



| December 18, 2025 |

ROADWAY SAFETY AUDIT

Eagle Drive, from North Texas Boulevard
to Bell Avenue

City of Denton



North Central Texas
Council of Governments





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INTRODUCTION

NCTCOG Project Background

The North Central Texas Council of Governments (NCTCOG) identified high-injury corridors to conduct Road Safety Audits (RSAs) targeted by the NCTCOG Pedestrian Safety Action Plan (PSAP) and NCTCOG Roadway Safety Plan (RSP) within four core counties of the Dallas-Fort Worth metropolitan region (Collin, Dallas, Denton, and Tarrant Counties).

In 2023, the NCTCOG was awarded a planning grant from the United States Department of Transportation FY23 Safe Streets and Roads for All (SS4A) competitive grant program. The grant funding allows for conducting additional detailed planning for targeted high-injury corridors reflected in the RSP and PSAP. In addition, these planning tasks include in-depth data collection such as updated traffic/user counts (all mode types), utility impact identification, lighting conditions, accessibility, pavement markings/signage inventory, parking facilities/behaviors, vehicle speeds, traffic signal/equipment conditions/performance, transit stops/operations, and various roadway asset characteristics.

As a result of the SS4A funding, an RSA was conducted for Eagle Drive, spanning from North Texas Boulevard to Bell Avenue. The corridor location and limits are shown in **Figure 1**.

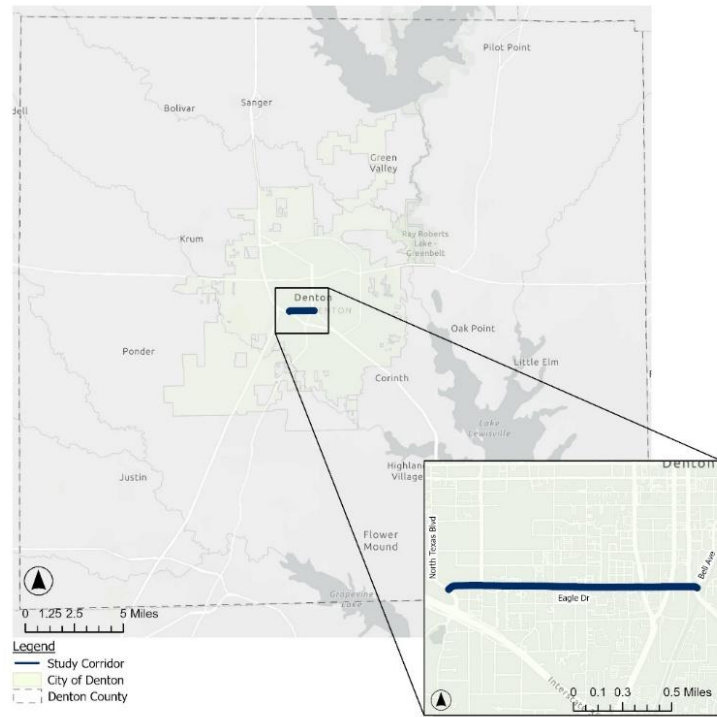


Figure 1 – Eagle Drive Location Map



RSA PROCESS AND APPROACH

The Federal Highway Administration (FHWA) established the roadway safety audit process to improve the overall safety performance of roadways. A Road Safety Audit (RSA) is the formal examination of an existing or proposed road or intersection by an independent, multidisciplinary team. The RSA qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users (vehicles, pedestrians, bicycles, and transit). The RSA process involves an 8-step process, which is defined below.

■ Step 1: Identify Project

- **Process:** To identify the existing road to be audited and to set the parameters for the RSA.
- **Approach:** NCTCOG, along with other stakeholders, developed a Pedestrian Safety Action Plan (PSAP) and a Roadway Safety Plan (RSP), which identified corridors around the metroplex with the highest fatal or serious injury crashes. Eagle Drive was identified as a high-injury corridor in the Pedestrian Safety Action Plan.

■ Step 2: Select RSA Team

- **Process:** A multidisciplinary team was formed to conduct a road safety audit.
- **Approach:** The RSA Team included the following members:

City of Denton

- Sahar Esfanyari
- Mohammad Shalbak
- James Andrews
- Ashley Ekstedt
- Rakib Alam
- Justin Stackhouse

NCTCOG

- Christopher Nelson

Kimley-Horn

- Brendan Yarborough
- Brian Shamburger
- Raul Orozco

■ Step 3: Pre-Audit Meeting

- **Process:** The objective of the pre-audit meeting is to set the context for the RSA by bringing together the project owner, the design team, and the audit team to discuss its scope and review all the information available.
- **Approach:** The pre-audit meeting was held at the City of Denton Development Services Center in Training Room Four on Friday, July 11, 2025. The consultant team reviewed the RSA process, provided an overview of the desktop evaluation of the corridor (see Corridor Mobility Map **Figure 2**), and provided an overview of the crash history (see Crash History Strip Map **Figure 5**).

■ Step 4: Perform Field Reviews

- **Process:** A field review was conducted to gain insight into existing road conditions and to identify safety concerns.
- **Approach:** The RSA team performed the field review on Wednesday, July 16, 2025. The field review began at 8 a.m., starting at the intersection of Carroll Boulevard and Eagle Drive. The team conducted the post-audit meeting on-site directly following the field review. Observations made during the field review, such as infrastructure deficiencies and driver behavior, were noted. A nighttime site visit was also conducted on Tuesday, September 9, 2025, at 8:00 p.m. The goal of the nighttime site visit was to identify deficiencies in lighting, striping/signage visibility, and other factors.

■ Step 5: Analyze and Report Findings

- **Process:** Analyze and prepare an RSA report to succinctly report the findings of the audit team through the identification and prioritization of safety issues. Recommendations are then made to reduce the degree of risk.
- **Approach:** The consultant team summarized all notes from the field review into a table with potential recommended countermeasures. The Recommendations Table for this corridor can be found in **Table 3** alongside the Recommendations Table, the consultant team created Recommendations Summary Exhibits, which visually displays all countermeasures listed in the Recommendations Table on a map for ease of reference (see **Figure 25**).

■ Step 6: Present Findings to Owner

- **Process:** The audit findings are presented to the project owner and design team to report the key results of the audit.
- **Approach:** The consultant team sent the Recommendations Summary Exhibit and Table to the rest of the RSA Team for review on Friday, August 29, 2025, two weeks before the RSA Follow-Up Meeting on Wednesday, September 10, 2025. During the RSA Follow-Up Meeting, the consultant team reviewed the Recommendations Summary Exhibit with the RSA Team and provided a brief overview of potential countermeasures. Through feedback received during and after this meeting, the team revised the Recommendations Summary Exhibit and Table.



■ **Step 7: Prepare Formal Response**

- **Process:** The project owner prepares a written response to the final RSA report.
- **Approach:** After the RSA report has been completed, the project owner should review the report and formally respond with what actions the project owner will take with respect to each safety concern listed in the report. To build support for the findings and the overall RSA process, the RSA findings may be presented in a public meeting, or the report could be made available to the public. The timeframe for responding to this request and making the information public may vary for each agency.

■ **Step 8: Incorporate Findings**

- **Process:** Incorporate findings into the project when appropriate.
- **Approach:** After the response to the RSA report is prepared, the project owner should work to implement the agreed-upon safety measures or create an implementation plan. Implementation of the suggested measures is at the discretion of the project owner and appropriate staff based on their project schedules and available funds.



EXISTING CORRIDOR CONDITIONS

Eagle Drive, located between North Texas Boulevard and Bell Avenue, lies within the borders of Denton, near the University of North Texas. Between North Texas Boulevard and Carroll Avenue, the corridor is a three-lane undivided roadway with a center turn lane and bike lanes on both sides of the corridor, along with four- to five-foot wide sidewalks. There are some portions of this segment with missing sidewalk, primarily on the north side of the corridor. Between Carroll Avenue and Bell Avenue, the corridor is a four-lane, undivided roadway with four- to five-foot wide sidewalks along both sides. The corridor provides connectivity to major roadways, including IH-35 to the west and Bell Avenue to the east.

As shown in **Figure 2** below, this section of Eagle Drive has a mix of commercial and residential land uses. Additionally, this corridor provides direct access to the University of North Texas.

Eagle Dr - Denton, TX Corridor Mobility

Project Background

NCTCOG and City of Denton are committed to end traffic deaths and serious injuries. City of Denton, NCTCOG and Kimley-Horn are partnering to conduct a Roadway Safety Audit along Eagle Drive, diagnose safety issues, and recommend countermeasures. This corridor is part of the Vision Zero Plan that aims to improve high injury networks.

Corridor: Eagle Dr **Begin Point:** North Texas Blvd **ADT:** 8,000-10,300
City: Denton **End Point:** S Bell Ave **TxDOT Status:** Partially
County: Denton **Length (miles):** 1.27 **Speed Limit:** 30 mph
Multi-Modal Elements: sidewalks, on-street bike lanes, bus stops

Legend

- RSA Corridor Limits
- Railroad
- Bus Route
- Bus Stop
- Signalized Intersection
- Park
- School
- Library
- ADT (2024 from City of Denton)



Connectivity
 This corridor provides access to the University of North Texas, high residential neighborhoods, and provides indirect access to I-35 East.

North Texas Blvd to Carroll Blvd
Carroll Blvd to S Bell Ave

Multimodal
 This corridor includes visually separated on-street bike lanes from N Texas Blvd to Carroll Blvd of the road, various bus stops, and sidewalk on both sides varying in width.

Figure 2 – Corridor Mobility Map



Data Collection

As part of the RSA, speed counts, traffic counts, and crash data (collected from 2020 to 2024) for the corridor were collected and analyzed. 24 hours of speed data and bi-directional tube counts were collected on Eagle Drive on Wednesday, August 27, 2025. Peak-hour turning movement counts (TMCs) were collected on the same day at the intersection of Bell Avenue (Dallas Drive). Crash data was obtained from TxDOT’s Crash Records Information System (CRIS) for all crashes along the corridor that occurred between 2020 and 2024.

Speed Data

Vehicle speed data was measured using tube counters (between Kendolph Street and Avenue C) over 24 hours on August 27, 2025. While the speed limit on the corridor is 30 mph, speed count data showed the 85th percentile speed of 31 mph. **Figure 3** shows the speed data grouped into 5 mph increments. The raw dataset can be found in **Appendix A**.

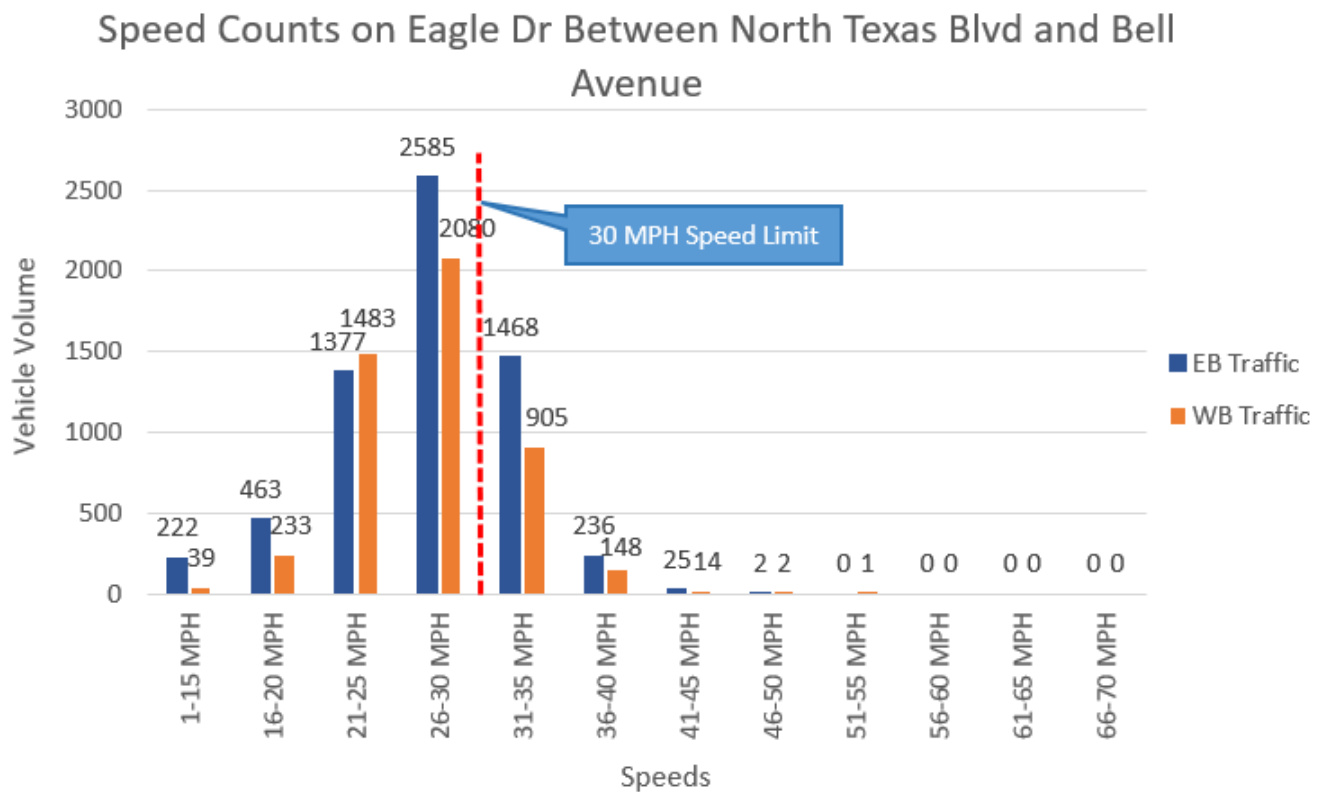


Figure 3 – Speed Counts on Eagle Drive



Traffic Counts

A turning movement count (TMC) was collected for the signalized intersection at Bell Avenue (Dallas Drive) and Eagle Drive during both the AM and PM peak hours. TMCs were taken at this intersection specifically to gather a better understanding of the existing volumes and turning movements. The intersection of Bell Avenue (Dallas Drive) and Eagle Drive was one of the highest-crash intersections, in part due to its unusual geometry. Aside from better understanding the existing conditions at the intersection, TMCs were collected to aid in determining the feasibility of alternative intersection control options, such as replacing the southbound right-turn yield with a stop sign. The AM and PM peak hour counts are summarized in **Figure 4**. The raw counts are included in **Appendix A**.

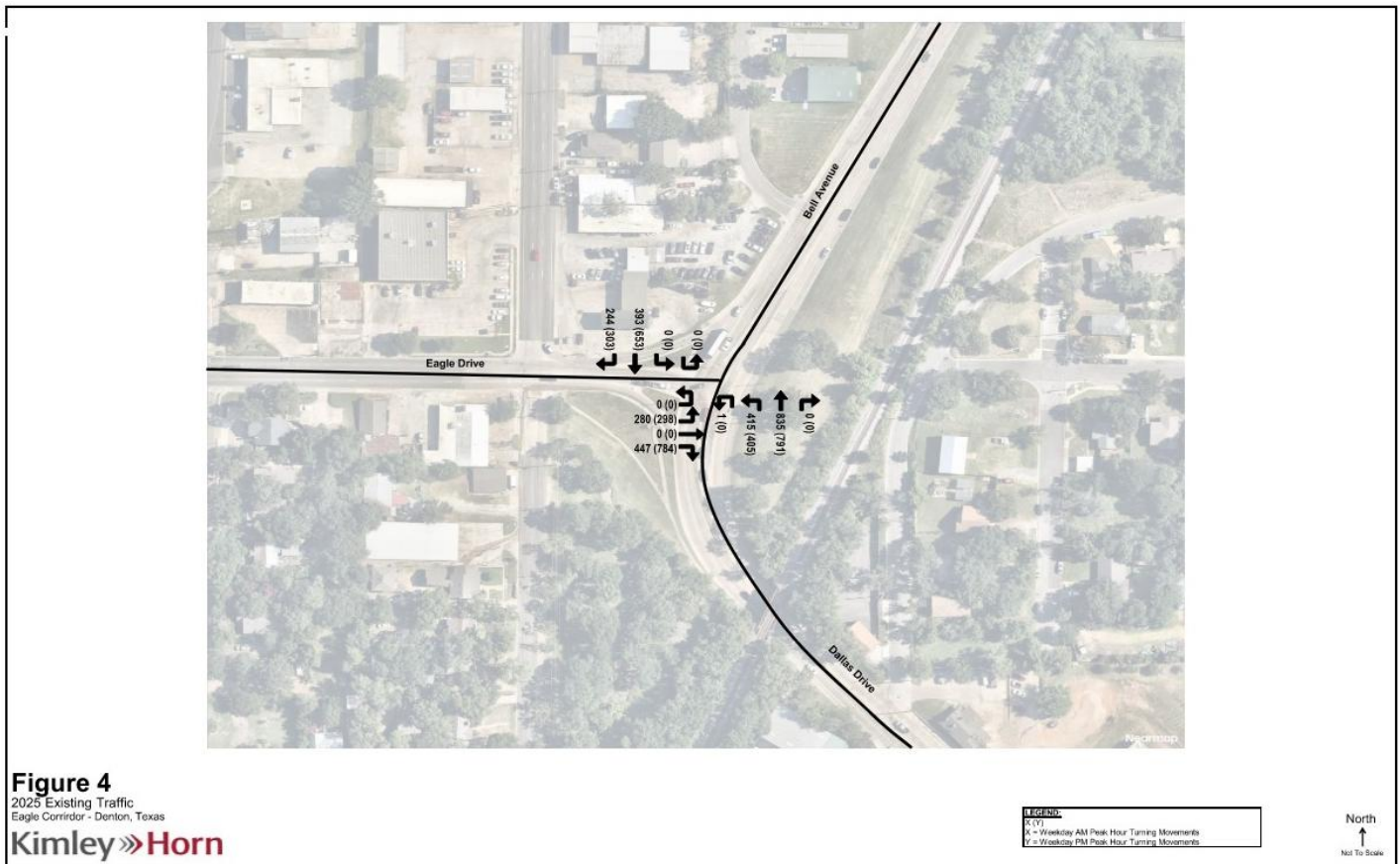


Figure 4 – 2025 Existing Traffic Volumes



Crash Data

The corridor experienced 294 crashes during the study period (2020–2024). Of the 294 crashes, approximately 21% resulted in an injury crash (KAB). There were no fatal injury crashes (K) in the corridor during this period; however, there were six (6) serious injury crashes (A) and 57 minor injury crashes (B). While these crashes span throughout the entire corridor, the majority of KAB crashes occur at Fort Worth Drive/Elm Street, as shown in **Figure 5**. As part of the Roadway Safety Audit, crash narratives for all suspected serious injury crashes that occurred in the corridor during the study period were acquired from NCTCOG. Crash narratives are essential in determining safety countermeasures for roadways by providing specific details on why and how a crash occurred. All crash narratives for suspected serious injury crashes on this corridor are in **Appendix B**.

While, on average, this corridor experienced fewer severe crashes compared to the overall County average, it had a higher-than-average number of minor injury crashes, particularly those involving vulnerable road users, such as bicyclists and pedestrians. **Table 1** indicates that pedestrian and bicyclist crashes are more prevalent on this corridor compared to the County average. Specifically, both bicycle and pedestrian crashes are at least twice the County average. Although the corridor is multimodal, the number of crashes involving vulnerable road users indicates there is a need to identify issues and improve pedestrian and bicyclist facilities along the corridor.

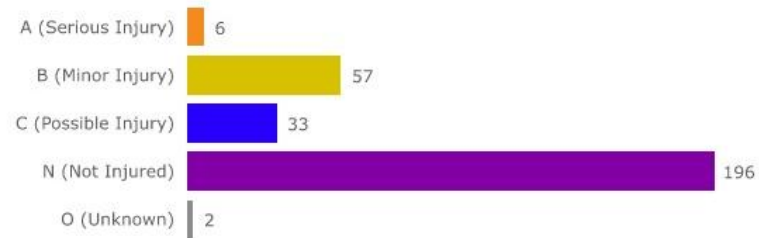
As shown in **Figure 5**, the top manner of collision was “Opposite Direction One-Straight One Left Turn” crashes. These refer typically involve a vehicle traveling straight colliding with another vehicle turning left. Opposite Direction crashes accounted for approximately 36% of all crashes. The contributing factor “Failed to Yield Right-of-Way – Turning Left” is more than twice the county average. The second most common type of crash on the corridor is “Angle” crashes, accounting for approximately 24% of crashes. These crashes are more common in corridors like Eagle Drive due to the high density of intersections and driveways along the corridor. Proposed countermeasures should focus on addressing issues contributing to the cause of opposite direction and angle crashes.

A contributor of opposite direction crashes is typically insufficient lighting, as it can lead to decreased visibility, resulting in unsafe turning movements. On the corridor, approximately 33% of the crashes happened in dark conditions, the majority being in ‘Dark – Lighted’ conditions. This means that some form of lighting was present at the location of the crash. With approximately one-third of the crashes occurring in dark conditions, there is a need to evaluate the existing lighting on the corridor. As shown in **Table 1**, the intersections on the corridor experience higher-than-average numbers of crashes in dark conditions.

Eagle Drive - Denton, TX Crash History Strip Map

294
Count of Crashes

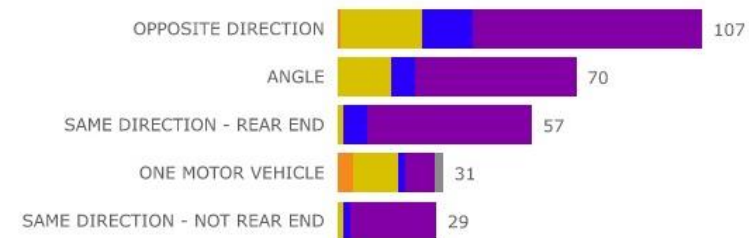
Crash Severity



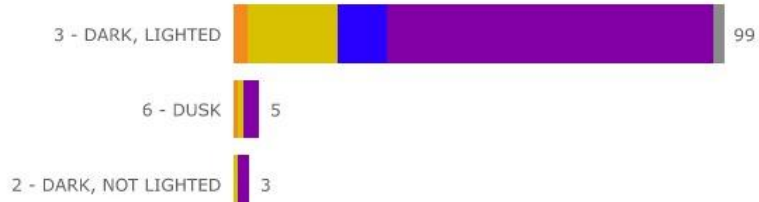
Vulnerable Road Users



Manner of Collision



Poor Lighting Conditions

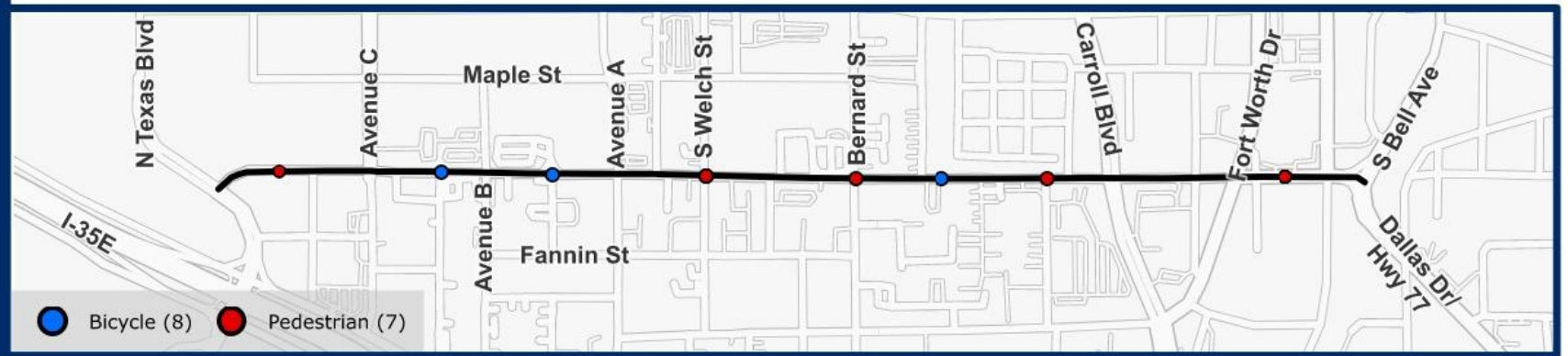


Crash Severity
 A (Serious Injury)
 B (Minor Injury)
 C (Possible Injury)
 N (Not Injured)
 O (Unknown)

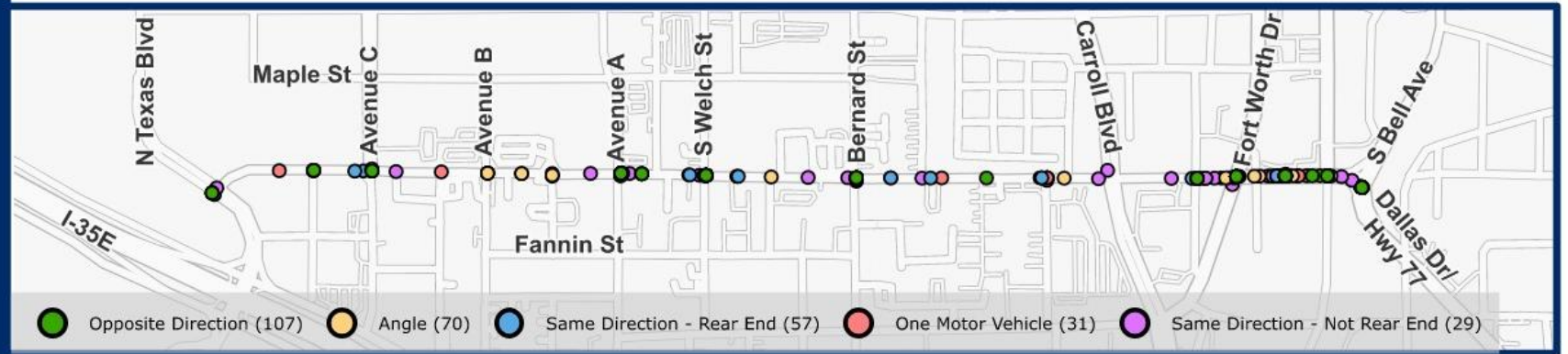
Fatal, Serious, and Minor Injury Crashes



Vulnerable Road Users Crash Frequency



Manner of Collision Crash Frequency



Poor Lighting Conditions Crash Frequency

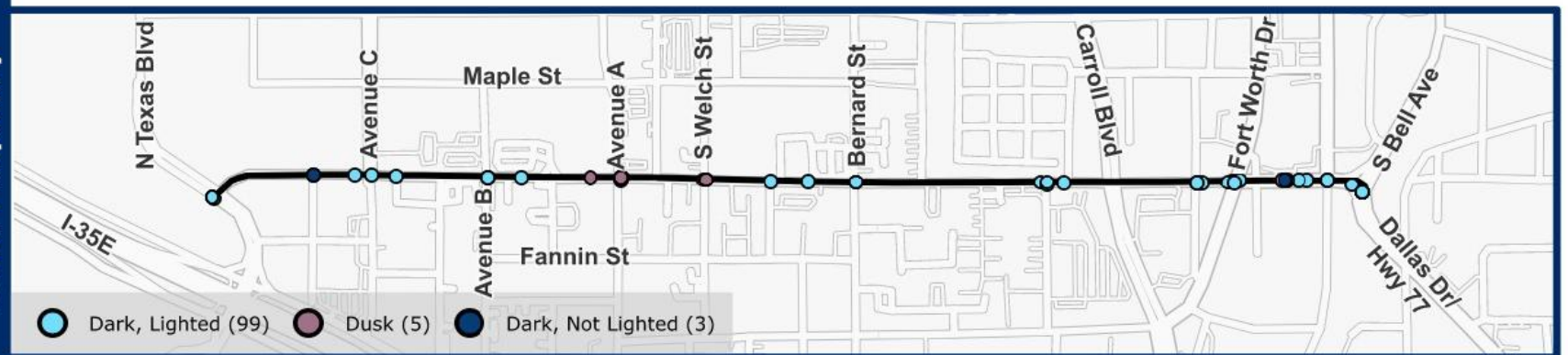


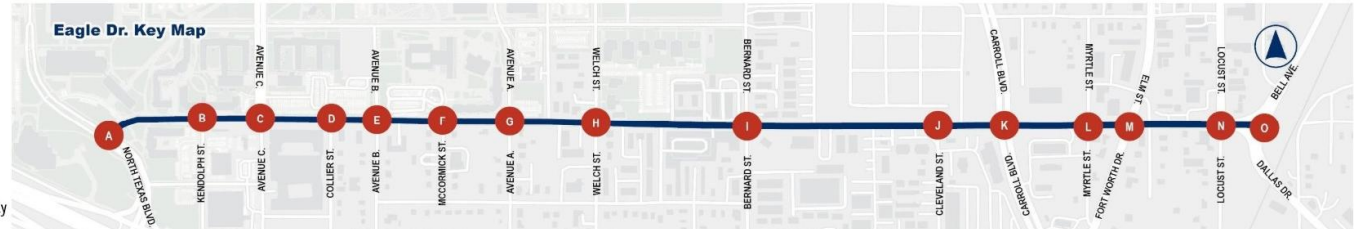
Figure 5 – Crash History Strip Map

Table 1 – Intersection Crash Comparison Table by Crash Type

Eagle Dr. in Denton, TX

Table 1 - Corridor Comparison Table

Limits: North Texas Blvd. to Bell Ave.



Legend

XX	Indicates when a value is above average for the county
XX	Indicates when a value is 2 times above average for the county

Category	Attributes	Denton County Average (Percent & Count)		Eagle Dr. Corridor																	
		100.0%	65,089	A. North Texas Blvd.	B. Kendolph St.	C. Avenue C	D. Collier St.	E. Avenue B	F. McCormick St.	G. Avenue A	H. Welch St.	I. Bernard St.	J. Cleveland St.	K. Carroll Blvd.	L. Myrtle St.	M. Elm St.	N. Locust St.	O. Bell Ave.			
Crash Severity	K - Fatal	0.4%	266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	A - Incapacitating Injury	2.2%	1,404	6	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0
	B - Non-Incapacitating Injury	11.2%	7,267	57	1	0	1	0	1	1	5	3	2	3	0	2	29	1	0	0	0
	C - Possible Injury	13.3%	8,656	33	1	0	1	1	0	0	1	1	2	0	1	1	19	1	0	0	0
	N - Not Injured	68.0%	44,262	196	3	4	3	0	1	1	11	14	6	3	0	6	77	9	18	0	0
	99 - Unknown	5.0%	3,234	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
First Harmful Event	Motor Vehicle In Transport	73.8%	48,015	263	5	3	5	0	2	1	17	17	9	3	1	9	120	11	17	0	0
	Fixed Object	14.9%	9,670	10	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0
	Parked Car	7.7%	5,016	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Overturned	1.0%	667	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pedestrian	1.0%	651	7	0	0	0	0	0	0	0	2	1	1	0	0	2	0	0	0	0
	Pedalcyclist	0.6%	395	8	0	0	0	1	0	1	0	1	0	0	0	0	4	0	0	0	0
Light Conditions	Daylight	69.6%	45,300	186	2	3	4	1	1	2	7	17	8	4	1	8	77	9	7	0	0
	Dark (Lighted/Not Lighted/Unknown Lighting)	27.0%	17,602	103	3	1	1	0	1	0	7	3	2	2	0	1	48	2	11	0	0
	Dawn/Dusk	2.7%	1,758	5	0	0	0	0	0	0	3	1	0	0	0	0	1	0	0	0	0
Manner of Collision	One Motor Vehicle - Going Straight	19.3%	12,565	18	0	1	0	1	0	0	1	0	1	0	1	0	3	0	0	0	0
	Same Direction - One Straight-One Stopped	13.6%	8,846	37	1	0	1	0	0	0	2	2	2	0	1	2	12	1	5	0	0
	Same Direction - Both Going Straight-Rear End	11.3%	7,352	20	0	0	0	0	0	0	1	3	1	1	0	1	2	0	1	0	0
	Same Direction - Both Going Straight-Sideswipe	11.2%	7,281	18	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0
	Angle - Both Going Straight	10.5%	6,857	41	0	0	2	0	0	1	5	5	3	0	0	4	13	6	0	0	0
	Opposite Direction - One Straight-One Left Turn	9.4%	6,140	104	3	2	1	0	0	0	6	5	2	0	2	0	75	1	4	0	0
	Angle - One Straight-One Left Turn	5.7%	3,698	15	0	1	0	0	2	0	0	1	1	0	0	0	3	0	2	0	0
	Angle - One Straight-One Right Turn	3.0%	1,945	10	0	0	0	0	0	0	3	0	0	0	0	0	4	0	2	0	0
Same Direction - One Straight-One Right Turn	1.2%	798	9	1	0	1	0	0	0	0	1	0	2	0	0	1	1	0	0	0	
Contributing Factor	Failed To Control Speed	24.5%	15,958	42	1	1	0	1	0	0	2	3	0	1	0	2	13	1	4	0	0
	Driver Inattention	13.2%	8,573	45	2	2	0	0	1	1	6	7	2	1	0	0	12	2	2	0	0
	Failed To Yield Right Of Way - Turning Left	9.2%	5,962	85	0	2	1	0	0	0	6	5	2	0	0	3	60	1	1	0	0
	Changed Lane When Unsafe	8.3%	5,422	17	0	0	0	0	0	0	0	0	0	0	0	1	5	0	3	0	0
	Failed To Drive In Single Lane	5.3%	3,448	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Unsafe Speed	4.6%	2,997	6	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0
	Disregard Stop and Go Signal	3.8%	2,473	20	2	0	2	0	0	0	0	3	0	0	0	0	12	0	1	0	0
	Followed Too Closely	3.2%	2,114	16	1	0	0	0	0	0	0	3	1	2	0	0	1	1	1	0	0
	Disregard Stop Sign or Light	2.2%	1,460	18	0	0	0	0	0	1	5	1	2	0	0	0	9	0	0	0	0
	Other (Explained in Narrative)	8.2%	5,310	26	0	0	0	0	0	0	2	2	1	1	0	0	8	3	3	0	0
	None	3.6%	2,339	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0



KA Crashes

Between 2020 and 2024, Eagle Drive had six (6) serious injury (A) crashes. During the study period, there were two (2) crashes involving pedestrians and one (1) involving a bicyclist that resulted in suspected serious injury. A complete list of all of KA crashes, along with their crash ID, manner of collision, and other information, is listed below in **Table 2**.

As part of the Roadway Safety Audit, crash narratives for all fatal and serious injury crashes that occurred on the corridor during the study period were acquired from NCTCOG. Crash narratives are essential in determining safety countermeasures for roadways by providing specific details on why and how a crash occurred. All crash narratives for fatal and serious injury crashes on this corridor are in **Appendix B**.

Table 2 – KA Crash Descriptions

Crash ID	Crash Severity	Date & Time	Location	Involved Units	Contributing Factors	Manner of Collision	Weather Condition	Light Condition	Description
17876946	A - Serious Injury	Sep 23, 2020; 2:43 PM	Eagle Dr & Carroll Blvd	Vehicle & Pedestrian	Pedestrian Failed To Yield Right Of Way To Vehicle	One Motor Vehicle - Going Straight	2 - Cloudy	1 - Daylight	Unit 1 was traveling southbound in the 800 block of S. Carroll Blvd in the right lane. Unit 2, a pedestrian, was traveling westbound on Eagle Dr in a market crosswalk. Unit 2 was running across the intersection and did not utilize the crossing signal button to activate a safe crossing. Unit 2, as a pedestrian, failed to yield right of way to a motor vehicle (Unit 1). Unit 2 ran into the path approaching Unit 1. Unit 1's FC struck Unit 2. Unit 2 then impacted the right side of the front windshield of Unit 1. Unit 2 grazed the right side of Unit 1 becoming airborne until coming to rest in the right lane of S Carroll Blvd.
19026603	A - Serious Injury	July 22, 2022; 3:45 AM	Segment Crash	Vehicle Only	Failed to Drive in Single Lane; Under Influence - Alcohol	One Motor Vehicle - Going Straight	1 - Clear	3 - Dark, Lighted	Unit 1 was traveling northbound in the 100 block of Dallas Dr (US 77). Unit 1 failed to drive in single lane when coming into a curve in the roadway. Unit 1 struck a raised curbline for a median. Unit 1 continued out of control and struck a curb line on the opposite side of the roadway. The driver of Unit 1 was thrown from the motorcycle coming to rest adjacent to the sidewalk for S Bell Ave. Unit 1 continued north another approx. 30 ft before coming to rest. Driver of Unit 1 was found to be intoxicated and was charged with driving while intoxicated.
19066694	A - Serious Injury	Aug 17, 2022; 7:37 AM	Eagle Dr & S Welch St	Vehicle & Bicyclist	Failed To Yield Right go Way - Turning Left	One Motor Vehicle - Turning Left	1 - Clear	1 - Daylight	Unit 1 was westbound in the 1100 block of W Eagle Drive in the left turn lane. Unit 2 was eastbound in the 1000 block of W eagle Drive in the bicycle lane. Driver of Unit 1 stated that she had a green light and observed a pedestrian crossing in the crosswalk westbound. After pedestrian was clear, Unit 1 began to make the turn and collided with Unit 2. Rider of Unit 2 stated that she was traveling westbound on W Eagle Drive in the bike lane approaching the intersection with Welch. Rider of Unit 2 stated that the traffic light turned green and they began to enter the intersection and was struck by Unit 1. Driver of Unit 1 failed to yield the right of way while turning left.
19189757	A - Serious Injury	Oct 24, 2022; 11:14 PM	Eagle Dr & S Welch St	Vehicle & Pedestrian	Failed to Yield Right of Way - To Pedestrian; Pedestrian Failed to Yield Right of Way to Vehicle	One Motor Vehicle - Going Straight	3 - Rain	6 - Dusk	Unit 1 was headed eastbound on W Eagle Drive crossing S Welch St. Unit 2 was walking on the eastern crosswalk of the intersection crossing from the north side to the south side of the street. Unit 1 struck Unit 2 while she was almost all the way across the intersection. Unit 1 claims he had a green light. Unit 2 claims she had a walk sign.
20113091	A - Serious Injury	April 03, 2024; 11:53 PM	Segment Crash	Vehicle Only	Under Influence - Alcohol; Other (Explain in Narrative)	One Motor Vehicle - Going Straight	1 - Clear	3 - Dark, Lighted	Unit 1 traveled westbound on W Eagle Drive in the 1900 block of W Eagle Drive the operator lost control of the Unit 1 laying the motorcycle down on the left side. The driver and passenger became separated from Unit 1 as Unit 1 continued to travel westbound and came to rest in the grass area near the sidewalk. The driver and passenger were also located off the roadway in the grass area north of Eagle Drive. There were fresh skid marks leading straight into the curb at the point of impact. W Eagle Drive is eastbound lane, and one center turning lane. No other units were involved.
20512218	A - Serious Injury	Nov 19, 2024; 11:56 PM	Eagle Dr & S Welch St	Vehicle Only	Failed To Yield Right Of Way - Turning Left	Opposite Direction - One Straight-One Left Turn	1 - Clear	3 - Dark, Lighted	Unit 1 was traveling eastbound on the 1100 block of Eagle Drive while Unit 2 traveled westbound on 100 block of Eagle Drive. Unit 1 failed to yield right of way and attempted to turn northbound onto the 800 of Welch Street. This resulted in the collision of both vehicles. The light was green for both east and westbound traffic with no green arrow.



Other Studies and Designs

Future developments, ongoing projects, and planned projects for the corridor were obtained and reviewed by the RSA team to ensure that audit recommendations aligned with current and future plans. Several key initiatives are underway that impact the study area.

The City of Denton has plans to replace six traffic signals within its city limits due to aging infrastructure. Those intersections include some that are within the Eagle Drive corridor limits, which are at the cross streets of Fort Worth Drive/Elm Street, Bell Avenue, and Bernard Street. These projects are currently not funded, but the city is seeking funding. The intersection of Eagle Drive and Avenue A is currently undergoing construction for improvements to pedestrian equipment. This would also be an opportunity to upgrade existing signals.

The City of Denton performed a study (3 to 4 years ago) at Eagle Drive and Bell Avenue to determine if a roundabout is feasible. The study concluded that a three-lane roundabout would not accommodate bike and pedestrian mobility and would require additional right-of-way. Therefore, the proposed roundabout would not be feasible at the intersection. Instead, other improvements to the existing intersection would be recommended.

The City of Denton has plans to improve drainage on Eagle Drive at Elm Street. These improvements will remove structures from the 100-year floodplain, thereby alleviating flooding in the area.



FIELD OBSERVATIONS

In-field observations were conducted to gain a deeper understanding of the existing conditions and their impact on crash history. Observations were made through walking and driving the corridor, both during daylight and nighttime, to obtain an accurate representation of lighting conditions in these scenarios. Data from the field observations was collected through the ArcGIS Field Maps app and paper notes filled out by the RSA Team. Field notes and photos were logged in the mobile app to geo-tag the field observations to the correct locations. The observations were used to create recommendations that fall into one of four categories: corridor-wide, intersection, segment, or spot recommendations. In this report, only the most common observations are included; however, all observations related to the recommended countermeasures are listed in the Recommendations Table.

General Observations

During the in-field visit, safety deficiencies were observed in the corridor, including faded pavement markings, sidewalk gaps (areas where the sidewalk is missing), overgrown vegetation, bus stops in need of improvement, and insufficient lighting. Pavement markings, such as lane markings, stop bars, and crosswalks, were faded in places. Faded pavement markings, such as those shown in **Figure 6**, can confuse drivers, especially at night, when it is difficult to see the division between lanes.



Figure 6 – Example of Faded Pavement markings



Figure 7 – Example of Sidewalk Gaps

Sidewalks are not present along both sides of the corridor, although many sections have an obvious desired pedestrian path, as shown in **Figure 7**, which shows a demand for a sidewalk. The sidewalk gaps provide very little comfort for pedestrians along the corridor, as some of the pedestrian crossings are not connected through sidewalks.



Overgrown vegetation is infringing on sidewalks, warning signs, and lighting in several places along the corridor. The vegetation is interfering with the pedestrian's path as well as obstructing the view of warning signs and blocking lighting. This leads to uncomfortable situations for pedestrians, as shown in **Figure 8** and poor sight distance for vehicles on the roadway.



Figure 8 – Example of
Overgrown Vegetation

This section of Eagle Drive features several bus stops along the corridor. The existing bus stops are only bus stop signs with no bus pads or shelters, which do not provide accessibility for riders, as shown in **Figure 9**.



Figure 9 – Example of Existing
Bus Stop



Insufficient lighting exists on one side of the corridor for the entire duration of the corridor. During the nighttime site visit, it was apparent that the existing luminaires do not provide sufficient lighting for the corridor, resulting in poor driver visibility. **Figure 10** shows a section of the corridor that is missing lighting.

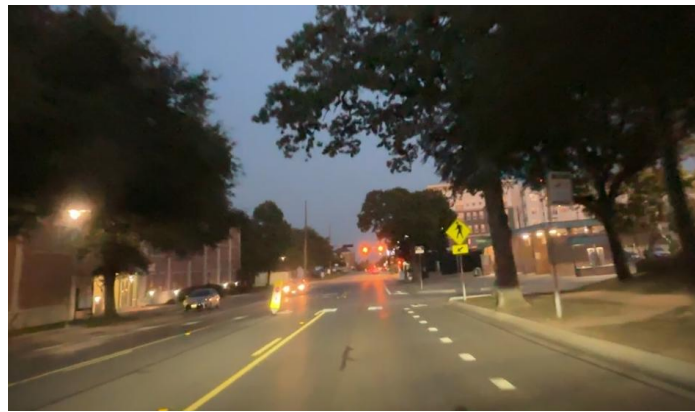


Figure 10 – Example of Missing Lighting



Intersection Observations

At intersections, both signalized and stop-controlled, there are missing or faded crosswalk markings, non-directional curb ramps, and missing detectable warning surfaces. Faded or missing crosswalks (**Figure 11**) were frequent throughout the entire corridor. Refreshing existing high-visibility crosswalks and installing them where they are missing allows for increased visibility of upcoming crosswalks and pedestrians using them.



Figure 11 – Example of Missing Crosswalks

Several intersections have diagonal curb ramps, as shown in **Figure 12**. At some of these crossings, the curb ramps have old-style detectable warning surfaces or are missing them. These curb ramps may direct pedestrians with visual disabilities toward the center of the intersection, posing a safety hazard.



Figure 12 – Example of Faded Crosswalk Markings and a Non-Directional Curb Ramp



At Carroll Boulevard and intersections to the east, the pedestrian signals need improvement. The pedestrian push buttons are older style with fewer accessibility functions or are missing, as shown in **Figure 13**. Installing accessible pedestrian signals (APS) with push buttons enables increased communication with individuals who are visually or audibly impaired.



Figure 13 – Example of Missing Push Button

Many intersections along this corridor do not have retroreflective backplates on the signal heads shown in **Figure 14**. Adding a reflective border around the signal head increases visibility of the traffic signals, especially at night or in poor weather conditions.



Figure 14 – Example of Missing Retroreflective Backplates



While the observations above were consistently seen at the intersections of the corridor, the intersection of Eagle Drive and Bell Avenue had unique issues identified during the in-field visit. The intersection at Bell Avenue has a lot of conflicts, including vehicular traffic, pedestrian activity, a northbound curve, and southbound right-turn channelization, as shown in **Figure 15**. The pedestrian signal equipment and crossing are not accessible, and the southbound right-turn yield lacks visibility for pedestrians and weaving cars from the northbound left turn traffic, making turns on northbound Locust St difficult.



Figure 15 – Field Observations at Bell Avenue



POTENTIAL COUNTERMEASURES

From the field observations, potential countermeasures were identified to address safety issues along the corridor. All recommended countermeasures were summarized in the Recommendations Table, which lists the types of recommendations, their locations, detailed observations, and corresponding recommendations. To accompany the Recommendations Table, a Recommendations Summary Exhibit was created to provide a visual summary of all countermeasures. Unique identification numbers were given to each countermeasure using the key map shown in **Figure 16**. Intersections were labeled based on the order of their appearance, proceeding from west to east along the corridor. Segment recommendations were assigned IDs based on their limits and the order in which they appeared on the Recommendations Summary Exhibit. Similarly to segment recommendations, spot recommendations were assigned identification numbers based on their locations between intersections and order of appearance. **Figure 25** provides a visual summary of all countermeasures and their locations on the corridor. Accompanying that figure, **Table 3** provides more detailed information on what was observed, how the observations influenced the countermeasure selection, and a detailed description of the countermeasure. The countermeasures described in the following sections are not a complete list of all recommended countermeasures.

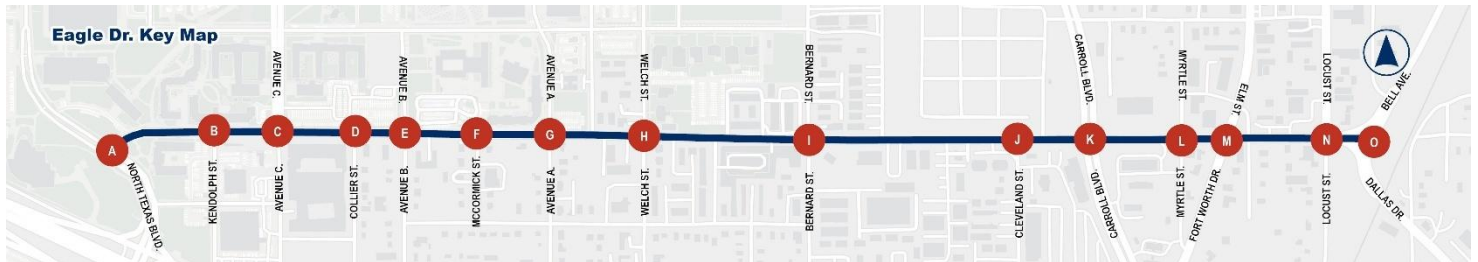


Figure 16 – Eagle Drive Corridor’s Intersection Key Map



Short-Term

One of the most common observations on the corridor was faded pavement markings and the absence of some turn lane arrows. The RSA Team recommends that all crosswalks and pavement markings be refreshed. At key intersections (signalized or high pedestrian crossings), it is recommended to install high-visibility crosswalks (**Figure 17**). This would aid in pedestrian visibility at intersections. Pavement markings to be refreshed would also include stop bars at intersections and the installation of edge lines along the corridor.



Figure 17 – Example of a High Visibility Crosswalk

At various signalized intersections on the corridor, it is recommended to install retroreflective backplates (**Figure 18**) on all signal heads to increase driver awareness when approaching the intersection, especially at night or in certain weather conditions. Retroreflective backplates are currently not present on all signal heads at the signalized intersections.

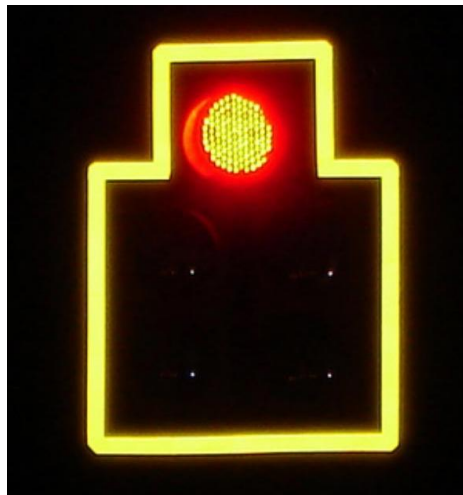


Figure 18 – Example of a Retroreflective
Backplate

Source: FHWA Proven Safety Countermeasures



Long-Term

Throughout the corridor, several intersections had either non-accessible or missing curb ramps. To create safe crossings for vulnerable road users, it is recommended that directional, accessible curb ramps with detectable warning surfaces be installed where necessary. **Figure 19** shows a typical example of these curb ramps.

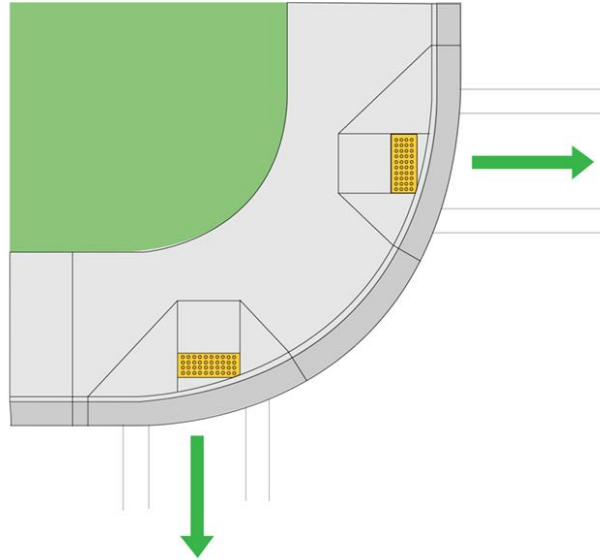


Figure 19 – Example of Directional, Accessible Curb Ramps

At signalized intersections, it was observed that the pedestrian equipment consisted of older-style push buttons, rather than APS. The RSA Team recommends that accessible pedestrian signals (**Figure 20**) be installed at all signalized crossings. This will also relocate the pedestrian signals closer to the crosswalks and replace faded signage.



Figure 20 – Example of Accessible Pedestrian Signal



The corridor is lacking in lighting coverage since the existing luminaires are only on one side of the corridor and are not sufficient at some crosswalks. The RSA Team recommends that a lighting study be conducted to ensure proper coverage of roadway and pedestrian facilities (Figure 21). By increasing corridor lighting, visibility of the roadway at nighttime will be enhanced, allowing for increased driver awareness along the corridor.

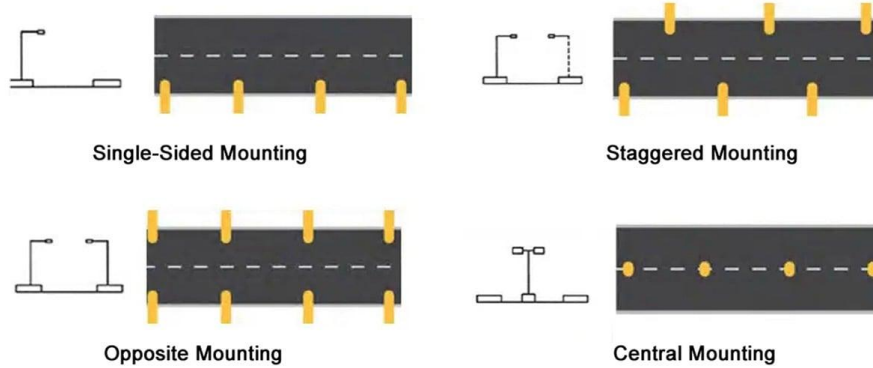


Figure 21 – Street Light Mounting Options

The intersection of Eagle Drive and Avenue C lacks bicycle accommodations to connect to the two-way cycle track that was implemented on Avenue C north of Eagle Drive. Bicycle marking intersection treatments are recommended to accommodate cyclists connecting between facilities on Eagle Drive and Avenue C. The RSA Team recommends bicycle intersection treatments such as two-stage turn boxes, bicycle signals, separate bicycle phasing, or bike boxes. Figure 22 shows an example of a two-stage bicycle turn box.

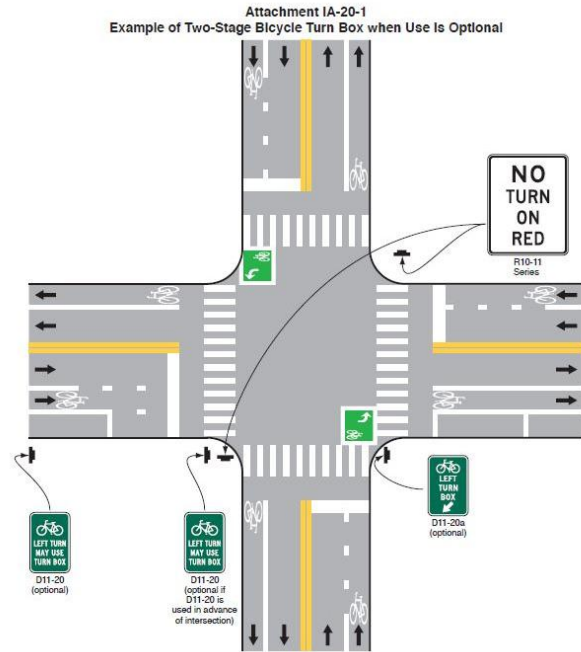


Figure 22 – Example of Two-Stage Bicycle Turn Box
Source: FHWA



This corridor features several bus stops. Some of which are missing pads and/or shelters. It is recommended that pedestrian pads and shelters (**Figure 23**) be installed at bus stops to ensure the safety of vulnerable road users while they wait for public transportation.



Figure 23 – Example of DCTA Bus Shelter

Enhanced pedestrian crossings increase pedestrian visibility and provide clear warnings to drivers of pedestrians at midblock or uncontrolled crossing locations. These treatments can significantly reduce pedestrian crashes when warranted. The intersection of Eagle Drive and Kendolph Street currently lacks a pedestrian crossing, yet pedestrians frequently cross in the area. Based on existing pedestrian demand, it is recommended to install an enhanced pedestrian crossing with a rectangular rapid flashing beacon (RRFB), **Figure 24**, along with a pedestrian refuge, a high-visibility crosswalk, and ensure adequate pedestrian lighting.



Figure 24 – Rectangular Rapid Flashing Beacon (RRFB)
Source: TxDOT

Eagle Drive - Denton, TX

Recommendations Exhibit | Limits: North Texas Boulevard to Bell Avenue

Corridor-wide Recommendations

-  Refresh Striping
-  Retroreflective Backplates
-  Lighting
-  Bus Shelters and Platforms



Figure 25 – Recommendations Exhibit

Eagle Drive - Denton, TX

Recommendations Exhibit | Limits: North Texas Boulevard to Bell Avenue

Corridor-wide Recommendations

-  Refresh Striping
-  Retroreflective Backplates
-  Lighting
-  Bus Shelters and Platforms



Figure 25 – Recommendations Exhibit

Eagle Drive - Denton, TX

Recommendations Exhibit | Limits: North Texas Boulevard to Bell Avenue

Corridor-wide Recommendations

- Refresh Striping
- Retroreflective Backplates
- Lighting
- Bus Shelters and Platforms



Figure 25 – Recommendations Exhibit

Table 3 – Recommendations Table (1 of 6)

Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
1.1	Eagle Dr	Corridor-wide	Along the Corridor	Short	Refresh Striping	Observation: Striping along corridor is fading or missing Recommendation: Refresh striping along the corridor and at intersections	All
1.2	Eagle Dr	Corridor-wide	Along the Corridor at Intersections	Short	Retroreflective Backplates	Observation: Multiple intersections are missing retroreflective backplates on signal heads Recommendation: Install retroreflective backplates on all signal heads	All
1.3	Eagle Dr	Corridor-wide	Along the Corridor	Long	Lighting	Observation: Lighting is missing on one side of the corridor throughout Recommendation: Conduct a lighting study to ensure proper coverage of roadway and pedestrian facilities	All
1.4	Eagle Dr	Corridor-wide	Along the Corridor	Long	Pedestrian Bus Shelter and Pads	Observation: Transit stops are missing pedestrian shelters or pads Recommendation: Install pedestrian shelters and/or pads at all transit stops along corridor	All
A.1	Eagle Dr	Intersection	North Texas Blvd	Short	Widen Crosswalks	Observation: Crosswalks are narrower than the pedestrian ramps Recommendation: Widen crosswalk to be at least as wide as the pedestrian ramps	Sheet 1 of 3
A.2	Eagle Dr	Intersection	North Texas Blvd	Long	Signal Modification	Observation: Pedestrian equipment is not accessible and other signal equipment are needed around the intersection Recommendation: Install new push buttons on supplemental pedestrian poles for accessibility, replace signal pole on west corner to include luminaire, install flashing yellow arrow for left turns, and leading pedestrian interval	Sheet 1 of 3
B.1	Eagle Dr	Intersection	Kendolph St	Short	High Visibility Crosswalk	Observation: Crosswalk markings are missing on south side of intersection Recommendation: Stripe high visibility crosswalk along the south side of intersection	Sheet 1 of 3
B.2	Eagle Dr	Intersection	Kendolph St	Short	Crosswalk Ahead Warning Sign	Observation: Existing crossing is missing advance warning signage for crosswalk Recommendation: Install advance warning signs for the crossing to increase pedestrian safety	Sheet 1 of 3
B.3	Eagle Dr	Intersection	Kendolph St	Short	Trim Vegetation	Observation: Trees are hanging over sidewalk where crosswalk is located, sight issue for signage Recommendation: Trim vegetation on both sides of Eagle Dr where the crosswalk is located	Sheet 1 of 3
B.4	Eagle Dr	Intersection	Kendolph St	Long	Pedestrian Refuge	Observation: The pedestrian crossing is on the western leg of an intersection. Left turn traffic from Kendolph should be encouraged to make a wider turn Recommendation: Add either a pedestrian refuge in the middle or left turn calming devices (similar to speed bumps)	Sheet 1 of 3
B.5	Eagle Dr	Intersection	Kendolph St	Long	Rectangular Rapid Flashing Beacon	Observation: Existing crossing is unenhanced with only static pedestrian signage. Recommendation: Due to proximity to the University, the crossing should be enhanced with a rectangular rapid flashing beacon to warn drivers of crossing to increase pedestrian safety	Sheet 1 of 3
B.6	Eagle Dr	Intersection	Kendolph St	Long	Crosswalk Lighting	Observation: Pedestrian lighting at crosswalk on west side of intersection is missing Recommendation: Install new lighting at intersection to illuminate crosswalk and increase pedestrian safety	

Table 3 – Recommendations Table (Page 2 of 6)

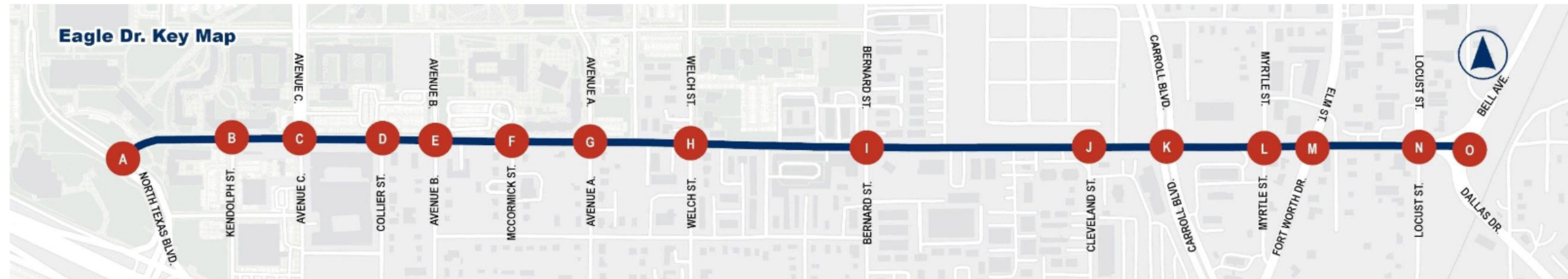
Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
BC.1	Eagle Dr	Spot Recommendation	South of Honors Hall	Short	Speed Feedback	Observation: Speeding was observed in this area of the corridor Recommendation: Install speed feedback sign for traffic calming	Sheet 1 of 3
BC.2	Eagle Dr	Segment	Kendolph St-Avenue C, entire southern side of block	Long	New Sidewalk	Observation: There is a sidewalk gap for approximately 280' on south side of Eagle Drive Recommendation: Install approximately 280' of accessible sidewalk along south side of Eagle Drive	Sheet 1 of 3
C.1	Eagle Dr	Intersection	Avenue C	Short	Refresh Crosswalk	Observation: Crosswalk pavement markings are fading, low visibility Recommendation: Restripe crosswalk throughout the intersection	Sheet 1 of 3
C.2	Eagle Dr	Intersection	Avenue C	Short	Bicycle Accommodations	Observation: A two-way cycle track was added on Avenue C north of Eagle Drive. The intersection does not have bicycle accommodations at the intersection to connect from/to Eagle Drive and Avenue C. Recommendation: Add bike accommodations for crossing at intersection such as two-stage turn boxes, separate bicycle phases, bicycle signals, or bike boxes	Sheet 1 of 3
CD.1	Eagle Dr	Segment	Avenue C-Collier St, entire northern side of block	Long	New Sidewalk	Observation: There is a sidewalk gap along the north side of Eagle for approximately 420' Recommendation: Install approximately 420' of accessible sidewalk along the north side of the Eagle Drive	Sheet 1 of 3
D.1	Eagle Dr	Intersection	Collier St	Short	Left Turn Lane	Observation: There is a break in the two-way left turn lane since that is confusing Recommendation: Restripe the turn lanes to be back to back even between Collier Street and Avenue B	Sheet 1 of 3
DE.1	Eagle Dr	Segment	Collier St-Avenue B, entire northern side of block	Long	New Sidewalk	Observation: There is a sidewalk gap along the north side of Eagle Drive for approximately 270'. Recommendation: Install approximately 270' of accessible sidewalk along the north side of Eagle Drive.	Sheet 1 of 3
E.1	Eagle Dr	Intersection	Avenue B	Short	Left Turn Lane	Observation: There is a break in the two-way left turn lane since that is confusing Recommendation: Restripe the turn lanes to be back to back even between Collier Street and Avenue B	Sheet 1 of 3
E.2	Eagle Dr	Intersection	Avenue B	Long	Signal Warrant Study	Observation: There is a new dorm and two multifamily developments south of Eagle Drive Recommendation: The intersection should be studied when all three developments are open for a potential traffic signal	Sheet 1 of 3
EF.1	Eagle Dr	Spot Recommendation	North of Eagle Apartments	Short	Trim Vegetation	Observation: Vegetation is hanging over sidewalk blocking pedestrian path Recommendation: Trim vegetation on the south side of the segment	Sheet 1 of 3
EF.2	Eagle Dr	Segment	South of Kerr Hall Colling Tower Parking Lot	Long	New Sidewalk	Observation: There is a sidewalk gap along the north side of Eagle Drive for approximately 225' Recommendation: Install approximately 225' of accessible sidewalk along the north side of Eagle Drive	Sheet 1 of 3
F.1	Eagle Dr	Intersection	McCormick St	Long	Remove Driveway Island	Observation: Median on the parking lot entrance/exit does not seem necessary. Cars have been observed ignoring and making left turns out from the site. Recommendation: Remove channelizing median from north side of intersection	Sheet 1 of 3

Table 3 – Recommendations Table (3 of 6)

Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
F.2	Eagle Dr	Intersection	McCormick St	Long	Pedestrian Signal Study	Observation: Intersection is uncontrolled has bus stops on both sides of the street Recommendation: Conduct pedestrian signal study at intersection to evaluate the need for a signal to increase safety of pedestrians using the bus	Sheet 1 of 3
G.1	Eagle Dr	Intersection	Avenue A	Short	Bicycle Accommodations	Observation: A bicycle lane was added on Avenue A north of Eagle Drive. The intersection does not have bicycle accommodations at the intersection to connect from/to Eagle Drive and Avenue A. Recommendation: Add bike accommodations for crossing at intersection such as two-stage turn boxes, separate bicycle phases, bicycle signals, or bike boxes	Sheet 2 of 3
G.2	Eagle Dr	Intersection	Avenue A	Short	Refresh Crosswalk	Observation: Crosswalk pavement markings are fading at intersection Recommendation: Restripe crosswalk throughout the intersection	Sheet 2 of 3
G.3	Eagle Dr	Intersection	Avenue A	Short	Refresh Striping	Observation: Double yellow pavement markings do not connect Recommendation: Adjust striping to connect double yellows	Sheet 2 of 3
G.4	Eagle Dr	Intersection	Avenue A	Short	Advance Lane Use Signage	Observation: No signage or markings for northbound left turn Recommendation: Advance lane use signage and markings on Avenue A approaching Eagle Drive	Sheet 2 of 3
GH.1	Eagle Dr	Segment	Avenue A-Welch St, entire northern side of block	Long	New Sidewalk	Observation: There is a sidewalk gap along the north side of Eagle Drive for approximately 415' Recommendation: Install approximately 415' of accessible sidewalk along the north side of Eagle Drive	Sheet 2 of 3
H.1	Eagle Dr	Intersection	Welch St	Short	Refresh Crosswalk	Observation: Crosswalk pavement markings are fading Recommendation: Restripe crosswalk throughout the intersection	Sheet 2 of 3
H.2	Eagle Dr	Intersection	Welch St	Short	Refresh Striping	Observation: Pavement markings at intersection are fading Recommendation: Restripe all markings in intersection	Sheet 2 of 3
H.3	Eagle Dr	Intersection	Welch St	Long	Flashing Yellow Arrow	Observation: Traffic signal does not have flashing yellow arrow for left turns Recommendation: Install a flashing yellow arrow at intersection	Sheet 2 of 3
H.4	Eagle Dr	Intersection	Welch St	Long	Detectable Warning Surface	Observation: Pedestrian ramps have old style of detectable warning surfaces Recommendation: Install updated detectable warning surfaces on all corners of intersection	Sheet 2 of 3
H.5	Eagle Dr	Intersection	Welch St	Long	Accessible Pedestrian Signals	Observation: Pedestrian push button on southeast corner was not activated Recommendation: Fix APS on southeast corner of the intersection	Sheet 2 of 3
HI.1	Eagle Dr	Spot Recommendation	North of Denton Student Apartments	Short	Sign Improvement	Observation: Speed limit sign is protruding and is too close to base Recommendation: Raise sign to 7' minimum from base to the bottom of the sign and straighten sign vertically	Sheet 2 of 3
I.1	Eagle Dr	Intersection	Bernard St	Long	Planned Signal Rebuild	Observation: Traffic signal is a span wire signal Recommendation: Intersection has been fully designed for a signal rebuild including lighting with construction to begin within the next year	Sheet 2 of 3
IJ.1	Eagle Dr	Spot Recommendation	Bernard St-Cleveland St, along southside of block	Short	Trim Vegetation	Observation: Vegetation is hanging over sidewalk Recommendation: Trim vegetation on the south side of the segment	Sheet 2 of 3

Table 3 – Recommendations Table (4 of 6)

Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
IJ.2	Eagle Dr	Spot Recommendation	I.O.O.F. St.	Short	Install Stop Bar	Observation: I.O.O.F. St. is missing stop bar markings at existing stop-controlled approach Recommendation: Install stop bar markings on I.O.O.F. St. to increase visibility of stop-controlled approach	Sheet 2 of 3
IJ.3	Eagle Dr	Spot Recommendation	East of I.O.O.F. St	Long	Pedestrian Transit Platform	Observation: Bus stop does not have any pedestrian facilities leading to the stop Recommendation: Install pedestrian infrastructure at bus stop to intersection	Sheet 2 of 3
J.1	Eagle Dr	Intersection	Cleveland St	Short	Install Stop Bar	Observation: Cleveland St. is missing stop bar markings at existing stop-controlled approach Recommendation: Install stop bar markings on Cleveland St. to increase visibility of stop-controlled approach	Sheet 3 of 3
J.2	Eagle Dr	Intersection	Cleveland St	Long	Pedestrian Ramps	Observation: Crossing is missing pedestrian curb ramps Recommendation: Install pedestrian curb ramps on the southeast side of intersection	Sheet 3 of 3
JK.1	Eagle Dr	Segment	North of Grease Monkey	Long	New Sidewalk	Observation: There is a sidewalk gap along the south side of Eagle Drive for approximately 110' Recommendation: Install approximately 110' of accessible sidewalk along the south side of Eagle Drive	Sheet 3 of 3
K.1	Eagle Dr	Intersection	Carroll Blvd	Short	Left Turn Lane	Observation: During the field audit, a car used inside left turn lane to go straight through intersection and westbound left traffic does not warrant dual left turns Recommendation: Remove inside left turn with striping to create a single left turn only lane	Sheet 3 of 3
K.2	Eagle Dr	Intersection	Carroll Blvd	Long	Pedestrian Ramps	Observation: Curb ramps on northwest, northeast, and southeast corners are angled toward middle of intersection Recommendation: Add directional curb ramps three corners	Sheet 3 of 3
K.3	Eagle Dr	Intersection	Carroll Blvd	Long	Detectable Warning Surface	Observation: Curb ramps at intersection are missing detectable warning surface Recommendation: Add detectable warning surfaces on all corners of intersection	Sheet 3 of 3
K.4	Eagle Dr	Intersection	Carroll Blvd	Long	Accessible Pedestrian Signals	Observation: Pedestrian push button and pedestrian signal head are far from curb ramp Recommendation: Move pedestrian pole, APS push button and pedestrian signal head closer to the curb ramp on the southwest corner of intersection	Sheet 3 of 3
K.5	Eagle Dr	Intersection	Carroll Blvd	Long	Leading Pedestrian Interval	Observation: Limited protection for pedestrians when using crosswalk Recommendation: Install leading pedestrian interval to increase pedestrian safety	Sheet 3 of 3
K.6	Eagle Dr	Intersection	Carroll Blvd	Long	Protective Phasing	Observation: Left turn phases do not have a protected left movement Recommendation: Install protective phasing for left turns to have a protected turn arrow	Sheet 3 of 3
KL.1	Eagle Dr	Segment	QuikTrip Driveway	Short	Install Vertical Delineators	Observation: Traffic turning left from Eagle into driveway that is right turn only entering the QuikTrip Recommendation: Add vertical delineator posts to restrict westbound traffic from turning left into driveway	Sheet 3 of 3

Table 3 – Recommendations Table (5 of 6)

Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
L.1	Eagle Dr	Intersection	Myrtle St	Short	High Visibility Crosswalks	Observation: No crosswalk to connect north and south side of intersection Recommendation: Install crosswalk on west side of intersection to connect north and south side	Sheet 3 of 3
L.2	Eagle Dr	Intersection	Myrtle St	Long	New Sidewalk	Observation: Sidewalk on south side of Myrtle does not extend to intersection Recommendation: Install approximately 25' of sidewalk on south side to connect to intersection	Sheet 3 of 3
L.3	Eagle Dr	Intersection	Myrtle St	Long	Pedestrian Ramps	Observation: Curb ramp is missing at southwest and northwest corner of intersection Recommendation: Install curb ramp on southwest and northwest corner of intersection	Sheet 3 of 3
M.1	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Short	Eliminate Pedestrian Crossing	Observation: Along the western side of Elm St, there is no sidewalk connectivity Recommendation: Eliminate pedestrian crossing on west side of intersection	Sheet 3 of 3
M.2	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Short	Refresh Crosswalks	Observation: Crosswalk striping is missing or fading at intersection Recommendation: Stripe and restripe crosswalk markings on north and south sides of the intersection	Sheet 3 of 3
M.3	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Short	Retroreflective Backplates	Observation: Retroreflective backplates are missing from the intersection Recommendation: Upgrade signals with retroreflective backplates	Sheet 3 of 3
M.4	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Short	Lane Use Signage	Observation: Westbound signal is missing "NO LEFT TURN" sign for northbound left turns onto Elm St. Recommendation: Install "NO LEFT TURN" sign to reinforce the prohibition of northbound left turn onto Elm St.	Sheet 3 of 3
M.5	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Long	Detectable Warning Surface	Observation: Intersection is missing pedestrian push buttons at all corners Recommendation: Install pedestrian push buttons on all corners of intersection	Sheet 3 of 3
M.6	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Long	Accessible Pedestrian Signals	Observation: Intersection is missing pedestrian signal heads on all corners Recommendation: Install pedestrian signal heads on all corners of intersection	Sheet 3 of 3
M.7	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Long	Pedestrian Ramps	Observation: Curb ramps are missing on southeast corner of the intersection Recommendation: Install pedestrian curb ramps on the southeast corner of intersection	Sheet 3 of 3
M.8	Eagle Dr	Intersection	Fort Worth Dr/Elm St	Long	High Visibility Crosswalk	Observation: No pedestrian crosswalk on the east side of the intersection Recommendation: Install crosswalk on the east side of the intersection	Sheet 3 of 3
MN.1	Eagle Dr	Segment	Across Eagle north of Mallouf Hat Company	Short	Eliminate Pedestrian Crossing	Observation: Mid block crossing is within 150' from the traffic signal at Elm Recommendation: Eliminate mid-block crossing	Sheet 3 of 3
MN.2	Eagle Dr	Segment	West of O'Reilly Auto Parts Driveway	Long	New Sidewalk	Observation: Sidewalk connectivity is missing on north side of segment Recommendation: Install approximately 85' of accessible sidewalk along north side of segment to connect to existing sidewalk	Sheet 3 of 3
MN.3	Eagle Dr	Segment	North of Smilin Rick's Tattoo	Long	New Sidewalk	Observation: There is a sidewalk gap along the south side of Eagle Drive for approximately 175' Recommendation: Install approximately 175' of accessible sidewalk along the south side of Eagle Drive	Sheet 3 of 3
N.1	Eagle Dr	Intersection	Locust St	Short	Eliminate Pedestrian Crossing	Observation: Crosswalk on east side of intersection is not needed Recommendation: Eliminate pedestrian crossing on east side of the intersection	Sheet 3 of 3

Table 3 – Recommendations Table (6 of 6)

Recommendations for Eagle Dr. from North Texas Blvd. to Bell Ave. in Denton, TX



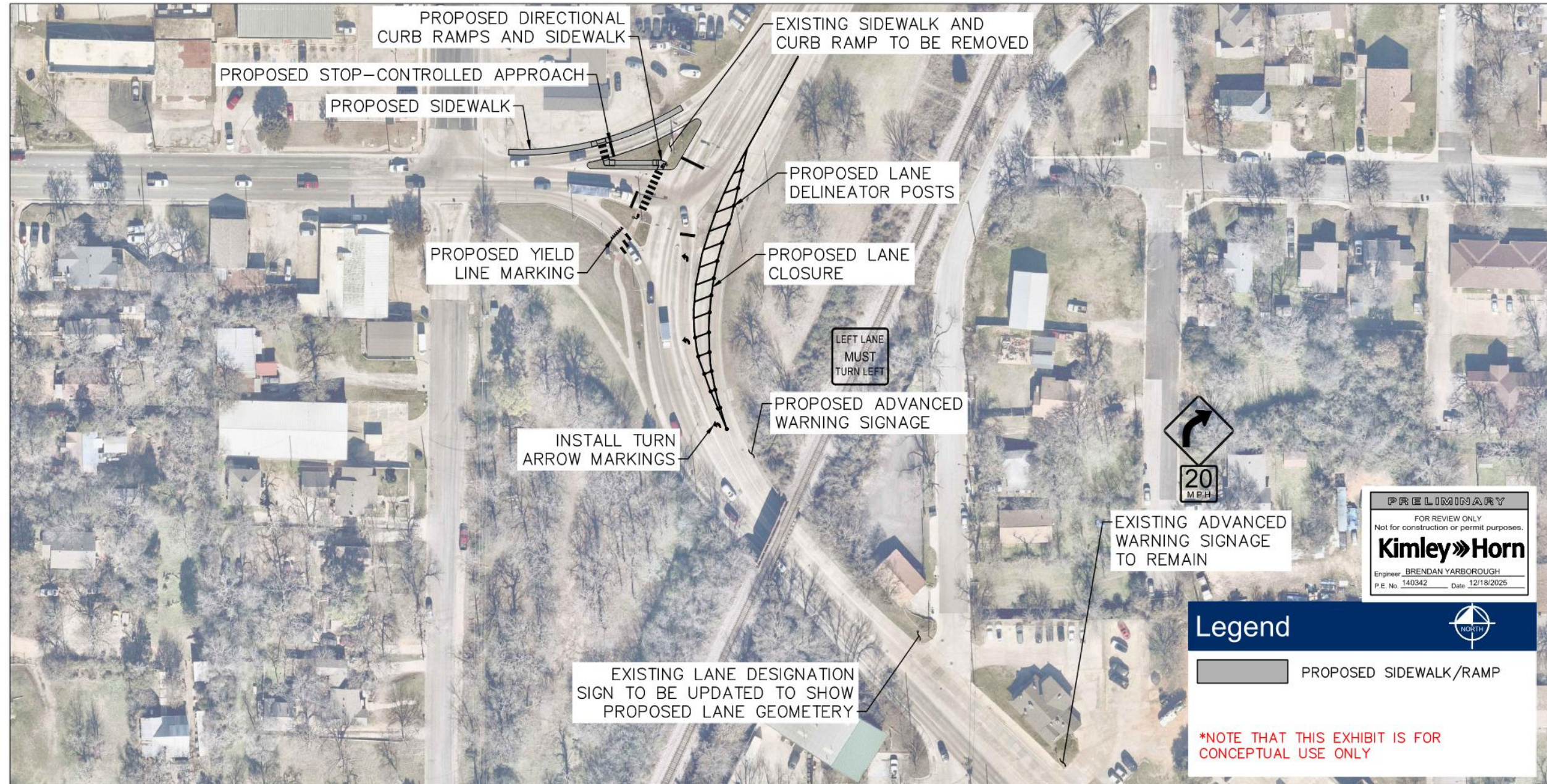
ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
N.2	Eagle Dr	Intersection	Locust St	Short	Refresh Crosswalk	Observation: Striping is missing on both north and south crosswalks Recommendation: Stripe crosswalk on north and south side crosswalks across intersection	Sheet 3 of 3
N.3	Eagle Dr	Intersection	Locust St	Long	Pedestrian Ramps	Observation: Pedestrian curb ramps are not directional at both north side corners and is missing at the southwest corner of intersection Recommendation: Construct directional curb ramps at each corner of the intersection	Sheet 3 of 3
NO.1	Eagle Dr	Segment	Southeast corner of Eagle Dr and Locust St	Short	Trim Vegetation	Observation: Vegetation observed to block the light pole Recommendation: Trim vegetation from light pole	Sheet 3 of 3
NO.2	Eagle Dr	Segment	South of Sticker Station	Long	New Sidewalk	Observation: There is a sidewalk gap along the north side of Eagle Drive for approximately 175' Recommendation: Install approximately 175' of accessible sidewalk along the north side of Eagle Drive	Sheet 3 of 3
O.1	Eagle Dr	Intersection	Bell Ave	Short	Signal Ahead Warning Sign	Observation: Signalized intersection is around a curve for northbound traffic on Bell Ave Recommendation: Install signal ahead warning signs approximately 300' in advance of the intersection for northbound traffic	Sheet 3 of 3
O.2	Eagle Dr	Intersection	Bell Ave	Short	Pavement Marking	Observation: Northbound left turn is missing lane use pavement markings Recommendation: Add a left turn arrow pavement marking for northbound left turns to discourage last-minute through movement	Sheet 3 of 3
O.3	Eagle Dr	Intersection	Bell Ave	Short	Sign Improvement	Observation: Multiple signs leading up to and in intersection are faded Recommendation: Replace faded "CURVE AHEAD" warning and "20 MPH" advisory sign south of Johnson St along the northbound side and replace faded Merge Traffic sign on the center median in the northbound direction, north of the intersection	Sheet 3 of 3
O.4	Eagle Dr	Intersection	Bell Ave	Long	Install Stop-Controlled Approach	Observation: Southbound right turn is a yield operation Recommendation: Change to a stop-controlled approach with a stop bar marking and supplementary red reflective tape on the "STOP" sign pole. Reroute the curb ramp and crosswalk pavement markings to be further west in front of the stop bar.	Sheet 3 of 3
O.5	Eagle Dr	Intersection	Bell Ave	Long	Intersection Reconfiguration	Observation: No pedestrian infrastructure, through traffic and right turn issues Recommendation: Rebuild intersection where northbound through traffic is pushed to the right and the other through lane will be a drop left turn onto Eagle Drive. For the southbound right turn, change the yield operations to stop controlled approach. Add all new pedestrian infrastructure in reconfiguration. Prior to altering the lane geometry or closing a lane, a comprehensive traffic analysis should be performed to ensure intersection operations are not negatively impacted. The City of Denton would need to get approval from the TxDOT Denton Area Office prior to any lane closure.	Sheet 3 of 3



The intersection of Eagle Drive and Bell Avenue is a complex one. There is a northbound curve that can cause sight distance issues, a southbound right-turn channelization with a pedestrian crossing, and a lack of pedestrian infrastructure throughout the intersection. Several improvements can be made at this intersection. An example of some of the recommendations can be seen in **Figure 26**. Please note that the recommendations shown in the figure are for conceptual purposes only. Prior to altering the lane geometry or closing a lane, a comprehensive traffic analysis should be performed to ensure intersection operations are not negatively impacted. The City of Denton would need to get approval from the TxDOT Denton Area Office prior to any lane closure.

Eagle Drive - Denton, TX

Figure 26 | Bell Avenue Intersection Recommendations



Road Safety Audit 2025

Page 1 of 1

Figure 26 – Eagle Drive and Bell Avenue Intersection Reconfiguration



Crash Modification Factors and Cost Estimates

Since the RSA identified several countermeasures for Eagle Drive, prioritization based on the effectiveness and cost of these countermeasures will help guide thoughtful implementation. **Appendix C** provides a list of common countermeasures, along with their crash modification factors (CMF) and estimated costs. Crash modification factors are values that indicate the number of crashes that can be expected after a specific countermeasure is implemented. All cost estimates are approximate and intended for planning purposes only.



NEXT STEPS AND OTHER RESOURCES

The RSA plays a critical role in improving the overall safety performance of a roadway. Completing the RSA for Eagle Drive ensured that planned recommendations were identified through a data-driven approach as well as stakeholder input. The RSA Team and the City of Denton are committed to enhancing safety throughout the corridor for all users. Implementation efforts will focus on deploying high-impact countermeasures that address identified crash patterns. Leveraging federal, state, and local funding sources will be pivotal in all implementation efforts. Additionally, the audit aims to align proposed improvements with broader Vision Zero initiatives, reinforcing the city’s commitment to reducing serious crashes and improving multimodal accessibility.

Potential Funding Sources

Table 4 lists several potential funding sources that can be leveraged for implementing the identified countermeasures on Eagle Drive. The table lists funding sources and provides information about each one’s agency, local match requirements, and a short description of the program’s goals.

Table 4 – Potential Funding Sources

Funding Opportunity	Agency	Local Match	Description
City Bond and/or CIP Budgets	City of Denton	N/A	Local City Bond programs and CIP budgets provide dedicated funding for roadway infrastructure projects, typically through voter-approved bonds and multi-year capital planning. These funds can be used for various roadway improvements, such as intersection upgrades, pedestrian facilities, and traffic signal enhancements.
Denton County	Denton County	50%	The Denton County MCIP is a funding program available to cities within Denton County to support infrastructure improvements across the region. New projects are authorized annually based on categories such as roadway safety, regional connectivity, and pedestrian/bicyclist accessibility.
Safe Streets and Roads for All (SS4A)	USDOT	20%	A SS4A implementation grant is a federally funded program that covers the implementation of safety strategies identified in the Comprehensive Safety Action Plan (CSAP). This program can fund any roadway or intersection



Funding Opportunity	Agency	Local Match	Description
			improvements listed in the CSAP that enhance vehicle or pedestrian safety.
Highway Safety Improvement Program (HSIP)	TXDOT	10%	HSIP invests in construction and operational safety improvements for locations both on and off the state highway system. Typical improvements include traffic signal improvements, sidewalks, signage, pavement markings, and signal detection upgrades.
Better Utilizing Investments to Leverage Development (BUILD)	USDOT	20%	BUILD is a highly competitive funding opportunity that invests in planning or construction of surface transportation infrastructure projects that improve safety; environmental sustainability; quality of life; mobility and community connectivity; economic competitiveness, including tourism; state of good repair; partnership and collaboration; and innovation.
Transportation Set-Aside (TA)	TxDOT NCTCOG	20%	TxDOT and NCTCOG fund projects that focus on bike and pedestrian facilities through the TA program.
Transportation Infrastructure Finance and Innovation Act (TIFIA)	USDOT	51%	Loan opportunity that funds 49% of costs for projects with a minimum project cost of \$10 million. Project-eligible facilities can include bike and pedestrian paths that connect to and are within 0.5 miles of a transit facility. This can be used to increase access and mobility for users.



Appendix:

Appendix A: Traffic Counts & Speed Data

Appendix B: Crash Narratives

Appendix C: Common Safety Countermeasure Table



| January 07, 2026 |

ROADWAY SAFETY AUDIT

Hickory Street, from Avenue C to S Bell Avenue

City of Denton



North Central Texas
Council of Governments





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INTRODUCTION

NCTCOG Project Background

The North Central Texas Council of Governments (NCTCOG) identified high-injury corridors to conduct Road Safety Audits (RSAs) targeted by the NCTCOG Pedestrian Safety Action Plan (PSAP) and NCTCOG Roadway Safety Plan (RSP) within four core counties of the Dallas-Fort Worth metropolitan region (Collin, Dallas, Denton, and Tarrant Counties).

In 2023, the NCTCOG was awarded a planning grant from the United States Department of Transportation FY23 Safe Routes and Roads for All (SS4A) competitive grant program. The grant funding allows for conducting additional detailed planning for targeted high injury corridors reflected in the RSP and PSAP. In addition, these planning tasks include in-depth data collection such as updated traffic/user counts (all mode types), utility impact identification, lighting conditions, accessibility, pavement markings/signage inventory, parking facilities/behaviors, vehicle speeds, traffic signal/equipment conditions/performance, transit stops/operations, and various roadway asset characteristics.

As a result of the SS4A funding, an RSA was conducted for W. Hickory Street from Avenue C to S. Bell Avenue. The segment falls within the city boundaries for Denton, as shown in **Figure 1**.

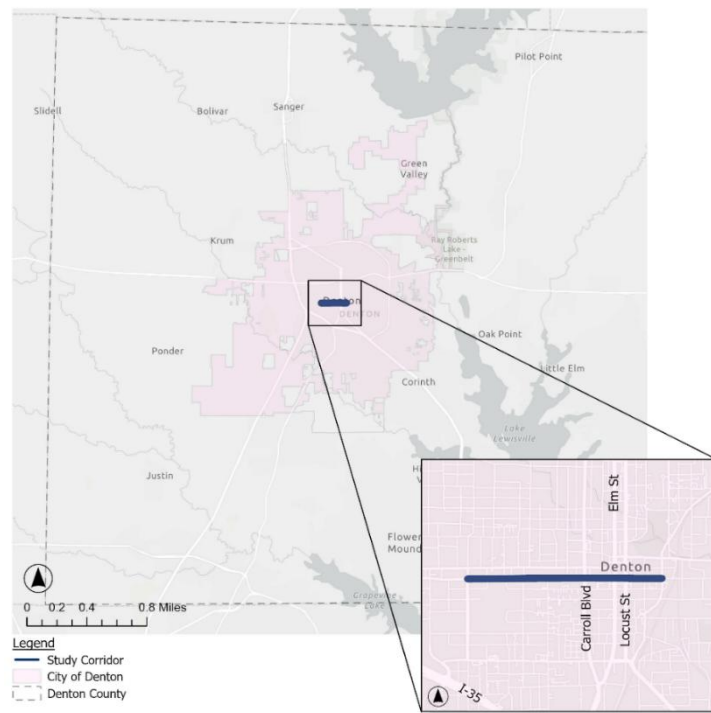


Figure 1 – W. Hickory Street Location Map



RSA PROCESS AND APPROACH

The Federal Highway Administration (FHWA) established the roadway safety audit process to improve the overall safety performance of roadways. A Road Safety Audit (RSA) is the formal examination of an existing or proposed road or intersection by an independent, multidisciplinary team. The RSA qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users (vehicles, pedestrians, bicycles, and transit). The RSA process involves an 8-step process, which is defined below.

■ Step 1: Identify Project

- **Process:** To identify the existing road to be audited and to set the parameters for the RSA.

Approach: NCTCOG, along with other stakeholders, developed a Pedestrian Safety Action Plan (PSAP) and a Roadway Safety Plan (RSP), which identified corridors around the metroplex with the highest fatal or serious injury crashes. W. Hickory Street was identified as a high-injury corridor in the Pedestrian Safety Action Plan.

■ Step 2: Select RSA Team

- **Process:** A multidisciplinary team was formed to conduct a road safety audit.
- **Approach:** The RSA team included the following members:

City of Denton

- Chandrakanth Muruganandham
- Farhan Butt
- Justin Stackhouse
- Sahar Esfandyari
- Seth Garcia

NCTCOG

- Christopher Nelson

Kimley-Horn

- Brendan Yarborough
- Brian Shamburger
- Raul Orozco
- Seth Ragsdale
- Alejandra Galindo

■ Step 3: Pre-audit Meeting

- **Process:** The objective of the pre-audit meeting is to set the context for the RSA by bringing together the project owner, the design team, and the audit team to discuss its scope and review all the information available.
- **Approach:** The pre-audit meeting was held at City of Denton Development Services building on Monday, September 8, 2025. The consultant team reviewed the RSA process, provided an overview of the desktop evaluation of the corridor (see Corridor Mobility Map **Figure 2**), and provided an overview of the crash history (see Crash Strip Map **Figure 4**).

■ Step 4: Perform Field Reviews

- **Process:** The field visit is used to gain further insight into the project or existing road and to further verify/identify safety concerns.
- **Approach:** The RSA team performed the field review on Thursday, September 18, 2025. The field review began at 8 am, starting at the intersection of S Bell Avenue and W Hickory Street. The team conducted the post-audit meeting on-site directly after the field review. Observations from the field review, such as infrastructure deficiencies and driver behavior, were noted. A nighttime site visit was also performed on Tuesday, September 9, 2025, at 8 pm. The RSA team also discussed potential countermeasures to help mitigate any deficiencies during the review.

■ Step 5: Analyze and Report Findings

- **Process:** Analyze and prepare an RSA report to succinctly report the findings of the audit team through the identification and prioritization of safety issues. Recommendations are then made to reduce the degree of risk along the corridor.
- **Approach:** The consultant team summarized all notes from the field review into a table with potential countermeasures. The Recommendations Table for this corridor can be found in Table 3. Alongside the Recommendations Table for this corridor, the consultant team created a Recommendations Summary Exhibit, which visually displays all countermeasures listed in the Recommendations Table on a map for ease of reference (see **Figure 20**).

■ Step 6: Present Findings to Owner

- **Process:** The objective of presenting audit findings to the project owner and design team is to report orally the key findings of the audit as presented in the audit report.
- **Approach:** The consultant team sent the Recommendations Summary Exhibit and Table to the rest of the RSA Team for review on Friday, October 10, 2025. This was two weeks before the RSA Follow-Up Meeting on Monday, October 27, 2025. The consultant team reviewed each page of the Recommendations Summary Exhibit, providing a brief overview of potential countermeasures and soliciting the RSA Team's opinions, questions, or concerns. Through feedback received during and after the RSA Follow-Up Meeting, edits were made to both the Recommendations Summary Exhibit and Table.

■ Step 7: Prepare Formal Response

- **Process:** The project owner prepares a written response to the final RSA Report.
- **Approach:** After the RSA, the project owner should review the report and formally respond with what actions the project owner will take with respect to each safety concern listed in the report. To build support for the findings and overall RSA process, the RSA findings may be presented in a public meeting, or the report should be made available to the public. The timeframe for this response and making this information public may vary for each agency.

■ Step 8: Incorporate Findings

- **Process:** Incorporate findings into the project when appropriate.
- **Approach:** After the response to the RSA report is prepared, the project owner should work to implement the agreed-upon safety measures or create an implementation plan. Implementation of the suggested measures is at the discretion of the project owner and appropriate staff based on their project schedules and available funds.



EXISTING CORRIDOR CONDITIONS

W. Hickory Street between Avenue C and S. Bell Avenue spans between the University of North Texas and City of Denton's Downtown. Between Avenue C and Locust Street, the typical section includes a two-lane one-way roadway with on-street parking on the north side of the street and a bike lane on the south side of the street. Between Locust Street and Bell Avenue, the typical section includes a two-lane undivided roadway with on-street parking on both sides of the street. This section of W. Hickory Street was selected as a study corridor because it was identified as a high injury roadway segment through NCTCOG's Pedestrian Safety Action Plan. W. Hickory Street in its entirety is a key corridor for the area due to its connectivity to Denton Square, the University of North Texas and I-35.

As shown in **Figure 2**, this section of W. Hickory Street has two different land contexts. West of the Carroll Boulevard intersection, the corridor's land use is primarily residential with some commercial towards the S Bell Avenue end of the corridor. While the west side of the corridor is heavily residential, east of the Carroll Boulevard intersection the context changes to primarily commercial with direct access to various businesses.

There are several bus routes and stops spanning the study corridor, as shown in **Figure 2**. In addition to the buses, the corridor includes sidewalk that ranges from four feet to nine feet wide. This corridor contains pedestrian and transit facilities, and one-way on-street bike lanes on the south side of the street (between Avenue C and Locust Street).

Hickory Street- Denton, TX Corridor Mobility

Project Background

NCTCOG and the City of Denton are committed to end traffic deaths and serious injuries. City of Denton, NCTCOG and Kimley-Horn are partnering to conduct a Roadway Safety Audit along Hickory Street, diagnose issues and recommend countermeasures. This corridor is part of the Vision Zero Plan that aims to improve high injury networks.

Corridor: Hickory Street	Begin Point: Avenue C	AADT: 2,200-5,900
City: Denton	End Point: S Bell Ave	TxDOT Status: Off
County: Denton	Length (miles): 1.3	Speed Limit: 25mph
Multi-Modal Elements: undivided and divided bike lanes, on-street parking sidewalks		

Legend

- RSA Corridor Limits
- Railroad
- Bus Route
- Bus Stop
- Signalized Intersection
- Park
- School
- Library
- AADT (2024 from TxDOT)

0 500 1,000 Feet

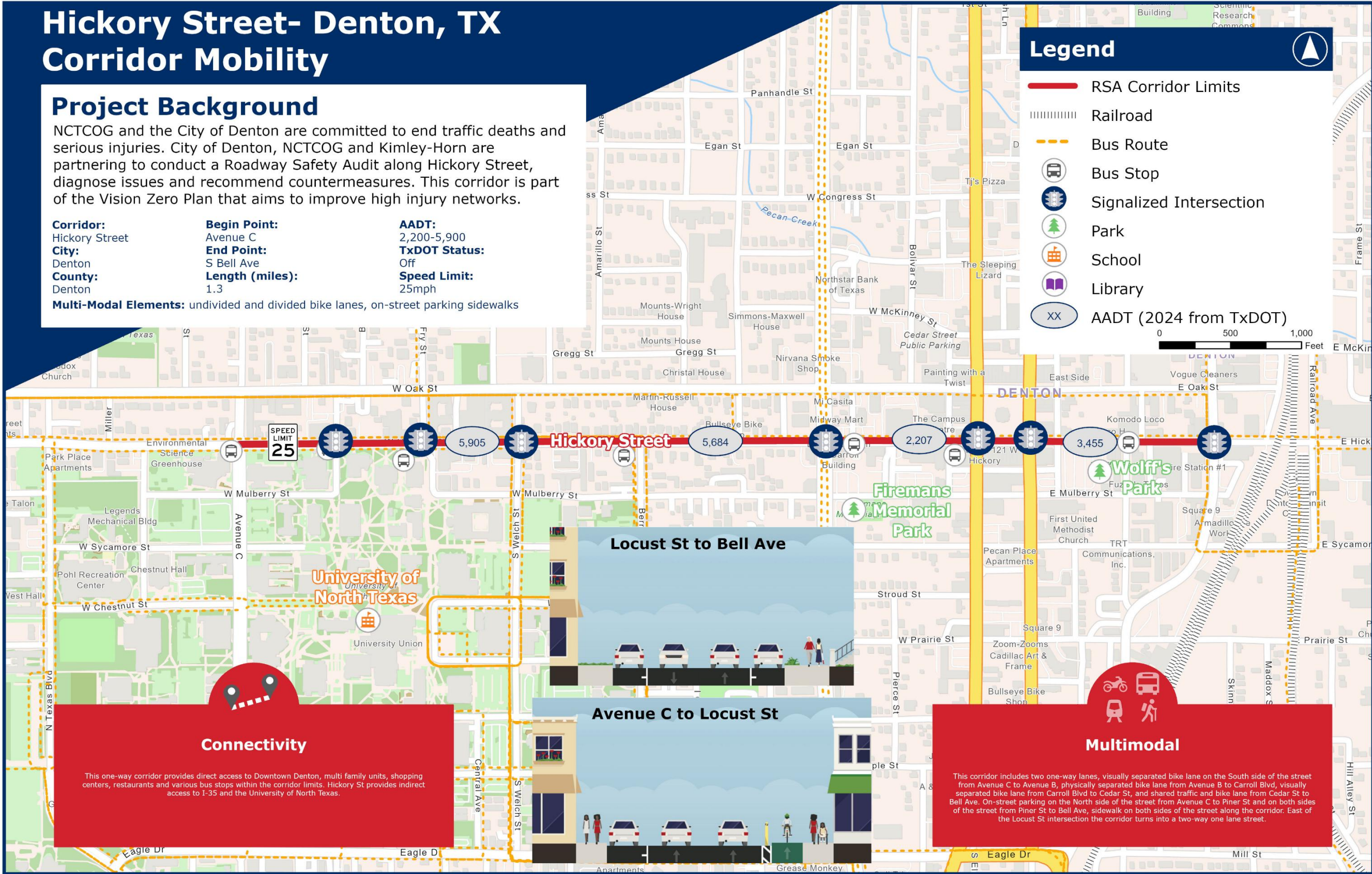


Figure 2 - Corridor Mobility Map

Data Collection

As part of the RSA, 24-hour speed counts and crash data (collected from 2020 to 2024) for the corridor were collected and analyzed. 24-hours of speed data and directional tube counts were collected on Hickory Street on Wednesday, October 1, 2025. Crash data was obtained from TxDOT's Crash Records Information System (CRIS) for all crashes on the corridor between 2020 and 2024.

Speed Data

Vehicle speed data was collected using tube counters (between Bernard Street and Carroll Boulevard) over 24-hours on October 1, 2025. During field observations, the RSA Team observed speeding by drivers; to confirm these observations, speed data was collected along this section. While the speed limit on the corridor is 25 MPH, speed count data showed an 85th percentile speed of 35 MPH (**Figure 3**) confirming the observations made by the RSA Team in the field.

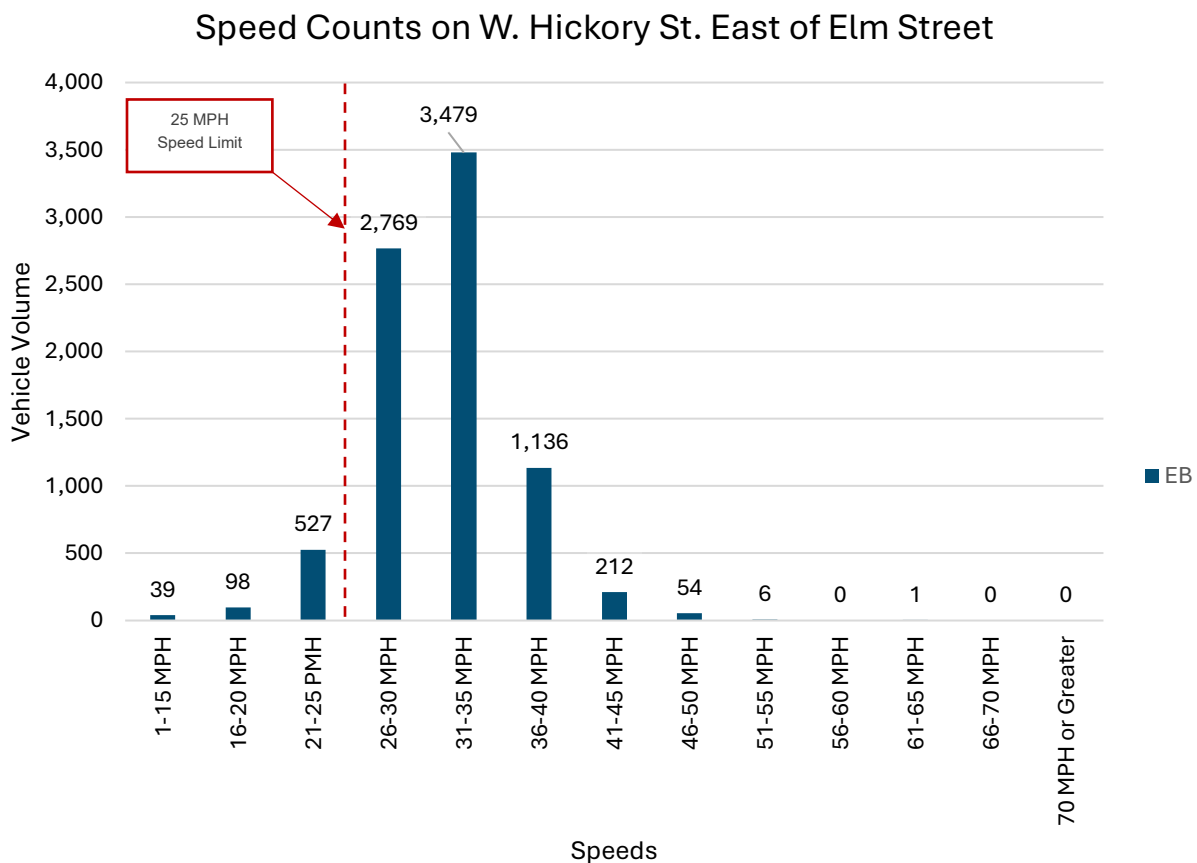


Figure 3 - Speed Counts on W. Hickory St.

Crash Data

The corridor experienced 147 crashes during the study period (2020 – 2024). Of the 147 crashes, approximately 9% resulted in an injury crash (KAB). There were no fatal injury crashes (K) in the corridor during this period; however, there was one (1) suspected serious injury crash (A) and 13 suspected minor injury crashes (B). Crash clusters are occurring at Carroll Boulevard, as shown in **Figure 4**. As part of the Roadway Safety Audit, crash narratives for all fatal and suspected serious injury crashes that occurred in the corridor during the study period were acquired from NCTCOG. Crash narratives are essential in determining safety countermeasures for roadways by providing specific details on why and how a crash occurred. All crash narratives for fatal and suspected serious injury crashes on this corridor are in **Appendix B**.

While, on average, this corridor experienced fewer fatal and severe crashes when compared to the overall Denton County average, the corridor had a higher-than-average number of crashes involving vulnerable road users, bicyclists, and pedestrians. **Table 1** indicates that pedestrian crashes are more prevalent on this corridor compared to the Denton County average. The number of crashes involving vulnerable road users and parked vehicles indicates there is a need to identify issues and improve pedestrian and parking facilities.

As shown in **Figure 4**, the top manner of collision, was ‘Angle’ crash. Angle crashes accounted for approximately 33% of crashes. These crashes are more common on corridors such as W. Hickory Street due to the high density of intersections and driveways, coupled with on-street parking that may provide visibility constraints. The second most common types of crashes on the corridor are ‘One Motor Vehicle’ and ‘Same Direction - Not Rear End’, commonly known as side-swipe crashes, with one motor vehicle crashes accounting for approximately 22% of crashes and not rear end crashes accounting for approximately 22% of crashes. These crashes are primarily occurring near the signalized intersections on the corridor, such as at Avenue A and Carroll Boulevard. Proposed countermeasures should focus on addressing issues contributing to the cause of angle, one motor vehicle and not rear end crashes.

A contributor to angle crashes is typically insufficient street lighting, as it can lead to decreased visibility, resulting in turning movements that may result in conflicts. However, for this corridor specifically, angle crashes can also be attributed to the number of parked cars. On the corridor, approximately 37% of crashes happened in dark conditions, the majority being in ‘Dark – Lighted’ conditions. This means that there was lighting present in some capacity at the location of the crash. With more than a third of crashes occurring in dark conditions, there is a need to evaluate existing street lighting on the corridor.

Hickory Street - Denton, TX Crash History Strip Map

147
Count of Crashes

Count of Crashes

- Crash Severity**
- A (Serious Injury)
 - B (Minor Injury)
 - C (Possible Injury)
 - N (Not Injured)
 - O (Unknown)

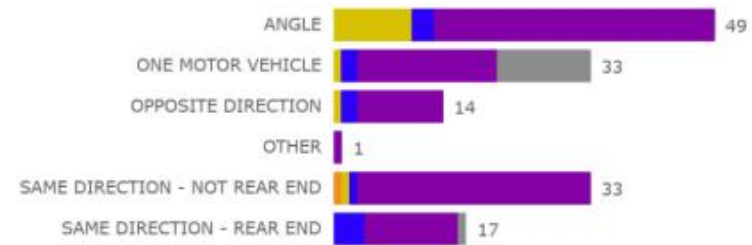
Crash Severity



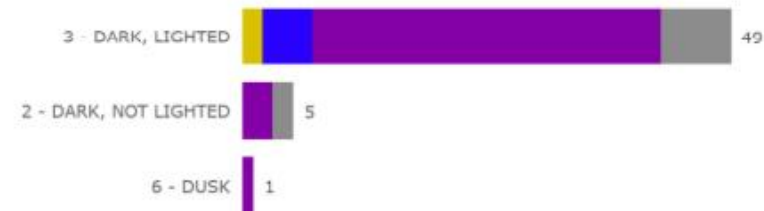
Vulnerable Road Users



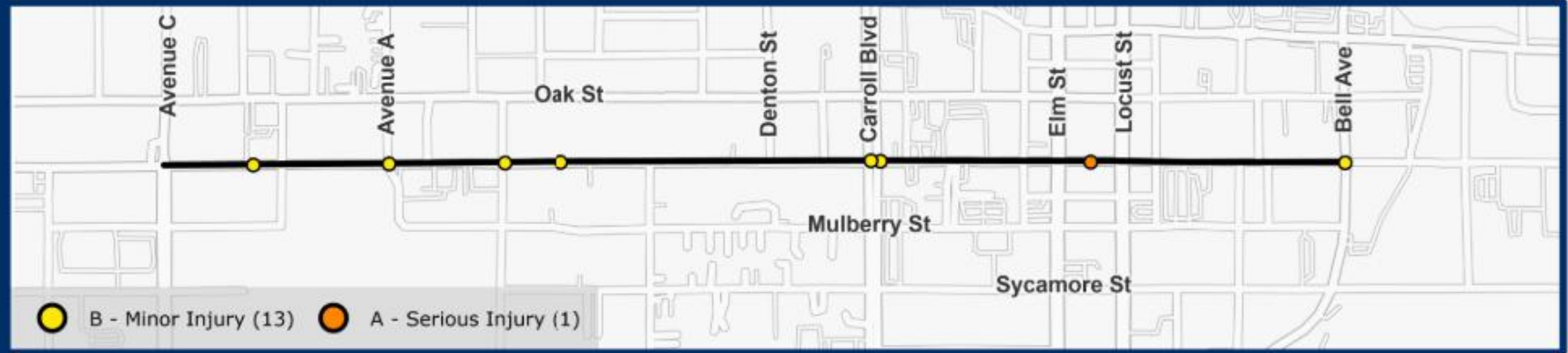
Manner of Collision



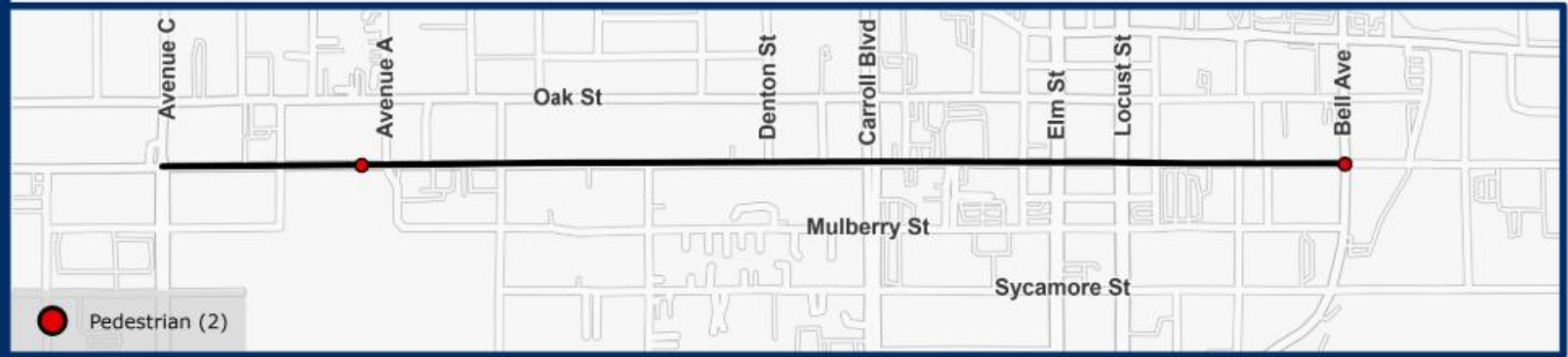
Poor Lighting Conditions



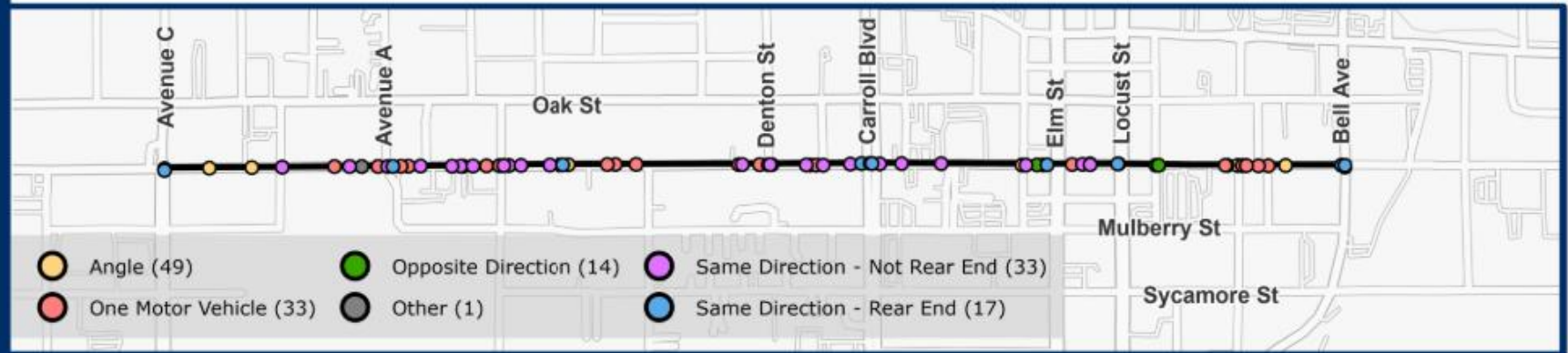
Fatal, Serious, and Minor Injury Crashes



Vulnerable Road Users Crash Frequency



Manner of Collision Crash Frequency



Poor Lighting Conditions Crash Frequency



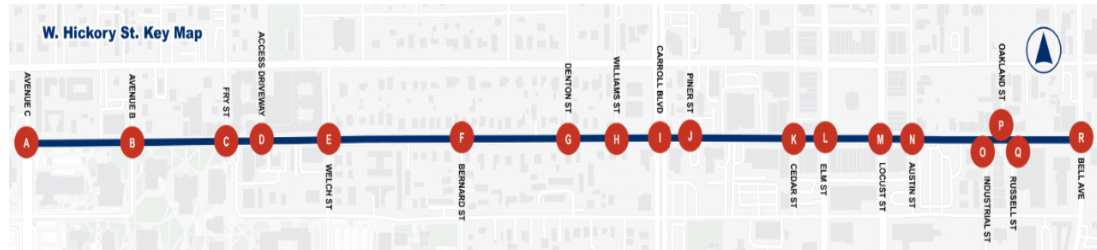
Figure 4 - Crash History Strip Map

Table 1 - Corridor Comparison Table

Hickory St. in Denton, TX

Corridor Comparison Table

Limits: Avenue C to Bell Ave.



Legend

- XX Indicates when a value is above average for the county
- XX Indicates when a value is 2 times above average for the county

Category	Attributes	County or City Average (Percent & Count)		Hickory St. Corridor																				
		100.0%	65,089	A. Avenue C	B. Avenue B	C. Fry St.	D. Access Driveway	E. Welch St.	F. Bernard St.	G. Denton St.	H. Williams St.	I. Carroll Blvd.	J. Pine St.	K. Cedar St.	L. Elm St.	M. Locust St.	N. Austin St.	O. Industrial St.	P. Oakland St.	Q. Russell St.	R. Bell Ave.			
Crash Severity	K - Fatal	0.4%	266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	A - Incapacitating Injury	2.2%	1,404	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0		
	B - Non-Incapacitating Injury	11.2%	7,267	13	0	0	1	0	2	0	0	0	6	0	0	1	0	0	0	0	0	0	1	
	C - Possible Injury	13.3%	8,656	12	1	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	3	
	N - Not Injured	68.0%	44,262	108	4	4	1	0	5	0	1	1	21	0	1	0	7	4	1	0	0	0	10	
	99 - Unknown	5.0%	3,234	13	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
First Harmful Event	Motor Vehicle In Transport	73.8%	48,015	114	6	3	2	0	7	0	1	1	29	0	1	1	9	4	1	0	0	0	12	
	Fixed Object	14.9%	9,670	5	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	
	Parked Car	7.7%	5,016	26	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Overtuned	1.0%	667	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pedestrian	1.0%	651	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Pedalcyclist	0.6%	395	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Light Conditions	Daylight	69.6%	45,300	91	5	3	1	0	5	0	2	0	21	0	1	0	6	3	0	0	0	0	12	
	Dark (Lighted/Not Lighted/Unknown Lighting)	27.0%	17,602	54	1	1	1	0	2	0	0	0	9	0	0	1	3	1	1	0	0	0	2	
	Dawn/Dusk	2.7%	1,758	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Manner of Collision	One Motor Vehicle - Going Straight	19.3%	12,565	18	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	
	Same Direction - One Straight-One Stopped	13.6%	8,846	13	1	0	0	0	0	0	0	0	3	0	0	1	1	0	0	0	0	0	1	
	Same Direction - Both Going Straight-Rear End	11.3%	7,352	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Same Direction - Both Going Straight-Sideswipe	11.2%	7,281	16	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	
	Angle - Both Going Straight	10.5%	6,857	38	4	1	1	0	3	0	0	0	18	0	0	0	3	2	0	0	0	0	4	
	Opposite Direction - One Straight-One Left Turn	9.4%	6,140	11	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	6	
	Angle - One Straight-One Left Turn	5.7%	3,698	5	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	
	Same Direction - One Straight-One Left Turn	2.0%	1,284	14	1	2	0	0	3	0	1	1	0	0	0	1	0	0	0	0	0	0	0	
	One Motor Vehicle - Backing	2.1%	1,363	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contributing Factor	Failed To Control Speed	24.5%	15,958	19	2	0	0	0	0	0	0	3	0	0	1	2	1	0	0	0	0	0	2	
	Driver Inattention	13.2%	8,573	23	2	1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	1	
	Failed To Yield Right Of Way - Turning Left	9.2%	5,962	11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	6	
	Changed Lane When Unsafe	8.3%	5,422	15	0	0	1	0	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	
	Failed To Drive In Single Lane	5.3%	3,448	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Unsafe Speed	4.6%	2,997	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
	Disregard Stop and Go Signal	3.8%	2,473	18	0	1	0	0	2	0	0	0	10	0	0	2	0	0	0	0	0	0	3	
	Disregard Stop Sign or Light	2.2%	1,460	12	2	0	0	0	1	0	0	0	6	0	0	1	1	0	0	0	0	0	1	
	Turned Improperly - Wrong Lane	1.2%	750	13	1	2	0	0	3	0	1	1	0	0	1	0	0	0	0	0	0	0	0	
	Other (Explained in Narrative)	8.2%	5,310	11	1	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
	None	3.6%	2,339	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



KA Crashes

Between 2020 and 2024, Hickory Street had one (1) suspected serious injury (A) crash. A complete list of all KA crashes on the corridor, with their crash ID, manner of collision, and other information, is listed below in **Table 2**.

As part of the RSA, crash narratives for all fatal and serious injury crashes that occurred on the corridor during the study period were acquired from NCTCOG. Crash narratives are essential in determining safety countermeasures for roadways by providing specific details on why and how a crash occurred. All crash narratives for fatal and serious injury crashes on this corridor are in **Appendix B**.

Table 2 - KA Crash Descriptions

Crash ID	Crash Severity	Date & Time	Location	Involved Units	Contributing Factors	Manner of Collision	Weather Condition	Light Condition	Description
18268482	A - Suspected Serious Injury	May 20, 2021; 2:29PM	Segment Crash	Vehicle Only	Changed Lane when Unsafe	Same Direction - Both Going Straight, Sideswipe	2 - Cloudy	1 - Daylight	Unit 2 was traveling northbound 100 S. Locust St (US 77) in the left lane. Unit 1 was traveling northbound 100 S. Locust St in the right lane. As both units were proceeding through the intersection unit 1 changed lanes when unsafe. Unit 1 moved from the right lane into the left lane. Unit 1's LP struck the RFQ of unit 2. Unit 1 changed lanes due to an uninvolved vehicle that was backing from a parking space located along Locust St. This crash was captured on a video camera located on Denton's square owned and maintained by the City of Denton. The video clearly showed the events of the crash. The video clip was saved and placed into a case file. The video clearly discounted the account given by the driver of unit 1 and a witness who stated that he observed the crash.



Other Studies and Designs

Future developments, ongoing projects, and planned projects for the corridor were obtained and reviewed by the RSA Team to ensure the audit recommendations aligned with current and future plans. There was one construction project on the corridor the RSA Team reviewed, and Hickory was included in the Downtown Denton Plan.

At Avenue B, traffic signal and pedestrian facility improvements were in progress during the RSA and were completed as of October 27, 2025. Crosswalks and curb ramps at this intersection were installed to create a safer and more comfortable pedestrian environment.

The City of Denton has plans to improve the Downtown Denton area, including a portion of W. Hickory Street from Avenue A to Railroad Avenue. This segment of W. Hickory Street was included in section 1B Pedestrian Priority Routes and Denton Chill Streets of the Downtown Denton plan. The “Pedestrian Priority Routes” refer to improving walkability between key destinations by creating comfortable and safe paths beyond the Downtown Denton Square. “Denton Chill Streets” seek to boost comfort and sustainability by enhancing shade, walkability, connectivity, and eco-friendly transit options. Some of the improvements, as part of the “Pedestrian Priority Routes and Denton Chill Streets”, include adding more trees along both sides of the street to provide better shade for pedestrians and cyclists, and installing crosswalk pavement markings.



FIELD OBSERVATIONS

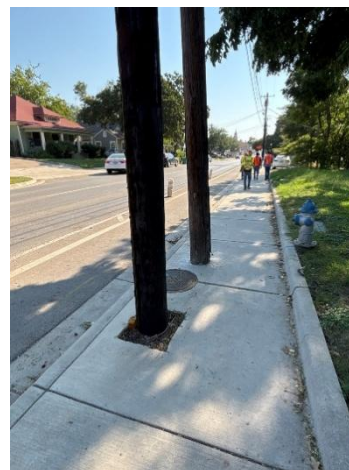
In-field observations were conducted to gain a deeper understanding of the existing conditions and their impact on crash history. Observations were made through walking and driving the corridor, both during daylight and nighttime, to obtain an accurate representation of lighting conditions in these scenarios. Data from the field observations was collected through the ArcGIS Field Maps app and paper notes filled out by the RSA Team. Field notes and photos were logged in the mobile app to geo-tag the field observations to the correct locations. The observations were used to create recommendations that fall into one of four categories: corridor-wide, intersection, segment, or spot recommendations. In this report, only the most common observations are included; however, all observations related to the recommended countermeasures are listed in the Recommendations Table.

General Observations

During the in-field visit, safety deficiencies were observed in the corridor, such as obstructed sidewalks, turning movements that might result in conflict, insufficient lighting, and bus stops that needed improvement. Obstructed sidewalks exist on both ends of the corridor, but they are more prevalent east of Locust Street. Sidewalk obstructions include fire hydrants, vegetation, and utility features as shown in **Figure 5**. These sidewalk obstructions narrow the pedestrian paths and may create mobility challenges for some users.



(A) Fire hydrant on the north side of the corridor, east of Oakland St



(B) Power poles on the south side of the corridor, east of Denton St

Figure 5 – Example of Sidewalk Obstructions on the Corridor



In addition to sidewalk obstructions, other deficiencies were observed. Overgrown vegetation and other debris obstructing signs and signals were consistent observations along the corridor. At some intersections the overgrown vegetation obstructed the visibility and sight distance of traffic signals and signs, specifically at the S. Bell Avenue intersection, as shown in **Figure 6**.

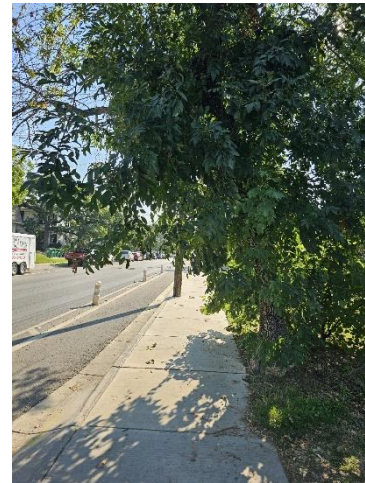


Figure 6 - Example of Overgrown Vegetation

During nighttime field observations, there were locations along the corridor that were dark, as shown in **Figure 7**. Throughout the corridor, the light poles alternate on which side of the street they are located which resulted on different levels of lighting along the corridor. Based on the site observations, there are not enough light poles to adequately illuminate the roadway.

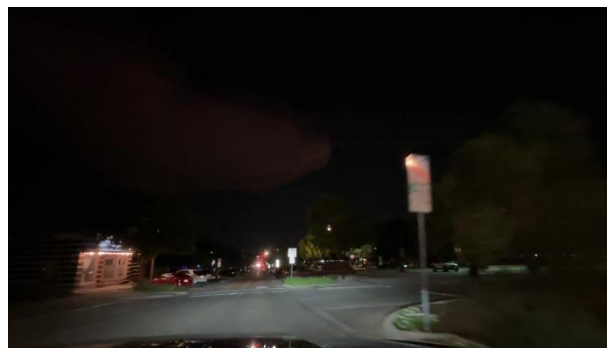


Figure 7 – Example of Insufficient Lighting



Intersection Observations

At intersections, both signalized and stop-controlled, there was a lack of crosswalks, existing marked crosswalks were faded, or directional curb ramps with detectable warning surfaces were missing. Faded or missing crosswalks were frequent along the entire corridor, more specifically east of the Carroll Boulevard intersection (**Figure 8**).



(A) Faded Crosswalk at S Bell Ave.



(B) Missing crosswalk at Industrial St.

Figure 8 - Examples of Crosswalk Deficiencies

Many intersections along this corridor do not have retroreflective backplates on the signal heads, as shown in **Figure 9**. Adding a reflective border around the signal head increases visibility of the traffic signals, especially at night or in poor weather conditions.



Figure 9 - Example of Missing Retroreflective Backplates



At the Cedar Street intersection, there was a sight distance issue due to the tall planters located close to the intersection (**Figure 10**). The location of the planters blocks drivers' view of pedestrians trying to cross the street safely when the drivers are approaching the intersection and trying to turn left onto Cedar Street. The planters should be relocated to provide adequate sight distance.

Figure 10 - Planters at Cedar St.

Another common observation was pedestrian visibility issues or “daylighting”, particularly at crossings where parking is near the intersections. Several intersections along the corridor do not have physical bulb outs which creates a longer crossing distance and where a pedestrian starts to cross is hidden by the parked vehicles (**Figure 11**).

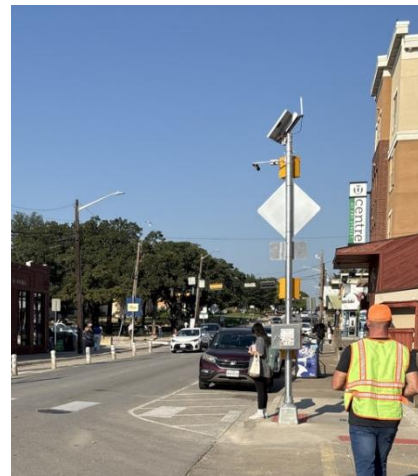


Figure 11 – Example of on-street parking

POTENTIAL COUNTERMEASURES

From the field observations, potential countermeasures were identified to address safety issues in the corridor. All recommended countermeasures were summarized in the Recommendations Table, which lists the type of recommendation, the location, detailed observations, and detailed recommendations. To accompany the Recommendations Table, a Recommendations Summary Exhibit was created to provide a visual summary of all countermeasures. Unique IDs were given to each recommendation using the key map shown in **Figure 12**. Intersections were labeled based on the order of their appearance, proceeding from west to east along the corridor. Segment recommendations were assigned IDs based on their limits and the order in which they appeared on the Recommendation Summary Exhibit. Similarly to segment recommendations, spot recommendations were assigned IDs based on their locations between intersections and order of appearance. **Figure 20** provides a visual summary of all countermeasures and their locations in the corridor. Accompanying the figure, **Table 3** provides more detailed information on what was observed, how the observations influenced the countermeasure selection, and a detailed description of the countermeasure. The countermeasures described in the following sections are not a complete list of all recommended countermeasures.



Figure 12 – W. Hickory Street Corridor's Intersections Key Map



Short-Term

One of the most common observations in the corridor was the obstructed sidewalks. Sidewalks were primarily obstructed by overgrown vegetation or gravel debris. All sidewalks should be cleared of obstructions to ensure a clear walkway with no tripping hazards. All overgrown vegetation should be trimmed, all debris should be swept off the sidewalk, and all obstructing utility poles and infrastructure should be relocated.

At various signalized intersections on the corridor, it is recommended to install retroreflective backplates (**Figure 13**) on all signal heads to increase driver awareness when approaching the intersection, especially at night or in certain weather conditions. Retroreflective backplates are currently not present on all signal heads at the signalized intersections.

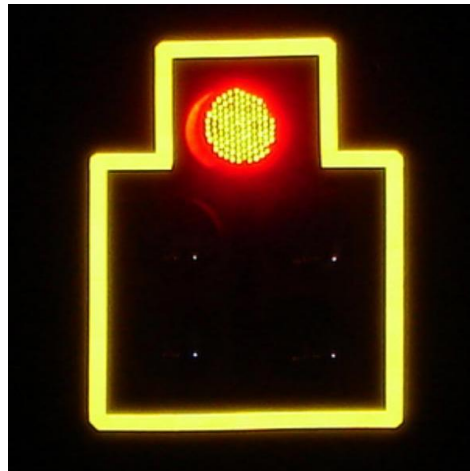


Figure 13 – Example of a Retroreflective Backplate

Source: FHWA Proven Safety Countermeasures

To address faded crosswalks and pavement markings seen throughout the corridor, the RSA Team recommends all crosswalks and pavement markings be refreshed. At key intersections (signalized or high pedestrian crossings), it is recommended to install high-visibility crosswalks (**Figure 14**). This would aid in pedestrian visibility at intersections. Pavement markings to be refreshed would also include stop bars at intersections and turn-lane markings.



Figure 14 - Example of a High Visibility Crosswalk



Other signage improvements include adding pedestrian signage at pedestrian crossings to alert drivers, adding ‘STOP HERE TO PEDS’ signs (**Figure 15**) and signs with a pedestrian crossing symbol. All signs should meet TMUTCD size, color and placement requirements to ensure they are visible and being used correctly. More information on signage recommendations along the corridor is available in **Table 3**.



Figure 15 - Example of “STOP HERE FOR PEDESTRIANS” Sign

Source: MUTCD



Long-Term

Throughout the corridor, various intersections had either non-compliant or missing curb ramps. To create safe crossings for vulnerable road users, the RSA Team recommends that directional, accessible curb ramps with detectable warning surfaces be installed where necessary. **Figure 16** shows an example of the curb ramps that are recommended for implementation.

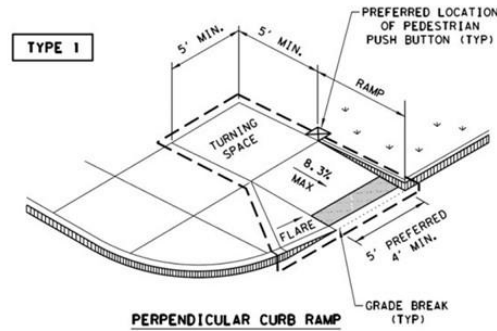


Figure 16 - Example of Directional and Accessible Curb Ramps with Detectable Warning Surfaces

At intersections with on-street parking it is recommended to add corner bulb outs, as seen in **Figure 17**. Corner bulb-outs shorten the crossing distance for pedestrians, allow pedestrians to see past parked vehicles along the street, and improve sight distance between drivers and pedestrians.

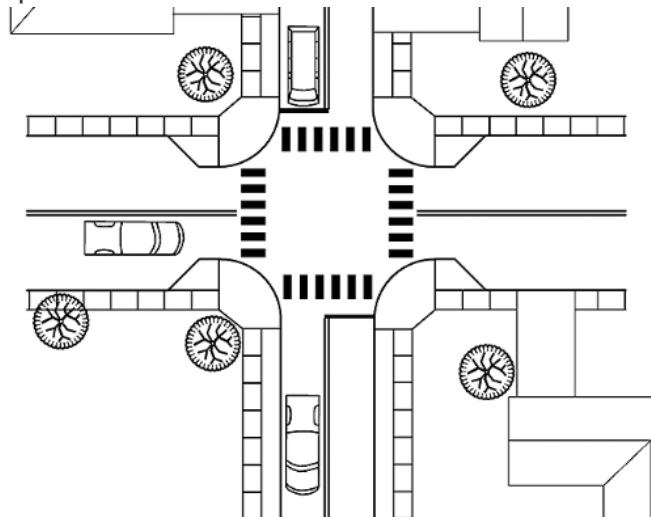


Figure 17 - Example of Corner Bulb Outs

At the access driveway east of Fry Street, pedestrians were not always using the push buttons on the existing rectangular rapid flashing beacon to cross W. Hickory Street, and vehicles were observed not yielding to pedestrians crossing the street. An enhanced pedestrian crossing increases pedestrian visibility and provides clear warnings for drivers of pedestrians. The RSA Team recommends to conduct a study to evaluate this location for an upgrade to a Pedestrian Hybrid Beacon (**Figure 18**), based on existing pedestrian activity and drivers' behavior.

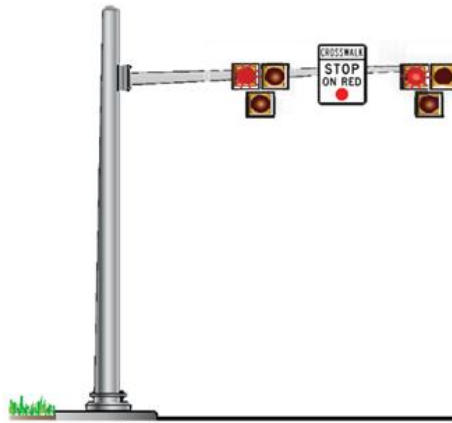


Figure 18 - Example of a Pedestrian Hybrid Beacon

Street lighting was a corridor-wide issue observed by the RSA team during nighttime observations. The existing luminaires alternate which side of the street they are located on and resulted in insufficient lighting in some segments of the corridor and at some crosswalks. The corridor should have a consistent, uniformly spaced number of lighting fixtures along the limits of the corridor (**Figure 19**). A lighting study ensures that the roadway and pedestrian facilities are properly covered by street lighting, resulting in improved visibility of drivers and pedestrians at nighttime.

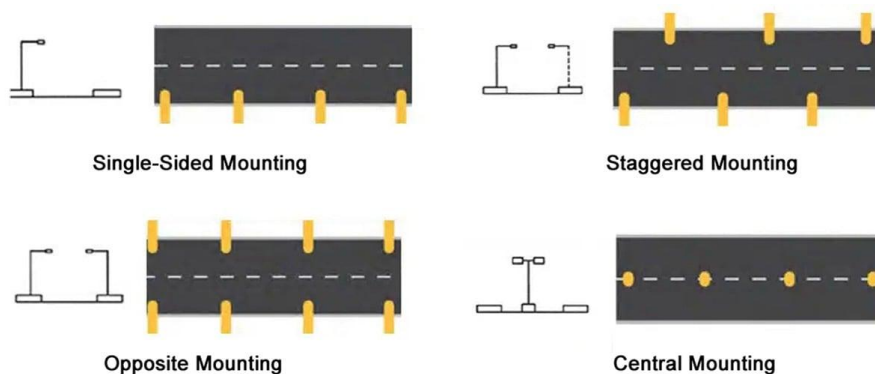


Figure 19 – Street Light Mounting Options

Hickory Street - Denton, TX

Recommendations Exhibit | Limits: Avenue C to S Bell Avenue

Corridor-wide Recommendations

-  Add Retroreflective Backplates
-  Add Bike Lane Markings
-  Lighting Photometric Study
-  Fill-In Landscape Beds
(from Cedar St to Bell Ave)

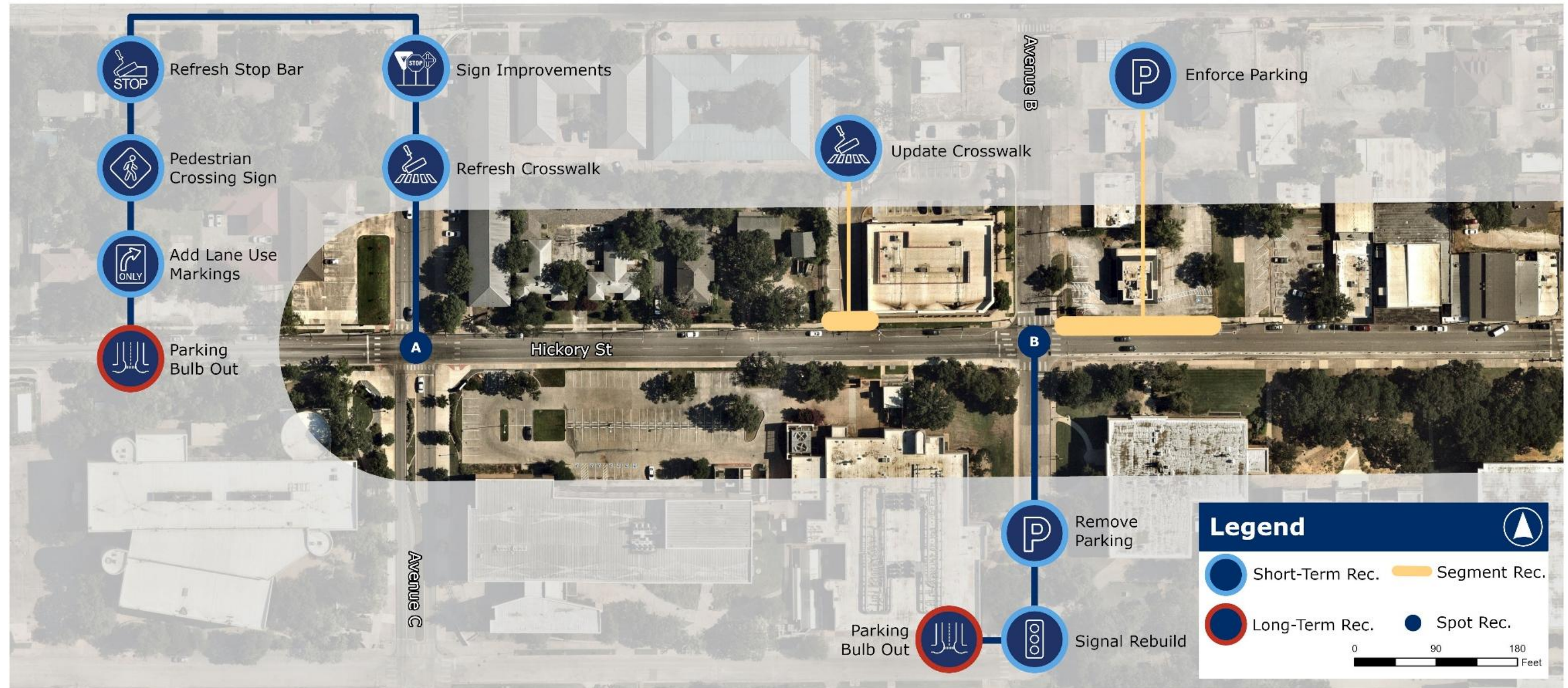


Figure 20 - Recommendations Exhibit (Page 1 of 5)

Hickory Street - Denton, TX

Recommendations Exhibit | Limits: Avenue C to S Bell Avenue

Corridor-wide Recommendations

- 
Add Retroreflective Backplates
- 
Add Bike Lane Markings
- 
Lighting Photometric Study
- 
Fill-In Landscape Beds
(from Cedar St to Bell Ave)



Hickory Street - Denton, TX

Recommendations Exhibit | Limits: Avenue C to S Bell Avenue

Corridor-wide Recommendations

-  Add Retroreflective Backplates
-  Add Bike Lane Markings
-  Lighting Photometric Study
-  Fill-In Landscape Beds
(from Cedar St to Bell Ave)



Figure 20 - Recommendations Exhibit (Page 3 of 5)

Hickory Street - Denton, TX

Recommendations Exhibit | Limits: Avenue C to S Bell Avenue

Corridor-wide Recommendations

-  Add Retroreflective Backplates
-  Add Bike Lane Markings
-  Lighting Photometric Study
-  Fill-In Landscape Beds
(from Cedar St to Bell Ave)

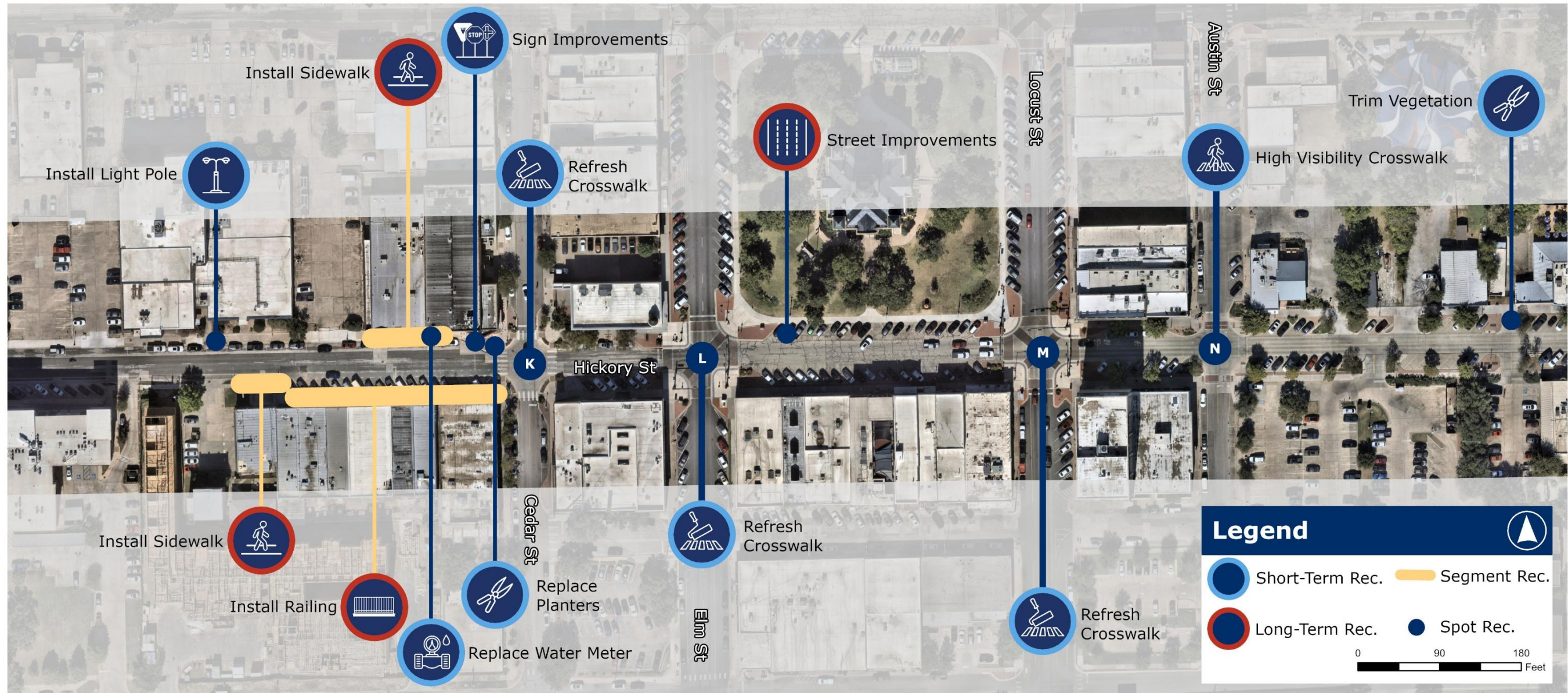


Figure 20 - Recommendations Exhibit (Page 4 of 5)

Hickory Street - Denton, TX

Recommendations Exhibit | Limits: Avenue C to S Bell Avenue

Corridor-wide Recommendations

-  Add Retroreflective Backplates
-  Add Bike Lane Markings
-  Lighting Photometric Study
-  Fill-In Landscape Beds
(from Cedar St to Bell Ave)

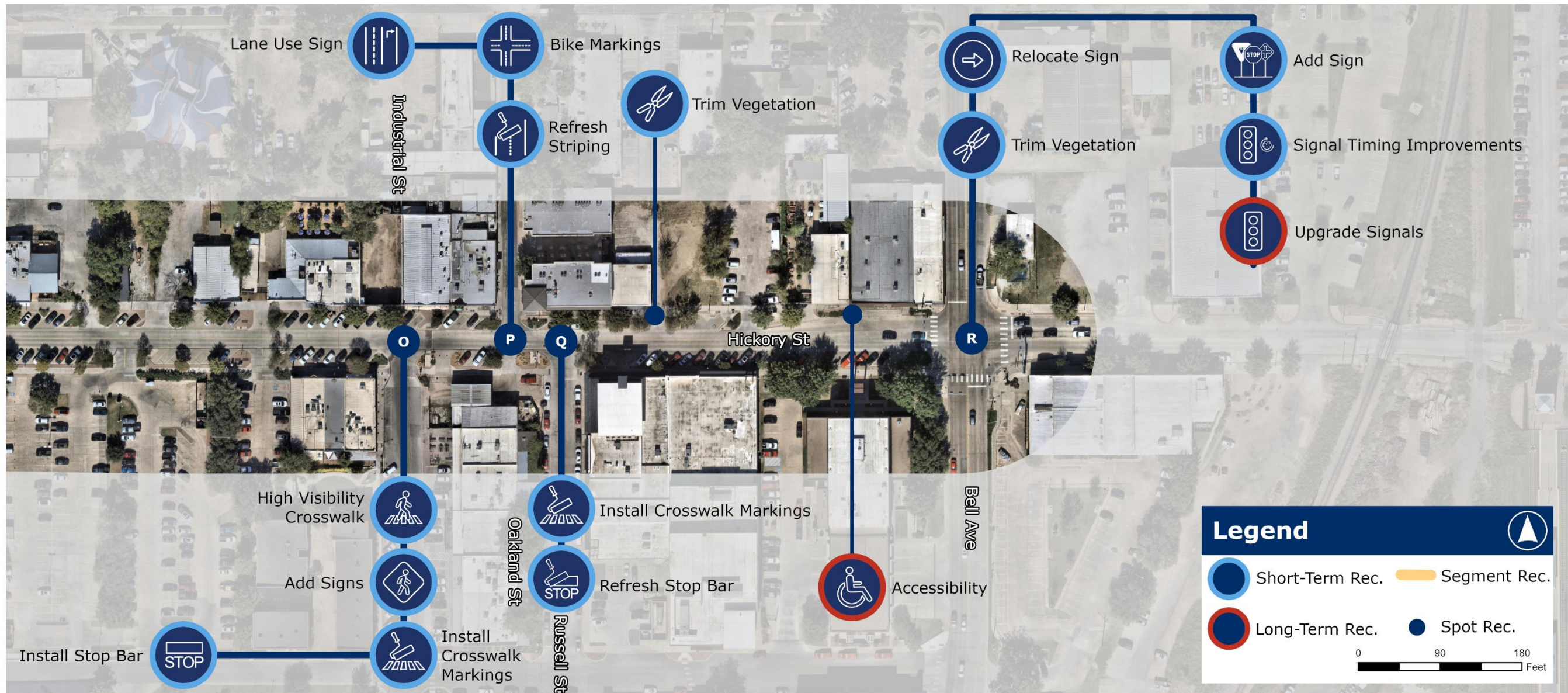


Figure 20 - Recommendations Exhibit (Page 5 of 5)

Table 3 - Recommendations Table (Page 1 of 4)

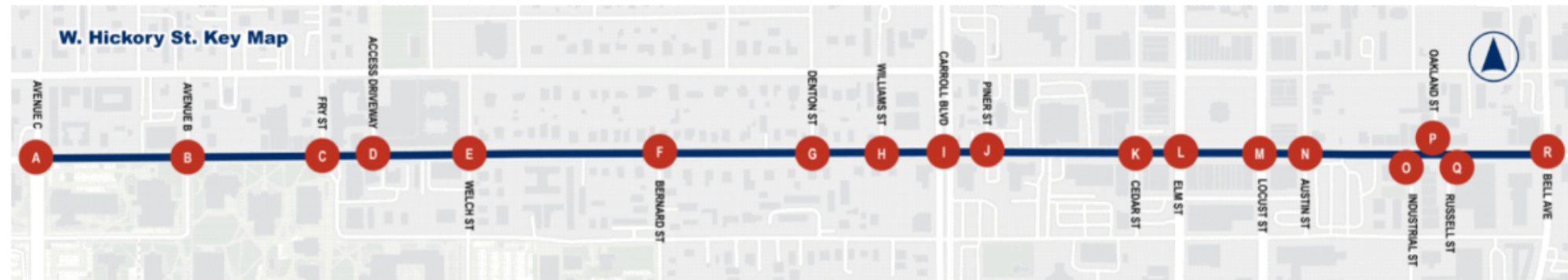
Recommendations for W. Hickory St. from Avenue C to S. Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
1.1	Hickory St	Corridor-Wide	Along the corridor	Short	Add Retroreflective Backplates	Observation: Signal heads do not have retroreflective backplates Recommendation: Install retroreflective backplates to all signal heads	All Sheets
1.2	Hickory St	Corridor-Wide	Along the corridor	Short	Add Bike Lane Markings	Observation: Few bike lane symbols are present throughout the corridor. Recommendation: Install additional bike lane symbols spaced at 250' between Avenue C and Carroll Avenue. Install conflict green pavement markings at streets designated by the city.	All Sheets
1.3	Hickory St	Corridor-Wide	Along the corridor	Short	Lighting Photometric Study	Observation: The corridor has existing street lighting but the light poles alternate on which side of the street they are located. During the nighttime observation, there were locations along the corridor that were dark. Recommendation: Perform a lighting photometric study to determine appropriate lighting upgrades.	All Sheets
1.4	Hickory St	Corridor-Wide	From Cedar St to Bell Ave	Short	Fill-in Landscape Beds	Observation: Landscape beds have eroded and missing either mulch or landscape rock making them not level with the sidewalk Recommendation: Fill in landscape beds with rocks or mulch to be at level with the sidewalk	Sheet 4 & 5
A.1	Hickory St	Intersection	Avenue C	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings on all crossings	Sheet 1
A.2	Hickory St	Intersection	Avenue C	Short	Sign Improvements	Observation: Existing "Wrong Way" signs are small and not visible Recommendation: Add new "Wrong Way" signs (36"x24") on the back of the stop signs on the eastbound approach	Sheet 1
A.3	Hickory St	Intersection	Avenue C	Short	Refresh Stop Bar	Observation: Existing stop bar pavement markings are faded Recommendation: Refresh existing stop bar pavement markings on all approaches	Sheet 1
A.4	Hickory St	Intersection	Avenue C	Short	Pedestrian Crossing Sign	Observation: No pedestrian signage for the east pedestrian crossing Recommendation: Add pedestrian signage (W11-2) on the east crossing	Sheet 1
A.5	Hickory St	Intersection	Avenue C	Short	Add Lane Use Markings	Observation: No lane use signage or pavement markings on any approach, it can be confusing for drivers Recommendation: Add arrow pavement markings throughout the intersection to make it more clear for drivers	Sheet 1
A.6	Hickory St	Intersection	Avenue C	Long	Parking Bulb Out	Observation: On-street parking is not physically separated at the intersections. Currently only striping. Recommendation: Recommend bulbuing the northeast and northwest corners to provide a physical barrier for the on-street parking. This will also shorten the crossing distance for pedestrians.	Sheet 1
AB.1	Hickory St	Segment	North side of Hickory St at the CVS driveway; west of Avenue B	Short	Update Crosswalk	Observation: Existing crosswalk pavement markings at the CVS driveway are blue and do not comply with TMUTCD guidelines Recommendation: Update the existing crosswalk pavement markings to be in accordance with the TMUTCD	Sheet 1
B.1	Hickory St	Intersection	Avenue B	Short	Remove Parking	Observation: There are two vehicle parking space between Avenue B and the second driveway on the northeast corner of the intersection that are too close to the intersection and not needed. Recommendation: Remove parking space on the northeast corner	Sheet 1
B.2	Hickory St	Intersection	Avenue B	Short	Signal Rebuild	Observation: Existing signals are cable mounted and there are no pedestrian push buttons Recommendation: Full signal rebuild (this intersection is currently either being designed or about to go to construction for a full signal rebuild)	Sheet 1
B.3	Hickory St	Intersection	Avenue B	Long	Parking Bulb Out	Observation: On-street parking is not physically separated at the intersections. Currently only striping. Recommendation: Recommend bulbuing the northeast and northwest corners to provide a physical barrier for the on-street parking. This will also shorten the crossing distance for pedestrians.	Sheet 1
BC.1	Hickory St	Segment	North side of Hickory St; east of Avenue B	Short	Enforce Parking	Observation: Vehicles park illegally in front of the parking lot in front of an abandoned business Recommendation: Enforce no parking zone along this segment	Sheet 1
C.1	Hickory St	Intersection	Fry St	Short	Leading Pedestrian Interval	Observation: Pedestrians needed more time to cross Hickory St on the east crossing of the intersection. This location was a high pedestrian crossing location. Recommendation: Add a leading pedestrian interval to allow pedestrians to cross Hickory St safely	Sheet 2

Table 3 - Recommendations Table (Page 2 of 4)

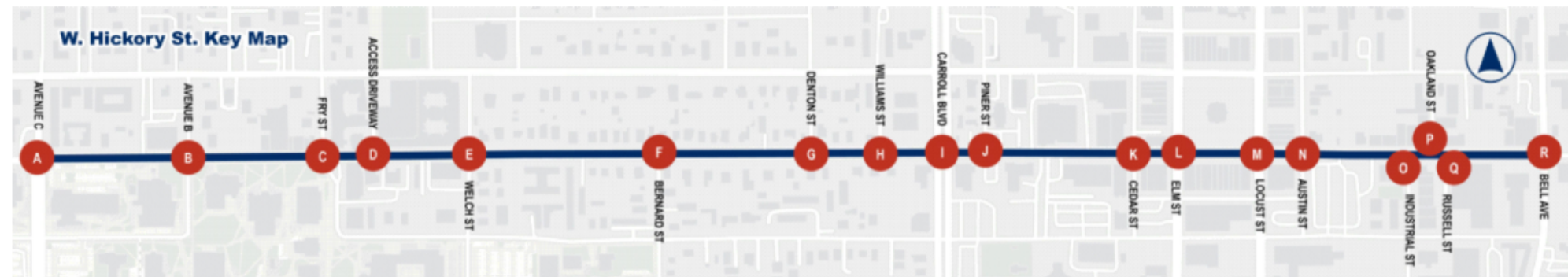
Recommendations for W. Hickory St. from Avenue C to S. Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
C.2	Hickory St	Intersection	Fry St	Long	Parking Bulb Out	Observation: On-street parking is not physically separated at the intersections. Currently only striping. Recommendation: Recommend bulbding the northeast and northwest corners to provide a physical barrier for the on-street parking. This will also shorten the crossing distance for pedestrians.	Sheet 2
D.1	Hickory St	Intersection	Access Driveway	Short	Update Crosswalk	Observation: Existing crosswalk pavement markings at the access driveway are yellow and do not comply with TMUTCD. Recommendation: Update the existing crosswalk pavement markings to be in accordance with the TMUTCD.	Sheet 2
D.2	Hickory St	Intersection	Access Driveway	Long	Upgrade Crossing to RRFB or PHB	Observation: Pedestrians were observed not using the ped push buttons to cross Hickory St. Recommendation: Recommend upgrading the crossing to either a RRFB or PHB with pedestrian detection.	Sheet 2
D.3	Hickory St	Intersection	Access Driveway	Long	Parking Bulb Out	Observation: On-street parking is not physically separated at the intersections. Currently only striping. Recommendation: Recommend bulbding the northeast and northwest corners to provide a physical barrier for the on-street parking. This will also shorten the crossing distance for pedestrians.	Sheet 2
DE.1	Hickory St	Spot	South side of Hickory St; east of Access Driveway	Short	Fix Pedestrian Flasher	Observation: South side flashers do not work Recommendation: Fix south side flashers	Sheet 2
DE.2	Hickory St	Spot	Across Hickory St	Short	High Visibility Crosswalk	Observation: Crosswalk pavement markings are not very visible. Sun makes it hard to see the existing crosswalk markings Recommendation: Install high visibility crosswalk markings on the east pedestrian crossing	Sheet 2
E.1	Hickory St	Intersection	Welch St		Pedestrian Curb Ramp	Observation: Existing pedestrian curb ramp on the northeast corner has a drainage issue Recommendation: Install pedestrian curb ramp with appropriate cross slope to mitigate drainage issue.	Sheet 2
E.2	Hickory St	Intersection	Welch St	Long	Parking Bulb Out	Observation: On-street parking is not physically separated at the intersections. Currently only striping. Recommendation: Recommend bulbding the northwest corner to provide a physical barrier for the on-street parking. This will also shorten the crossing distance for pedestrians.	Sheet 2
EF.1	Hickory St	Spot	South side of Hickory St; east of Welch St	Long	Accessibility	Observation: There is a power pole obstructing sidewalk Recommendation: Add additional sidewalk on the backside of the existing sidewalk to provide adequate pedestrian sidewalk width.	Sheet 2
EF.2	Hickory St	Spot	South side of Hickory St; west of Bernard St	Short	Pedestrian Bus Pad	Observation: No existing pedestrian transit platform for bus stop in eastbound direction Recommendation: Install a pedestrian transit platform at existing eastbound bus stop	Sheet 2
F.1	Hickory St	Segment	Bernard St	Long	Install Sidewalk	Observation: Missing sidewalk along the west side of Bernard St just south of Hickory St Recommendation: Install sidewalk on the west side of Bernard St going south of Hickory St	Sheet 2
FG.1	Hickory St	Spot	South side of Hickory St; east of Bernard St	Short	Trim Vegetation	Observation: Vegetation is blocking sidewalk path. Recommendation: Trim the vegetation on the south side of Hickory St.	Sheet 3
FG.2	Hickory St	Spot	South side of Hickory St; west of Denton St	Short	Trim Vegetation	Observation: Vegetation is blocking sidewalk path. Recommendation: Trim the vegetation on the south side of Hickory St.	Sheet 3
G.1	Hickory St	Intersection	Denton St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings on the north crossing	Sheet 3
G.2	Hickory St	Intersection	Denton St	Short	Refresh Stop Bar	Observation: Existing stop bar pavement markings are faded Recommendation: Refresh existing stop bar pavement markings on all approaches	Sheet 3
GH.1	Hickory St	Spot	South side of Hickory St; east of Denton St	Long	Accessibility	Observation: There are two power poles obstructing sidewalk Recommendation: Add additional sidewalk on the backside of the existing sidewalk to provide adequate pedestrian sidewalk width.	Sheet 3
GH.2	Hickory St	Spot	North side of Hickory St; east of Denton St	Short	Trim Vegetation	Observation: Vegetation is blocking sidewalk path Recommendation: Trim the vegetation on the north side of Hickory St	Sheet 3

Table 3 - Recommendations Table (Page 3 of 4)

Recommendations for W. Hickory St. from Avenue C to S. Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
H.1	Hickory St	Intersection	Williams St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings at the north crossing	Sheet 3
I.1	Hickory St	Intersection	Carroll Blvd	Short	APS Push Buttons	Observation: Push buttons at intersection are not APS push buttons Recommendation: Install APS pedestrian push buttons at every signal	Sheet 3
I.2	Hickory St	Intersection	Carroll Blvd	Long	Modify Bulb Out	Observation: Existing bulb out on the northeast corner is the just the ramp extending out into the roadway Recommendation: Modifying bulb out up to the gas station driveway. This will require inlet/drainage improvements as well.	Sheet 3
II.1	Hickory St	Segment	South side of Hickory St; median between vehicle lane and bike lane	Short	Bike Lane Median Improvements	Observation: Pavement markings on median between the bike lane and the travel lane are faded. Recommendation: Refresh pavement markings on the bike lane median and replace existing bollard with new bollard as the existing one is damaged.	Sheet 3
II.2	Hickory St	Segment	North side of Hickory St; from Carroll Blvd to Piner St	Long	Install Sidewalk	Observation: Existing sidewalk is broken and cracking. Recommendation: Install 105' of accessible sidewalk	Sheet 3
J.1	Hickory St	Intersection	Piner St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings at the north crossing	Sheet 3
J.2	Hickory St	Intersection	Piner St	Short	Detectable Warning Surface	Observation: Existing detectable warning surfaces on the north crossing does not extend the full width of the ramp. Recommendation: Extend the detectable warning surface the full width of the ramp.	Sheet 3
J.3	Hickory St	Intersection	Piner St	Long	Remove Curb Ramp	Observation: Existing curb ramp on the northeast corner going south does not have a corresponding curb ramp across the street Recommendation: Remove existing curb ramp going south on the northeast corner	Sheet 3
JK.1	Hickory St	Spot	North side of Hickory St; west of Cedar St	Short	Install Light Pole	Observation: Existing light pole missing Recommendation: Install new light pole on existing light pole foundation	Sheet 4
JK.2	Hickory St	Segment	South side of Hickory St; west of Cedar St	Long	Install Sidewalk	Observation: Existing sidewalk is broken and cracking Recommendation: Install 65' of accessible sidewalk	Sheet 4
JK.3	Hickory St	Segment	South side of Hickory St; west of Cedar St	Long	Install Railing	Observation: There is a steep drop from existing sidewalk to on-street parking Recommendation: Install railing to physically separate sidewalk and on-street parking, and curb stops. Railing should have interval openings for access to the parking.	Sheet 4
JK.4	Hickory St	Segment	North side of Hickory St; west of Cedar St	Long	Install Sidewalk	Observation: Existing sidewalk is broken and cracking Recommendation: Install 90' of accessible sidewalk	Sheet 4
JK.5	Hickory St	Spot	North side of Hickory St; west of Cedar St	Short	Replace Water Meter	Observation: Existing water meter has a broken cap Recommendation: Replace water meter cap	Sheet 4
JK.6	Hickory St	Spot	North side of Hickory St; west of Cedar St	Short	Sign Improvements	Observation: Existing sign is "YIELD TO PEDS" which is not up to the current Texas standard. Recommendation: Upgrade to "STOP HERE TO PEDS" signs on both sides of the street	Sheet 4
JK.7	Hickory St	Spot	North side of Hickory St; west of Cedar St	Short	Replace Planters	Observation: Existing planters and vegetation impact sight distance for vehicles and pedestrians Recommendation: Replace planters and vegetation with lower profile plants and vegetation to improve sight distance	Sheet 4
K.1	Hickory St	Intersection	Cedar St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings on the west crossing	Sheet 4
L.1	Hickory St	Intersection	Elm St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings throughout the intersection	Sheet 4
LM.1	Hickory St	Spot	North side of Hickory St; east of Elm St	Long	Street Improvements	Observation: Existing parking pavement has sunk and resulted in a drainage problem Recommendation: Replace panel of parking pavement to provide positive drainage	Sheet 4

Table 3 - Recommendations Table (Page 4 of 4)

Recommendations for W. Hickory St. from Avenue C to S. Bell Ave. in Denton, TX



ID	Study Corridor	Context	Location	Timeline	Simplified Recommendation	Detailed Observation/Recommendation	Countermeasure On Page
M.1	Hickory St	Intersection	Locust St	Short	Refresh Crosswalk	Observation: Existing crosswalk pavement markings are faded Recommendation: Refresh existing crosswalk pavement markings throughout the intersection	Sheet 4
N.1	Hickory St	Intersection	Austin St	Short	High Visibility Crosswalk	Observation: Crosswalk pavement markings are faded Recommendation: Install high visibility crosswalk markings on all the pedestrian crossings	Sheet 4
NO.1	Hickory St	Spot	North side of Hickory St; east of Austin St	Short	Trim Vegetation	Observation: Vegetation is blocking pedestrian path Recommendation: Trim the vegetation on the north side of Hickory St	Sheet 4
O.1	Hickory St	Intersection	Industrial St	Short	High Visibility Crosswalk	Observation: East crosswalk pavement markings are faded Recommendation: Replace east crosswalk pavement markings with high visibility crosswalk markings	Sheet 5
O.2	Hickory St	Intersection	Industrial St	Short	Add Signs	Observation: There are no pedestrian signs on the east crossing Recommendation: Upgrade to "STOP HERE TO PEDS" signs on both sides of the street	Sheet 5
O.3	Hickory St	Intersection	Industrial St	Short	Install Crosswalk Markings	Observation: There are no crosswalk markings on the south crossing Recommendation: Install crosswalk pavement markings on the south pedestrian crossing	Sheet 5
O.4	Hickory St	Intersection	Industrial St	Short	Install Stop Bar	Observation: There is not stop bar on the south approach of the intersection Recommendation: Install stop bar on the south approach	Sheet 5
P.1	Hickory St	Intersection	Oakland St	Short	Refresh Striping	Observation: Existing roadway striping is faded Recommendation: Refresh roadway striping	Sheet 5
P.2	Hickory St	Intersection	Oakland St	Short	Bike Markings	Observation: The two-way cycle track along Oakland St north of Hickory lacks signage and protection from vehicular traffic Recommendation: Add bicycle buffer between the bike lanes and the travel lane.	Sheet 5
P.3	Hickory St	Intersection	Oakland St	Short	Lane Use Sign	Observation: Lane use on the north approach is not very clear to users Recommendation: Add a lane use sign to the north approach	Sheet 5
Q.1	Hickory St	Intersection	Russell St	Short	Install Crosswalk Markings	Observation: There are no crosswalk markings on the south crossing Recommendation: Install crosswalk pavement markings on the south pedestrian crossing	Sheet 5
Q.2	Hickory St	Intersection	Russell St	Short	Refresh Stop Bar	Observation: The stop bar on the south approach of the intersection is faded Recommendation: Refresh stop bar on the south approach	Sheet 5
QR.1	Hickory St	Spot	North side of Hickory St; east of Russell St	Short	Trim Vegetation	Observation: Vegetation is blocking pedestrian path Recommendation: Trim the vegetation on the north side of Hickory St	Sheet 5
QR.3	Hickory St	Spot	North side of Hickory St; west of Bell Ave	Long	Accessibility	Observation: Existing drainage flume is a tripping hazard Recommendation: Add metal plate over the drainage flume to have an even surface and meet accessibility requirements	Sheet 5
R.1	Hickory St	Intersection	Bell Ave	Short	Trim Vegetation	Observation: Vegetation is blocking traffic signal and "NO RIGHT TURN ON RED" sign, and is blocking pedestrian path Recommendation: Trim the vegetation on the southwest and northeast corners of the intersection	Sheet 5
R.2	Hickory St	Intersection	Bell Ave	Short	Relocate Sign	Observation: The "NO RIGHT TURN ON RED" sign on the west approach is blocked by a tree Recommendation: Relocate the "NO RIGHT TURN ON RED" sign to the pedestrian pole	Sheet 5
R.3	Hickory St	Intersection	Bell Ave	Short	Add Sign	Observation: Vehicles block the intersection and cause traffic to back up on the south side of the intersection Recommendation: Add "DO NOT BLOCK INTERSECTION" sign on the south approach of the intersection to avoid traffic back up	Sheet 5
R.4	Hickory St	Intersection	Bell Ave	Short	Signal Timing Improvements	Observation: Vehicle queues from McKinney Avenue back up through Hickory at Bell intersection. Recommendation: Recommend evaluating signal timing at McKinney Avenue and Bell Avenue to help with queues along Bell Avenue.	Sheet 5
R.5	Hickory St	Intersection	Bell Ave	Long	Upgrade Signals	Observation: Current intersection signals do not have a vehicle detection system Recommendation: Add vehicle detection system to signal upgrade	Sheet 5



Crash Modification Factors and Cost Estimates

Since the RSA identified several countermeasures for W. Hickory Street, prioritization based on the effectiveness and cost of these countermeasures will help guide thoughtful implementation. **Appendix C** provides a list of common countermeasures, along with their crash modification factors (CMF) and estimated costs. Crash modification factors are values that indicate the number of crashes that can be expected after a specific countermeasure is implemented. All cost estimates are approximate and intended for planning purposes only.



NEXT STEPS AND OTHER RESOURCES

The RSA plays a critical role in improving the overall safety performance of a roadway. Completing the RSA for W. Hickory Street ensured that planned recommendations were identified through a data-driven approach as well as stakeholder input. The RSA Team, and the City of Denton are committed to enhancing safety throughout the corridor for all users. Implementation effort will focus on deploying high-impact countermeasures that address identified crash patterns. Leveraging federal, local, and state funding sources will be pivotal in all implementation efforts. Additionally, the audit aims to align proposed improvements with broader Vision Zero initiatives, reinforcing the city’s commitment to reducing serious crashes and improving multimodal accessibility.

Potential Funding Sources

Table 4 lists several potential funding sources that can be leveraged for implementing the identified countermeasures on W. Hickory Street. The table lists funding sources and provides information about each one’s agency, local match requirements, and a short description of the program’s goals.

Table 4 - Potential Funding Sources

Funding Opportunity	Agency	Local Match	Description
City Bond and/or CIP Budgets	City of Denton	N/A	Local City Bond programs and CIP budgets provide dedicated funding for roadway infrastructure projects, typically through voter-approved bonds and multi-year capital planning. These funds can be used for various roadway improvements, such as intersection upgrades, pedestrian facilities, and traffic signal enhancements.
Denton County MCIP	Denton County	50%	The Denton County Municipal Capital Improvement Program (MCIP) is a funding program available to cities within Denton County to support infrastructure improvements across the region. New projects are authorized annually based on categories such as roadway safety, regional connectivity, and pedestrian/bicyclist accessibility.
Safe Streets and Roads for All (SS4A)	USDOT	20%	A SS4A implementation grant is a federally funded program that covers the implementation of safety strategies identified in the Comprehensive Safety Action Plan (CSAP). This program can fund any roadway or intersection



Funding Opportunity	Agency	Local Match	Description
			improvements listed in the CSAP that enhance vehicle or pedestrian safety.
Highway Safety Improvement Program (HSIP)	TXDOT	10%	HSIP invests in construction and operational safety improvements for locations both on and off the state highway system. Typical improvements include traffic signal improvements, sidewalks, signage, pavement markings, and signal detection upgrades.
Better Utilizing Investments to Leverage Development (BUILD)	USDOT	20%	BUILD is a highly competitive funding opportunity that invests in planning or construction of surface transportation infrastructure projects that improve safety; environmental sustainability; quality of life; mobility and community connectivity; economic competitiveness, including tourism; state of good repair; partnership and collaboration; and innovation.
Transportation Set-Aside (TA)	TxDOT NCTCOG	20%	TxDOT and NCTCOG fund projects that focus on bike and pedestrian facilities through the TA program.
Transportation Infrastructure Finance and Innovation Act (TIFIA)	USDOT	51%	Loan opportunity that funds 49% of costs for projects with a minimum project cost of \$10 million. Project-eligible facilities can include bike and pedestrian paths that connect to and are within 0.5 miles of a transit facility. This can be used to increase access and mobility for users.



Appendix:

Appendix A: Traffic Counts & Speed Data

Appendix B: Crash Narratives

Appendix C: Common Safety Countermeasure Table