

US 10 / US 75 Corridor Study Moorhead, MN

May 29, 2020

Fargo-Moorhead Council of Governments (Metro COG) and its partners, the Minnesota Department of Transportation (MnDOT), City of Moorhead, Downtown Moorhead, Inc., MATBUS and Minnesota State University Moorhead, completed a study of the US 10 and US 75 corridors in Moorhead. The purpose of the study was to develop context-sensitive solutions for the corridors that balance the needs of the City of Moorhead with area stakeholders and users. Ultimately, the study developed corridor visions along US 10 and US 75 that enhance the corridor environment for all users, guide future studies, and set the framework for MnDOT's 2025 and 2026 reconstruction projects.



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About the Study

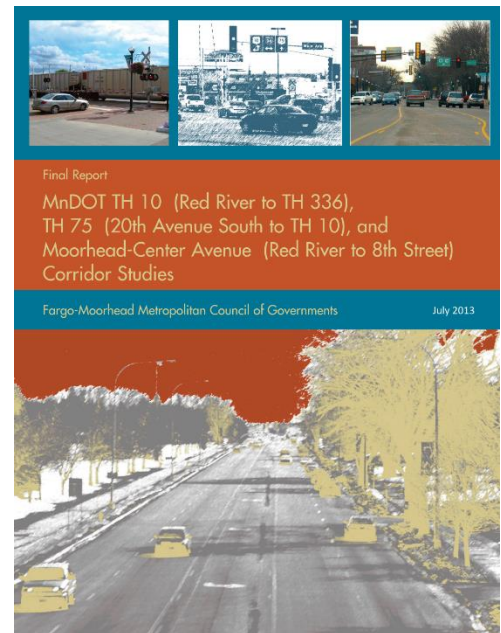
Highlights:

- Study partners included the Fargo-Moorhead Metro COG, MnDOT, City of Moorhead, Downtown Moorhead, Inc., MATBUS and Minnesota State University Moorhead.
- Purpose of the study was to develop context-sensitive solutions for the corridors that balance the needs of the City of Moorhead with area stakeholders and users.
- Study builds on work completed as part of the 2013 study and incorporates recent and ongoing work with the 12th Avenue corridor and future downtown grade-separation.
- Future route changes of US 10 and US 75, and changes to Main Avenue in Fargo, will change how traffic travels through downtown Moorhead.
- Land uses that serve the US 10 and US 75 corridors vary significantly. Three focus areas (Downtown, US 75 South, and US 10 East) were defined to ensure the right users were being prioritized based on the characteristics of each area.
- Study was conducted in three phases with a focus on working with various stakeholders and providing numerous opportunities for community input.

The Fargo-Moorhead Council of Governments (Metro COG) and its partners, the Minnesota Department of Transportation (MnDOT), City of Moorhead, Downtown Moorhead, Inc., MATBUS and Minnesota State University Moorhead, completed a study of the US 10 and US 75 corridors in Moorhead. The purpose of the study was to develop context-sensitive solutions for the corridors that balance the needs of the City of Moorhead with area stakeholders and users. Ultimately, the study developed locally preferred corridor visions along US 10 and US 75 that enhance the corridor environment for all users, guide future studies, and set the framework for MnDOT’s 2025 and 2026 reconstruction projects. The reconstruction project is programmed to address poor pavement conditions and will be implemented over the two-year construction period. Pavement needs and the implementation plan are detailed in later sections of this report.

These corridors were studied in 2013 and subsequent roadway rehabilitation and pedestrian and bicycle improvement projects were completed. As the nature of development and redevelopment with more mixed commercial and residential uses has changed in Moorhead with a focus on promoting an environment where residents work, live, and play, developing visions with community input that balance the needs of all users will inform MnDOT as they plan for the full reconstruction of both US 10 and US 75.

Prior to the reconstruction project the route for US 10 and US 75 through downtown Moorhead will likely change. The current route (i.e. MnDOT jurisdiction) for US 10 and US 75 is along 8th Street between Main and Center Avenues, and then along Center Avenue between 8th and 11th Streets. Following the route change, US 10 and US 75 will shift to Main Avenue and 11th Street. The new route will be along Main Avenue between 8th and 11th Streets, and then along 11th Street between Main and Center Avenues. The current route will be transferred to the City of Moorhead. This transfer is independent of if or when 11th Street has grade-separated railroad crossings between Main and Center Avenues for the BNSF KO Subdivision and between Center and 1st Avenues for the BNSF Prosper Subdivision.



Study Area History

Previous studies for the corridors led to improvements phased-in over time. As previously noted, in 2013 the US 10 (Red River to Hwy 336), US 75 (20th Avenue to US 10) and Center Avenue (Red River to 8th Street) Corridor Studies were completed. This current study builds on the previous studies with updated data, analysis, concepts, and public and stakeholder engagement to be reflective of the current conditions and assumptions that will inform MnDOT's 2025 and 2026 reconstruction projects. Since the completion of the 2013 study, the projects and studies completed (or in progress) that impact travel patterns for the study corridors are noted in Figure 1.



Study Goals & Vision

This study looked at balancing the needs of motorized and non-motorized traffic with business access, while considering the effects of changes on Main Avenue in downtown Fargo and what it means for traffic traveling across the Red River through downtown Moorhead. Community and stakeholder input were key in informing the future visions for the corridors. The study was guided by the following overarching goals in which the recommended vision needs to:

- Provide roadways that **fit land use** (i.e., appropriate access and design).
- Accommodate **appropriate users** (i.e., complete streets).
- Create an environment to **stimulate growth**.
- Provide flexibility for **near and long-term transportation needs**.
- Improve **“Gateway” feel** for US 10 and US 75 corridors.

Ultimately, the study will inform develop and execute a project that **meets the needs for 30+ years**.



Identification of Needs

The need for the multimodal transportation improvements and the relationship to regional transportation need is based on the transportation analyses completed as part of this study. The study partners determined sufficient need was identified to inform the framework for MnDOT's year 2025 and 2026 projects and warranted the development of future corridor improvement concepts for both corridors. In addition to addressing the overall study goals and corridor visions, it was determined that future corridor planning and improvements should address the following needs for each respective corridor:

- **Pavement condition** needs.
- Vehicle **safety** and **mobility** needs.
- **Walkability** and **bikeability** needs.



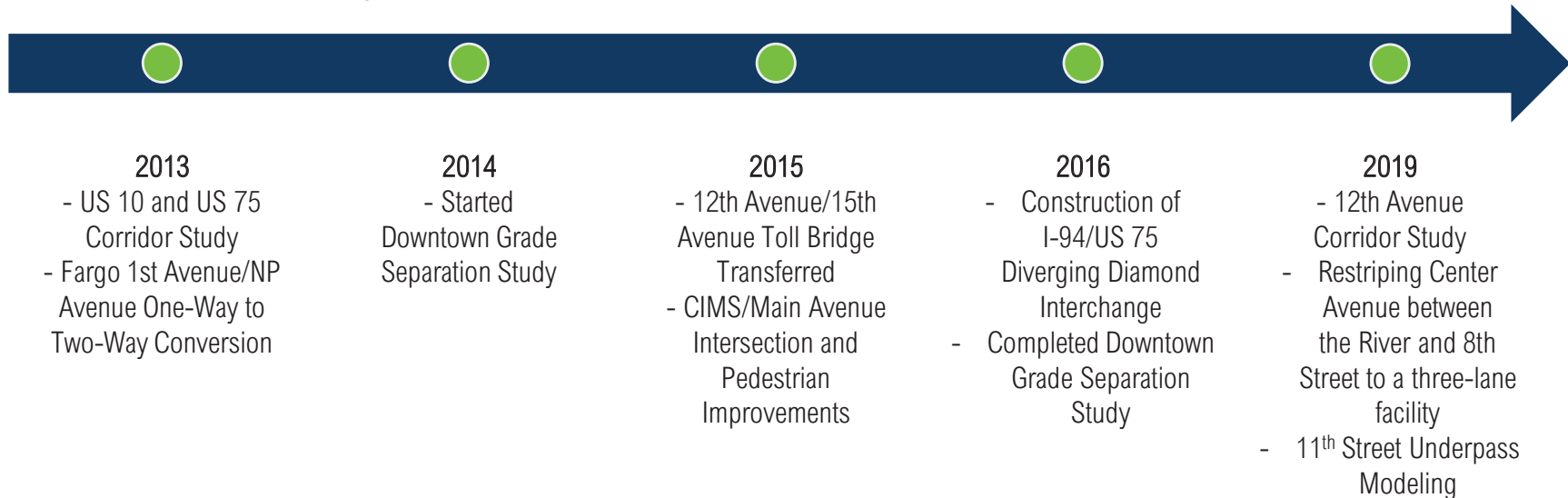
Focus Areas

Land uses that serve the US 10 and US 75 corridors vary significantly. As a result, a “one size fits all” approach will not accomplish the goals of the study. Thus, three focus areas were defined based on the types of land uses that exist today and what is being considered in the future. The purpose of identifying the focus areas was to ensure the right users were being prioritized for the visions based on the characteristics of each area. Figure 2 depicts the following focus areas identified for this study:

- **Downtown** – Central business district with commercial and residential uses.
- **US 75 South of Downtown** – Residential and institutional uses.
- **US 10 East of Downtown** – Commercial and industrial uses.

Further details regarding the characteristics, needs, priorities and visions for the three focus areas are included in later sections of this report.

Completed Studies and Projects:



Ongoing and Future Work:

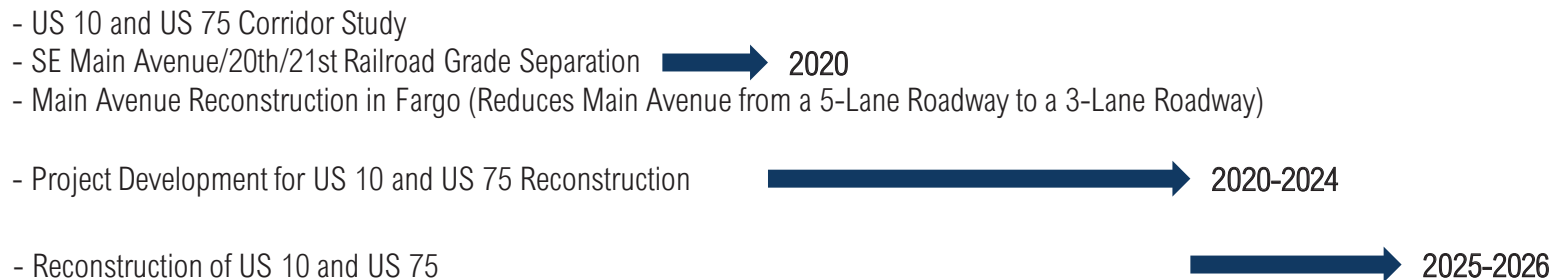
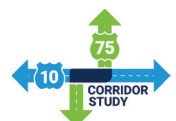


Figure 1: Timeline for Projects Impacting Downtown Moorhead

US 10 / US 75 Corridor Study



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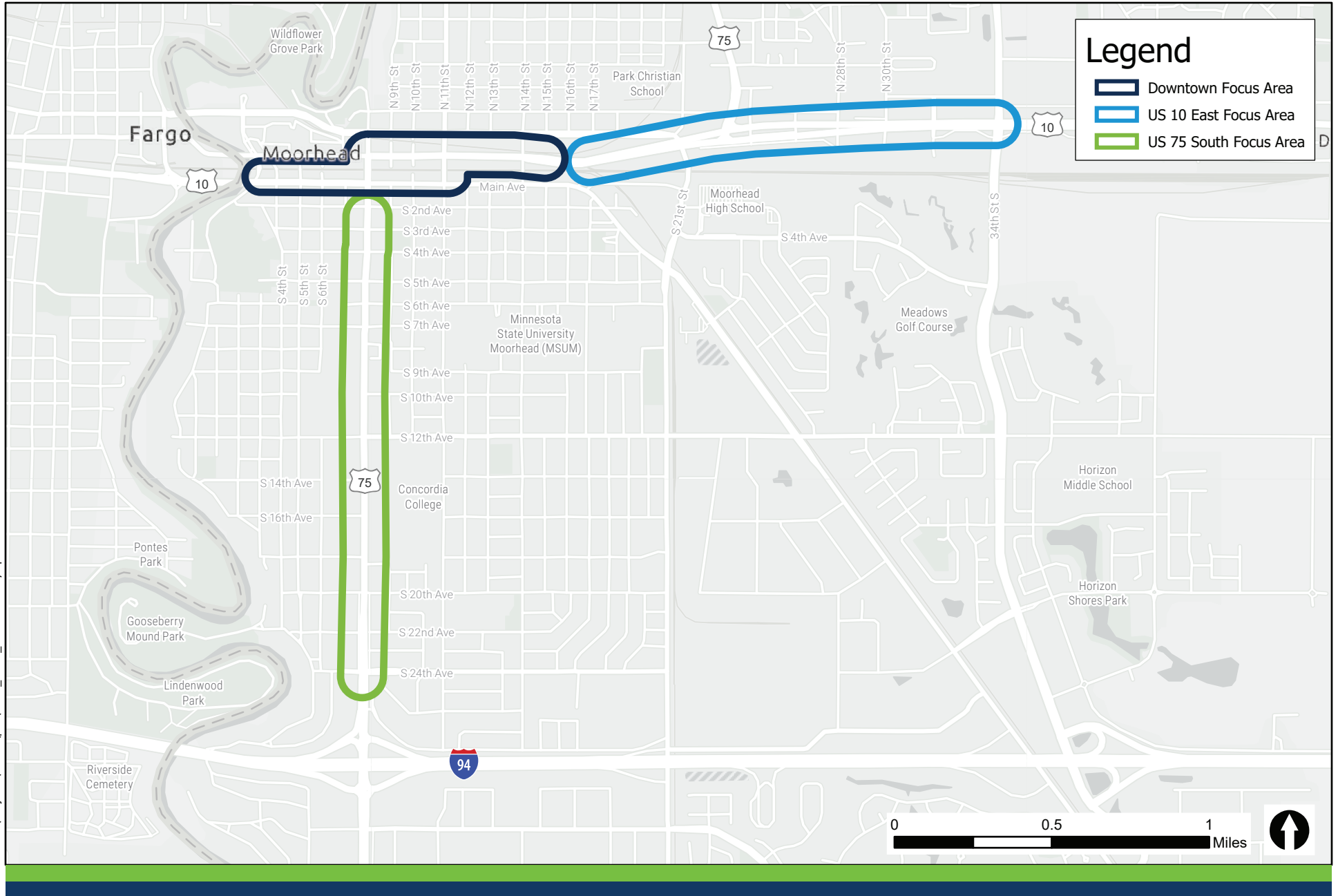


Figure 2: Focus Areas

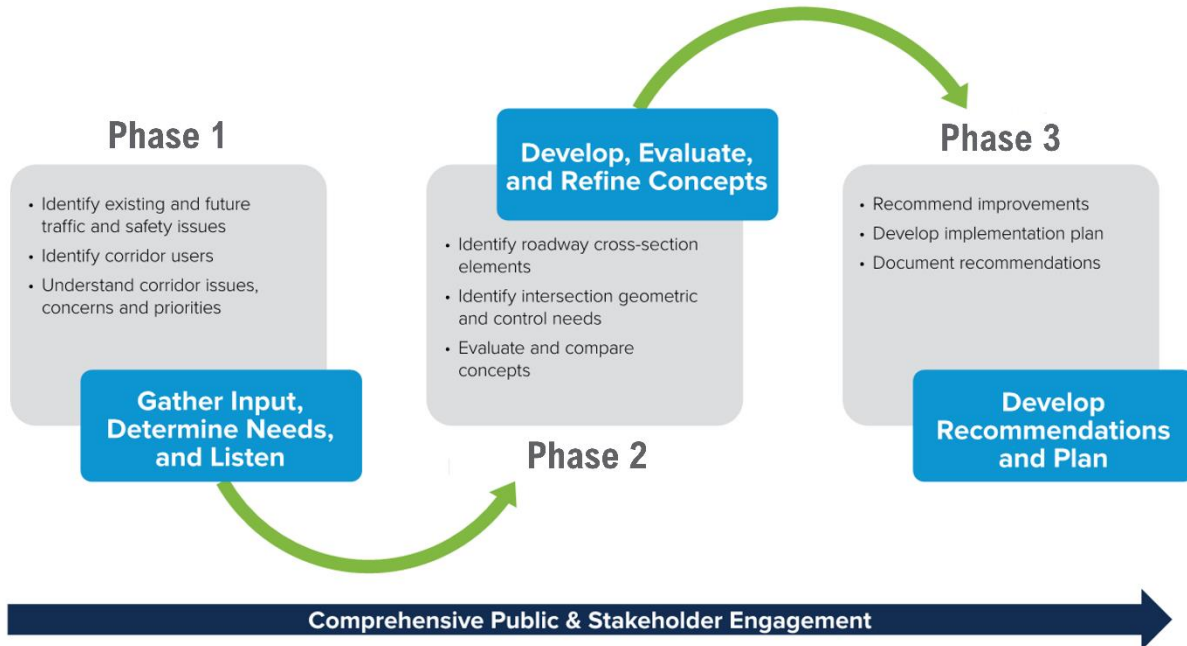
US 10 / US 75 Corridor Study



Study Process

The study was conducted in three phases as illustrated in Figure 3 with a focus on working with various stakeholders and providing numerous opportunities for community input. Guidance and decision-making were led by a Study Review Committee (SRC) consisting of the study partners of Metro COG, the City of Moorhead, Downtown Moorhead, Inc., MnDOT and MATBUS. The SRC played a key role in ensuring data needs were accommodated, issues were heard and vetted, alternatives developed were feasible and the evaluation was technically sound, and the final recommendations and implementation plan address the needs of the corridors.

Figure 3: Study Process



Phase 1 included developing the purpose and need for the study along with the identification of issues and priorities, and subsequently developing corridor visions. This included reviewing previous area studies, collecting traffic counts and conducting an evaluation of the area’s crash history and land use and development plan. An important outcome of this phase was developing an understanding of how both US 10 and US 75 function today and what future changes may influence the corridors. Engagement in this phase focused on gathering input, determining needs and listening.

Phase 2 included identifying potential alternatives. This included roadway cross-sectional elements that could fit within the existing right of way, intersection control alternatives at key intersections, pedestrian and bicycle enhancements, and geometric and access alternatives along both corridors. Alternatives were evaluated and compared to determine their effectiveness in meeting the purpose and need. Engagement in this phase focused on gathering the community’s support and input on the range of alternatives developed.

Phase 3 included the development of recommendations along with an implementation plan to identify the order in which the corridors would be reconstructed. Engagement in this phase focused on education of the study outcomes while providing feedback on how the community’s input was used to inform recommendations. This last phase also provided information on what the community can expect moving forward.

Engaging the Community

Highlights:

- Community input was a major component of the study since there are varying land uses and many different types of users along the US 10 and US 75 corridors.
- In-person stakeholder meetings, public community events and pop-up meetings were used to obtain input and educate a wide cross-section of the community. On-line surveys were also used to capture even a broader cross-section of corridor users. Presentations were conducted to keep elected officials informed.
- Many communication channels were used to reach out the community, including hosting a study website.
- Over 1,650 people were reached through the engagement efforts. Input was used to establish existing conditions, inform the vision for the corridors and/or the development of concepts.

The US 10 and US 75 corridors are unique and serve many types of land uses and corridor users. To ensure the proper balancing of needs between motorized and non-motorized users while considering the benefits and impacts to local businesses, community input was a major component of the study to help identify context sensitive solutions. Below is a brief summary of the overall study engagement efforts and more details follow that summarize the opportunities provided for public input along with what was heard throughout. Additional details, overall engagement summaries and survey data are included in Appendix A. Input from the engagement was used to establish existing conditions and to inform the vision and concepts.

Public & Stakeholder Engagement Summary

1650+
people engaged

Broad public engagement and specific outreach for each Focus Area

10+ ENGAGEMENT STRATEGIES



WHAT WE HEARD

- The corridors should be planned to accommodate all users.
- Streetscape improvements, including wider sidewalks, artistic elements, and designs for safer crossings, should be considered.
- Bicycle and pedestrian infrastructure improvements are needed.
- The US 10 corridor could be improved by making design changes to reduce vehicular speeds.

ROUND 1

126

surveys completed

43

people attended in-person engagement events

ROUND 2

261

surveys completed

100

people attended in-person engagement events

730

written comments received

ROUND 3

400+

attendees for online open house

10

public comments received



Attendees support the Locally Preferred Downtown Focus Area Alternative

Opportunities for Community Input

Stakeholder Focus Group Meetings

Stakeholder focus group meetings were held in March, May and August of 2019 with **five main stakeholder groups**. Downtown, US 75 South and US 10 East focus group meetings included a presentation followed by a facilitated discussion regarding issues, concerns and priorities, and to brainstorm ideas for the corridors. For the Moorhead Business Association (MBA), a presentation was given along with discussion and a question and answer session. The last meeting included State Patrol, Police, Fire and Emergency Services to discuss options for maintaining the vehicle inspection site on US 10 just east of the US 10 and US 75 split. Feedback, as summarized in Table 1, was important in shaping an overall understanding of key issues and priorities of those directly impacted by the corridors.

Table 1: Input from Stakeholder Focus Group Meetings

Key Stakeholder Input	Establish Existing Conditions	Inform Corridor Visions and Concepts
Downtown Focus Group		
Desire to improve downtown area for walkers and bikers making it more pedestrian friendly and a better place for residents to live, work and play. Downtown Moorhead is experiencing high-density residential growth. Input included addressing the lack of on-street parking, improving the visibility of pedestrian crossings, improving north-south bike connections and widening sidewalks where opportunities are presented. Current parking regulations can be problematic for existing and future business owners.	✓	✓
Desire to provide opportunities to improve the streetscaping or art elements along the corridors to improve the “gateway” feel of downtown and calm traffic speeds. Corridors and intersections are wide and do not provide any traffic calming.	✓	✓
Need to consider how to promote connections for walkers and bikers between downtown and US 75 (8th Street) south of downtown. Connections are currently lacking.	✓	✓
Need to consider how delivery trucks navigate downtown. Many deliveries occur using the dead-ends on the north side of Main Avenue.	✓	✓
Strong desire to consider road diet on Main Avenue similar to what is being done on the Fargo side of the Red River. The road diet would promote a walkable and bikeable environment while addressing on-street parking concerns.		✓
US 75 South Focus Group		
US 75 (8th Street) is an important corridor for Moorhead by having access to I-94 but having another access to I-94 at 20th Street would better distribute traffic in the area allowing for more opportunities to “right-size” US 75 (8th Street).	✓	
Trucks have difficulty turning from US 75 (8th Street) due to narrower side-streets, specifically at 7th Avenue.	✓	
US 75 (8th Street) feels like a “highway”. Currently there is not signage or gateway features directing users to Minnesota State University Moorhead. Need to improve the environment to stimulate development activity.	✓	✓
It was recommended from the group that the “jog” on US 75 (8th Street) between 4th Avenue and 5th Avenue be removed.	✓	✓
Consider a trail along US 75 (8th Street) north of 12th Avenue.		✓
Need to improve visibility of pedestrian crossings.		✓

Table 1: Input from Stakeholder Focus Group Meetings (continued)

Key Stakeholder Input	Establish Existing Conditions	Inform Corridor Visions and Concepts
US 10 East Focus Group		
Businesses feel isolated and have had costumers complain that they are difficult to access and there are minimal options to access them when walking or biking.	✓	✓
Group supports removal of wide median with the addition of trails on both sides of US 10 to complete the “gap” and improve the environment for walking and biking.		✓
Preference is to improve the aesthetics and feel of the corridor and connecting the character of US 10 between Moorhead and Dilworth.		✓
Moorhead Business Association (MBA)		
Desire is to make Main Avenue west of US 75 (8th Street) more walkable as this is an area of importance for businesses.		✓
Consider making all 5th and 11th Streets two-way traffic instead of one-way traffic.		✓
Consider the impacts to trucks with narrower lanes. Consider how deliveries can be accommodated with narrower lanes and a potential reduction in the number of lanes (use on-street parking as loading zones). Can trucks be directed to use 20th Street?		✓
Desire is to make US 75 (8th Street) more urban with the goal of slowing down traffic. Can traffic be diverted to other roads, such at 20th Street since it is underutilized? Is there a future project at I-94/20th Street interchange to provide all movements? It was recommended from the group that the “jog” on US 75 (8th Street) between 4th Avenue and 5th Avenue be removed.		✓
Left-turns to US 75 (8th Street) are challenging at 2nd Avenue. Further, there is a significant number of pedestrians crossing US 75 (8th Street) at 2nd Avenue due to the existing bus stop and pedestrians crossing to access Hornbacher’s and Dorothy Day.	✓	✓
Access modification (median closure) on south side of US 10 at 34th Avenue was noted as a positive since this area is congested and is a safety concern.	✓	✓
For access options along US 10 East, should 30th Street be the main connection as it keeps transfer station traffic off 28th Street?		✓
Are businesses going to be “hurt” by not being “fronted” by US 10 if vacated land is redeveloped? Need to consider the impacts to the businesses.		✓
State Patrol, Fire, Emergency Services		
Emergency Services noted concerns with the safety of the 21st Street/1st Avenue intersection. Emergency Vehicle Preemption (EVP) is being planned for installation by the City of Moorhead.	✓	
State Patrol prefers to maintain existing commercial vehicle inspection site on US 10 East as this is an ideal location, but it is not required to be in the median. Certain permits that are issued where commercial vehicles need to be on a state highway instead of I-94. State Patrol’s preference is to maintain the site in both directions in low speed environment if possible, because of the use of a portable Weigh-in-Motion (WIM) apparatus that is bi-directional. Flagging occurs at 24th and 26th Streets with only one pullover on each side at a time.	✓	✓

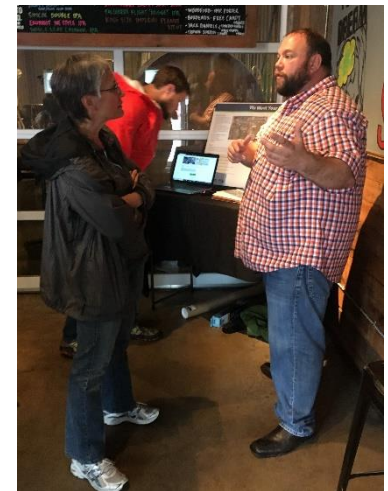
Community Events

In-person and online opportunities were held throughout the study for the broader community. The purpose was to share information about the study face-to-face with community members and ask for their experiences and feedback based on the information presented. All informational materials shared at the events were made available on the study website. For in-person opportunities, study partners were available to help answer questions, address concerns and collect input from the attendees.

The first public community event held in February 2019 occurred at the beginning of the study. The event served as an opportunity to introduce the study, the partners, and explain how the public would play a role in shaping the final recommendations. This was the first study partners met with the overall community in-person and allowed for two-way dialogue to occur. Verbal and written feedback were documented with the **first study survey** providing a foundation of information to guide the study forward. Maps and a dot voting exercise were used to establish issues and priorities. For community members unable to attend the community event, an online survey was made available which sought similar feedback as the community event, making it possible for community members to provide input in a variety of ways. Input included issues and priorities for the corridors along with concept ideas.



The second community event was replaced with an **online story map** due to the COVID-19 nationwide pandemic. Information was produced for online viewing beginning in May 2020 and served as the culmination of data collection, analysis and public engagement efforts. The intent of this engagement was to inform the community of the study findings and recommendations and gauge support for potential redesigns of Main Avenue in downtown Moorhead. The story map highlighted the corridor visions and locally preferred concepts. Additional information was provided on next steps regarding the implementation of the visions and access to the draft study report was included. The story map also included an opportunity for community input if desired. The respondents indicated support for the locally preferred concept for Main Avenue.

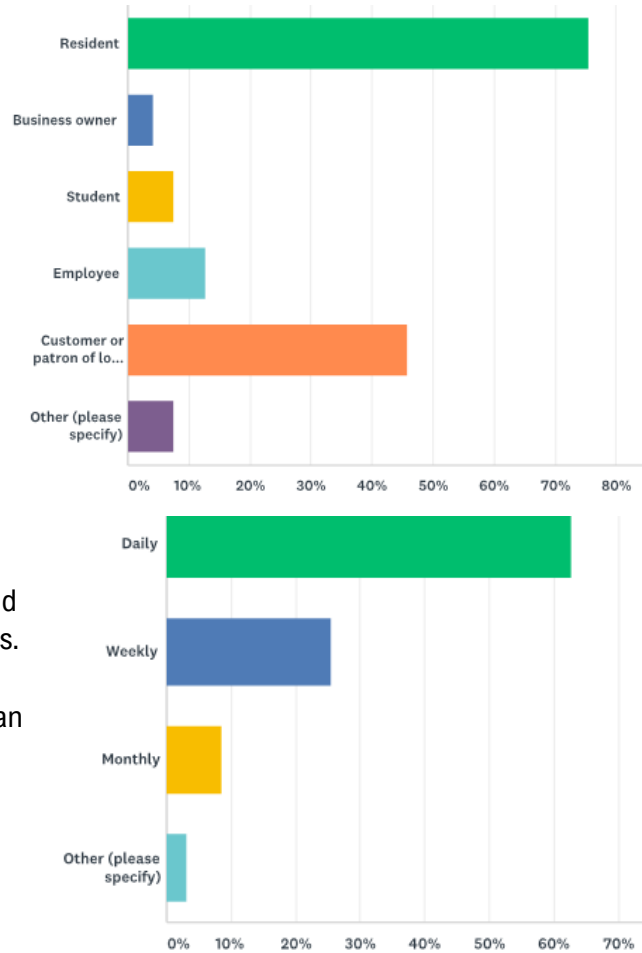


Pop-up meetings were held in June of 2019. The purpose of these meetings was to meet people where they are as opposed to asking people to come to us. These meetings were used to disseminate information to the community about the study, where they can find more information, how they can become involved, and to issue the **second study survey**. Boards with information were available and paper and online access to the survey were provided.

An additional pop-up meeting was held in February 2020 in conjunction with engagement efforts taking place for the Moorhead Downtown Master Planning study. Staff were available with informational materials to provide an update on the study and answer questions regarding potential concepts for the corridors. Additional engagement provided by the downtown study team noted the Main Avenue (US 10) corridor from the Red River to 8th Street (US 75) will be designated as a walkable development district with complete streets characteristics. 8th Street (US 75) south of Main Avenue (US 10) will also be designated as a walkable development district that transitions to a preserved neighborhood district at 4th Avenue. This portion of 8th Street prioritizes vehicular safety and pedestrian safety improvements given this is a higher vehicular-volume street.

Community Input Surveys

The first study survey aimed to determine user issues and priorities for each focus area to understand who uses the corridors and how often. Multiple options were available, and respondents could select more than one use of the corridor. Of the respondents, almost 80 percent indicated they use the corridors as resident and almost 50 percent indicated they use the corridors as a patron of local businesses. Just over 60 percent of the respondents indicated they use the corridor daily. A summary of the takeaways from the initial survey are included below:



Downtown Focus Area

- At six of the nine intersections evaluated, walking and biking was ranked as higher priority than vehicles.
- Walking and biking improvements, traffic congestion and issues with the railroad ranked top 3 for all intersections.
- Trucks were noted as an issue in downtown.
- Improving the placemaking, streetscaping and pedestrian environment was a priority.
- Coordination of signals is needed, especially their interaction with the trains.

US 75 South Focus Area

- Need for walking and biking accommodations ranked highest for all intersections.
- US 75 (8th Street)/12th Avenue intersection is highly used and has issues.
- Corridor has high speeds and no biking infrastructure.
- It is difficult to cross US 75 (8th Street) as walker or biker.
- Bus stops require buses to stop in traffic.
- Short cross-street green times cause red light running.

US 10 East Focus Area

- Vehicles are predominant use, but there is a desire for walking and biking uses.
- The 21st Avenue/1st Avenue intersection showed strongest desire for walking and biking improvements while the US 10/75 intersection showed the strongest desire for vehicle improvements.
- Intersection designs on west end are confusing.
- Need to determine future “character” of this corridor and area.
- Speeds are an issue and need to evaluate all intersections together and address the corridor.

The second survey was intended to obtain feedback on the concepts being considered for the corridors; however, most of the value from this survey came from the written comments. Almost 730 written comments were provided which helped inform the corridor visions. These redacted comments are included in Appendix A and were used to refine the corridor visions presented later in this report.

Community Presentations

Findings and recommendations from the study were presented to the community in May 2020. Three different opportunities were made available to view the presentation online and provide feedback:

- Moorhead City Council Meeting – May 11, 2020
- Metro COG Transportation Technical Committee (TTC) – May 14, 2020
- Metro COG Policy Board – May 21, 2020

The Moorhead City Council approved a resolution in support of the study. Both the Metro COG TTC and Policy Board also recommended approval of the study. No feedback from the community was submitted at these presentations.

Communications

Metro COG hosted a **study website** (<http://www.fmmetrocog.org/projects-rfps/us-1075-corridor-study>) that contained background information, promotion of upcoming public engagement events, meeting materials and contact information. Information on “what we heard” throughout the study was also included to report back to the public regarding their input and feedback. Additionally, multiple communication channels were used to notify area businesses and residents, community members, and regional users about the study’s engagement activities.

Email announcements were distributed prior to each focus group and community event. **Social media** was used via Metro COG and MnDOT social media channels. MnDOT ran Facebook ads in advance of both community events. **Press releases** were sent to local media outlets and posted on the Metro GOG website prior to the two community events.

Coordination with Other Studies

Highlights:

- Three studies in downtown Moorhead directly influence the vision and recommendations for the US 10 / US 75 Corridor Study.
- The 12th Avenue Corridor Study recommended improvements at the 8th Street (US 75)/12th Avenue intersection that are adopted by this study.
- Current work for the Proposed Downtown Moorhead Railroad Crossing Mobility Improvement Project was coordinated with this study, and future outcomes and recommendations will be adopted.
- The visions developed for the US 10 / US 75 Corridor Study will be coordinated with the overall Moorhead Downtown Master Plan efforts, including recommendations regarding future roadway types and improvements for pedestrians and bicyclists.

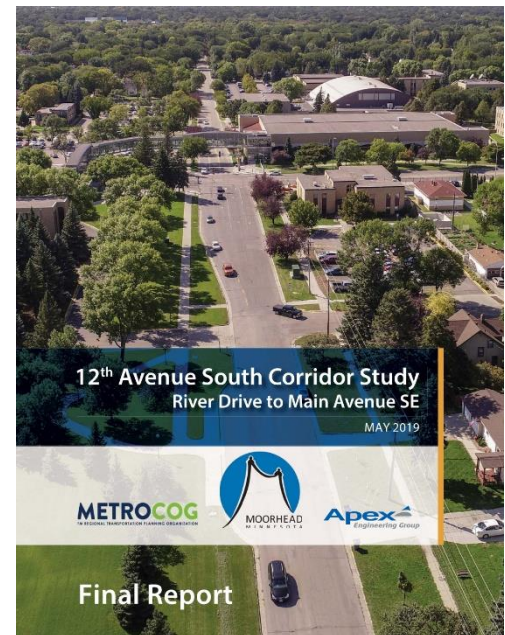
There are three other studies that overlap with the study area of the US 10 / US 75 Corridor Study. The study partners coordinated with the project teams of the studies to ensure a cohesive vision and plan for the corridors. Those studies included:

- 12th Avenue Corridor Study
- 11th Street Grade Separation
- Moorhead Downtown Master Plan

A brief summary of these studies along with how they influence the US 10 / US 75 Corridor Study are included below. Since the studies will be completed at different times, recommendations for each study will be adopted.

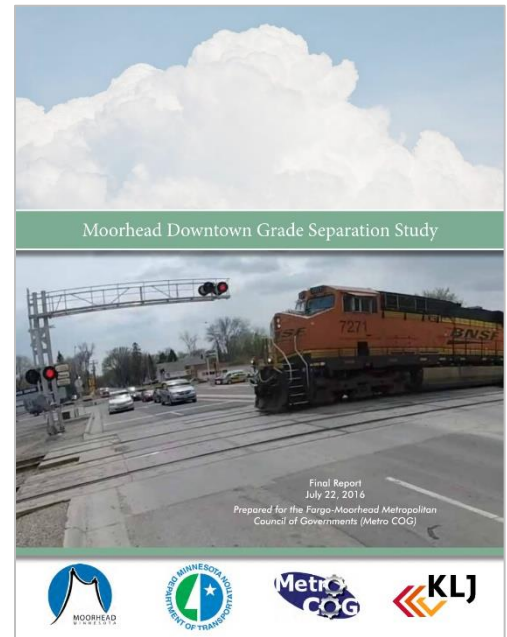
12th Avenue Corridor Study

The City of Moorhead currently has a project programmed for 2020 to construct improvements on 12th Avenue. A study was completed in 2019 that identified existing and future intersection operation issues (i.e., long delays and traffic queues) at the 8th Street (US 75)/12th Avenue intersection, a need to address the lane shift offset traveling east-west through the intersection, and a need to improve accommodations for pedestrians and bicyclists. At the intersection, improvements include modifying the eastbound approach from a left-, shared thru/right-turn lane configuration to a shared left/thru and right-turn lane configuration, which requires modifications to the curb to better align the eastbound/westbound through lanes, and removing the eastbound left-turn protected signal phase. Further, it was recommended to install a Leading Pedestrian Interval (LPI) to allow pedestrians to start crossing before vehicles are given a green light to proceed through the intersection and to install “No Right Turn on Red” blank out signs at the intersection. During the peak periods during the school year, it is recommended that vehicles continue to be directed to not make right-turn on red for pedestrian safety considerations. The study also recommended installing a shared-use path on the south side of 12th Avenue between 5th and 11th Streets.



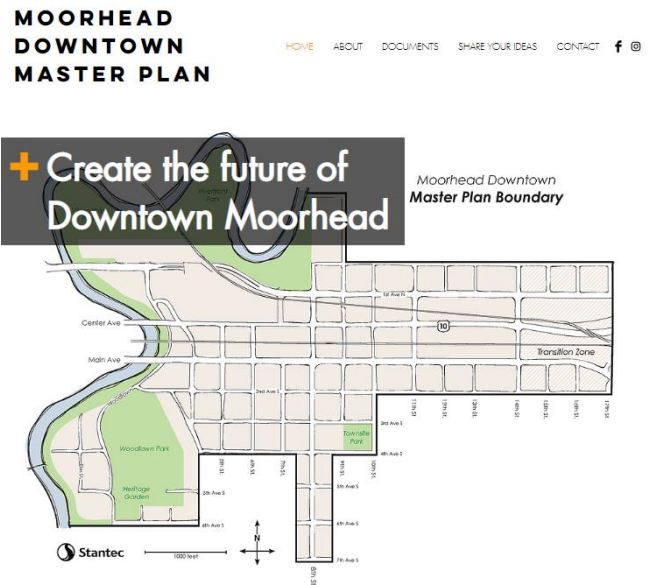
11th Street Grade Separation

MnDOT and the City of Moorhead are currently partnering on the layout and environmental documentation phase of an underpass project in downtown Moorhead. The project includes two grade-separations of US 10/75 under the BNSF rail lines, paving, pedestrian accessibility (ADA) improvements, utility replacements and signals. Moorhead is bisected by multiple rail lines and this project provides many safety and mobility benefits by removing crossing blockages caused by heavy rail traffic. This project was initiated through a long history of evaluating and identifying solutions to address safety and mobility issues and Moorhead, including the previously identified Moorhead Downtown Grade Separation Study which recommended 11th Street as the location for the future grade-separations. The US 10 / US 75 Corridor Study coordinated traffic projections and traffic operations modeling with efforts currently being undertaken by MnDOT and the City of Moorhead. The outcome of the environmental documentation and layout will supplement the recommendations from this study. Additional details can be found here: <http://fmmetrocog.org/projects-rfps/completed-projects/12th-avenue-south-corridor-study>.



Moorhead Downtown Master Plan

The City of Moorhead and Downtown Moorhead, Inc. are currently developing a 20-year Downtown Master Plan. The plan is building on recent efforts in the downtown area to make the area a better place to socialize, work, shop and live. This began with the City's approval to reduce Center Avenue from a four-lane roadway to a three-lane roadway that will accommodate vehicular traffic and on-street parking while improving the environment for pedestrians and bicyclists. The plan is anticipated to be completed in the summer of 2020. The visions developed for the US 10 / US 75 Corridor Study will be coordinated with the overall downtown planning efforts, including recommendations regarding future roadway types and improvements for pedestrians and bicyclists in downtown. Additional details can be found here: <https://www.dtmoorheadplan.org/>.



Understanding Existing Conditions

Highlights:

- Historical traffic volumes in Moorhead have remained relatively unchanged. Redevelopment growth in downtown Fargo has significantly increased, but traffic volumes on major roadways have not increased, suggesting that a mode shift has occurred.
- Existing mobility issues were identified at the Center Avenue (US 10)/30th Street, 8th Street (US 75)/2nd Avenue South, and 8th Street (US 75)/4th Avenue intersections.
- Train events impact traffic resulting in poor travel time reliability in the downtown area causing drivers to re-route.
- Existing safety issues were identified at the Center Avenue (US 10)/34th Street and 8th Street (US 75)/2nd Avenue intersections. Safety issues were also identified along Main Avenue (US 10) from the river to 9th Street and along Center Avenue (US 10) from 21st Street/1st Avenue to 34th Street.
- All study segments except Center Avenue (US 10/75) from 14th Street to 21st Street/1st Avenue exceed the standard with respect to access density (i.e., number of access points per mile).
- There is an existing gap in the pedestrian/bicycle network along Center Avenue (US 10/75) between the 11th Street and 21st Street/1st Avenue intersections. Shared use trails are provided along 8th Street (US 75) south of 12th Avenue on the east side of the road and along Center Avenue (US 10) east of 28th Street.
- MATBUS transit routes operate along or across the US 10 and US 75 study corridors.
- Land uses along the corridors vary. Main Avenue (US 10/75) includes low- and high-density residential, low-density office, service, light industrial and commercial land uses. BNSF's KO and Prosper Subdivisions line the north and south sides of Main Avenue/Center Avenue (US 10/75). East of downtown there are commercial land uses. South of downtown includes low- to medium-density residential and institutional land uses.
- All study segments were identified to need pavement quality improvements within 10 years.
- Existing utilities (i.e., lighting, drainage/storm sewer, sanitary sewer, watermain, and private utilities) were documented.
- Preliminary archaeological, cultural, and historic resources near the US 10 and US 75 corridors were documented.

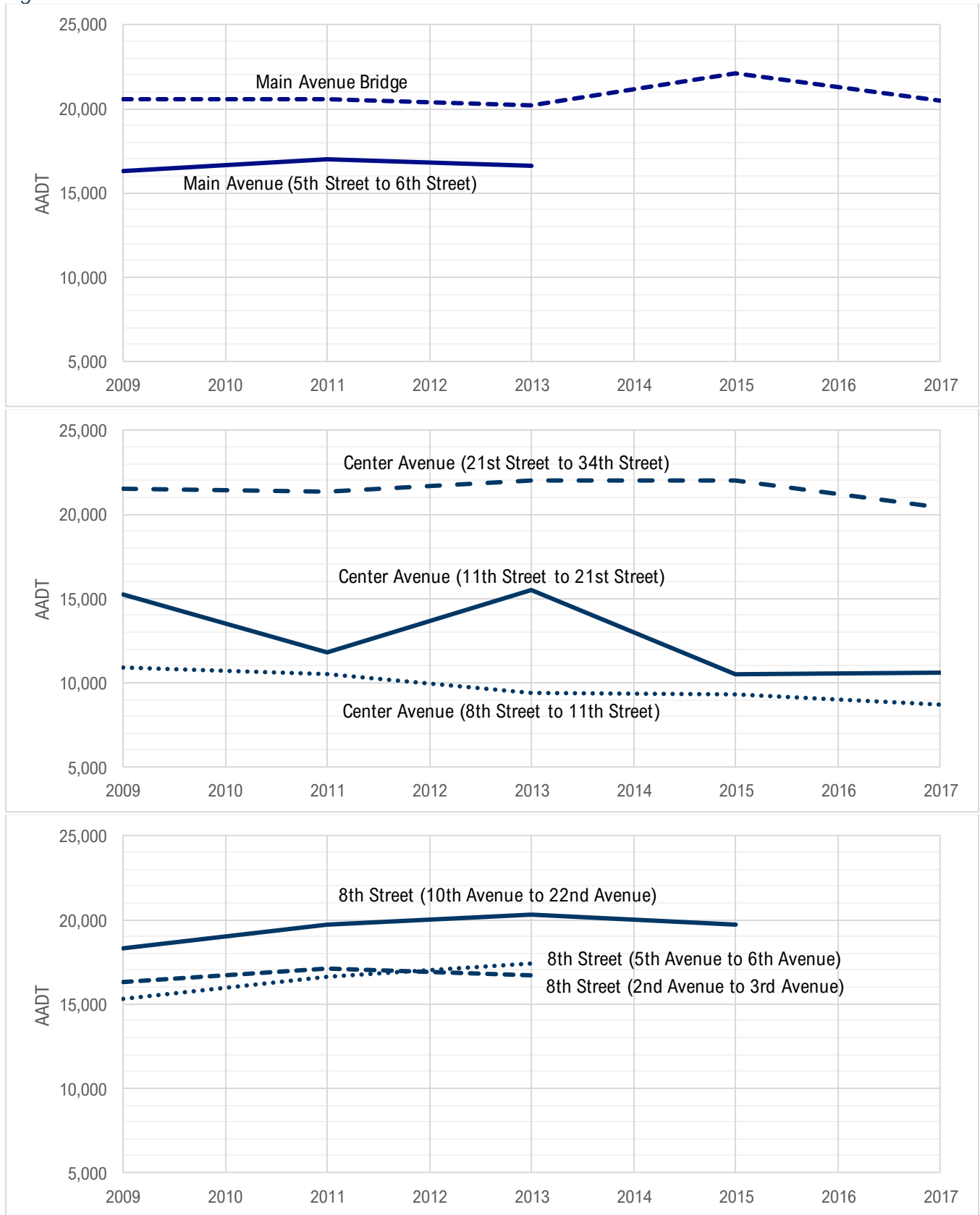
The existing conditions were reviewed for the study corridors to establish a baseline for future comparisons. This included evaluating the mobility, safety and access functionality of the corridors, including the influence of freight rail operations; reviewing pedestrian and bicycle facilities, transit considerations, and land use; understanding existing roadway design characteristics and utilities; and, understanding historical resources that will need to be considered as the reconstruction project develops. Additional details for this section of the report are documented in technical memorandums located in Appendices B-D.

Daily Traffic Volumes

Historical annualized average daily traffic (AADT) volumes provided by MnDOT were reviewed to identify traffic volume growth trends (see Figure 4). A review of data between year 2009 and 2017 indicates that traffic volumes have remained relatively consistent, but there are some locations where traffic volumes have increased an average of three (3) percent per year (i.e., along 8th Street (US 75) between 5th Avenue and 6th Avenue) and where traffic volumes have decreased an average of five (5) percent per year (i.e., along Center Avenue (US 10/75) between 11th Street and 21st Street/1st Avenue). Further details are included in Appendix C.

Additional traffic volume data in downtown Fargo were also reviewed. In the last 10 to 15 years, redevelopment growth in Fargo has significantly increased with the addition of apartment complexes along with office and retail development. However, traffic volumes along the major roadways in downtown Fargo, such as Main Avenue, 10th Street, and University Drive, have not increased. This could suggest that a mode shift has occurred that is associated with the development growth in downtown Fargo where there is a greater number of people walking, biking, and/or taking transit and/or residents and employees are making more multi-use type trips. Likely these trips are shorter with more residential uses in downtown. Further details are included in Appendix D.

Figure 4: Historical Traffic Volume Trends



Traffic Analysis

PTV VISSIM (Version 11.00-02) was used for the traffic analysis since it is an effective tool to analyze how pedestrian and train activity influence traffic operations. To support analysis, data for pedestrians, bicyclists, passenger vehicles, and transit vehicles and trucks for peak periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) were collected at intersections not directly impacted by current construction activities or where recent count data was not available. The data was supplemented by counts provided by the City of Moorhead that were previously collected when construction was not impacting traffic patterns. Short duration counts were also collected to estimate low-volume public or private driveway traffic volumes and patterns. Additional details regarding traffic data collection are included in Appendix B. It is recommended that new data be collected prior to the reconstruction project once traffic has stabilized following the many ongoing construction projects in the area. The existing peak hour traffic volume data set used for each focus area is shown in Figures 5-7.

Results for the traffic analysis identify a Level of Service (LOS) which indicates the quality of traffic flow through an intersection. Intersections are ranked from LOS A through LOS F based on average delay per vehicle. LOS A indicates the best traffic operation with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity, or a breakdown of traffic flow. LOS D or better is considered acceptable as this indicates the intersection can handle the traffic being evaluated. For non-signalized intersections with higher mainline traffic volumes it is typical 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. Results of the existing a.m. and p.m. peak hour traffic analysis are illustrated in Figure 8 and Figure 9, respectively. Additional details regarding the analysis, including detailed analysis outputs, are included in Appendix C.

Downtown Focus Area

Main Avenue (US 10) from the Red River through 8th Street (US 75) serves as one of three main east-west routes across the river generating traffic in downtown Moorhead. As traffic crosses the river into downtown, queuing is often experienced eastbound at the 4th Street intersection. A main connection to Main Avenue (US 10) between the river and 8th Street (US 75) is the 5th Street intersection, which serves traffic one-way from the south where traffic uses this intersection to bypass the heavily traveled Main Avenue (US 10)/8th Street (US 75) intersection. At the Main Avenue (US 10)/8th Street (US 75) intersection, long delays and queuing are routinely experienced causing congestion issues at the adjacent 7th Street and 2nd Avenue intersections. This is the key intersection in downtown Moorhead where the two study highways intersect. From here, traffic either stays on Main Avenue or turns and uses US 10/75 along Center Avenue. Drivers often choose their route based on train activity through downtown.

The two BNSF railroad subdivision lines in Moorhead were included in the analysis. The KO line operates between Center and Main Avenues. The Prosper line operates between 1st and Center Avenues. Railroad crossings have flashing light and gate signal systems, are within locomotive-horn Quiet Zones, and have advance pre-emption systems with the adjacent roadway and intersection traffic signal system. Generally, during train events queuing will extend into the adjacent intersections. Once the train event ends (i.e., the gate arms raise), most vehicles can clear in one signal cycle, with a portion of vehicles taking two cycles to clear. Also, during train events vehicles were observed to re-route through the study area to avoid the train.

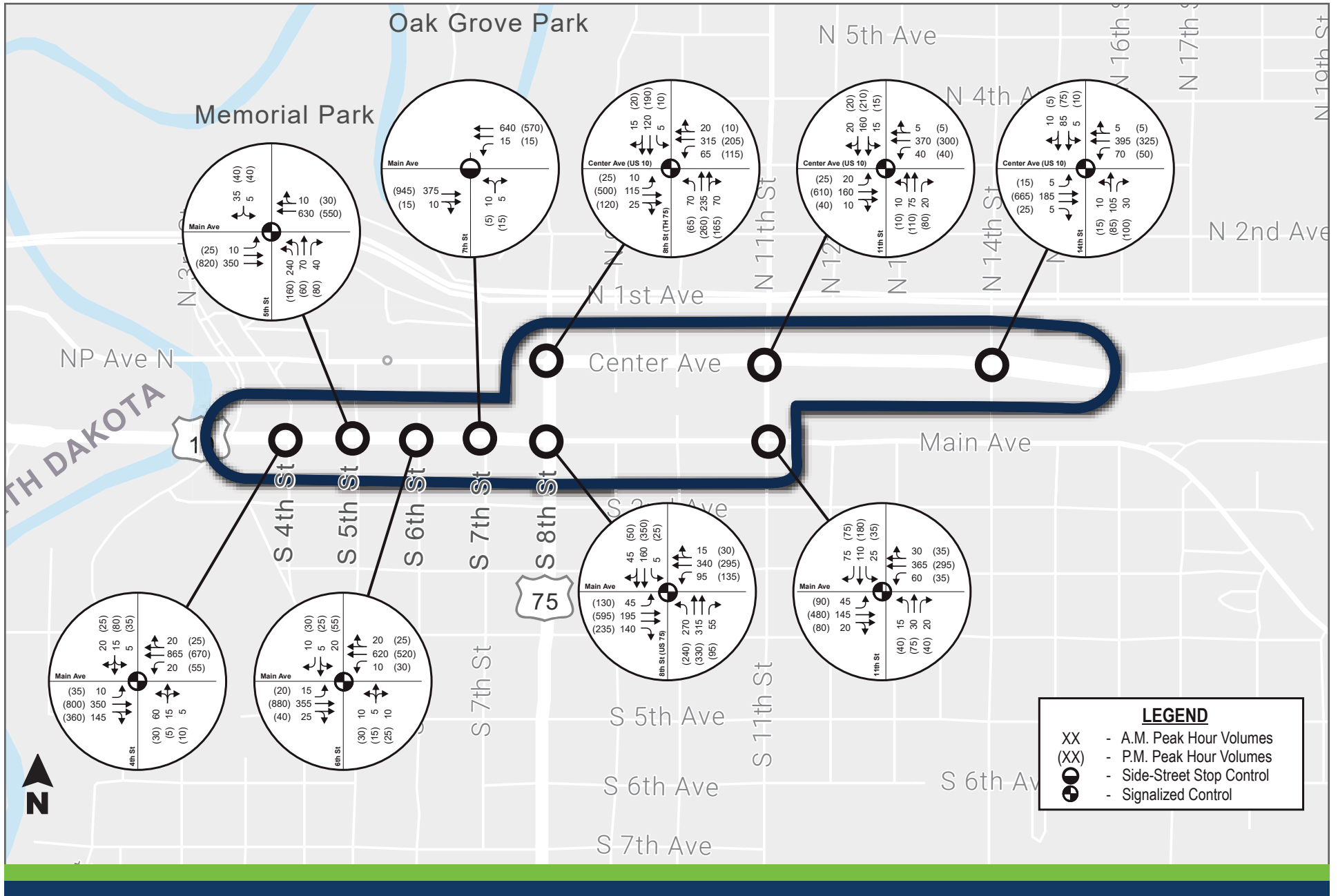


Figure 5: Existing A.M. Peak Hour Turning Movement Counts (Downtown)



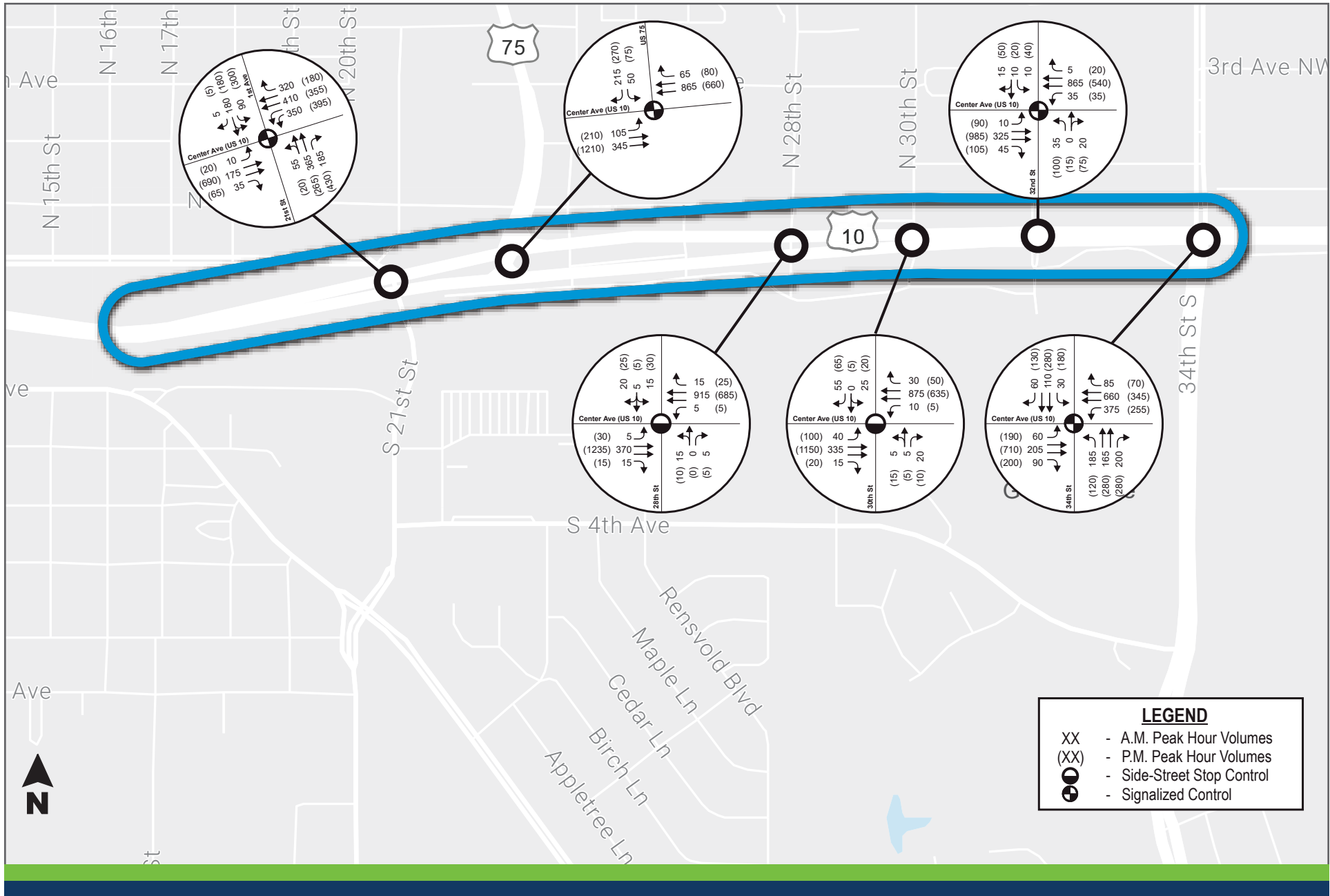
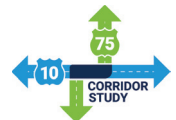


Figure 6: Existing A.M. Peak Hour Turning Movement Counts (East)



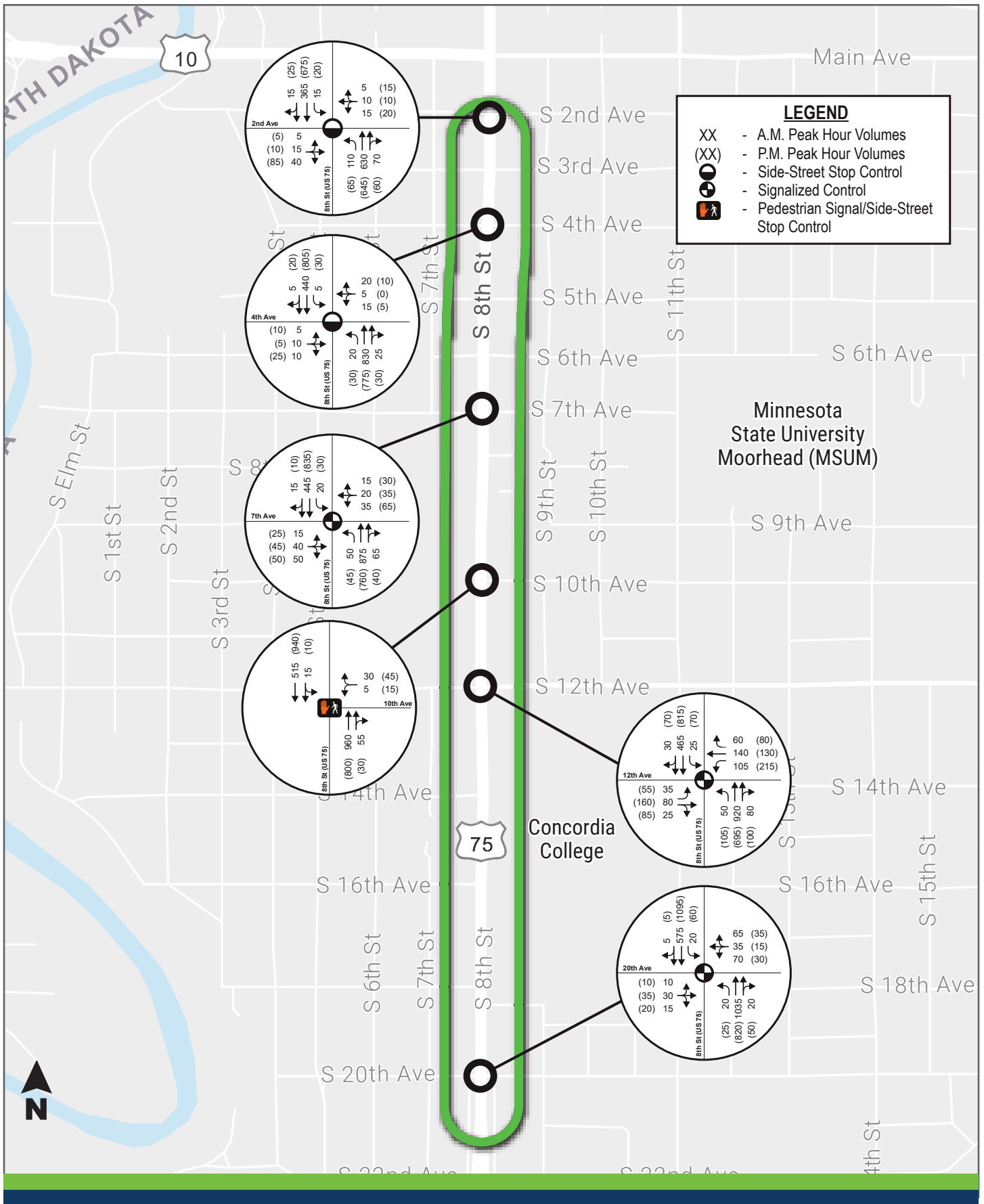
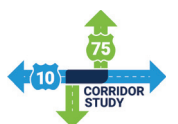


Figure 7: Existing A.M. Peak Hour Turning Movement Counts (South)



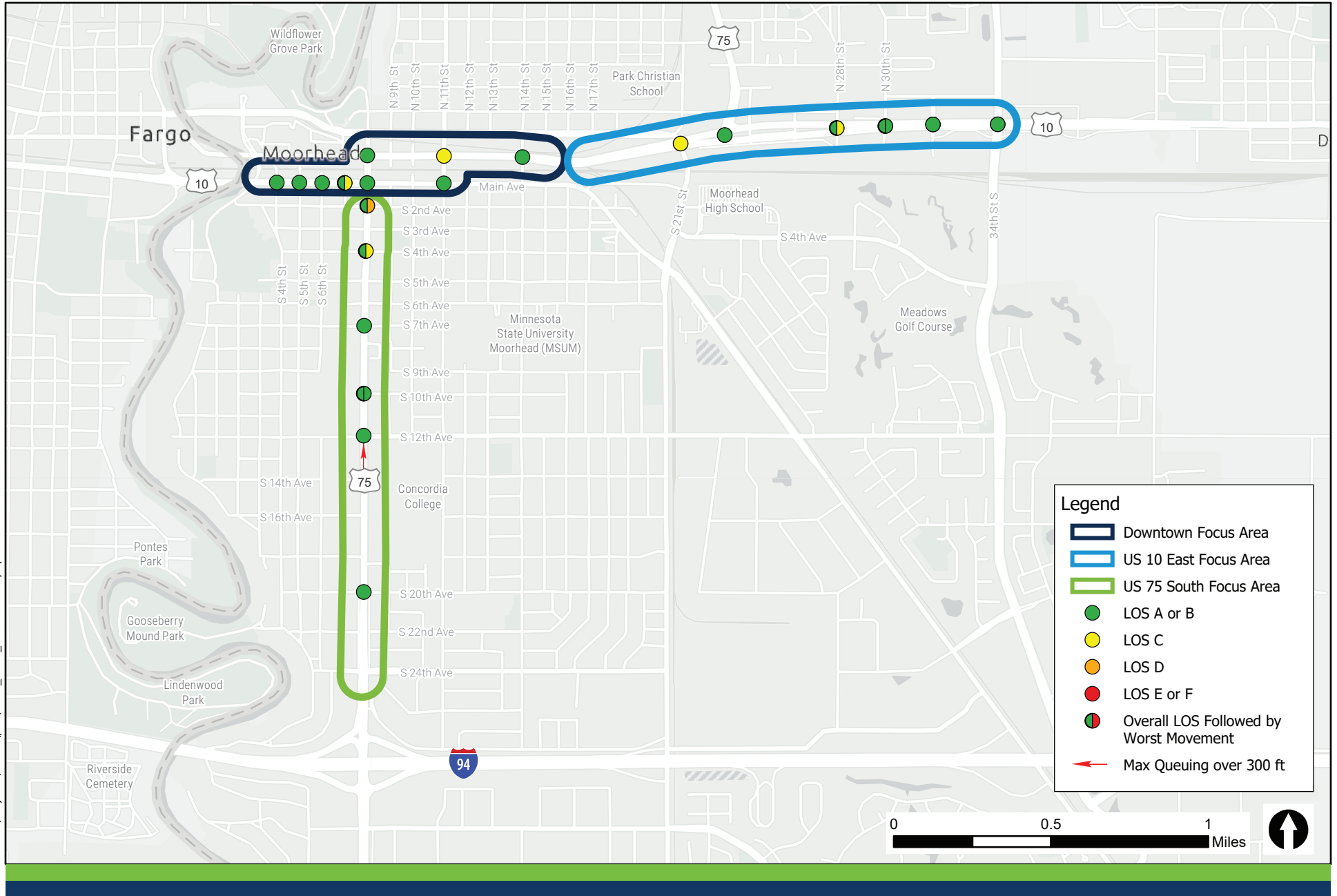
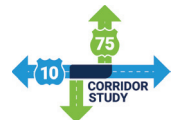


Figure 8: Existing A.M. Peak Hour Traffic Operations

US 10 / US 75 Corridor Study



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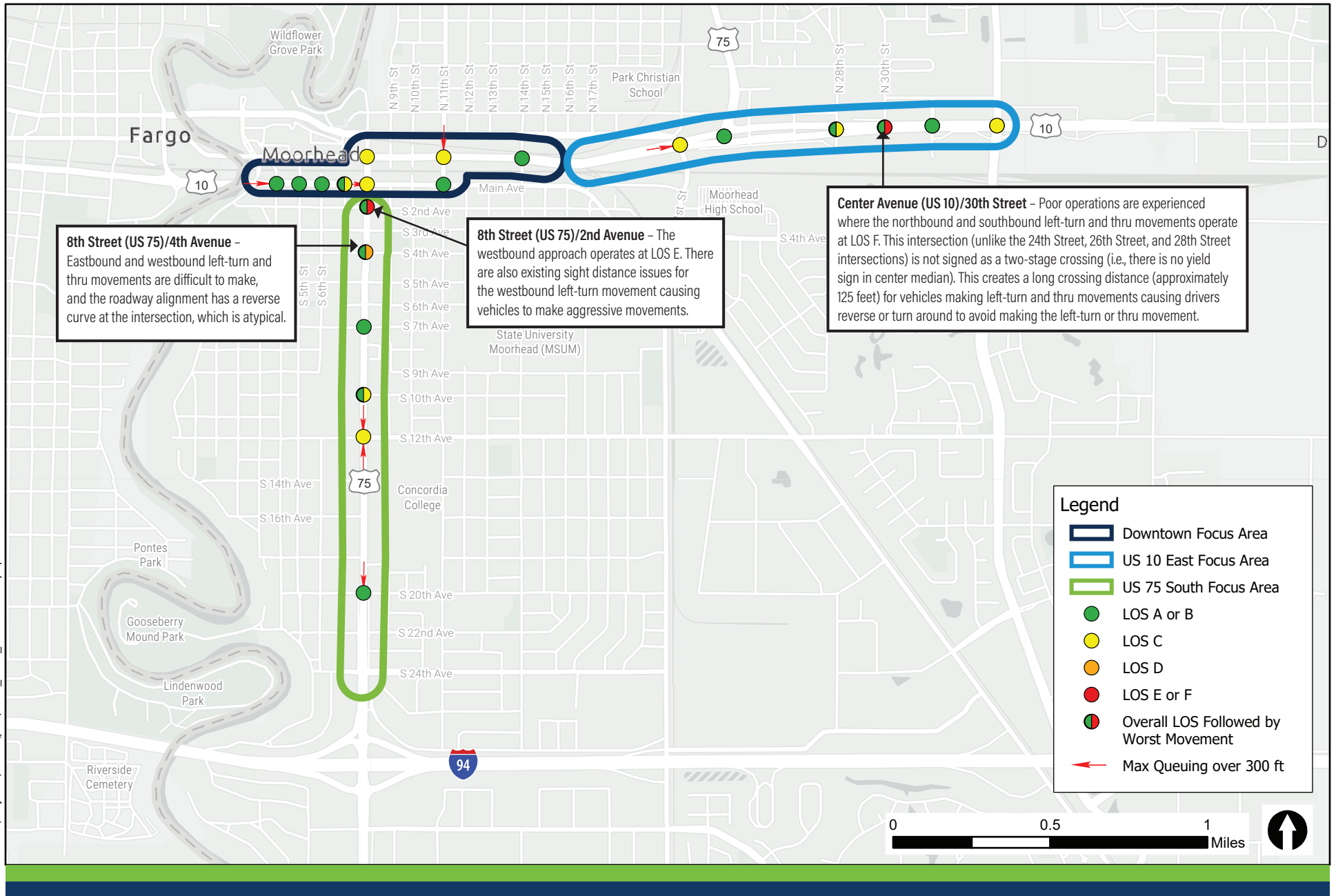
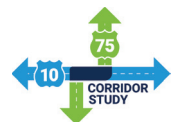


Figure 9: Existing P.M. Peak Hour Traffic Operations

US 10 / US 75 Corridor Study



US 10 East Focus Area

Center Avenue (US 10) east of downtown is the main east-west connection between Moorhead and Dilworth and connecting the Moorhead area to greater Minnesota. Key intersections along this stretch of US 10 include the 1st Avenue/21st Street, US 10/75 and 34th Street intersections. Additionally, the 28th and 32nd Street intersections serve as key connections to residential and commercial uses on both sides of the highway. At the 30th Street intersection, poor operations are routinely experienced where the northbound and southbound left-turn and thru movements are difficult to make. This intersection, which is unlike the 24th Street, 26th Street, and 28th Street intersections, is not signed as a two-stage crossing (i.e., there is no yield sign in center median). This creates a long crossing distance (approximately 125 feet) for vehicles making left-turn and thru movements causing drivers to reverse or turn around to avoid making the left-turn or thru movement.

US 75 South Focus Area

8th Street (US 75) serves as the main north-south connection to/from downtown Moorhead with I-94 serving many residential, institutional and commuter users. With heavy north-south traffic and congestion at the Main Avenue (US 10)/8th Street (US 75) intersection, poor traffic operations are experienced at the 2nd Avenue intersection. The westbound approach operates poorly and has long delays. There are also existing sight distance issues for the westbound left-turn movement causing vehicles to make aggressive movements. Further, the northbound left-turn from 8th Street (US 75) to 2nd Avenue is a heavy movement where drivers will use this intersection to bypass congestion at the Main Avenue intersection during train events. Congestion is also experienced at the 4th Avenue intersection where eastbound and westbound left-turn and thru movements are difficult to make, and the roadway alignment has a reverse curve at the intersection, which is atypical. At the 20th Avenue intersection, queuing heading towards I-94 is often experienced in the afternoon.

One of the other key intersections along 8th Street (US 75) is the 12th Avenue intersection. Poor operations are routinely experienced due to the many vehicles turning at this intersection that conflict with heavy pedestrian traffic associated with Concordia College. As previously noted, this intersection was studied at length as part of a separate corridor study and those study recommendations are adopted by this study.

Safety

Crash history was reviewed based on data from January 1, 2013 through December 31, 2017. This included reviewing the specific types of crashes that occur at the intersections and along the corridors (see Figure 10). Calculated crash rates (i.e., the number of crashes per vehicles entering the intersection for segment) were compared to typical Minnesota crash rates for locations with similar characteristics. A higher than typical crash rate does not necessarily indicate a significant crash problem, so the critical crash rates were also calculated to determine the statistical significance of the crash rates. If the crash rate is below the critical crash rate, crashes that occurred are typically due to the random nature of crashes and not to a geometric design or traffic control issue. Table 2 provides the summary of crash rates by intersection and Table 3 provides the rates by segment.

Table 2: Intersection Crash Rates (2013-2017)

Intersection	Crash Rate		
	Expected	Actual	Critical
Downtown Focus Area			
Main Avenue (US 10)/4th Street	0.70	0.35	1.05
Main Avenue (US 10)/5th Street	0.70	0.47	1.09
Main Avenue (US 10)/6th Street	0.70	0.28	1.09
Main Avenue (US 10)/7th Street	0.18	0.13	0.40
Main Avenue (US 10)/8th Street (US 75)	0.70	0.57	1.01
Main Avenue/11th Street	0.52	0.70	0.91
Center Avenue (US 10/US 75)/8th Street	0.70	0.79	1.12
Center Avenue (US 10/US 75)/11th Street	0.52	0.60	0.92
Center Avenue (US 10/US 75)/14th Street	0.52	0.32	0.93
US 10 East Focus Area			
Center Avenue (US 10/US 75)/21st Street/1st Avenue	0.70	0.73	1.01
Center Avenue (US 10)/US 75	0.70	0.32	1.03
Center Avenue (US 10)/28th Street	0.18	0.30	0.38
Center Avenue (US 10)/30th Street	0.18	0.17	0.38
Center Avenue (US 10)/32nd Street	0.70	0.27	1.06
Center Avenue (US 10)/34th Street	0.70	1.12	0.99
US 75 South Focus Area			
8th Street (US 75)/2nd Avenue	0.18	0.47	0.39
8th Street (US 75)/4th Avenue	0.18	0.27	0.39
8th Street (US 75)/7th Avenue	0.70	0.41	1.08
8th Street (US 75)/10th Avenue	0.18	0.24	0.34
8th Street (US 75)/12th Avenue	0.70	0.51	1.04
8th Street (US 75)/20th Avenue	0.70	0.38	1.01

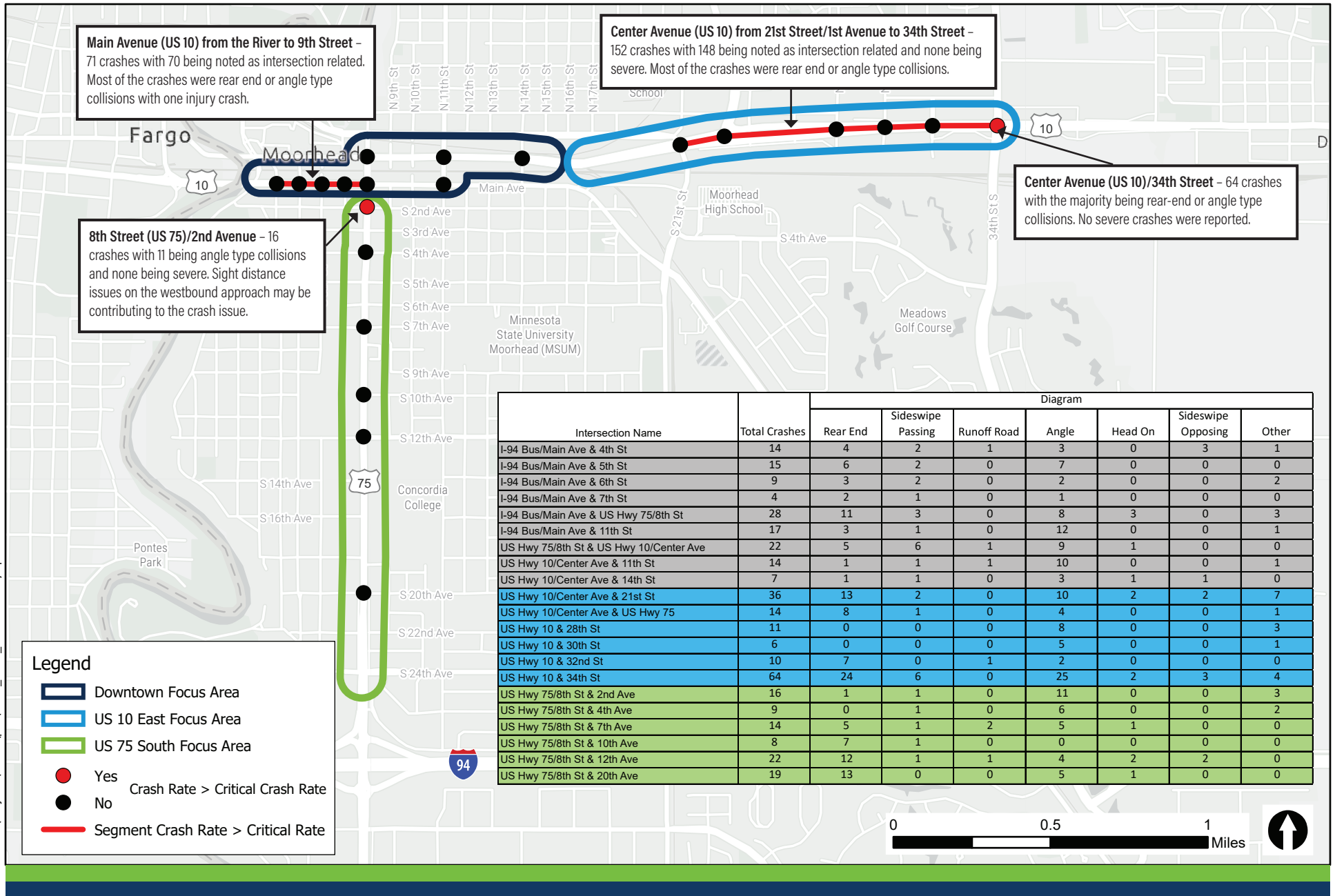


Figure 10: Crash History (2013-2017)



Table 3: Segment Crash Rates (2013-2017)

Corridor Segments	Crash Rate		
	Expected	Actual	Critical
Main Avenue (US 10) from the River to 9th Street	2.59	4.57	4.14
Main Avenue (US 10) from 9th Street to 12th Street	2.59	4.74	5.53
Center Avenue (US 10/US 75) from 7th Street to 15th Street	2.59	4.45	4.49
Center Avenue (US 10/US 75) from 15th Street to 21st Street/1st Avenue	2.76	1.62	5.02
Center Avenue (US 10) from 21st Street/1st Avenue to 34th Street	0.87	3.24	1.38
8th Street (US 75) from 2nd Avenue to 11th Avenue	2.59	2.78	3.92
8th Street (US 75) from 11th Avenue to 22nd Avenue	2.59	2.22	3.81

Based on the analysis the following deficiencies were noted, additional details regarding the safety analysis are included in Appendix C:

- **Center Avenue (US 10)/34th Street Intersection** – 64 crashes were reported with the majority being rear-end or angle type collisions. No severe crashes were reported.
- **8th Street (US 75)/2nd Avenue Intersection** – 16 crashes were reported with 11 being angle type collisions and none being severe. Sight distance issues on the westbound approach may be contributing to the crash issue.
- **Main Avenue (US 10) Segment from the River to 9th Street** – 71 crashes were reported with 70 being noted as intersection related. Most of the crashes were rear-end or angle type collisions with one injury.
- **Center Avenue (US 10) Segment from 21st Street/1st Avenue to 34th Street** – 152 crashes were reported with 148 being noted as intersection related and none being severe. Most of the crashes were rear-end or angle type collisions.

Severe crashes may be widely (but not randomly) scattered around the highway system. Therefore, the basic premise behind the systemic risk assessment approach is to examine the system to identify locations with similar characteristics that can be attributed to severe crashes that have been experienced elsewhere. Study locations with more characteristics like other locations that have severe crashes are considered more “at-risk” and are a higher priority for safety investment. Therefore, a systemic risk location is an opportunity, not an existing transportation “issue”. Based on data provided in the May 2016 MnDOT District 4 Safety Plan Update, all study segments and 18 intersections along the US 10/75 corridors were identified as being “at risk”. The plan stated that right-angle collisions and pedestrian involved crashes in urban areas were identified as priorities for safety investment and represent the greatest opportunity for reducing severe crashes in urban areas across the state system.

Access

The frequency of access points can impact safety (i.e., introduce unnecessary conflict points) and reduce the amount of traffic a roadway can carry. Roadways are classified based on their function, the types of land use they serve, and the number of access points permitted. Per MnDOT’s access spacing guidelines, “*it is MnDOT’s preference to permit public street connections rather than driveways in urban/urbanizing areas. Where possible, MnDOT should work with local agencies to encourage the development of a supporting road system to serve the property.*” In the urban core, driveways are permitted in areas where properties have access rights and no reasonable alternative is available for access to a public street. Table 4 summarizes the existing public and private access compared to access standards. Access locations are mapped in Figures 11-13.

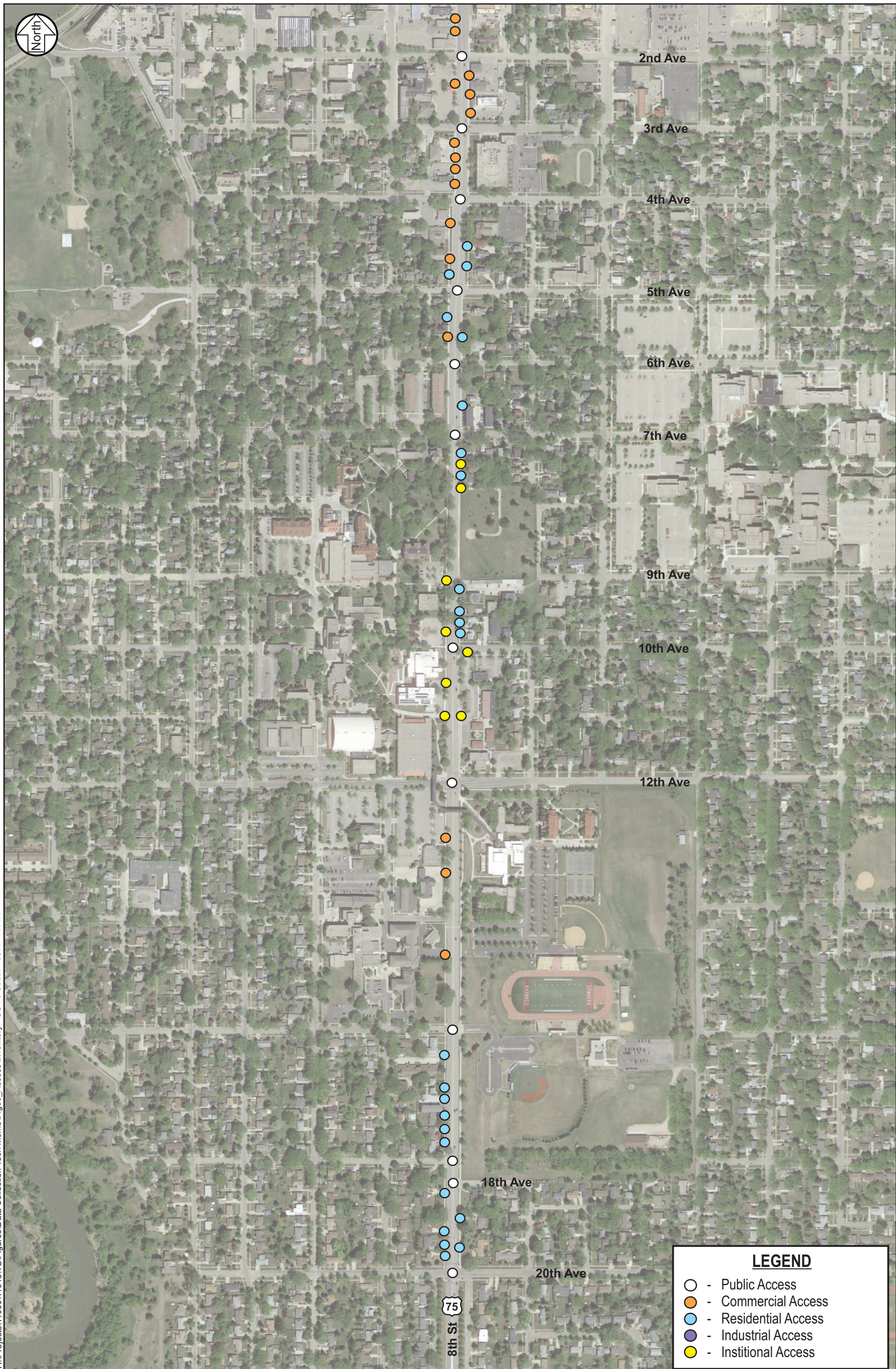
Table 4: Existing Public/Private Access Compared to Access Standards

Roadway Segment	Standard for Access Points (Private and Public)	Existing Access Density (Access/Mile)	Existing Access is...
Main Avenue (US 10) from the River to 8th Street	8-18	52	3 times higher than the standard
Main Avenue (US 10) from 8th Street to 11th Street	8-18	63	3.5 times higher than the standard
Center Avenue (US 10/US 75) from 8th Street to 14th Street	8-18	48	2.5 times higher than the standard
Center Avenue (US 10/US 75) from 14th Street to 21st Street/1st Avenue	4	4	In compliance with standards
Center Avenue (US 10) from 21st Street/1st Avenue to 34th Street	4	8	2 times higher than the standard
8th Street (US 75) from 2nd Avenue to 12th Avenue	8-18	60	3 times higher than the standard
8th Street (US 75) from 12th Avenue to 20th Avenue	8-18	36	2 times higher than the standard

8th Street (US 75) and Center Avenue (US 10/75) west of 14th Street are classified as urban core. Center Avenue (US 10/75) from 14th Street to 34th Street is classified as urban/urbanizing. Based on these assumptions, all segments except Center Avenue (US 10/75) from 14th Street to 21st Street/1st Avenue exceed the standard with respect to access density (i.e., number of access points per mile) as shown in Table 4. Additional details are included in Appendix B and C.







LEGEND

- - Public Access
- - Commercial Access
- - Residential Access
- - Industrial Access
- - Institutional Access

Pedestrian and Bicycle Facilities

Existing facilities for pedestrians and bicyclists were inventoried and are shown in Figure 14. There is an existing gap in the network for both users along Center Avenue (US 10/75) between the 11th Street and 21st Street/1st Avenue intersections where 2nd Avenue is the nearest east-west connection. Bicycle facilities (i.e., shared use trails) are provided along 8th Street (US 75) south of 12th Avenue on the east side of the road to 20th Avenue and along Center Avenue (US 10) east of 28th Street. Along 8th Street (US 75) the key east-west connections are at 7th Avenue, 10th Avenue, and at 20th Avenue. There are three Moorhead parks and recreation areas located within 1/8 mile of the corridors. No other existing trails or trails programmed for construction are included elsewhere along the US 10/75 study corridors.

Transit

MATBUS operates routes in Moorhead that travel either along or across the US 10/75 study corridors, as shown in Figure 14. Through downtown MATBUS has east-west routes along Main Avenue (Routes 1 and 2) and along Center Avenue/1st Avenue (Route 4). Route 1 does divert from Main Avenue using 6th Street to serve 8th Street (US 75) and then returns to Main Avenue using 5th Street. Route 2 circulates serving downtown using 11th and 14th Streets. Route 4 continues east of downtown to serve the US 10 East focus area by re-connecting to US 10 at the 1st Avenue/21st Street intersection. Route 4 then leaves US 10 at 28th Street and serves the land uses along the south side of US 10 before it reconnects to US 10 at 32nd Street and then over to 34th Street where it heads north. Routes 3, 6 and 9 circulate the 32nd Street and 34th Street business areas.

Land Use

Understanding the existing land use informs the visions by balancing the needs to different and conflicting users. The following summarizes the existing land uses along the US 10/75 corridors. The existing land use zoning map is illustrated in Figure 14 and summarized below.

Downtown Focus Area

Along Main Avenue (US 10/75) between 4th and 11th Streets the corridor has a combination of low-density office, service and commercial land uses. In addition, there are existing high-density residential developments located near 4th Street and additional residential developments currently under construction in the southeast quadrant of the Main Avenue (US 10/75)/8th Street (US 75) intersection, the southwest quadrant of the Main Avenue (US 10/75)/10th Street intersection, and the northwest quadrant of the Center Avenue (US 10)/10th Street intersection. Near 11th Street, it transitions to an assortment of light industrial and light commercial uses.

As previously noted, the BNSF's KO and Prosper Subdivisions also line the north and south sides of Main Avenue/Center Avenue (US 10/75) between 11th and 14th Streets. The land use pattern, which also includes vacant parcels and a few residential uses, extends through 28th Street.

US 10 East Focus Area

This focus area serves light industrial and light commercial uses. This land use pattern, which also includes vacant parcels and a few residential uses, extends through 28th Street. East of 28th Street, there are commercial land uses, such as big box retailers and strip shopping centers.

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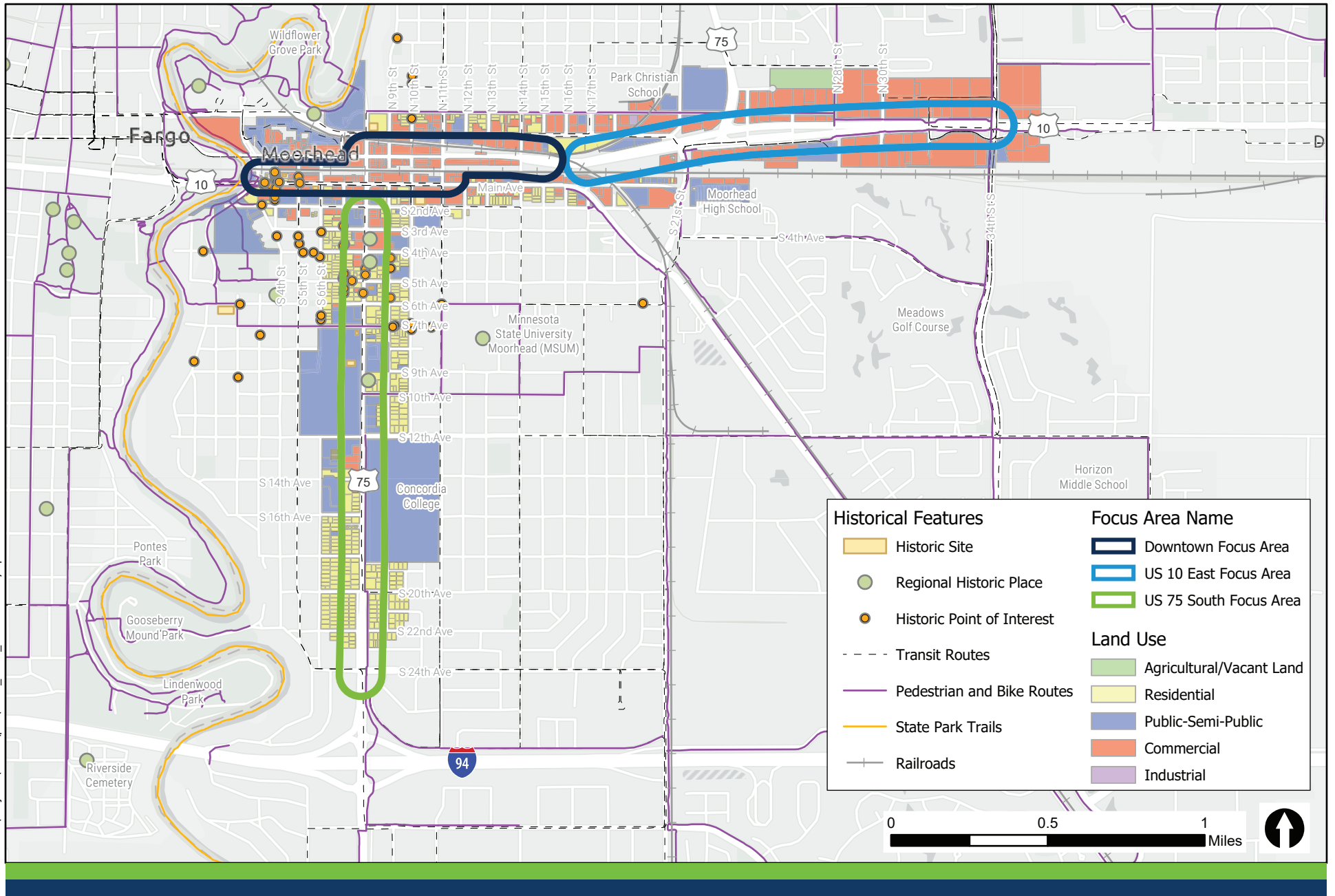


Figure 14: Pedestrian and Bicycle Facilities, Transit, and Land Use

US 10 / US 75 Corridor Study



US 75 South Focus Area

Along 8th Street (US 75) between 4th and 20th Avenues the corridor consists of low- to medium-density residential land uses and institutional land uses (i.e., Concordia College, churches, and surface parking lots). The existing land uses along 8th Street (US 75) between Main Avenue (US 10/75) and 4th Avenue are largely a combination of downtown office, service and commercial uses. Nearly all parcels adjacent to the 8th Street (US 75) corridor are privately held, excluding the Comstock House site between 5th and 6th Avenues, which is owned by the Minnesota Historical Society. It is also important to note the context of this focus area, which is an area characterized by large street trees with more of a neighborhood feel mixed with a collegiate environment with many pedestrians. Many of the homes in this area derive access directly from 8th Street (US 75).

Roadway Characteristics

The existing street and highway typical sections and right-of-way were documented, and more details are included in Appendix C. This is for information only as the 2025 and 2026 projects will be full reconstruction projects.

Pavement Conditions

MnDOT performed pavement condition ratings along the study corridors via a Digital Inspection Vehicle that uses the severity of transverse and longitudinal cracking, the severity of longitudinal joint distress, and the severity of cracking, rutting, raveling and patching to determine a surface rating. The scale ranges from 0.0 for very poor to 5.0 for very good. Based on the surface rating, MnDOT estimates an infrastructure improvement “need” year, which is detailed Table 5. All study segments were identified to need pavement quality improvements within 10 years.

Table 5: Existing Pavement Conditions and Estimated Need Year

Segment	Surface Rating (2018)	Last Year Worked On	Estimated Need Year
Main Avenue (US 10) from the River to 8th Street	2.7	2013	2021
Center Avenue (US 10/US 75) from 8th Street to 11th Street	3.7	2016	2027
Center Avenue (US 10/US 75) from 11th Street to 14th Street	3.5	2016	2026
Center Avenue (US 10/US 75) from 14th Street to 21st Street/1st Avenue	3.6	2009	2026
Center Avenue (US 10) from 21st Street/1st Avenue to 34th Street	3.6	2010	2026
8th Street (US 10/US 75) from Main Avenue to Center Avenue	3.7	2016	2026
8th Street (US 75) from 2nd Avenue to 10th Avenue	2.9	2010	2022
8th Street (US 75) from 10th Avenue to 20th Avenue	3.1	2010	2024

Utilities

Existing utilities (i.e., lighting, drainage/storm sewer, sanitary sewer, watermain, and private utilities) were documented, and more details are included in Appendix C. The following provides a brief summary:

- **Lighting** – Existing lighting levels should be investigated with the reconstruction project and compared to current standards.
- **Drainage** – Downtown and US 75 South focus areas have urban drainage systems and the US 10 East focus area is primarily rural drainage consisting of ditches and culverts.
- **Sanitary Sewer** – Sanitary sewer system consists of a mixture of large diameter vitrified clay, reinforced concrete, brick, and PVC pipe that drains via gravity to two different lift stations and then from the lift stations to the wastewater treatment facility via forcemain.
- **Watermain** – Watermain for the Downtown and US 10 East focus areas consist of PVC pipe. The US 75 South focus area watermain consists of a mixture of cast iron and PVC pipe.
- **Private Utilities** – Private utilities in all three focus areas consist of facilities owned by Century Link, Windstream, Sanford Hospital, MnDOT, Enventis, Concordia College, CableOne, 702 Communications, Dakota Carrier Network, Midco, Xcel Energy, Charter Communications, and Zayo bandwidth. These facilities are located within road right-of-way or within utility easements. Corridor improvements will likely impact private utilities and an adjustment or relocation could be required.

Historic Resources

Preliminary archaeological, cultural, and historic resources near the US 10/75 corridors were identified through data provided by the Metro COG, the City of Moorhead, and National Register of Historic Places. Details are included in Appendix C. Additional classification of historic districts and sites currently registered on the National Register of Historic Places was also completed. Additional analysis and identification of sites will be completed as part of the environmental documentation phase of the reconstruction project. This may include discovery of new sites that were not previously identified in any of the above-mentioned resources. Six (6) sites located along the study corridors are registered on the National Register of Historic Places. Three (3) sites of regional historic importance are located within 1/8 mile of the corridors.

Additional points of interest were identified through data provided by the MN State Historic Preservation Office (SHPO) and the MnDOT Cultural Resources Unit (CRU) in the 2013 Corridor Study. Of the SHPO and CRU points of interest, 37 sites fall within 1/8 mile of the corridors, contained identifiable address data, and are not already registered on the National Register of Historic Places or recognized as a regional historic place. 21 of these places are private residences and 16 are commercial sites. The identification and proper consideration of these sites is necessary to ensure that impacts to known or previously identified archaeological, cultural, and historic resources are minimized as part of the evaluation of the corridor alternatives.

Future Conditions

Highlights:

- The Fargo-Moorhead Travel Demand Model forecasts an annual growth rate of one (1) percent to year 2045; however, historical traffic volumes in Moorhead have remained relatively unchanged and data reviewed in downtown Fargo suggests that a mode shift has occurred.
- The year 2045 analysis was used to assess the risk of implementation of the alternatives assuming the one (1) percent growth rate forecasted by the Travel Demand Model. This analysis was done to consider higher volumes if assumptions were to change in the future. Based on historical data in both downtown Moorhead and downtown Fargo, we do not expect a growth rate of one (1) percent to occur.
- The jurisdictional transfer of US 10/75 from 8th Street and along Center Avenue to along Main Avenue and 11th Street was assumed. This transfer is expected to occur regardless if or when 11th Street has grade-separated railroad crossings between Main Avenue and 1st Avenue.
- It is estimated that with the jurisdictional transfer, approximately 15 percent of motorists will change their route.
- If/when 11th Street is grade-separated, approximately 75 percent of motorists will change their route from the current jurisdiction to the future jurisdiction; however, only 50 percent are expected to change their route during the peak hours due to operational and queuing issues along Main Avenue at the 8th and 11th Street intersections.
- With future year 2045 traffic volumes and no changes being made other than adjustments to signal timing and the jurisdictional transfer, all study intersections are expected to continue to operate acceptably during the a.m. and p.m. peak hours, but eight intersections are expected to have movements that experience long delays and queuing.

Understanding how the Moorhead area will change over time sets the baseline to compare future conditions. This section of the report documents the traffic projections developed for the US 10 / US 75 Corridor Study, a review of the capacity of the roadways, and the future conditions no-build (i.e., do nothing) traffic analysis. Additional details are included in Appendix D and E.

Traffic Projections

To evaluate how the existing roadway network and alternatives will operate in the long-term, year 2045 traffic forecasts were developed using the Fargo-Moorhead Regional Travel Demand Model, which accounts for planned roadway and land use within the area, as well as engineering judgment.

Forecasted Growth

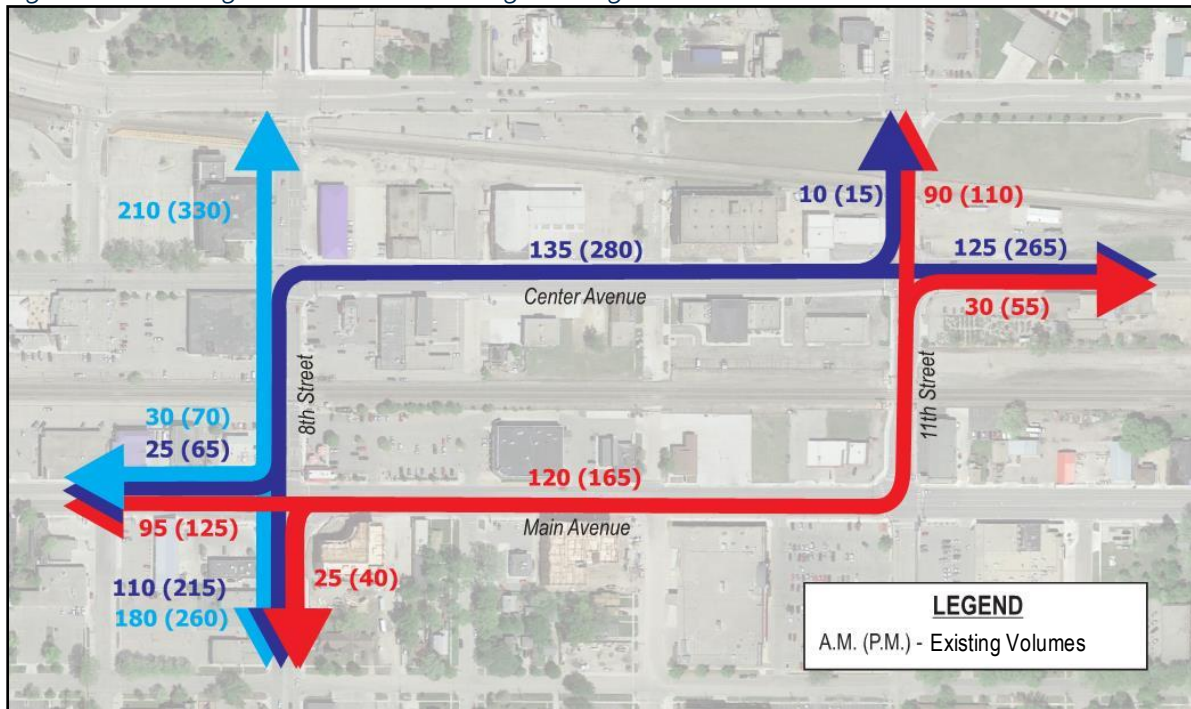
As part of this study, the year 2045 socio-economic (SE) data in the traffic analysis zones (TAZs) near downtown Moorhead were reviewed and updated based on input provided by the Metro COG and the City of Moorhead to be consistent with current development expectations in the downtown area. Additionally, the external growth rate was modified in the Travel Demand Model from 2.5 percent to 0.25 percent. A growth rate of 0.25 percent is more consistent with the historical traffic volume growth along roadways external to the Fargo-Moorhead area. Based on these updates the Travel Demand Model forecasts an annual growth rate of approximately one (1) percent to year 2045; however, as previously noted historical traffic volumes in Moorhead have remained relatively unchanged and data reviewed in downtown Fargo suggests that a mode shift has occurred. Therefore, the year 2045 analysis was used to assess the risk of implementation of the alternatives assuming the one (1) percent growth rate forecasted by the Travel Demand Model. This analysis was done to consider higher volumes if assumptions were to change in the future. Based on historical data in both downtown Moorhead and downtown Fargo, we do not expect a growth rate of one (1) percent to occur.

Influence of Jurisdictional Transfer

The 2013 Corridor Study and subsequent Moorhead Downtown Grade Separation Study recommended a jurisdictional transfer of US 10/75 from the existing jurisdiction along 8th Street (between Main and Center Avenues) and along Center Avenue (between 8th and 11th Streets) to a future jurisdiction along Main Avenue and along 11th Street. This transfer is expected to occur regardless if/when 11th Street has grade-separated railroad crossings between Main and Center Avenues (BNSF KO Subdivision) and between Center and 1st Avenues (BNSF Prosper Subdivision). To determine the expected traffic shifts for the jurisdictional transfer existing truck and traffic volumes and patterns were reviewed. It was assumed trucks need to follow the designated jurisdiction and vehicles utilizing GPS or drivers that are unfamiliar with the roadway network are also the most likely to follow the road jurisdiction. The existing travel times and peak hour traffic volumes for motorists using the existing and future routes were reviewed to estimate how many drivers would change their route.

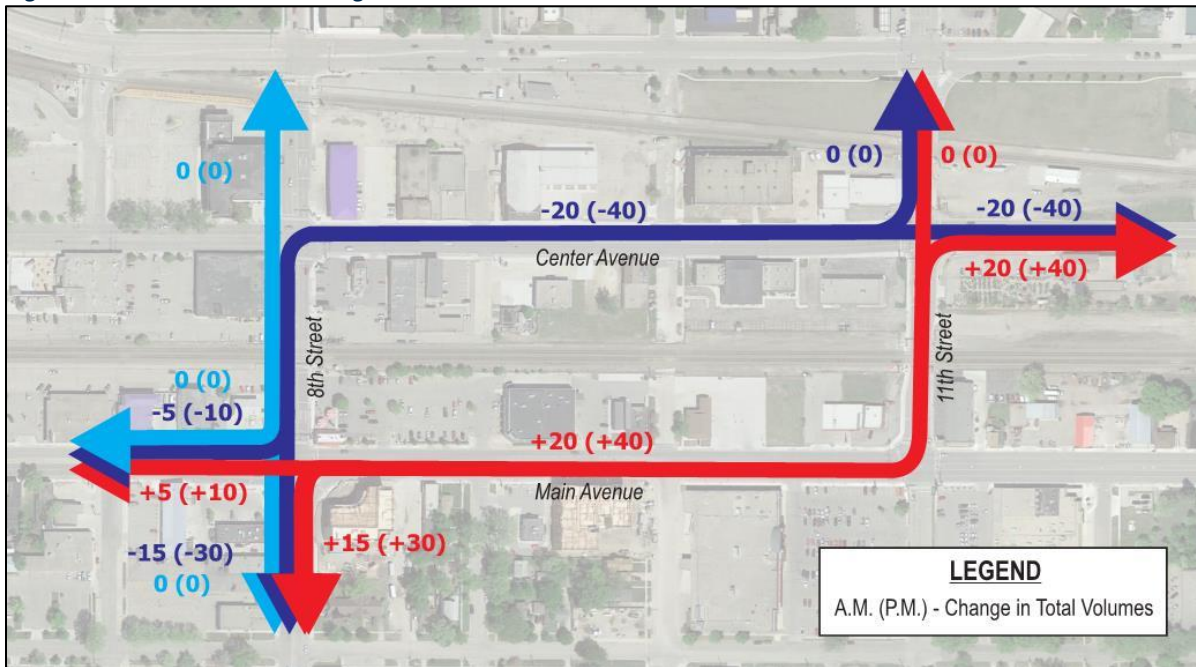
Results of the travel time analysis indicate that the future jurisdiction on 11th Street has the same or faster travel time in both directions compared to the existing jurisdiction on 8th Street. Further review of existing traffic volumes and patterns indicate that motorists are generally selecting the route that they need to make the least amount of turns, in particular left-turns. The existing volumes reviewed are summarized in Figure 15. It should be noted that vehicles traveling northbound and southbound along 8th Street, with origins/destinations north of 1st Avenue are included in Figure 15 (light blue) and discussed further under the grade-separation alternative.

Figure 15: Existing Traffic Volumes Along Existing/Future Jurisdiction and 8th Street



Based on this review, it is estimated that with the jurisdictional transfer, approximately 15 percent of motorists will change their route from the current alignment (dark blue) to the future jurisdiction (red). The 15 percent includes trucks, which make up approximately five (5) percent of vehicles, as well as motorists that are using GPS or are unfamiliar with the area, which are estimated to make up approximately 10 percent of vehicles. The change in peak hour volumes between the existing and future jurisdiction is shown in Figure 16.

Figure 16: Estimated Existing Volume Shift with Jurisdictional Transfer



If/when 11th Street is grade-separated between Main and Center Avenues (BNSF KO Subdivision) and between Center and 1st Avenues (BNSF Prosper Subdivision), this provides a reliable routing option for motorists without risk of getting stopped by a train. Once this grade-separation occurs, it is anticipated that more motorists will change their route to 11th Street and a behavioral change will result in more motorists using 11th Street regardless of whether there is a train or not. In addition to reviewing the percent of vehicles expected to change their route from the current to future jurisdiction under the grade-separation alternative, a similar percent of vehicles currently traveling northbound or southbound along 8th Street at Center Avenue, are expected to re-route to the 11th Street corridor to avoid the at-grade railroad crossings along 8th Street. It is estimated that with the grade-separation, approximately 75 percent (60 percent shift plus 15 percent from jurisdictional transfer) of daily traffic volume trips will change their route to utilize the grade-separation along 11th Street. This is consistent with the assumptions used for the 2013 Corridor Study.

However, during peak periods, it is expected that less than 75 percent of trips will shift to 11th Street due to traffic operational and queueing issues along Main Avenue at the 8th and 11th Street intersections. Therefore, through an iterative process that balanced the expected demand of motorists that would want to use 11th Street with the expected traffic operations during the peak periods at the study intersections, it was determined that approximately 50 percent of peak hour trips would be expected to change their route from 8th to 11th Street. The change to peak hour volumes with the grade-separation and jurisdictional transfer is shown in Figure 17. The estimated existing traffic volumes with both the grade-separation and jurisdictional transfer shifts is shown in Figure 18.

Figure 17: Grade-Separation and Jurisdictional Transfer Existing Traffic Volume Shift

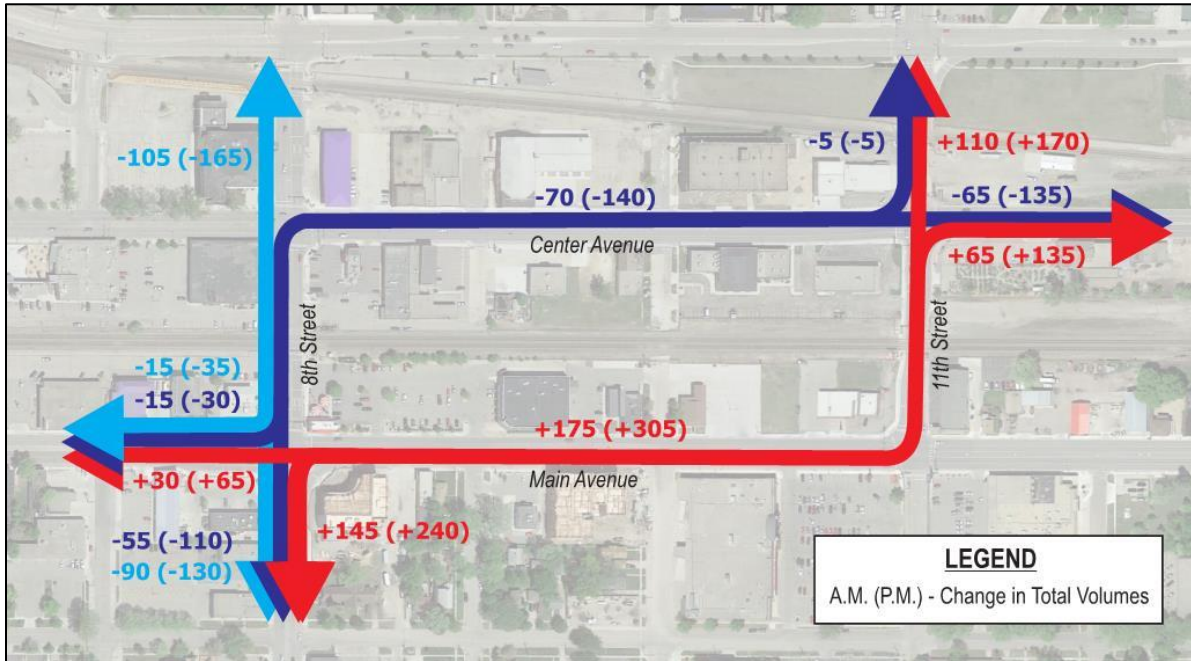
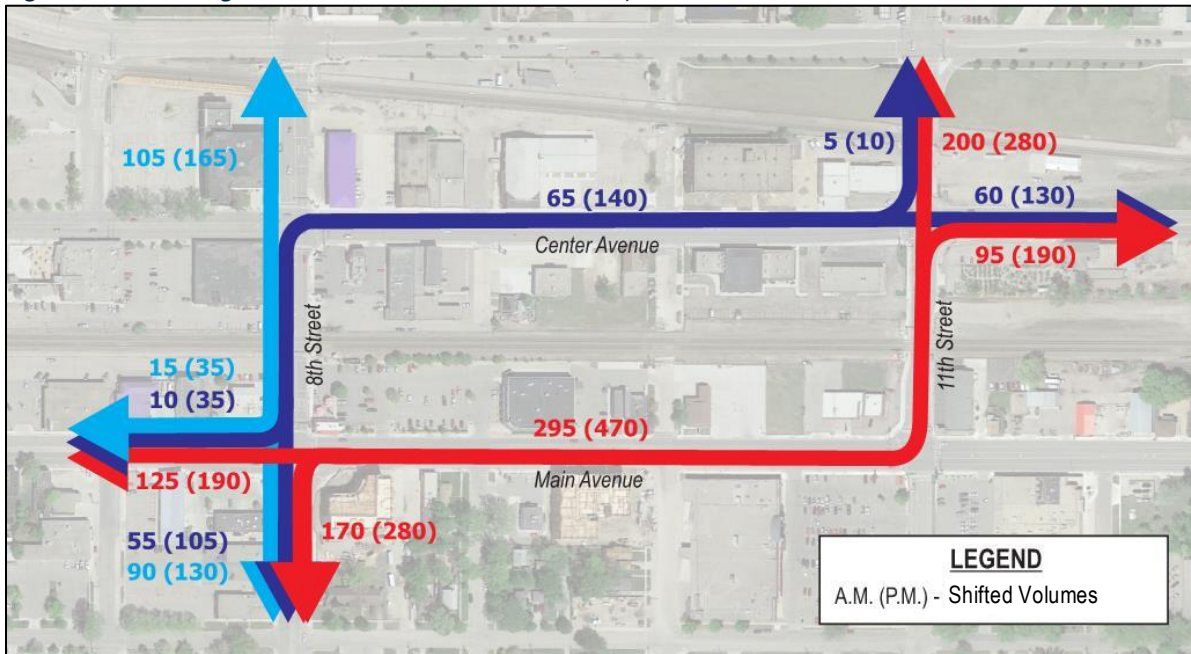


Figure 18: Existing Traffic Volumes with Grade-Separation and Jurisdictional Transfer



Converting these peak hour traffic volume shifts to a daily volume, we estimate an increase of 5,000 vehicles per day along Main Avenue between 8th and 11th Streets. This is traffic volume shifting from Center Avenue, which is where we expect a decrease in traffic.

It is important to note these assumptions were based on the best current data available, which is currently being influenced by ongoing construction projects in both Moorhead and Fargo. New data will need to be collected and re-evaluated once traffic stabilizes following the completion of these projects.

Comparison to the Proposed 11th Street Grade Separation

Additional analysis was conducted concurrently with this study to identify benefits to traffic, safety and emergency response times relative to the future railroad grade-separation at 11th Street. The analysis focused on understanding how traffic would dynamically re-route through the downtown area east of 8th Street during a train event to utilize the new grade-separation along 11th Street. To support the environmental documentation work being completed for the future underpass, the analysis identified roadway and traffic signal modifications to the area along 11th Street from Main Avenue to 1st Avenue.

It is important to note that the basis for this concurrent analysis was new traffic volume data collected in April 2019. Further, the methodology to predict traffic re-routing following the grade-separation included developing a traffic model that evaluated traffic dynamically over the course of a 24-hour period. Based on the analysis completed, both studies predicted a shift in traffic of approximately 2,500 (underpass modeling) to 5,000 vehicles per day (US 10 / US 75 Corridor Study) to Main Avenue east of 8th Street thereby increasing traffic levels along this segment of Main Avenue while decreasing traffic levels on Center Avenue and on 1st Avenue.

While the two study methodologies differ and are based on different existing data sets, neither assume traffic diversion resulting from Main Avenue being reduced to one lane in each direction with a center left-turn lane on the Fargo side of the Red River. This diversion will need to be determined during project development when new data can be collected following completion of the Main Avenue reconstruction project, as well as the completion of other ongoing construction projects impacting traffic in downtown Moorhead.

Roadway Capacity Analysis

Congestion on a roadway is judged to exist when the ratio of daily traffic volume to roadway capacity (i.e., V/C ratio) approaches or exceeds 1.0. The ratio of volume-to-capacity provides a measure of congestion along a stretch of roadway and can help determine where roadway improvements, access management, transit services or demand management strategies need to be implemented. It does not, however, provide a basis for determining the need for specific intersection improvements. Table 6 provides a V/C summary assuming no jurisdictional transfer or grade-separation at 11th Street. For each facility type, the typical planning-level AADT (i.e., daily volume) capacity ranges and 85th percentile volume ranges are listed. These volume ranges are based on guidance from the Highway Capacity Manual and professional engineering judgment. A range is used since the maximum capacity of any roadway design (i.e., V/C = 1.0) is a theoretical measure that can be affected by its functional classification, traffic peaking characteristics, access spacing, speed and other roadway characteristics. This allows for capacity improvements that can be achieved by roadway performance enhancements.

Table 6: Roadway Capacity Analysis without Jurisdictional Transfer or Grade-Separation

Section	Existing Roadway Type	Near Capacity	Existing AADT (V/C)	Year 2045 AADT 0.5% (V/C)	Year 2045 AADT 1.0% (V/C)
Main Avenue (US 10) the River to 8th Street	Five-lane Urban	27,200	18,500 (0.68)	21,500 (0.79)	24,900 (0.92)
Main Avenue (US 10) 8th Street to 11th Street	Five-lane Urban	27,200	10,600 (0.39)	12,300 (0.45)	14,300 (0.53)
Center Avenue (US 10/US 75) 8th Street to 14th Street	Five-lane Urban	27,200	9,600 (0.35)	11,200 (0.41)	12,900 (0.47)
Center Avenue (US 10/US 75) 14th Street to 21st Street/1st Avenue	Four-lane Divided Rural	32,300	10,600 (0.33)	12,300 (0.38)	14,300 (0.44)
Center Avenue (US 10) 21st Street/1st Avenue to 34th Street	Four-lane Divided Rural	32,300	22,000 (0.68)	25,500 (0.79)	29,700 (0.92)
8th Street (US 75) 2nd Avenue to 10th Avenue	Five-lane Urban	27,200	17,500 (0.64)	20,300 (0.75)	23,600 (0.87)
8th Street (US 75) 10th Avenue to 22nd Avenue	Five-lane Urban	27,200	19,700 (0.72)	22,900 (0.84)	26,600 (0.98)

Table 7 provides a summary assuming the jurisdictional transfer and a grade-separation at 11th Street.

Table 7: Roadway Capacity Analysis with Jurisdictional Transfer or Grade-Separation

Section	Existing Roadway Type	Existing AADT (V/C)	Year 2045 AADT 1.0% (V/C)	Year 2045 Transfer (V/C)	Year 2045 Separation (V/C)
Main Avenue (US 10) 8th Street to 11th Street	Five-lane Urban	10,600 (0.39)	14,300 (0.53)	14,800 (0.54)	19,300 (0.71)
Center Avenue (US 10/US 75) 8th Street to 14th Street	Five-lane Urban	9,600 (0.35)	12,900 (0.47)	12,400 (0.46)	10,900 (0.40)

As shown in Tables 6 and 7, no study segments were identified to have existing capacity issues or are expected to in the current risk-based 2045 analysis.

Future No-Build Traffic Analysis

MnDOT is planning to reconstruct the US 10/75 corridors in years 2025-2026. The no-build assumes that the existing intersection geometrics, roadway cross-sections, and traffic controls will all remain consistent with current conditions, but the existing signal timing was assumed to be optimized at intersections currently signalized. Year 2045 peak hour traffic volumes for the Downtown, US 10 East and US 75 South focus areas are illustrated in Figure 19, Figure 20, and Figure 21, respectively. It should be noted the jurisdictional transfer of US 10/75 from Center Avenue to Main Avenue between 8th and 11th Streets, which is planned to occur prior to year 2045 conditions, was assumed in the no-build conditions traffic analysis.

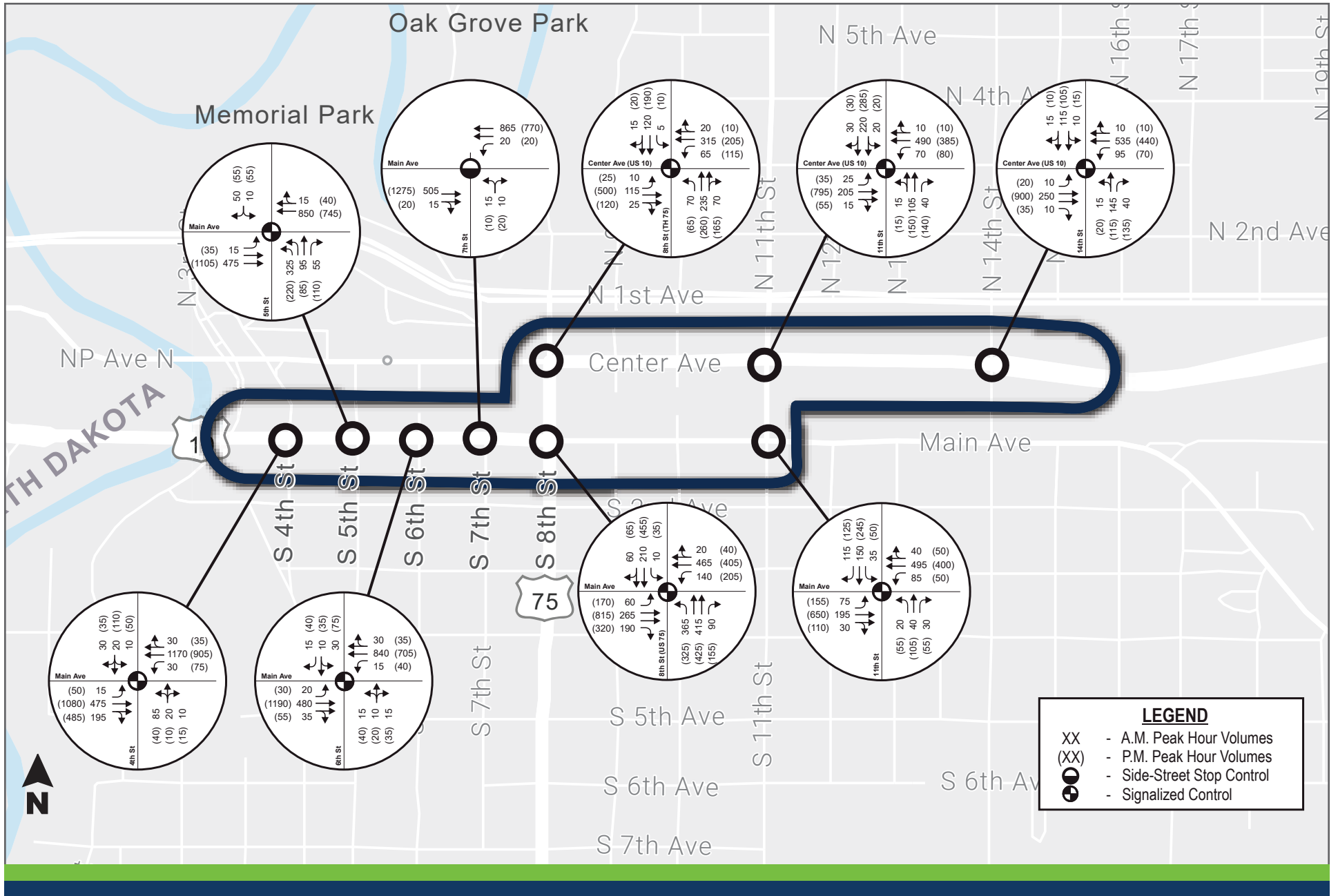
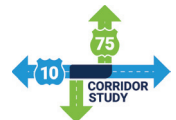


Figure 19: 2045 No Build A.M. Peak Hour Turning Movement Counts (Downtown) US 10 / US 75 Corridor Study



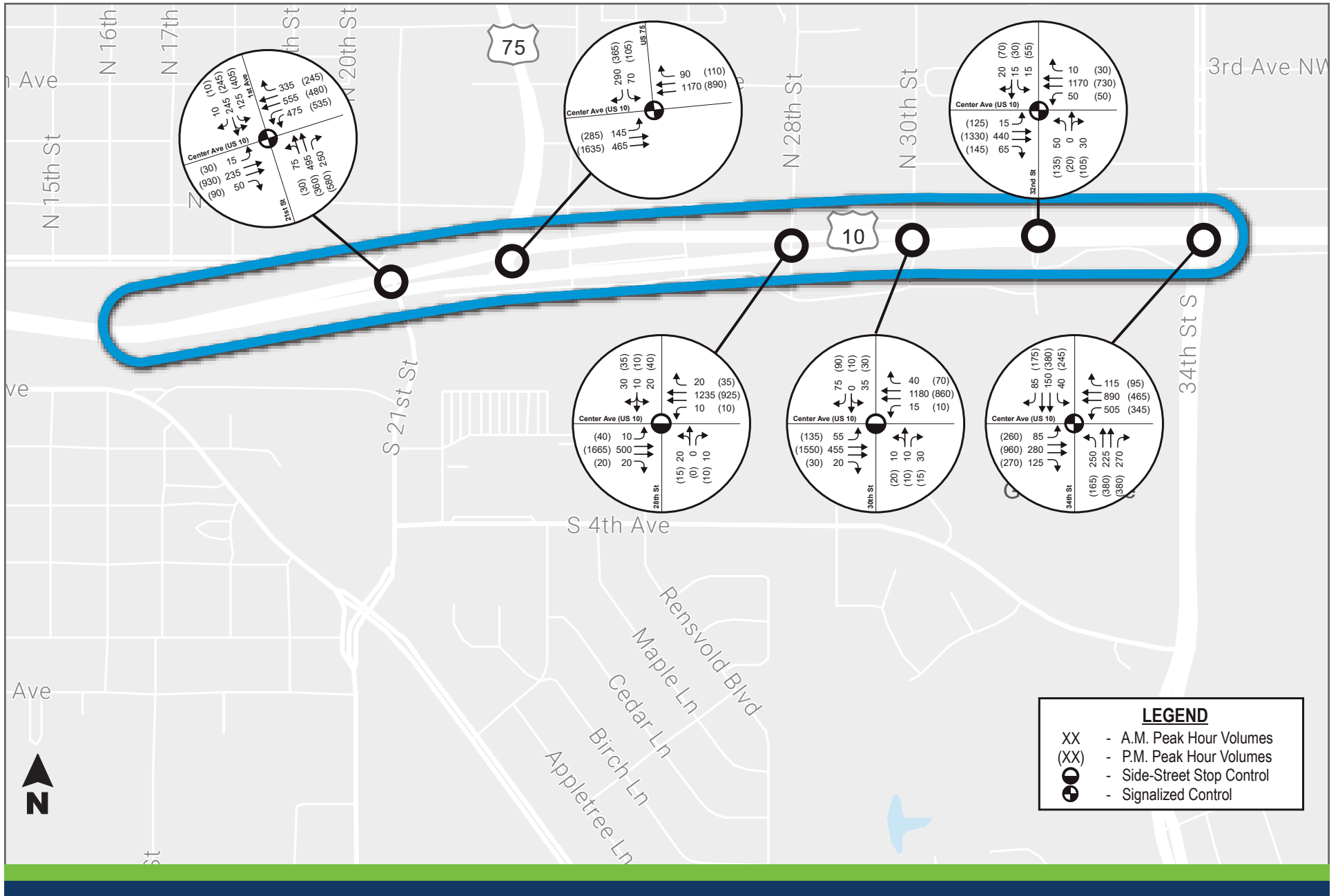


Figure 20: 2045 No Build A.M. Peak Hour Turning Movement Counts (East)

US 10 / US 75 Corridor Study



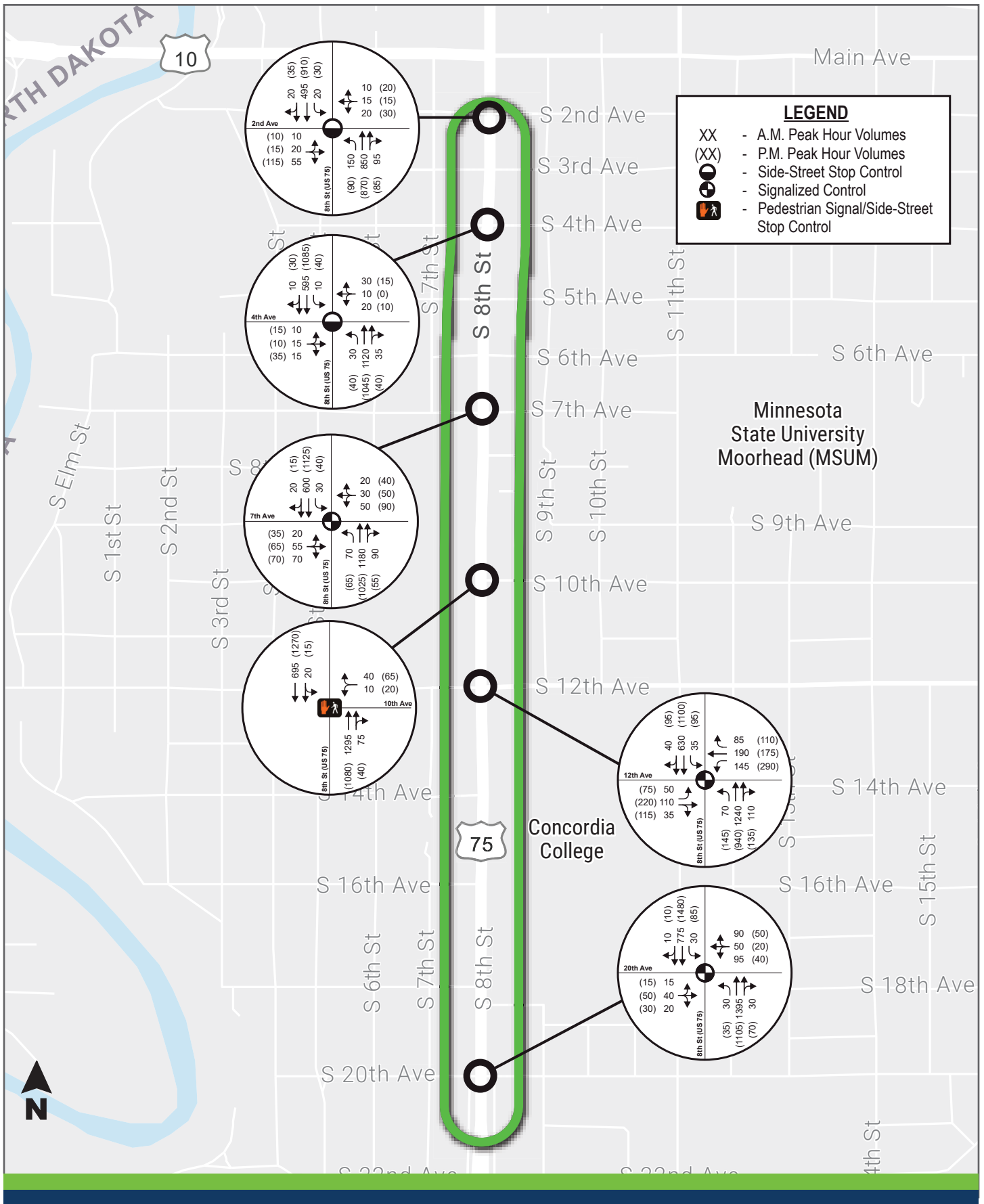
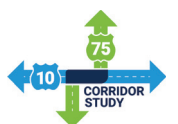


Figure 21: 2045 No Build A.M. Peak Hour Turning Movement Counts (South)



With future year 2045 traffic volumes and no changes being made other than adjustments to signal timing and the jurisdictional transfer, all study intersections are expected to continue to operate acceptably during the a.m. and p.m. peak hours. While the intersections will operate acceptably, eight intersections are expected to have movements that experience long delays and queuing, including:

- Main Avenue (US 10)/4th Street
- Center Avenue (US 10/75)/11th Street
- Center Avenue (US 10/75)/21st Street/1st Avenue
- Center Avenue (US 10)/28th Street
- Center Avenue (US 10)/30th Street
- 8th Street (US 75)/2nd Avenue
- 8th Street (US 75)/4th Avenue
- 8th Street (US 75)/12th Avenue

Design Standards and Street Types

Highlights:

- Current urban design standards along with Performance Based Practical Design (PBPD) practices were used to develop street types ranging in the number of travel lanes and presence or absence of a raised median.
- Usages for each were identified along with right of way impacts.

Pertinent design standards were identified for this study to inform the street types. Resources included:

- [Minnesota State-Aid Standards](#)
- [MnDOT Design Guides](#)
- [NACTO Urban Street Design Guide](#)
- [AASHTO Guide for the Development of Bicycle Facilities](#)
- [FHWA Separated Bike Lane Planning and Design Guide](#)

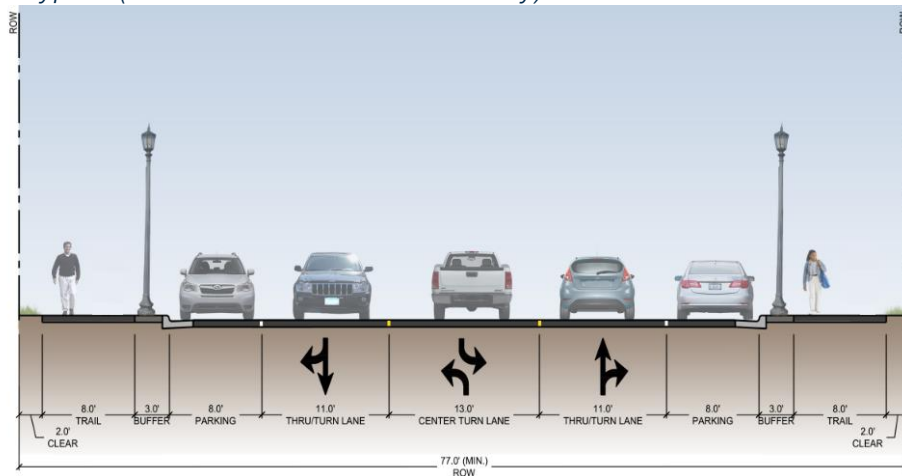
Based on a recent legislative request, the MnDOT State Aid Department updated the State Aid Design Standards to be more inclusive of multimodal systems. This review was to help merge the gap between the differences of the Minnesota (MN) Trunk Highway Standards and the Minnesota State Aid Standards. Ultimately, edits to the State Aid Design Standards created a level a flexibility like the MN Trunk Highway Standards. These edits have been adopted into Minnesota State Statute.

For this study, four (4) key street types were developed (see Figures 22-25) with the goal of taking advantage of the new urban design flexibility and guidance to improve the walkability and bikeability of the corridors by potentially reducing lane widths and increasing sidewalk and trail widths. Studies have shown reducing lane widths below the typical 12-foot standard does not negatively impact safety, but in fact provides a traffic calming effect and reduces the required crossing distances for pedestrians. That said, ongoing evaluation of the safety performance of future lane widths relative to design vehicle is needed during project development. Also, trade-offs between property impacts and wider path and boulevards will need to be considered. It's important to note that the corridors do vary in typical section today. While the goal is to provide a consistent typical section, some locations will continue to be varied to ensure existing street trees are not impacted with the reconstruction.

Dimensions noted for buffers for street trees and lighting are absolute minimums for successful growth of trees and minimization of impacts to poles. The goal is to include trees and lighting when possible, however, tradeoffs need to be evaluated during project development relative to travel lane, boulevard, trail and sidewalk widths.

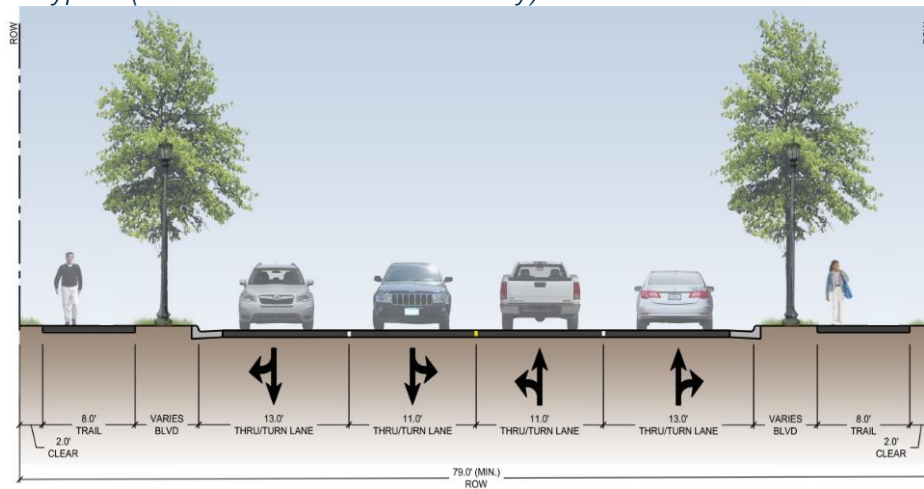
MnDOT is undertaking an effort to work with community partners to enhance and maintain the highway right of way. Stakeholder discussions have gathered feedback on aesthetic elements such as maintenance quality, vegetation appearance, paint condition on noise walls, presence of litter in their right of way, artistic treatments, etc. MnDOT staff presented an overview of their work and its intent to the study partners. MnDOT is committed to working with study partners as the 2025 and 2026 reconstruction projects develop to ensure coordination on roadway aesthetics takes place.

Figure 22: Street Type 1 (Three-Lane Undivided Roadway)



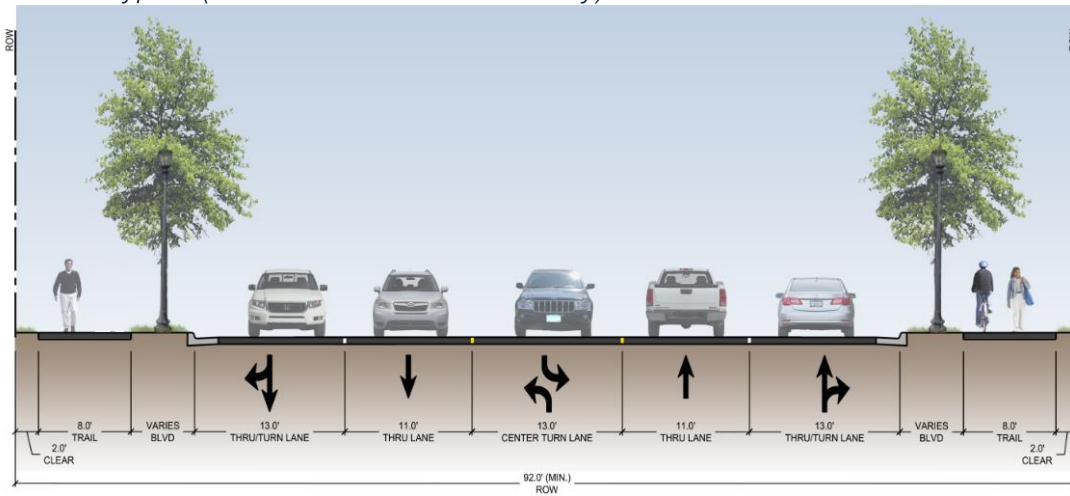
The three-lane undivided roadway shown in Figure 22 has a minimum right of way ranging from 71 feet to 77 feet depending on the presence of 8-foot trails on one or both sides and the final lane-widths selected. This street type includes 8-foot on-street parking lanes and a 3-foot buffer on both sides of the roadway. The 3-foot buffer could potentially provide space for decorative street lighting. The buffer distance can be increased by reducing the 8-foot trail to a 5-foot sidewalk on one or both sides of the roadway.

Figure 23: Street Type 2 (Four-Lane Undivided Roadway)



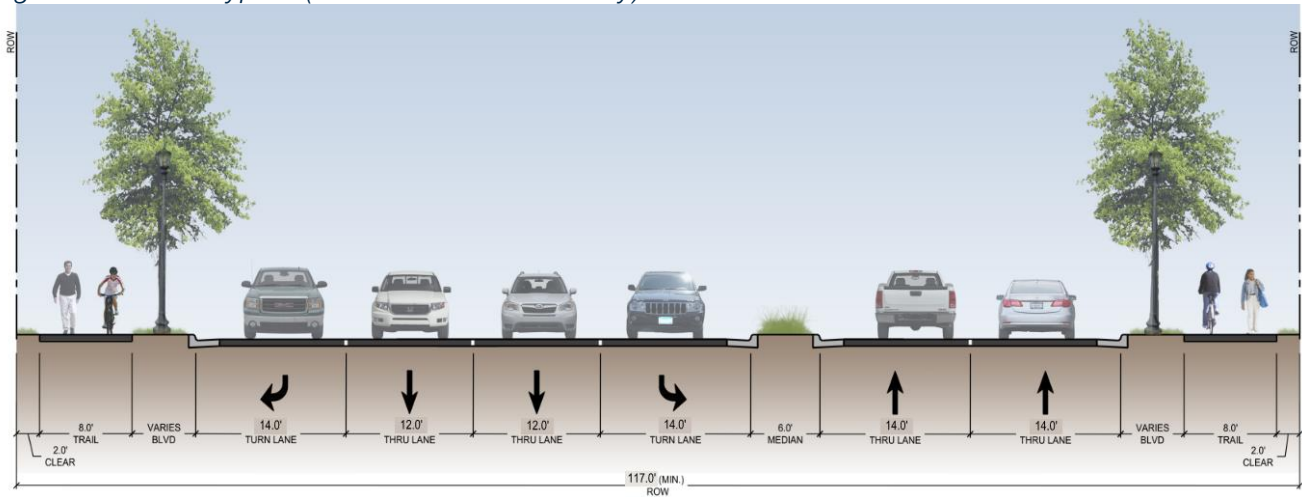
The four-lane undivided roadway shown in Figure 23 has a minimum right of way ranging from 68 feet to 79 feet depending on the presence of 8-foot trails on one or both sides and the final lane-widths selected. This street type includes a 5.5-foot buffer on both sides of the roadway, which is the minimum needed to provide successful street trees. The buffer distance can be increased by reducing the 8-foot trail to a 5-foot sidewalk on one or both sides of the roadway. The buffer distance can also be decreased to a minimum of 3 feet where decorative street lighting can still potentially be provided. While the outside travel lanes are noted as 13 feet, this includes 11-foot driving lines with a 2-foot shy distance from the face of the outside curbs.

Figure 24: Street Type 3 (Five-Lane Undivided Roadway)



The five-lane undivided roadway shown in Figure 24 has a minimum right of way ranging from 81 feet to 92 feet depending on the presence of 8-foot trails on one or both sides and the final lane-widths selected. This street type includes a 5.5-foot buffer on both sides of the roadway, which is the minimum needed to provide successful street trees. Again, the buffer distance can be increased by reducing the 8-foot trail to a 5-foot sidewalk on one or both sides of the roadway. The buffer distance can also be decreased to a minimum of 3 feet where decorative street lighting could still potentially be provided. While the outside travel lanes are noted as 13 feet, this includes 11-foot driving lines with a 2-foot shy distance from the face of the outside curbs.

Figure 25: Street Type 4 (4-Lane Divided Roadway)



The four-lane divided roadway shown in Figure 25 has a minimum right of way of 117 feet. Since this is proposed along the US 10 East focus area where trails on both sides are being proposed and adequate right of way exists, 8-foot trails with a 5.5-foot buffer on both sides of the roadway to provide street trees was assumed. While the inside the outside travel lanes are noted as 14 feet, these include 12-foot driving lines with a 2-foot shy distance from the face of the inside and outside curbs. Final details for each street type will be determined during the environmental documentation phase of the reconstruction project.

Vision & Concepts for Downtown Focus Area

Highlights:

- Downtown focus area prioritizes walkability and bikeability by “right-sizing” the roadways.
- Pavement rehabilitation is needed within 5 years for Main Avenue (US 10) from the river to 8th Street (US 75).
- Corridor safety issues exist for Main Avenue (US 10) from the river through 8th Street (US 75).
- Poor intersection operations are expected at the Main Avenue (US 10)/4th Street and Center Avenue/11th Street intersections.
- There is a gap in the trail system between 11th Street and 28th Street and the community expressed the desire to make downtown more pedestrian and bicycle friendly.



Downtown Focus Area Goals & Vision

The Downtown focus area serves many differing land uses including a combination of low-density office, service, commercial and residential land uses. Additional high-density residential developments are currently under construction. The City of Moorhead’s goal is to make downtown a better place to socialize, work, shop and live. The following highlights key input obtained through this study’s engagement efforts:

- Widen the sidewalk along 8th Street between 1st and Center Avenues.
- Utilize dead-end spaces for public uses like park space, benches, or parking.
- Add signage that notifies motorists to find an alternate route when trains are approaching downtown.
- Make street design improvements (i.e., streetscaping and reduced roadway width) to reduce traffic speeds along Center Avenue between 14th Street and 21st Street/1st Avenue.
- Improve the pedestrian crossing at the Main Avenue (US 10)/7th Street intersection.
- Redesign Center Avenue to work for walkers, bikers and drivers.
- Potentially redesign Main Avenue following Main Avenue project in Fargo.

The vision largely prioritizes roadway design elements, as presented in Table 8, that focus on improving the environment for pedestrians and bicyclists by taking advantage of opportunities presented by reductions in vehicular traffic volumes along key downtown roadways.

Table 8: Vision for Downtown Focus Area

Overarching Goals	Elements of Vision for Focus Area
Provide roadways that fit land use (i.e., appropriate access and design)	<ul style="list-style-type: none"> ▪ Downtown is a dense commercial area with many business accesses ▪ Future redevelopment will increase residential living opportunities
Accommodate appropriate users (i.e., complete streets)	<ul style="list-style-type: none"> ▪ Downtown has high pedestrian activity ▪ With future redevelopment opportunities, pedestrian activity will increase ▪ Numerous transit routes serve the corridors ▪ Need to prioritize walking and biking
Create an environment to stimulate growth	<ul style="list-style-type: none"> ▪ Prioritizing a pedestrian friendly environment stimulates growth ▪ Roadway design needs to consider changing environment in downtown
Provide flexibility for near and long-term transportation needs	<ul style="list-style-type: none"> ▪ Red River crossing at Main Avenue is important as a mobility corridor but also needs to balance the needs of a downtown that desires to become a more pedestrian friendly environment ▪ Future route jurisdiction change of US 10 /75 and railroad grade-separation will alter traffic patterns providing opportunities to “right-size” roadways ▪ Reconstruction of Main Avenue in Fargo will also alter traffic patterns providing opportunities to “right-size” roadways
Improve “Gateway” feel for US 10 and US 75 corridors	<ul style="list-style-type: none"> ▪ “Right-size” roadways to provide more space for streetscaping aesthetics



Downtown Focus Area Needs

As previously noted, the need for the multimodal transportation improvements and the relationship to regional transportation need is based on the transportation analyses completed as part of this study and documented in Appendix E and F. In addition to addressing the overall study goals and vision for downtown, it was determined that future corridor planning and improvements should address the needs presented in Table 9.

Table 9: Downtown Focus Area Needs

Overarching Needs	Needs for Focus Area
Pavement condition	<ul style="list-style-type: none"> Pavement rehabilitation is needed within 5 years for Main Avenue (US 10) from the river to 8th Street (US 75) All remaining roadways in downtown will need pavement rehabilitation within 10 years
Vehicle safety and mobility	<ul style="list-style-type: none"> Corridor safety issues exist for Main Avenue (US 10) from the river through 8th Street (US 75) Poor intersection operations are expected at the Main Avenue (US 10)/4th Street intersection Poor intersection operations are expected at the Center Avenue/11th Street intersection Need to accommodate future jurisdictional change of US 10/75
Walkability and bikeability	<ul style="list-style-type: none"> There is a gap in the trail system between 11th Street and 28th Street Community expressed desire to make downtown more pedestrian and bicycle friendly



Downtown Focus Areas Concepts

The recommended concepts for the Downtown focus area prioritize walkability and bikeability by “right-sizing” the roadways where applicable and giving space to other users, installs marked pedestrian crossings where appropriate, converts one-way roadways to two-way operations, and utilizes dynamic signing to help alert drivers of when trains are arriving. As such, Figures 26-27 illustrate the locally preferred concept where Main Avenue (US 10) is converted to a three-lane roadway with on-street parking from the river to 8th Street (US 75). The impetus for the reduction in the numbers of lanes is to take advantage of a potential reduction in traffic resulting from the Main Avenue reconstruction in Fargo. The alternate option, as shown in Figures 28-30, maintains the existing five-lane roadway without on-street parking from the river to 8th Street (US 75). Key elements include:

- Converting Center Avenue from 8th Street (US 75) to 11th Street (US 10/75) to a three-lane roadway with on-street parking to take advantage of a reduction in traffic along this segment following the jurisdictional change of US 10/75 and the future underpass at 11th Street.
- Maintain the roadway type along 8th Street between Center and Main Avenues while promoting narrower travel lanes where appropriate to increase the space for other users.
- Through downtown Moorhead, the City’s preference is to prioritize 1st Avenue as the mobility corridor.

The expected traffic diversion will need to be determined during project development when new data can be collected following completion of the Main Avenue reconstruction project and other ongoing projects impacting traffic in downtown Moorhead. Without any assumed diversion the daily volume ranges from 18,500 (existing) to 24,900 (2045), which both are within the expected capacity range of a three-lane roadway (17,000 to 25,000 daily vehicles). The threshold depends on roadway characteristics, access spacing, and traffic patterns. From a peak hour perspective, overall poor operations (LOS E or worse) are expected during the afternoon peak at the signalized intersections of 4th Street, 5th Street, and 8th Street with the three-lane concept. However, MnDOT’s Performance-Based Practice Design notes a “*design vehicular LOS of D or lower is suggested for urban streets as an appropriate balance between design-year peak-hour operation and off-peak safety.*” Thus, the trade-off between the less than ideal peak hour operations under worst-case volume conditions to promote walkability and bikeability is locally supported.

The three-lane roadway concept for Main Avenue (US 10) is consistent with the current Moorhead Downtown Master Plan, public input, Complete Streets guidance and MnDOT’s goal to reduce greenhouse gas (GHG) emissions. With the changing traffic patterns that are likely to result from the Fargo Main Avenue roadway conversion, it will be necessary to conduct traffic counts in or around 2022-2023 along Main, Center and 1st Avenues. Access reductions and railroad signal pre-emptions will be important to include in final design. Table 10 summarizes the vision and how each component addresses the goals and corridor needs.

It should also be noted that State law prohibits bicyclists from using the sidewalk in a business district. Based on input from the SRC, bikers will be accommodated by “sharing the road” with vehicles for both the three-lane and five-lane roadway concepts. With the three-lane concept, buffered bicycle lanes were considered but it was determined with the road diet that bikers along Main Avenue should be accommodated similarly to other corridors where road diets are being implemented in Moorhead, such as Center Avenue just parallel one block to the north. Further, community input indicated the need for additional parking and by having bikers share the road, on-street parking can be included with the three-lane concept.

LEGEND

- PAVED ROADWAY
- SIDEWALK
- SHARED USE PATH
- TRAFFIC SIGNAL
- IMPROVEMENTS DEPENDENT UPON 11TH ST GRADE SEPARATION STUDY
- MAT BUS STOP AND SHELTER

SRE ENGINEERS
PLANNERS
DESIGNERS
Consulting Group, Inc.







PRELIMINARY
SUBJECT TO CHANGE
4/29/2020
SRE
Consulting Group, Inc.



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LEGEND

-  PAVED ROADWAY
-  SIDEWALK
-  SHARED USE PATH
-  TRAFFIC SIGNAL
-  IMPROVEMENTS DEPENDENT UPON 11TH ST GRADE SEPARATION STUDY
-  MAT BUS STOP AND SHELTER

SRE ENGINEERS
Consulting Group, Inc. PLANNERS
DESIGNERS

PRELIMINARY
SUBJECT TO CHANGE
4/29/2020

SRE
Consulting Group, Inc.






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LEGEND

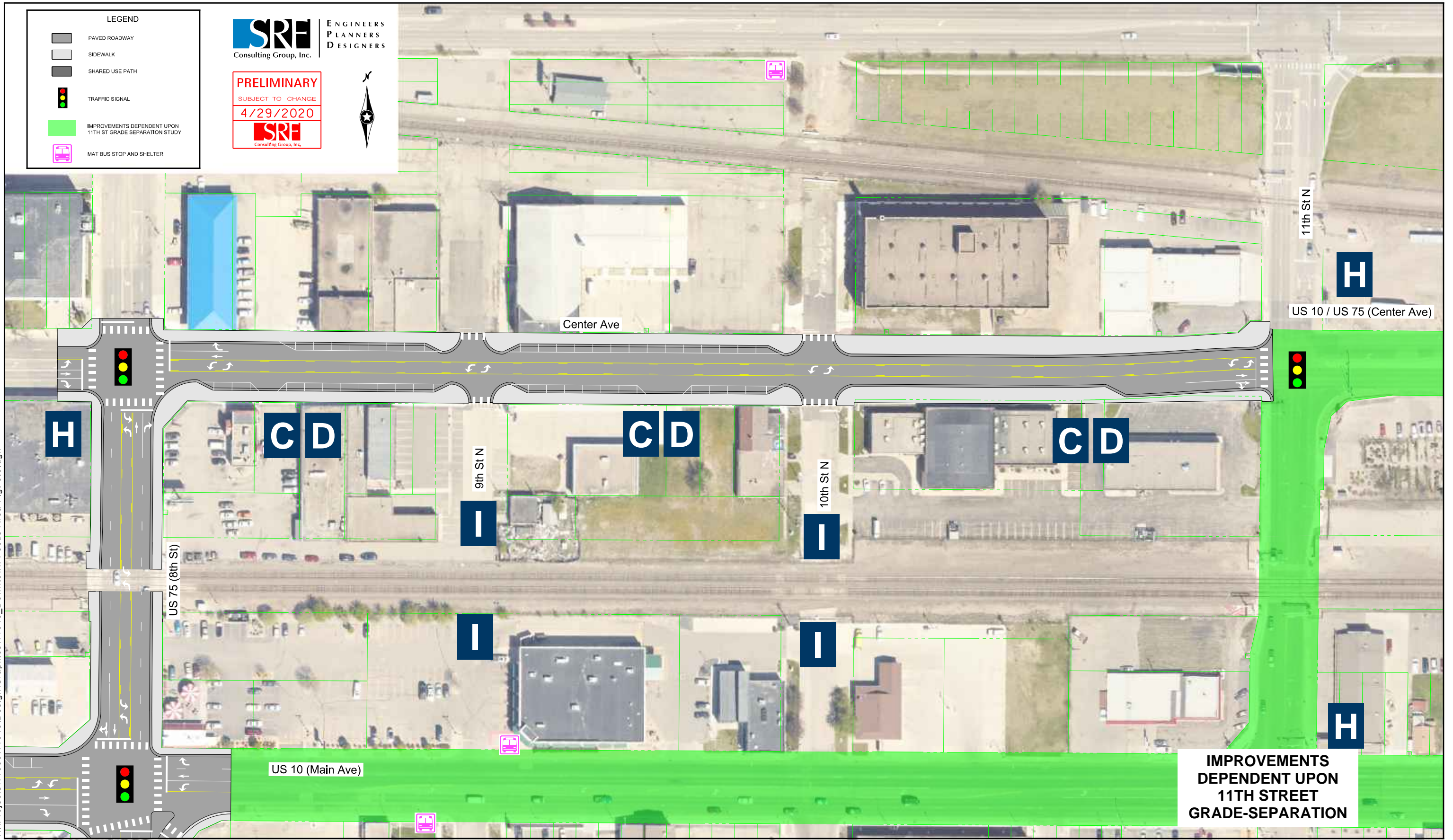
- PAVED ROADWAY
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- MAT BUS STOP AND SHELTER

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PRELIMINARY
SUBJECT TO CHANGE
4/30/2020

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Consulting Group, Inc.





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SRE Locally Preferred Concepts for Downtown Focus Area

US 10 / US 75 Corridor Study
Moorhead, Minnesota

Job # 11648
4/29/2020

**IMPROVEMENTS
DEPENDENT UPON
11TH STREET
GRADE-SEPARATION**

Figure 30

Table 10: Downtown Focus Area Concepts

Concepts for Downtown Focus Area		How do concepts address the goals?	Do concepts address corridor needs?		
			Pavement Conditions	Safety and Mobility	Walkability and Bikeability
A	Reconstruct Main Avenue (US 10) as a Three-lane undivided roadway from the river to 8th Street (US 75)	<ul style="list-style-type: none"> Reconstructs poor pavement conditions Promotes a more pedestrian-friendly environment On-street parking can stimulate economic growth and improve safety for pedestrians by creating a barrier 	✓	✓	✓
B	Reconstruct Main Avenue (US 10) as a Five-lane undivided roadway from the river through 8th Street (US 75)	<ul style="list-style-type: none"> Reconstructs poor pavement conditions Maintains existing safety and mobility conditions 	✓	✓	
C	Reconstruct Center Avenue as a Three-lane undivided roadway from 8th Street to 11th Street	<ul style="list-style-type: none"> Reconstructs poor pavement conditions Promotes a more pedestrian-friendly environment On-street parking can stimulate economic growth and improve safety for pedestrians by creating a barrier 	✓	✓	✓
D	Minimize lane widths along all roadways	<ul style="list-style-type: none"> Reduced lane widths help promote slower driving speeds and slower speeds reduce the severity of crashes Narrower streets shorten the distance pedestrians need to cross major roadways (US 10) Reduced lane widths provide more space to be used as green space or for wider sidewalks/trails 	✓	✓	✓
E	Install curb bump-outs with marked pedestrian crossing at 7th Street for pedestrians crossing Main Avenue (US 10)	<ul style="list-style-type: none"> Curb bump-outs shorten the crossing distance which limits exposure to pedestrians from vehicular traffic Marked crossing provides designated crossing location while alerting drivers to where pedestrians are crossing 		✓	✓
F	* Install marked pedestrian safety island at 7th Street for pedestrians crossing Main Avenue (US 10)	<ul style="list-style-type: none"> Pedestrian safety island limits exposure to pedestrians from vehicular traffic by providing a refuge Marked crossing provides designated crossing location while alerting drivers to where pedestrians are crossing 		✓	✓
G	Convert 5th Street to two-way street between Main Avenue (US 10) and 2nd Avenue	<ul style="list-style-type: none"> Two-way streets are good for business and stimulate economic growth 			
H	Install dynamic signs that alert drivers of when trains are approaching (locations to be determined during project development)	<ul style="list-style-type: none"> Improves mobility by alerting drivers to alternate routes during train events, which cause major delays today 		✓	
I	Utilize dead-end spaces for public uses like park space, benches, or parking	<ul style="list-style-type: none"> Improve "Gateway" feel 			

Note: * Optional crossing pending further study regarding demand for crossing following future downtown redevelopment.

Vision & Concepts for US 75 South Focus Area

Highlights:

- US 75 South focus area priorities addressing existing safety and operational deficiencies and improving accommodations and crossings for pedestrians and bicyclists while maintaining its historical feel.
- Pavement rehabilitation is needed within 5 years for the entire corridor.
- Intersection safety issues exist at the 8th Street (US 75)/2nd Avenue intersection.
- Poor intersection operations are expected at the 2nd, 4th and 12th Avenue intersections.
- There is a gap in the trail system between 12th and Main Avenues.



US 75 South Focus Area Goals & Vision

The US 75 south focus area roughly encompasses the neighborhoods surrounding the three main higher education institutions in the City (Concordia College, Minnesota State University Moorhead, and Minnesota State Community and Technical College). Commercial uses on the northern end transition to low/medium density housing to institutional use (Concordia College) as you head south. The following highlights key input obtained through this study’s engagement efforts:

- US 75 corridor "feels like a highway".
- Need to consider multi-use path along 8th Street (US 75).
- Need to address safety concerns along 8th Street (US 75) between Main and 4th Avenues.
- Consider removing the existing "jog" in 8th Street (US 75).
- There is high pedestrian activity crossing at 2nd Avenue.

The vision largely prioritizes maintaining the existing historical character with the large street trees having more of a neighborhood feel mixed with a collegiate environment with many pedestrians. Many of the homes in this area derive access directly from 8th Street (US 75). Roadway design elements presented in Table 11 focus on improving the environment for pedestrians and bicyclists while maintaining the historic feel of the corridor.

Table 11: Vision for US 75 South Focus Area

Overarching Goals	Elements of Vision for Focus Area
Provide roadways that fit land use (i.e., appropriate access and design)	<ul style="list-style-type: none"> ▪ Maintain access to residential land uses that still require direct access to 8th Street (US 75) ▪ Minimize impacts to business accesses between 5th and Main Avenues ▪ Maintain mobility for commuter users as 8th Street (US 75) is the main connection between I-94 and downtown Moorhead
Accommodate appropriate users (i.e., complete streets)	<ul style="list-style-type: none"> ▪ Improve crossings for the high pedestrian activity that cross 8th Street (US 75) ▪ Improve north-south trail connections
Create an environment to stimulate growth	<ul style="list-style-type: none"> ▪ Focus area is well developed so this is a low priority goal for US 75 South
Provide flexibility for near and long-term transportation needs	<ul style="list-style-type: none"> ▪ Address traffic safety and operational deficiencies at key intersections ▪ Address "jog" in corridor alignment
Improve "Gateway" feel for US 10 and US 75 corridors	<ul style="list-style-type: none"> ▪ Maintain historic feel of corridor by limiting impacts to existing street trees



US 75 South Focus Area Needs

As previously noted, the need for the multimodal transportation improvements and the relationship to regional transportation need is based on the transportation analyses completed as part of this study and documented in Appendix E and F. In addition to addressing the overall study goals and vision for US 75 South, it was determined that future corridor planning and improvements should address the needs presented in Table 12.

Table 12: US 75 South Focus Area Needs

Overarching Needs	Needs for Focus Area
Pavement condition	<ul style="list-style-type: none"> ▪ Pavement rehabilitation is needed within 5 years for entire corridor
Vehicle safety and mobility	<ul style="list-style-type: none"> ▪ Safety issues exist at the 8th Street (US 75)/2nd Avenue intersection ▪ Poor intersection operations are expected at the 8th Street (US 75)/2nd Avenue intersection ▪ Poor intersection operations are expected at the 8th Street (US 75)/4th Avenue intersection ▪ Poor intersection operations are expected at the 8th Street (US 75)/12th Avenue intersection
Walkability and bikeability	<ul style="list-style-type: none"> ▪ There is a gap in the north-south trail system between 12th and Main Avenues due to right of way ▪ Improve crossings for pedestrians crossing 8th Street (US 75)



US 75 South Focus Areas Concepts

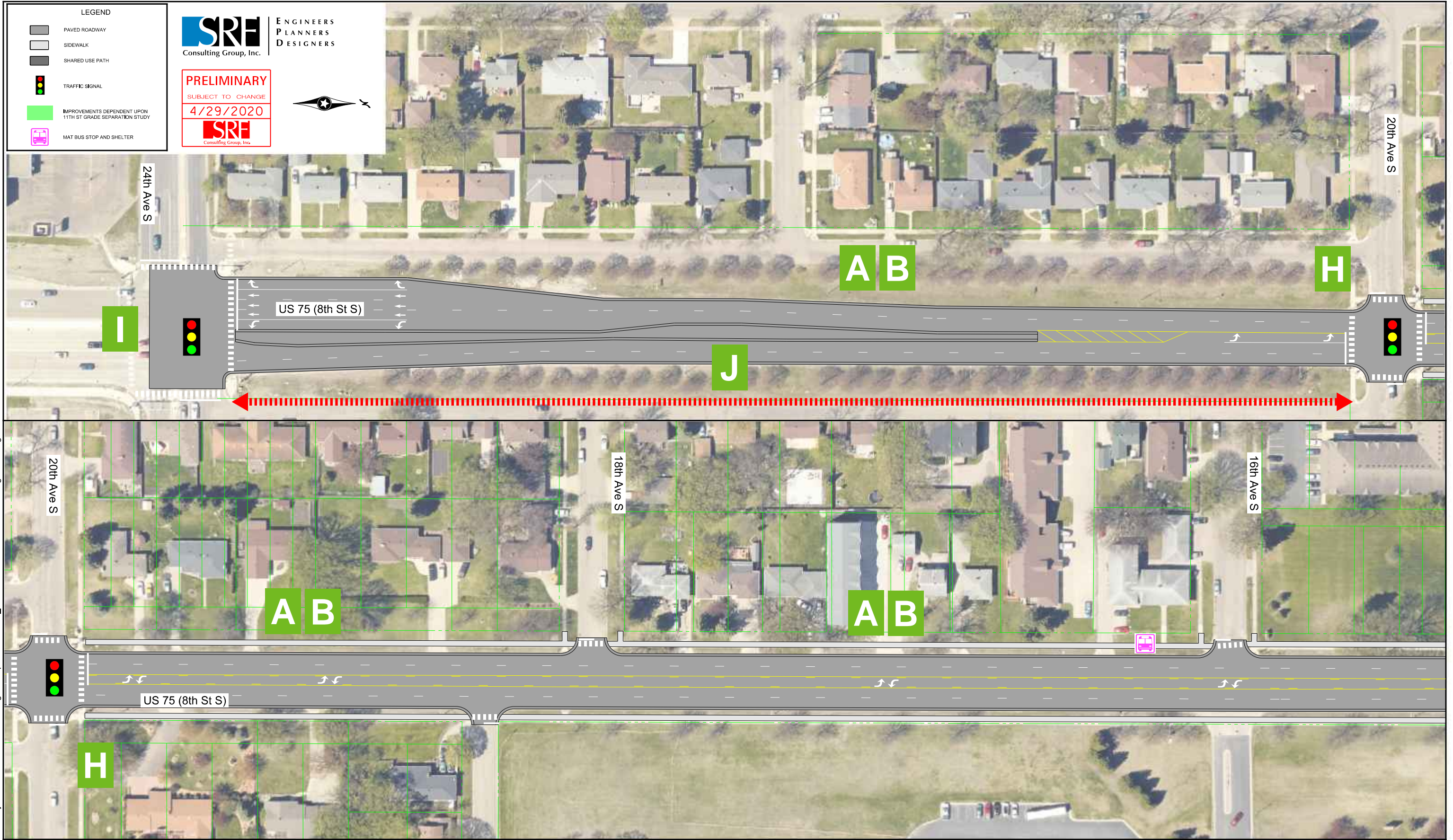
The recommended concepts for the US 75 South focus area are illustrated in Figures 31-33. The concepts prioritize reducing lane widths where possible to reduce “feels like a highway” atmosphere by allocating this space to the boulevard or other users while minimizing the jog between 4th and 6th Avenues and addressing traffic safety issues on the north end by restricting access at 2nd Avenue. The concept also improves pedestrian crossings at several locations by providing either marked crossings or marked crossings with a pedestrian safety island, or by providing traffic signal control. Key elements include:

- Besides adding a crossing for pedestrians at 2nd Avenue with a pedestrian safety island, which is not a signalized location, no other marked crossings were recommended at unsignalized locations. Similar crossings throughout Moorhead have led to unreasonable expectations with motorists and pedestrians and therefore, it is the City’s preference to direct pedestrians to a signalized intersection when needing to cross a multi-lane undivided roadway. The key controlled crossings are at 7th, 10th, 12th and 20th Avenues. 2nd Avenue has significant pedestrian crossing demand today, so it was determined there is need to improve the crossing.
- With the proposed access restriction at 2nd Avenue, a future controlled crossing at 4th Avenue is recommended. Based on current traffic volumes, traffic signal control is warranted, and more volume will shift to 4th Avenue with access restrictions at 2nd Avenue.
- Recommendations from the recently completed 12th Avenue Corridor Study are adopted as part of this study to address mobility issues caused by high pedestrian activity at the intersection. Improvements include modifying the eastbound approach from a left-, shared thru/right-turn lane configuration to a shared left/thru and right-turn lane configuration, which requires modifications to the curb to better align the eastbound/westbound through lanes, and removing the eastbound left-turn protected signal phase. Further, it was recommended to install a Leading Pedestrian Interval (LPI) to allow pedestrians to start crossing before vehicles are given a green light to proceed through the intersection and to install “No Right Turn on Red” blank out signs at the intersection. During the peak periods during the school year, it is recommended that vehicles continue to be directed to not make right turns on red for pedestrian safety considerations. The study also recommended installing a shared-use path on the south side of 12th Avenue between 5th and 11th Streets.
- A multi-use path along 8th Street (US 75) north of 12th Avenue was considered but the impacts to existing street trees and utilities is an issue and was not supported by the public. Using the east frontage road between 20th and 24th Avenues as separated bike facility would close the gap between the two roadways,

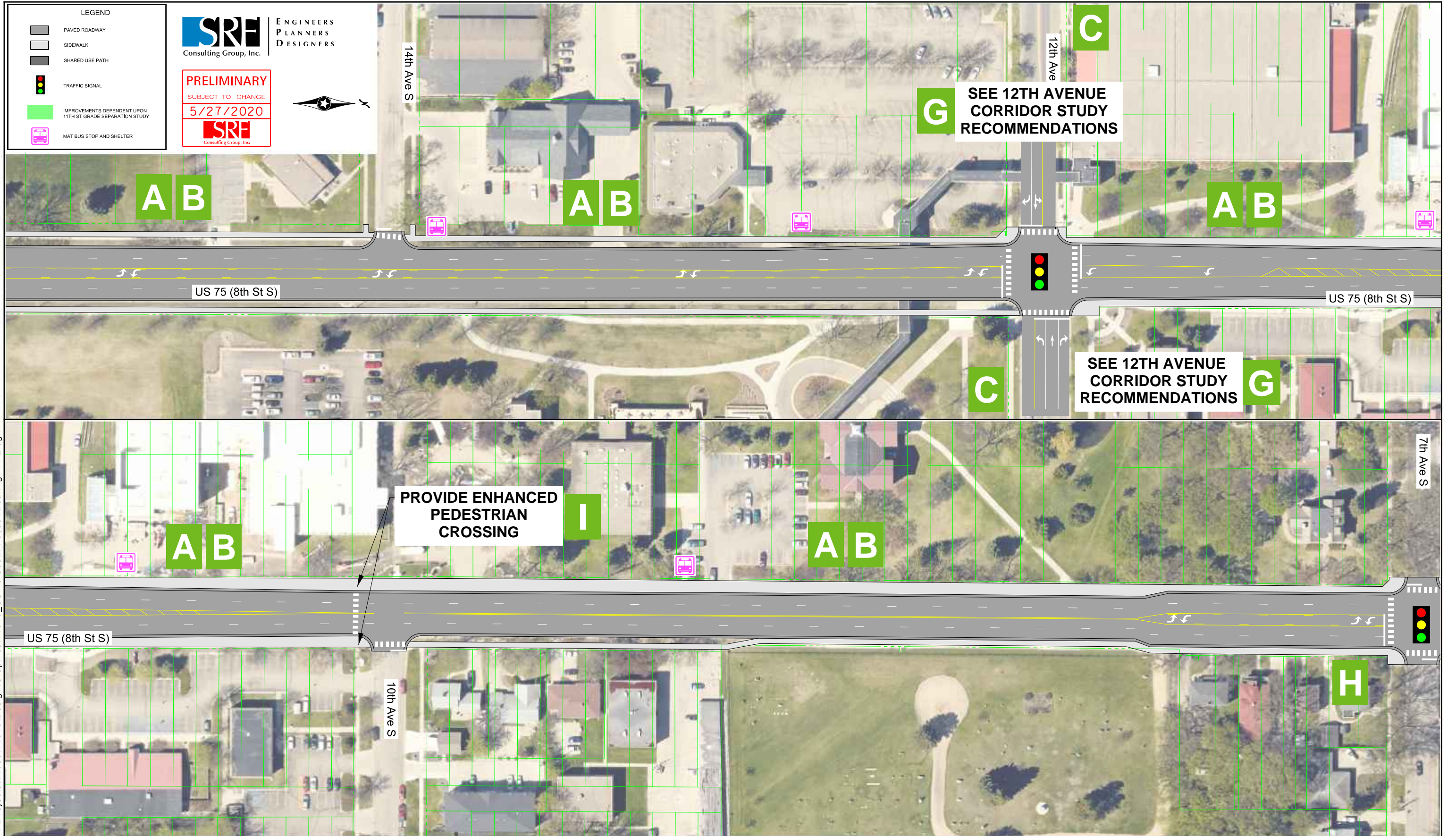
connecting the route from 12th Avenue through 24th Avenue to the route that crosses I-94. Alternate routes were identified and should be considered as part of future pedestrian and bicycle connections. These include the use of 5th and 6th Streets which can be accessed east-west via the future path proposed along 12th Avenue. 11th Street currently is a one-way street, and this could be used as an alternate route if converted to two-way operations in the future. Reducing the number of lanes along 8th Street (US 75) was also considered to allow for shared-used paths, cycle tracks or buffered bicycle lanes, but it was determined that 8th Street is a higher vehicular-volume roadway that serves as a main connection between downtown Moorhead and I-94. Therefore, a reduction in lanes was not recommended. The key crossings for bicycles located at 7th, 10th, 12th and 20th Avenues.

- An Intersection Control Evaluation (ICE) report (see Appendix G) was prepared for the 8th Street (US 75)/20th Avenue intersection to identify the most appropriate form of intersection control. Through the comprehensive technical analysis of safety and traffic operations, and other considerations such as right of way impacts, overall corridor considerations, transit considerations, and pedestrian and bicycle crossing considerations, it was recommended to continue controlling the intersection using a traffic signal.

Table 13 summarizes the vision and how each component addresses the goals and corridor needs.



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H:\Projects\11000\11648\Design\Graphics\11648_US 75 South Focus Area Fig. 14.2.dgn



H:\Projects\11000\11648\Design\Graphics\11648_US 75 South Focus Area Fig. 14.3.dgn

SRE Locally Preferred Concepts for US 75 South Focus Area
 US 10 / US 75 Corridor Study
 Moorhead, Minnesota

Job # 11648
 4/30/2020

Table 13: US 75 South Focus Area Concepts

Concepts for US 75 South		How do concepts address the goals?	Do concepts address corridor needs?		
			Pavement Conditions	Safety and Mobility	Walkability and Bikeability
A	Reconstruct entire corridor	<ul style="list-style-type: none"> Reconstructs poor pavement conditions 	✓	✓	✓
B	Minimize lane widths along entire corridor	<ul style="list-style-type: none"> Reduced lane widths help promote slower driving speeds and slower speeds reduce the severity of crashes Narrower streets shorten the distance pedestrians need to cross major roadways (US 75) Reduced lane widths provide more space to be used as green space or for wider sidewalks/trails 	✓	✓	✓
C	Use 4th Street and 5th Street or 11th Street for parallel bike route	<ul style="list-style-type: none"> Moving bike route to adjacent corridors maintains “Gateway” feel for corridor since trees will not need to be demolished Parallel routes promote bikeability by connecting other routes 			✓
D	Restrict access at 2nd Avenue and install marked pedestrian safety island for pedestrians crossing 8th Street (US 75)	<ul style="list-style-type: none"> Access restriction addresses near and long-term needs by addressing an existing safety issue Pedestrian safety island limits exposure to pedestrians from vehicular traffic by providing a refuge Marked crossing provides designated crossing location while alerting drivers to where pedestrians are crossing 		✓	✓
E	Install traffic signal control at 4th Avenue when warranted by traffic levels	<ul style="list-style-type: none"> Addresses long-term needs by providing accommodating additional traffic that will shift to 4th Avenue from 2nd Avenue caused by the access restriction at 2nd Avenue Traffic signals are effective at stopping traffic to allow pedestrians to cross a major roadway (US 75) 		✓	✓
F	Minimize “jog” in corridor between 4th Avenue and 6th Avenue	<ul style="list-style-type: none"> Provides flexibility for near and long-term needs by addressing an existing lane continuity issue 		✓	
G	Revise intersection geometry and lane usage, and make signal timing improvements, including installing a leading pedestrian interval and install dynamic no right-turn on red, at 12th Avenue	<ul style="list-style-type: none"> Addresses near and long-term needs by reducing overall vehicle delays Improves walkability by enhancing visibility of pedestrians in the intersection to reinforce their priority over turning vehicles 		✓	✓

Table 13: US 75 South Focus Concepts (continued)

Concepts for US 75 South		How do concepts address the goals?	Do concepts address corridor needs?		
			Pavement Conditions	Safety and Mobility	Walkability and Bikeability
H	Reinstall traffic signal control at 7th Avenue and 20th Avenue	<ul style="list-style-type: none"> Addresses long-term needs by providing accommodating additional traffic that will shift to 4th Avenue from 2nd Avenue caused by the access restriction at 2nd Avenue Traffic signals are effective at stopping traffic to allow pedestrians to cross a major roadway such as 8th Street (US 75) 		✓	✓
I	Reinstall enhanced pedestrian crossing treatment at 10th Avenue (type to be determined during preliminary engineering)	<ul style="list-style-type: none"> Enhanced pedestrian crossings are effective at stopping traffic to allow pedestrians to cross a major roadway such as 8th Street (US 75) 10th Avenue is a key crossing location to connect to the pedestrian and bicycle system 			✓
J	Construct separated bike facility along east frontage road between 20th and 24th Avenues	<ul style="list-style-type: none"> Fills gap between 20th and 24th Avenues Provides connection between 12th Avenue and across I-94 			✓
K	Tie into recent reconstruction at 24th Avenue	<ul style="list-style-type: none"> Completes overall corridor reconstruction 	✓		

Vision & Concepts for US 10 East Focus Area

Highlights:

- US 10 East focus area prioritizes providing a consistent typical section connecting the urban character between downtown Moorhead and US 10 in Dilworth.
- Pavement rehabilitation is needed within 10 years for the entire corridor.
- Intersection safety issues exist along the corridor and at the 34th Street intersection.
- Poor intersection operations are expected at the 21st, 28th and 30th Street intersections.
- There is a gap in the trail system between 21st and 28th Streets and there are no connections to downtown Moorhead.
- Crossings for pedestrians and bicycles need to be improved.



US 10 East Focus Area Goals & Vision

The US 10 East focus area primarily consists of land uses that are industrial and commercial type uses but the focus area has been identified as an area with opportunities for redevelopment. Further, in this focus area US 10 transitions from urban to rural with limited access except at key intersections. Trails are not provided on both sides of US 10 nor are there any pedestrian or bicycle connections to downtown. There is a need to address intersection and corridor safety issues identified along with a few traffic operations issues. The following highlights key input obtained through this study’s engagement efforts:

- Need to convert to "urban" corridor by removing the ditch median to be consistent with the roadway both east and west of the focus area.
- Consider limiting movements that can be made at certain intersections to help improve safety.
- Construct trails along both the north and south sides of corridor.
- Consider pedestrian and bicycle underpasses at US 10/US 75 and 21st Street/1st Avenue intersection.
- MnDOT’s preference is to maintain opportunity for commercial vehicle inspection site.

The vision largely prioritizes connecting the urban character of downtown with US 10 east of the focus area in Dilworth while addressing safety and mobility issues and improving connections for pedestrians and bicycles. Roadway design elements presented in Table 14 focus on improving the character of the corridor.

Table 14: Vision for US 10 East Focus Area

Overarching Goals	Elements of Vision for Focus Area
Provide roadways that fit land use (i.e., appropriate access and design)	<ul style="list-style-type: none"> ▪ Connect urban character between downtown Moorhead and Dilworth
Accommodate appropriate users (i.e., complete streets)	<ul style="list-style-type: none"> ▪ Maintain mobility for commuters ▪ Improve US 10 crossings for pedestrians and bicycles ▪ Improve east-west trail connections and provide connection to downtown Moorhead
Create an environment to stimulate growth	<ul style="list-style-type: none"> ▪ Redevelopment opportunities exist so access needs to be safety managed and planned
Provide flexibility for near and long-term transportation needs	<ul style="list-style-type: none"> ▪ Address traffic safety and operational deficiencies at key intersections
Improve “Gateway” feel for US 10 and US 75 corridors	<ul style="list-style-type: none"> ▪ Connect urban character between downtown Moorhead and Dilworth



US 10 East Focus Area Needs

As previously noted, the need for the multimodal transportation improvements and the relationship to regional transportation need is based on the transportation analyses completed as part of this study and documented in Appendix E and F. In addition to addressing the overall study goals and vision for US 10 East, it was determined that future corridor planning and improvements should address the needs presented in Table 15.

Table 15: US 10 East Focus Area Needs

Overarching Needs	Needs for Focus Area
Pavement condition	<ul style="list-style-type: none"> ▪ Pavement rehabilitation is needed within 10 years for entire corridor
Vehicle safety and mobility	<ul style="list-style-type: none"> ▪ Safety issues exist along the entire focus area corridor ▪ Safety issues exist at the US 10/34th Street intersection ▪ Poor intersection operations are expected at the US 10/75 and 1st Avenue/21st Street intersection ▪ Poor intersection operations are expected at the US 10/28th Street intersection ▪ Poor intersection operations are expected at the US 10/30th Street intersection ▪ Need to maintain functionality as a US Highway
Walkability and bikeability	<ul style="list-style-type: none"> ▪ There is a gap in the east-west trail system between 21st and 28th Streets ▪ There is a gap between the Downtown and US 10 East focus areas ▪ There is a desire to improve the connections across US 10/75 at 1st Avenue/21st Street



US 10 East Focus Areas Concepts

The recommended concepts for the US 10 East focus area are illustrated in Figure 34. The concepts prioritize changing the character of this area to connect the urban character of downtown Moorhead and US 10 in Dilworth. This includes removing the existing wide median and providing better pedestrian and bicycle connections while implementing appropriate access management techniques and intersection control treatments to address traffic safety and mobility issues. Key elements include:

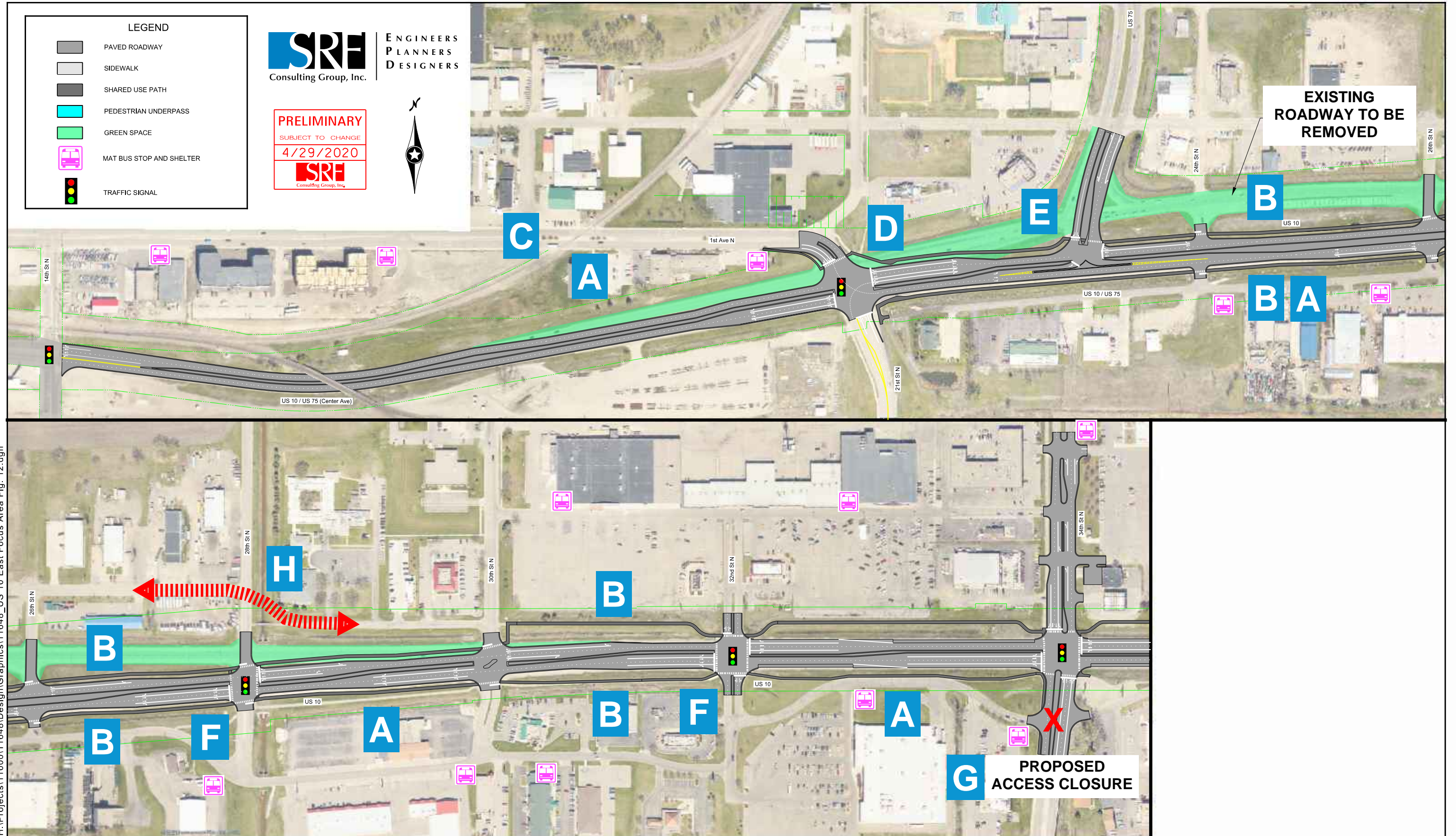
- In addition to the 21st Street, US 75 and 34th Street full-access intersections, maintaining full-access at the 28th and 32nd Street intersections was identified to best provide overall connections to the area. 28th Street is a key connection to serve land uses north of US 10 and 32nd Street is a key intersection providing access to a multitude of businesses and transit.
- The concept recommends a future underpass for pedestrians and bicycles crossing at or near the 1st Avenue/21st Street intersection to provide a key connection across US 10/75. Further, providing trails on both sides of the corridor in the focus area, along with providing a connection to a future trail along the south side of 1st Avenue, provide the missing connection between downtown Moorhead and US 10 east. Once the future alignment for US 10 is established the proposed location of the trail on the south side of US 10 will need to be further evaluated relative to impacts to the drainage system and connections to transit.
- An Intersection Control Evaluation (ICE) report (see Appendix G) was prepared for the US 10/75 intersection to identify the most appropriate form of intersection control. Through the comprehensive technical analysis of safety and traffic operations, and other considerations such as right of way impacts, overall corridor considerations, transit considerations, and pedestrian and bicycle crossing considerations, it was recommended to convert the intersection to a continuous green T-intersection. This maintains the flow of eastbound traffic while providing a signalization for the westbound thru and southbound left-turn conflict. The green-T minimizes the risk for traffic to back-up into the 1st Avenue/21st Street intersection. The green-T would keep traffic flowing at higher speeds further justifying an underpass for pedestrians and bicycles.

Table 16 summarizes the vision and how each component addresses the study goals and corridor needs. Further details regarding a potential future commercial vehicle inspection site are covered later in the section of the report.

LEGEND	
	PAVED ROADWAY
	SIDEWALK
	SHARED USE PATH
	PEDESTRIAN UNDERPASS
	GREEN SPACE
	MAT BUS STOP AND SHELTER
	TRAFFIC SIGNAL

SRE ENGINEERS
Consulting Group, Inc. PLANNERS
DESIGNERS

PRELIMINARY
SUBJECT TO CHANGE
4/29/2020
SRE
Consulting Group, Inc.



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Table 16: US 10 East Focus Area Concepts

Concepts for US 10 East		How do concepts address the goals?	Do concepts address corridor needs?		
			Pavement Conditions	Safety and Mobility	Walkability and Bikeability
A	Reconstruct entire corridor while narrowing the median to remove the wide median	<ul style="list-style-type: none"> Reconstructs poor pavement conditions Narrowing the median promotes the urban character for the corridor connecting US 10 with downtown 	✓	✓	✓
B	Construct a shared-use path along both the north and the south sides US 10 between 21st Street/ 1st Avenue and 28th Street	<ul style="list-style-type: none"> Provides connection for pedestrians and bicycles between the downtown connections and trails that already exist on the east end of the corridor 			✓
C	Construct a shared-use path along 1st Avenue between 21st Street/1st Avenue and 11th Street	<ul style="list-style-type: none"> Provides connection for pedestrians and bicycles between downtown and US 10 east of downtown Existing railroad bridge makes it difficult to construct trail along US 10 from 11th Street to 1st Avenue/21st Street 			✓
D	Revise intersection geometry, remove split-phased signal timing, and construct a pedestrian and bicycle underpass near the intersection	<ul style="list-style-type: none"> Mobility is improved by removing the split-phasing at the traffic signal Pedestrian/bicycle tunnel provides key connection for users south of US 10 to cross to the north side 		✓	✓
E	Construct continuous green-T intersection at US 10/US 75 intersection	<ul style="list-style-type: none"> Green-T accommodates traffic levels while ensuring queues between the 1st Avenue/21st Avenue intersection and the US 10/US 75 intersection can be accommodated Provides signalization for the westbound thru and southbound left-turn conflict Overall mobility is improved 		✓	✓
F	Provide signalized full-access intersections at 28th Street and 32nd Street east of US 75 (and restrict access at the other intersections)	<ul style="list-style-type: none"> Proper access management minimizes conflicts and improves the safety and mobility of the intersections 		✓	
G	Restrict access at south frontage road at 34th Street to a right-in/right-out access	<ul style="list-style-type: none"> Access is too close to US 10 causing safety issues 		✓	
H	Connect frontage road between 26th and 30th Streets	<ul style="list-style-type: none"> Promotes connectivity with access restrictions 		✓	

Considerations for Maintaining a Commercial Vehicle Inspection Site

Removing the existing wide median along US 10 impacts the existing commercial vehicle inspection site. Input from stakeholders indicates a desire to maintain a future inspection site along US 10. To address this, several alternatives were developed (see Appendix H) that can be further considered as the project develops:

1. **Use the City-owned transfer facility property in the southwest quadrant of the 28th Street intersection.** This location would require trucks to exit and re-enter US 10. Further, the City desires to keep this property for potential redevelopment opportunities if other inspection site locations are feasible.
2. **Use of the existing northern frontage road.** This option also requires trucks to exit and re-enter US 10, using the northern frontage road between 26th and 28th Streets.
3. **Use of the future narrower median.** Maintaining an inspection site in both directions in the median is not feasible unless a traditional signalized intersection is constructed at US 10/75. With the continuous green-T intersection recommendation at US 10/75, an inspection site in the westbound direction is not feasible.
4. **Use of a new site east of Dilworth.** While State Patrol would prefer the inspection site remains near the US 10/75 intersection where travel speeds are low and commercial vehicles can be captured in both directions, an inspection site on both shoulders of US 10 east of Dilworth between the 12th and 60th Street intersections can be accommodated and would be acceptable. This would still allow for the inspection of trucks that bypass the I-94 weigh station and access US 10 via Hwy 336.

A final determination of where the inspection site exists will be based on further review of traffic along the corridor during the next phase of project development.

Transit Considerations

Highlights:

- MATBUS operates routes that travel along or across the US 10/75 corridors.
- Final recommendations for changes to transit will need to occur during the next phase of project development.
- MATBUS has obtained funding to implement transit priority throughout their system.
- Transit stops will need to be revised if Main Avenue (US 10) becomes a three-lane roadway. Buses will no longer be able to stop in the outside travel lane since only one lane will exist. Either boarding bulb stops or curbside pull-outs can be considered.
- Safety improvements at the US 10/34th Street intersection include closing the median to the southern frontage road. This impacts Route 6. However, three feasible options were identified for future consideration.

As previously noted, MATBUS operates routes in Moorhead that travel either along or across the US 10/75 study corridors. Since this is a planning study and the final design for the future reconstruction projects will be determined through the next phase of project development, final recommendations for changes to transit are not documented in this report. However, several considerations were noted that require further evaluation and discussion with MATBUS staff and drivers as project development continues.

Transit Signal Priority (TSP)

One assumption for this study is that MATBUS has obtained funding to implement Transit Signal Priority (TSP) in their system. This provides an advantage at traffic signals to minimize delays to buses and improve travel times by having the bus communicate with the signal system to either give the buses an early green light or extend the green light allowing them to pass through the intersection.

Converting Main Avenue (US 10) to a Three-lane Roadway

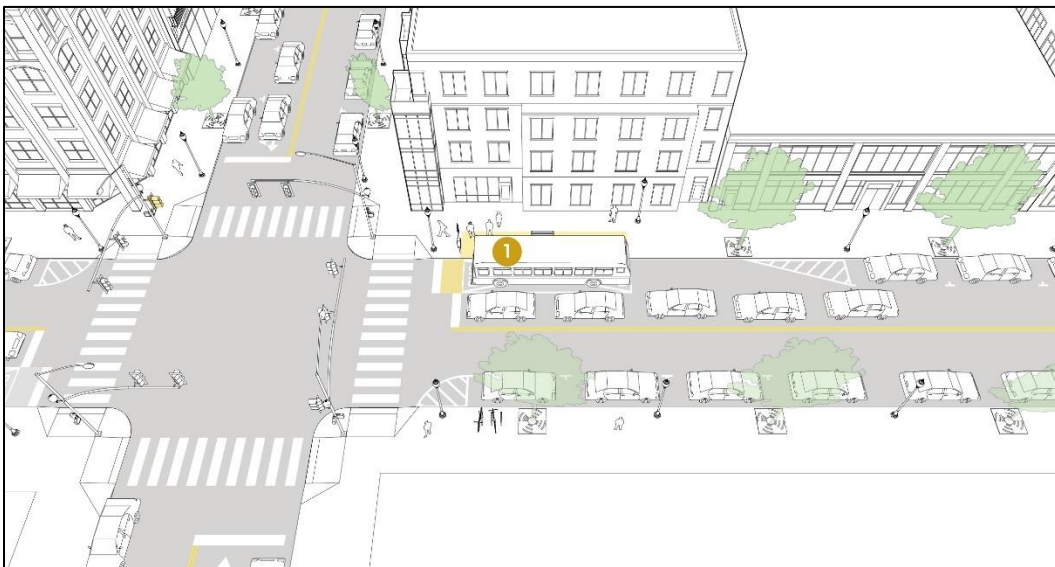
Through downtown Moorhead MATBUS has east-west routes along Main Avenue (Routes 1 and 2). Transit stops for these routes could be impacted by a potential conversion of Main Avenue to a three-lane roadway. Route 1 diverts from Main Avenue using 6th Street to serve 8th Street (US 75) and then returns to Main Avenue using 5th Street. There are both eastbound and westbound nearside stops at 4th Street. There is a nearside westbound stop at 5th Street and a nearside eastbound stop at 6th Street. Today, buses stop in the outside travel lane given there are two travel lanes in each direction. If Main Avenue is converted to a three-lane roadway as part of the downtown reconstruction project, these stops will need to be revised.

When one lane of travel exists in each direction, buses either need to pull-off the roadway or stop in the lane of travel. Tradeoffs exist between these options where buses must slow down to pull-off and have difficulty re-entering the travel lanes. Bus drivers and transit agencies typically prefer to stop in a travel lane. The following transit stop configurations should be evaluated if Main Avenue is converted to a three-lane roadway:

- **Boarding Bulb Stop:** These stops include curb extensions to allow transit buses to stop in the travel lane and still extend their platforms to the curb for easy passenger loading and unloading. These can either be nearside or farside. With TSP being implemented, often farside stops provide the best transit advantage. This type of stop reduces the risk for transit delays when traffic flows are heavier. The following page includes a schematic from NACTO illustrating a boarding bulb stop:



- **Curbside Pull-Out Stop:** These stops require buses to pull-off the roadway next to the curb to allow for loading and unloading of passengers. Again, these can either be nearside or farside and farside typically provides the most benefit with TSP. These can be challenging and cause delays for transit if traffic flows are heavier as drivers need to re-enter the main travel lane. Below is a schematic from NACTO illustrating a curbside pull-out stop:



Evaluation will need to be completed through project development to ensure transit stops are being accommodated with any potential changes in the roadway network. It is recommended to engage MATBUS staff and drivers to ensure needs are met. Additional details regarding transit stop options can be found in NACTO's Transit Street Design Guide located here: <https://nacto.org/publication/transit-street-design-guide/stations-stops/stop-configurations/>.

Implementing Access Restrictions to Frontage Road on 34th Street

The locally preferred concept for the US 10 East focus area includes closing the median on 34th Street on the south side of US 10 which restricts access to the frontage road system. Crash history at this intersection that is close to US 10 necessitates the need for the restriction. MATBUS routes 3, 6 and 9 circulate the 32nd Street and 34th Street business areas, but signalization of the 32nd Street/US 10 intersection is proposed to remain so there are no impacts to transit at this location. Route 6, however, is impacted by the median closure at the south frontage road along 34th Street. With the closure of the median, Route 6 will no longer be able to make the southbound-to-eastbound left-turn from 34th Street to access the transit stops along the frontage road east of 34th Street. Three possible were considered and should be evaluated as the project develops:

1. **Reverse Route Direction:** This option would reverse the direction of Route 6 east of 34th Street. Buses would now head east through the 34th Street intersection and access the northern frontage, continue east, and then crossover US 10 to access the southern frontage road before returning to the west. The circulation west of 34th Street would remain as is.
2. **Use Next Intersection East:** This option would have Route 6 use the intersection just to the east of 34th Street to make a right-turn to access the southern frontage road. This would require relocation of the stops near 34th Street or require the buses to make a U-turn to head back east.
3. **Install Bus-Only Right-Turn Lane:** This option would install an eastbound bus-only right-turn lane just downstream of the 34th Street intersection. While this would be simplest option this introduces another access along US 10, and it would be difficult to keep non-transit buses from using the turn lane to access the businesses along the frontage road.

While addressing safety needs along 34th Street impact Route 6, there is a range of feasible options that can be considered in the next phase of project development.

Implementing the Visions

Highlights:

- MnDOT has a fiscally constrained 4-year program of projects and a 10-year plan of projects.
- Roadway capacity and safety needs, pavement condition, and construction staging were used to develop implementation plan.
- Phase 1 prioritizes the need to address deteriorating pavement conditions (year of need) along US 75 (8th Street) and along US 10 (Main Avenue) west of US 75 (8th Street) while minimizing potential construction staging and coordination issues associated with a future grade-separation project in downtown.
- Phase 2 reconstructs the US 10 East focus area reconstructing US 10 (Center Avenue) from 14th Street to 34th Street.
- Reconstruction of US 10/75 (Main Avenue) east of US 75 (8th Street) will be planned and coordinated with future grade-separation project at 11th Street (future US 10/75).
- US 10 east of 34th Street will be determined in an upcoming corridor study is anticipated to be completed in 2021/2022.

MnDOT has a fiscally constrained 4-year program of projects and a 10-year plan of projects. These only include projects that MnDOT can reasonably be expected to construct each year based on the projected revenues it predicts to receive. Base on MnDOT's near- and long-term needs, the reconstruction of US 10 and US 75 will need to be implemented in phases. The projects should also be coordinated with future projects on the Fargo side of the Red River to ensure that alternate routes are not simultaneously under construction. One of the key aspects of implementation is to find discrete segments of the project that could move forward based on the available funding while identifying logical sequencing or staging of the project. Improvements were prioritized along US 10/75 focusing the immediacy of need (i.e., roadway capacity, safety, and/or condition of pavement) and construction staging (i.e., minimization of construction related impacts). The following implementation plan was developed:

- **Phase 1 (Construction Year 2025):** MnDOT Programmed Funds = \$14.6M
 - US 75 (8th Street): 24th Avenue to US 10 (Main Avenue)
 - US 10 (Main Avenue): River to US 75 (8th Street)
- **Phase 2 (Construction Year 2026):** MnDOT Programmed Funds = \$10.8M
 - US 10 (Center Ave): 14th Street to 34th Street

Phase 1 of the implementation plan prioritizes the need to address deteriorating pavement conditions (year of need ranges from 2021-2024) along US 75 (8th Street) and along US 10 (Main Avenue) west of US 75 (8th Street) while minimizing potential construction staging and coordination issues associated with a future grade-separation project in downtown. The proposed location of the grade-separation is anticipated to be at 11th Street. MnDOT and the City of Moorhead are currently working through the environmental documentation process and developing preliminary design plans; however, funding is not currently identified for any changes.

Phase 2 of the implementation plan reconstructs the US 10 East focus area reconstructing US 10 (Center Avenue) from 14th Street to 34th Street, which addresses pavement needs (year of need is 2026). Construction staging and coordination is not expected to be an issue in the area because of the amount of existing right of way. Reconstruction of (Main Avenue east of 8th Street will be planned and coordinated with any future downtown grade-separation project.

The future vision for US 10 east of 34th Street will be determined in an upcoming corridor study anticipated to be completed in 2021/2022. Restriping and/or reconstruction of Center Avenue between US 75 (8th Street) and 11th Street will occur following the jurisdictional transfer of this segment to the City of Moorhead, which will provide a consistent roadway with Center Avenue just west of 8th Street. The addition of the trail along 1st Avenue will take place once a funding source has been identified.

As the US 10 and US 75 corridors move into the next phase of project development, additional community outreach and input will be included, and further vetting and evaluation of concepts will take place. The purpose of this study was to develop corridor visions and identify context-sensitive concepts to be considered during project development. Further, it is important to note concepts developed for this study include assumptions based on the best current data available, which is currently being influenced by ongoing construction projects in both Moorhead and Fargo. New data will need to be collected and re-evaluated once traffic stabilizes following the completion of these projects.