be studied. Similarly to the previous study corridor, this segment of Bailey Boswell Road is a 6-lane, divided roadway with a speed limit of 40 MPH. The speed limit does diminish to 20 MPH within the school zone. Unlike previous corridors, this study corridor is in a single-family residential context with High Country Elementary School and Highland Middle School in the middle of the corridor. This section of Bailey Boswell Road also provides access to one of the few trails in Saginaw; the opening is approximately 800' east of Basswood Boulevard. Due to the presence of the schools and trail, this study corridor also has two midblock crossings with rectangular rapid flashing beacons to provide safer crossings for pedestrians and bicyclists.



Crash History

This segment of E. Bailey Boswell Road experienced

41

crashes during the study period (2021–2025)

1

fatal crashes (K)

0

suspected serious
injury crash (A)

5

suspected minor
injury crashes (B)

Of the 41 crashes, **64% of crashes were intersection related and 35% were speed related**. This pattern indicates there are safety issues at intersections and drivers may tend to speed through the corridor. Furthermore, the top contributing factor for this corridor is 'Failed to Control Speed'; 32% of all crashes listed failing to control speed as a contributing factor. Given the primarily residential context with two schools on the corridor, the speeding on the corridor is a safety risk not only for other drivers but also pedestrians and bicyclists.



Corridor & Segment Recommendations

- Refresh pavement markings
- Install Sidewalk on southside of the corridor (Basswood Blvd. to 700' east of Basswood Blvd.)

Intersection Recommendations

Basswood Boulevard

- Install high visibility crosswalks (all approaches)

Blue Mound Boulevard

- Install high visibility crosswalks (all approaches)
- Relocate crosswalk and stop bar closer to the intersection (northbound approach)

Spot Recommendations

- Install eastbound speed feedback sign (500' east of Basswood Blvd.)
- Install westbound speed feedback sign (600' west of High Country Trl.)
- Install high visibility crosswalks (location of existing west rectangular rapid flashing beacon)
- Refresh pavement marks for RRFB (location of existing west rectangular rapid flashing beacon)
- Install high visibility crosswalks (all driveways for Highland Middle School)
- Install high visibility crosswalks (location of existing east rectangular rapid flashing beacon)
- Update Pavement Markings to "U-Turn Only" (westbound left storage lane 700' west of Blue Mound Rd.)

A summary of existing conditions and crash statistics for E. Bailey Boswell Road are in **Exhibit 25** on page 101. All recommendations are shown in **Exhibit 26** on page 102.



EXHIBIT 25. E. BAILEY BOSWELL ROAD (BASSWOOD BOULEVARD TO BLUE MOUND ROAD) SUMMARY SHEET

E. BAILEY BOSWELL ROAD

FROM BASSWOOD BOULEVARD TO BLUE MOUND ROAD

EXISTING CONDITIONS

- Minor Arterial
- 6-lane divided
- Total Volume: 16,000
- 0.73 mile segment of fully single-family residential
- Two schools on the corridor
- 2 midblock crossings near the schools

CRASH SUMMARY

- 41** Total Crashes
- 26** Intersection Related Crashes
- 1** Fatal Crash
- 0** Suspected Serious Injury Crashes
- 5** Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

Failed to Control Speed

32%

Driver Inattention

27%

Changed Lane When Unsafe

10%

Faulty Evasive Action

10%

MANNERS OF COLLISION

Same Direction – One Straight – One Stopped

32%

Same Direction – Rear End

15%

Same Direction – Sideswipe

12%

One Motor Vehicle – Going Straight

12%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users
(Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



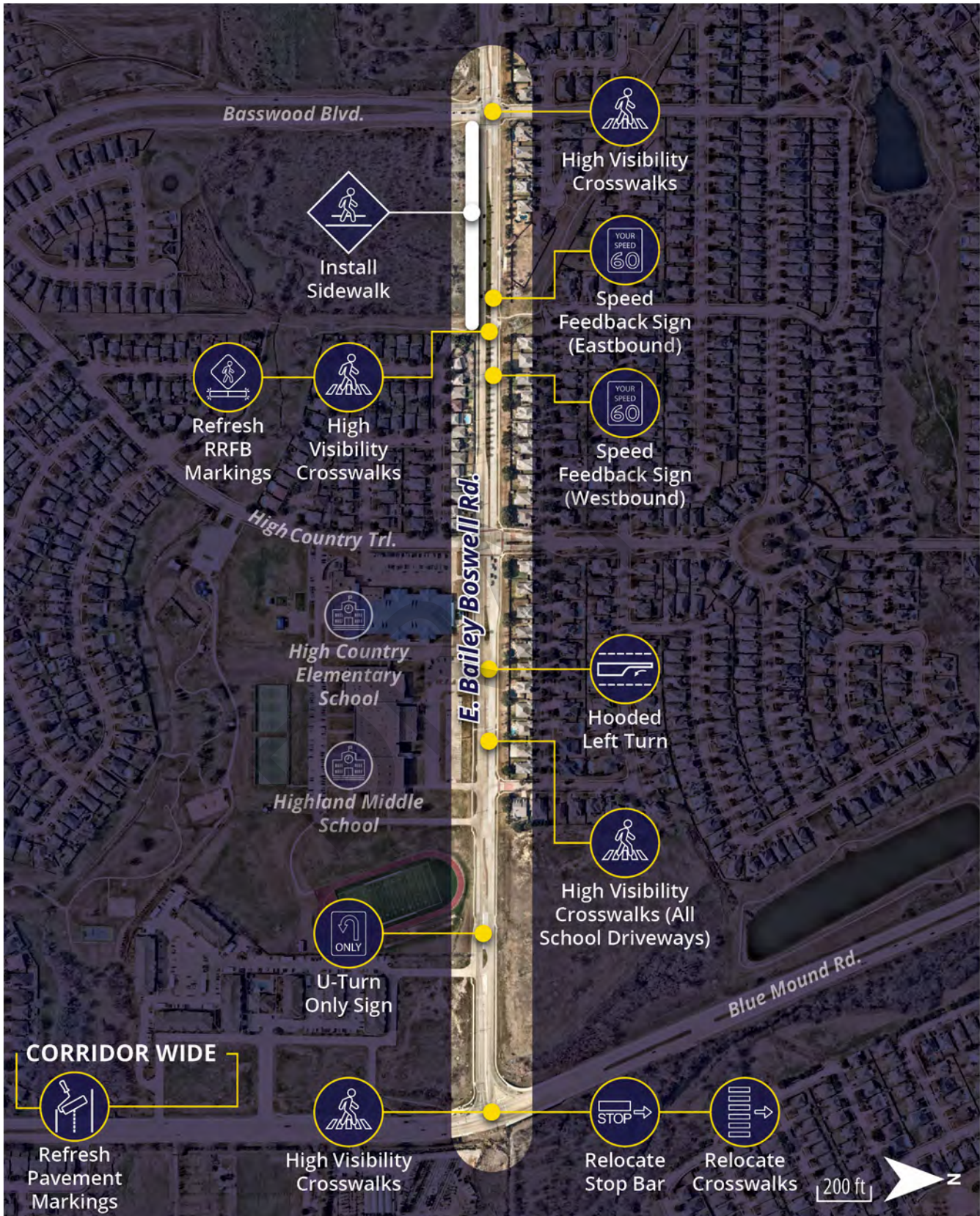
Distracted Driving



Occupant Protection
(No seatbelt Used)

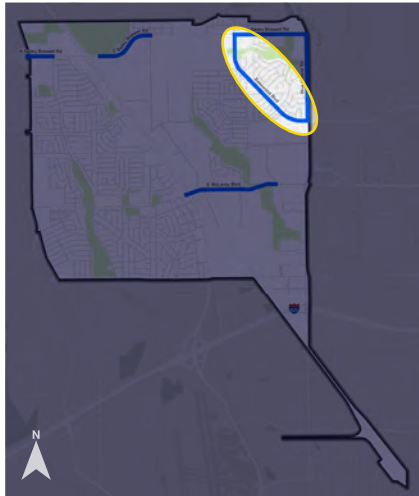


EXHIBIT 26. E. BAILEY BOSWELL ROAD (BASSWOOD BOULEVARD TO BLUE MOUND ROAD)
RECOMMENDATIONS SHEET





BASSWOOD BOULEVARD | BLUE MOUND ROAD TO E. BAILEY BOSWELL ROAD



Context

Basswood Boulevard from Blue Mound Road to E. Bailey Boswell Road spans 1.27 miles. Currently, Basswood Boulevard is a six-lane, divided roadway with a posted speed limit of 30 MPH aside from the school limit where the speed limit lowers to 20 MPH. Due to Basswood Boulevard's connection to two arterials, E. Bailey Boswell Road and Blue Mound Road, it is categorized as a collector in the City. This corridor is mostly residential with Saginaw High School on the southern end of the corridor and Fire Station #2 in the middle of the corridor. While there are no retail businesses throughout the corridor, there are several businesses, like Kroger and CVS, at the Blue Mound Road and Basswood Boulevard intersection. Because of the residential context, there is a need to ensure the safety of vulnerable road users.



Crash History

This segment of Basswood Boulevard experienced

68

crashes during the study period (2021–2025)

0

fatal crashes (K)

1

suspected serious
injury crash (A)

11

suspected minor
injury crashes (B)

Intersection safety is a key issue on Basswood Boulevard. **Approximately 85% of all crashes are intersection related** and 3 out of the 4 top manners of collision are related to unsafe turning movements; 'Angle – Both Going Straight' (25%), 'Opposite Direction – One Straight – One Left Turn' (16%), 'Angle – One Straight – One Left Turn' (9%). Additionally, 'Failed to Yield ROW – Stop Sign' and 'Disregarding Stop Sign or Light' are contributing factors for 13% and 12% of all crashes, respectively. Aside from the intersection safety issues on the corridor, there is a significant issue regarding pedestrian and bicyclist safety. A third of fatal and severe crashes on the corridor were pedestrian or bicyclist related crashes. Given the context of the corridor, it is imperative to increase vulnerable user safety.



Corridor & Segment Recommendations

- Roadway reconfiguration (Blue Mound Rd. to High Country Trl.)
 - 6 lanes divided into 4 lanes divided
- Refresh pavement markings
- Install sidewalk
- Repair sidewalk (southside of the corridor 400' west of Remington Dr.)

Intersection Recommendations

Blue Mound Boulevard

- Widen pedestrian refuges (northbound and southbound approaches)
- Install high visibility crosswalks (all approaches)
- Relocate speed limit signs (northwest corner of intersection)

Remington Drive

- Replace landing area (west crosswalk)

Grand Central Parkway

- Install roundabout
- Relocate crosswalk to create a pedestrian refuge (northwest)

Santa Fe Drive

- Upgrade curb ramps to be ADA compliant and directional (all curb ramps)

Redding Drive

- Install hooded left turn
- Install westbound left turn lane

Whistle Stop Drive

- Upgrade curb ramp to be ADA compliant and directional (northwest corner of intersection)
- Install high visibility crosswalks (south, east, and west approaches)

High Country Trail

- Install Roundabout
- Install high visibility crosswalks (all approaches)

Spot Recommendations

- Install speed feedback sign (100' W of Blue Mound Rd. for northbound traffic)

Saginaw High School

- Upgrade crosswalk to be perpendicular (north driveway)
- Install ADA compliant, directional curb ramps (north driveway)
- Install stop sign and stop bar (north driveway)
- Relocate stop sign (north driveway)

A summary of existing conditions and crash statistics for Basswood Boulevard are in **Exhibit 27** on page 105. All recommendations are shown in **Exhibit 28** on page 106.



EXHIBIT 27. BASSWOOD BOULEVARD (BLUE MOUND ROAD TO E. BAILEY BOSWELL ROAD) SUMMARY SHEET

BASSWOOD BOULEVARD

FROM BLUE MOUND DRIVE TO E. BAILEY BOSWELL ROAD

EXISTING CONDITIONS

- Minor Collector
- 6-lane divided
- Total Volume: 1,000
- 1.27 mile segment of primarily residential
- Corridor has a school and fire station
- Commercial area located at Blue Mound Rd.

CRASH SUMMARY

- 68** Total Crashes
- 4** Pedestrian & Bicyclist Crashes
- 58** Intersection Related Crashes
- 0** Fatal Crash
- 1** Suspected Serious Injury Crashes
- 11** Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

Driver Inattention

32%

Failed to Control Speed

19%

Failed to Yield ROW – Stop Sign

13%

Disregard Stop Sign or Light

12%

MANNERS OF COLLISION

Angle – Both Going Straight

25%

Same Direction – One Straight – One Stopped

24%

Opposite Direction – One Straight – One Left Turn

16%

Angle – One Straight – One Left Turn

9%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users
(Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



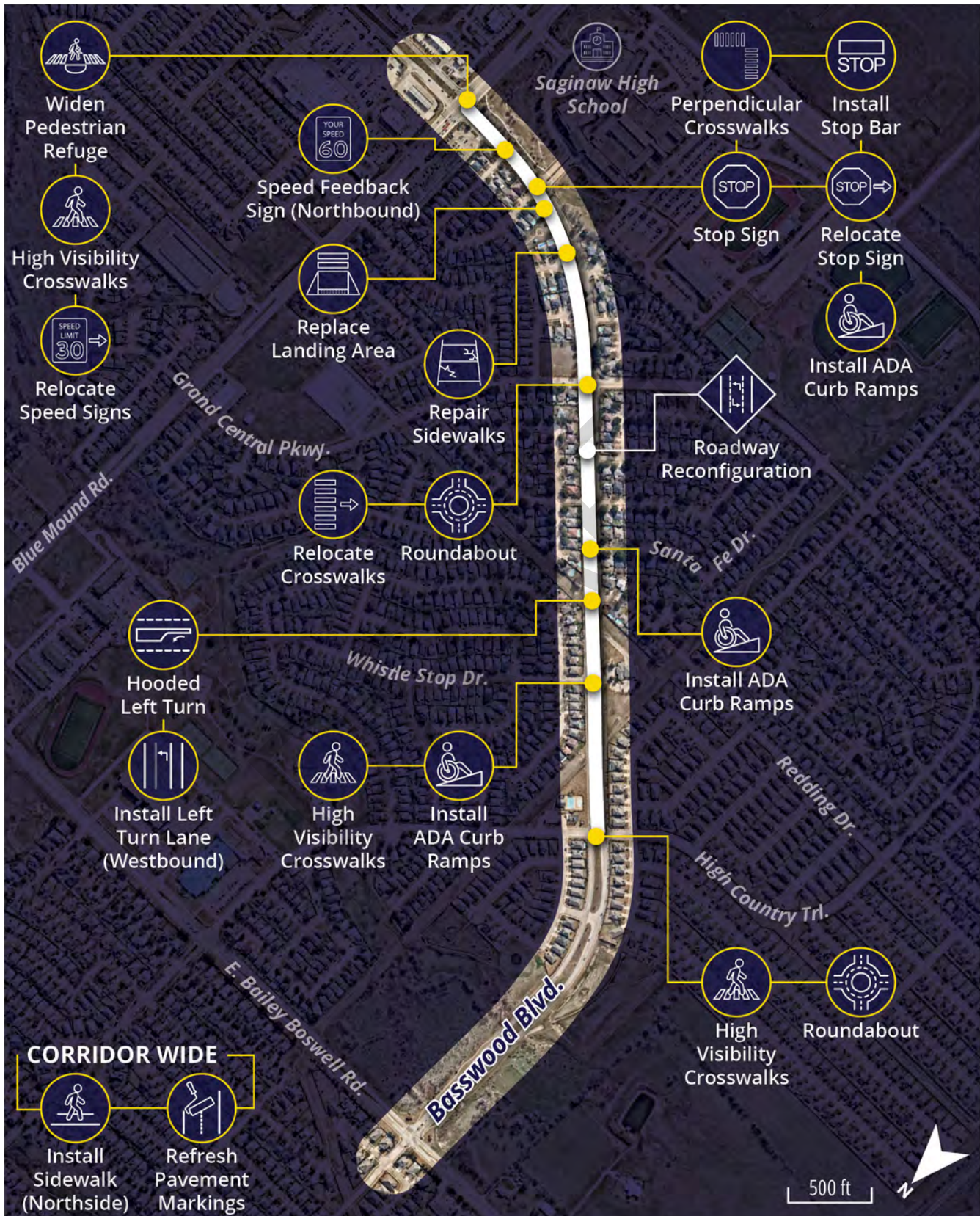
Distracted Driving



Occupant Protection
(No seatbelt Used)

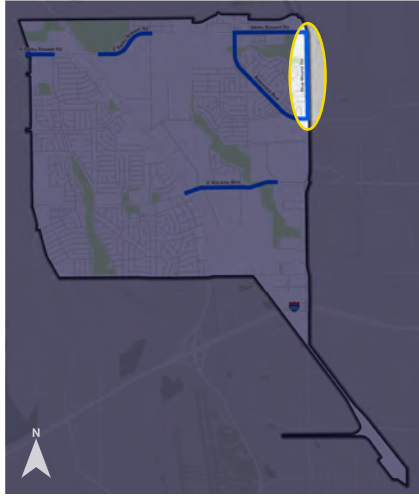


EXHIBIT 28. BASSWOOD BOULEVARD (BLUE MOUND ROAD TO E. BAILEY BOSWELL ROAD)
RECOMMENDATIONS SHEET





BLUE MOUND ROAD | E. BAILEY BOSWELL ROAD TO BASSWOOD BOULEVARD



Context

The study corridor on Blue Mound Road is from E. Bailey Boswell Road to Basswood Boulevard; a 0.90 mile segment. This segment of Blue Mound Road is a minor arterial roadway in the City due to it being a north-south connector on the east side of Saginaw. While the study corridor is primarily a mix between multifamily and single family residential units, there are two schools; each on opposite ends of the corridor. Additionally, there on the southern end of the corridor there are several retail businesses, such as Kroger and CVS, surrounding the intersection at Basswood Boulevard.



Crash History

This segment of Blue Mound Road experienced

60

crashes during the study period (2021–2025)

1

fatal crashes (K)

1

suspected serious
injury crash (A)

8

suspected minor
injury crashes (B)

The top manners of collision on the corridor are 'Angle – Both Going Straight', 'Angle – One Straight – One Left Turn', and 'Same Direction – Rear End'. Furthermore, the top contributing factors for the corridor are 'Failed to Control Speed', 'Failed to Yield ROW – Stop Sign', 'Driver Inattention', and 'Failed to Yield ROW – Turning Left'. Furthermore, **63% of corridor crashes were intersection related and 34% were speed related.** These indicate potential issues regarding intersections and unsafe speeding on the corridor.



Intersection Recommendations

E. Bailey Boswell Road

- Relocate crosswalk and stop bar (northbound approach)
- Install retroreflective backplates

Lazy Spur Boulevard

- Install a hooded left turn lane (southbound)
- Install “No Left Turn” sign (westbound approach)
- Install high visibility crosswalk
- Upgrade curb ramps to be ADA compliant and directional (all curb ramps)

Grand Central Parkway

- Install high visibility crosswalk (all approaches)
- Upgrade curb ramps to be ADA compliant and directional (all curb ramps)
- Install retroreflective backplates
- Trim Vegetation

Victoria Drive

- Install traffic signal
- Install high visibility crosswalk (east and westbound approaches)
- Upgrade curb ramps to be ADA compliant and directional (all curb ramps)
- Increase intersection lighting
- Refresh pavement markings
- Trim vegetation

A summary of existing conditions and crash statistics for Blue Mound Road are in **Exhibit 29** on page 109. All recommendations are shown in **Exhibit 30** on page 110.



EXHIBIT 29. BLUE MOUND ROAD (E. BAILEY BOSWELL ROAD TO BASSWOOD BOULEVARD) SUMMARY SHEET

BLUE MOUND ROAD

FROM E. BAILEY BOSWELL ROAD TO BASSWOOD BOULEVARD

EXISTING CONDITIONS

- Minor Arterial
- 4-lane divided
- Total Volume: 16,000
- 0.90 mile segment of primarily a mixture of multifamily and single-family residential
- Two schools on the corridor
- Commercial retail near Basswood Blvd.

CRASH SUMMARY

- 60** Total Crashes
- 39** Intersection Related Crashes
- 1** Fatal Crash
- 1** Suspected Serious Injury Crashes
- 8** Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

- Failed to Control Speed
27%
- Failed to Yield ROW – Stop Sign
20%
- Driver Inattention
18%
- Failed to Yield ROW – Turning Left
10%

MANNERS OF COLLISION

- Angle – Both Going Straight
32%
- Angle – One Straight – One Left Turn
15%
- Same Direction – Rear End
12%
- Opposite Direction – One Straight – One Left Turn
8%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users (Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



Distracted Driving



Occupant Protection (No seatbelt Used)

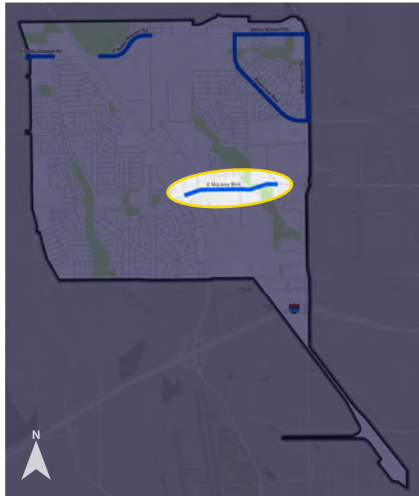


EXHIBIT 30. BLUE MOUND ROAD (E. BAILEY BOSWELL ROAD TO BASSWOOD BOULEVARD)
RECOMMENDATIONS SHEET





E. MCLEROY BOULEVARD | SAGINAW BOULEVARD TO LAVONNE LANE



Context

The segment of E. McLeroy Boulevard from Saginaw Boulevard to Lavonne Lane spans 0.93 mi. E. McLeroy Boulevard on this section is a four-lane, undivided roadway with a speed limit of 40 MPH. McLeroy Boulevard runs east to west through the center of the City making it an arterial. The surrounding area around the study corridor is primarily industrial apart from a multifamily residential complex towards the east end of the corridor. Part of the industrial context of the corridor includes two railroad crossings; one near Saginaw Boulevard the other near Burlington Road. This corridor also encompasses one of the most highly used intersections in the City, Saginaw Boulevard and McLeroy Boulevard.



Crash History

This segment of E. McLeroy Boulevard experienced

112

crashes during the study period (2021–2025)

0

fatal crashes (K)

2

suspected serious
injury crash (A)

15

suspected minor
injury crashes (B)

The top two contributing factors on the corridor are 'Same Direction – One Straight – One Stopped' (25%) and 'Same Direction – Rear End' (13%). Both these manners of collision are prevalent when there are **speeding issues or a need for drivers to frequently stop and go**. Due to the major intersection at Saginaw Boulevard and the two rail lines on the corridor, these crash types could be exasperated. Furthermore, 'Failed to Control Speed' (29%) and 'Driver Inattention' (25%) were two of the top contributing factors on the corridor.



Corridor & Segment Recommendations

- Roadway reconfiguration (East of Spring Hollow Dr.)
 - Four lanes to three lanes with a center turn lane
- Refresh pavement markings
- Install sidewalk (both sides of corridor)
- Increase lighting
- Repair potholes
- Refresh railroad crossing stop bars
- Install speed feedback signs
- Access management

Intersection Recommendations

Saginaw Boulevard

- Upgrade to permanent traffic signal
- Install retroreflective backplates
- Refresh pavement markings
- Install flashing yellow arrow signal
- Install ADA compliant and directional curb ramps
- Install pedestrian signals
- Add curb to southwest corner of intersection

Spring Hollow Drive

- Install a high visibility crosswalk
- Install ADA compliant and directional curb ramps

Creek Terrace Drive/Sansom Boulevard

- Install a high visibility crosswalk (southbound approach)
- Refresh stop bars (both approaches)
- Relocate stop bar (southbound approach)

Lavonne Lane

- Refresh stop bar

Spot Recommendations

- Driveway Closure (driveway adjacent to Burlington Rd.)
- Improve railroad signage (Burlington Northern Santa Fe Railway)
 - Add signage and markings to prohibit vehicles from stopping on train tracks
- Driveway Closure (Miller Milling's west driveway)
- Install a high visibility crosswalk (Abberly apartments driveway)

A summary of existing conditions and crash statistics for E. McLeroy Boulevard are in **Exhibit 31** on page 113. All recommendations are shown in **Exhibit 32** on page 114.



EXHIBIT 31. E. MCLEROY BOULEVARD (SAGINAW BOULEVARD TO LAVONNE LANE) SUMMARY SHEET

E. MCLEROY BOULEVARD

FROM SAGINAW BOULEVARD TO LAVONNE LANE

EXISTING CONDITIONS

- Minor Arterial
- 4-lane undivided
- Total Volume: 10,000
- 0.93 mile segment of primarily industrial with multifamily residential towards the east of the corridor
- 2 major railroad crossings near Saginaw Blvd.

CRASH SUMMARY

112 Total Crashes

1 Pedestrian & Bicyclist Crashes

68 Intersection Related Crashes

0 Fatal Crash

2 Suspected Serious Injury Crashes

15 Suspected Minor Injury Crashes

CONTRIBUTING FACTORS

Driver Inattention

29%

Failed to Control Speed

25%

Changed Lane When Unsafe

9%

Failed to Yield ROW – Turning Left

7%

SAFETY EMPHASIS AREAS



Intersection Related



Vulnerable Road Users
(Pedestrian & Bicyclists)



Speed Related



Roadway & Lane Departures



Impaired Driving



Distracted Driving



Occupant Protection
(No seatbelt Used)

MANNERS OF COLLISION

Same Direction – One Straight – One Stopped

25%

Same Direction – Sideswipe

13%

Angle – Both Going Straight

12%

One Motor Vehicle – Going Straight

9%



EXHIBIT 32. E. MCLEROY BOULEVARD (SAGINAW BOULEVARD TO LAVONNE LANE)
RECOMMENDATIONS SHEET



CHAPTER



6

ACTION PLAN

INTRODUCTION

This chapter outlines the recommended policies and programs that support the Mission Statement established by the Vision Zero Task Force (VZTF). Together, these actions are intended to address identified safety deficiencies within the City's transportation system and provide a practical framework for improving safety over time. To create a clear path toward achieving the goals of the CSAP, this chapter describes the implementation actions, responsibilities, and next steps needed to move recommendations into practice.



IMPLEMENTATION PROGRAM

ACTION MATRIX STRUCTURE

The actions included within this section in **Table 22** on page 117 aim to enhance safety in the City.



Guiding Principles and Six "E's"

The first two elements of the action matrix are the Guiding Principles and the Five "E's" of Safety, described in **Chapter 1**.



Timeframe

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

- **Short (<2 years):** This action is a top priority and can be a "quick win" for Vision Zero.
- **Medium (2-5 years):** This action may take longer but can be accomplished before the next CSAP update.
- **Long (>5 years):** This action will require many years but will have a significant impact when complete.



Partners

In many instances, collaboration with partner organizations, entities, or stakeholders is crucial to successfully implement the recommended actions. These partners play a vital role by contributing resources, expertise, and support to achieve the Plan's goals. The following list identifies internal and external partners that could aid in the implementation process, though it is not exhaustive:

- City Manager (CM)
- Planning Department (PD)
- Public Works (PW)
- Texas Department of Transportation (TxDOT)



Funding

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

- Existing Funds
- Reallocation of Funds
- Grant Acquisition

**TABLE 22. ACTION ITEMS**

Action Item	Emphasis Area	Five E's	Timeframe	Funding
Develop a public communications campaign that covers the Police Department's targeted speed enforcement program	Speed Related	Enforcement	Short (<2 years)	Reallocation
Increase demand for rideshare services by partnering with major local event organizers to sponsor discount codes with Uber and/or Lyft	Impaired Driving	Education	Short (<2 years)	Reallocation
Add an option in the Citizen Request Portal for residents to submit issues to the Traffic Safety Advisory Board which could include comment categories such as signal issues, safety issues, traffic calming requests, etc.	Intersection Safety	Evaluation	Short (<2 years)	Reallocation
Add an option in the Citizen Request Portal for residents to submit for targeted police presence	Speed Related	Enforcement	Short (<2 years)	Reallocation
Coordinate emergency vehicles signal preemption	Post-Crash Care	Engineering	Short (<2 years)	Existing
Partner with Police and Fire Departments, local hospitals, and ISD to increase awareness of car seat safety programs	Occupant Protection	Encouragement	Short (<2 years)	Existing



TABLE 22. ACTION ITEMS (CONTINUED)

Action Item	Emphasis Area	Five E's	Timeframe	Funding
Partner with ISD to provide drivers safety courses for new drivers	Impaired Driving	Education	Short (<2 years)	Reallocation
Develop a public communications campaign the covers roundabout education and safety	Intersection Safety	Education	Short (<2 years)	Grants
Develop a screening process to deploy rumble strips, raised buttons, and/or refreshed striping as part of the City's existing pavement maintenance program	Roadway & Lane Departure	Engineering	Medium (2–5 years)	Reallocation
Update City's design standards on crosswalks	Vulnerable Road Users	Engineering	Medium (2–5 years)	Existing
Explore the implementation of a street maintenance fee program for the City	Intersection Safety	Evaluation	Medium (2–5 years)	Grants
Create a City policy for employees to enable driving/focus mode on cell phone when operating city-owned vehicles	Distracted Driving	Enforcement	Medium (2–5 years)	Existing
Develop intersection evaluation program for installing roundabouts at appropriate intersections	Intersection Safety	Engineering	Medium (2–5 years)	Reallocation



COMPREHENSIVE SAFETY ACTION PLAN

SAGINAW