Highway 10 Corridor Study through Dilworth, MN

Final Report

April, 2023

Highway 10 Corridor Study

34th Street to 60th Street

Dilworth, MN

Final Report

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Minnesota Department of Transportation
City of Dilworth

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April 2023

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1.0 INTRODUCTION

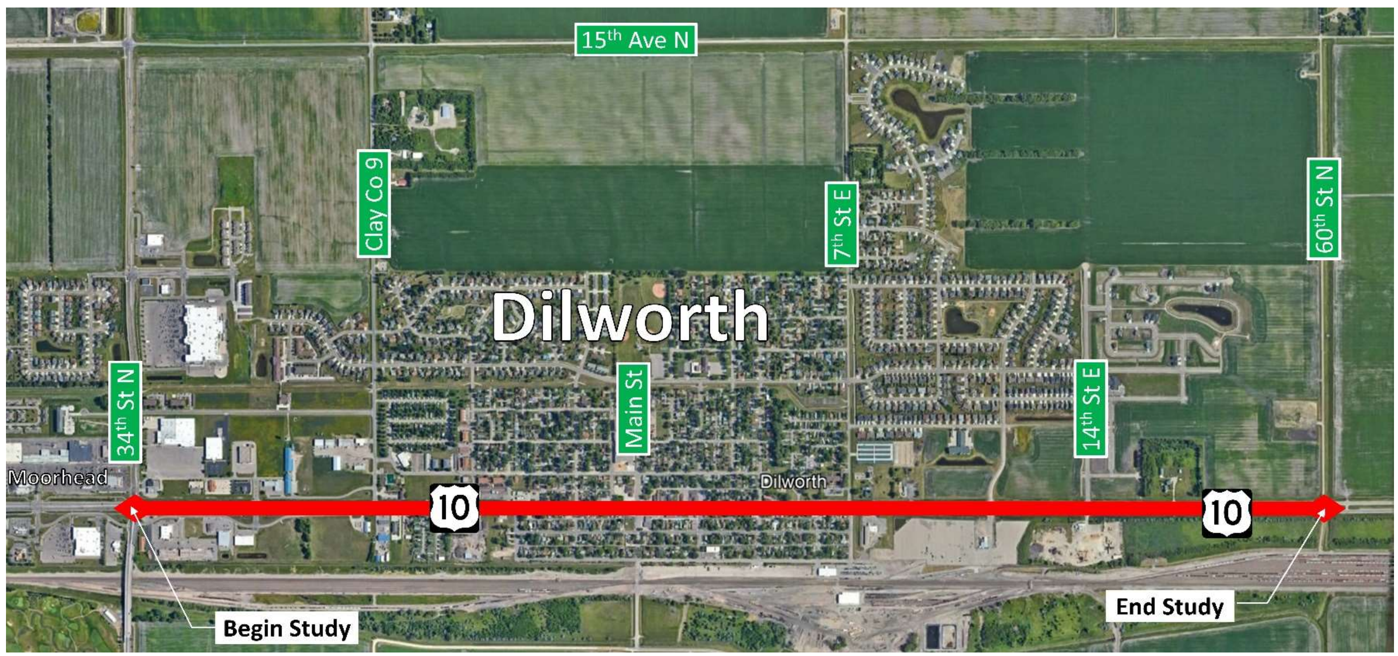
1.1 Study Background

The Fargo-Moorhead Metropolitan Council of Governments (Metro COG), Minnesota Department of Transportation (MnDOT), and the city of Dilworth, Minnesota have conducted a corridor study of Highway 10 through Dilworth from the western city limits at 34th Street to the eastern city limits at 60th Street. Complete Streets improvement projects are currently programmed for this corridor in the next 5-10 years.

Purpose and Need

The purpose of the study was to identify the existing and future needs along the Highway 10 corridor by engaging the community of Dilworth and the public. The study guides the development and evaluation of corridor alternatives through a Complete Streets and context-sensitive approach and provides a framework for implementation of the alternatives. The alternatives will support the economic success of the community with consideration for future land use and growth and balance the needs of the local users, commuters, multi-modal users, and nearby property and business owners.

Study Location

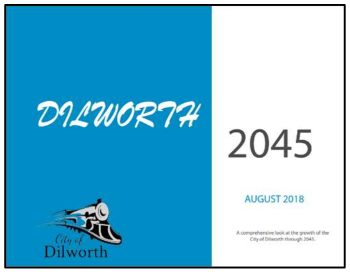


Highway 10 is Principal Arterial roadway on the US Highway system that runs east-west through the city of Dilworth, Minnesota. Dilworth is located on the eastern edge of the Fargo-Moorhead metropolitan area. It is the second largest community in Clay County. Highway 10 serves as the main roadway to and through the city, with connections to I-94 via 34th Street on the west side of Dilworth and MN State Highway 336 located one mile east of 60th Street.

There are varying cross section configurations and diverse contextual areas along the Highway 10 corridor as it traverses through the study area. The adjacent land use varies to include traditional downtown commercial, single family residential, industrial, and public open spaces. The location of Highway 10 creates an opportunity to connect the adjacent community, as well as travelers on Highway 10, to nearby gas stations, shopping centers, restaurants, and entertainment venues.

1.2 Related Studies

There are several relative studies and planning documents that have been completed which have helped shape the existing characteristics of the Highway 10 corridor and provide guidance for the future. The following studies are the most relevant to this Highway 10 corridor study.



Dilworth Comprehensive Plan

"Dilworth 2045" is the city's comprehensive plan completed in 2018 by the City Administration, City Council, City Planning Commission, and Metro COG. The plan serves as a guiding document for development in the city. It contains information on current development and resources and anticipates future demand for certain land uses, municipal services, and other community needs. The plan establishes the vision for the community as "Dilworth is a welcoming, friendly community with small town character and an array of excellent schools, parks, civic amenities, and commercial conveniences. By continuing to invest in its neighborhoods, community services, and recreational facilities, the city will ensure its legacy as a thriving and independent community while contributing to the success and progress of the metropolitan area." The Comprehensive Plan identifies a future land use plan and transportation needs within the community. Key recommendations of the plan relating to transportation along Highway 10 include:

- Provide an efficient, safe, and connective transportation system that is coordinated with existing needs and will effectively serve projected travel needs.
- Enhance walking and bicycling as alternative transportation options which increase mobility and improve public health.
- Promote a strong and unique sense of community through downtown development that adds to Dilworth's charm and integrity as a small town.

2045 Fargo-Moorhead Metropolitan Transportation Plan

Metro Grow is the metropolitan area's Metropolitan Transportation Plan. It was created in 2019 by Metro COG and its member jurisdictions. It provides performance assessments of the multimodal transportation system, gathers a multifaceted cross-section of input from across the community, and provides improvement alternatives that are constrained by the anticipated amount of transportation funding that will be available between the creation of the plan and the 2045 planning horizon.

METRO GROW
2045 F-M TRANSPORTATION PLAN

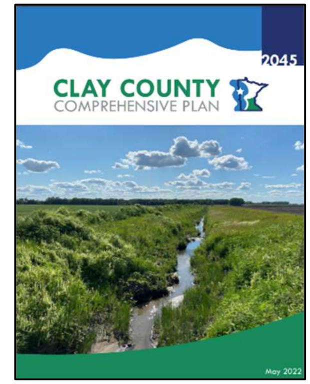
The plan identified Highway 10 in Dilworth as one of the region's corridors with a high level of motorist delay and low level of travel time reliability. Recommendations for future projects that would impact the corridor include railroad grade separation projects at either Main Street or 14th Street E south of Highway 10.

75
10
CORRIDOR STUDY

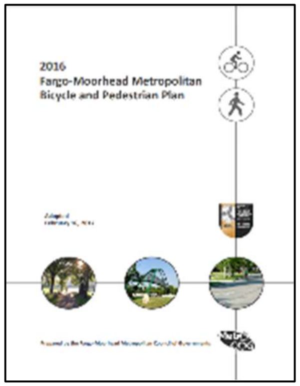
US 10/75 Corridor Study

In May 2020, the city of Moorhead, MnDOT, and Metro COG completed a study of Highway 10 and Highway 75 through Moorhead. The study developed context sensitive solutions for each corridor, balancing the needs of the jurisdictions, stakeholders, and users. This study on Highway 10 ended at 34th Street, which is the border between Moorhead and Dilworth. The recommendations of this study will have an influence on the future of Highway 10 in Dilworth as well. The study recommended reshaping Highway 10 west of 34th Street from a 4-lane divided highway to an urbanized corridor. This would impact the commercial vehicle inspection site 0.75 miles west of 34th Street. The study suggests a potential location for the inspection site would be between 12th and 60th streets in Dilworth.

2045 Clay County Comprehensive & Transportation Plan



The 2045 Clay County Comprehensive Plan describes the analysis, future projections, goals, and objectives that the county has developed for how decisions will be made over the next 25 years. The plan sets broad approaches to direct the future growth and development in the areas of land use, transportation, natural resources, housing, and economic competitiveness. For each topic, the plan sets goals, establishes objectives to achieve those goals, and identifies strategies and actions needed for implementation. The plan identified County Road 9 north of Highway 10 in Dilworth as a route for future urbanization.

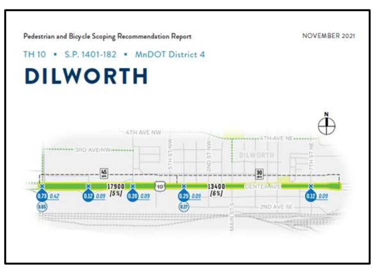


Fargo-Moorhead Bicycle and Pedestrian Plan

Metro COG maintains the Bicycle and Pedestrian Plan with updates every 5 years. The 2016 plan looks at all types of bicycle and pedestrian facilities that have a transportation element. The purpose of the plan is to “identify current issues and needs as they relate to bicycling and pedestrian movements in the area; develop goals, objectives, and recommendations to enhance bicycle and pedestrian accommodations and safety for all types of users regardless of age, gender, race, social status, or mobility needs.” The plan includes a long-range project to construct a shared use path along Highway 10 from County Rd 9 to 12th Street NE. An update to this plan was being developed while the Highway 10 Corridor Study was underway in 2022.

MATBUS 2021-2025 Transit Development Plan

Metro Area Transit (MATBUS) is the region’s provider of fixed-route and demand-response transit services. The Transit Development plan provides a 5-year guide to MATBUS service with an emphasis on future needs and sustainable growth. The plan identifies changes to Route 6, which provides service to Dilworth and utilizes a portion of Highway 10 along with parallel corridors through the city.



MnDOT Pedestrian and Bicycle Scoping Report

MnDOT completed a Pedestrian and Bicycle Scoping Report through Dilworth in 2021 with observations made by MnDOT’s Bicycle & Pedestrian Safety Engineer and staff, District Staff, and Dilworth representatives during a virtual field walk. The report identified existing issues in the non-motorized system and recommended improvements to be included with future projects.

2.0 SUMMARY OF PUBLIC AND AGENCY INVOLVEMENT

2.1 Study Review Committee

A Study Review Committee (SRC) was formed at the beginning of the Study process to provide general guidance on the direction of the study, to assist in identifying issues and reviewing alternatives, to evaluate information prior to public viewing, and to relay information back to other members of their respective agency.

The SRC included participation from the following agencies and individuals:

- **Metro COG** - Michael Maddox
- **City of Dilworth** – Peyton Mastera, Don Lorsung, Julie Nash
- **MnDOT District 4** – Mary Safgren, Trudy Kordosky, Makala Girodat
- **MnDOT Central Office** – Sonja Piper, Robert Wagner
- **MATBUS** – Lori Van Beek
- **Apex Engineering Group** – Brent Muscha, Josh Olson
- **Transportation Collaborative and Consultants (TC2)** – Matt Pacyna
- **Hoisington Koegler Group, Inc. (HKGi)** – Lance Bernard

A total of six meetings were held with the SRC between March 2022 and February 2023 utilizing a combination of in-person and virtual meetings tools. Meeting topics included development of the study schedule and outcomes, public engagement, identification of issues, vision/purpose and need, and alternative development.

2.2 Community Engagement

Community Engagement Plan

The study team developed a Community Engagement Plan (CEP) to guide the public engagement strategies for the Highway 10 study. The complete Community Engagement Plan can be found in the appendix. The CEP outlines the three phases of engagement:

- Phase 1 – Inform and Listen
- Phase 2 – Consult, Explore and Create
- Phase 3 – Report, Discuss and Agree

A study website was created to house the study information and provide online input opportunities during each phase of the study. The CEP identified the key stakeholders and outlined the various engagement tactics that would be used during the study including:

- Print ads in local newspapers
- Social media posts and events
- Postcards mailed to properties adjacent to the corridor
- Printed flyers delivered to businesses adjacent to the corridor
- Email invitations distributed to study partners and stakeholders
- Online and in-person surveys
- Interactive online comment map

Public Input Meetings

Two formal public input meetings were held during the study at the Dilworth Community Center. In addition, two separate listening sessions were held with stakeholders owning properties or businesses adjacent to the Highway 10 corridor.

Public Input Meeting #1 – July 6, 2022

The goal of this first meeting was to hear from the public regarding what they viewed as the key issues and needs along the corridor. Information presented included existing roadway conditions and traffic analysis. This meeting utilized an open-house format along with a formal presentation of the study information. Approximately 30 members of the public and various agencies attended the meeting along with a media reporter from KVLY who ran a news story about the meeting.

Public Input Meeting #2 – January 19, 2023

The second meeting provided the public an opportunity to view the future traffic information, issues and needs that had been identified, and alternative concepts that had been developed. Information pertaining to the adjacent land uses and reinvestment opportunities were also shared for public comment. This meeting also utilized an open-house format along with a formal presentation of the study information. There were over 25 members of the public and agency representatives at the meeting. In addition to the open house, study staff members were stationed at the Hi-Ho Burgers and Brews restaurant located on Highway 10 in Dilworth.

Stakeholder Meetings – July 6 and December 7, 2022

Two separate meetings were held with stakeholder groups including property and business owners along Highway 10. The first meeting was held in advance of the first Public Input meeting at the Dilworth Community Center, to allow those groups to meet directly with study staff members and share their concerns, needs, and vision for the corridor. The second meeting, held at Dilworth City Hall, was a listening session conducted with business owners and developers to discuss alternative concepts and how they would impact existing and future land uses and reinvestment along the corridor.

In addition to the two larger stakeholder meetings. Separate meetings were held to discuss the following topics with these stakeholders:

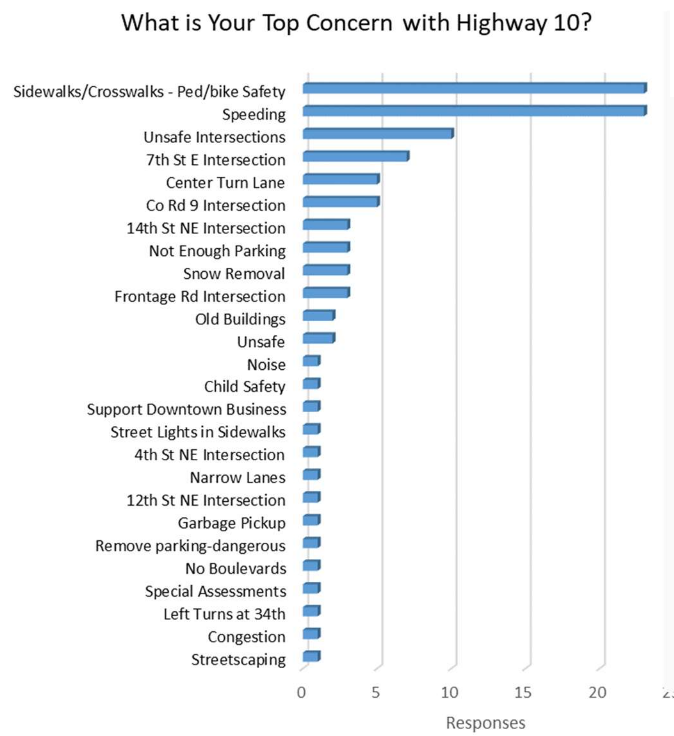
- Minnesota State Patrol – potential locations for a commercial vehicle inspection site
- BNSF Railroad – potential future rail crossing connecting to Highway 10
- Clay County Engineer – potential future improvements to nearby county routes and to 15th Avenue N which is under township jurisdiction

Surveys and Interactive Maps

Two online surveys were available to the public during the course of the study. The surveys were hosted on the SurveyMonkey platform and were accessible from weblinks on the study website, social media posts, postcards, flyers, and emails.

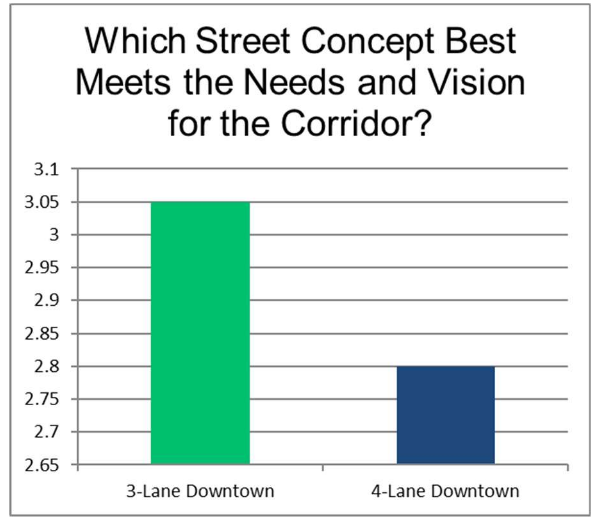
Online Survey #1

This survey was available during the first phase of public engagement. 44 responses were received to questions that helped identify the top concerns regarding the corridor and the vision for the future of the corridor. The main concerns were related to sidewalk and crosswalk safety, vehicles speeding, intersection safety, and lack of left turn lanes. The complete results of the survey can be found in the Appendix.



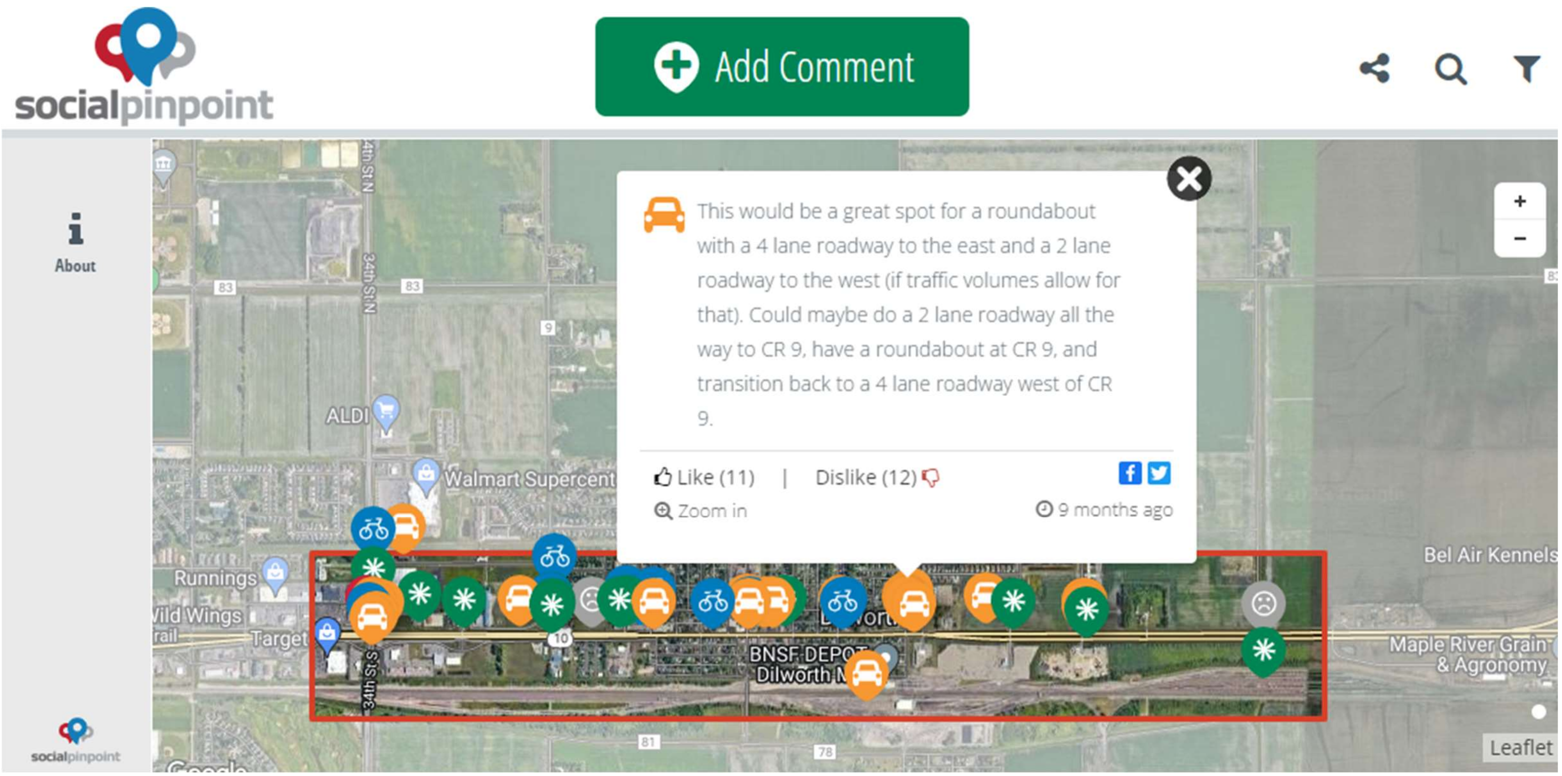
Online Survey #2

This survey was available during the second phase of public engagement. 155 responses were received to questions that asked how well a 3-lane or 4-lane concept fit the vision of the corridor, intersection and access options, and downtown vision alignment.



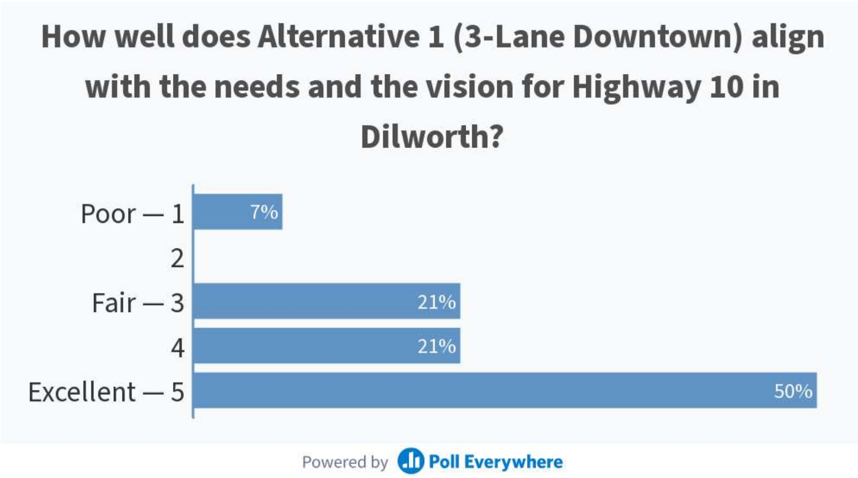
Social Pinpoint Interactive Map

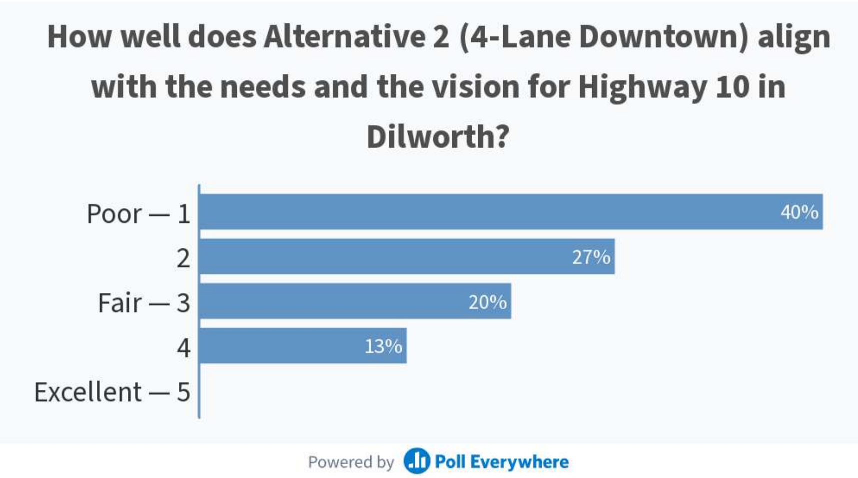
Social Pinpoint was used to identify community needs and issues along the corridor. Social Pinpoint is a map-based online engagement tool that allows community members to leave comments on specific areas of the corridor via a map and others to vote if they like or dislike the comment. This map was available during all phases of public engagement. There were over 60 comments received and 335 votes on the comments.

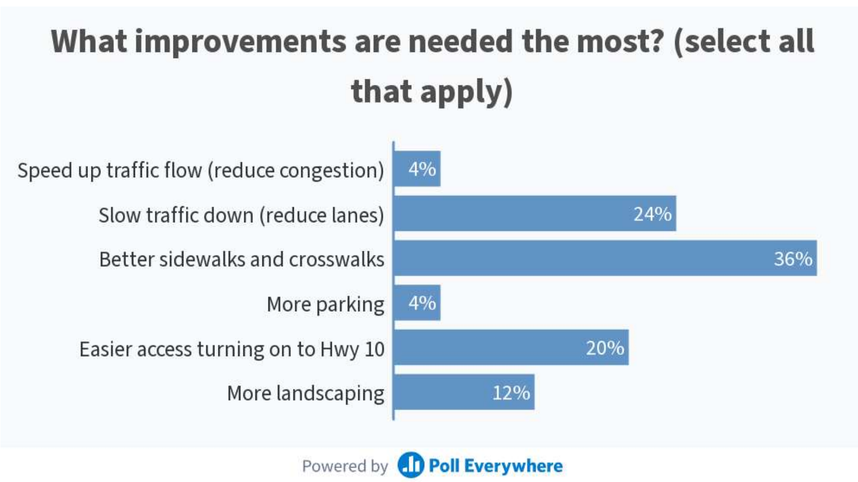


Live-Polling with Poll Everywhere

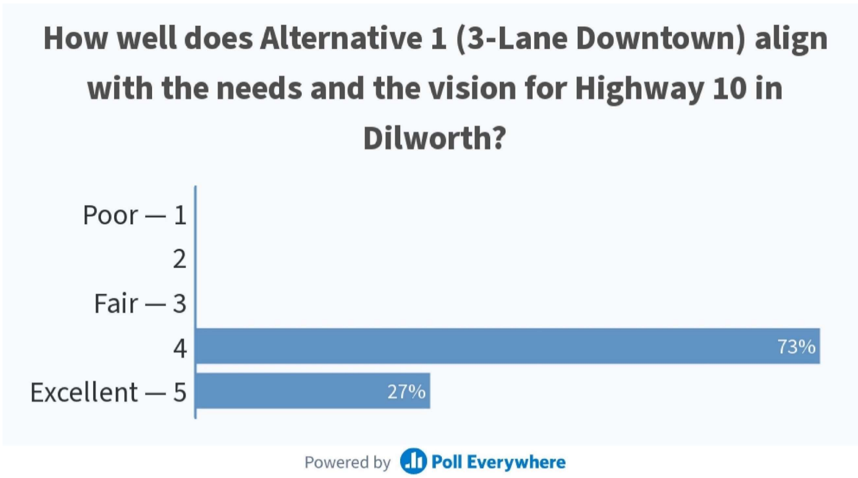
It was important to capture tangible and objective feedback from those that attended the public input meetings. After having a chance to discuss with study team members and listen to the formal presentation, attendees were asked to respond to few brief questions.

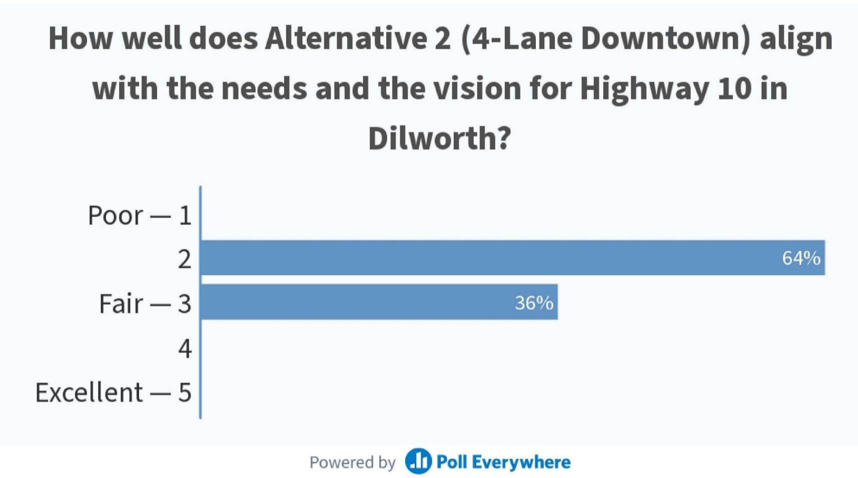


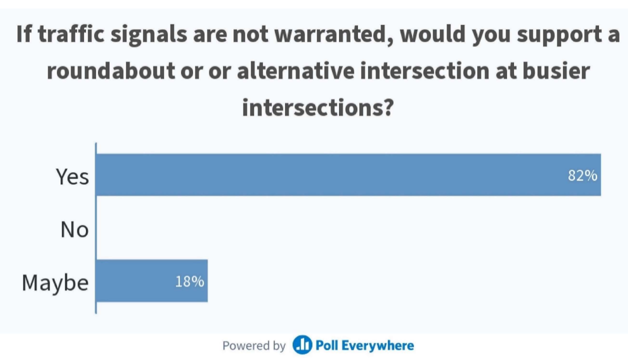




At the final SRC meeting near the conclusion of the study, the members of the SRC were also polled to summarize the committee's assessment of which concepts best met the needs and vision of the corridor.







3.0 EXISTING CONDITIONS

3.1 Construction History

Highway 10 was originally graded in 1923 as a rural 2-lane roadway. In 1954 and 1965 the corridor was expanded to a 4-lane facility. There have also been numerous minor projects such as resurfacing and modifying turn lanes. The complete history of construction of the corridor can be found on MnDOT's eDocs website.

3.2 Geometry and Typical Section

There are three distinct roadway sections through the corridor study area. Each section has a distinguishable roadway configuration, speed limit, pedestrian and bicycle facilities, access control, and adjacent land use.

Highway 10 Typical Sections		
Segment	**Notes**	
Zone 1 34th Street to 5th Street W	• Divided 4-lane roadway with raised concrete median • 12' driving lanes with 8' outside and 4' inside shoulders, 16' median (88' pavement total) • Turn lanes • 45 mph speed limit • Frontage roads • 8' wide sidewalk on south side • 155' Right of Way • 5" bituminous pavement • 8" concrete Base The existing pavement in this segment is showing signs of transverse cracking, longitudinal cracking, longitudinal joint distress, rutting and weathering. Curb and gutter located in the median is in average to below average condition. Weeds and grass are growing in the concrete median joints.	 East of 34th Street - Facing East

Highway 10 Typical Sections		
Segment	**Notes**	
Zone 2 5th Street W to 7th Street E	• Undivided 4-lane roadway • 12’-14’ driving lanes, 8’ 10” parking lane on north side of road from Main Street to 3rd Street W (58’ 10” pavement total) • No turn lanes • 30 mph speed limit • Sidewalks located on north and south side various widths • 76’ Right of Way • 4”-5” bituminous pavement • 7”-8” concrete/gravel base The existing pavement in this segment is showing signs of transverse cracking, longitudinal cracking, longitudinal joint distress, rutting and weathering. Curb and gutter located in the median is in average to below average condition. Weeds and grass are growing in the concrete median joints.	 East of Main Street - Facing East
Zone 3 7th Street E to 60th Street	• Divided 4-lane roadway with a 46’ grass median • Two 12’ driving lanes. 10’ and 4’ shoulders (38’ pavement total each roadway) • Turn lanes • 65 mph speed limit • No sidewalks • 256’ Right of Way • 2”- 3” bituminous pavement (EB) • 6” bituminous pavement (WB) • Base – 8” concrete base The existing pavement in this segment is showing signs of transverse cracking, longitudinal cracking, longitudinal joint distress, and weathering. Curb and gutter in this section shows signs of pitting and distress. Weeds and grass are growing in the concrete median joints.	 East of 7th Street E – Facing East

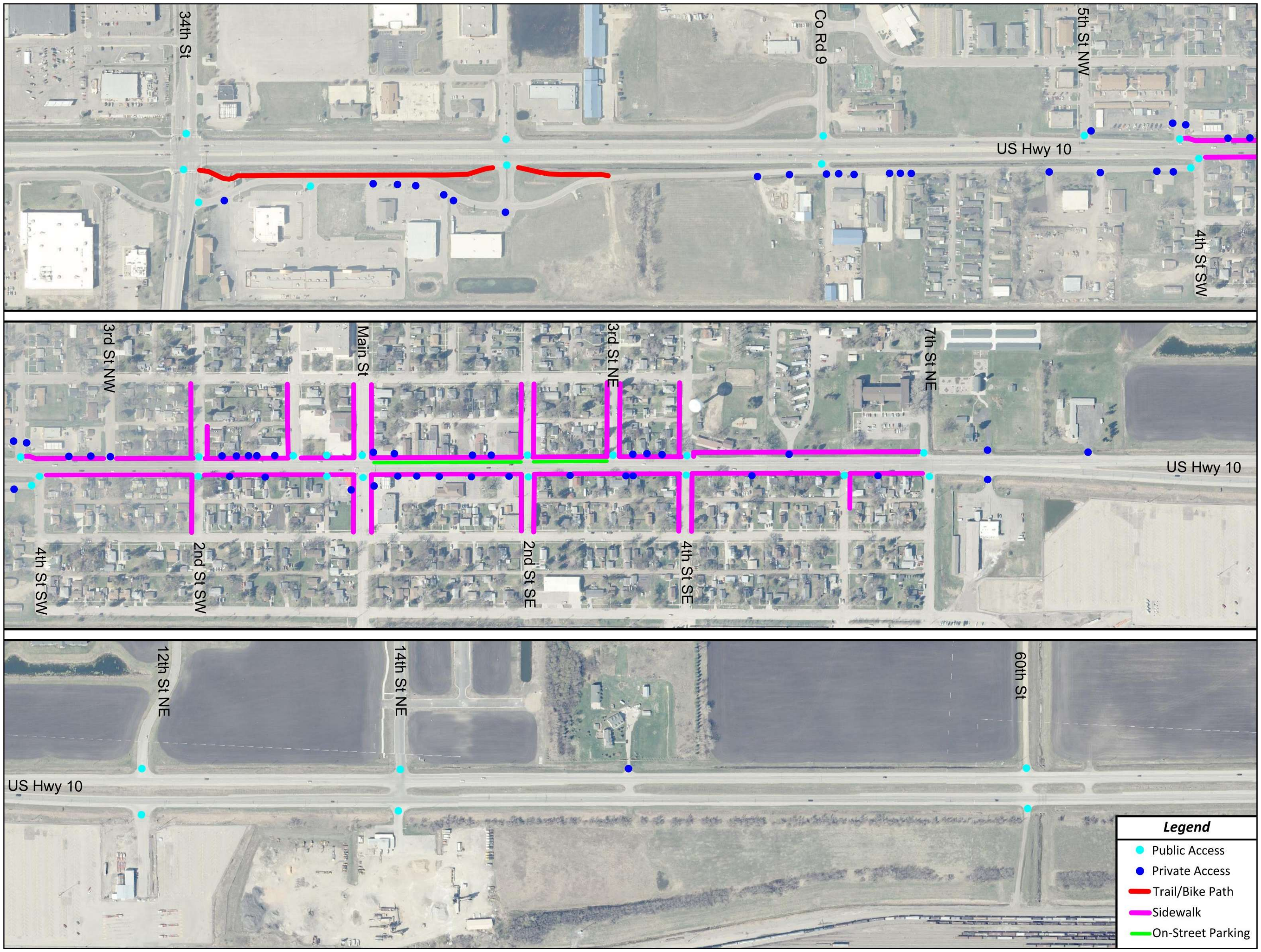
3.3 Access and Parking

There is no parking along the south side of Highway 10 throughout the corridor. Parking is only allowed on the north side between Main Street and 3rd Street E between the hours of 6 a.m. and 2 a.m. This area has businesses and homes that do not have driveways or access to parking directly off Highway 10.

There are 61 total direct access points on the 2.5 mile corridor, equating to an average of 24 accesses per mile. 31 of the access points are to private property, 30 are public roads (considering the north and south sides of a full intersection as separate accesses). The highest concentration is between 4th Street W and 4th Street E where there are 38 access points within a half mile.

MnDOT provides guidance for spacing of street and driveway access points. Primary street intersections should be spaced at ½ mile apart and secondary streets should be no less than 1/4 mile apart through urban areas. In the urban core areas, a spacing of 300-600 feet is recommended, depending on block spacing. Driveway spacing guidance is not provided for an urban core area, as there are many factors contributing to the necessary location of the driveways including business or residential driveways that provide the sole access to a mid-block property.

Access, Parking, and Sidewalks



3.4 Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities were analyzed throughout the corridor. The existing sidewalks are either concrete or bituminous pavement, in generally poor condition, and vary in width from four to eight feet. There are multiple gaps in the sidewalk network.

The lack of sidewalk facilities in certain areas hinders and discourages pedestrian and bicycle movements through the corridor. There is no connectivity between the central downtown area of Dilworth and the east and west areas, limiting connections between residential and business districts. There are no bicycle-specific facilities within the corridor. Dilworth's city ordinance allows people on bicycles to ride on the sidewalk, except when riding in a business district.

The sidewalk facilities through the corridor are as follows:

- 34th Street to County Rd 9 – intermittent eight foot sidewalk on the south side of Highway 10, no sidewalk on the north side.
- County Rd 9 to 4th Street W – No sidewalks present.
- 4th Street W to Main Street – four foot sidewalk on both the north and south sides.
- Main Street to 2nd Street E – eight foot sidewalk on the north side and four foot sidewalk on the south side.
- 2nd Street E to 7th Street E – eight foot sidewalk on both the north and south sides.
- 7th Street E to 60th Street – No sidewalks present.

Pedestrian Comfort Level Assessment

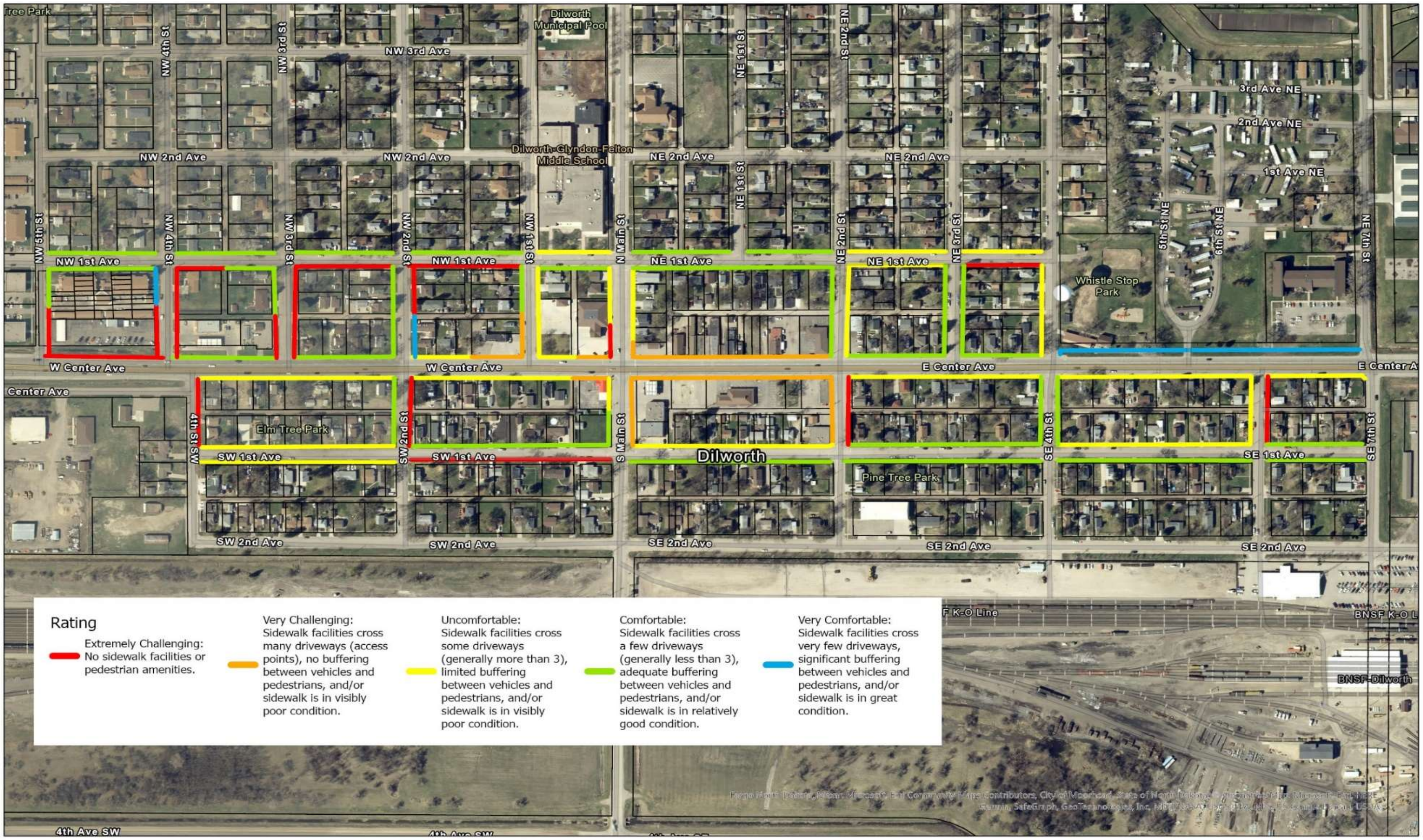
A visual assessment of the pedestrian facilities along and around Highway 10 was conducted. This assessment primarily considered pedestrian perceptions of safety and level of comfort on the sidewalks. The assessment takes into consideration the presence of intersections and driveways (access points), the presence and quality of buffering between the pedestrian and vehicle infrastructure (including roadways and parking areas), and the overall condition of the path and the surrounding environment.

The assessment used a simple rating system between one and four. Zero was used to denote locations where no sidewalks are present, but there may still be pedestrian activity. These rankings were further translated to one's comfort level when using the corridor for walking.

Pedestrian Facilities Rating Standards:

- **Extremely Challenging** (Rating = 0): No sidewalk facilities or pedestrian amenities.
- **Very Challenging** (Rating = 1): Sidewalk facilities cross many driveways (access points), no buffering between vehicles and pedestrians, and/or sidewalk is in visibly poor condition.
- **Uncomfortable** (Rating = 2): Sidewalk facilities cross some driveways (generally more than 3), limited buffering between vehicles and pedestrians, and/or sidewalk is in visibly poor condition.
- **Comfortable** (Rating = 3): Sidewalk facilities cross a few driveways (generally less than 3), adequate buffering between vehicles and pedestrians, and/or sidewalk is in relatively good condition.
- **Very Comfortable** (Rating = 4): Sidewalk facilities cross very few driveways, significant buffering between vehicles and pedestrians, and/or sidewalk is in excellent condition.

Pedestrian Level of Stress Rating



General Findings

Generally, Highway 10 may be perceived as an uncomfortable environment for pedestrians based on the number of driveway crossings, parking lots, and limited buffering between vehicles. Nearly half of the blocks are considered “challenging” or “uncomfortable.” Sidewalks that are considered “comfortable” are generally located outside of the corridor along side-streets or parallel routes.

There are either signed or marked crosswalks at 34th Street, Main Street, and 4th Street E. The distance from 34th Street to Main Street is one mile and there are gaps in the pedestrian facilities between the crosswalks, increasing the likelihood of pedestrians crossing at unmarked locations.

The pedestrian crossing at 4th Street E was enhanced with a Rectangular Rapid Flashing Beacon (RRFB) system in 2020. While the RRFB provides additional conspicuity to the crosswalk, there is a possibility of a motorist not seeing a pedestrian because their view is blocked by a same-direction vehicle in the adjacent lane. Crosswalks for multi-lane roads may benefit from additional RRFB's and signs mounted overhead or in or a median refuge.

Another issue concerning the existing sidewalks is snow storage, particularly along the south side of Highway 10 between 4th Street W and 7th Street E. There is no boulevard space for snow storage and the existing sidewalks become blocked during the winter months.

3.5 Lighting and ITS

There is existing lighting from 34th Street to 14th Street E. The lights from 34th Street to 4th Street are not LED style lights. The lights from 4th Street W to 7th Street E were recently updated with new poles and LED fixtures. The lights on the south side in this segment are located the middle of the sidewalk, approximately 2 feet from the curb, blocking the pedestrian access route. There is no existing street lighting from 14th Street E to 60th Street.

There is one Dynamic Message Sign (DMS) for eastbound traffic located on the south side of Highway 10 just east of 7th Street E. MnDOT uses these signs to display information to travelers such a road conditions, closures, and safety messages.

3.6 Utilities

There are existing city-owned utilities throughout the corridor along with storm sewer infrastructure and some privately owned utilities.

Sanitary Sewer

There is sanitary sewer running parallel with Highway 10 throughout the corridor between 34th Street and 5th Street W, crossings at 1st Street W and east of Main Street, and parallel again between 3rd Street E and 7th Street E where it ends.

Watermain

The watermain between 34th Street and 2nd Street E includes portions of Asbestos Cement Pipe (ACP) and should be considered for replacement as ACP could be considered a hazardous material if it is disturbed and is no longer used for watermain. There is no watermain between 2nd Street E and 7th Street E other than a crossing at 4th street and the watermain between 7th Street E and 60th St is PVC.

Storm Sewer

Stormwater runoff is collected in the north and south ditches between 34th Street and 4th Street W. From 4th Street W to 7th Street E there is a 15 to 18 inch storm sewer trunk line which carries stormwater from the curb inlets to the north ditch at 7th Street E. to the east of here the stormwater is again carried in the north and south ditches.

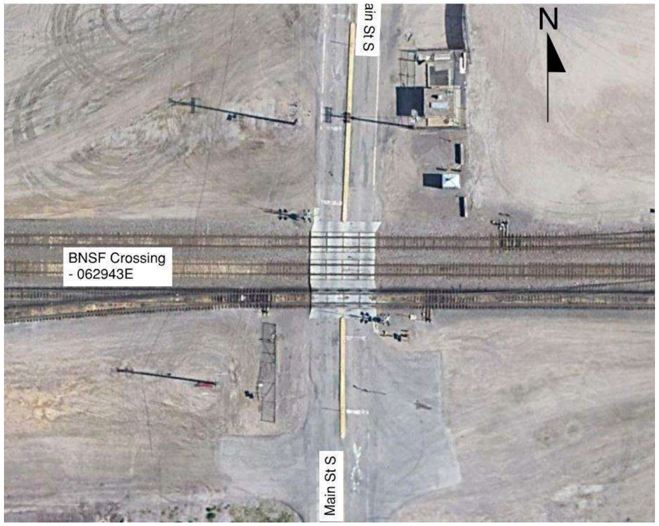
Other Public and Private Utilities

Several overhead and underground public and private utilities are present within the corridor including overhead electric lines primarily running parallel to Highway 10 although there are several lines that cross directly over the corridor. There are underground facilities including gas, electric and multiple cable/internet/telephone underground facilities in the study area.

3.7 Railroad Crossings

BNSF Railway

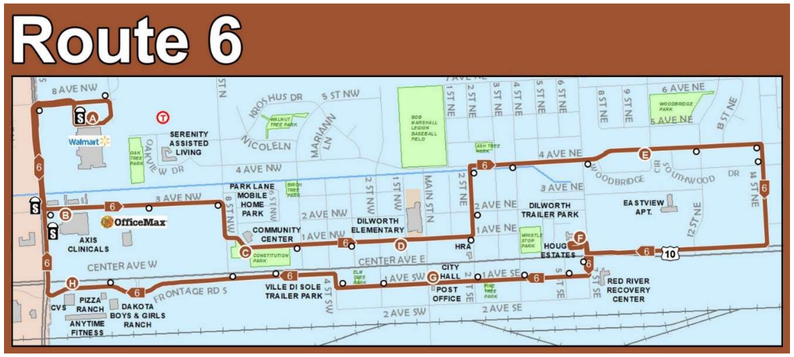
There is one at-grade railroad crossing near the Highway 10 corridor. It is located 850 feet south of the corridor on Main Street S. There are 3 tracks crossed with an average of 68 trains per day. Crossing gates are the in-place warning device. There are no pedestrian facilities at this crossing. There have been no accidents at this crossing since 1990, according to the data provided on the Federal Railroad Administration's database. This crossing has been identified by BNSF and by the city as a potential for closure, if a grade separated crossing can be constructed elsewhere in the community. 14th Street E has been identified as a potential location. A meeting was held with BNSF representatives who indicated that they are in favor of a new crossing, and would be willing partners, however the largest hurdle would be funding the local portion of a project.



3.8 Transit

MATBUS operates one route in Dilworth that travels across the Highway 10 corridor. Route 6 crosses Highway 10 at the 7th Street E and 34th Street Intersections. Between 4th Street E and 34th Street, the route utilizes the frontage road along the south side of Highway 10. It has been noted by MATBUS that the stops along this frontage road are not ideal and provide poor connectivity to the north side of Highway 10.

In 2019 there were 16,710 riders, in 2020 there were 15,244, and in 2021 there were 10,315. Total ridership in 2020 and 2021 was affected by the COVID-19 pandemic.

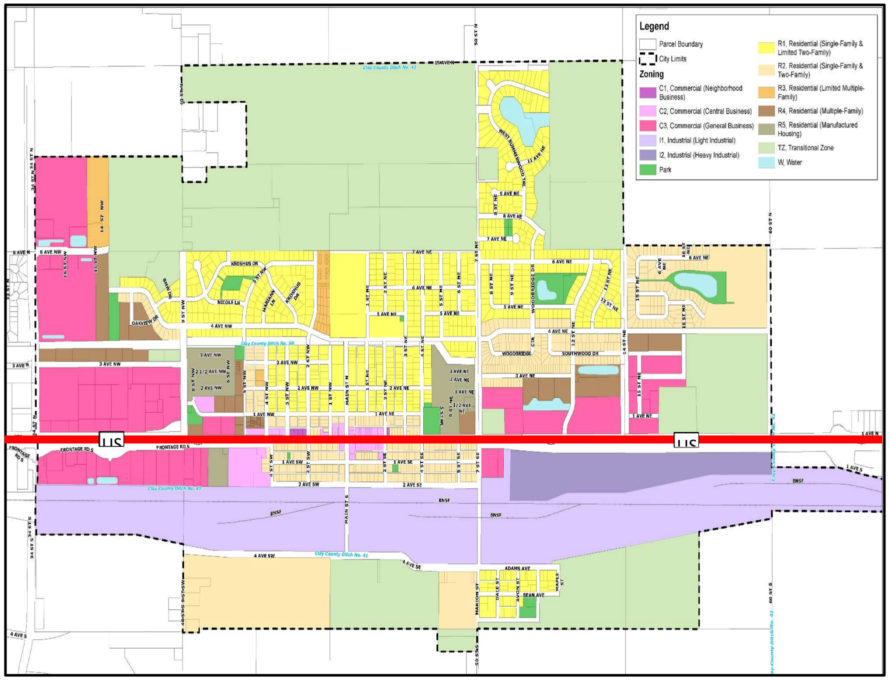


In addition to the MATBUS rides in 2020, Dilworth MAT Paratransit provided an additional 918 rides and Dilworth Metro Senior Ride provided an additional 639 rides. These services provide a door-to-door service for seniors and others with mobility concerns.

3.9 Land Use

The existing land use areas adjacent to the Highway 10 corridor through Dilworth vary from suburban commercial to urban residential according to the MnDOT Land Use Context Tech Memo. Land use for Highway 10 can be broken into three context areas. These zones are further discussed in Chapter 5.

2023 Land Zoning



Zone 1 - <u>34th Street to 5th Street W</u> – The existing land use in this segment could be described as "Suburban Commercial". The adjacent land in this segment is mostly zoned for commercial use. There are a few parcels of residential zoning. To the west, in Moorhead, the adjacent land use is similar with areas developing farther north.

Zone 2 - <u>5th Street W to 7th Street E</u> – The existing land use in this segment could be described as "Urban Residential". The adjacent land is a primarily residential, with a few commercial land use zones, along with city parks. This zone also includes the traditional downtown core area of Dilworth.

Zone 3 - <u>7th Street E to 60th Street</u> – The existing land use in this segment could be described as "Suburban Commercial". The north side of the roadway is a mix of commercial and transitional land use zones; this is the most rapidly growing area of the community. The south side of the roadway is entirely industrial with one parcel of commercial zoning. Land use east of Zone 3 transitions to primarily agricultural.

3.10 Trees and Landscaping

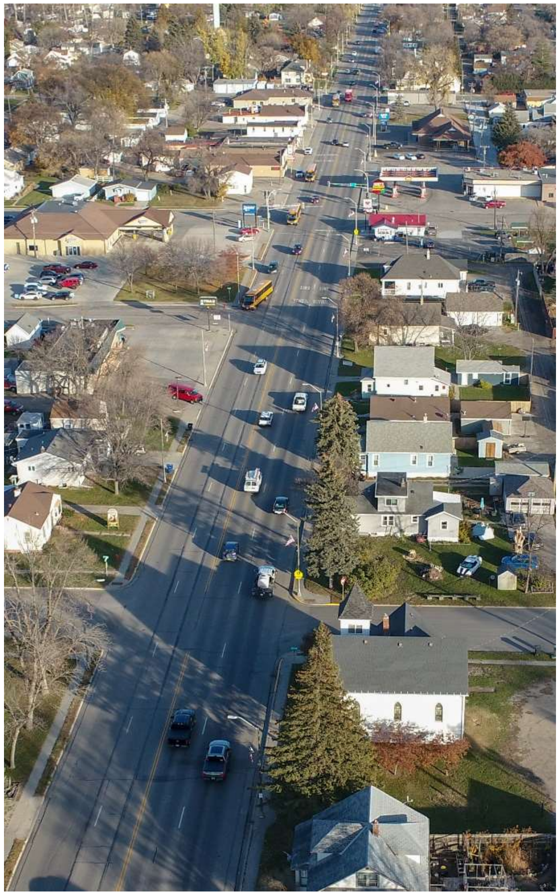
There are no existing trees or significant landscaping features within the Highway 10 right of way through the study corridor. There are, however, numerous private trees, especially through the core residential areas. There are a few small landscaping features outside of businesses and homes on adjacent private property.

3.11 Traffic Operations – Existing Conditions

Existing traffic conditions were reviewed within the study area to quantify current operations and identify any existing issues. The evaluation of existing conditions included collecting traffic volumes, observing roadway characteristics, analyzing crash history, and intersection capacity, which are described in the following sections.

Traffic Volumes

The following intersections and/or driveways along Highway 10 were included as part of the capacity analysis and study process.



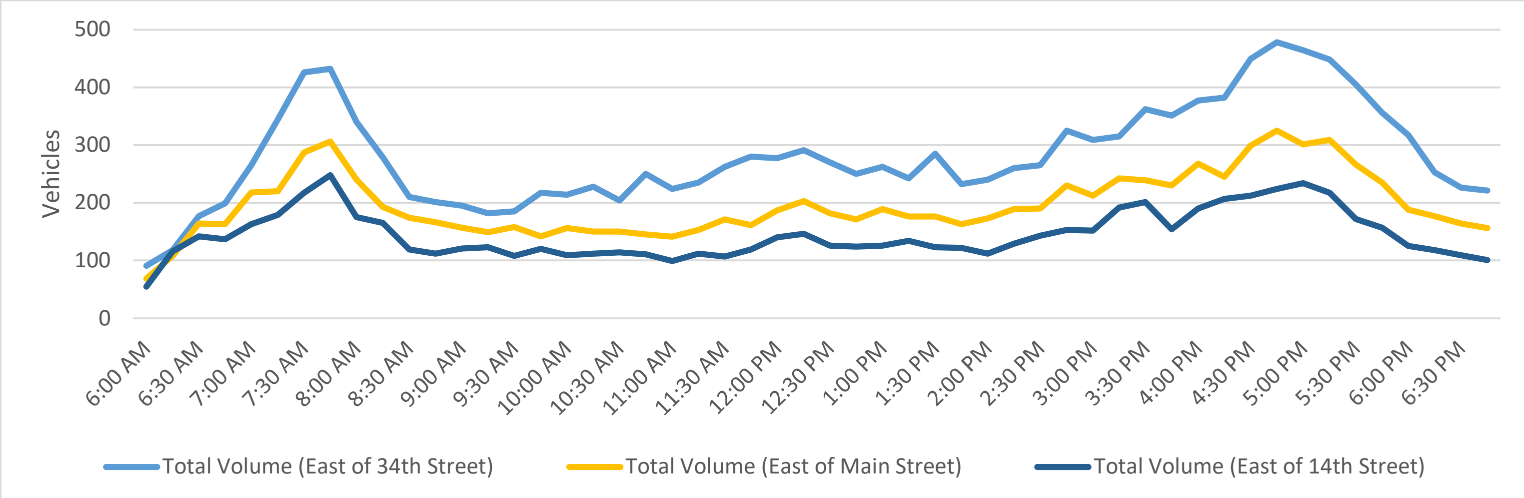
- 34th Street *
- Frontage Road / Shopping Center Access*
- County Road 9 / 40th Street W *
- 5th Street W
- 4th Street W
- 2nd Street W
- Main Street *
- 2nd Street E
- 4th Street E
- 7th Street E *
- 12th Street E
- 14th Street E *
- 60th Street N

** Denotes a study intersection where new counts were collected.*

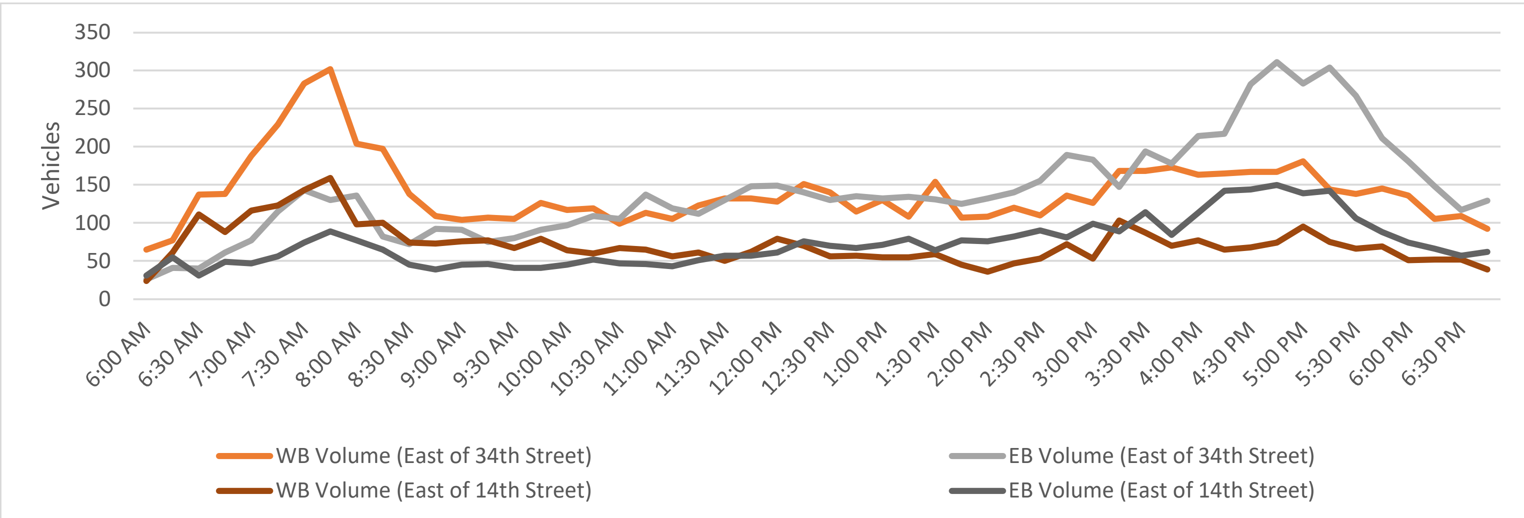
Intersection turning movement and pedestrian/bicyclist data was collected for a 13-hour period (i.e., from 6 a.m. to 7 p.m.) at each location to understand how traffic patterns vary throughout the day, as well as to assist with traffic control warrants as part of this study. Historical Annual Average Daily Traffic (AADT) volumes were provided by MnDOT.

Hourly profiles for total traffic volume and for directional volume were developed to help illustrate how vehicular activity varies throughout the day along segments of the corridor. In general, the corridor follows a typical pattern with a defined morning peak occurring between 7:15 and 8:15 a.m. and an evening peak between 4:30 and 5:30 p.m. There is also a defined commuter travel pattern, with a higher westbound traffic pattern during the a.m. peak period and a higher eastbound travel pattern during the p.m. peak period. Traffic volumes generally decrease as you travel from west to east along the corridor.

Total Hourly Traffic Volume Profile



Directional Hourly Traffic Volume Profile



Daily Traffic Volumes

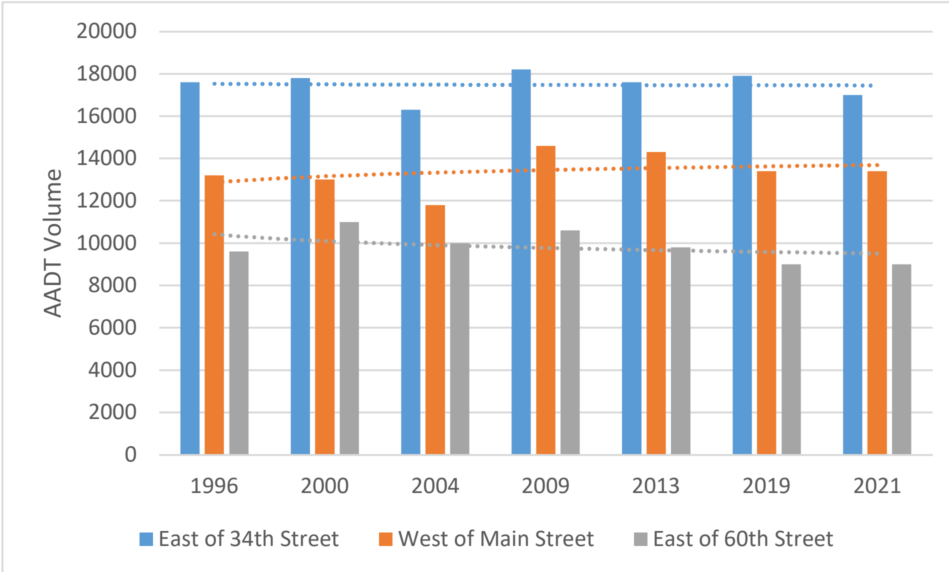
AADT volumes along Highway 10 have been relatively stable over the last 20-years. Although there has been a fair amount of development, this can partially be attributed to area transportation improvements, including the MN Highway 336 interchange construction which occurred during 2003 and 2004, as well as new I-94 Access at 34th Street, which has had an impact on regional travel patterns. Traffic volumes collected in 2021 and 2022 are generally consistent with pre-COVID conditions.

AADT volumes currently range from approximately 9,000 to 18,000 vehicles per day (vpd) along the Highway 10 corridor. Daily traffic volumes are highest near 34th Street and steadily decrease to the east side of the study corridor, near MN Highway 336. Cross-street ADT volumes range from a couple hundred vehicles per day, up to approximately 2,500 vpd.

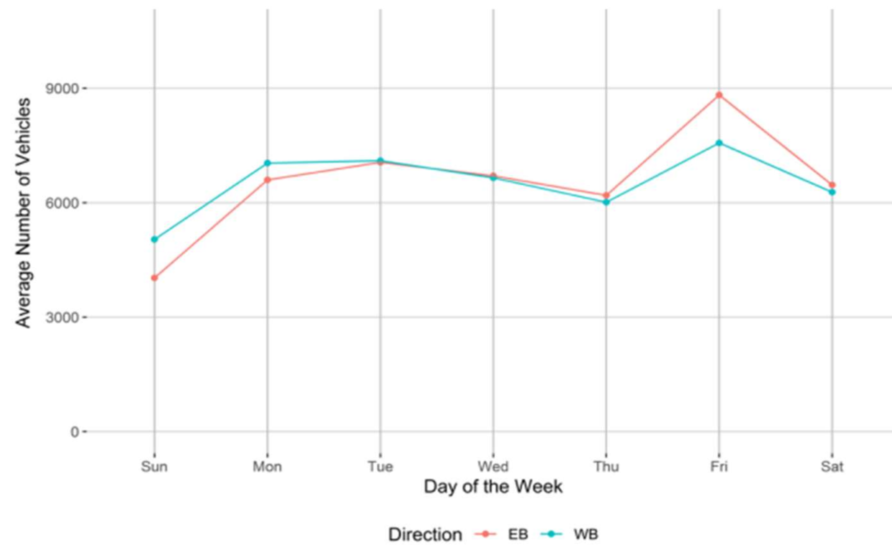
Since the study corridor is known to be used as a commuter route, freight route, and recreational route, average daily traffic volumes along the corridor were reviewed by day of the week and time of the year as well. This data is based on traffic data from the adjacent Weigh in Motion (WIM) Station #43, which is located east of MN Highway 336, just outside of the study area.

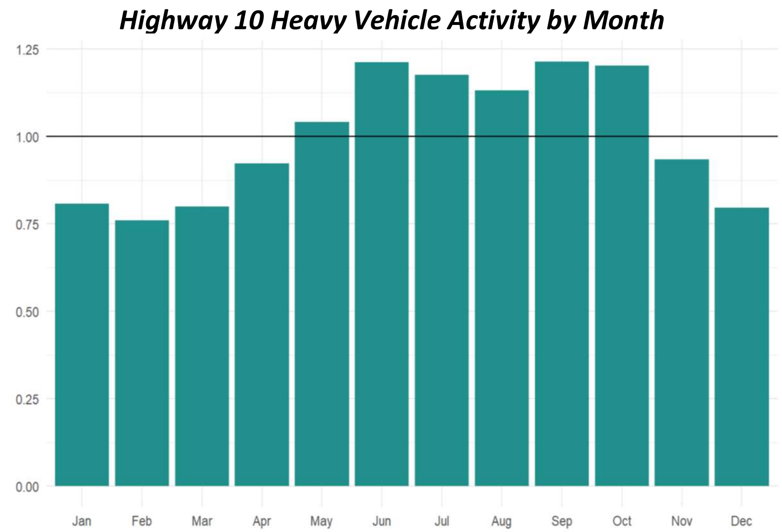
The AADT volumes are relatively steady and balanced between eastbound and westbound between Monday and Thursday. However, there is a noticeable increase on Fridays in the eastbound direction, and a similar increase on Sundays in the westbound direction. This data is consistent with the recreational travel patterns associated with Fargo-Moorhead area residents traveling to/from "lake country" in western Minnesota for the weekend.

Highway 10 Historical Annual Average Daily Traffic Volumes



Highway 10 AADT Volumes by Day / Direction





Truck activity is generally steady between Monday and Thursday, with less activity on Friday, Saturday, and Sunday. Approximately 10 percent of eastbound vehicles are classified as heavy commercial vehicles compared to approximately 5 percent of westbound vehicles.

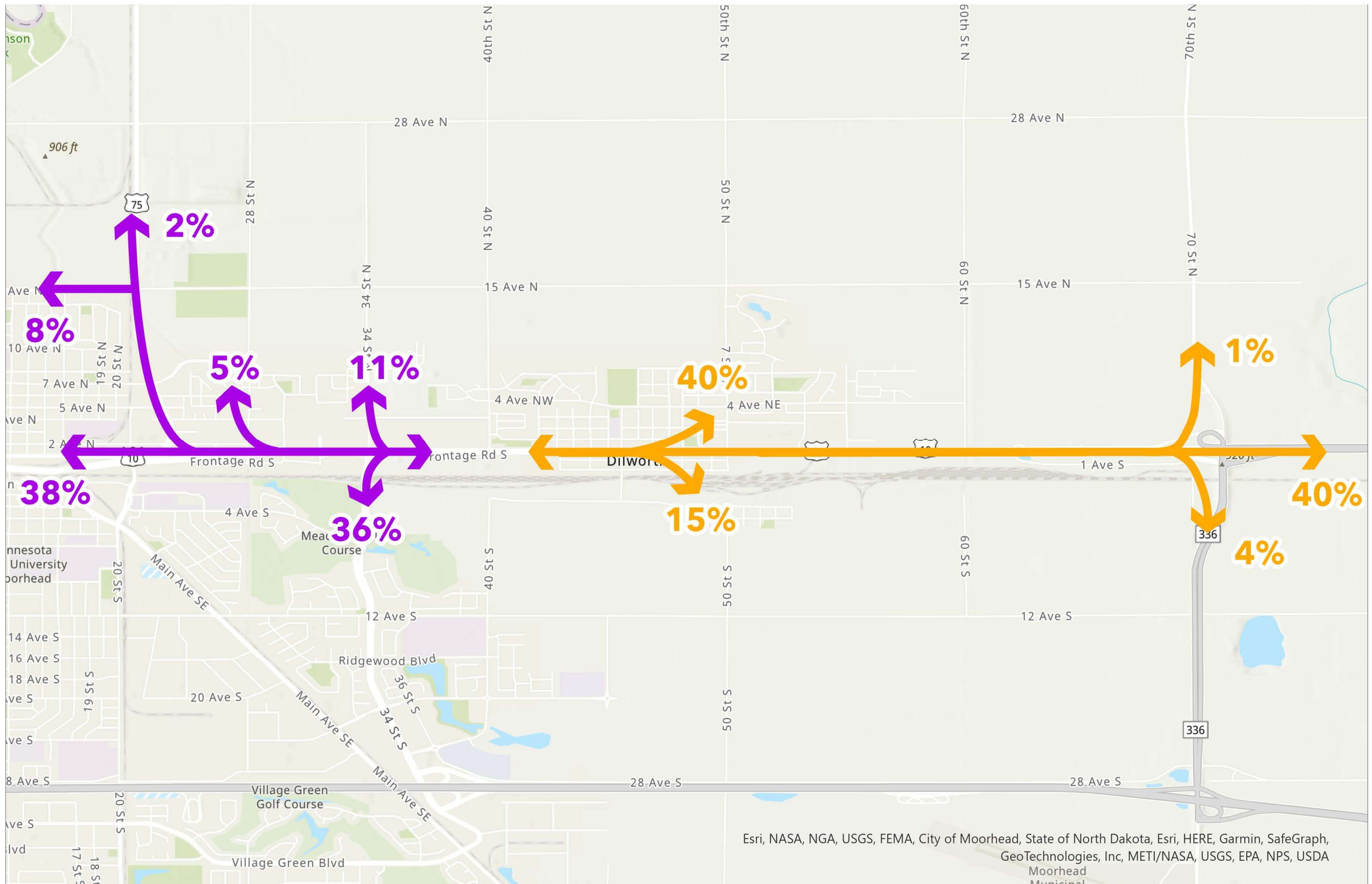
The graph to the left illustrates heavy vehicle activity by month, with 1.00 being an average month. This data illustrates an increase of approximately 20% in heavy vehicle activity between May and October in the area, which coincides with peak agricultural activity. American Crystal Sugar has a large processing plant located in Moorhead to the northwest of the study corridor and there is a grain elevator to the east of the study area on Highway 10 near MN Highway 336. These businesses generate additional ag-related freight activity during the summer and fall.

Travel Patterns

To understand who's using the corridor, a combination of StreetLight data, existing turning movement counts, and land use information was leveraged. This information was organized and summarized into key travel patterns of Highway 10 motorists. The key travel patterns indicate that approximately 55 percent of motorists along Highway 10 (east of 34th Street) originate or are destined to the Dilworth area, while the remaining motorists are traveling to/from MN Highway 336 or Highway 10 (east of MN Highway 336).

West of the study corridor, motorists travel patterns are relatively balanced between continuing along Highway 10 towards Fargo as well as areas to both the north and south of Highway 10. 34th Street, south of Highway 10, is a popular travel pattern for motorists within the study segment, with approximately 35 percent of users that originate or are destined for 34th Street. Approximately 10 percent of users travel to/from the MN Highway 75 and 15th Avenue area. This is illustrated in purple in the figure.

Pedestrian and bicyclist activity was identified at the time traffic data was collected. Most of the pedestrian and bicycle movements were made at the signalized intersections. At 34th Street most movements were east-west across the intersection, while there were approximately 50 north-south pedestrian and bicycle crossings at Main Street.



Highway 10 Travel Patterns

Corridor and Intersection Operations

ADT volumes along Highway 10 range from approximately 9,000 to 18,000 vehicles per day. The corridor also varies from a four-lane undivided facility to a four-lane divided arterial with turn lanes to a four-lane expressway. Typical planning level capacity thresholds by facility type are shown below.

Planning Level Capacity Thresholds *SOURCE: Mn/DOT and WSB & Associates*						
Facility Type	**LOS A**	**LOS B**	**LOS C**	**LOS D**	**LOS E**	**LOS F**
Primary/Principal Arterial (5-lane)	< 11,400	< 18,200	< 29,100	< 32,600	< 36,300	< 36,300
Primary/Principal Arterial (4-lane)	< 7,600	< 12,100	< 19,400	< 23,300	< 27,600	< 27,600
Primary/Principal Arterial (3-lane)	< 4,900	< 7,900	< 12,700	< 17,000	< 21,100	< 21,100
Primary/Principal Arterial (2-lane)	< 3,100	< 5,000	< 8,000	< 12,000	< 15,900	< 15,900

Highway 10 Planning Level Capacity Analysis			
Highway 10 Segment	**Existing Facility Type**	**Existing AADT Volume**	**Planning-Level LOS**
Zone 1 34th Street to 5th Street W	5-lane	17,900	LOS B
Zone 2 5th Street W to 7th Street E	4-lane	13,400	LOS C
Zone 3 7th Street E to 60th Street	5-lane	9,000	LOS A

Based on this planning-level capacity approach, the Highway 10 corridor operates between the Level of Service (LOS) A or LOS C range, depending on the segment. Although the planning-level capacity can provide a good barometer of corridor operations, intersection performance often provides a clearer indication of how the corridor operates. Therefore, a detailed capacity analysis was completed at the study intersections along Highway 10 to understand various performance metrics, including LOS, queuing, and travel time.

Level of Service quantifies how an intersection is operating. Intersections are graded from LOS A through LOS F, which corresponds to the average delay per vehicle. An overall intersection LOS A though LOS D is generally considered acceptable in the Fargo-Moorhead Metropolitan Area. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity.

Intersection Level of Service Thresholds		
Level of Service	**Average Delay / Vehicle**	
	Stop, Yield, and Roundabout Intersections	**Signalized Intersections**
A	< 10 seconds	< 10 seconds
B	10 to 15 seconds	10 to 20 seconds
C	15 to 25 seconds	20 to 35 seconds
D	25 to 35 seconds	35 to 55 seconds
E	35 to 50 seconds	55 to 80 seconds
F	> 50 seconds	> 80 seconds

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service, which takes into account the total number of vehicles entering the intersection and the capability of the intersection to support the volumes.

Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, most delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high-levels of delay (i.e., poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

The existing intersection capacity analysis indicates that all study intersections currently operate at an overall LOS C or better during the a.m. and p.m. peak hours. However, it is difficult to make left-turn or crossing maneuvers from the side-street approaches along the corridor, particularly at the Frontage Road and County Road 9 during the peak hours. This is illustrated by the LOS E and LOS F operations for these side-street approaches during the peak hours. In the table, the first letter represents the overall intersection level of service, while the second letter represents the worst side-street approach if it is an unsignalized intersection. The seconds of delay shown for signalized intersections is for the overall intersection, while for unsignalized intersections, the delay shown is for the worst side-street approach.

Existing Intersection Capacity Analysis			
Highway 10 Intersection	**Traffic Control**	**AM Peak Hour**	**PM Peak Hour**
34th Street	SIGNAL	B (24 sec)	C (31 sec)
Frontage Road	SSS	A / E (47 sec)	B / F (155 sec)
CR 9 / 40th Street	SSS	A / E (37 sec)	A / F (98 sec)
5th Street W	SSS	A / C (24 sec)	A / B (14 sec)
4th Street W	SSS	A / C (24 sec)	A / C (24 sec)
2nd Street W	SSS	A / C (22 sec)	A / C (23 sec)
Main Street	SIGNAL	A (7 sec)	A (6 sec)
2nd Street E	SSS	A / C (19 sec)	A / C (21 sec)
4th Street E	SSS	A / C (18 sec)	A / C (21 sec)
7th Street E	SSS	A / C (19 sec)	A / C (23 sec)
12th Street E	SSS	A / B (11 sec)	A / B (11 sec)
14th Street E	SSS	A / C (17 sec)	A / B (13 sec)
60th Street	SSS	A / B (14 sec)	A / B (13 sec)

The busiest intersection along the corridor is at 34th Street, where there are several movements where queues extend through the full length of the available turn lane storage. During the a.m. peak hour, these queues occur in the westbound and northbound left-turn lanes. During the p.m. peak hour, queues are generally within the available turn lane storage, but the eastbound and southbound through movement queues extend beyond the adjacent turn lanes, impacting access to the turn lanes. This occurs approximately five percent of the peak hour. Northbound and southbound queues also regularly extend beyond the adjacent Frontage Road access points along 34th Street, which are located approximately 150 feet and 100 feet to the north and south of Highway 10, respectively.

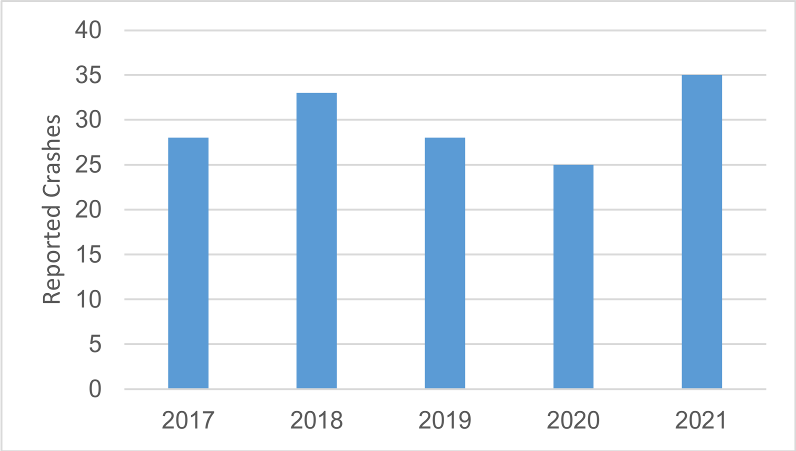
3.12 Crash History

A review of historical crash data was completed along the corridor to identify any trends, hotspots or contributing factors. Five years of crash history were reviewed within the study area, which included data from January 2017 through December 2021. The crash data was obtained using MnDOT's MnCMAT2 crash mapping tool.

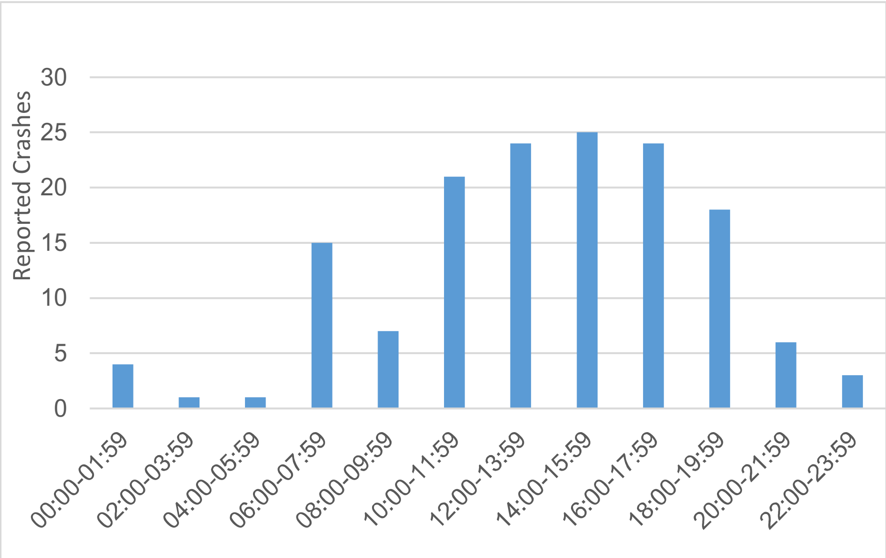
During the analysis period, there were a total of 149 reported crashes within the study area, which equates to an average of 30-crashes per year. There was a noticeable dip in 2020, which was likely tied to the decrease in vehicle activity associated with the COVID-19 Pandemic.

The majority of the crashes occurred between 6 a.m. and 8 p.m., with peak crash activity occurring between 12 p.m. and 6 p.m. There is a noticeable increase in reported crashes on Fridays, which coincides with the increase in recreational activity along the corridor.

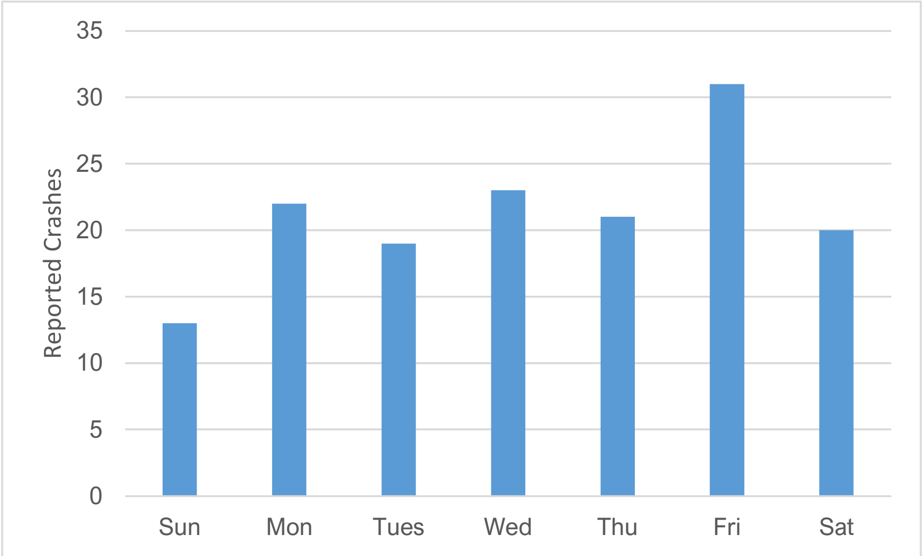
Reported Crashes by Year



Crashes by Time of Day



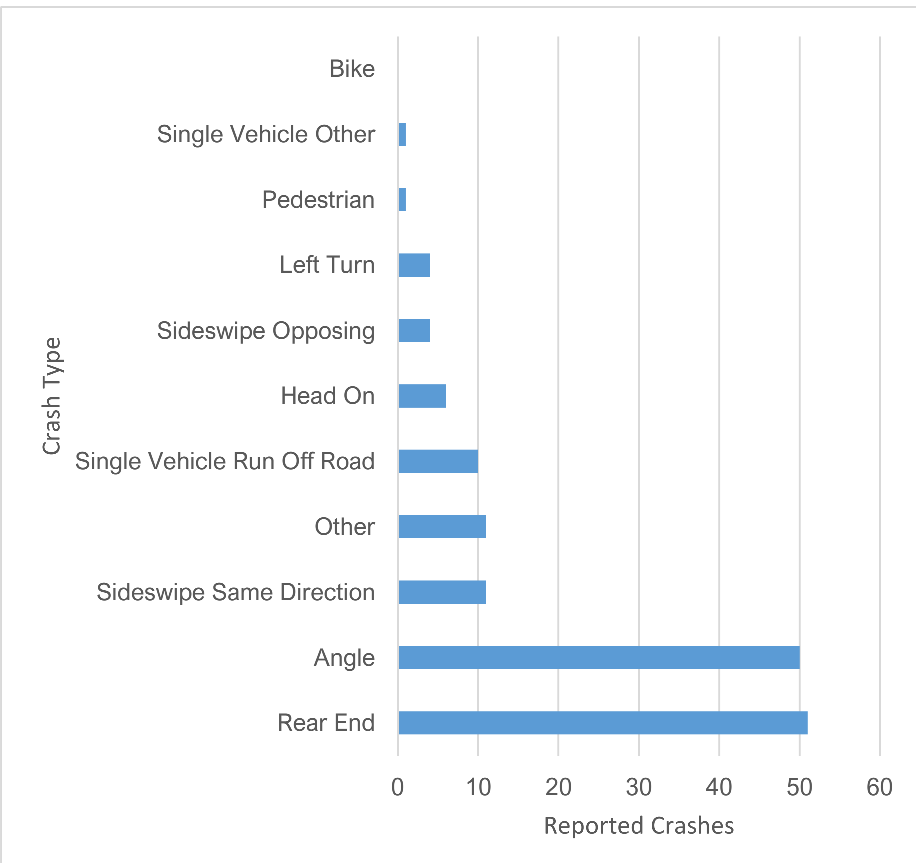
Crashes by Day of the Week



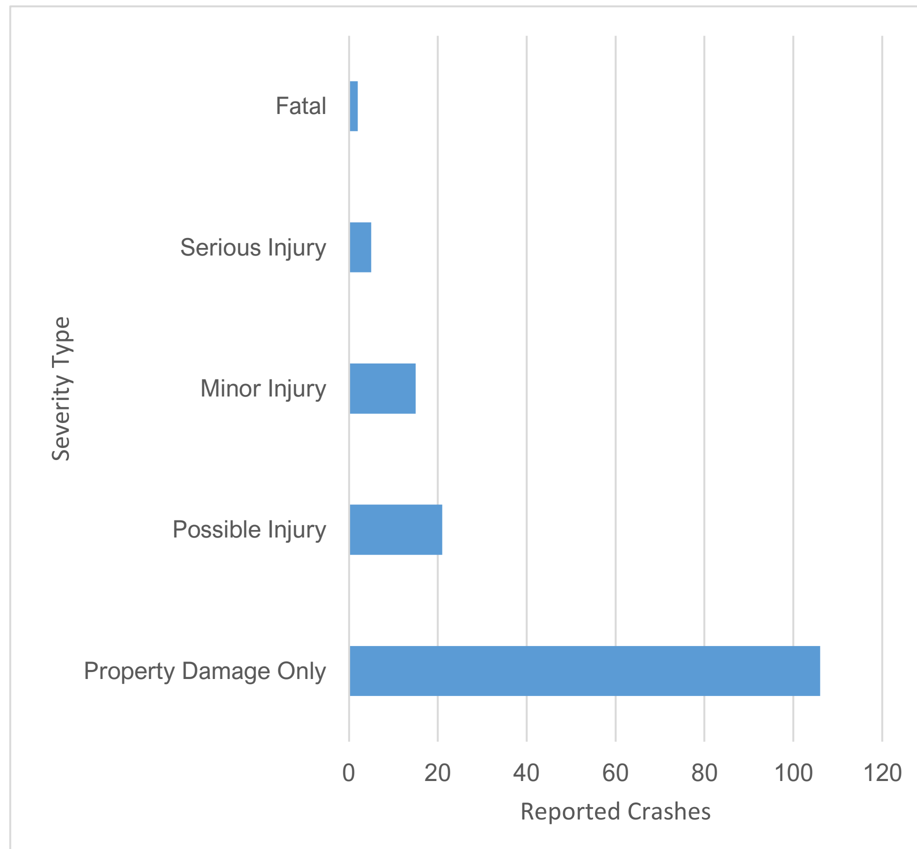
Crash types, severity, and location were reviewed as part of the crash history. This data indicates that most reported crashes were either rear-end or angle-type crashes, which are the most common types associated with corridors with similar characteristics. Most of the reported crashes occurred at the Highway 10 and 34th Street intersection. The majority of other reported crashes occurred were intersection related, but there was not a specific location that was significantly higher than any other intersection. There was only one pedestrian related crash within the study area, at 34th Street.

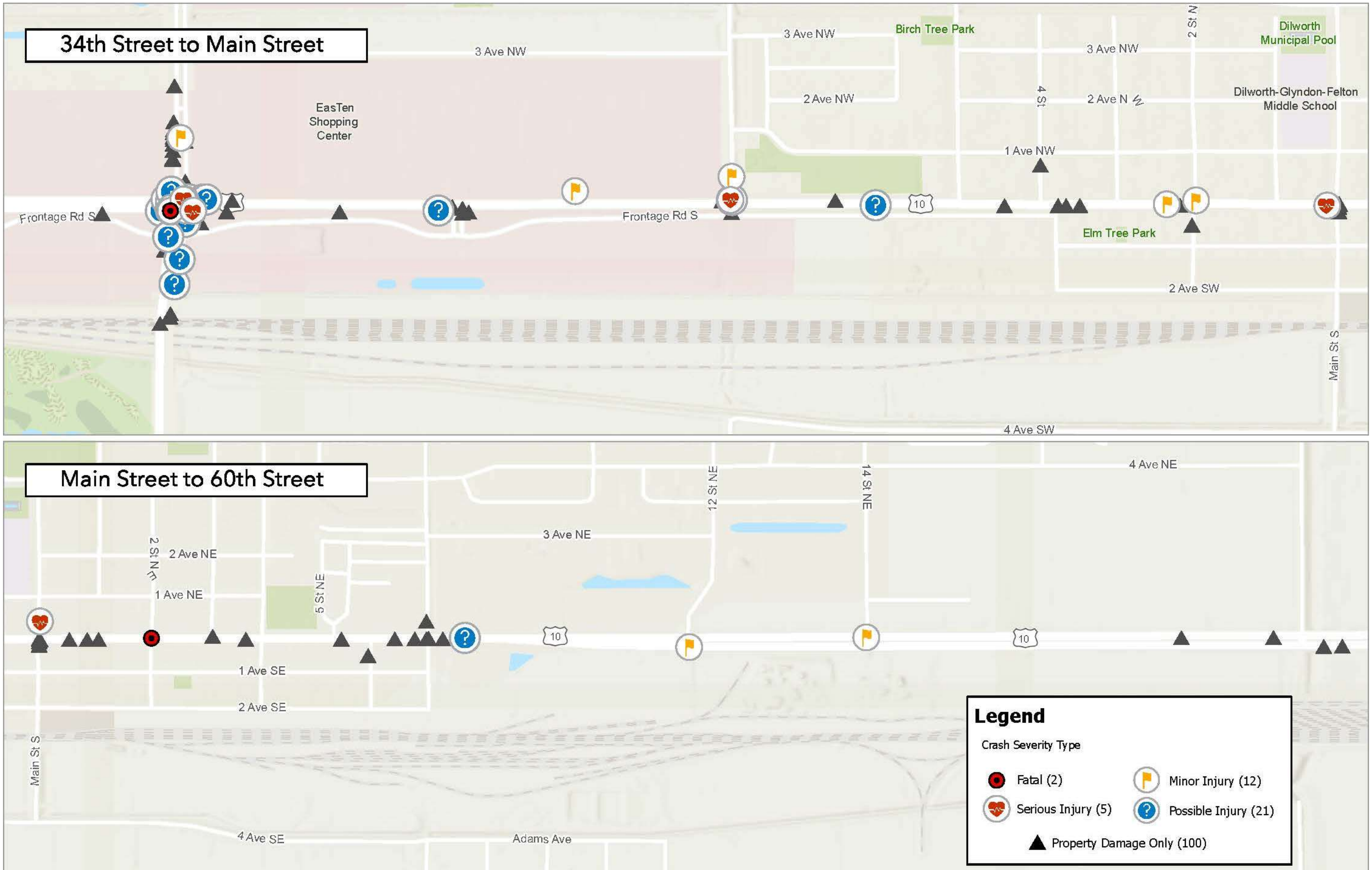
Most crashes were property-damage only. There were two fatal accidents and five serious injury crashes. One of the fatal accidents occurred at 34th Street in January 2018 due to a rear-end accident approaching the intersection, while the other occurred at 2nd Street E in September 2021. The crash at 2nd Street E involved a motorcyclist hitting a westbound vehicle on Highway 10. There were no engineering/geometric related issues identified that contributed to the crashes.

Crash Type

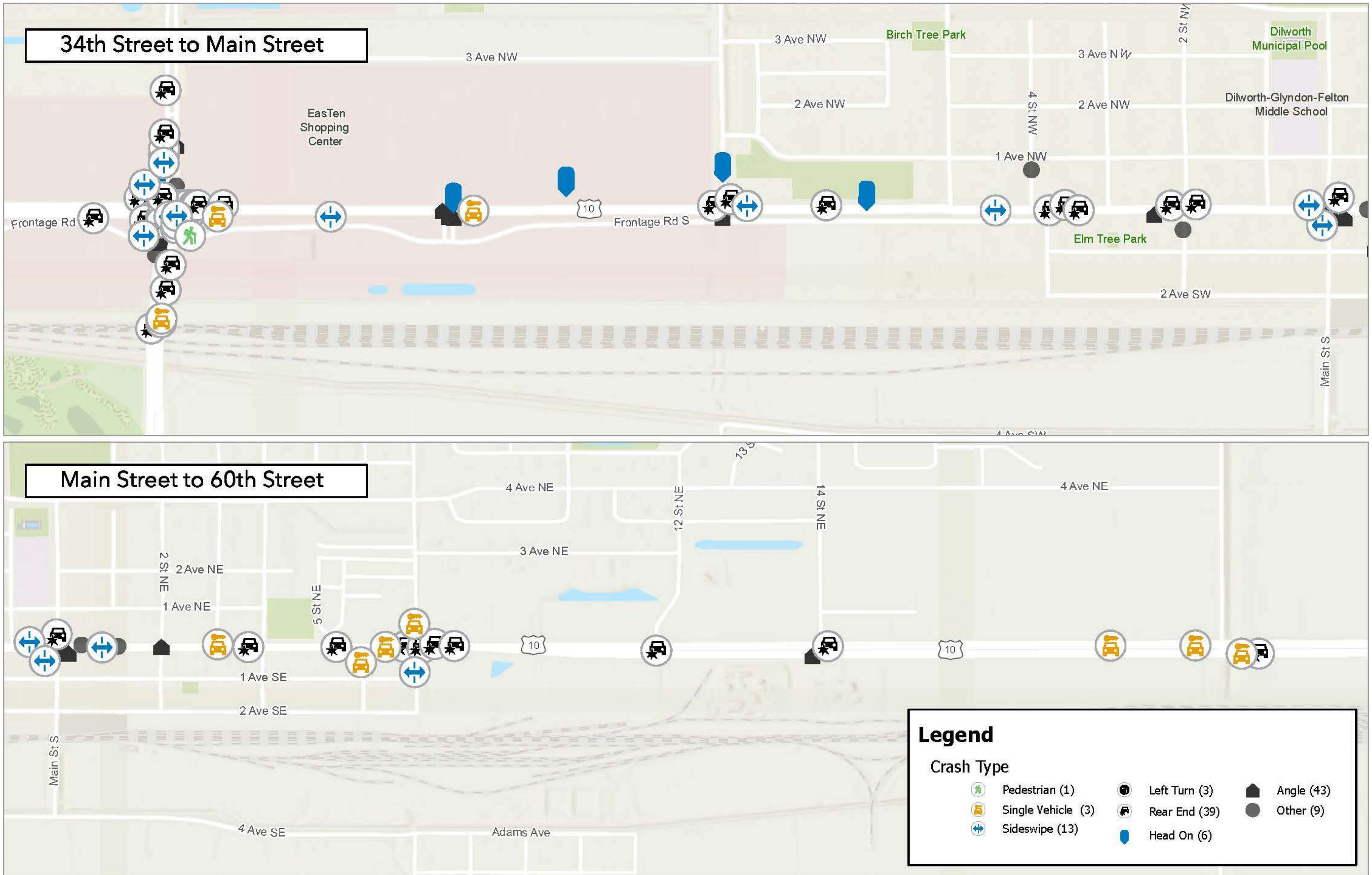


Crash Severity





Highway 10 Crash Severity (2017 through 2021)



Highway 10 Crash Type (2017 through 2021)

Corridor Safety Screening

A basic segment crash performance calculation was completed. The study corridor has a segment crash rate of 2.1 crashes per million vehicle-miles and an observed fatal and serious injury crash rate (FAR) of approximately 9.9. This compares to statewide averages of approximately 2.0 and 2.7, respectively, for corridors with similar characteristics. From a crash frequency perspective, the study corridor is about average, however there are significantly more fatal and serious injury crashes than comparable corridors.

Intersection Safety Screening

There were 58 reported crashes at the 34th Street intersection during the last 5 years. The crash and severity rates of this intersection are well above the statewide average and critical rates for intersections with similar characteristics. One of the contributing factors in this location is the adjacent access along 34th Street immediately to the north and south of Highway 10, which is within the functional area of the intersection. These accesses have already been or are being modified as part of a separate project.

The County Road 9 / 40th Street intersection has crash and severity rates above the critical rates for intersections with similar characteristics, while the 7th Street E intersection has a crash rate above the critical rate and the 2nd Street E intersection has a severity rate above the critical rate. At 7th Street E, this intersection had a slight offset in the north-south direction that was recently realigned and is also near the speed limit transition on the east end of the corridor. These issues can impact a motorist's perception of gaps and create additional conflicts and complexity while traveling. At 2nd Street E, the severity rate is skewed by a fatal accident which was not engineering related and therefore this location does not have an immediate issue to address.

Intersection Crash and Severity Rate Summary

Highway 10 Intersection	Reported Crashes 2017 thru 2021	Crash Rate			Severity Rate		
		Observed	Average	Critical	Observed	Average	Critical
34th Street	58	1.03	0.51	0.76	7.11	0.69	3.00
Frontage Road	5	0.15	0.13	0.30	0.00	0.31	3.03
CR 9 / 40th Street W	9	0.33	0.13	0.32	3.62	0.31	3.48
5th Street W	0						
4th Street W	3	0.12	0.13	0.33	0.00	0.31	3.76
3rd Street W	0						
2nd Street W	2	0.08	0.13	0.33	0.00	0.31	3.78
1st Street W	0						
Main Street	7	0.27	0.51	0.89	3.82	0.69	4.68
2nd Street E	1	0.04	0.13	0.33	4.05	0.31	3.78
3rd Street E	1	0.04	0.13	0.33	0.00	0.31	3.78
4th Street E	1	0.04	0.13	0.33	0.00	0.31	3.78
6th Street E	1	0.07	0.13	0.40	0.00	0.31	5.59
7th Street E	7	0.41	0.13	0.38	0.00	0.31	4.93
12th Street E	0						
14th Street E	2	0.13	0.13	0.39	0.00	0.31	5.37
60th Street E	0						

Values in red indicate a rate above the critical crash or severity rate

The other study intersections do not have crash or severity rates that are significantly higher from a statistical metric above statewide intersections with similar characteristics. All other study intersections had less than 10 crashes per location over the last five years, which equates to less than 2 crashes per year on average.

4.0 FUTURE CONDITIONS

4.1 Traffic Forecasts

When making infrastructure decisions, understanding future conditions, issues, and needs are important to ensure a fiscally responsible plan is in place in anticipation of future improvements. Therefore, year 2045 traffic forecasts were developed, with a goal of identifying long-term corridor and intersection capacity needs within the study area.

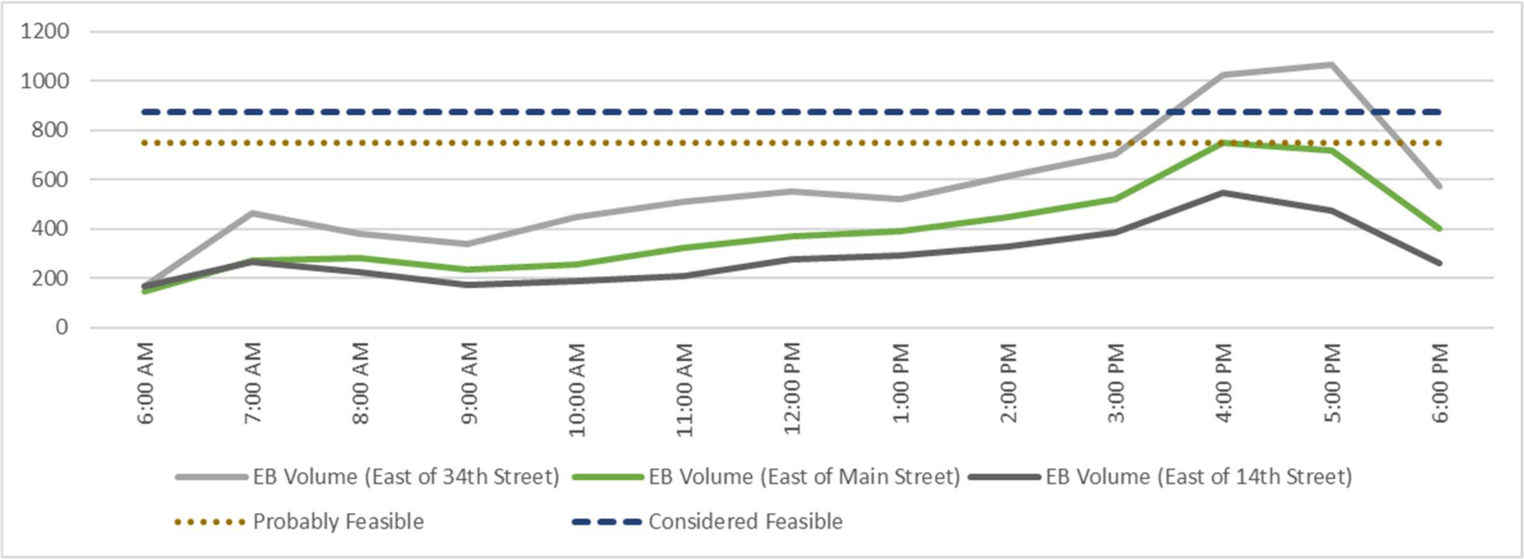
To develop year 2045 traffic forecasts, a multi-pronged approach was used. This process included a review of historical average daily traffic (ADT) volumes within the study area, traffic forecasts developed as part of the long-range transportation plan, and collaboration with MnDOT's forecasting group. Based on this approach, the project team agreed to use an annual growth rate of one-half percent per year. This growth rate was applied to the existing peak hour and average daily traffic volumes to develop year 2045 base conditions.

Future year 2045 forecasts along the study corridor are expected to range from 10,000 to 19,100 vehicles per day. The higher volumes are located along the western limits of the study area, near 34th Street. The lower volumes are along the eastern limits of the study area, near 60th Street. Note that these forecasts do not include specific reductions and/or travel pattern shifts associated with the following improvements and/or developments:

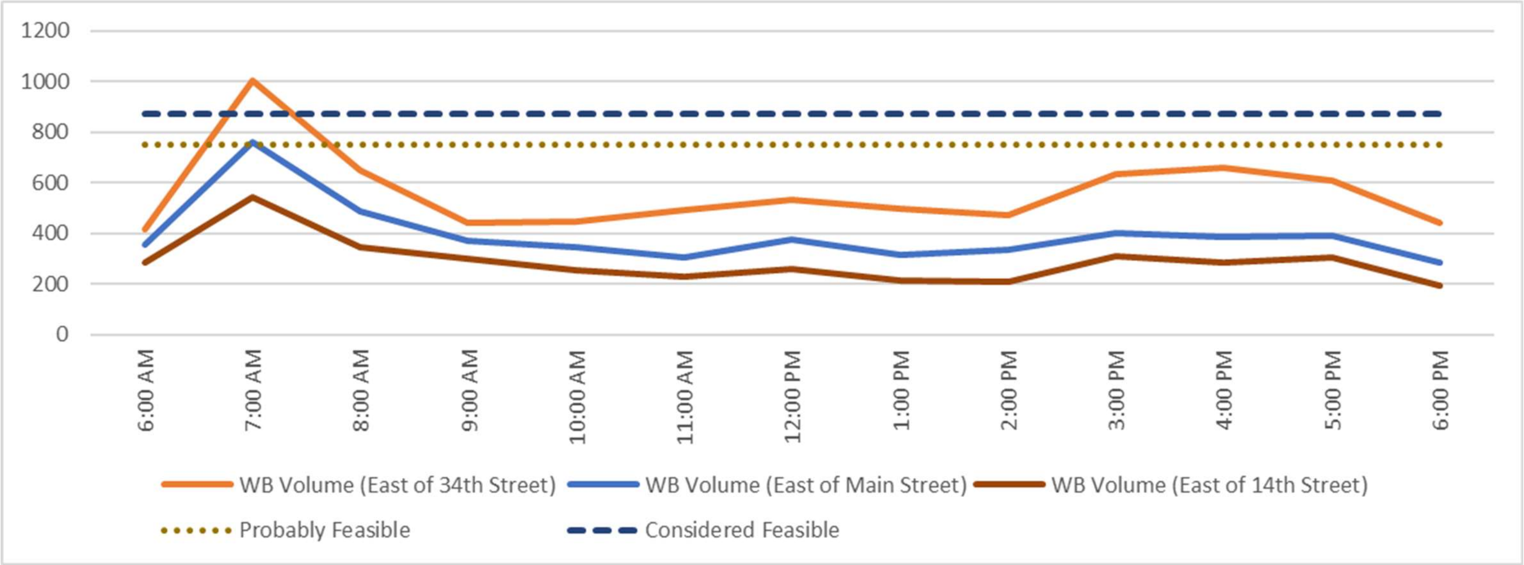
- Paving 15th Avenue N (East of County Road 9)
- New BNSF Overpass at 14th Street
- Specific Development and/or Redevelopment within the Corridor

ADT Volume Forecasts		
Highway 10 Segment	**Existing**	**2045**
Zone 1 34th Street to 5th Street W	17,000	19,100
Zone 2 5th Street W to 7th Street E	13,400	15,000
Zone 3 7th Street E to 60th Street	8,900	10,000

2045 Hourly Traffic Volume Profiles - Eastbound



2045 Hourly Traffic Volume Profiles - Westbound



4.2 Traffic Operations – 2045 Base Conditions

Corridor and Intersection Operations

Future year 2045 ADT volumes along Highway 10 are expected to range from approximately 10,000 to 19,100 vehicles per day. The corridor context also varies from a four-lane expressway to a four-lane undivided facility to a four-lane divided arterial with turn lanes. Based on a planning-level capacity approach, the Highway 10 corridor is expected to continue to operate within the LOS A to LOS C range, depending on the segment.

Planning Level Capacity Analysis					
Highway 10 Segment	Facility Type	ADT Volume		Planning-Level LOS	
		Existing	2045 Base	Existing	2045 Base
Zone 1 34th Street to 5th Street W	5-lane	17,900	19,100	LOS B	LOS C
Zone 2 5th Street W to 7th Street E	4-lane	13,400	15,000	LOS C	LOS C
Zone 3 7th Street E to 60th Street	5-lane	9,000	10,000	LOS A	LOS A

The future year 2045 intersection capacity analysis indicates that all study intersections are expected to operate at an overall LOS D or better. However, making a left-turn or crossing maneuvers from the side-street approaches along the corridor, particularly at the Frontage Road and County Road 9 during the peak hours, is expected to become more challenging. This is illustrated by the LOS F operations for these side-street approaches during the peak hours. In order to maintain mobility along Highway 10, it may be acceptable for an intersection to have a lower LOS on stop-control side streets if there are adjacent side-streets with alternative traffic control providing better access to Highway 10. For example, improvements to the County Road 9 intersection could also improve the Frontage Road intersection.

The busiest intersection along the corridor is expected to continue to be 34th Street, where there are several movements where queues extend through the full length of the available turn lane storage. During the a.m. peak hour, these queues occur in the westbound and northbound left-turn lanes, as well as the southbound direction. During the p.m. peak hour, eastbound through movement and northbound left-turn queues are expected to extend approximately 400 feet, impacting adjacent travel lanes. The northbound left-turn lane is expected to extend beyond the existing turn lane storage approximately 15% of the p.m. peak hour. Northbound and southbound queues are also expected to continue to regularly extend beyond the adjacent Frontage Road access points along 34th Street.

Year 2045 Intersection Capacity Analysis					
Highway 10 Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Existing	2045 Base	Existing	2045 Base
34th Street	SIGNAL	B (24 sec)	C (28 sec)	C (31 sec)	D (38 sec)
Frontage Road	SSS	A / E (47 sec)	A / F (88 sec)	B / F (155 sec)	D / F (>180 sec)
CR 9 / 40th Street W	SSS	A / E (37 sec)	A / F (54 sec)	A / F (98 sec)	A / F (>180 sec)
5th Street W	SSS	A / C (24 sec)	A / D (31 sec)	A / B (14 sec)	A / C (16 sec)
4th Street W	SSS	A / C (24 sec)	A / D (31 sec)	A / C (24 sec)	A / D (30 sec)
2nd Street W	SSS	A / C (22 sec)	A / D (27 sec)	A / C (23 sec)	A / D (28 sec)
Main Street	SIGNAL	A (7 sec)	A (7 sec)	A (6 sec)	A (6 sec)
2nd Street E	SSS	A / C (19 sec)	A / C (22 sec)	A / C (21 sec)	A / D (25 sec)
4th Street E	SSS	A / C (18 sec)	A / C (21 sec)	A / C (21 sec)	A / D (25 sec)
7th Street E	SSS	A / C (19 sec)	A / C (23 sec)	A / C (23 sec)	A / D (30 sec)
12th Street E	SSS	A / B (11 sec)	A / B (12 sec)	A / B (11 sec)	A / B (11 sec)
14th Street E	SSS	A / C (17 sec)	A / C (20 sec)	A / B (13 sec)	A / C (15 sec)
60th Street E	SSS	A / B (14 sec)	A / C (16 sec)	A / B (13 sec)	A / B (14 sec)

SSS – Side-Street-Stop

4.3 Traffic Operations – 2045 Alternative Conditions

The alternatives analyzed for the future conditions in 2045 include a 3-lane or a 4-lane configuration through the entire corridor. The projected 2045 traffic volumes are within an acceptable planning level volume threshold for either configuration, and evaluating each separately helps to identify where a transition between the configurations may be beneficial and which intersections may benefit from alternative traffic control treatments if traffic signal warrants are not met.

A 5-lane configuration was also considered but was not further analyzed. It was determined that the traffic volumes, particularly east of 5th Street W, did not warrant expansion to a 5-lane roadway. Other factors considered include the significant impacts to adjacent properties where the right of way narrows to 76 feet, affecting the downtown core of Dilworth, and pedestrian and bicycle mobility impacts created by crossing additional lanes of traffic and having potentially narrower boulevards and sidewalks. After a thorough review of these factors along with the forecasted traffic volumes, the SRC agreed that a 5-lane facility would not be included in further alternative analysis.

To provide conservative planning conditions for the following alternative analysis, no diversion of traffic to 15th Avenue N is assumed. If improvements are made to 15th Avenue N to create a parallel connection between MN Highway 336 and 34th Street, LOS conditions along Highway 10 could correspondingly improve as a up to an estimated 3,000 vehicles per day could 15th Avenue N instead of Highway 10.

3-Lane Facility

The analysis of a 3-lane facility assumes no changes to the 34th street intersection, the roadway would transition to a 3-lane section between 34th Street and the Frontage Road intersection, and a two-way center left-turn lane would be provided through the study area with no access control changes.

In this scenario, the Frontage Road intersection and County Road 9 intersection operate poorly. The side-streets west of Main Street are the most impacted (i.e., difficult to turn left onto Highway 10). Most of the issues are in the NB direction where a higher volume of left turning vehicles experience significant delay trying to enter Highway 10.

4-Lane Facility (Base)

The analysis of a future 4-lane facility is the same as the base conditions but with future traffic volumes. The assumption is that no changes would be made at 34th Street and any access or intersection control changes that might apply to a 3-lane facility would also affect a 4-lane facility in a similar fashion.

Year 2045 Intersection Capacity Analysis Comparison

Highway 10 Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		2045 4-Lane (Base)	2045 3-Lane	2045 4-Lane (Base)	2045 3-Lane
34th Street	SIGNAL	C (28 sec)	C (29 sec)	D (38 sec)	D (36 sec)
Frontage Road	SSS	A / F (88 sec)	C / F (>180 sec)	D / F (>180 sec)	F / F (>180 sec)
CR 9 / 40th Street W	SSS	A / F (54 sec)	A / F (>180 sec)	A / F (>180 sec)	B / F (>180 sec)
5th Street W	SSS	A / D (31 sec)	A / E (40 sec)	A / C (16 sec)	A / C (24 sec)
4th Street W	SSS	A / D (31 sec)	A / F (72 sec)	A / D (30 sec)	A / E (40 sec)
2nd Street W	SSS	A / D (27 sec)	A / F (61 sec)	A / D (28 sec)	A / E (38 sec)
Main Street	SIGNAL	A (7 sec)	B (11 sec)	A (6 sec)	A (9 sec)
2nd Street E	SSS	A / C (22 sec)	A / D (32 sec)	A / D (25 sec)	A / D (32 sec)
4th Street E	SSS	A / C (21 sec)	A / E (38 sec)	A / D (25 sec)	A / D (31 sec)
7th Street E	SSS	A / C (23 sec)	A / D (34 sec)	A / D (30 sec)	A / E (35 sec)
12th Street E	SSS	A / B (12 sec)	A / C (15 sec)	A / B (11 sec)	A / B (14 sec)
14th Street E	SSS	A / C (20 sec)	A / C (23 sec)	A / C (15 sec)	A / C (19 sec)
60th Street E	SSS	A / C (16 sec)	A / C (19 sec)	A / B (14 sec)	A / C (18 sec)

SSS – Side-Street-Stop

4.4 Future Operational Needs / Considerations

Access Management

With any alternative, there are general corridor needs to consider. Primary and secondary access points should be identified to guide decisions regarding control of public access points. Management of private access points should also be a priority along the corridor, especially to properties with multiple access points or redundant access points on side-streets or alleys. Medians can be considered for access control as well as streetscaping/landscaping and streetlighting.

Transition Areas

Transition areas need to be identified between a 3-lane and 4-lane facility. The operational analysis at the Frontage Road intersection and at County Road 9 indicates those intersections would not function well as a purely 3-lane configuration with no change to intersection control. Because County Road 9 is a primary intersection it provides an opportunity for a transition either through a traffic signal (if warranted), roundabout, or other control method. Likewise, a transition from 3-lanes back to 4-lanes could occur at 7th Street E, 14th Street E, or 60th Street at the western edge of Dilworth without a discernable change to the LOS.

Additional Considerations

34th Street

The 34th Street intersection would benefit from dual northbound left turn lanes to address queueing issues, as well as access management north and south of Highway 10 to restrict crossing traffic and improve safety conditions.

Frontage Road Access

This intersection could be considered for access control method to limit northbound and southbound left turns. This would improve the LOS and reduce the potential for vehicle crashes involving left turns.

County Road 9

The south approach at County Road 9 could be removed or relocated if a traffic signal, roundabout, or other control method is implemented. These alternative intersection traffic control methods would improve the LOS for side-street traffic and provide a potential location for a marked pedestrian crossing.

4th Street West

The south approach at 4th Street W should be realigned with the north approach, or relocated to align with 5th Street W. This would provide better access for side-street traffic and create another opportunity for a marked pedestrian crossing.

12th Street East

This intersection could be considered for a ¾ access median that would provide the ability for westbound vehicles to enter the BNSF yard on the south side of Highway 10, and eastbound vehicles could access the newer residential area north of Highway 10.

14th Street East

This intersection should be designed with consideration of a potential future BNSF overpass south of Highway 10. This intersection should also be considered for an alternative traffic control method if a traffic signal is not warranted, to safely accommodate traffic to the growth area north of Highway 10.

5.0 LAND USE AND REINVESTMENT

Land uses along the Highway 10 corridor consist of a mix of uses at varying scales and development patterns. The majority of this land is planned by the city of Dilworth's Comprehensive Plan for commercial uses. It is assumed land uses will change over time through reinvestment initiatives and infill opportunities. The purpose of this analysis is to identify those opportunities, along with safe, effective, and feasible transportation options that will help strengthen the public realm and community identity.

5.1 Corridor Wide Opportunities

Bike and Pedestrian Improvements

It is important to continue to emphasize the construction of trails and sidewalks as part of future investments to ensure a walkable environment. Future connections should lead to community destinations and provide a high-quality trail experience. This includes planning for a robust trail network that connects to the future Heartwood Trail.

Gateways

There are opportunities to create a stronger sense of place when entering Dilworth through the use of gateway treatments. A gateway should provide a first impression of the community and be visible from Highway 10. They can also serve as a traffic calming technique to lower traffic speeds, while notifying drivers that they are entering a more urban environment. Potential locations for gateways are identified in Zone 1 and Zone 3.

Highway Buffers

Future developments and roadway investments should prioritize an attractive frontage along Highway 10 by creating a variety of public spaces and pedestrian friendly streets. Development should also enhance the pedestrian environment and be planned to accommodate transit users. This will help support a growing demand for transit service along the corridor.

Highway Transition Areas

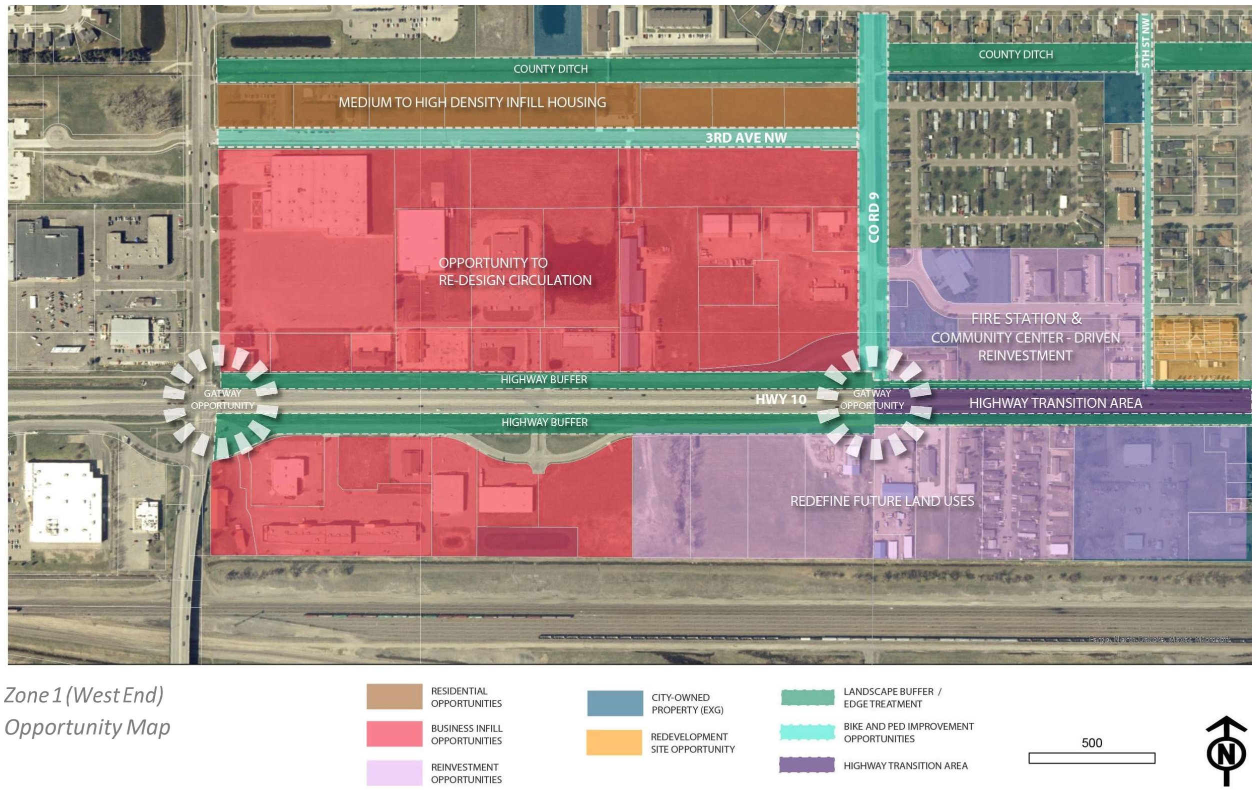
Future transportation facilities should fit the context of the community and environment. This is important to consider given the varying land use patterns that are developing and intensifying (Zone 1 and 3) on both ends of downtown (Zone 2). As these zones develop, future transportation facilities should support a more urban context that provides a seamless transition to and from the downtown by decreasing speeds and providing pedestrian/bicycle amenities.

Landscape Buffer/Edge Treatments

Streets occupy the most space within the public realm and play a huge role on how people experience a place. Because most of the street space has been typically dedicated to pavement for vehicles, greater attention needs to be given to enhance the users experience and encourage pedestrian/bicycle movement. It is also an opportunity to introduce boulevards and greenspaces (e.g., street trees, grasses, raingardens, and flower gardens) that contribute to the quality of the public space of streets. Boulevards and greenspaces can also be used to address stormwater needs, snow storage, and the location of utilities.

5.2 Zone 1 (West-End) Opportunities

Zone 1 is Dilworth's primary commercial hub. This area is anchored by several large retail stores and a mix of shops, restaurants, offices, and light industrial uses. Land patterns are characterized by larger surface parking lots and low lot coverages. Land in this area is predominately planned and zoned for commercial uses and present a number of infill opportunities.



Zone 1 (West End) Opportunity Map

Business Infill

There are several large vacant parcels that offer a number of infill opportunities. These sites are attractive for their visibility from the highway. However, certain development types (e.g., big box stores and retail uses) may be challenging to attract based on regional markets. To overcome these challenges, the city may want to consider mixed-use developments that allow for the integration of residential uses (vertically or horizontally). Allowing for this type of development to occur can help bolster economic development activity and create a more vibrant place for people to live, work, and shop.

Circulation

There are opportunities to partner with property owners to implement internal circulation improvements, shared parking strategies, and the consolidation of access points and driveways. Frontage road definition and improvement has been identified as a potential opportunity. Internal pedestrian and bicycle connections are also limited with varying degrees of connectivity to building entrances. Future developments should consider strategies (e.g., cross access agreements and shared parking opportunities) that improve vehicle, pedestrian, and bicycle access.

Reinvestment

The eastern edge of Zone 1 presents several opportunities to redefine future land uses and reinvest in the quality of uses that are compatible with adjacent neighborhoods. Future development should ensure compatible design transitions between commercial/industrial and residential uses. Site design standards could include greater setbacks and landscaping standards. All commercial or industrial development should also be screened from the view of adjacent houses and Highway 10.

Residential Development

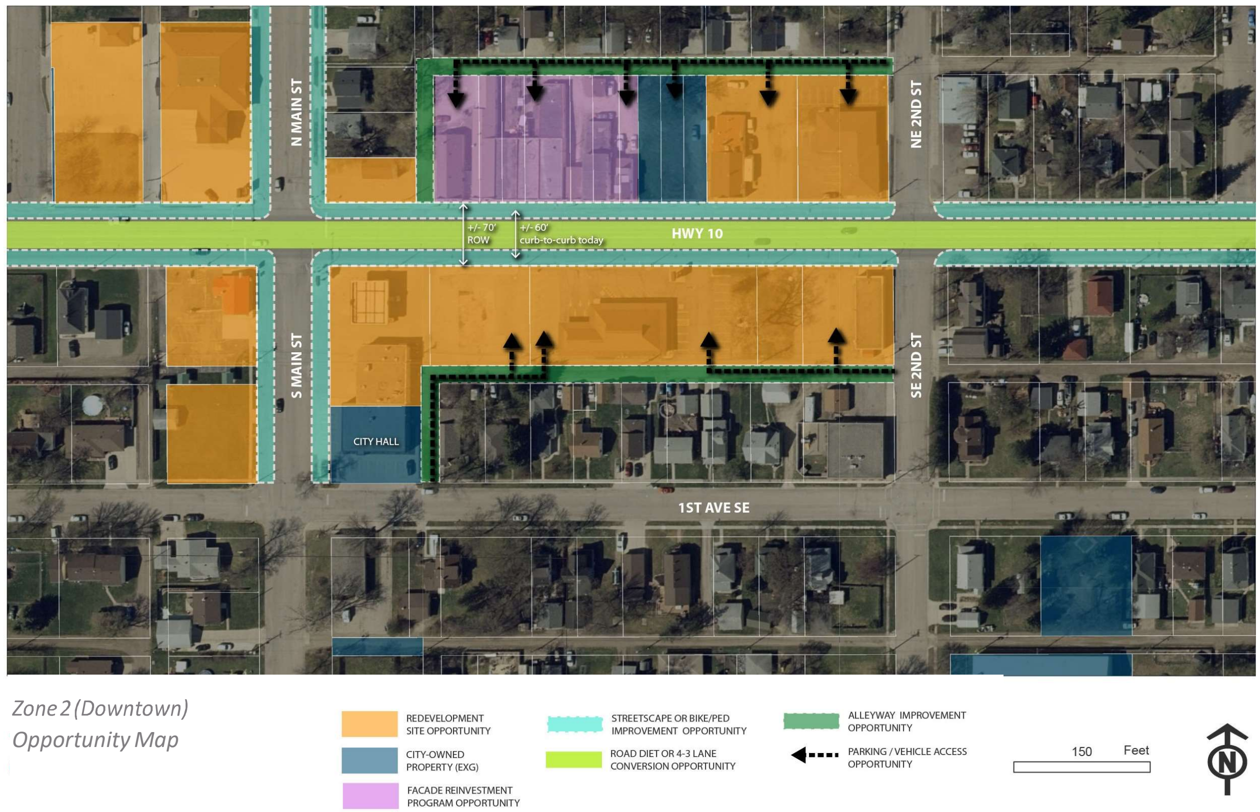
Recent developments along 3rd Avenue NW has consisted of medium to high density housing products. Its proximity to adjacent commercial uses makes for an attractive live/ work environment. However, it is important to continue to build a safe and accessible pedestrian and bicycle network that links residents to key destinations. A potential barrier in making these connections includes the county legal drain.

5.3 Zone 2 (Downtown) Opportunities

Historically the downtown area has been planned for commercial land uses; however, the term "mixed-use" more accurately describes the evolving nature of the area. The downtown area consists of a mix-of-uses that include convenience stores, city hall, restaurants/bars, shops, and single-family homes.

Alleyway Improvements

Alleyways can improve traffic circulation and minimize access points along Highway 10. Access points on Highway 10 should be eliminated and access provided from the alley to improve the street frontage by creating more space for amenities (e.g., sidewalks, plantings, lighting, and benches) and eliminate conflicts between vehicle and pedestrians. The alleyways also provide an opportunity to better access parking lots without being accessed from Highway 10.



Zone 2 (Downtown) Opportunity Map

Façade Reinvestment Program

Although building facades are private property, they perform a public function by contributing to the enclosure of the public space of the street. As such, there are opportunities to improve the feel and character of downtown by reinvesting in building facades to create a unique destination. Building facades should be compatible in scale and character to ensure neighborhood cohesion between commercial and residential land uses.

Mixed-Use Development

Reinvestment Sites

Downtown will continue to evolve through the change of land uses or infill development opportunities. Regardless of those changes, future investments need to carefully take into consideration design standards that support a walkable and interesting place to visit. Typical design standards can include relatively small building setbacks, specific façade treatments, architectural guidelines, and maximum parking requirements. These types of standards will be explored further as part of a separate study, in addition to the exploration of preferred reinvestment types.

Streetscape and Bike/Ped Improvements

Numerous streets in the adjacent neighborhoods provide a pleasant walking experience to downtown. However, Highway 10 offers a less desirable experience for pedestrians given the sidewalks placement/design and adjacency to traffic. It is important to consider the role a walkable environment and enhanced public realm plays in the success of a downtown's economic development activity. In that respect, the pedestrian experience and public realm will need to be considered heavily in the redesign of Highway 10.

Based on the study's traffic analysis, reducing the number of vehicle travel lanes from four lanes to three lanes is feasible for the stretch of Highway 10 in downtown. Proceeding with this option will provide greater opportunities to enhance the public realm and support revitalization efforts.

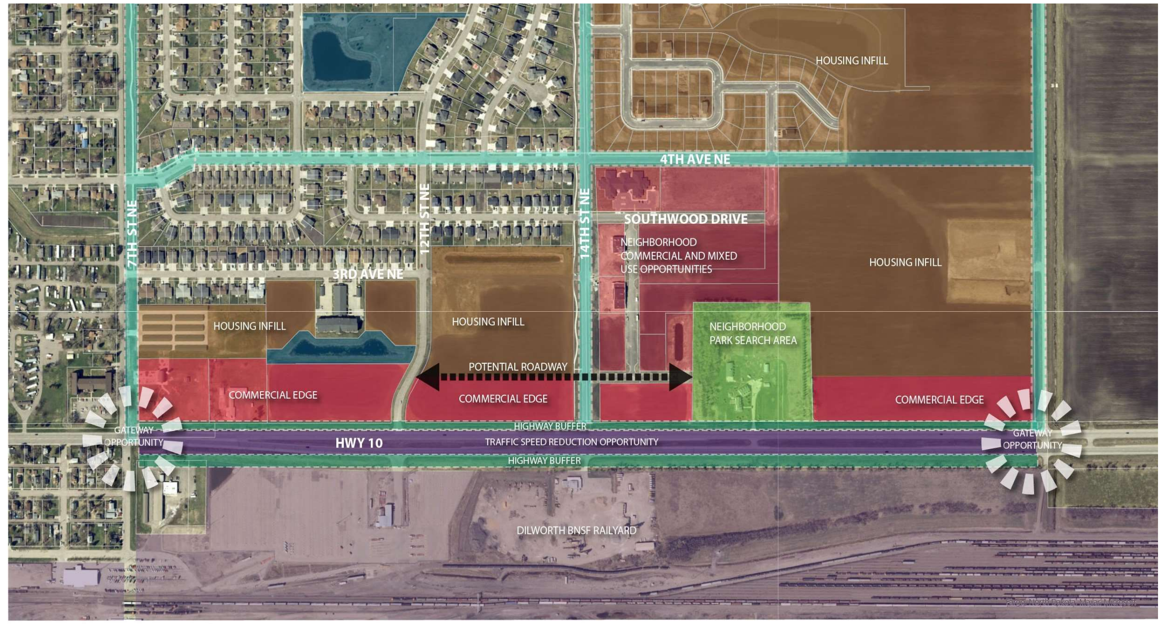
Steetscaping and Curb Extensions (Bulb Outs)

5.4 Zone 3 (East-End) Opportunities

The eastern edge of the community is experiencing greater development pressure. Most of this pressure is occurring in the form of residential developments. Land directly along Highway 10 continues to be vacant and predominately planned for commercial uses. Highway 10 is currently a rural high-speed corridor through this area and to the east of Dilworth. The future configuration of Highway 10 should consider both the existing and future land use context.

Business Infill

Site design and building aesthetics along the corridor should promote a positive image of the community. This can be achieved through design principles (e.g., building materials and landscaping) that convey the corridor as an attractive place for visitors and prospective businesses. Development along Highway 10 will also need to take into consideration backage roads, as access onto Highway 10 will be limited at key intersections.



Zone 3 (East-End) Opportunity Map

Neighborhood Commercial & Mixed Use Developments

Development along 14th Street NE is best characterized as neighborhood commercial or mixed-use centers. These uses are smaller scale, providing retail goods and services to the surrounding neighborhoods. Expanding this type of development patterns and land uses will strengthen opportunities to provide goods and services that directly cater to a limited geographic area or adjacent neighborhoods. Convenient access to these businesses will reduce stress on the transportation system by limiting trip lengths for the purchase of retail goods and services. More importantly, pedestrian and bicycle connections to these commercial nodes will build stronger neighborhood cohesion and identity.

Park/Open Spaces

Dilworth has a healthy number of parks and trails that contribute to making it a desirable place to live, where residents can stay active and connected. As the eastern edge grows, a stronger demand for parks and open spaces will increase to accommodate new residents. Natural areas should be protected for future park opportunities. An area of opportunity to preserve for a future park includes a farm lot north of Highway 10.

Residential Developments

The Comprehensive Plan identifies east-west “stretches” of medium- to high-density residential uses that serve as a buffer between commercial and low-density residential uses. It is important to consider the integration of a mix of housing products (e.g., townhomes and duplexes) throughout single-family neighborhoods to create stronger neighborhood cohesion.

6.0 ALTERNATIVE DEVELOPMENT

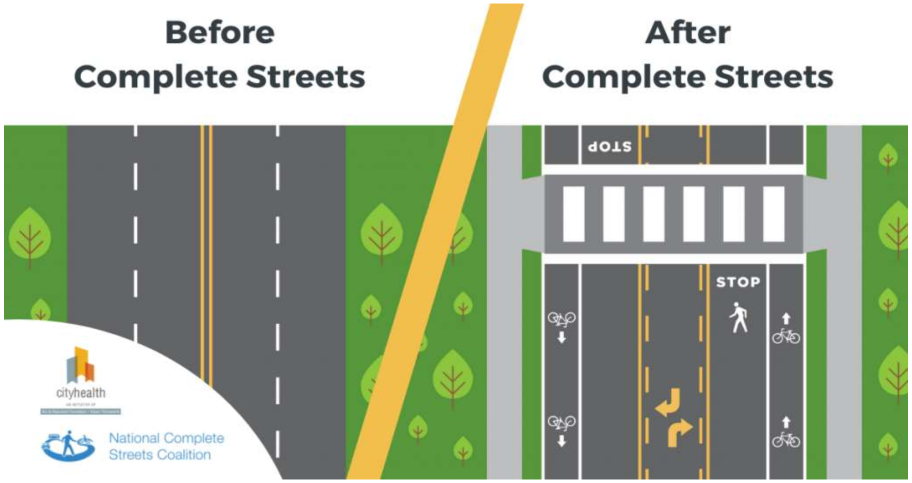
6.1 Vision

The issues along the Highway 10 corridor are based on factors identified through stakeholder and public input, existing conditions, and the 2045 projected traffic operations as discussed in previous sections of this report. The needs for this corridor encompass multimodal transportation improvements and regional transportation needs. The study review committee met on several occasions throughout the study to discuss the issues and needs and develop a vision for the corridor. Although there are unique needs and uses throughout the corridor, it was important to create a common overall vision for the study area.

"The vision for Highway 10 through Dilworth is to provide a transportation corridor that is safe and accessible for all users while supporting the local and regional economy."

In addition to addressing the overall study goals and corridor vision, the future planning and implementation of corridor improvements should address the following:

- Adopt a complete streets and context sensitive concept for the corridor
- Improve pedestrian and bicycle facilities
- Provide acceptable Level of Service (LOS)
- Reduce vehicle speeds, provide traffic calming
- Create a gateway feel when entering the city
- Create a corridor that invites and stimulates growth
- Provide flexibility for near- and long-term transportation needs
- Implement streetscaping and beautification opportunities
- Minimize right of way impacts



Complete Streets

Based on the issues and needs that were identified with this study, and the vision created for Highway 10, future improvements for the corridor should meet a "Complete Streets" approach. Complete streets are designed so that all travelers - either by car, bike, walking, bus, wheelchair, or any mode - can travel safely, comfortably, and easily. These are corridors that provide accessibility for people of all ages and abilities, strengthen local economies, and recognize that needs vary in urban and rural settings. The design of the corridor should also consider the context of the surrounding land use as well as the needs of the city in regards to maintenance and operations. A good example of this is providing boulevard space for snow storage so that streets, parking spaces, and sidewalks can be kept clear in the winter. There are many examples of Complete Streets across the region.

6.2 Concept Development

The proposed concepts for the Highway 10 corridor through Dilworth shown in this study were developed to address the issues and needs that were identified and to meet the vision for the corridor. Combining geometric features (reducing the lane widths, increasing boulevard widths, increasing sidewalk widths, providing turn lanes, adding raised medians, access management, and providing pedestrian crossings) throughout the study area will reduce the highway feel of the corridor while maintaining acceptable mobility for a US Highway and introduce a safe system for all users.

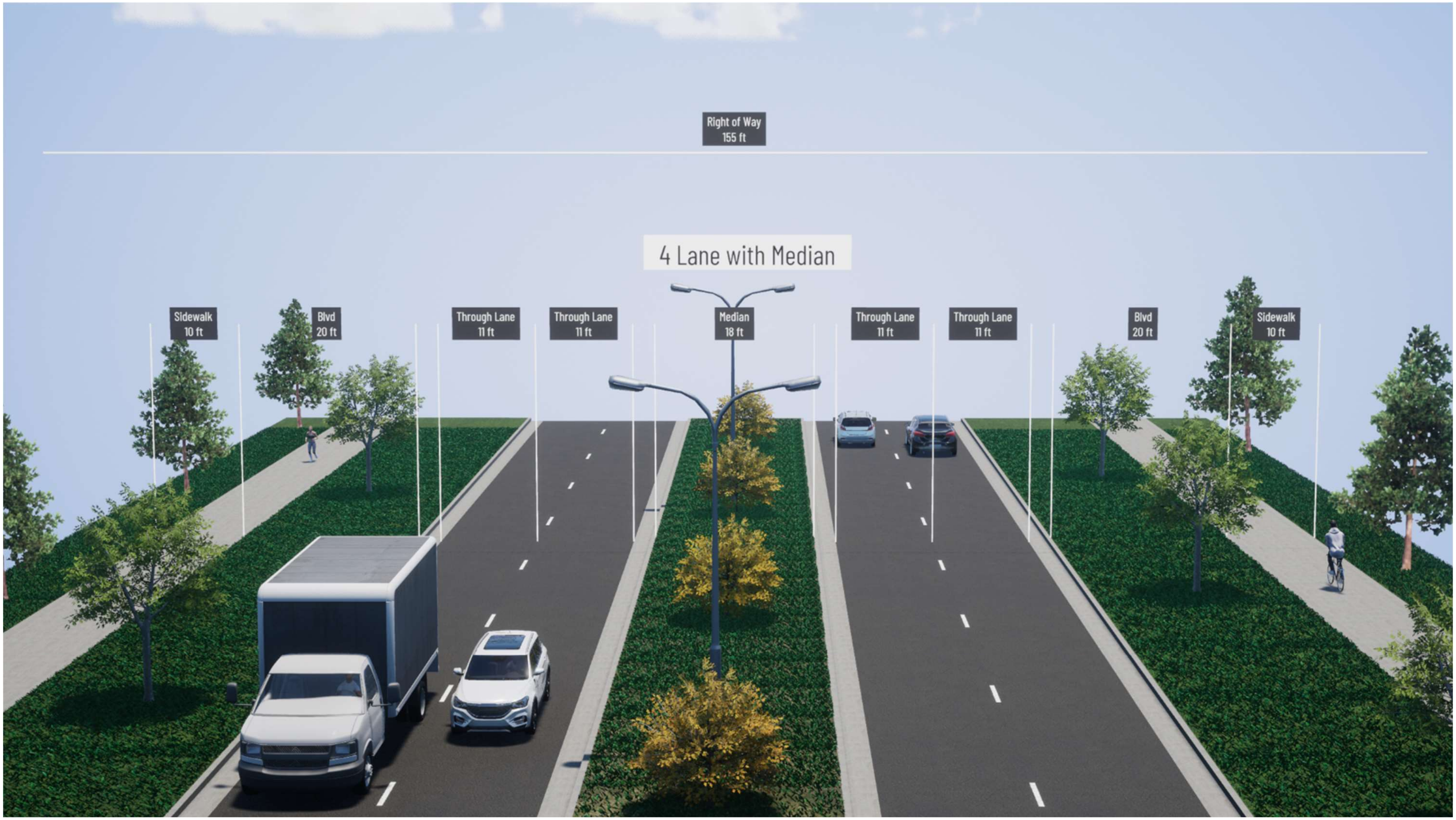
Because land uses along the Highway 10 corridor vary throughout the corridor, the roadway section should also vary to accomplish the goals of this study. To accommodate this, the alternative design varies for each zone. These different zones were identified to ensure the vision of the corridor was incorporated based on the unique characteristics and users of each area. The following needs were identified for each zone:

- Zone 1 - 34th Street to 5th Street W
  - Urbanize this section of roadway with curb & gutter
  - Create a western gateway feel for the city
  - Improve pedestrian/bike facility connections
  - Provide raised medians with dedicated left and right turn lanes
  - Provide acceptable operations at the Frontage Road and County Road 9 intersections
- Zone 2 - Downtown (5th Street W to 7th Street E)
  - Optimize roadway section within existing 76’ right of way
  - Create a corridor that supports the identity of the community
  - Support the context of the existing adjacent land use and support the community’s vision for future reinvestment
  - Reduce vehicle speeds
  - Improve pedestrian/bicycle facilities
  - On street parking options in downtown section
- Zone 3 - 7th Street E to 60th Street
  - Urbanize this section of roadway with curb & Gutter
  - Transition from urban section to rural section
  - Create an eastern gateway for the city
  - Reduce vehicle speeds
  - Add pedestrian/bicycle facilities that will connect to the future Heartwood Trail

In this study, various lane configurations were proposed for the Highway 10 corridor. The goal of each configuration was to maximize the accessibility through the corridor for pedestrians and road users within the existing right of way. The implementation of increased sidewalk widths on both sides of the road will improve walkability. High visibility crossings can be placed to provide safe cross-street access. Reduced lane widths will provide more room for sidewalks, on street parking and boulevard space. Reducing lane widths from the typical 12-foot standard to 11-foot-wide travel lanes also helps to shorten the crossing distance for pedestrians and reduce vehicle speeds. Transit considerations were focused on providing safe access to bus stop locations near Highway 10.

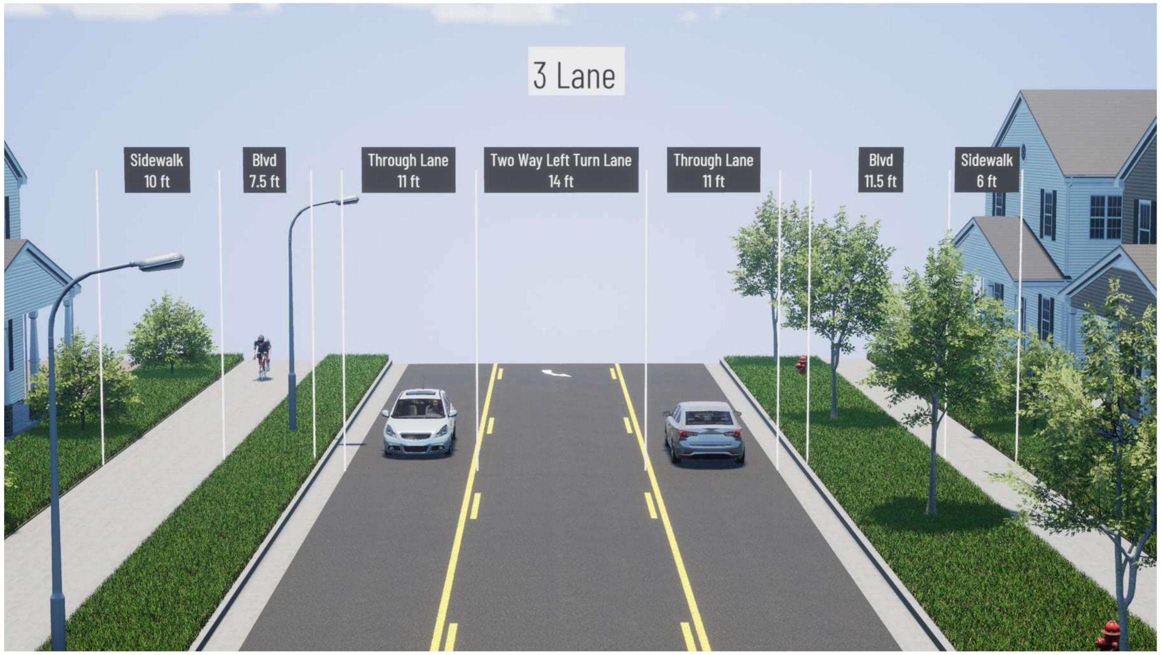
Zone 1: 4-lane divided urban roadway

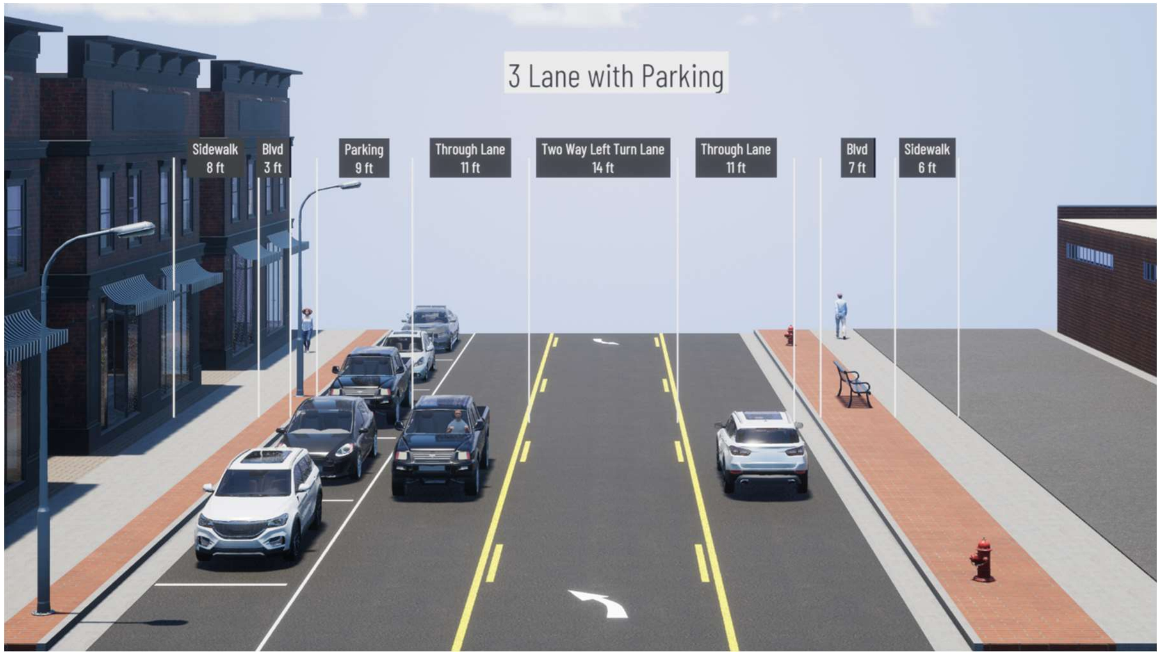
The 4-lane divided urban roadway alternative for Zone 1 has a typical right of way width of 155 feet. This section of roadway runs from 34th Street to 5th Street W. Lane widths in this section consist of 11 foot through lanes with an 18 foot raised median and curb and gutter. There are 10 foot sidewalks on the north and south sides. Boulevard widths are 20 feet on the north and south side of the roadway. This section also includes left and right turn lanes for major intersections.



Zone 2: 3-lane undivided urban roadway

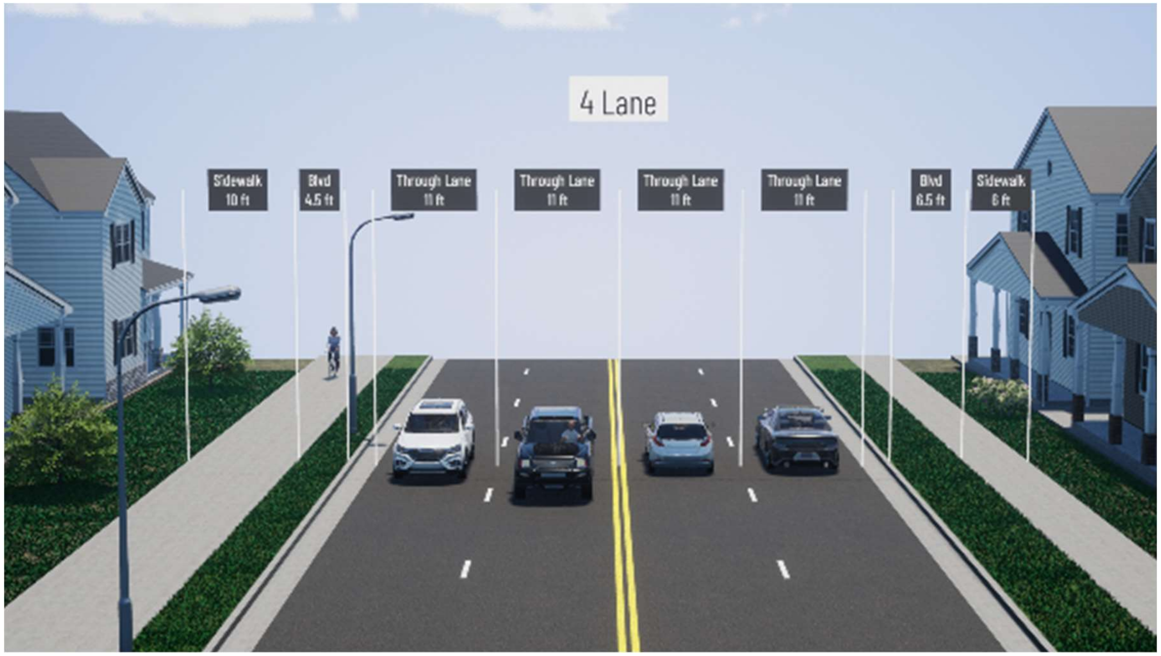
The 3-lane undivided urban roadway alternative for Zone 2 has a typical right of way width of 76 feet. This section of roadway runs from 5th Street W to 7th Street E. Lane widths in this section consist of 11 foot through lanes with a 14 foot center two-way left-turn lane and curb and gutter. There are two sidewalks in the section of roadway that consist of a 10 foot sidewalk on the north side and 6 foot sidewalk on the south side. Boulevard widths are 7.5 feet on the northside of the roadway and 11.5 feet on the southside of the roadway. There are also raised medians throughout this section in lieu of the center turn lane. If parking is provided between Main Street and 2nd Street E, the north sidewalk will be reduced 8 feet and the boulevard widths will be reduced.

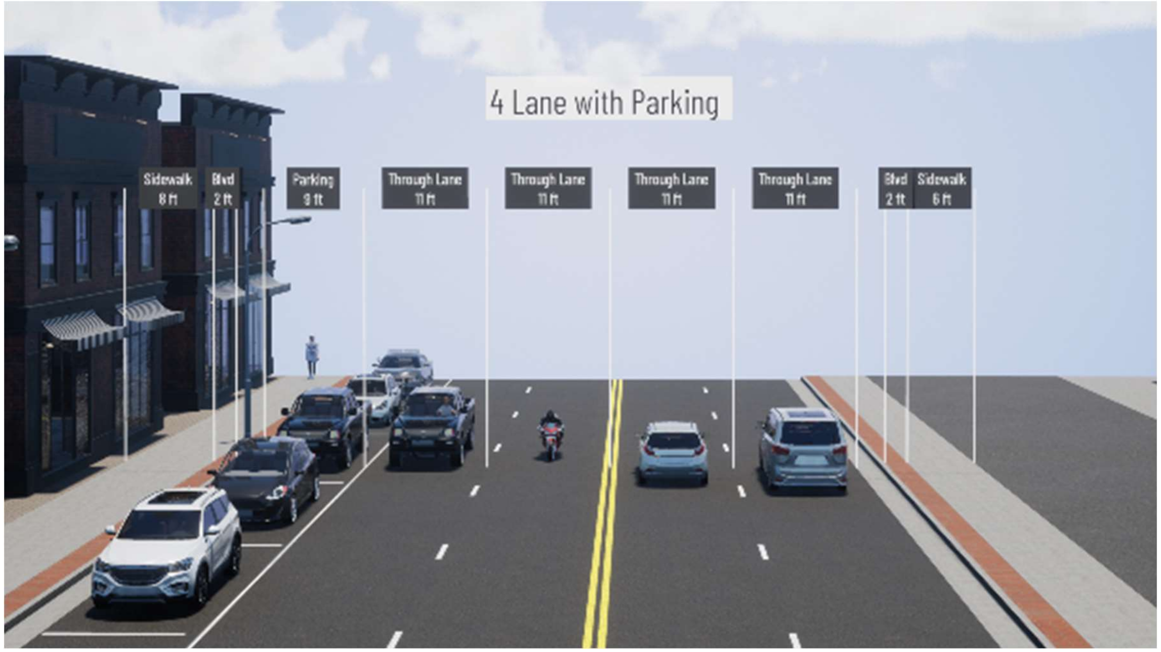


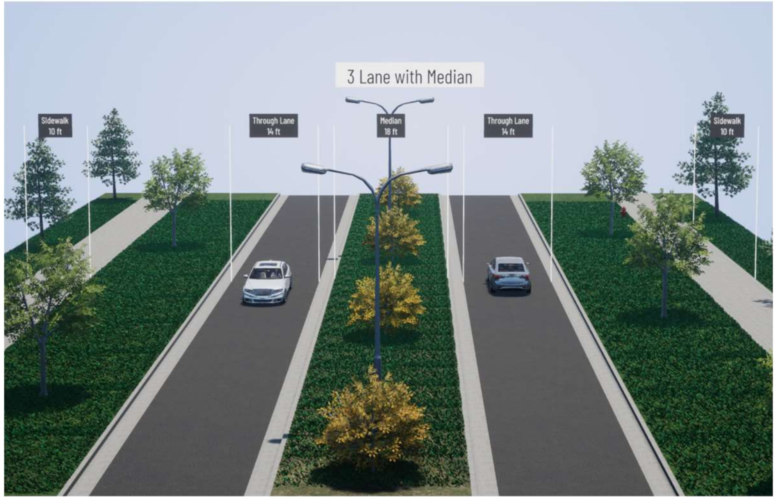


Zone 2: 4-Lane undivided urban roadway

The 4-lane undivided urban roadway alternative for Zone 2 has a typical right of way width of 76 feet. This section of roadway runs from 5th Street W to 7th Street E. Lane widths in this section consist of 11 foot through lanes with curb and gutter. There are two sidewalks in the section of roadway that consist of a 10 foot sidewalk on the north side and 6 foot sidewalk on the south side. Boulevard widths are 4.5 feet on the north side of the roadway and 6.5 feet on the south side of the roadway. If parking is provided between Main Street and 2nd Street E, the north sidewalk will be reduced 8 feet and the boulevard widths will be reduced.

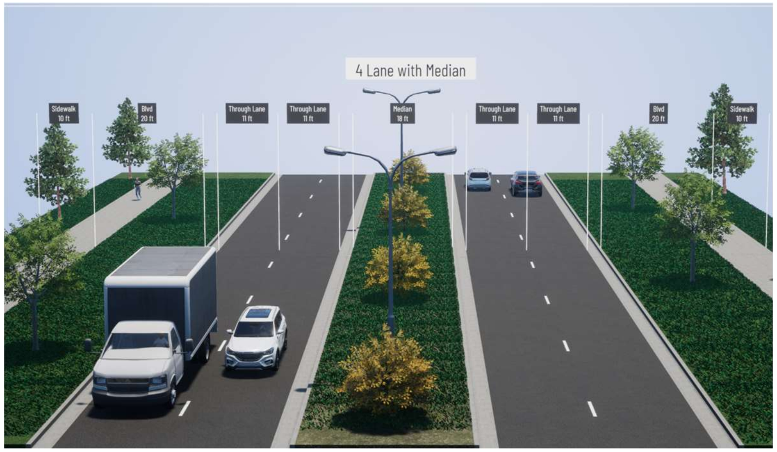






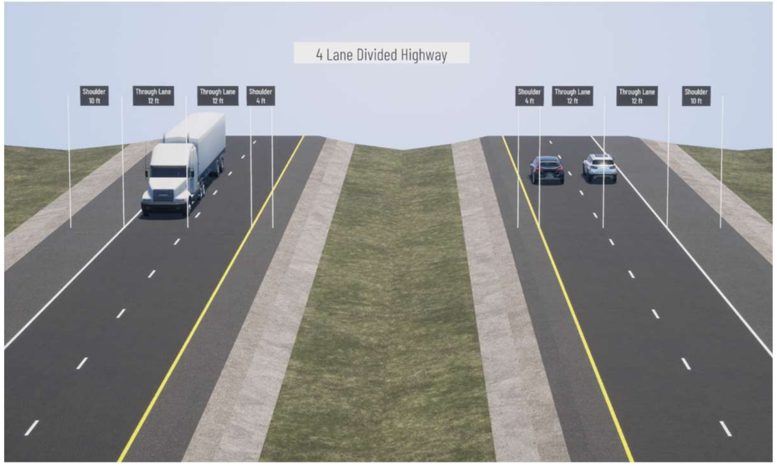
Zone 3: 3-Lane divided urban roadway

The 3-lane divided urban roadway alternative for Zone 3 has a typical right of way width of 256 feet. This section of roadway runs from 7th Street E to 14th Street E. Lane widths in this section are set at 11 feet and widen to 14 feet where there is a median 10 foot sidewalks can be extended from Zone 2 on the north and south sides. Boulevard widths would vary as the roadway transitions to a rural corridor. This section also includes left and right turn lanes for major intersections.



Zone 3: 4-Lane divided urban roadway

The 4-lane divided urban roadway alternative for Zone 3 runs from 7th Street E to 14th Street E. Lane widths in this section are set at 11 feet wide through lanes with curb and gutter. 10 foot sidewalks can be extended from Zone 2 on the north and south sides. Boulevard widths would vary as the roadway transitions to a rural corridor. This section also includes left and right turn lanes for major intersections.



Zone 3: 4-Lane divided rural roadway

The 4-lane divided rural roadway alternative for Zone 3 runs from 14th Street E to 60th Street N. Lane widths in this section are set at 12 feet wide through lanes with 10 foot outside shoulders and 4 foot wide inside shoulders. Median and ditch width would vary as the roadway transitions to a rural corridor. This section also includes left and right turn lanes for major intersections. This would match the existing section in this area.

6.3 Alternative 1

This alternative would provide a 4-lane section with raised median through Zone 1, a 3-lane section through Zone 2, and a transition from 3-lanes to 4-lane median divided section in Zone 3. The estimated cost of construction of this alternative as shown in this is $26.9 million. The ultimate total cost for this alternative will depend on design details that will be determined through the project development process.

Alternative 1 Design Concepts		
Concept	**Description**	**Issue/Need Addressed**
A	Reconstruct roadway with 4 lanes through Zone 1, 3 lanes through Zone 2, and 3-4 lanes through Zone 3	Improves pavement condition
B	Optimize lane widths	Moderates vehicle speed Improves space allocated to pedestrian/bicycle improvements Reduces crossing distance for pedestrians Increases boulevard width
C	Urbanize Zone 1 and Zone 3 with curb and gutter	Moderates vehicle speed Improves stormwater drainage Provides flat boulevard space that can be utilized streetscaping or bicycle/pedestrian improvements
D	Install curb extensions (bulb-outs) at parking areas	Reduces crossing distance for pedestrians Delineates end of parking area Provides greater visibility of pedestrians waiting to cross
E	On-Street parking	Provides parking for north-side businesses that currently rely on it Reduces the need for customers to cross the road
F	Enhanced pedestrian crossings	Improves pedestrian safety Provides additional locations to cross the road
G	Access management	Improves pedestrian and vehicle safety Reduces conflict points
H	Preserve right of way in growth areas	Provides space context appropriate design Accommodates future improvements
I	Raised median	Improves vehicle safety Provides opportunity for streetscaping, trees, and gateway aesthetics
J	Alternative intersection	Improves traffic level of service

Zone 1 – 34th Street to 5th Street W

Alternative 1 provides a 4-lane divided roadway through Zone 1 and a 10 foot wide sidewalk/path on both the north and south side of the roadway. These connect with the existing path from Moorhead and continue to the downtown section of Dilworth. A generous amount of buffer space is provided in the boulevard to separate sidewalk users and road users to enhance pedestrian safety. Crosswalk markings are provided on the side streets. Through lanes are reduced to 11 feet wide with curb and gutter. Raised medians can facilitate lighting and trees in this section of the corridor. Left and right turns lanes should be installed where warranted to separate turning movements from through traffic. Optional intersection configurations should be considered at the Frontage Road intersection and the County Road 9 intersection to improve future traffic operations. The south leg of the 4th Street W intersection could be removed if a south leg is added to the 5th Street W intersection. The design speed on Highway 10 through this section should be 35 or 40 mph.

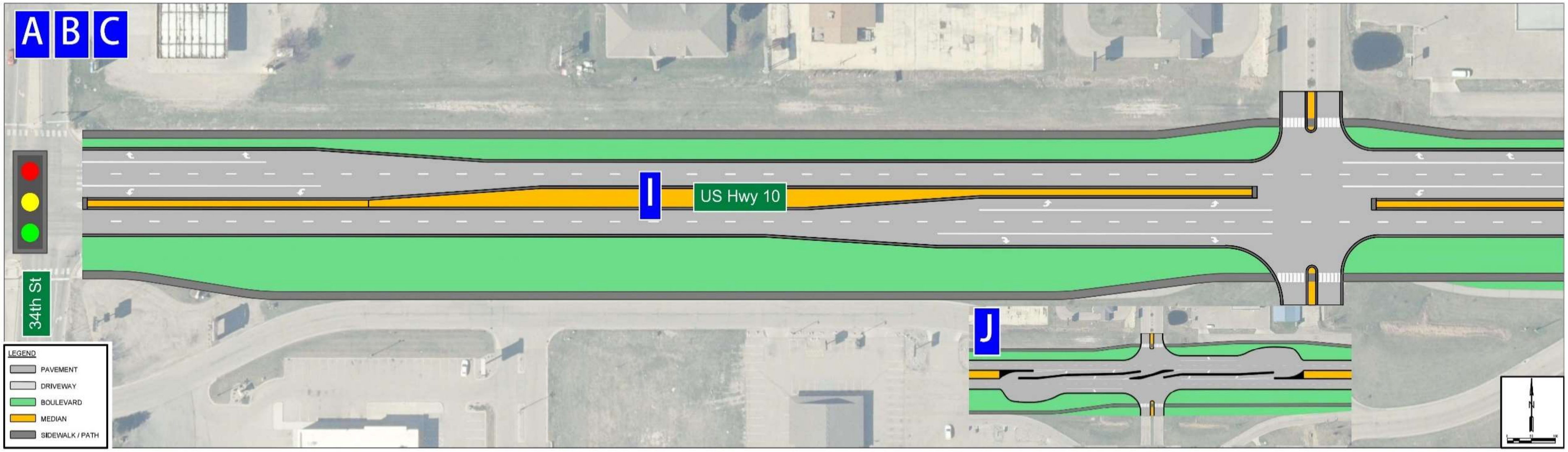
Zone 2 – 5th Street W to 7th Street E

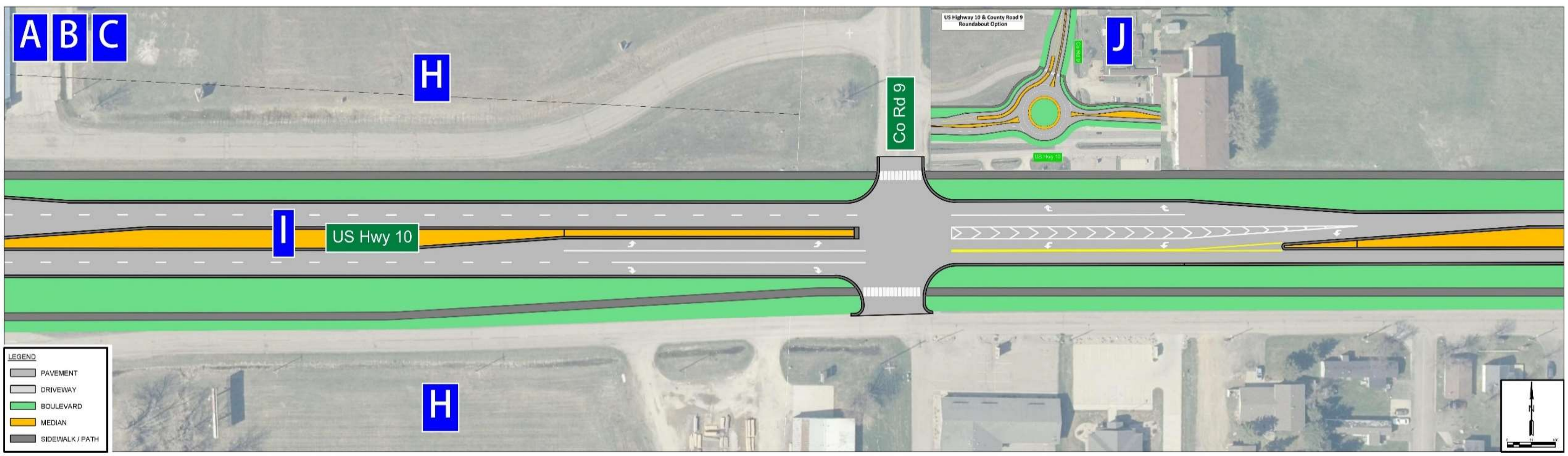
A 3-lane roadway concept through the downtown area for this alternative provides improved pedestrian access and walkability. North sidewalks/paths should be 8-10 feet wide and south sidewalks should be six feet wide. The increased sidewalk widths give pedestrians better access to and from the downtown and residential areas. New pedestrian crossings at 5th Street W and 7th Street E provide better connectivity to the north and south sidewalks. The reduction of lanes and the addition of bulb outs in parking areas for Alternative 1 provides a reduced crossing distance for pedestrians as compared to the existing 4 lane roadway. On street parking within the downtown area reduces the need to cross Highway 10 to access businesses on the north side of the road. These businesses currently depend on the on-street parking for their customers. The parking between 2nd Street E and 3rd Street E is not heavily used and may not be as critical to ultimately include. Medians can be implemented in areas where left turns are not allowed or as a method of access control. Access points (driveways) through this Zone should be reviewed for potential removal or consolidation. The design speed through this section should be 30 mph.

Zone 3 – 7th Street E to 60th Street E

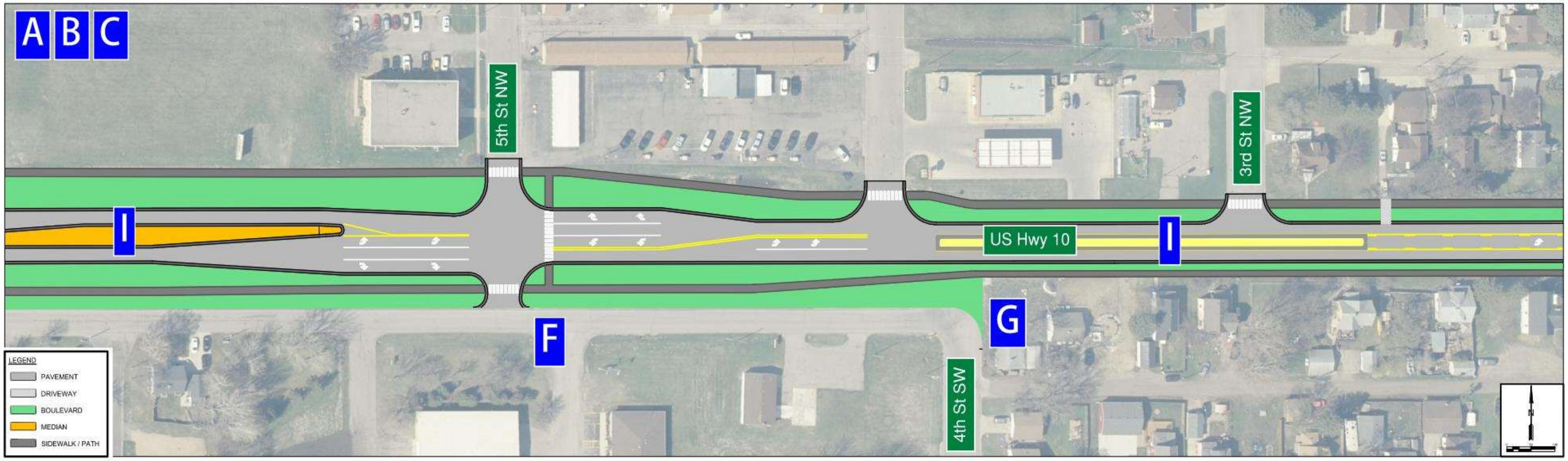
This zone will transition from 3-lanes to a 4-lane divided roadway to match the existing roadway configuration. A 10 foot wide sidewalk/path is provided on both the north and south side of the roadway. The north sidewalk connects with the existing system at 14th Street NE. An ample amount of buffer space is provided in the boulevard to separate trail users from roadway users. Left and right turn lanes should be installed were warranted facilitate turning movements. Through lanes are reduced to 11 feet wide with raised medians until 14th Street and transition to a 4-lane divided highway section with a median ditch towards 60th Street. This section should consider alternative intersection configurations at 7th Street E, 12th Street NE, and 14th Street NE. Additionally, a roundabout at one of these intersections could provide an opportunity for speed and lane configuration transition. The design speed in the 3-lane section should be 30 mph and transition to 45 mph where the 4-lane section begins and continue at 45 mph to 60th Street. A potential future BNSF overpass could be located south of the 14th Street NE intersection. Minnesota State Patrol should be engaged in future project development to include a potential commercial vehicle inspection area near 60th Street.

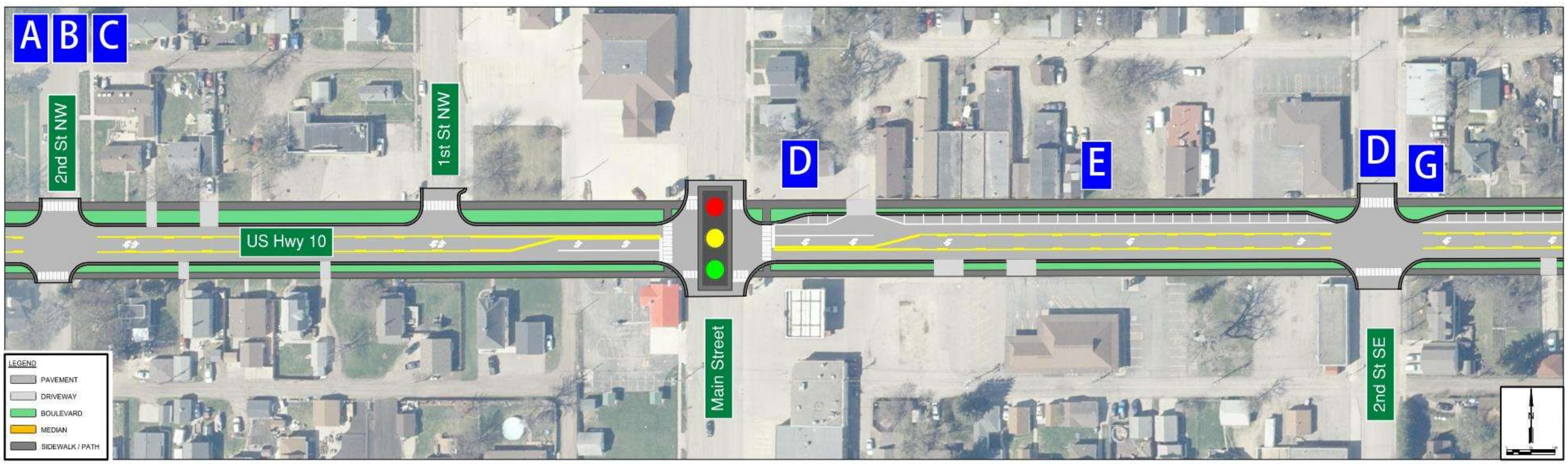
Alternative 1 – Zone 1



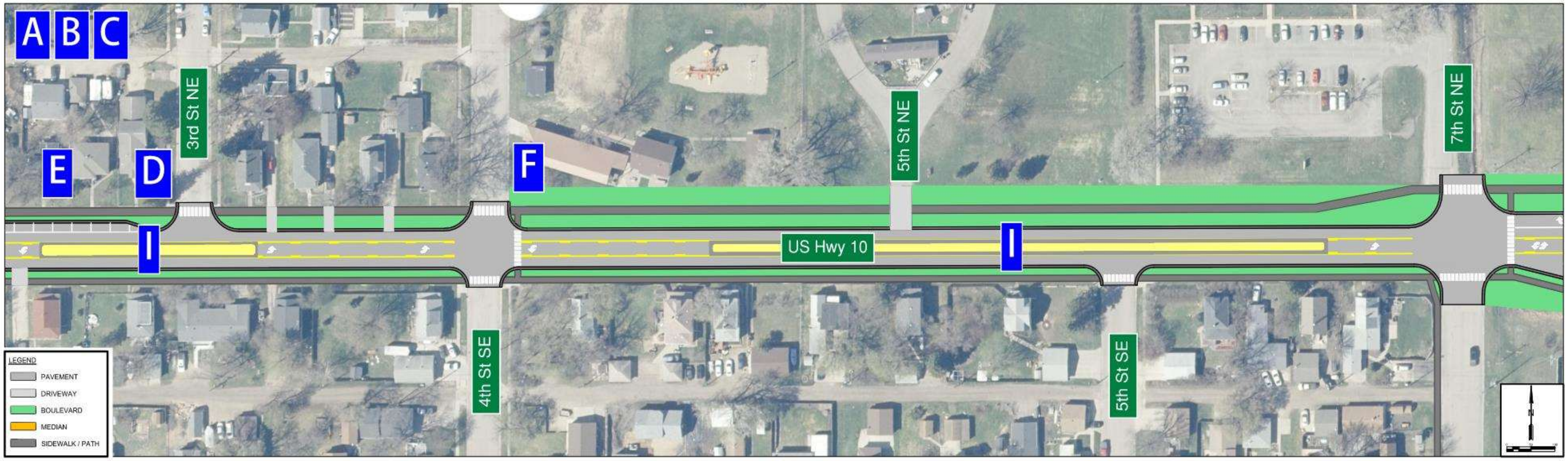


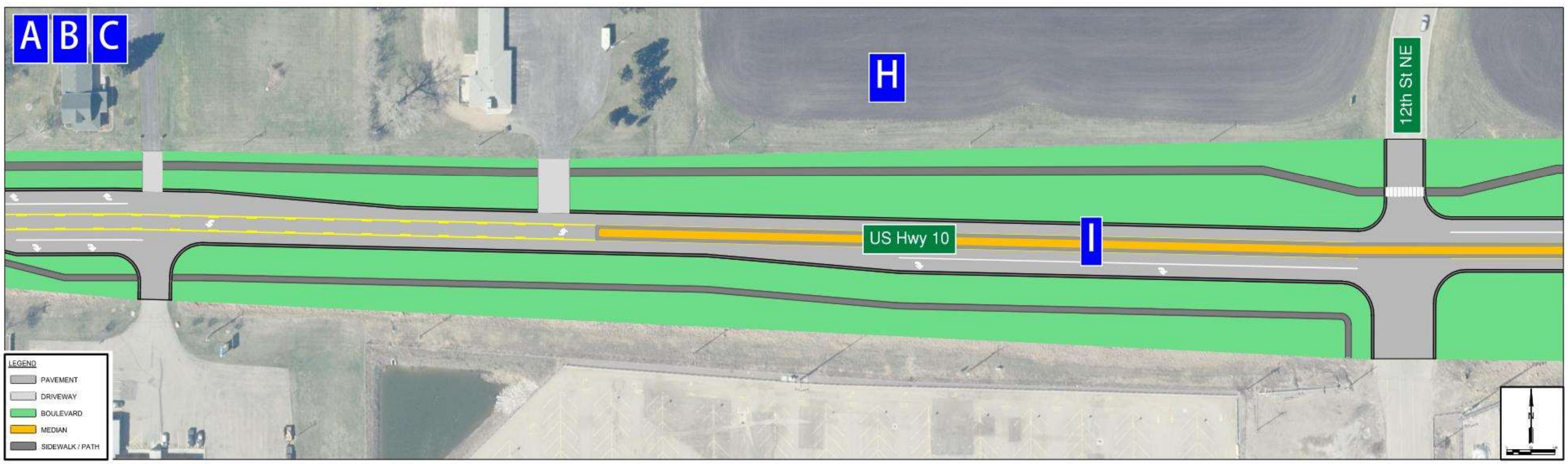
Alternative 1 – Zone 2



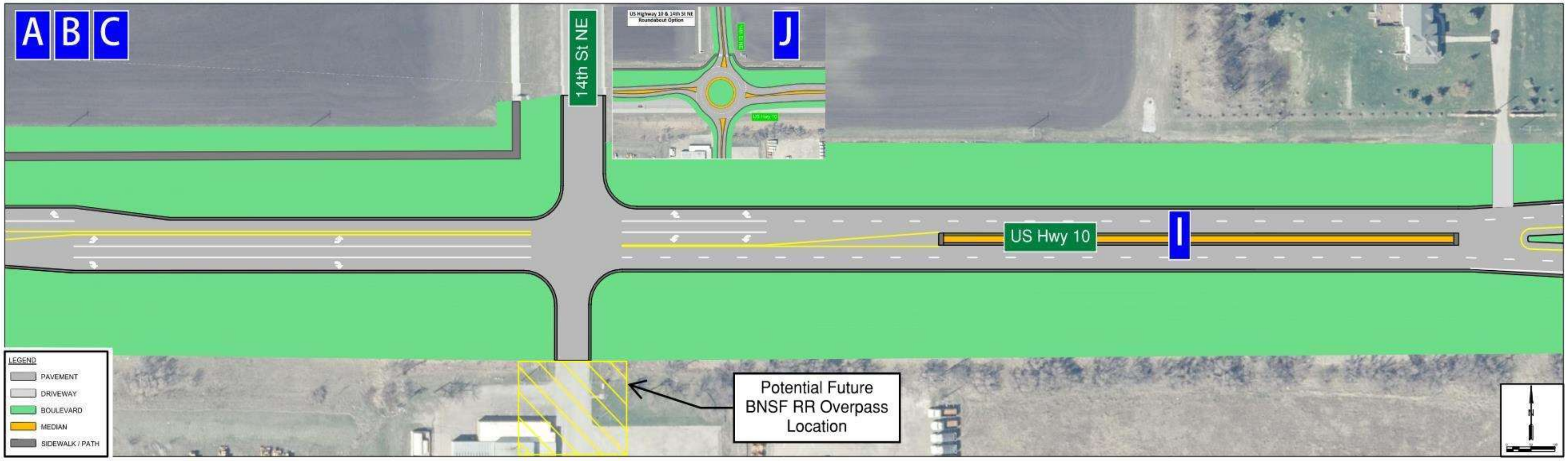


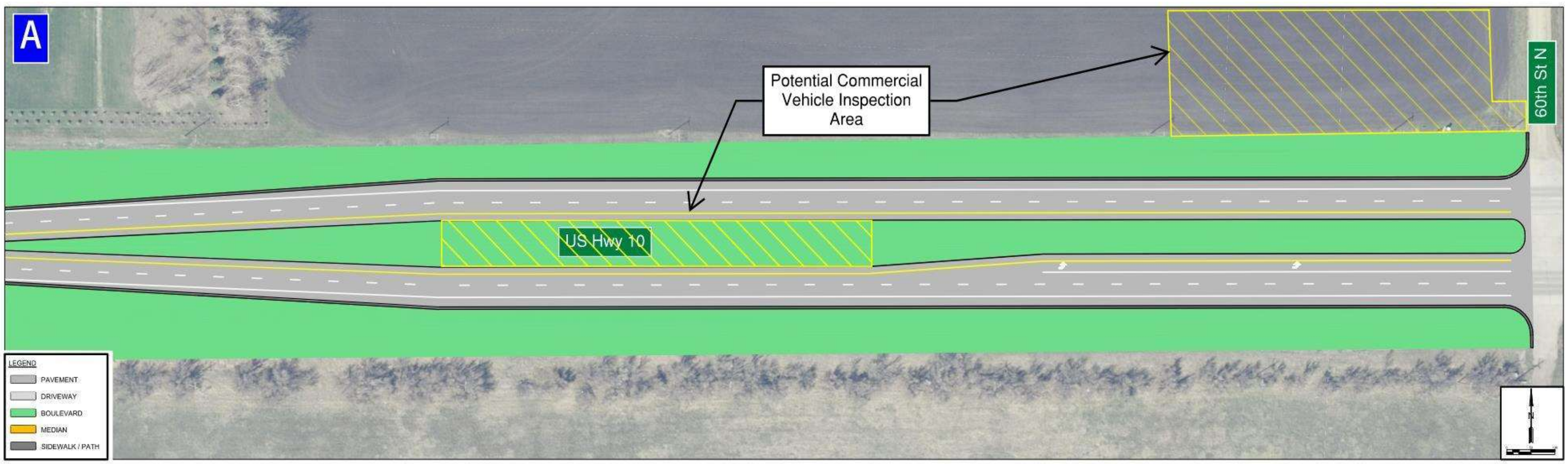
Alternative 1 – Zone 2 & 3





Alternative 1 – Zone 3





6.4 Alternative 2

This alternative would provide a 4-lane section with raised median through Zone 1, a 4-lane undivided section through Zone 2, and a transition from the undivided section to 4-lane median divided section in Zone 3. The estimated cost of construction of this alternative as shown in this is $28.5 million. The ultimate total cost for this alternative will depend on design details that will be determined through the project development process.

Alternative 1 Design Concepts		
Concept	**Description**	**Issue/Need Addressed**
A	Reconstruct roadway with 4 lanes through Zone 1, 3 lanes through Zone 2, and 3-4 lanes through Zone 3	Improves pavement condition
B	Optimize lane widths	Moderates vehicle speed Improves space allocated to pedestrian/bicycle improvements Reduces crossing distance for pedestrians Increases boulevard width
C	Urbanize Zone 1 and Zone 3 with curb and gutter	Moderates vehicle speed Improves stormwater drainage Provides flat boulevard space that can be utilized streetscaping or bicycle/pedestrian improvements
D	Install curb extensions (bulb-outs) at parking areas	Reduces crossing distance for pedestrians Delineates end of parking area Provides greater visibility of pedestrians waiting to cross
E	On-Street parking	Provides parking for north-side businesses that currently rely on it Reduces the need for customers to cross the road
F	Enhanced pedestrian crossings	Improves pedestrian safety Provides additional locations to cross the road
G	Access management	Improves pedestrian and vehicle safety Reduces conflict points
H	Preserve right of way in growth areas	Provides space context appropriate design Accommodates future improvements
I	Raised median	Improves vehicle safety Provides opportunity for streetscaping, trees, and gateway aesthetics
J	Alternative intersection	Improves traffic level of service

Zone 1 – 34th Street to 5th Street W

Alternative 2 provides a 4-lane divided roadway through Zone 1 and a 10 foot wide sidewalk/path on both the north and south side of the roadway. These connect with the existing path from Moorhead and continue to the downtown section of Dilworth. A generous amount of buffer space is provided in the boulevard to separate sidewalk users and road users to enhance pedestrian safety. Crosswalk markings are provided on the side streets. Through lanes are reduced to 11 feet wide with curb and gutter. Raised medians can facilitate lighting and trees in this section of the corridor. Left and right turns lanes should be installed where warranted to separate turning movements from through traffic. Optional intersection configurations should be considered at the Frontage Road intersection and the County Road 9 intersection to improve future traffic operations. The south leg of the 4th Street W intersection could be removed if a south leg is added to the 5th Street W intersection. The design speed on Highway 10 through this section should be 35 or 40 mph.

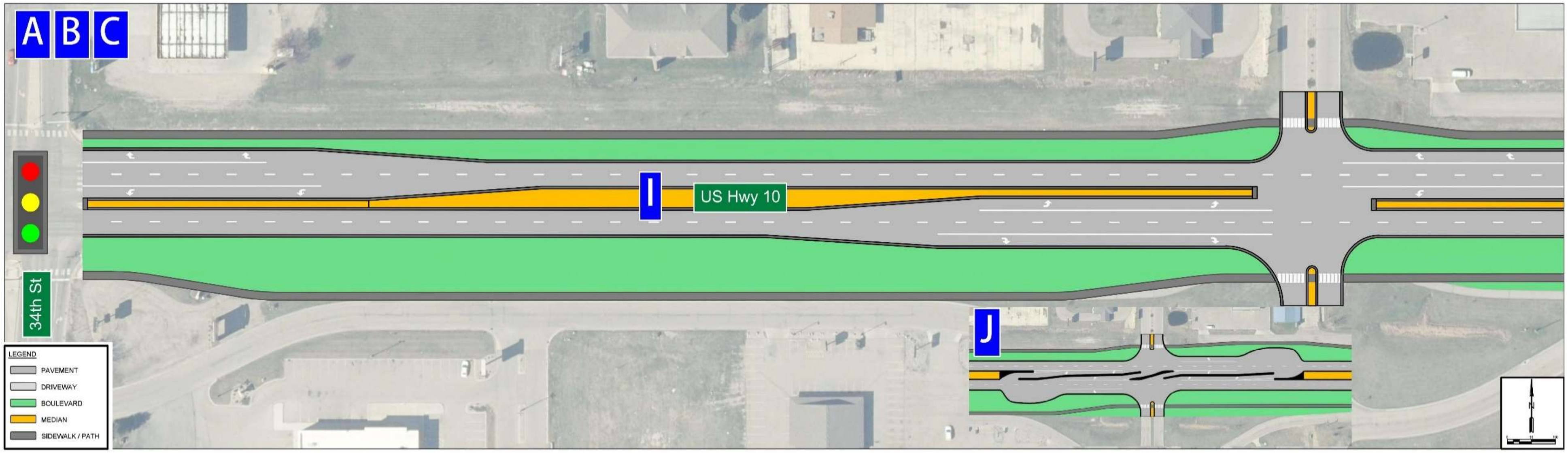
Zone 2 – 5th Street W to 7th Street E

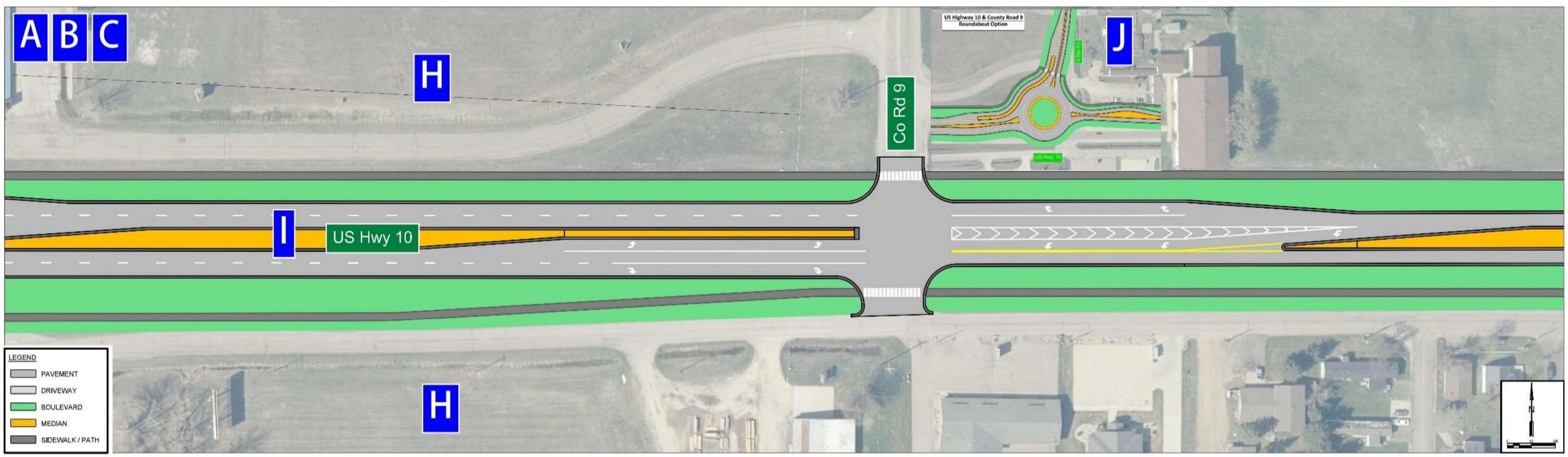
A 4-lane roadway concept through the downtown area for this alternative. North sidewalks/paths should be 8-10 feet wide and south sidewalks should be 6 feet wide. The increased sidewalk widths on both the north and south side of the roadway gives pedestrians better access to and from the downtown and residential areas. New pedestrian crossings at 5th Street W and 7th Street E provide better connectivity to the north and south sidewalks. The reduction of lane widths to 11 feet and the addition of bulb outs in parking areas for Alternative 2 provides a reduced crossing distance for pedestrians as compared to the existing 4 lane roadway. On street parking within the downtown area reduces the need to cross Highway 10 to access businesses on the north side of the road. These businesses currently depend on the on-street parking for their customers. The parking between 2nd Street E and 3rd Street E is not heavily used and may not be as critical to ultimately include. Access points (driveways) through this Zone should be reviewed for potential removal or consolidation. The design speed through this section should be 30 mph.

Zone 3 – 7th Street E to 60th Street E

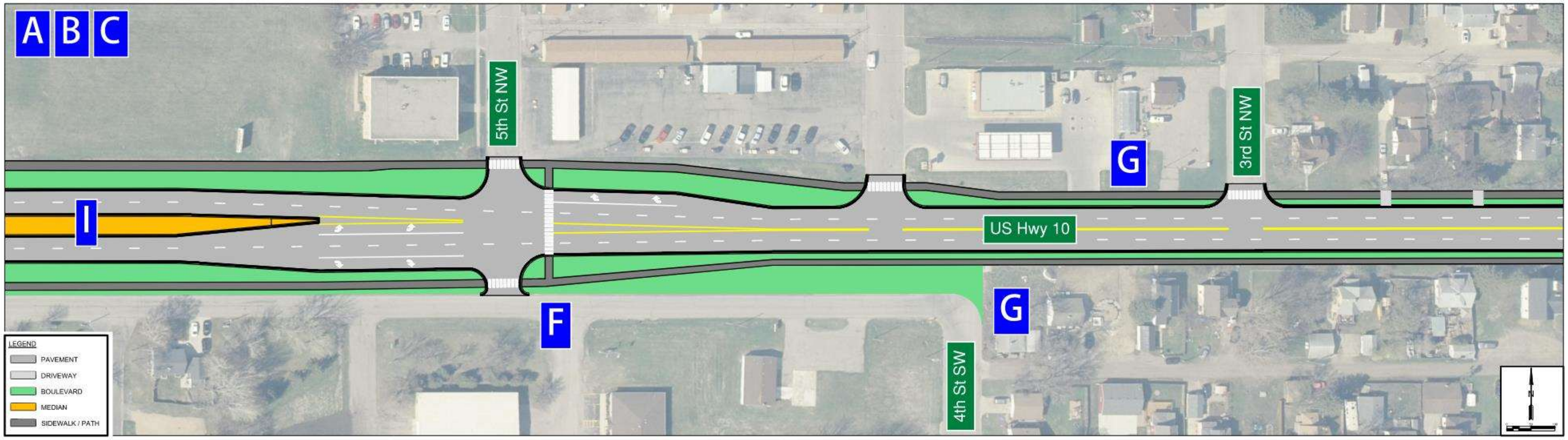
This zone will transition from the undivided section to a 4-lane divided roadway to match the existing roadway configuration. A 10 foot wide sidewalk/path is provided on both the north and south side of the roadway. The north sidewalk connects with the existing system at 14th Street NE. An ample amount of buffer space is provided in the boulevard to separate trail users from roadway users. Left and right turn lanes should be installed were warranted facilitate turning movements. Through lanes are reduced to 11 foot wide with raised medians until 14th Street and transition to a 4-lane divided highway section with a median ditch towards 60th Street. This section should consider alternative intersection configurations at 7th Street E, 12th Street NE, and 14th Street NE. Additionally, a roundabout at one of these intersections could provide an opportunity for speed and lane configuration transition. The design speed in the 4-lane undivided section should be 30 mph and transition to 45 mph where the 4-lane divided section begins and continue at 45 mph to 60th Street. A potential future BNSF overpass could be located south of the 14th Street NE intersection. Minnesota State Patrol should be engaged in future project development to include a potential commercial vehicle inspection area near 60th Street.

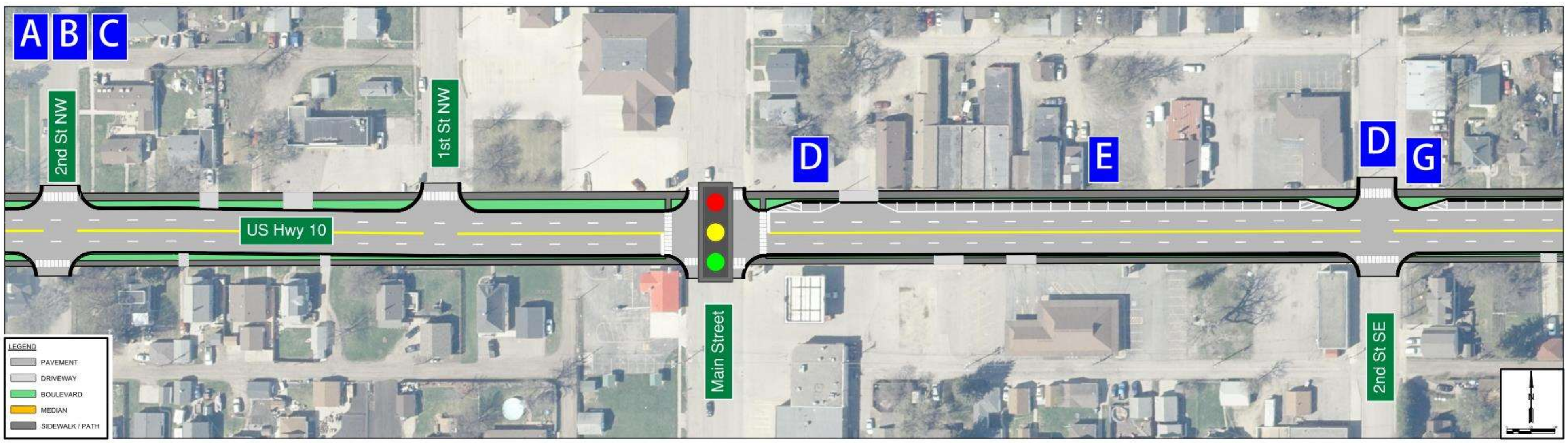
Alternative 2 – Zone 1





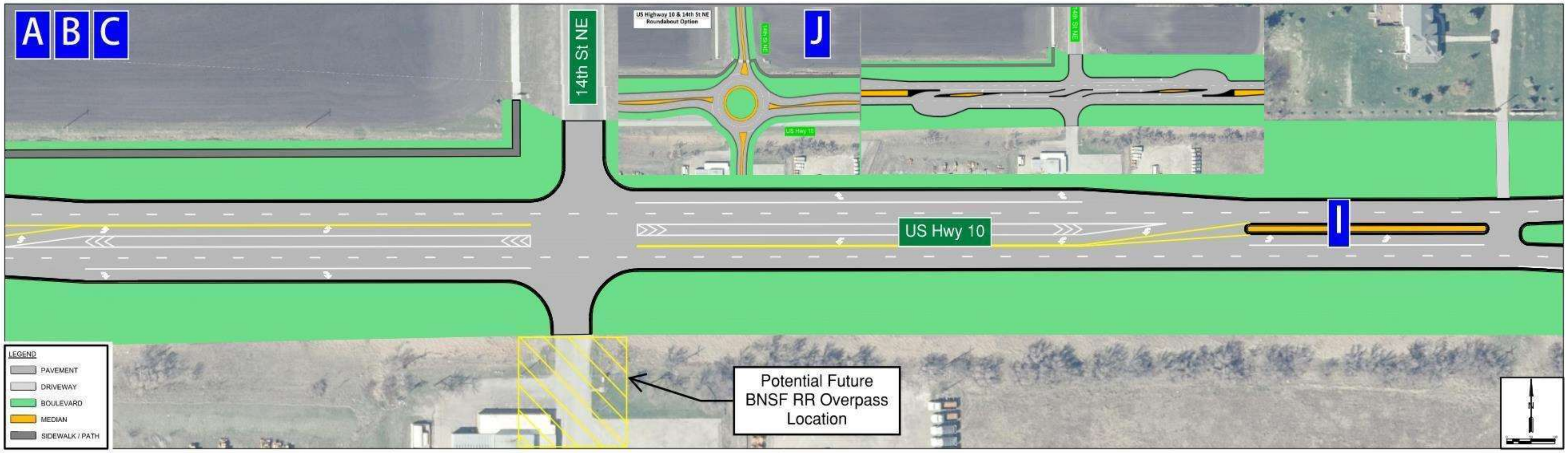
Alternative 2 – Zone 2

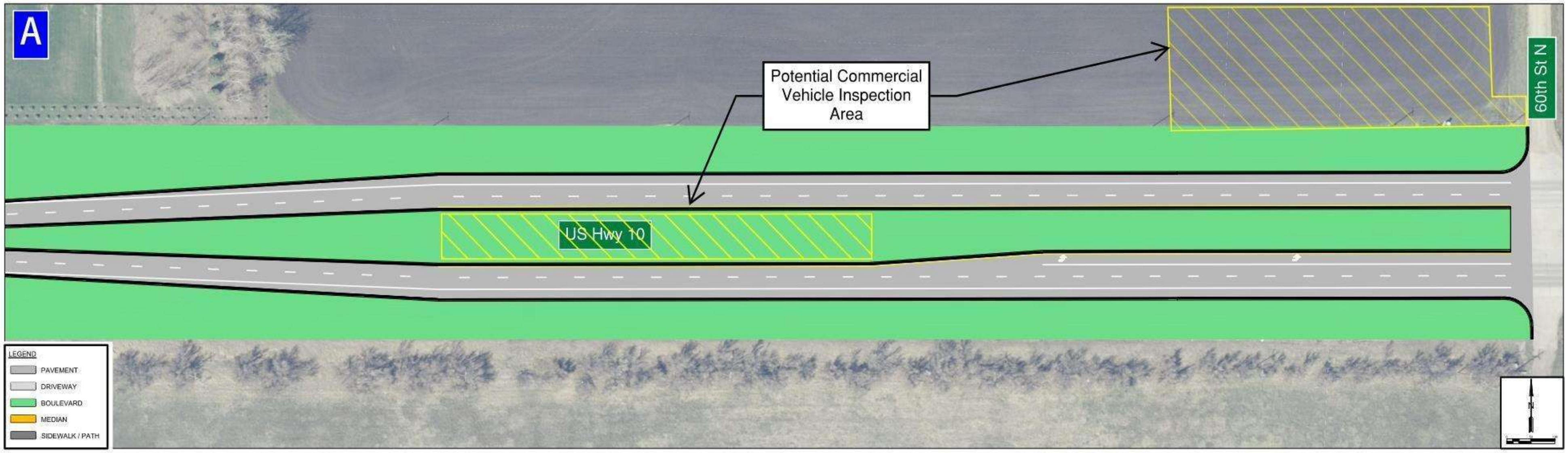




Alternative 2 – Zone 2 & 3

Alternative 2 – Zone 3

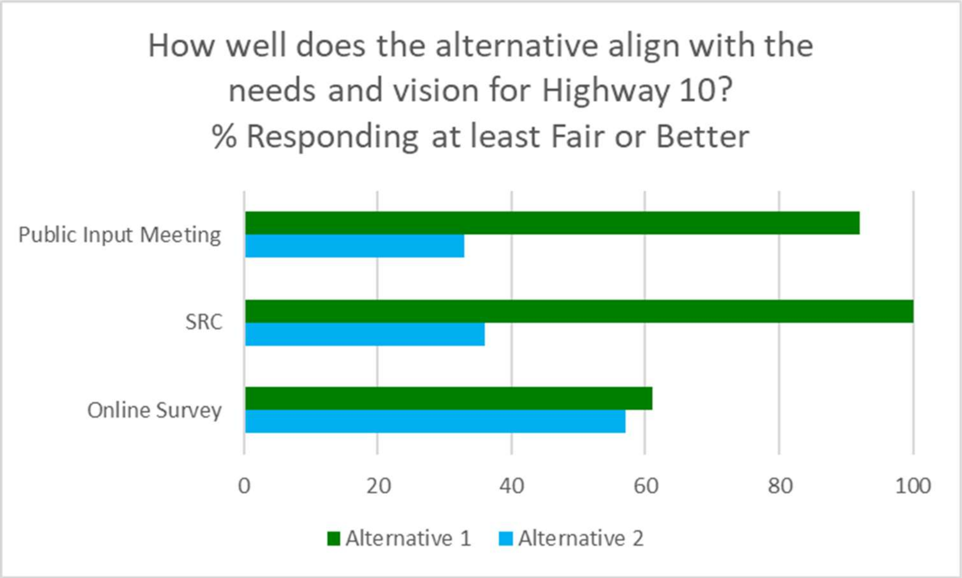




7.0 ALTERNATIVE EVALUATION AND IMPLEMENTATION

7.1 Public and SRC Consent

After developing the alternatives, a public input meeting was held to present the concepts to the public and gain consent on the validity of these options. Attendees were asked to respond to how well each alternative aligned with the needs and vision for the corridor, with 1 being not well and 5 being very well. The same question was also asked of the SRC members, and of responders to an online survey. The graph shows the percent of each group responding at least a 3 (fair) to 5 (very well).



The response shows that Alternative 1 was supported by all groups and received strong support the SRC members and the public input meeting attendees. The respondents of the online survey were generally supportive of both alternatives, though slightly more supportive of Alternative 1. The lower rate of support for either alternative in the online survey could be attributed to respondents not receiving the same amount of information about the alternatives as the public input meeting attendees and SRC members. The complete results of the surveys can be found in the appendix.

7.2 Alternative Evaluation Matrix

A matrix was developed to visually compare the alternatives related to how well they met a certain need or goal for the corridor. These areas were defined as:

- **Vehicle Safety** – The potential improvement for vehicle safety with each alternative
- **Vehicle Mobility** – The potential improvement for vehicle mobility with each alternative
- **Speed Reduction** – How well the alternative promotes slower, more consistent vehicle speeds
- **Pedestrian Experience** – Does the alternative provide opportunities to create a safer, more comfortable, and accessible bicycle/pedestrian network?
- **On-Street Parking** – Is on-street parking accommodated?
- **Community Reinvestment** – Does the alternative foster economic reinvestment and revitalization of the community?
- **Stakeholder & Public Input** – How well does the alternative meet the wants and needs of stakeholders and the public?
- **Landscaping/Beautification** – What is the potential to create a streetscaped environment along with gateway features at each end of the corridor?
- **Right of Way Impacts** – Will the alternative require right of way (temporary or permanent)?
- **Cost** – What is the approximate construction cost of each alternative?

US Hwy 10 Dilworth Elvaluation Criteria										
	Vehicle Safety	Vehicle Mobility	Speed Reduction	Pedestrian Experience	On-Street Parking	Community Reinvestment Initiatives	Stakeholder & Public Issues/Needs	Streetscaping/ Beautification Opportunity	Right of Way Impacts	Cost
Alternative 1 4-3-4 Lane										
Alternative 2 4 Lane										
Alternative 3 No-Build										

The purpose of this evaluation is to determine which alternative provides the greatest benefit and identify safe, effective, and feasible transportation improvements for all users, which support positive redevelopment and investment in the community

Greatest Benefit
Some Benefit
Little or No Benefit

Alternative 1 provides the greatest benefit in most areas. Alternative 2 provides at least some benefit in all areas. A no-build alternative would provide little or no benefit in most areas, while only providing the most benefit in terms of limited right of way impacts and no cost.

7.3 Implementation

The alternatives presented in this study are planning-level and will need additional refinement and design development along with environmental clearance and permitting before moving to construction. MnDOT currently has projects programmed in the 10-year Capital Highway Investment Program to reconstruct Highway 10 throughout Dilworth and Moorhead within in the next 5 years, pending available funding.

Project Limits

The currently programmed projects include reconstruction from 34th Street to 7th Street E. The limits of this project would need to be moved east closer to 60th Street if the improvements are to be made at 14th Street E and if a commercial vehicle inspection site is to be constructed near 60th Street. If the project limits are extended it may also result in a project that could require two years to construct. This could impact the scheduled reconstruction of Highway 10 in Moorhead and is a decision that should be made early in the next phase of project development.

Community Planning

At the time this Highway 10 Corridor Study was underway, the city of Dilworth began working on a Downtown Reinvestment Study. The purpose of this study is to imagine how reinvestment to downtown Dilworth will coincide with future improvements to Highway 10 and provide strategies for achieving the vision and goals for downtown. The city should also update the Comprehensive Plan to include recommendations from the Downtown Study to ensure that future development and reinvestment along the corridor are guided by the new strategies for building design, landscaping, sidewalks, access management. There should also be consideration for a future connection to the Heartwood Trail and to ensure that a robust sidewalk and trail system within the city is planned to allow Heartland Trail users to access the Highway 10 corridor.

Demonstration Project

Prior to construction of a project that could potentially reduce the number of lanes available for through-traffic, a demonstration project could be conducted. The project could use temporary pavement markings and other methods to convert Zone 2 (downtown) to a 3-lane section for a few weeks to test the alternate configuration and study traffic operations. Curb extensions (bulb-outs) and traffic signal modifications should also be included to provide signalized left turns at Main Street and allow pedestrians to realize the safety benefits of a shorter crossing.

15th Avenue North

One of the more critical ideas that should be incorporated with the development of this project is improving 15th Avenue N between County Road 9 and County Road 11 (north of MN 336). This corridor on the north side of Dilworth is parallel to, and 1 mile away from Highway 10 has the potential to significantly affect traffic mobility during construction, as well as the future traffic patterns in the region. Early coordination with the townships who have jurisdiction over this segment of 15th Avenue N should be focused on paving and widening the roadway prior to construction to accommodate detoured traffic. As the reconstruction of Highway 10 is completed, many motorists may continue to use 15th Avenue N and provide relief for overall traffic volumes through Dilworth.

Commercial Vehicle Inspection Site and BNSF Coordination

Also prior to construction, additional coordination will need to occur with MN State Patrol to determine the details of the proposed commercial vehicle inspection site. Coordination should also be made with BNSF to continue to advance the concept of a railroad overpass south of the 14th Street E intersection.

7.4 Corridor Study Summary

The Fargo-Moorhead Council of Governments (Metro COG) and its partners, the Minnesota Department of Transportation (MnDOT), and the city of Dilworth completed a study of the Highway 10 corridor through Dilworth. The purpose of the study was to develop solutions within the corridor that balance the needs of all users through a complete streets approach. Proposed solutions for the corridor were influenced by input from users, stakeholders, and the public. The study ultimately developed a corridor with a locally influenced vision though community engagement and discussion with the Study Review Committee. The updated corridor alternatives enhance the pedestrian experience, roadway user experience, provide speed reduction techniques and on street parking opportunities. The study lays out future development concepts for the various land use context areas along Highway 10 and will help guide future studies for the surrounding area. The reconstruction project is programmed to address poor pavement conditions and geometric design. The project is proposed to be implemented over a one to two-year construction period. The timing of this project will be coordinated with the reconstruction of Highway 10 in Moorhead.