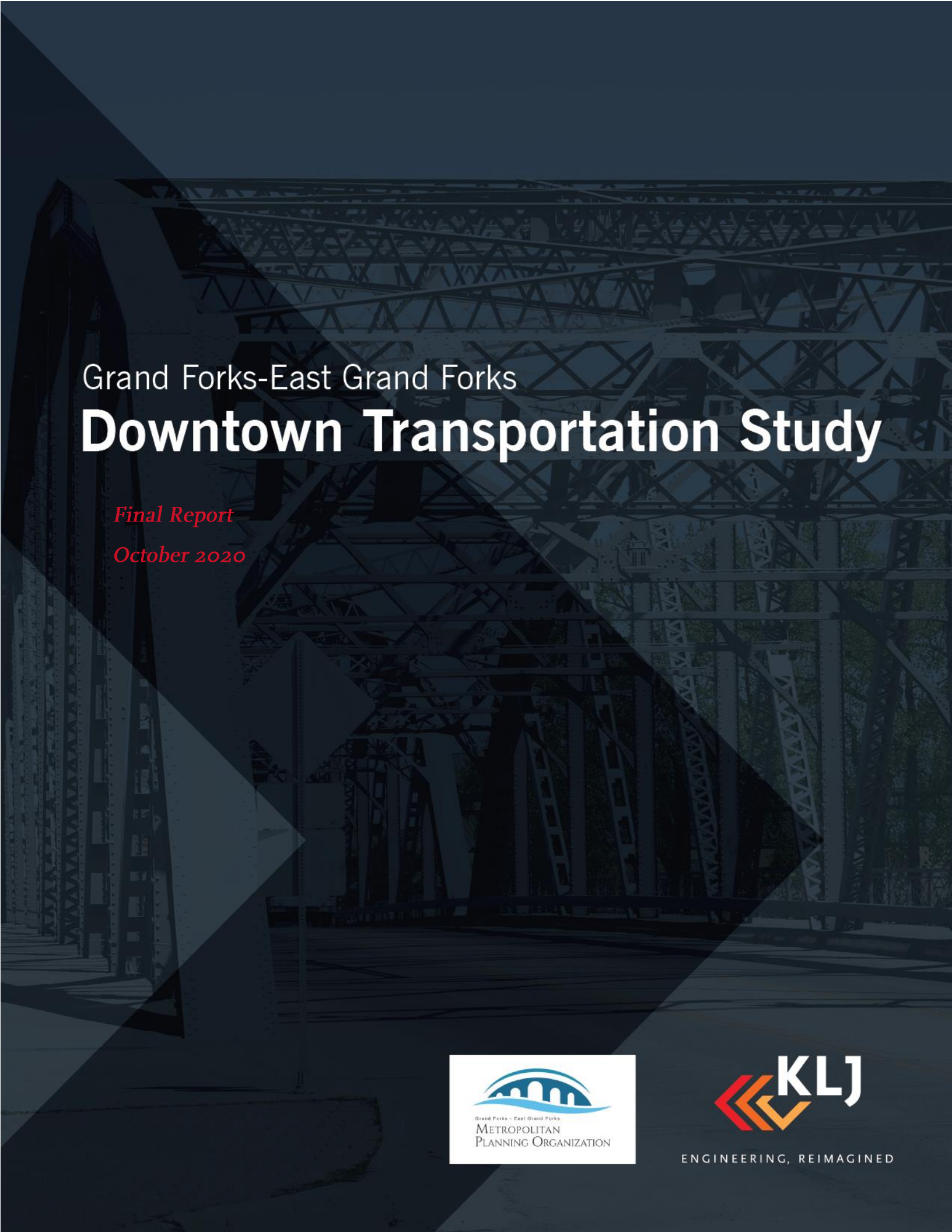

Grand Forks-East Grand Forks

Downtown Transportation Study

Final Report

October 2020

Grand Forks – East Grand Forks
METROPOLITAN PLANNING ORGANIZATION

KLJ
ENGINEERING, REIMAGINED

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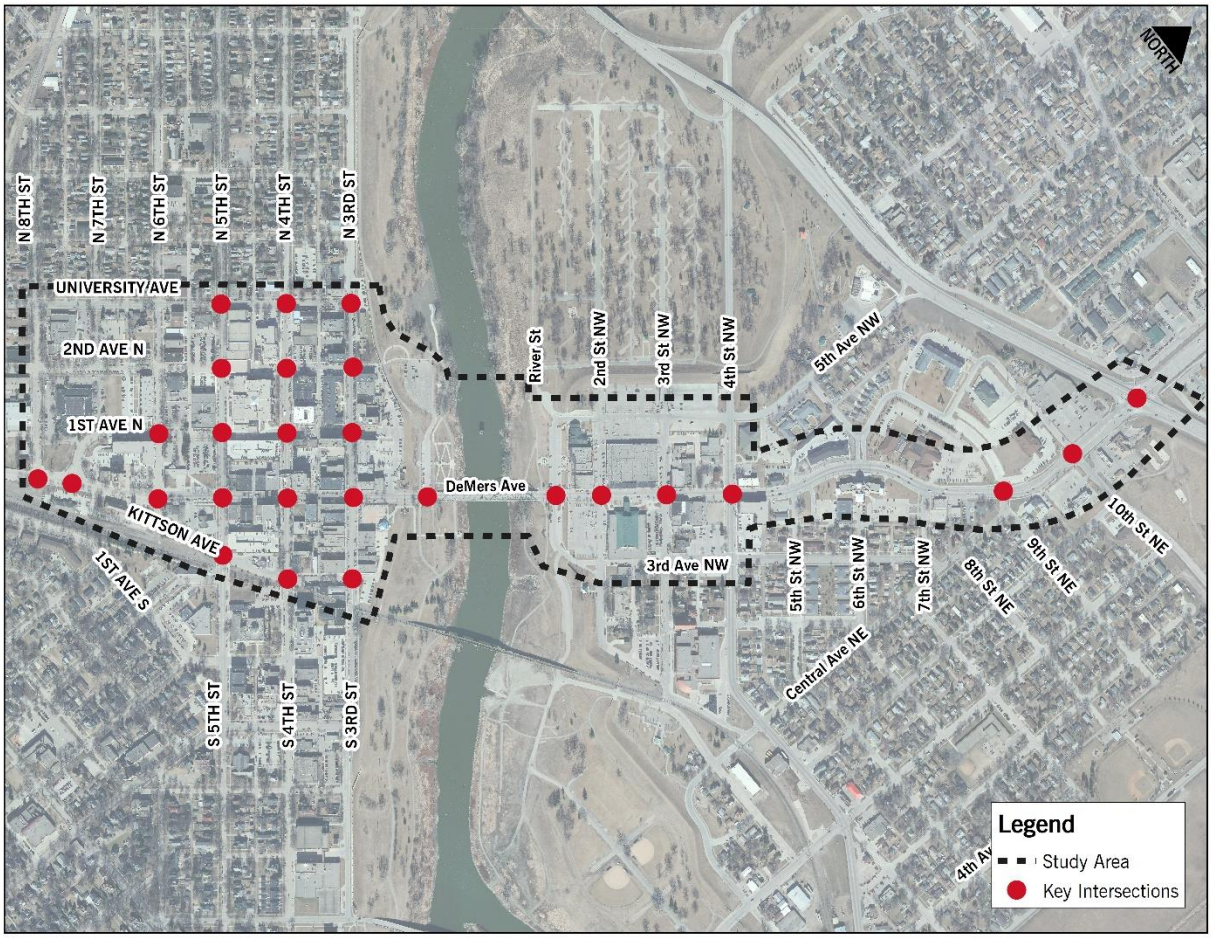
INTRODUCTION

Downtown throughout the region and across the globe historically support a combination of varied and often competing transportation uses. Downtown Grand Forks and East Grand Forks are no different. The two downtowns must balance downtown business traffic and parking, regional traffic and trucks on DeMers Avenue, transit, bicyclists, pedestrians, and taxis and ride-hailing. While each downtown has a unique and separate identity, they both must balance livability, supporting downtown growth, and maintaining the function of DeMers Avenue and its Red River crossing. This Downtown Transportation Study will focus on identifying solutions that can support healthy and vibrant downtowns in both communities.

STUDY AREA

The study area and key intersections are illustrated in Figure 1. Key intersections were selected for analysis based on a variety of factors including daily vehicular activity and the roadway's importance to the transportation network (functional classification).

Figure 1: Study Area



Previous Studies

Multiple recent planning efforts have studied a variety of issues throughout both Downtown Grand Forks and East Grand Forks. They are summarized below.

Downtown Action Plan

The City of Grand Forks hired a consultant to complete the Downtown Action Plan, which will describe a desired vision for the future of downtown and provide recommendations for public investment. The plan is scheduled to conclude in 2019 and will include parks, open spaces, branding, wayfinding, and development strategies. The plan identified multiple sites likely to see reinvestment within the next 10 years. Each of the sites vary in their size and development potential but combined will have a significant impact on transportation throughout downtown. The redevelopment scenarios will be imperative to consider in traffic forecasting completed for this study.

The Downtown Action Plan also included a variety of transportation related improvements that would support the vision established in this plan, including aesthetic improvements for 3rd Street in Grand Forks between DeMers Avenue and University Avenue, bicycle facilities, and roundabouts. These concepts will be considered in the alternative's development and assessment phase for this study.

Grand Forks Parking Study

The Grand Forks – East Grand Forks Metropolitan Planning Organization is in the process of completing a parking study in downtown Grand Forks. This study included a turnover and occupancy study and found that around half of the 3,600 parking spaces throughout downtown sit empty on a typical day. Even with the expected redevelopment over the next 10 years, there remains adequate parking throughout downtown.

The study recommended a series of management strategies and policies as well as infrastructure investments to improve the parking environment through Downtown Grand Forks. Prioritizing walking and biking investments throughout downtown was identified as a strategy to reduce parking demand and was strongly supported by the public and the study's steering committee.

East Grand Forks 2045 Land Use Plan

The City of East Grand Forks updates their land use plan on a five-year cycle, last updated in 2015. This plan catalogued existing land uses and outlined land use goals and policies. This plan identified East Grand Forks' downtown core as one of the city's strengths and recommended building on it with additional infill, including mixed-use residential and commercial. The large parking lots behind the Riverwalk Center were identified as underutilized parcels that may provide an opportunity for infill development, likely to occur between 2025 and 2035 as shown in Figure 2. The implementation plan also recommended using shared-use and other parking supply reduction strategies within downtown.

Figure 2: 2045 Future Land Use Plan Identifying Parking Lots as Mixed Use Residential/Commercial

River Forks Downtown Plan Update

In 2009, the Grand Forks – East Grand Forks MPO, Grand Forks, and East Grand Forks undertook a downtown planning process to identify initiatives and projects for the downtown area. This report identified additional commercial and residential opportunities the two downtowns could support; by 2021, this study expected the downtowns could support up to 50,000 square feet of commercial space and nearly 450 housing units. Specific recommendations from this report include a new pedestrian and bicycle bridge northwest of DeMers Avenue that would improve the multimodal connectivity between the two downtowns and commercial/residential concepts around the DeMers Avenue and 4th Street NW intersection in East Grand Forks, including the mixed-use building constructed since this report was completed.

Figure 3: Aerial View of Pedestrian Bridge and Mixed-Use Development from River Forks Downtown Plan Update

2045 Metropolitan Transportation Plan

The 2045 Metropolitan Transportation Plan (MTP) evaluates and prioritizes transportation projects across the Grand Forks – East Grand Forks metro through 2045 based on a combination of technical needs and community input. The MTP identified congested conditions along DeMers Avenue under 2015 conditions and expects conditions to continue to deteriorate through 2045. The plan identified many projects for the study area, resulting in more than $56 million in investments anticipated in the downtown area through 2045. This level of investment allows for improvements identified and prioritized in this study to translate into implementable projects. These are shown in Table 1.

Table 1: Anticipated Infrastructure Investments in Downtown Grand Forks and East Grand Forks

Project	Description	Time Frame	YOE Cost
US 2B (5th Street)	Chip Seal between Gateway Drive and DeMers Avenue	Short	$51,000
Citywide Signal Upgrade	Rehabilitate traffic signals on Urban Road system	Short	$3.1 M
Citywide Signal Upgrade	Rehabilitate traffic signals on Regional Road system	Short	$6.5 M
US 2B (DeMers Avenue)	CPR & Grind 6th Street to Red River	Mid	$158,000
US 2B (5th Street)	Mill & HBP	Long	$2.92 M
US 2B (Sorlie Bridge)	Repaint Bridge	Long	$2.8 M
N 3rd Street	Reconstruct from DeMers Avenue to University Avenue	Short	$5.3 M
N 4th Street	Reconstruct from DeMers Avenue to University Avenue	Mid	$7.3 M
Eastern Downtown Area	Revitalization	Short	$1.0 M
Northern Downtown Area	Revitalization	Mid	$1.0 M
Southern Downtown Area	Revitalization	Long	$1.0M
S 3rd Street	Reconstruct from DeMers Avenue to Division Avenue	Long	$11.2 M
S 4th Street*	Reconstruct from DeMers Avenue to Division Avenue	Long	$11.2 M
US 2B (EGF)	Replace 3 traffic signals from 2nd Street to 4th Street	Short	$600,000
US 2B (EGF)	Resurface DeMers Avenue to US 2 with Potential Turnback	Mid	$2.0 M
US 2B (EGF)	Concrete Rehabilitation DeMers Avenue from Red River to US 2	Mid	$4.0 M
US 2B (EGF) – Sorlie Bridge	Concrete Rehabilitation from Red River to 4th Street	Mid	$3.0 M
US 2B (EGF) – Sorlie Bridge	Repaint Bridge	Long	$2.8 M

**4th Street between DeMers Avenue and 1st Avenue will be submitted for the Urban Grant Program in 2020.*

DeMers Avenue Reconstruction

The DeMers Avenue Traffic Operations Report authored by North Dakota Department of Transportation (NDDOT) in Grand Forks has estimated traffic volumes on DeMers will increase from around 15,000 vehicles per day under existing conditions to around 22,000 vehicles per day by 2045 (a 47 percent increase). The current reconstruction effort is likely to result vehicular operational constraints during peak periods over the next 20 years, which may have impacts on the surrounding roadway network. Ultimately, the reconstruction maintained the same level of capacity, while removing some parking spaces on the minor approaches to provide curb bulbouts and most of the DeMers Avenue right-turn lanes (westbound right-turn lanes at 3rd Street, 4th Street, and 5th Street and eastbound right-turn lane at 3rd Street) to improve pedestrian safety and add aesthetic appeal to the corridor.

Sorlie Bridge Rehabilitation

The Sorlie Bridge provides the Red River crossing between Downtown Grand Forks and Downtown East Grand Forks on DeMers Avenue. The draft traffic operations report, completed as part of the rehabilitation project in 2017, identified future capacity constraints and multimodal constraints. Given the potential impacts to the

historic bridge structure and the remaining life of the structure, only minimal improvements were completed in 2017, including repainting and improving lighting.

University Avenue Corridor Study

With a grant from the Knight Foundation, the City of Grand Forks is currently completing a corridor study for University Avenue from Columbia Road to North 6th Street to create a redevelopment strategy, programmatic recommendations, and streetscape renderings and sketches on University Avenue. The goal of the study is to:

- Create a continuous, publicly accessible streetscape that has a distinct character and identity.
- Improve connectivity and pedestrian/bicycle access within and to the University Corridor.
- Improve the corridor's function for community engagement and enhancement of community identity.
- Provide analysis of recommendations for opportunity zones, zoning classifications, and economic development opportunities.

Because some parts of the University Avenue Corridor Study overlap with the Downtown Transportation Study study area, coordination between the two studies will be important to ensure consistent results.

MnDOT Mobility Report

In 2018, the Minnesota Department of Transportation completed the Greater Minnesota Mobility Study, focusing on vehicle and freight mobility investment needs on the National Highway System throughout Greater Minnesota. This study found that travel time is unreliable along DeMers Avenue in East Grand Forks and congestion is contributing to decreased speeds and pointed to the need to improve reliability along the corridor given its use as a regional arterial. This report did not identify specific solutions for this corridor, but did provide a toolbox of solutions, including signal timing, access modifications, and intersection configurations. These solutions will be further analyzed in this study.

A potential turnback of DeMers Avenue (US 2 Business) in the short- to mid-term could change the priorities of this corridor and allow for more local decision making as to its future use and operations. The turnback would shift DeMers Avenue from 4th Street NW to Highway 2 to the State System and the city would take over 4th Street NW from DeMers Avenue south to US 2.

BUILT ENVIRONMENT

Land Use

Land use is an important component of transportation planning, because of its strong correlation with trip making behavior, i.e. whether someone would walk, bike, take transit, or drive between destinations. For example, a neighborhood with a strong mix of residential, commercial, and office uses may support individuals working, shopping, and eating out closer to home, which minimizes the use of the vehicle transportation network and supports multimodal activity. Downtowns typically include a strong mix of land use types.

For a long time, Downtown Grand Forks has primarily included office and commercial uses (retail, restaurants). Recently, and expected to continue, there has been more interest in residential and mixed-use residential developments. As more people can live and work downtown, it is likely walking and biking activity throughout Downtown Grand Forks will increase.

Downtown East Grand Forks, includes very limited residential uses throughout their downtown. However, their downtown includes a mix of destination businesses that support people walking between, once they arrive downtown.

Land use is shown in Figure 4.

Grand Forks' Downtown Action Plan Impacts on Land Use

The Downtown Action Plan identified multiple redevelopment opportunity sites for Downtown Grand Forks, shown in Figure 5. These projects include:

1) **Pure Development (Under Construction)** is a redevelopment project that will include the Hugo's Family Marketplace and Alerus Financial, located along DeMers Avenue between 5th Street and 6th Street. This redevelopment project will also include three levels of residential space for approximately 50 new units.
2) **GFK 4th Street Development**

    - Selkirk Lofts is a development project on the former Arbor Park site and the first phase of GFK 4th Street Development. It includes 1,800 feet of commercial space on the first floor with up to 20 residential units above.
    - Eskers Development is a proposed mixed-use office and commercial space at the corner DeMers Avenue and 4th Street, in the currently vacant lot next to Norby's Work Perks. This building would include more than 32,000 square feet of usable space.

3) **Lyon's Project** is a redevelopment concept that includes 131 residential units and an unknown amount of commercial/office space on the first floor.
4) **Edgewood Parking Lot Redevelopment** would build on the parking lot to the northwest of the Edgewood Corporate Plaza. The redevelopment plans include a boutique hotel, event center, and commercial office space.
5) **Century Link Building and Adjacent Parking Lots (Block 6)** would redevelop the Century Link building and two adjacent parking lots. No specific development concepts have been identified for this site.
6) **County Government Center** redevelopment would build on the vacant lot and parking lot adjacent to the railroad tracks south of Kittson Avenue. No specific development concepts have been identified for this site.
7) **Greenfield Site near Guesthouse Hotel** would develop on the vacant site between 1st Avenue and 2nd Avenue. No specific development concepts have been identified for this site.
8) **Water Treatment Plant** would redevelop the decommissioned water treatment plant along 4th Street and Minnesota Avenue (outside of this study area). No specific development concepts have been identified for this site.

These redevelopment concepts would result in hundreds of new residential units and tens of thousands square feet of new commercial uses and would have a significant impact on the transportation network.

Figure 4: Land Use

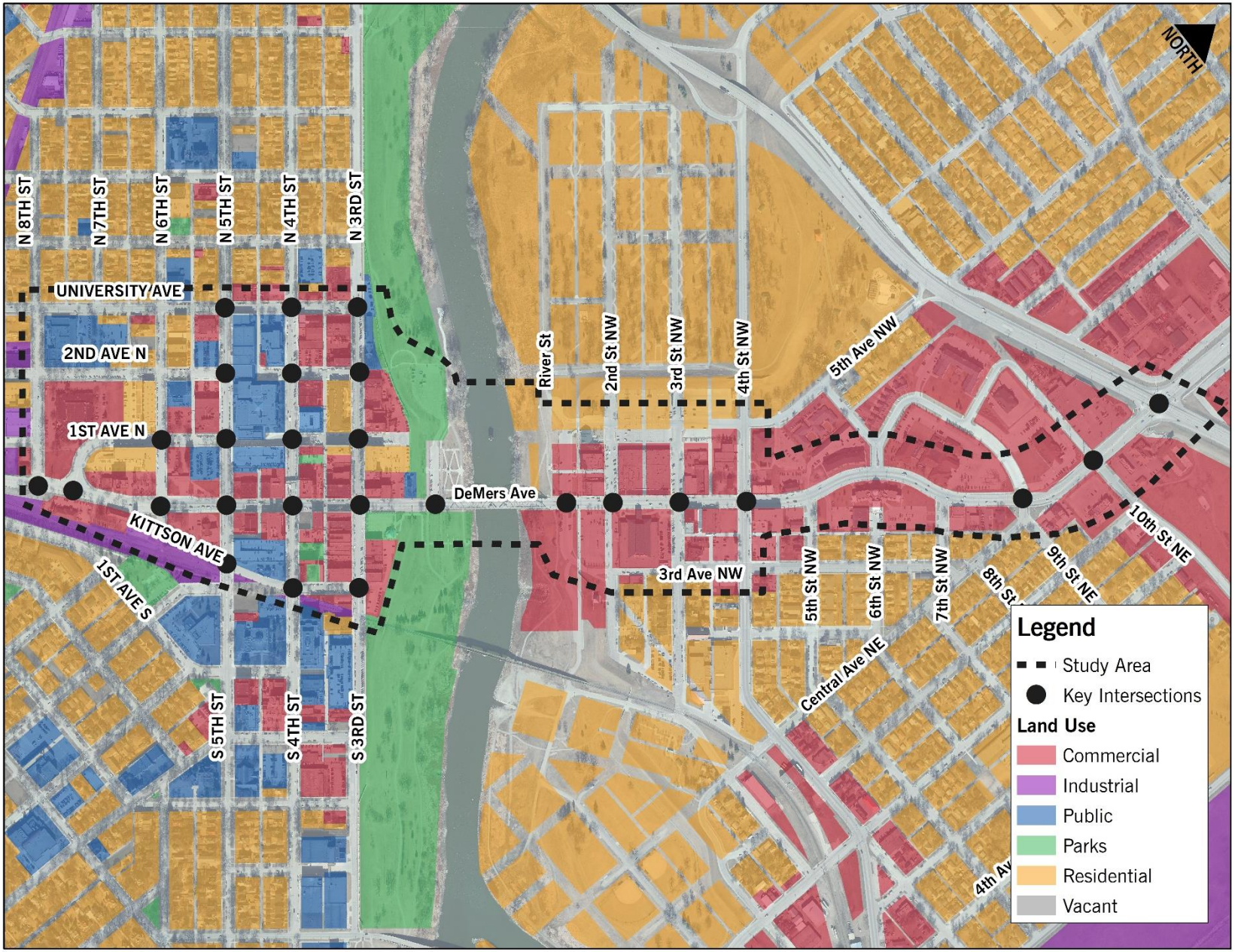
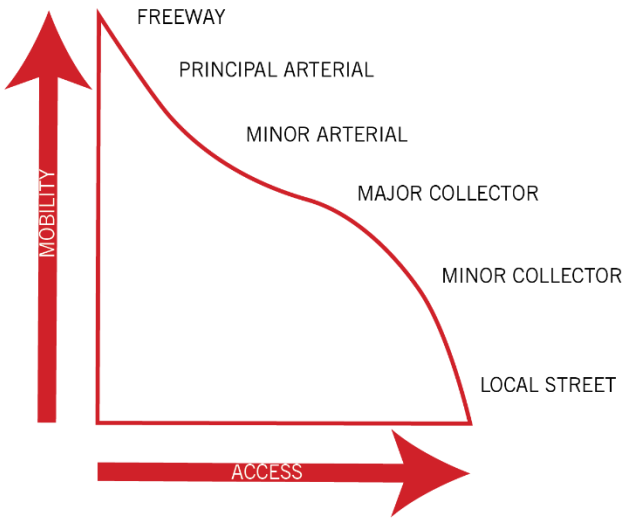


Figure 5: Downtown Action Plan Redevelopment Candidate Sites

Functional Classification

Roadways typically must balance access and mobility. The function of the roadway is dependent on classification; an interstate prioritizes mobility and has very strict access controls, permitting high speeds while a local road prioritizes access over mobility. Roadways that also have a functional classification are directly tied to the Federal-Aid Highway System and are eligible for federal transportation funding. Access and mobility relationships for functionally classified roadways is demonstrated in Figure 6.

Figure 6: Access and Mobility on Functionally Classified Roadways



Through both Grand Forks and East Grand Forks, DeMers Avenue is a principal arterial connecting I-29 to MN 220 and US Highway 2. It is an important connection for regional personal and freight traffic. While classified as an arterial, DeMers Avenue through the Grand Forks and East Grand Forks downtowns operates differently than it does through other areas of town with strip-style commercial development. In the downtowns, DeMers Avenue provides higher levels of access and balances parking, cross traffic, and pedestrian and bicycle activity. In commercial areas, access is reduced, and the primary function is moving vehicular traffic. Balancing the regional needs of DeMers Avenue with the local downtown needs of DeMers Avenue is one of the greatest challenges this study will look to address.

In East Grand Forks, 4th Street NW is a minor arterial as the US 2 Business Loop. In Grand Forks, 3rd Street, 4th Street, 5th Street, and University Avenue are minor arterials through some or part of the study area. In East Grand Forks, 4th Street north of DeMers Avenue is a minor arterial. All functionally classified roadways in the study area are shown in Figure 7.

Pavement Conditions

Studies have found timely pavement rehabilitation has the potential to be six to 14 times more cost-effective than rebuilding a deteriorated road. Another study found that rough roads add an average of $515 to the annual cost of car ownership due to damaged tires, suspensions, reduced fuel efficiency, and accelerated vehicle depreciation. Poor pavement also reduces bicyclist comfort and safety for on-road facilities.

The Grand Forks-East Grand Forks MPO derived a pavement conditions map for the 2045 Long Range Transportation Plan update that combined NDDOT, City of Grand Forks, and City of East Grand Forks pavement data into one pavement map. This is shown in Figure 8. On the Grand Forks side, there are a series of corridors within the study area with poor and failed pavement conditions, including 4th Street and 6th Street. On the East Grand Forks side, all pavement in the study area is in "Fair" or better condition. DeMers Avenue in Grand Forks is shown as excellent due to the 2019 reconstruction project.

A variety of pavement maintenance projects have been programmed in the 2020 through 2023 Transportation Improvement Program for Downtown Grand Forks:

- Mill and overlay of 5th Street between Gateway Drive and DeMers Avenue with aesthetic enhancements between DeMers Avenue and 1st Avenue (2020)
- Mill and overlay of University Avenue between State Street and 3rd Street (2020)
- Reconstruction of 3rd Street between DeMers Avenue and University Avenue with curb extensions, landscaping, and other aesthetics (2021)

No projects were programmed for East Grand Forks.

Figure 7: Functionally Classified Roadways

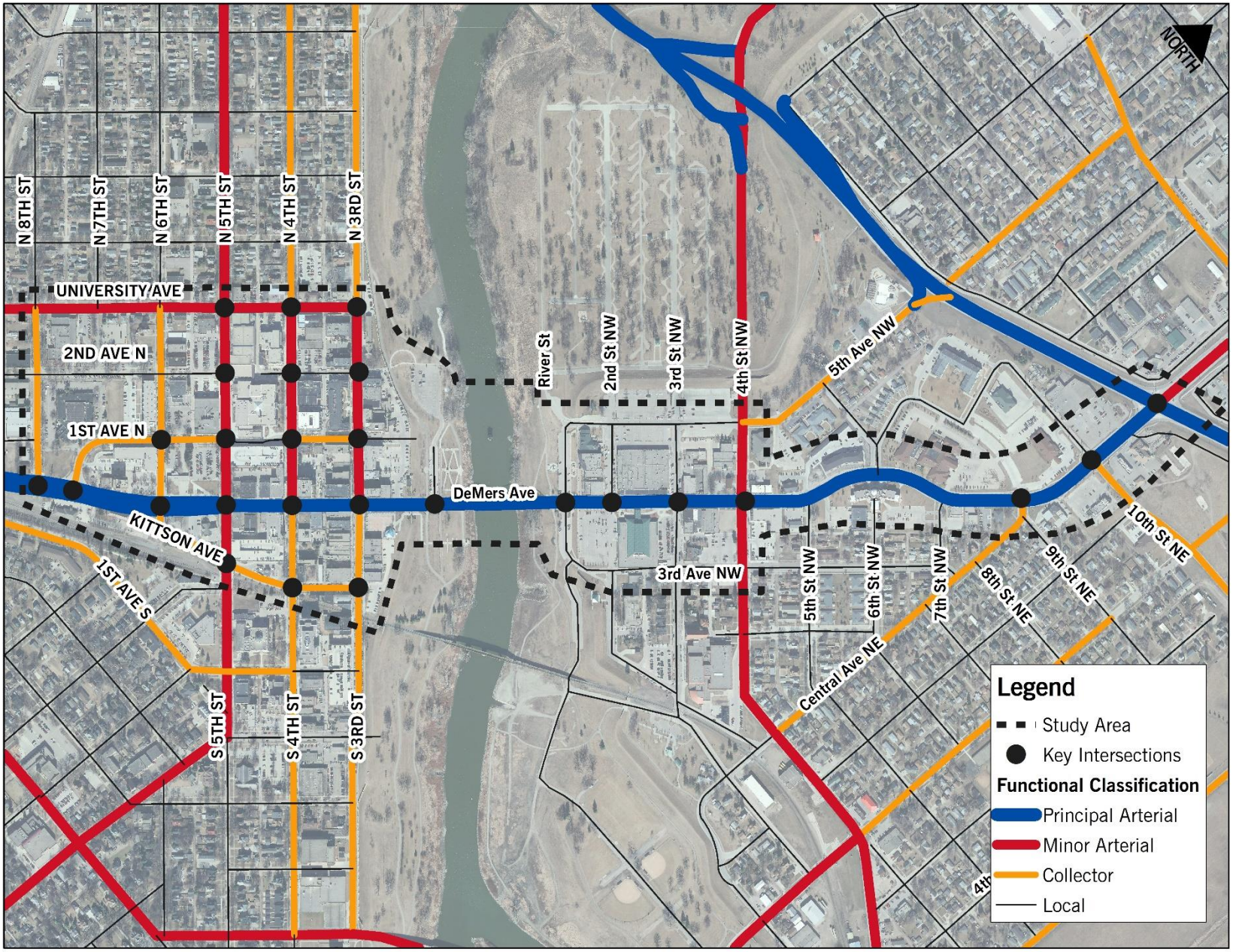
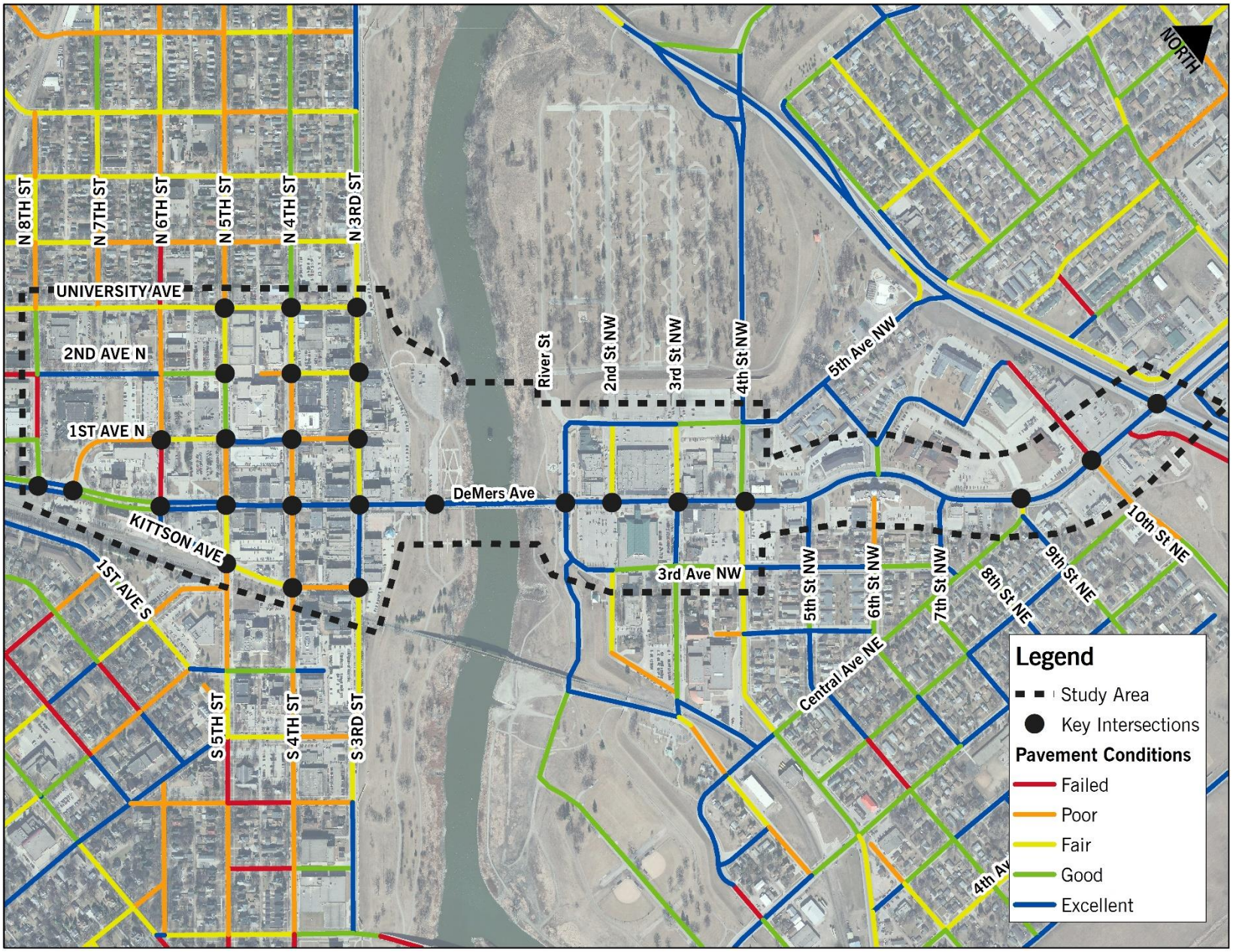


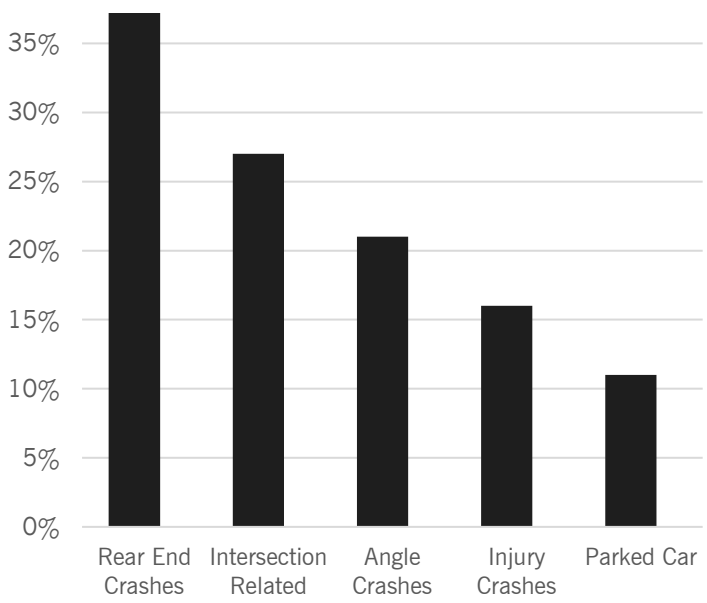
Figure 8: Pavement Conditions



CRASH HISTORY

Reviewing historic crash information can help identify existing deficiencies. Three years of crash records (January 1, 2016 through December 31, 2018) were provided by the Grand Forks – East Grand Forks MPO for both Grand Forks and East Grand Forks. Throughout the study area, there were 257 crashes (76 intersection related and 181 non-intersection related crashes). This corresponds to an average of 86 crashes per year with 13 crashes per year resulting in an injury, including the possible injury classification. There were no fatalities reported in the study area. An evaluation of total crash data identified the following trends:

Figure 9: Crash Trends



- 30 percent of crashes occurred at intersections.
- 16 percent of crashes resulted in an injury, including the possible injury classification.
- 39 percent of crashes were rear end crashes.
- 26 percent of crashes were angle crashes.
- 12 percent of crashes involved a parked motor vehicle.
- There were 2 pedestrian crashes, both resulted in injuries. There were no bicycle crashes.

During this time period, the Kennedy Bridge was impacted by construction which shifted traffic towards the Sorlie Bridge, DeMers Avenue, and other downtown corridors. It is unclear what, if any, impact this had on crash trends.

Crash Hot Spots

To identify overrepresented crash locations within the study area, the critical crash rate method was used. This method was developed by the Minnesota Department of Transportation (MnDOT) and is included in the NDDOT Design Manual. The method uses traffic volumes and crash rates and compares this rate against crash rates for similar facilities, based on MnDOT data. This helps identify intersections that may have fewer overall crashes, but on a per car basis, a much higher rate of crashes.

According to the critical crash analysis methodology, intersections and links with crash rates above the critical rate are considered overrepresented and in need for further review; there is a high probability that conditions at the site are contributing to the higher crash rate. Based on this analysis there were multiple intersections and roadway segments above the expected crash rate or the critical crash rate. Crash data is illustrated in Figure 10. Areas that fall above expected or critical crash rates are noted and discussed in subsequent sections.

Crash Trend Analysis

Intersection Crash Trends

Four intersections in the study area experience crash rates higher than the critical crash rate for similar types of intersections: 6th Street and University Avenue; 6th Street and 2nd Avenue; 6th Street and 1st Avenue; and 8th

Street and 2nd Avenue. These intersections are all in Grand Forks. This does not mean crash trends do not exist at other intersections but the low crash rates did not indicate an area of concern.

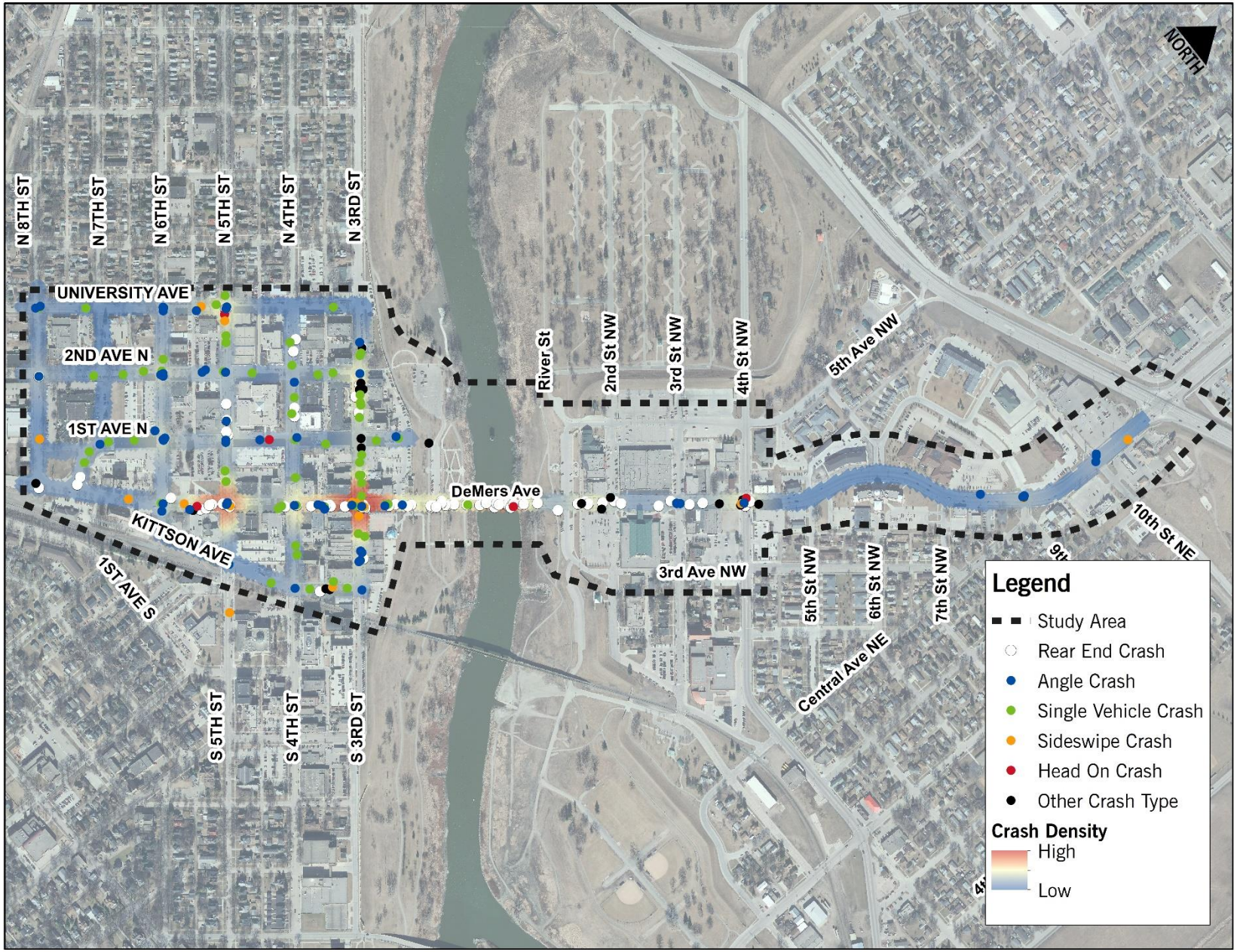
- **DeMers Avenue and 4th Street NW (East Grand Forks**). There were nine crashes (2 Non-Incapacitating, and 7 Property Damage crashes) reported during the analysis period. No predominant trends were observed for the crashes at the intersection.
- **DeMers Avenue and 5th Street (Grand Forks).** There were 14 crashes (1 Non-Incapacitating, 2 Possible Injury, and 11 Property Damage crashes) reported during the analysis period. Right-angle crashes (six) and rear-end crashes (five) were the most common type of crashes at the intersection. Nine of the 14 crashes occurred on the eastbound or westbound DeMers Avenue approaches. Six of the 14 crashes occurred along eastbound direction. This is the first signalized intersection within three-quarters of a mile for eastbound traffic. The right lane of the two-lane eastbound approach abruptly changes to a right-turn lane about 100 feet from the intersection. This forces thru-traffic on right lane of eastbound approach to slow and merge to thru-lane within the short distance from the intersection.
- **6th Street and 1st Avenue (Grand Forks).** There were seven crashes (1 Possible Injury, and 6 Property Damage crashes) reported during the analysis period. Angle crashes (four) were the most common type of crashes at the intersection. Five of the seven crashes occurred on 6th Street approaches. No predominant factors leading to the crashes were identified at the intersection. The building on the south quadrant of the intersection and the cars parked on-street may make it difficult for drivers to see around the corner and may be the contributing factor for the angle crashes.
- **6th Street and 2nd Avenue (Grand Forks).** There were six crashes (all Property Damage crashes) reported during the analysis period. Three crashes were angle crashes where the driver failed to yield; these occurred on the north or south approaches. Parked cars and overgrown trees may obscure the stop sign.

Segment Crash Trends

Except for the segment on Demers Avenue from N 8th Street to 6th Street in Grand Forks, and from 4th Street to US 2 in East Grand Forks, all other study segments experienced crash rates greater than the critical crash rates for similar type of facility.

- **DeMers Avenue from 6th Street (Grand Forks) to 4th Street (East Grand Forks).** There were 95 crashes (10 Non-Incapacitating, 9 Possible Injury, and 76 Property Damage crashes) reported during the analysis period. Rear-end crashes (68) and right-angle crashes (12) were the most common type of crashes in the segment. 28 of the 95 crashes occurred on the bridge of which 26 were rear-end crashes. About 70 percent of the crashes on the bridge occurred along westbound direction. Downtown setting, dense access spacings, multiple signalized intersections, traffic congestions and on-street parking facilities on both sides of the roadways creates potential high deceleration rates among drivers that may have contributed to the rear-end crashes along the segment.
- **3rd Street from Kittson Avenue to 2nd Avenue (Grand Forks).** There were 35 crashes (all Property Damage crashes) reported during the analysis period. Parked vehicle related crashes (13), angle crashes (6), and rear-end crashes (6) were the most common type of crashes in the segment. 74% of the crashes occurred in the segment north of Demers Avenue. The on-street parking on the segment may create friction between parked vehicles and traffic.
- **Other Study Segments (Grand Forks).** There were 81 crashes (2 Incapacitating, 2 Non-Incapacitating, 2 Possible injury, and 75 Property Damage crashes) reported during the analysis period in the rest of the network (excluding DeMers Avenue). Rear-end crashes were the most common type of crashes. Downtown setting, dense access spacings, multiple signalized intersections, traffic congestions and on-street parking facilities on both sides of the roadways creates potential high deceleration rates and uncertainty among drivers that may have contributed to crashes.

Figure 10: Crash Hot-Spots (Year 2016-2018)



MULTIMODAL OPERATIONS

APPROACH

Traditionally, transportation planning approaches have placed special emphasis on achieving certain levels of service for vehicular traffic, with cycling, walking, and transit modes sometimes being an afterthought. An auto-centric approach does not respond well to demand for other travel modes and can lead to uninviting or even unsafe facility design for roadway users that cannot or choose not to drive. To provide a more complete evaluation of the downtown transportation system, multimodal levels of service (MMLOS) was used on downtown roadways to better account for potential walking, biking, and transit deficiencies that may be present due to an unbalanced emphasis on automobile traffic. The MMLOS includes vehicular, bicycle, pedestrian, and transit. Each of the sections below will detail issues and existing operations for each specific modal environment, concluding with an unweighted multimodal level of service.

VEHICULAR ENVIRONMENT

TURNING MOVEMENT COUNTS

The Grand Forks – East Grand Forks MPO collected vehicular turning movements in April 2019 at the following study intersections:

- DeMers Avenue and 4th Street NW
- DeMers Avenue and 3rd Street NW
- DeMers Avenue and 2nd Street NW
- DeMers Avenue and River Street
- DeMers Avenue and 1st Avenue
- DeMers Avenue and 8th Street
- University Avenue and 4th Street
- University Avenue and 3rd Street
- 2nd Avenue and 4th Street
- 2nd Avenue and 3rd Street
- 1st Avenue and 6th Street
- 1st Avenue and 4th Street
- 1st Avenue and 3rd Street
- Kittson Avenue and 4th Street
- Kittson Avenue and 3rd Street

The Advanced Traffic Analysis Center's Traffic Analysis Tool was used to collect vehicular turning movements for a similar time period at the following intersections:

- DeMers Avenue and 3rd Street
- DeMers Avenue and 4th Street
- DeMers Avenue and 5th Street
- University Avenue and 5th Street
- 2nd Avenue and 5th Street
- 1st Avenue and 5th Street
- Kittson Avenue and 5th Street

These turning movement counts were used to complete the vehicular operational analysis and are included in the appendix. Current daily traffic is shown in Figure 11.

Truck Traffic

DeMers Avenue through Downtown Grand Forks is a critical urban freight corridor. DeMers Avenue and 5th Street in Grand Forks is a North Dakota Level 3 Freight Corridor. The City of Grand Forks currently designates 2nd Avenue and a segment of 8th Street as truck routes, but there have been discussions about removing these from the city truck routes. In East Grand Forks, trucks are permitted on all state aid roadways. Truck routes and existing average daily truck traffic is shown in Figure 13. While typical truck traffic only makes up around one to two percent of traffic, truck percentages on DeMers Avenue during fall beet harvest can approach six percent of total traffic and on 4th Street NW in East Grand Forks can approach nineteen percent of total traffic. The slow acceleration of trucks can have impacts on corridor-wide traffic flow and operations as they fill up storage bays and impact the amount of traffic that each signal can accommodate given their slower start-up times.

Figure 11: Current Daily Traffic

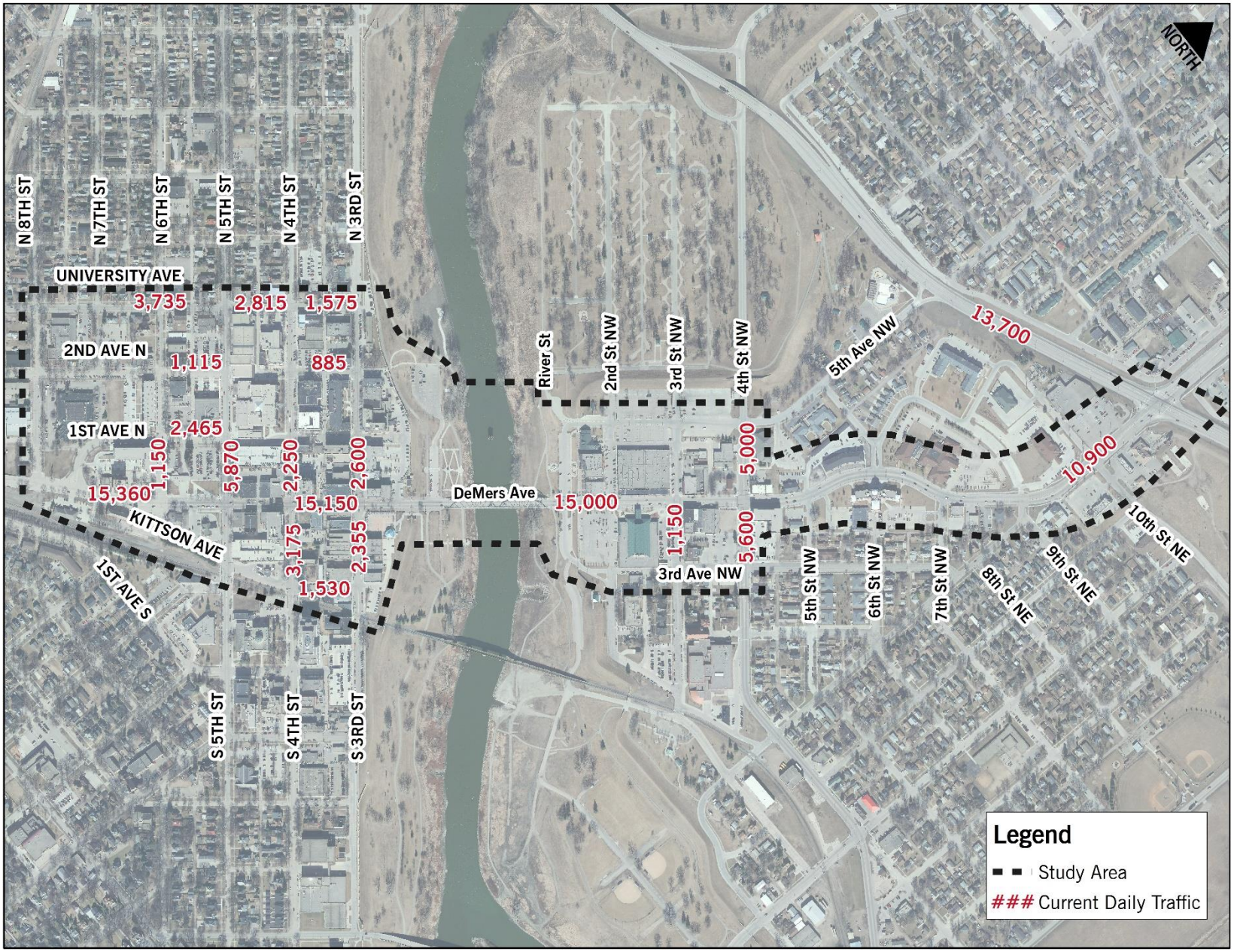
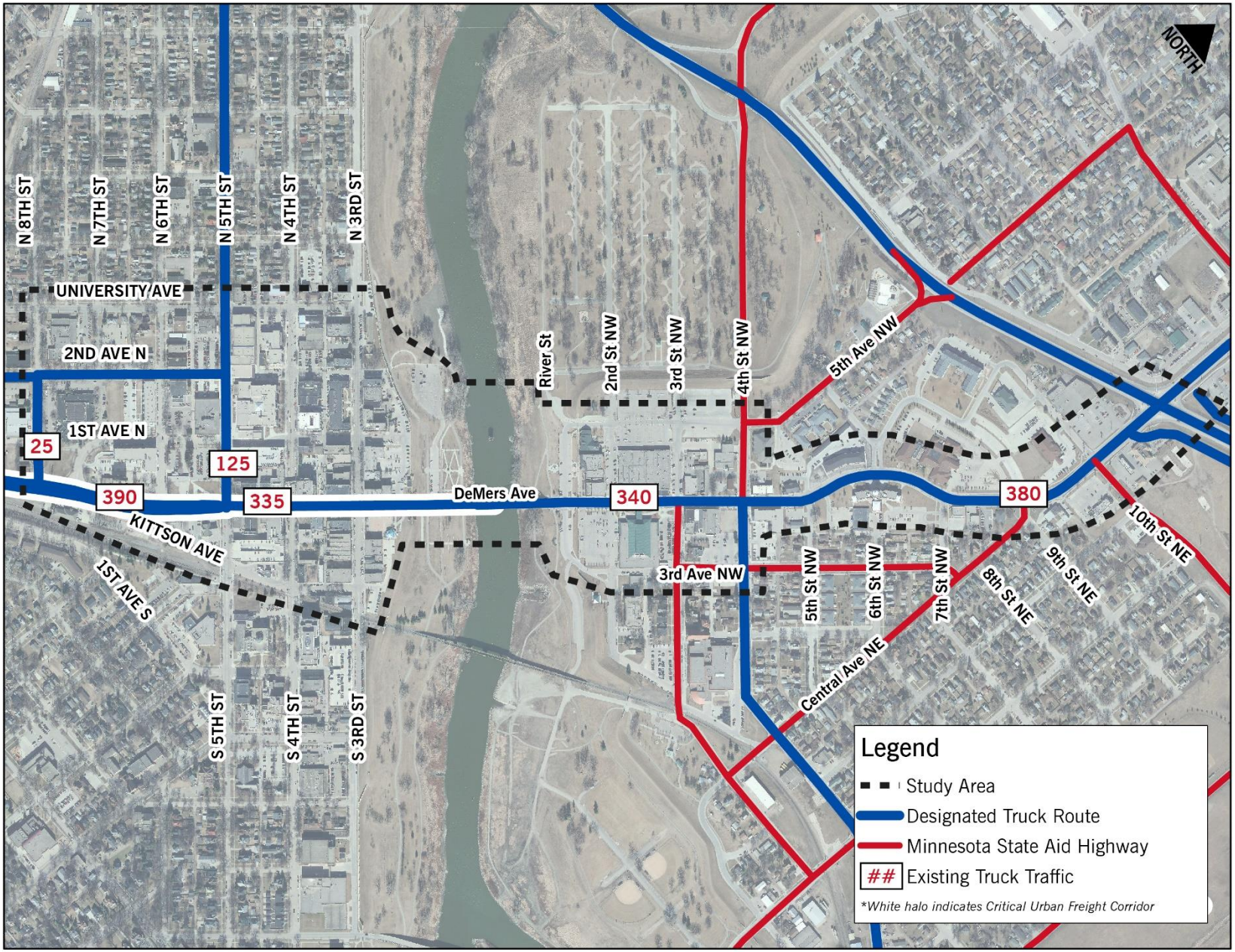


Figure 12: Existing Truck Traffic



Traffic Trends

Traffic patterns vary by the hour, day, and month. Evaluating and understanding this type of variability is important for overall system management. Using data from the Advanced Traffic Analysis Center (ATAC) and the GF-EGF MPO, traffic trends and variability for month and hour were evaluated at different locations within the study area.

Monthly Variability

The ATAC tool is only available for signalized intersections in Grand Forks, no similar dataset is available for East Grand Forks. Data collected from this tool was used to evaluate monthly traffic variations at DeMers Avenue and 5th Street and University Avenue and 5th Street. At both locations, traffic peaks in spring (April and May) and fall (September). For DeMers Avenue and 5th Street, additional data was evaluated due to large eastbound directional spikes; this trend was found across multiple locations between 2017 and 2019. This could correlate with agricultural activities, University student activity, or downtown events.

Figure 13: Monthly Traffic Variability at DeMers Avenue and 5th Street

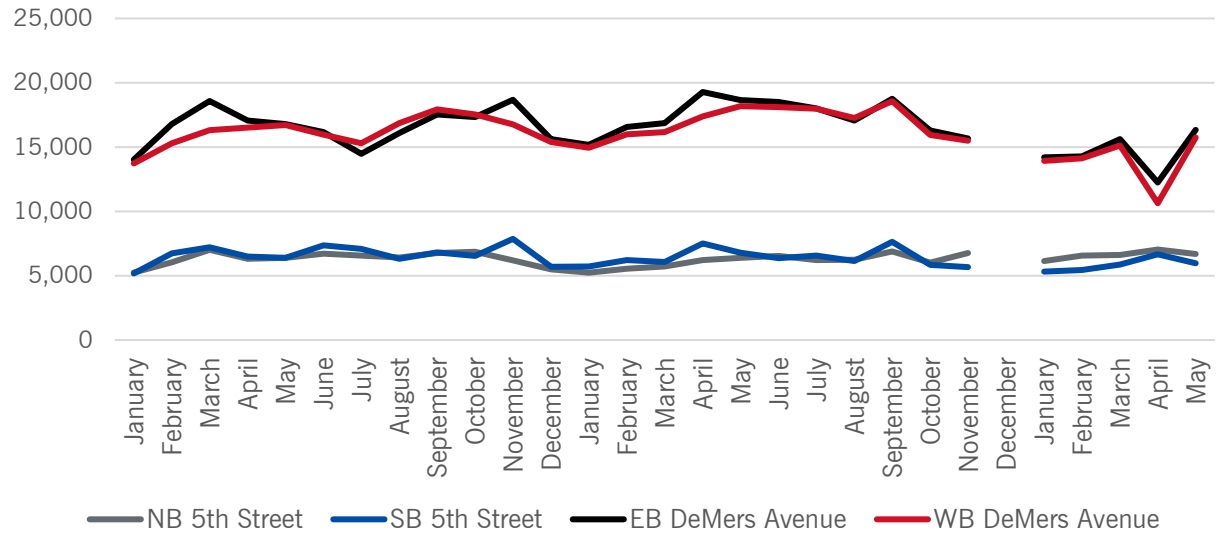
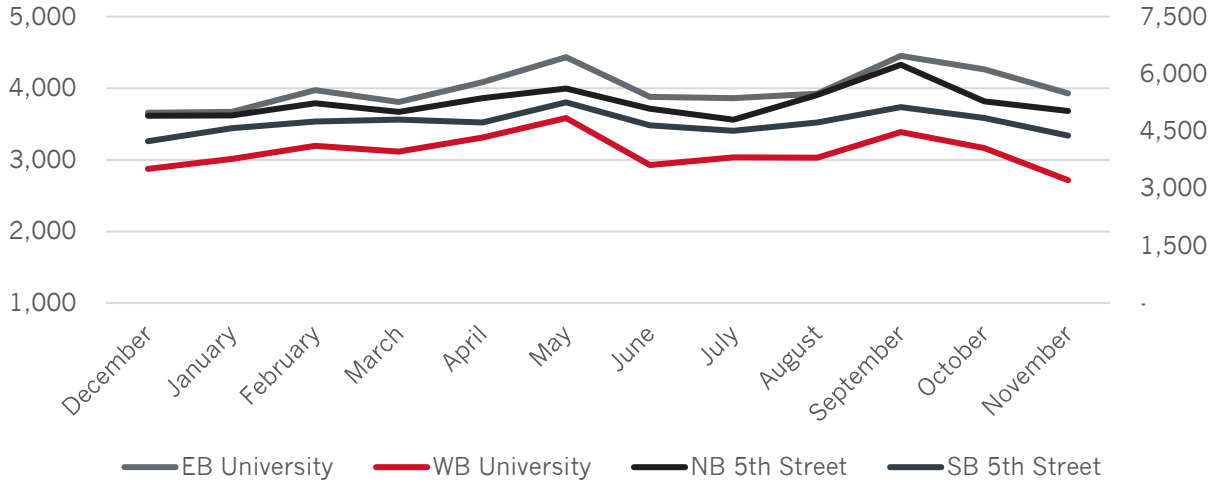


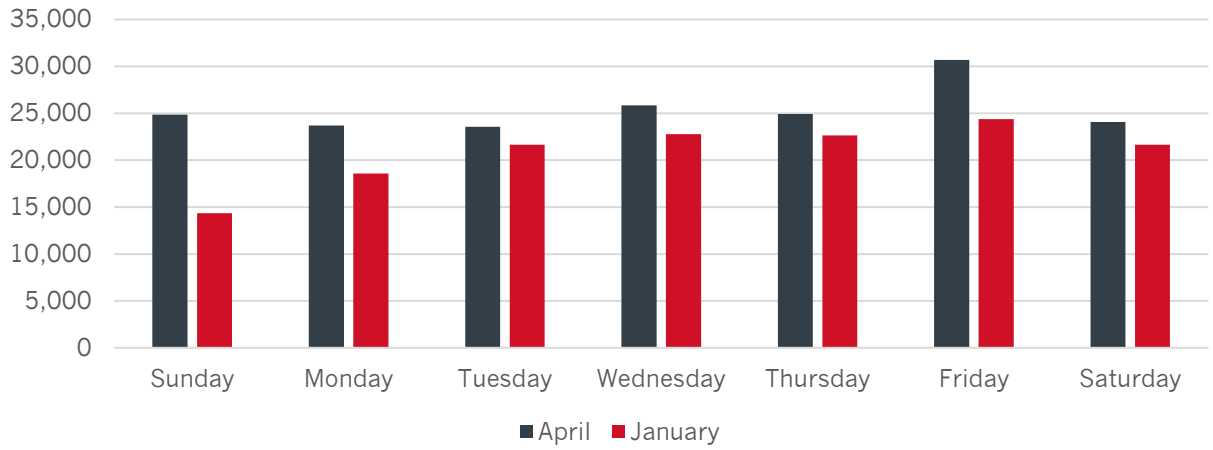
Figure 14: Monthly Traffic Variability at University Avenue and 5th Street



Daily Variability

Travel patterns change throughout the course of the week, depending on the time of year. Two months of data for the DeMers Avenue and 5th Street intersection are shown in Figure 15. This includes the highest month (April) and the lowest month (January) of traffic. The variability of traffic through downtowns is highly sensitive to events, weather, school and university schedules, and many more.

Figure 15: Daily Variability at DeMers Avenue and 5th Street Intersection



Time of Day Variability

Travel patterns change throughout a day as people arrive and leave work and school, shop, and dine in downtown. These vehicular travel patterns have impacts on roadway capacity and management strategies. For example, suburban corridors typically see high directional and time of day peaks as people leave home for work during the morning and return in the evening. However, downtowns with mixed uses see less noticeable peaking characteristics.

At DeMers Avenue and 5th Street, three peaks emerge on DeMers Avenue that correspond to the morning commute, lunch hour, and evening commute.

At University Avenue and 5th Street, University Avenue sees the typical morning commute and lunch hour peak, but its evening peak begins early, likely corresponding to Central High School's dismissal.

In East Grand Forks, at DeMers Avenue and 3rd Street NW, the directional and time of day peaks are more distinct on DeMers Avenue. On average, eastbound DeMers Avenue carries around six percent more traffic than westbound DeMers Avenue. This suggests motorists are using DeMers Avenue to travel eastbound but not using the same route on their return trip.

Figure 16: DeMers Avenue at 5th Street Time of Day Profile

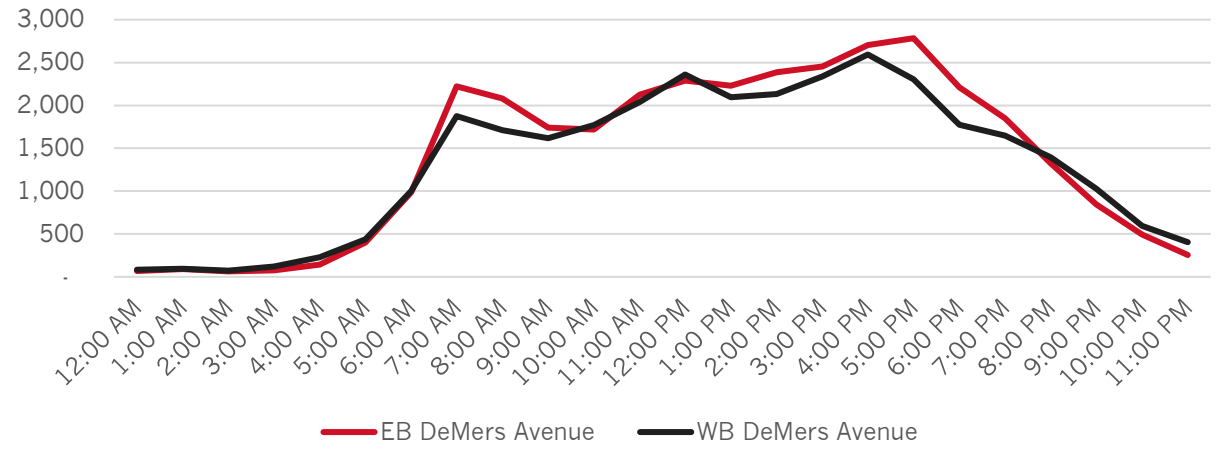


Figure 17: University Avenue at 5th Street Time of Day Profile

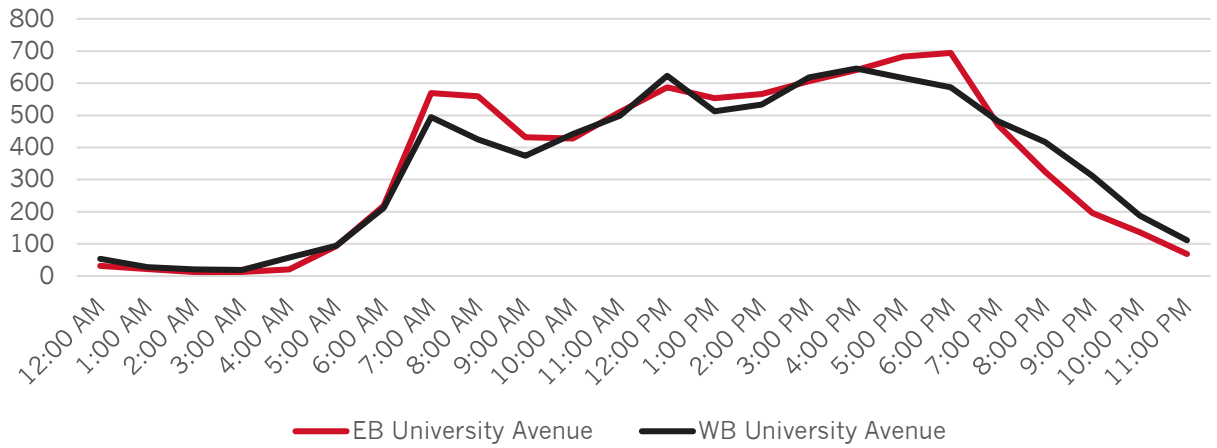
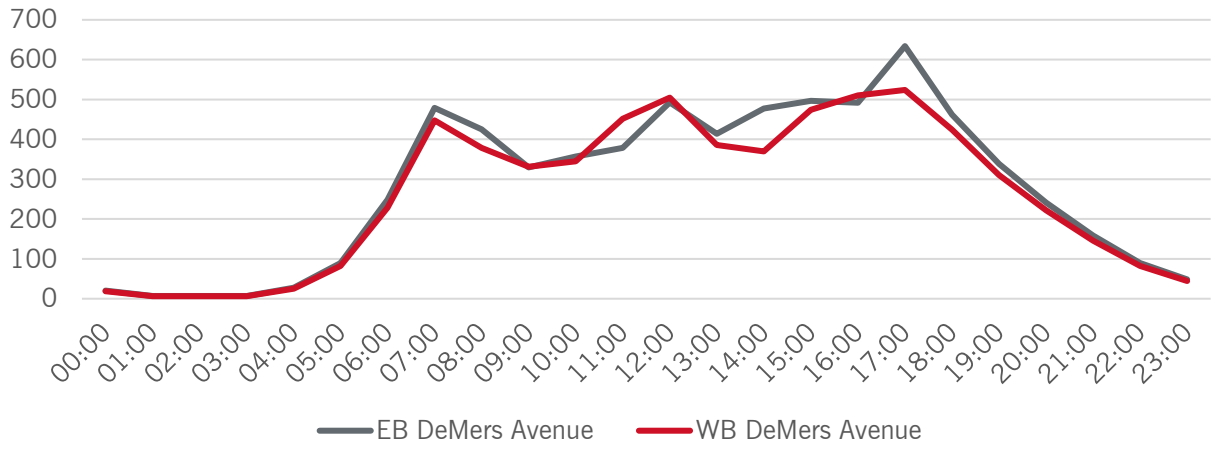


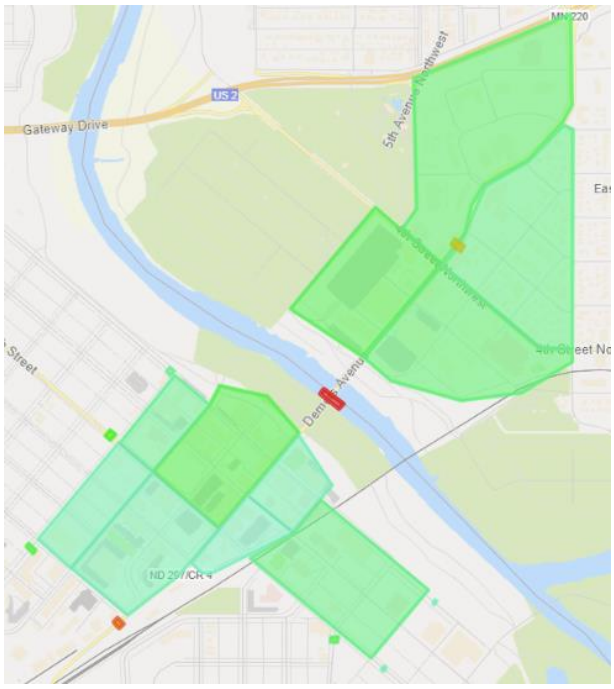
Figure 18: DeMers Avenue at 3rd Street NW Time of Day Profile



Travel Patterns

StreetLight data uses information from mobile devices to collect information about origins, destinations, and travel time. StreetLight data was analyzed for weekday trips beginning or ending in any of the green zones identified in Figure 19 as well as passing through Downtown Grand Forks and Downtown East Grand Forks on DeMers Avenue as noted with the orange and red boxes.

Figure 19: Downtown Origin/Destination Zone Locations



The data identified the following trends:

- 87% of all trips ending in either downtown were less than one mile in trip length. For reference, a one-mile buffer was applied to the study area and is shown in Figure 22. One mile is short but includes much of the older neighborhoods in Grand Forks and East Grand Forks and the major commercial centers in both cities.
- 84% of all trips took less than five minutes.
- 21% of eastbound and 28% of westbound traffic is traveling through both downtown areas without stopping.

One of the limitations of Streetlight data is that it does not collect and report information on trip chains. For example, if someone leaves their home, drops a child off at daycare, stops for coffee, and then ends in downtown, their total trip is made up of three trips. If a stop lasts five minutes or longer Streetlight may only be reporting the trip between the last stop and the downtown destination, instead of the entire trip. However, the number of short trips reported by this data indicates most of the trips to either downtown could be completed by walking or biking if high-quality facilities were provided.

Figure 20: Trip Length

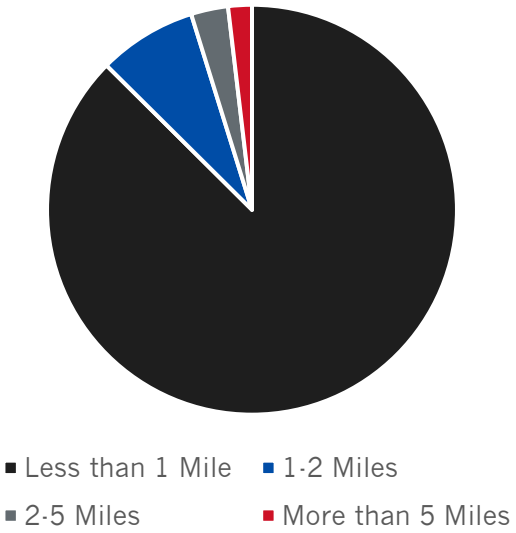


Figure 21: Trip Time

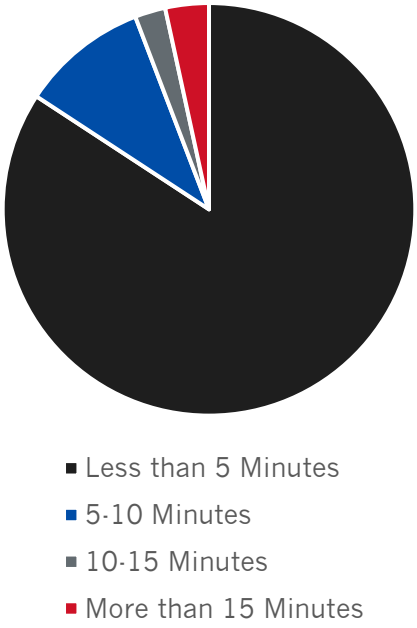
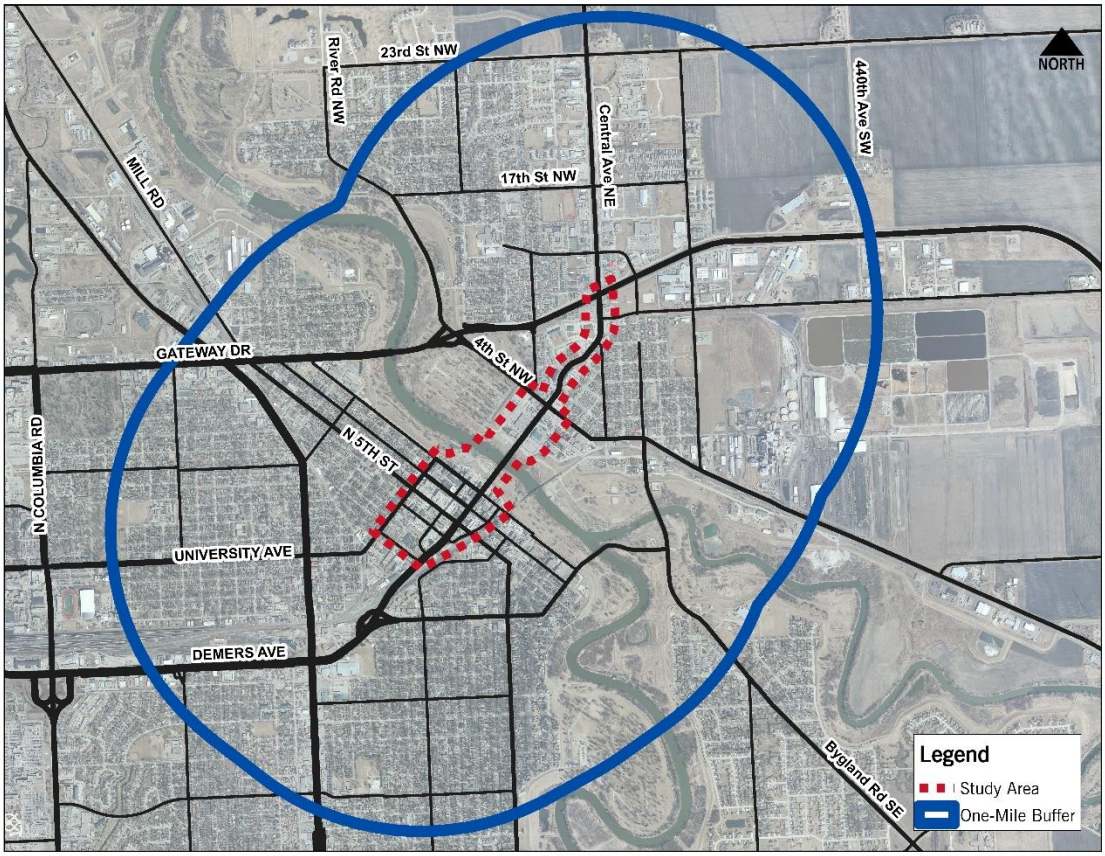


Figure 22: One-Mile Buffer Around Downtown Study Area



Existing Vehicular Level of Service

Vehicular traffic operations were analyzed at the key intersections. Intersection capacity analysis was evaluated in terms of delay and level of service (LOS). LOS is a term used to describe the operational performance of transportation infrastructure elements; it assigns a grade value that corresponds to specific traffic characteristics within a given system, as shown in Table 2. At intersections, LOS is a function of average vehicle delay, whereas LOS for a roadway section is defined by the average travel speed. LOS "A" represents free flow traffic whereas LOS "F" represents gridlock. LOS "E" or worse is considered deficient, in accordance with the NDDOT Traffic Operations Manual published in June 2015. Capacity analysis was conducted using Synchro, which applies deterministic equations published in the Highway Capacity Manual (HCM), an industry, MnDOT and NDDOT standard. DeMers Avenue capacity and reliability analysis was completed using Vissim microsimulation analysis, which simulates the movement of every vehicle through an intersection and then collects information for associated performance measures like delay, queue lengths, travel times, and density.

Table 2: Level of Service Thresholds

Control Delay (Sec/Veh)		Level of Service
Unsignalized	Signalized	
≤ 10	≤ 10	A
10 – 15	10 – 20	B
15 – 25	20 – 35	C
25 – 35	35 – 55	D
35 – 50	55 – 80	E
> 50	> 80	F

Existing Level of Service Analysis

Under current traffic demand, signal timing, and roadway configurations, all intersections operate acceptably at LOS "C" or better. There are deficient approach levels of service:

- At DeMers Avenue and 6th Street (Grand Forks), the northbound approach is deficient at LOS "E" during the AM peak and the northbound and southbound approaches are deficient at LOS "F" during the PM peak. This is common on the minor approaches of two-way stop-controlled intersections with heavy traffic on the mainline. It has no impacts on the overall intersection LOS, which operates at LOS A.
- At DeMers Avenue and 5th Street (Grand Forks), the northbound approach is deficient at LOS "E" during the PM peak, but the overall intersection operates at LOS B.
- At DeMers Avenue and River Street (East Grand Forks), the southbound approach is deficient at LOS "E" during the PM peak. This is common on the minor approaches of two-way stop-controlled intersections with heavy traffic on the mainline. It has no impacts on the overall intersection LOS, which operates at LOS A.

Intersection and segment LOS is shown in Figure 24.

Travel Times

While there are no level of service deficiencies, the closely spaced traffic signals and congestion result in the perception that there are deficiencies. The compounding nature of several closely spaced signals along the corridor can create longer than expected delays, particularly for those using this corridor for regional trips, even without LOS deficiencies.

Under free flow conditions, traveling between 8th Street in Grand Forks to the Red River should take around 65 seconds. During the AM peak, traveling eastbound experiences an additional 22.7 seconds of travel time (35.2 percent) and westbound an additional 24.1 seconds (37.4 percent). During the PM peak, traveling eastbound experiences an additional 32.8 seconds (50.8 percent) and traveling westbound experiences an additional 31.9 seconds (49.4 percent).

Under free flow conditions, traveling between the Red River to 5th Street NW in East Grand Forks should take around 40 seconds. During the AM peak, traveling eastbound experiences an additional 13.4 seconds of travel time (32.8 percent) and westbound experiences an additional 13.1 seconds (32.2 percent). During the PM peak, traveling eastbound experiences an additional 16.3 seconds of travel time (40.0 percent) and westbound experiences an additional 15.1 seconds (37.3 percent).

Figure 23: Free Flow v. Average Travel Time on DeMers Avenue

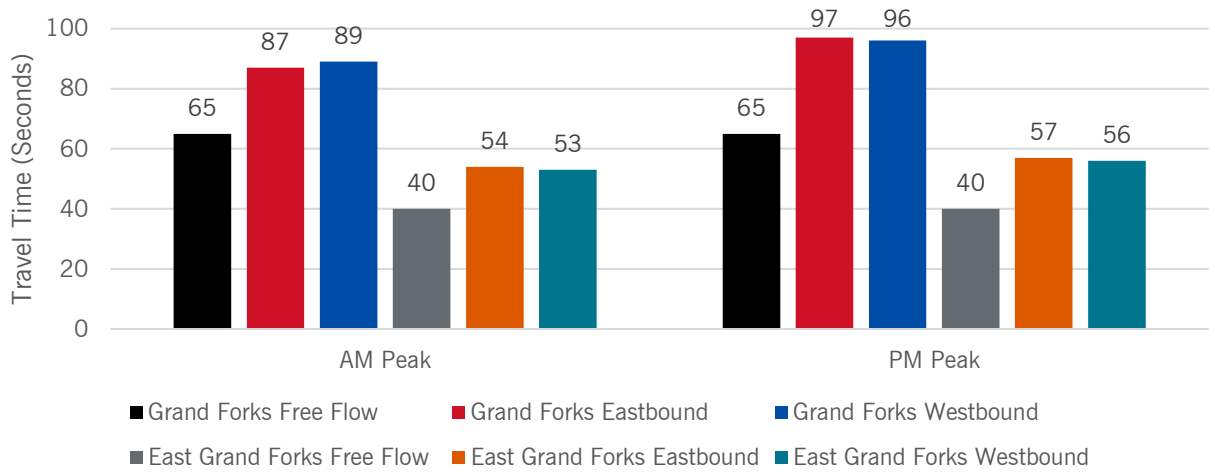


Figure 24: Existing Vehicular Level of Service

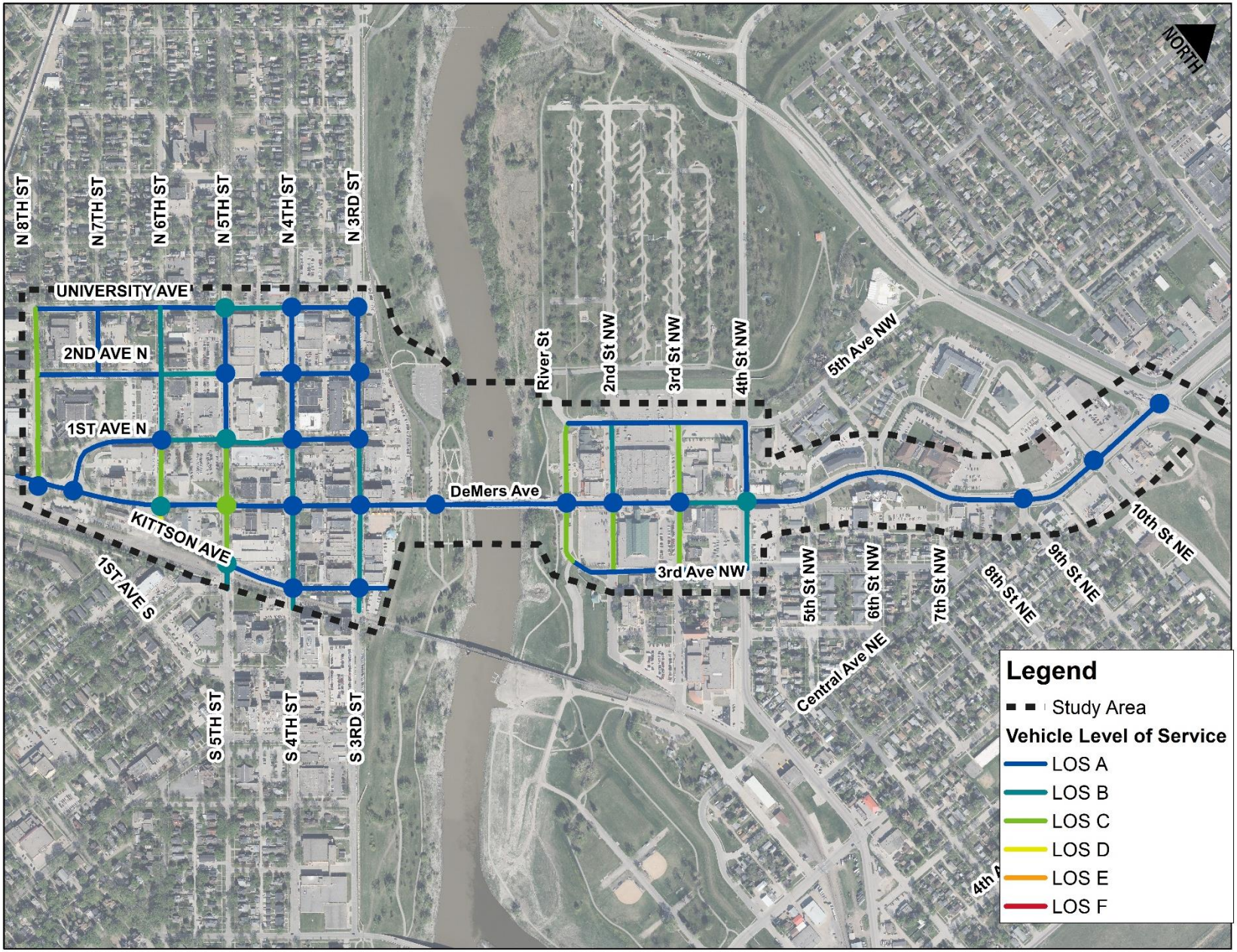


Figure 25: Existing Traffic Control

Traffic Control

Appropriate traffic control is essential for efficient traffic operations and crash mitigation. Selecting traffic control device requires consideration of traffic patterns and volumes, roadway geometry, lane configurations, and multimodal aspects. The *Manual of Uniform Traffic Control Device* (MUTCD) provides guidance and standards on the installation of traffic control methods based on vehicular volume, pedestrian volumes, and crash frequency for multiple roadway contexts. Warrant analysis does not require signals to be built. However, the analysis highlights the locations that may benefit from traffic control upgraded or removed. Research conducted by FHWA found that that removing unwarranted signals may result in a 24 percent decrease in all crashes, a 53 percent decrease in injury crashes, a 24 percent decrease in right-angle crashes, and a 29 percent decrease in rear-end crashes. Based on the issues identified in this report and the Future Conditions Report, specific traffic control alternatives will be analyzed in the *Alternatives Development and Assessment Report*, to be developed later. Figure 25 shows existing traffic control.

DeMers Avenue Reliability Analysis

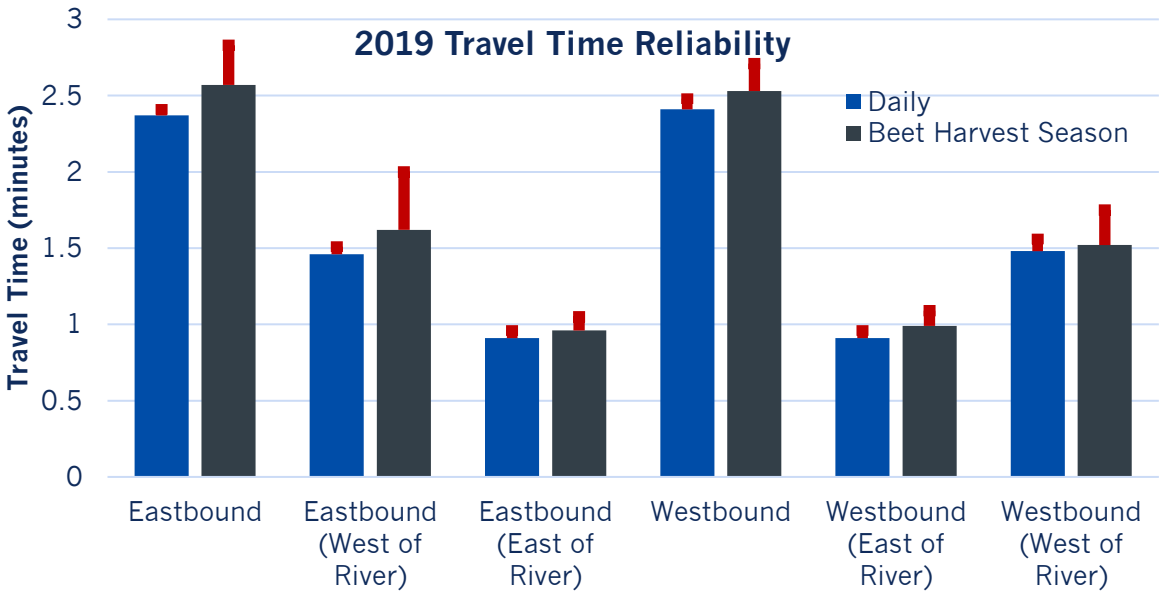
Travel time reliability is a measure of consistency to indicate day-to-day travel times on a given roadway. Most travelers are less tolerant of unexpected delays because they cannot be incorporated into planned travel time, resulting in late arrivals; alternatively budgeting twice as long as needed for a trip also can result in wasted time. The Level of Travel Time Reliability (LOTTR) is defined as the ratio of the 85th percentile travel time to an average travel time for all vehicles. An LOTTR of 1.50 and greater indicate severe unreliability for the given confidence interval. For example, a LOTTR of 2.00 means that motorists should plan for twice the amount of travel time to arrive at their destinations on time.

Congestion, crashes, and special events can impact travel time reliability. The Grand Forks – East Grand Forks Metropolitan Transportation Plan's performance target for reliability is to have 85 percent of person-miles traveled on the non-Interstate Highway System (DeMers Avenue) reliable, LOTTR under 1.5.

Daily traffic volumes on DeMers Avenue vary across time of day, day of the week, and month of the year, generally around seven percent. During fall beet harvest, truck traffic can approach six percent of total traffic (compared to less than two percent typically).

- Daily average travel times along DeMers Avenue are shown in the blue bar, with the LOTTR shown by the red bar in Figure 26. On a typical day, the LOTTR ranges between 1.04 and 1.08 for both directions of DeMers Avenue, indicating travel times are very consistent throughout the day.
  - On a typical day, eastbound and westbound average travel times are comparable in Grand Forks and East Grand Forks, with the LOTTR also very similar.
- Beet harvest average daily travel times and LOTTR along DeMers Avenue are shown in the gray bar in the same figure. On a typical beet harvest day, the LOTTR ranges between 1.09 and 1.38, indicating travel time does becomes somewhat unreliable during the seasonal variation.
  - During beet harvest or other seasonal variations, eastbound and westbound average travel times are comparable in Grand Forks and East Grand Forks. However, the LOTTR for the eastbound direction in Grand Forks is much higher than in East Grand Forks. This is likely due to the three traffic signals in Grand Forks and much higher truck traffic volumes with slow start up times.

Figure 26: DeMers Avenue Travel Time Reliability



These travel times and LOTTR are comparing daily variations for a typical day and a day during fall beet harvest using travel times based on the Vissim microsimulation outputs. These LOTTR show more reliable travel times on DeMers Avenue in East Grand Forks than the Greater Minnesota Mobility Study, which found LOTTR to be unreliable, or greater than 1.5. This study used a different travel time data source and the 80th percentile travel time to calculate the LOTTR, which may be the reason for the variation.

Pedestrian Environment

In urban areas, especially downtowns, alternative modes of transportation are important components of the transportation system. The following sections will focus on walking and biking.

Complete Streets

Enhancing the ability of people to walk or bike involves providing adequate infrastructure and linking urban design, streetscapes and land use to encourage walking and biking. Designing roadways to accommodate all types of users is commonly termed “complete streets” and the United States Department of Transportation has emphasized its importance and encouraged context sensitive and flexible design in transportation projects. This type of roadway design offers many benefits:

- Streets designed with sidewalks, raised medians, traffic-calming measures and treatments for travelers with disabilities improves pedestrian safety. Research has shown that sidewalks alone reduce vehicle-pedestrian crashes by 88 percent.
- Multiple studies have found a direct correlation between the availability of walking and biking options and obesity rates. The Centers for Disease Control and Prevention recently named adoption of complete streets policies as a recommended strategy to prevent obesity.
- Complete streets offer inexpensive transportation alternatives to roadways. A recent study found that most families spend far more on transportation than food.
- Research has found that people who live in walkable communities are more likely to be socially engaged and trusting than residents living in less walkable communities.

Planning efforts at all levels (city, MPO, state, and federal) have indicated the importance of biking and walking in the community, especially downtown.

Pedestrian Facilities and Amenities

Walkability refers to the attractiveness of an area for pedestrians. Factors that may impact walkability include sidewalk presence, quality and width; and the built and natural environment. Throughout both Downtown Grand Forks and Downtown East Grand Forks, there are sidewalks on both sides of the roadway, including the Sorlie Bridge. However, the provision of sidewalks is often not enough to ensure a safe and comfortable pedestrian experience. East Grand Forks recently completed an American with Disabilities Act transition plan that identified non-compliant traffic signals, curb ramps, and sidewalk; addressing these deficiencies will improve the pedestrian experience. No similar effort has been completed on the Grand Forks side. However, the DeMers Avenue reconstruction should ensure compliance along DeMers Avenue. Pedestrian facilities are shown in Figure 27.

Pedestrian Activity

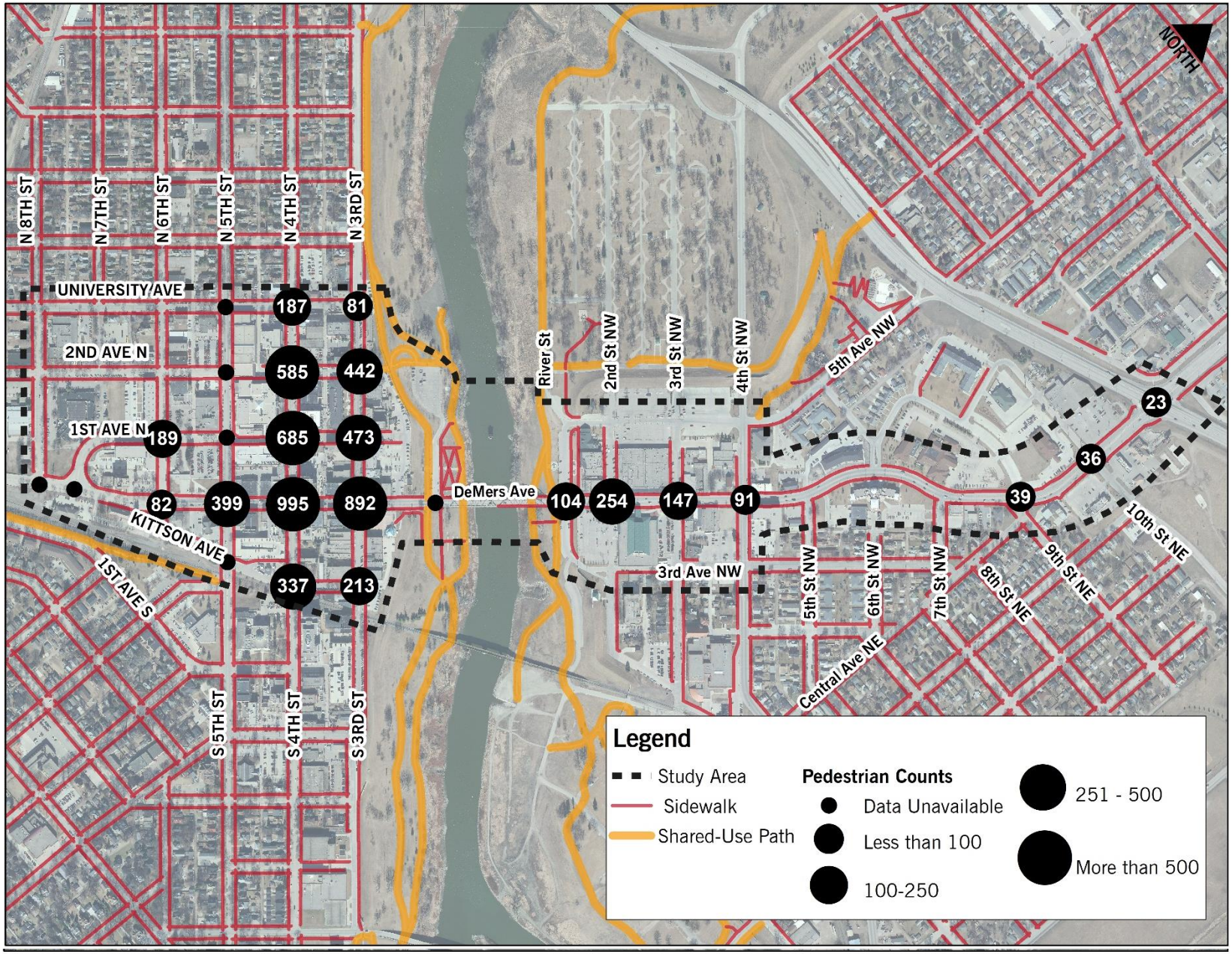
Pedestrian activity in Downtown Grand Forks and Downtown East Grand Forks is highly dependent on location. At 2nd Avenue and 3rd Street in Downtown Grand Forks, more than 400 people crossed the intersection in any direction between 6:30 AM and 6:30 PM, but just one block north at University Avenue and 3rd Street just 82 people crossed the intersection in any direction during the same timeframe. In East Grand Forks, pedestrian activity is highest at the DeMers Avenue and 2nd Street NW intersection, with more than 275 pedestrians crossing in any direction between 6:30 AM and 6:30 PM. It is possible that a significant amount of pedestrian activity is not reflected in the data given the strong nightlife and restaurant activities in both downtowns. Pedestrian activity, where available, is shown in Figure 27.

Pedestrian Level of Service

NCHRP 616: Multimodal Level of Service Analysis for Urban Streets provides a formula to calculate a pedestrian level of service for an area that is reflective of the perspective of pedestrians sharing the environment with vehicles. This formula incorporates the existence of sidewalks, separation from motorized vehicles, vehicle volumes, and speeds. Elements of this methodology were incorporated into the 6th Edition of the Highway Capacity Manual (HCM). However, this methodology was found to be preferable over the HCM methodology because of its focus on the user perception.

In Downtown Grand Forks, most areas see a pedestrian level of service “B” or better. DeMers Avenue is LOS “C” due primarily to high traffic volumes. Pedestrian LOS is shown in Figure 28.

Figure 27: Pedestrian Amenities and Activity



Bicycle Environment

Bicycle Facilities and Amenities

The Red River Greenway follows the Red River from the northern end of Grand Forks and East Grand Forks south past 47th Avenue in Grand Forks and from the northern end of East Grand Forks to south of 13th Street SE in East Grand Forks, providing a high-quality continuous bike route to downtown.

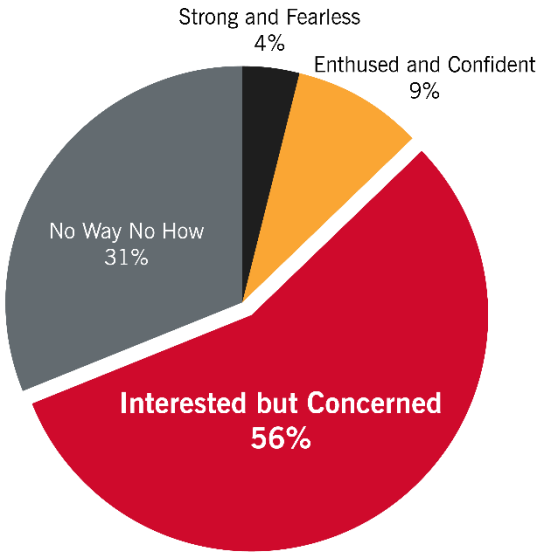
Outside of the Greenway, there are limited dedicated facilities within both downtowns but bicyclists can ride on any roadway in the study area. They are not permitted on the sidewalks within downtowns. The DeMers Avenue reconstruction project did not elect to provide bicycle facilities so alternative east-west routes will need to be considered during this study. Bicycle facilities will be constructed along 5th Street north of DeMers Avenue in a 2020 construction project. Existing facilities are shown in Figure 30.Future facilities through downtown will be identified through this planning process.

Types of Cyclists and Their Behavior

National research has found that there are generally four levels of interests/abilities when it comes to cycling.

- Strong and Fearless riders are those that are very comfortable without bike lanes. They will ride under most roadway and traffic conditions.
- Enthused and Confident riders will ride their bikes with appropriate infrastructure.
- Interested but Concerned riders are interested in biking more but are not comfortable with the infrastructure or have other barriers to biking.
- No Way No How are unable or uninterested in bicycling and no change to the environment or infrastructure is likely to encourage them to cycle more.

Figure 29: Cyclist Types and Their Behavior



Nearly three-quarters of Strong and Fearless, Enthused and Confident, and Interested but Concerned cyclists had ridden at least once in the last 30 days for transportation or recreation. Improving infrastructure and the environment can help encourage these three types of cyclists to choose bicycling more.

Bicycle Level of Service

NCHRP 616: Multimodal Level of Service Analysis for Urban Streets also provides a formula to calculate the bicycle level of service for an area that is reflective of the perspective of bicyclists sharing the environment with vehicles. This formula incorporates the travel lane width, vehicle volumes, speeds, heavy truck traffic and pavement condition. Elements of his methodology were incorporated into the 6th Edition of the Highway Capacity Manual (HCM). However, this methodology was found to be preferable over the HCM methodology because of its focus on the user perception.

In Downtown Grand Forks, most areas see a bicycle level of service "D" or worse, with the exclusion of Kittson Avenue and 4th Street south of DeMers Avenue. DeMers Avenue is LOS "E" from 5th Street in Grand Forks through 4th Street NW in East Grand Forks. High traffic volumes, speeds, and lack of dedicated facilities result in the lower levels of service. Bicycle LOS is shown in Figure 31.

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Figure 30: Bicycle Amenities

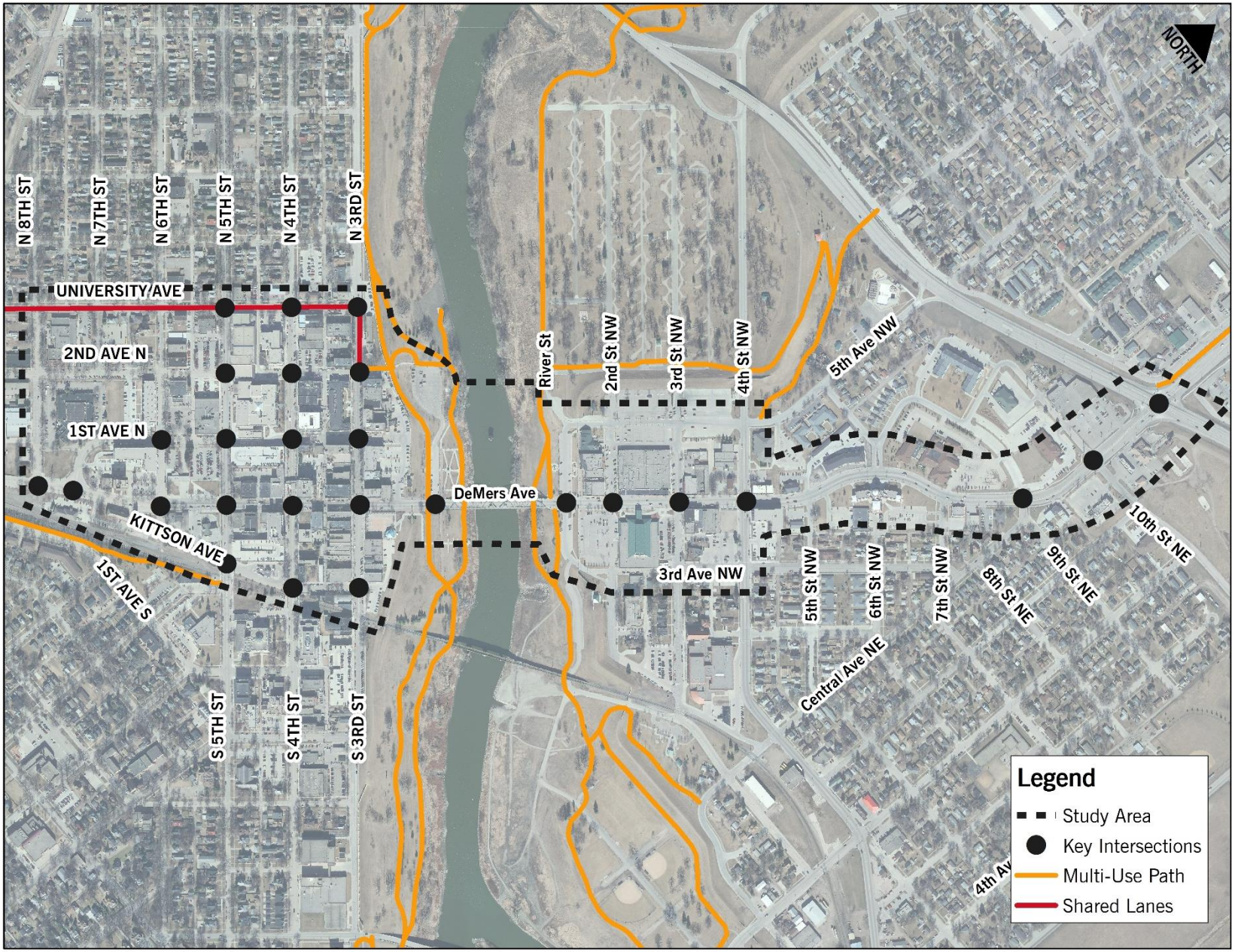
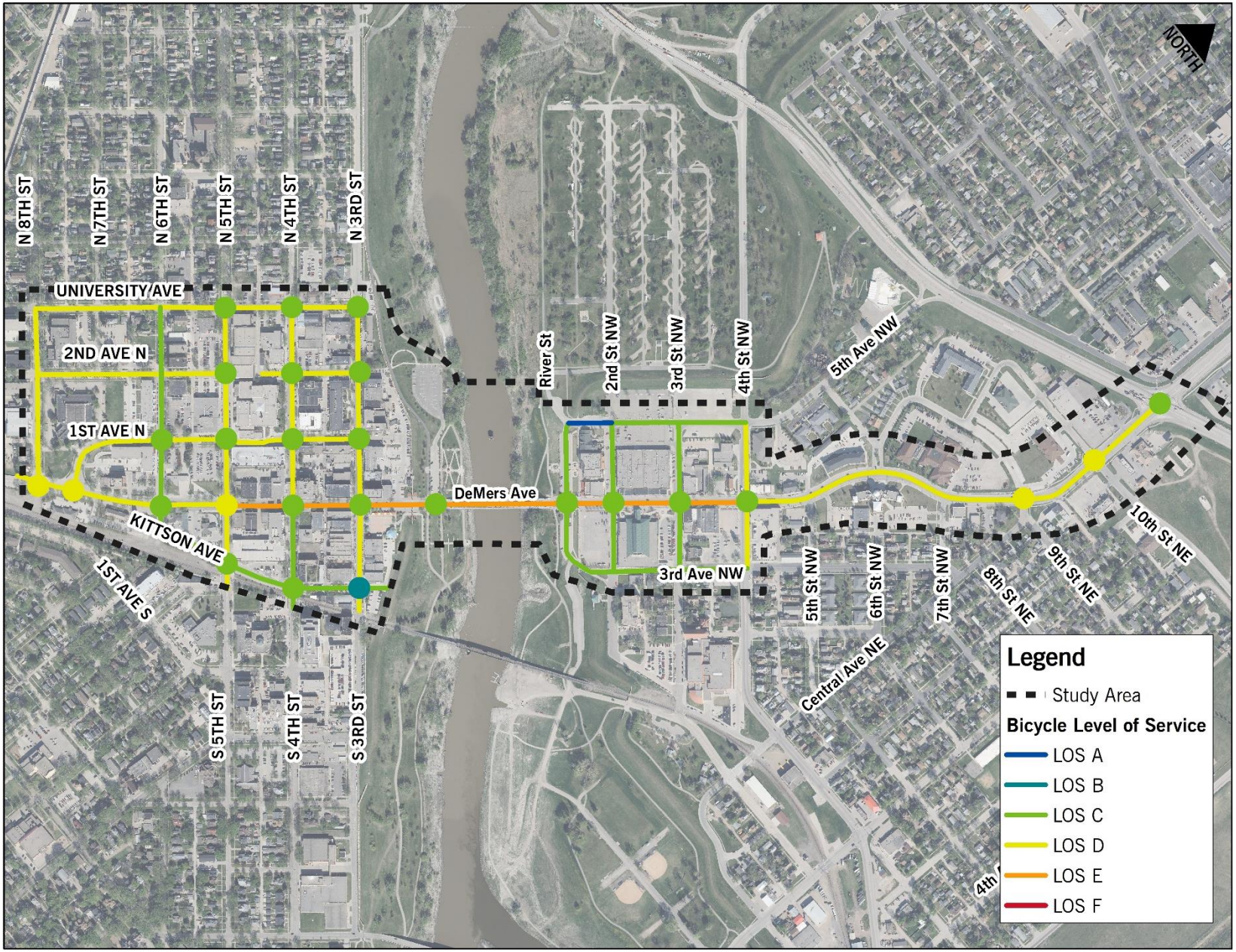


Figure 31: Bicycle Level of Service



Transit Environment

Grand Forks and East Grand Forks are served by Cities Area Transit (CAT). Currently, 13 routes serve the metro area, running on dedicated stops. Nine of these routes serve downtown Grand Forks with routes beginning and ending at the Metro Transit Center (MTC) located at 450 Kittson Avenue. All these routes operate hourly; however, some are staggered to effectively provide 30-minute service around downtown. Two routes, Route 4 and Route 7, serve downtown East Grand Forks with service beginning and ending at the MTC in downtown Grand Forks. These two routes effectively create 30-minute service through downtown East Grand Forks. East Grand Forks also provides a weekday city circulator, Route 12, with hourly service along 4th Street in downtown, including stops at the Campbell Library.

The Metro Transit Center, located at Kittson Avenue and 4th Street, is the primary transfer point for CAT routes. In addition to the transfer facility, there are multiple transit stops throughout downtown. Figure 32 shows the transit routes serving Downtown Grand Forks and Downtown East Grand Forks as well as transit facilities.

Transit Level of Service

Transit quality of service is generally determined by service hours, frequency, and the directness of transit routes. For this analysis service frequency was selected and applied to the roadway network; at intersections vehicular level of service was used. It is important to note that while transit users will typically walk up to one-quarter mile to access transit, this level of service analysis was only applied to the roadway and did not consider the walkshed. Given most trips ending in either downtown are less than one-mile, the walkshed likely captures a significant number of trips that could be made with transit. Transit level of service as currently applied is acceptable on the corridors it serves directly. Transit level of service is shown in Figure 33.

Existing Multimodal Level of Service

Vehicular, pedestrian, bicycle, and transit level of service was calculated independently throughout the Downtown Grand Forks and East Grand Forks study area. The unweighted multimodal level of service combines each of the four modal levels of service into a single level of service, which is shown by link and intersection in Figure 34. Vehicular and pedestrian level of service are very good throughout both downtowns and help to elevate the overall multimodal level of service. Bicycle and transit level of service across most segments are LOS D or worse. Ultimately, most corridors operate at LOS D or better under current conditions. With Steering Committee and public input, the level of service can be weighted to better reflect the priorities for the study area.

Ride-Hailing and Taxis

Ride-hailing and taxi services are an important element of mobility through and to downtowns and are growing in prevalence. Nationwide, in 2018, 36 percent of American adults used ride-hailing services. Nearly a quarter (22 percent) of ride-hail users, use the service at least monthly, and eight percent use the service weekly. The City of Grand Forks has already experienced some of the impacts increased ride-hailing and car services (party busses, particularly) have on curb space management like double parking and blocking travel lanes. In Summer 2018, the City instituted new policies for ride-hailing drop off spaces, including marking three locations for drop off and pick up only between 10 PM and 3 AM:

- The first block of 3rd Street North
- 300 block of 2nd Avenue North
- 200 block of 1st Avenue North (bus parking only to accommodate party bus type vehicles).

While ride-hailing is not yet a full replacement for car ownership – AAA has found its more than twice as expensive as private vehicle ownership – it can change the dynamic of travel to downtown and parking, especially during large events and nightlife hours. Ride-hailing level of service was not incorporated into the MMLOS but would be a combination of vehicular and pedestrian level of service, so is likely reflected in the current MMLOS analysis.

Figure 32: Transit Amenities

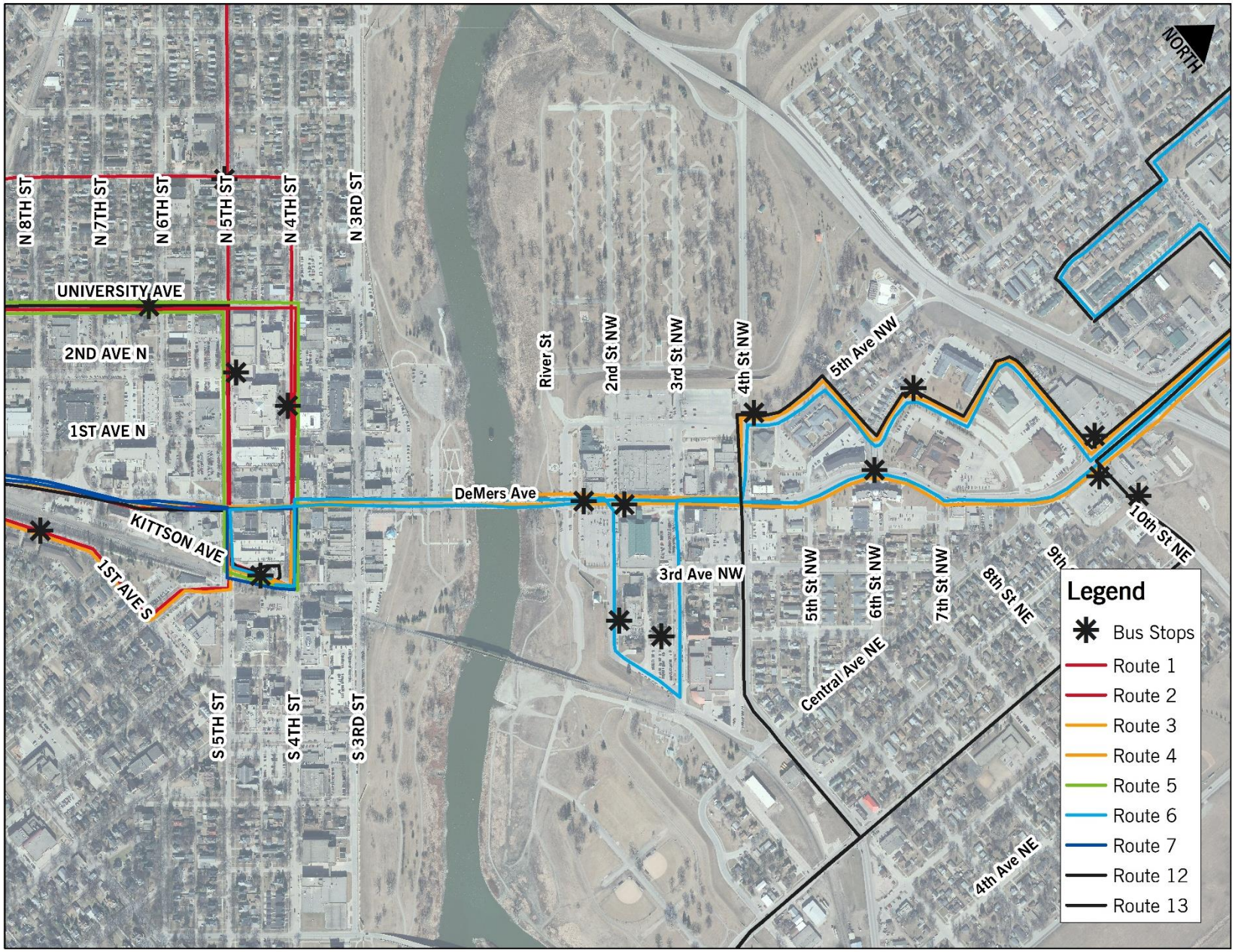


Figure 33: Transit Level of Service

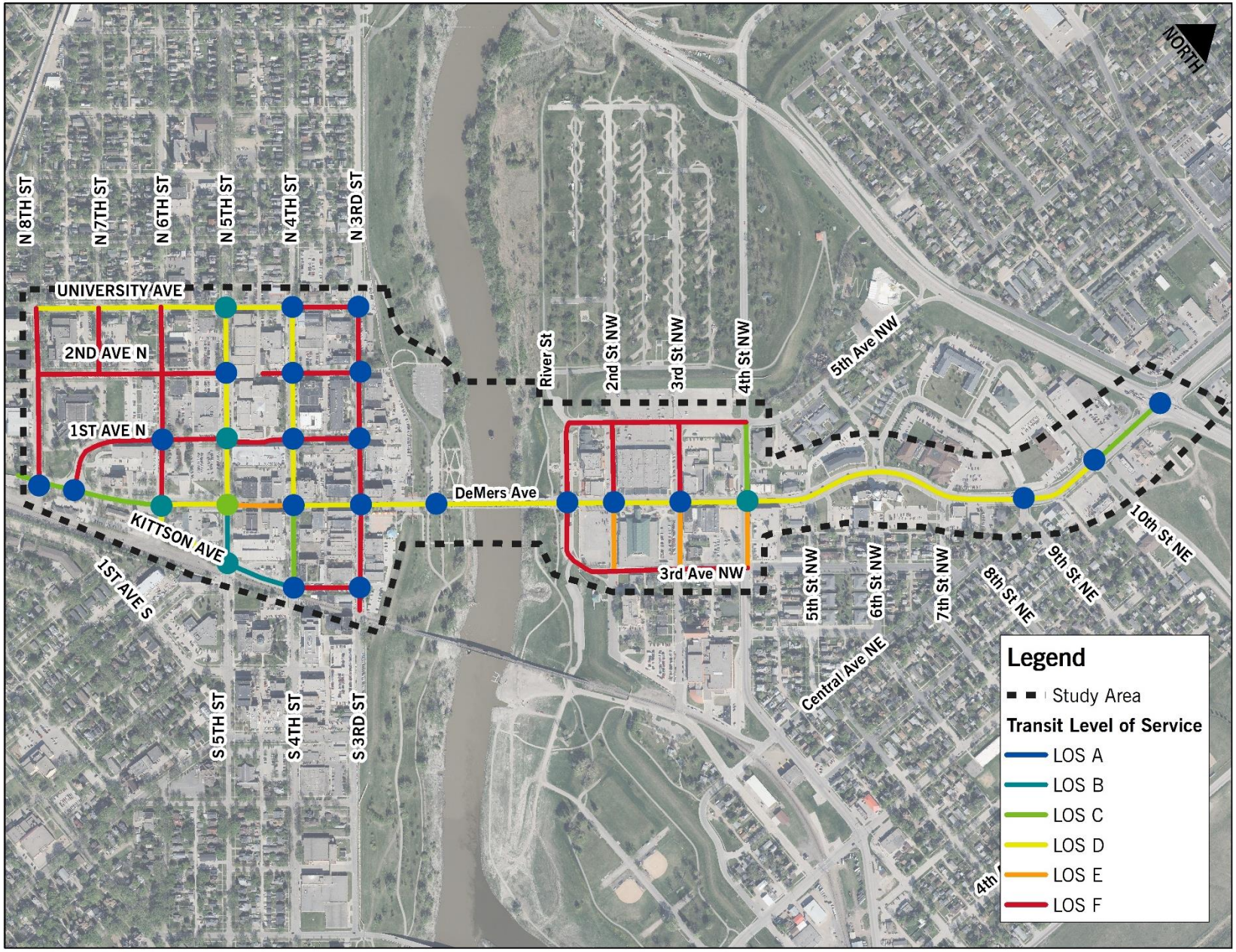
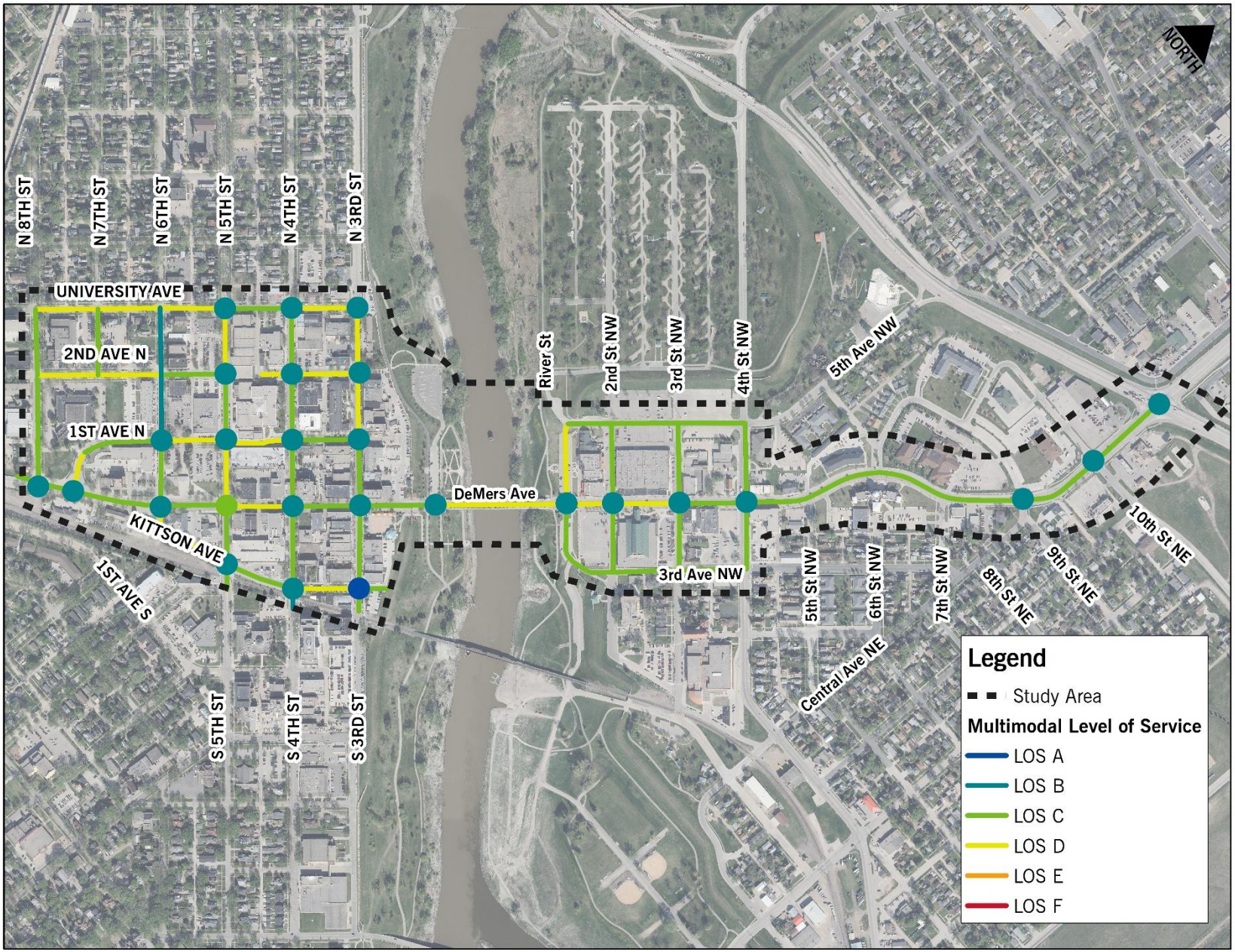


Figure 34: Multimodal Level of Service



PARKING ENVIRONMENT

Parking in downtown Grand Forks and East Grand Forks is a mix of public on- and off-street and private parking. The right balance must be struck between not providing enough parking, which deters individuals for visiting establishments, and providing too much parking, which has negative environmental impacts through increased impervious surface, financial impacts by using space for parking instead of taxable developments, and perception.

Parking in Downtown Grand Forks was studied extensively in the Downtown Grand Forks Parking Study that will be completed Fall 2019. Data presented in this section is from that study. Parking in East Grand Forks was only collected on DeMers Avenue, so less detail is available.

PARKING IN DOWNTOWN GRAND FORKS

The Downtown Grand Forks parking study collected parking supply and demand for 21 blocks from University Avenue to Gertrude Avenue, north and south, from the Red River to 5th Street and 8th Street, east and west in October 2018. The study evaluated six time periods of a normal weekday and four time periods of a normal weekend.

PARKING SUPPLY

Within this study area there are nearly 3,600 parking spaces, including 960 on-street spaces, 1,325 public off-street spaces, and 1,296 private off-street spaces. Parking supply is shown in Figure 35.

PARKING DEMAND

Downtown Grand Forks experiences much higher parking occupancy on weekdays than weekends due to school and office parking activity. The highest occupancy occurs in the 10 AM circuit with 50.5 percent of spaces occupied; this means there are more than 1,600 spaces available, even during the peak. Throughout a typical weekday, parking occupancy averages just 44.4 percent.

There are many locations that experience capacity at or above 85 percent, particularly on-street locations in front of major activity centers (City Hall, Central High School, County buildings, 3rd Street). There were 30 parking locations with occupancy rates at 85 percent or higher. These constraints may reinforce perceptions that downtown parking is challenging.

Downtown Grand Forks is very different on the weekends than the weekdays. Office and school parking activity changes to shopping, dining, and entertainment activity. During the Saturday this parking data was collected, the peak occupancy was 18.3 percent during the 8 PM circuit. This means there are more than 2,900 parking stalls available throughout Downtown on weekends.

The areas of high demand shift from the Central High School/City Hall area on the weekday to the shopping and restaurant area south of DeMers Avenue. During the 5 PM and 8 PM circuits, there were 19 and 15 parking locations with occupancy rates at 85 percent or higher, respectively.

Parking supply and demand is shown in Figure 36 and Figure 37.

Figure 35: Downtown Grand Forks Parking Supply

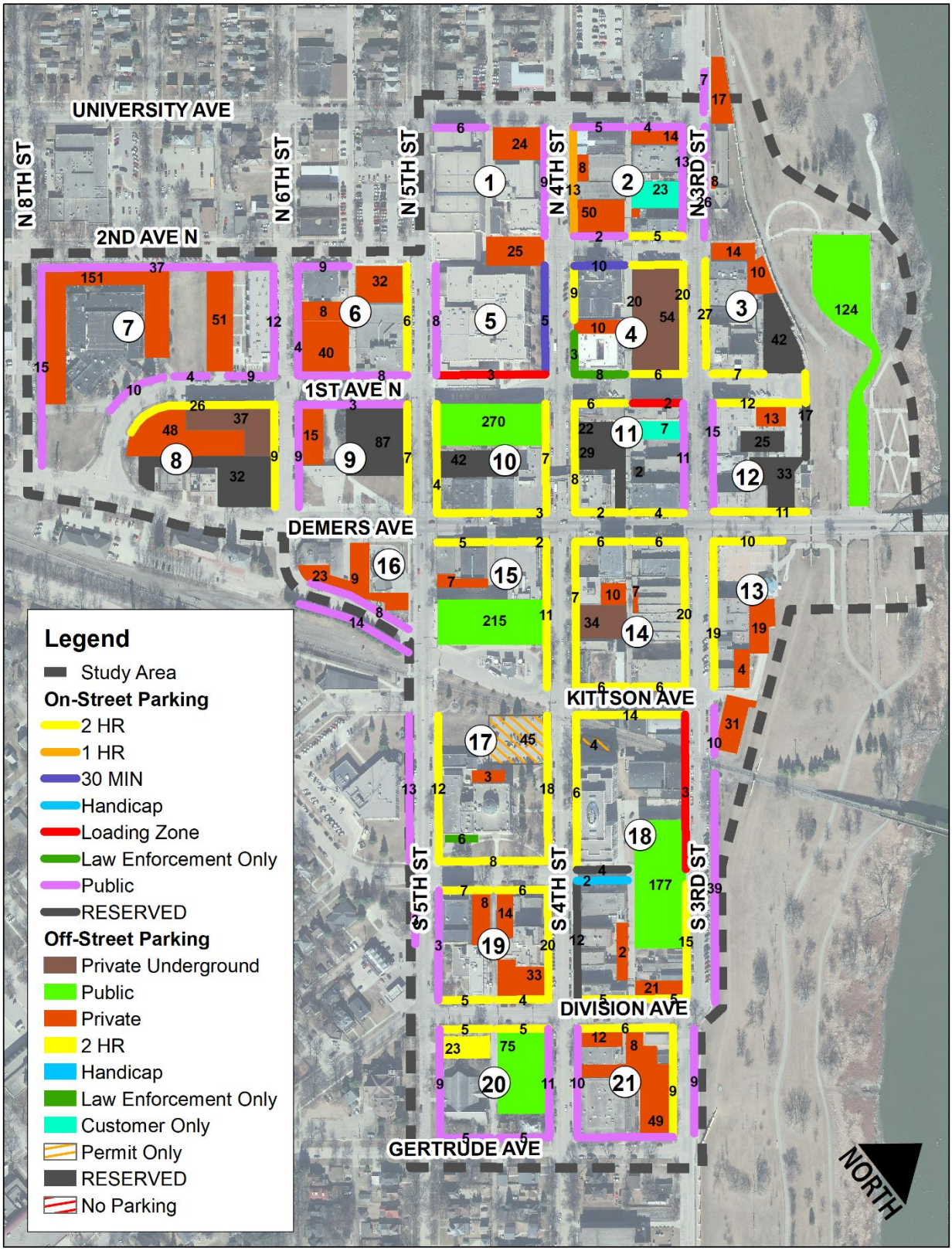


Figure 36: Weekday Parking Availability in Downtown Grand Forks

Figure 37: Weekend Parking Availability in Downtown Grand Forks

Parking in Downtown East Grand Forks

In 2011, a parking study was completed for East Grand Forks, which collected parking supply and demand for eight blocks between 5th Avenue NW and 3rd Avenue NW and River Street and 4th Street NW. The study evaluated six time periods of a normal weekday.

Parking Supply

Within this study area there were nearly 955 parking spaces, including 142 on-street spaces and 813 off-street spaces. Parking supply is shown in Figure 38.

Parking Demand

The daytime peak occupancy occurred between 12 Noon and 2 PM at 26 percent and the evening peak occupancy was at 34 percent between 7 PM and 9 PM. Overall, the occupancy is very low. However, there are pockets of high demand, like Lot 5 east of Cabela's which is between 84 and 94 percent occupied across the day and on-street parking east of Cabela's and west of the Riverwalk Center, which sometimes exceeds capacity during the later hours of the day. Ultimately, this study found that there is sufficient parking available in Downtown East Grand Forks, but the lack of safe pedestrian pathways and wayfinding discourages visitors from walking farther distances.

Parking demand is shown in Figure 39 and Figure 40.

Parking on DeMers Avenue in Downtown East Grand Forks

An updated parking study to evaluate parking supply and demand on DeMers Avenue from River Road to 4th Street NW was completed in August 2019. The study evaluated six time periods of a normal weekday and four time periods during a normal weekend.

Parking Supply

Parking supply on DeMers Avenue from River Road to 4th Street NW includes 44 parking spaces for on-street parking with various restrictions. In addition to these spaces, there is additional on-street parking on River Road/3rd Avenue NW and 3rd Street NW, and multiple large surface lots. Data was not collected for these locations.

Parking Demand

Parking demand along DeMers Avenue varies throughout a typical weekday, ranging from five percent occupancy during the 8 AM hour to 52 percent occupancy during the 6 PM hour. Parking occupancy peaks during the noon hour and the evening hour, likely associated with the many restaurants around Downtown East Grand Forks.

Parking demand on a typical weekend is higher than a typical weekday, ranging from 34 percent occupancy during the 11 AM hour to 50 percent occupancy during the 2 PM hour.

Parking supply and average weekday and weekend demand is shown in Figure 41.

Figure 38: 2011 Parking Supply in Downtown East Grand Forks

Figure 39: 2011 Daytime Peak Parking Occupancy in Downtown East Grand Forks

Figure 40: 2011 Evening Peak Parking Occupancy in Downtown East Grand Forks

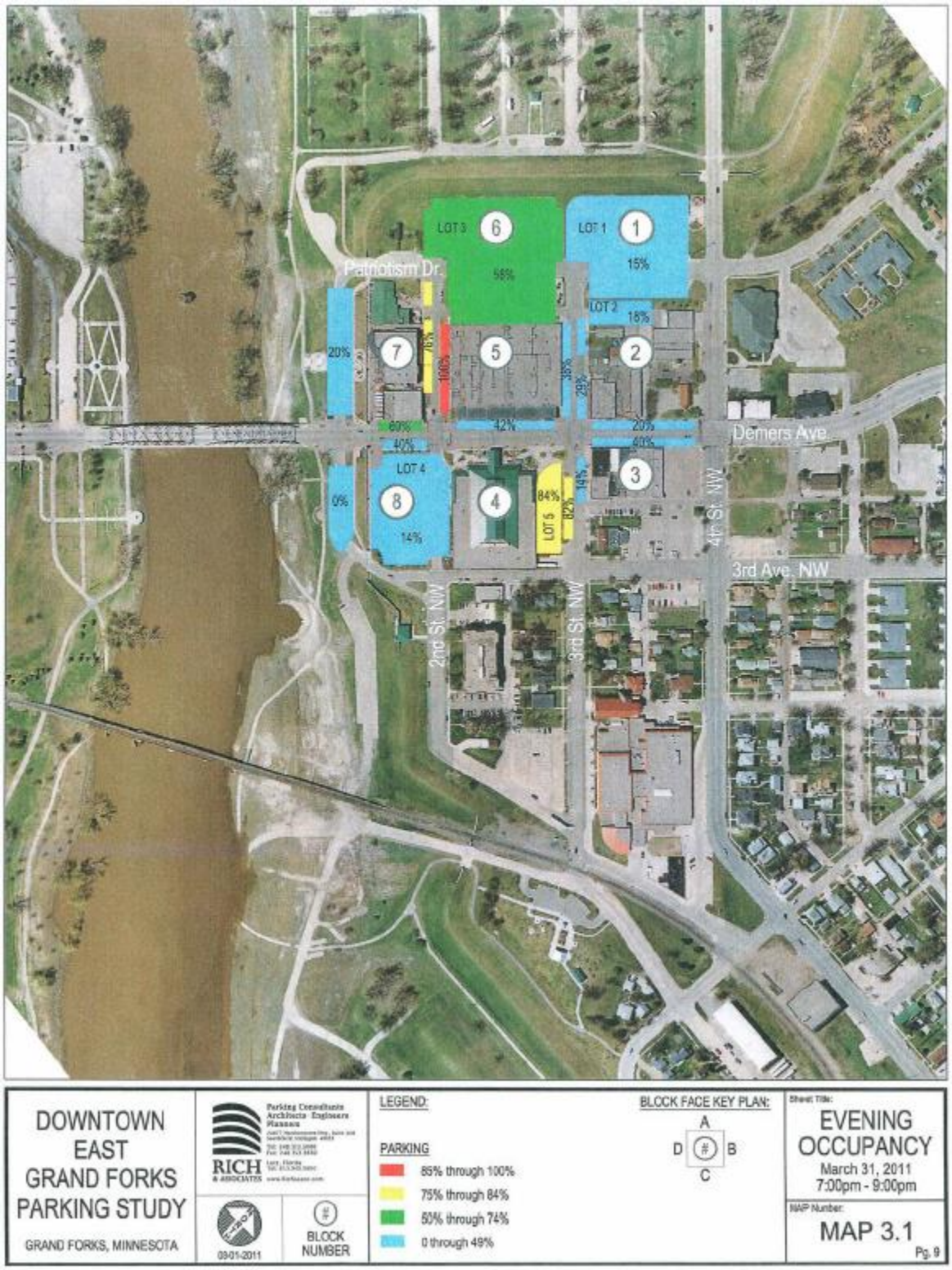
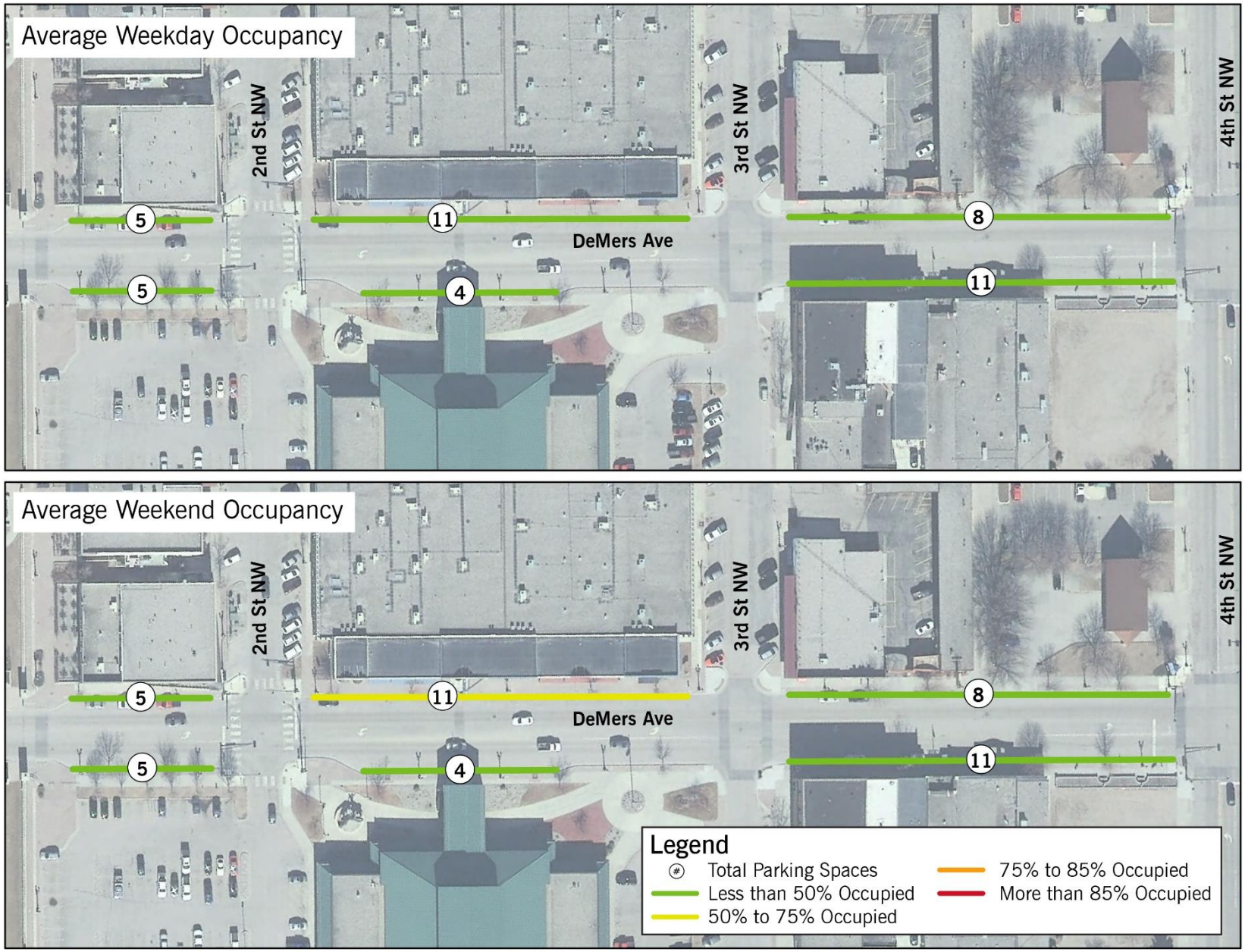


Figure 41: Parking Supply and Average Occupancy in Downtown East Grand Forks



FUTURE CONDITIONS

INTRODUCTION

As downtown Grand Forks and downtown East Grand Forks develop and redevelop, the transportation needs of these communities will change. Using the Grand Forks – East Grand Forks travel demand model, the Future Conditions Report will consider local changes within the two downtowns and regional changes to develop traffic projections for years 2030 and 2045 to understand the future transportation network needs. The needs identified in the existing conditions report and the 2030 and 2045 analysis will establish the issues to be addressed through the alternatives analysis.

TRAFFIC FORECASTING

Traffic forecasting is done using a regional travel demand model. Travel demand models are a computer model used to estimate travel behavior and travel demand for a specific future time frame based on a number of assumptions. Traditionally these models include four steps:

- **Trip generation:** the number of trips to be made based on socioeconomic characteristics like the number of jobs and households in an area, called a traffic analysis zone (TAZ).
- **Trip distribution:** where the trips from each TAZ desire to go based on the number of trip attractions (destinations like jobs, shopping, schools, etc.) in the other TAZs and the travel time.
- **Mode choice:** how the trips will be divided among the available modes of travel. The Grand Forks – East Grand Forks travel demand model assumes all trips are completed by car based on historic modal trends in the region, except for areas around the University of North Dakota campus.
- **Trip assignment:** what routes the trips will take, generally based on the quickest route to the destination.

The Advanced Traffic Analysis Center at North Dakota State University develops and maintains the Grand Forks – East Grand Forks travel demand model. This study reviewed the growth and outputs but did not make any changes to the model inputs.

2030 AND 2045 JOBS AND HOUSEHOLD GROWTH

New jobs and households were assigned to TAZs based on discussions between the Grand Forks – East Grand Forks Metropolitan Planning Organization (MPO), City of Grand Forks and City of East Grand Forks planning staff during the development of the 2045 Metropolitan Transportation Plan. The additional jobs and households data is generally reflective of the expected redevelopment concepts identified in the Downtown Action Plan for Grand Forks and the East Grand Forks 2045 Land Use Plan and River Forks Downtown Plan Update for East Grand Forks as shown in Figure 42, Figure 43, and Figure 44. This household and jobs growth is shown in Figure 45 and Figure 46.

Figure 42: Redevelopment Candidate Sites from Downtown Action Plan (GF)

Figure 44: Parking Lot Redevelopment from Future Land Use Plan (EGF)

Figure 43: Redevelopment Candidate Sites from River Forks Downtown Plan Update (EGF)

2030 AND 2045 TRAFFIC PROJECTIONS

The travel demand model is a tool best used at a regional scale. At smaller scales, like dense downtowns with a lot of walking, biking, and transit use, the model should be used as a foundation, combined with existing and historic trends and projected job and household growth. Based on these factors the travel demand model forecasted traffic for 2030 and 2045 for most corridors with some adjustments necessary. Generally, two approaches were used:

Some roadways (2nd Avenue in Grand Forks) are not included in the travel demand model. Forecasts for these locations used historical growth from 2010 to 2019 was used and applied to 2030 and 2045.

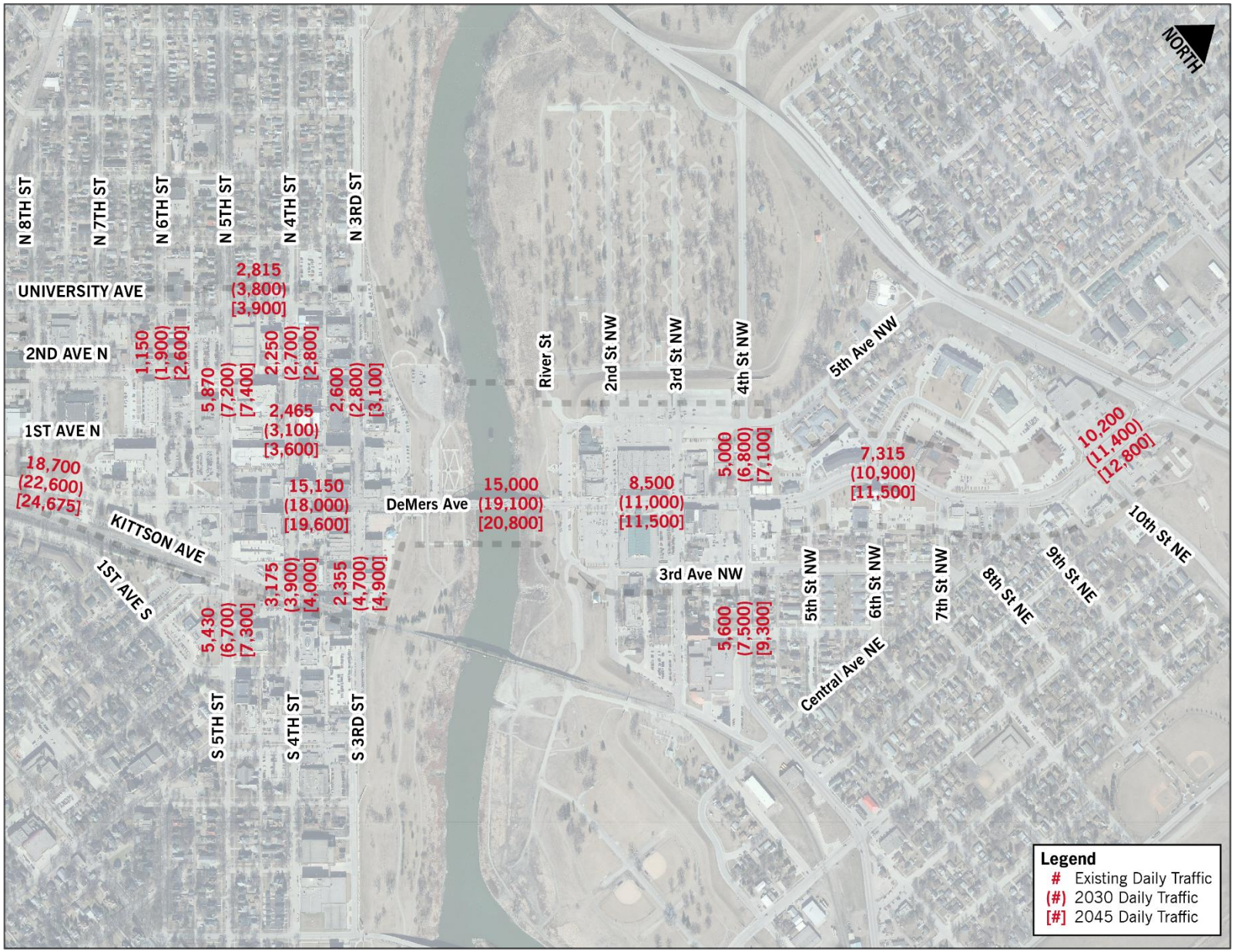
Some roadways (4th Street in Grand Forks, DeMers Avenue in East Grand Forks) had 2030 and 2045 forecasts that were lower than 2019 existing average daily traffic. Forecasts for these locations applied the modeled growth from 2015 (the current base model) to 2030 and 2015 to 2045 to 2019 average daily traffic volumes.

The projected traffic demand was applied to the 2019 turning movements following guidance in *NCHRP Report 765: Analytical Travel Forecasting Approaches for Project Level Planning and Design* to estimate 2030 and 2045 intersection demand. Differences between intersections were then balanced to develop the final 2030 and 2045 turning movement counts. These are shown in APPENDIX B.

Figure 45: 2015 to 2030 Household and Job Growth

Figure 46: 2015 to 2045 Household and Job Growth

Figure 47: Existing and Adjusted 2030 and 2045 ADTs

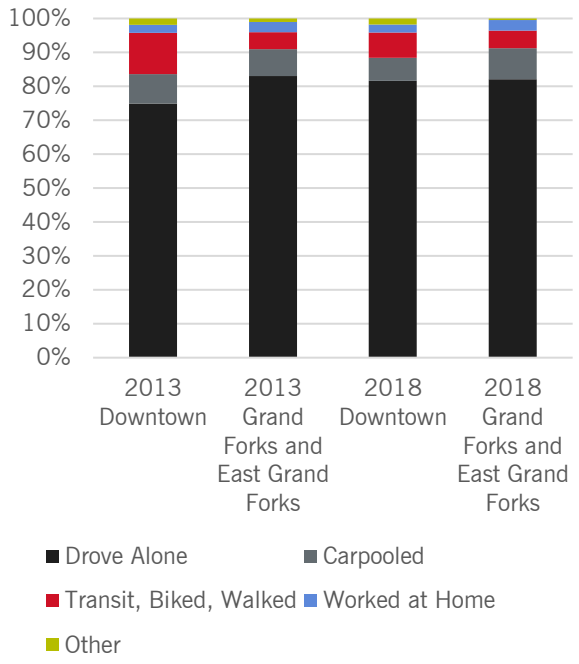


Changes to Travel Behavior

Changes to Walking, Biking, and Transit

In the downtown area, 7.4 percent of people commute to work by walking, biking, or using transit according to 2018 5-Year American Community Survey (ACS) data. This data shows a decline in walking, biking, and transit trips when compared to 2013 when more than 12 percent of people in the downtowns walked, biked, or use transit to get to work. The 5-Year ACS for 2013 would cover years 2008 to 2013, which covers the recession and the high gas prices experienced in 2008. Additionally, the number of jobs in downtown has declined between 2010 and 2015, despite a more than six percent increase in the number of households. While more people are living downtown, they are not working there, resulting in increased commuting trips by auto. Despite this decline, the downtown study area sees much higher utilization of transit, walk, and bicycle trips than the cities of Grand Forks and East Grand Forks as a whole.

Figure 48: Commuting Trends in the Downtown Study Area



In 2019, the City of Grand Forks adopted Grand Rides, a bikeshare program, with 18 bike stations across Grand Forks and East Grand Forks, with a special focus in downtown. More than 60 percent of riders used Grand Rides more than once between its introduction in August and the end of November. Most trips occur on weekdays at the noon and 4PM hours. Bike share can help support mode shifts by providing on-demand options.

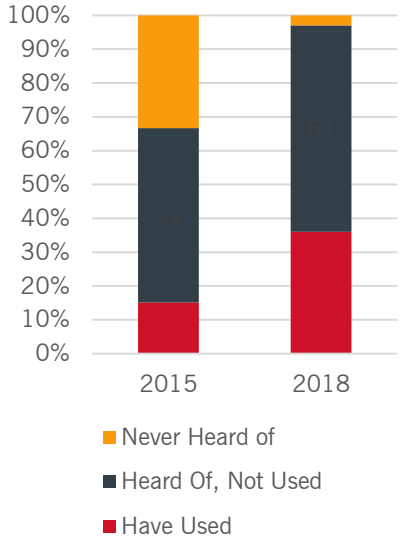
With continued investments in all types of development (residential, commercial, office) downtown and walking, biking, and transit infrastructure, it is likely that more people will choose walking and biking. Improving the walkability and bikeability to and through the downtowns may impact travel behavior in the following ways:

- Encourage people to "park once" and walk to multiple destinations for those that commute downtown instead of circulating looking for parking.
- Potentially reduce car ownership for those who live in or near the downtowns. Short trips would be completed with bike, walk, or transit trips.
- Even if bike, walk, and transit trips increase two percent per year, it is unlikely to change overall traffic demand, especially on corridors like DeMers Avenue, where the demand is primarily regional. No changes to traffic forecasts were made.

Ride-Hailing and Car Sharing Services

Ride-hailing services like Uber and Lyft use smart phone apps to provide door-to-door transport and these services have exploded across the US in the past three years. In 2015, the Pew Research Center completed a survey of American adults and found just 15 percent had used ride-hailing services like Uber and Lyft previously and 33 percent of American adults had never heard of ride-hailing services[1]. By the end of 2018, 36 percent of American adults had used ride-hailing services and just three percent of adults had never heard of ride-hailing services. Nearly a quarter (22 percent) of ride-hail users, use the service at least monthly, and eight percent use the service weekly.

Figure 49: American Adults Who Have Used Ride-Hailing Services

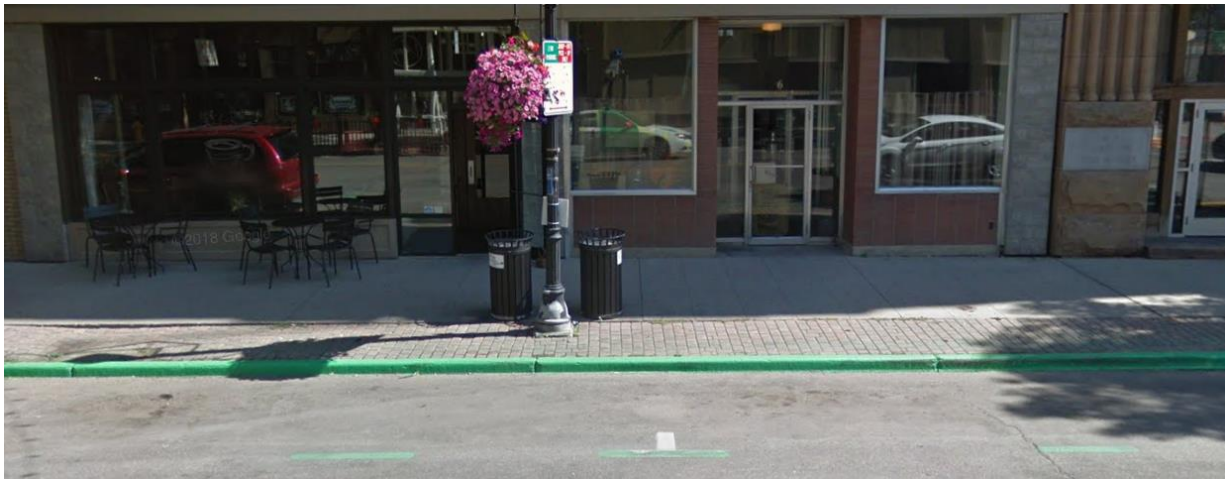


The City of Grand Forks has already experienced some of the impacts increased ride-hailing and car services (party busses, particularly) have on curb space management like double parking and blocking travel lanes. In Summer 2018, the City instituted new policies for ride-hailing drop off spaces, including marking three locations for drop off and pick up only between 10 PM and 3 AM, as shown in Figure 50:

- The first block of 3rd Street North
- 300 block of 2nd Avenue North
- 200 block of 1st Avenue North (bus parking only to accommodate party bus type vehicles).

While ride-hailing is not yet a full replacement for car ownership – AAA has found its more than twice as expensive as private vehicle ownership[2] – it can change the dynamic of travel to downtown and parking, especially during large events and nightlife hours.

Figure 50: Drop Off/ Pick Up Location on First Block of 3rd Street North of DeMers Avenue



Source: Google Earth

[1] http://www.pewresearch.org/fact-tank/2019/01/04/more-americans-are-using-ride-hailing-apps/
[2] https://newsroom.aaa.com/2018/08/ride-hailing-double-cost-car-ownership/

Impacts on Trip Making Behavior

Ride share is likely to continue to grow in popularity in downtown Grand Forks and downtown East Grand Forks but is unlikely to have significant impacts on daily trip making behaviors (commuting). Instead, its most significant impacts are likely to evening and weekend travel behavior.

- Ride-hailing replaces cab services. Cabs typically circulate downtown waiting to pick up passengers, but ride-hailing companies have already been restricted to specific drop-off/pick-up locations throughout downtown. This reduces traffic circulation in the most congested parts of downtown.
- Ride-hailing replaces certain single occupant vehicle trips downtown. University of California Davis research found that parking is the top reason urban ride-hailing users substitute ride-hailing services instead of driving themselves[3].
- More people use ride-hailing services instead of walking, biking, transit. The same UC Davis research found that almost 40 percent of trips current ride-hailing users took would have otherwise been made by walking, biking, or transit.
- Ride-hailing can improve travel safety. Research has found ride-hailing reduces fatal alcohol-related auto accidents up to 11.4 percent and driving under the influence (DUI) arrests up to 9.2 percent[4].

For the purposes of this study, it is unlikely that ride-hailing will change travel demand throughout the two downtowns. No changes to traffic forecasts were made. Specific goals and policies of planning documents like the Downtown Action Plan are trying to change travel modes in downtown, however, the changes have not been strong enough yet to alter traffic forecasting to assist other planning documents. This Study will work to help achieve those goals through alternatives developed and refined in later chapters.

FUTURE MULTIMODAL LEVEL OF SERVICE

In the same way the existing conditions were analyzed, the future conditions were also analyzed using a multimodal level of service (MMLOS). This provides a more complete evaluation of the downtown transportation system to account for walking, biking, and transit deficiencies that may be present due to an unbalanced emphasis on automobile traffic. The MMLOS includes vehicular, bicycle, pedestrian, and transit. Each of the sections below will detail issues and existing operations for each specific modal environment, concluding with an unweighted multimodal level of service.

VEHICULAR ENVIRONMENT

Vehicular traffic operations were analyzed at the key intersections. Intersection capacity analysis was evaluated in terms of delay and level of service (LOS). LOS is a term used to describe the operational performance of transportation infrastructure elements; it assigns a grade value that corresponds to specific traffic characteristics within a given system, as shown in Table 2. At intersections, LOS is a function of average vehicle delay, whereas LOS for a roadway section is defined by the average travel speed. LOS “A” represents free flow traffic whereas LOS “F” represents gridlock. LOS “E” or worse is considered deficient. Capacity analysis was conducted using Synchro, which applies deterministic equations published in the Highway Capacity Manual (HCM), an industry, MnDOT and NDDOT standard. DeMers Avenue capacity and reliability analysis was completed using Vissim microsimulation analysis, which simulates the movement of every vehicle through an intersection and then collects information for associated performance measures like delay, queue lengths, travel times, and density.

For signalized intersections, the signal timing was optimized using Synchro software. This helps ensure that operational deficiencies are a result of lack of capacity and not poor signal timing. Currently, there is no communication and coordination of signals in Grand Forks and East Grand Forks. To account for this limitation, signals in Grand Forks were coordinated together and signals in East Grand Forks were coordinated together

[3] https://steps.ucdavis.edu/new-research-ride-hailing-impacts-travel-behavior/
[4] https://www.citylab.com/life/2019/12/ride-hailing-alcohol-consumption-research-uber-lyft/603709/

with minimal effort to cross-coordinate. Options to improve this limitation will be discussed further in the alternatives chapter of the report.

Table 3: Level of Service Thresholds

Control Delay (Sec/Veh)		Level of Service
Unsignalized	Signalized	
≤ 10	≤ 10	A
10 – 15	10 – 20	B
15 – 25	20 – 35	C
25 – 35	35 – 55	D
35 – 50	55 – 80	E
> 50	> 80	F

2030 Vehicular Level of Service

Vehicular level of service was analyzed for 2030 using the existing roadway configurations, 2030 traffic demand estimated from the travel demand model, and optimized signal timing. Even with the expected traffic growth, the overall transportation network continues to operate effectively at LOS "D" or better. There are some areas of degraded vehicle levels of service at DeMers Avenue intersections in Grand Forks, including 8th Street and Kittson Avenue in Grand Forks and River Street and 3rd Street NW in East Grand Forks. These intersections are all stop controlled intersections.

Queueing is worsened with the additional traffic demand. Maximum queues on the eastbound approach at the DeMers Avenue and 5th Street can extend through the 6th Street/Kittson Avenue intersection as well as westbound at the DeMers Avenue and 3rd Street (GF) and DeMers Avenue and eastbound at the DeMers Avenue and 2nd Street NW (EGF). Intersection and segment LOS is shown in Figure 53.

2045 Vehicular Level of Service

Vehicular level of service was analyzed for 2045 using the existing roadway configurations, 2045 traffic demand estimated from the travel demand model, and optimized signal timing. Areas of deficient vehicle operations begin to emerge, especially on the minor approaches of DeMers Avenue intersections. Delays at Kittson Avenue/6th Street begin to affect overall intersections, which is expected to operate at LOS "F". Queues at the DeMers Avenue and 5th Street intersection in Grand Forks often extend through the 6th Street/Kittson Avenue intersection. Queues between 3rd Street in Grand Forks and 2nd Street in East Grand Forks extend onto the Sorlie Bridge, blocking Riverboat Road (GF) and River Street (EGF). Intersection and segment LOS is shown in Figure 54.

Figure 51: Eastbound DeMers Avenue Queues

DeMers Avenue Reliability Analysis

Congestion, crashes, and special events can impact travel time reliability. The Grand Forks – East Grand Forks Metropolitan Transportation Plan's performance target for reliability is to have 85 percent of person-miles traveled on the non-Interstate Highway System (DeMers Avenue) reliable with a level of travel time reliability (LOTTR) under 1.5, as measured by the ratio between the 85th percentile travel time divided by the average travel time. Travel time reliability is expected to be impacted with the projected traffic growth.

For this analysis, travel time is used to determine the reliability of travel on DeMers Avenue in the AM and PM peak for the year 2030 and 2045.

2030 Daily Travel Time and Reliability

Travel Time

While there are no level of service deficiencies on DeMers Avenue, the closely spaced traffic signals and congestion result in compounded delays and driver frustration. The compounding nature of several closely spaced signals along the corridor can create longer than expected delays, particularly for those using this corridor for regional trips, even without LOS deficiencies.

Under free flow conditions, traveling between 8th Street in Grand Forks to the Red River should take around 65 seconds. During the AM peak, traveling eastbound experiences an additional 38.3 seconds of travel time (59.0 percent) and westbound an additional 32.1 seconds (49.4 percent). During the PM peak, traveling eastbound experiences an additional 54.7 seconds (84.1 percent) and traveling westbound experiences an additional 36.7 seconds (56.4 percent).

Under free flow conditions, traveling between the Red River to east of 4th Street NW in East Grand Forks should take around 40 seconds. During the AM peak, traveling eastbound experiences an additional 23.0 seconds of travel time (57.4 percent) and westbound experiences an additional 20.3 seconds (50.8 percent). During the PM peak, traveling eastbound experiences an additional 20.0 seconds of travel time (50.0 percent) and westbound experiences an additional 19.3 seconds (48.3 percent).

Figure 52: 2030 Free Flow v. Average Travel Time on DeMers Avenue

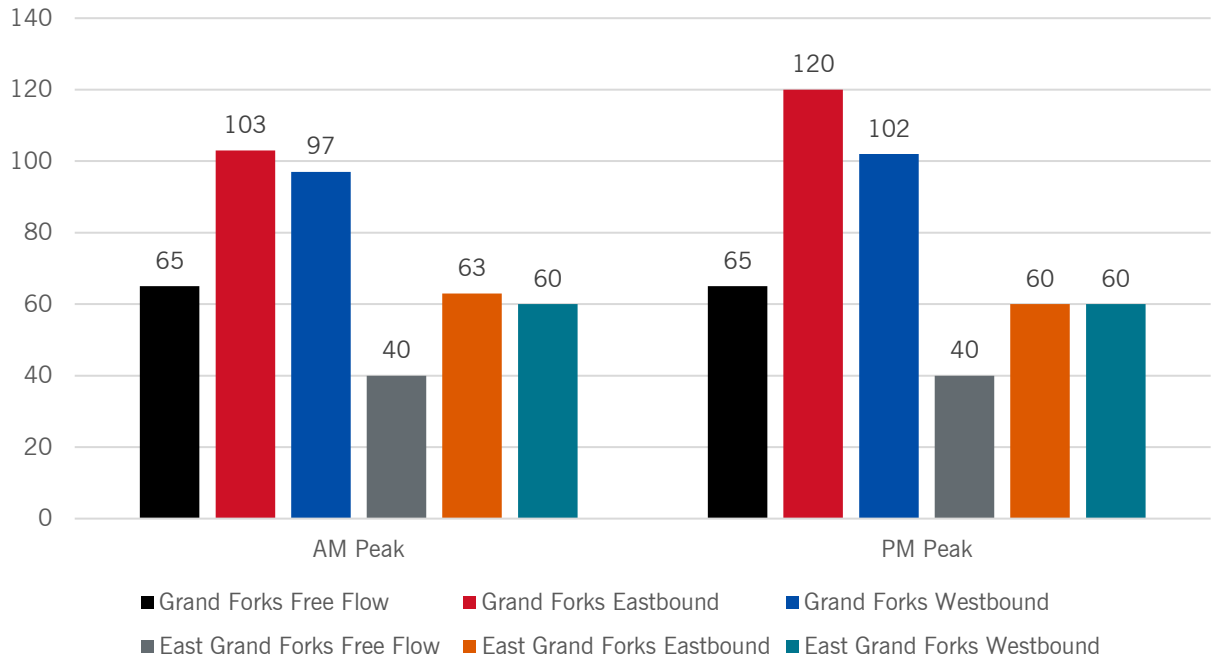


Figure 53: 2030 Vehicle Level of Service

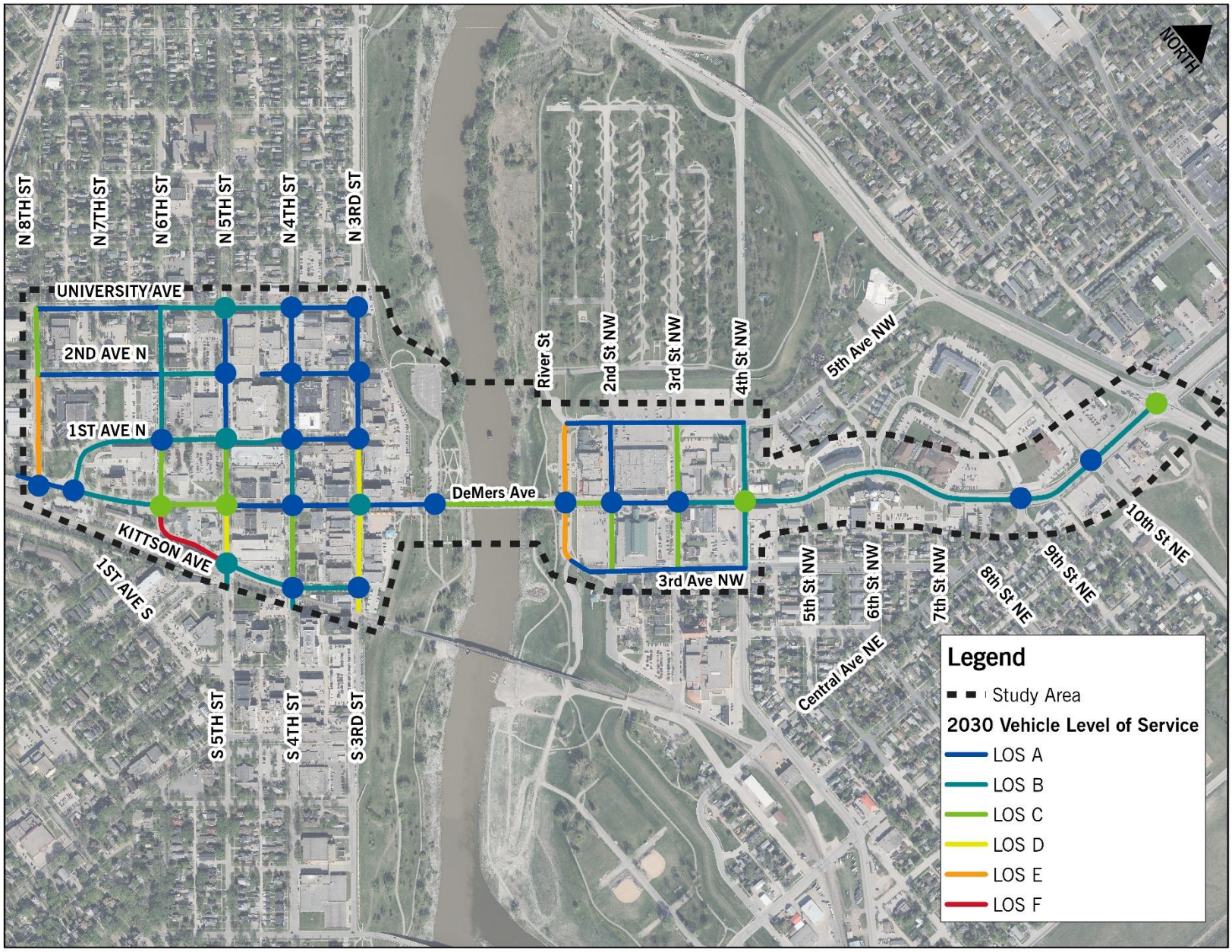
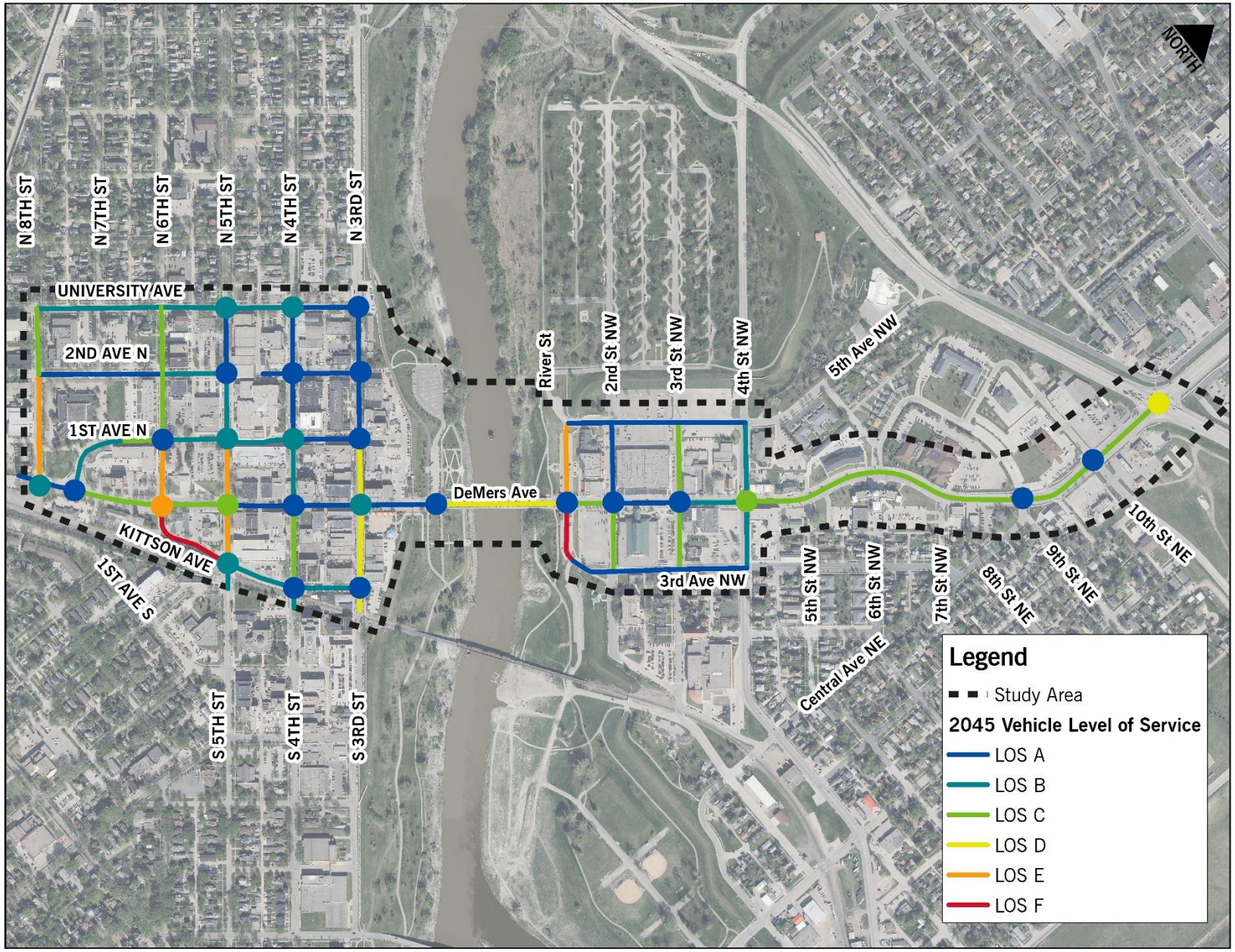


Figure 54: 2045 Vehicle Level of Service

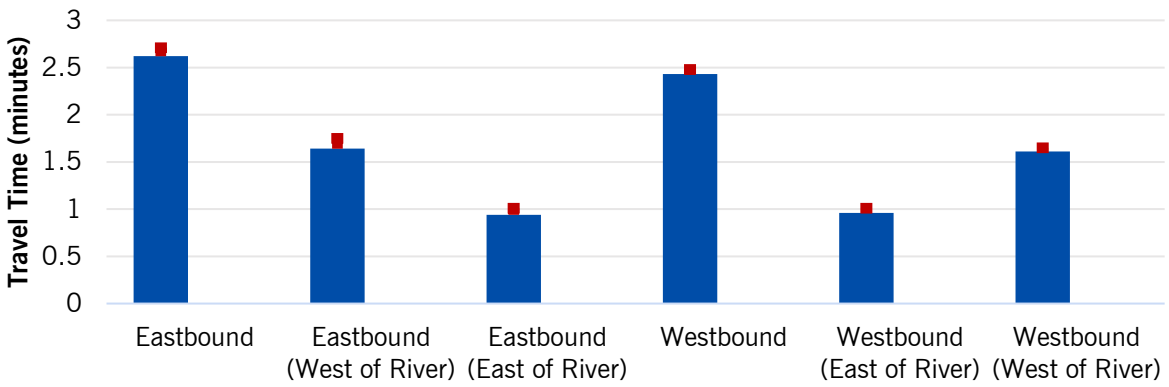


Reliability

Daily traffic volumes on DeMers Avenue vary across time of day, day of the week, and month of the year, generally around seven percent.

Daily average travel times along DeMers Avenue are shown in the blue bar, with the LOTTR shown by the red bar in Figure 55. On a typical day, the LOTTR ranges between 1.04 and 1.11 for both directions of DeMers Avenue. Even though travel times are expected to increase between 2019 and 2030, the system is still able to reliably operate, as indicated by the very consistent travel times throughout the day.

Figure 55: 2030 DeMers Avenue Travel Time Reliability



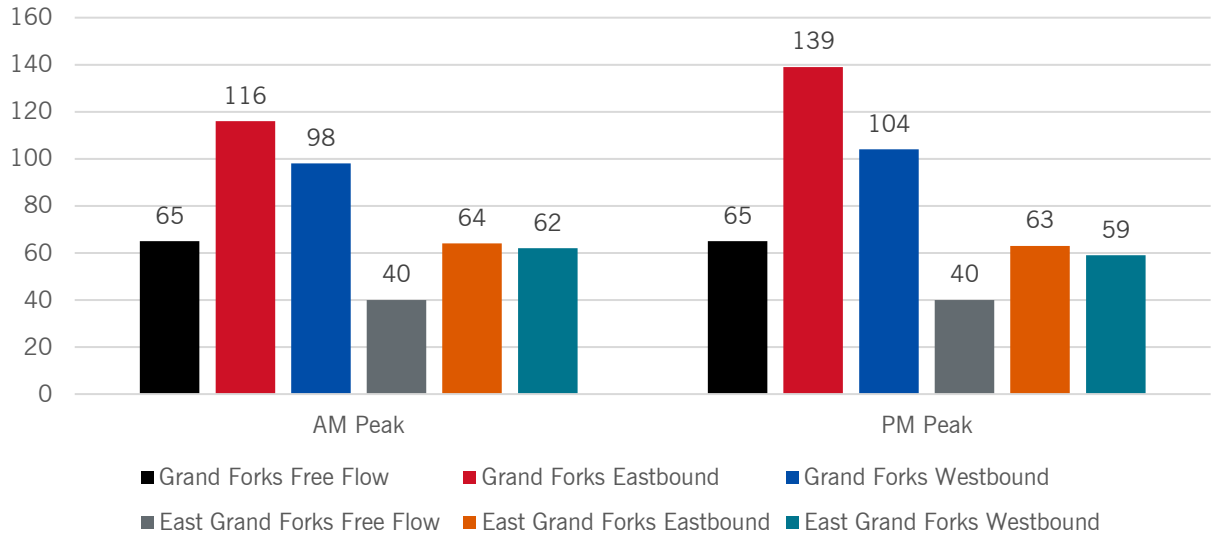
2045 Daily Travel Time and Reliability

While there are no level of service deficiencies on DeMers Avenue, the closely spaced traffic signals and congestion result in the perception that there are deficiencies. The compounding nature of several closely spaced signals along the corridor can create longer than expected delays, particularly for those using this corridor for regional trips, even without LOS deficiencies.

Under free flow conditions, traveling between 8th Street in Grand Forks to the Red River should take around 65 seconds. During the AM peak, traveling eastbound experiences an additional 51.0 seconds of travel time (78.5 percent) and westbound an additional 32.6 seconds (50.1 percent). During the PM peak, traveling eastbound experiences an additional 74.3 seconds (114.4 percent) and traveling westbound experiences an additional 39.2 seconds (60.3 percent).

Under free flow conditions, traveling between the Red River to east of 4th Street NW in East Grand Forks should take around 40 seconds. During the AM peak, traveling eastbound experiences an additional 23.7 seconds of travel time (59.2 percent) and westbound experiences an additional 22.2 seconds (55.5 percent). During the PM peak, traveling eastbound experiences an additional 23.2 seconds of travel time (58.1 percent) and westbound experiences an additional 19.2 seconds (47.9 percent).

Figure 56: 2045 Free Flow v. Average Travel Time on DeMers Avenue

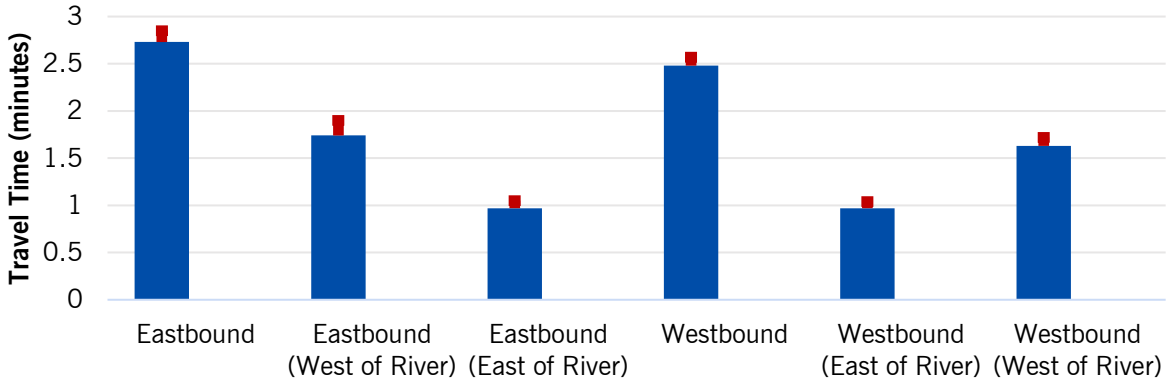


Reliability

Daily traffic volumes on DeMers Avenue vary across time of day, day of the week, and month of the year, generally around seven percent.

Daily average travel times along DeMers Avenue are shown in the blue bar, with the LOTTR shown by the red bar in Figure 57. On a typical day, the LOTTR ranges between 1.07 and 1.16 for both directions of DeMers Avenue. Even though travel times are expected to increase between 2019 and 2045, the system is still able to reliably operate, as indicated by the very consistent travel times throughout the day.

Figure 57: 2045 DeMers Avenue Travel Time Reliability



Seasonal Variability

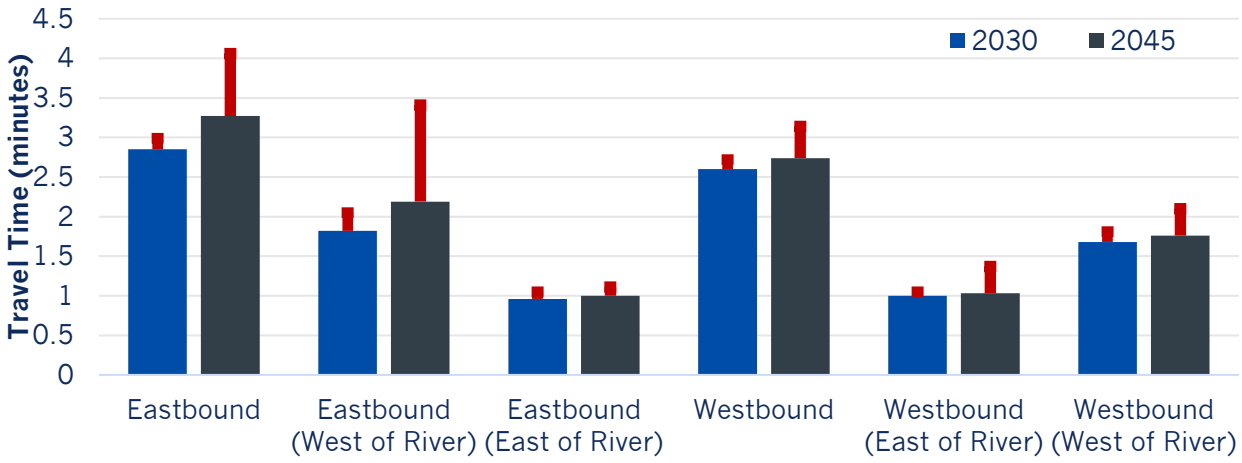
Daily traffic volumes on DeMers Avenue vary across time of day, day of the week, and month of the year, as much as seven percent. During fall beet harvest, truck traffic can approach six percent of total traffic (compared to less than two percent typically).

Microsimulation models were run for 2030 and 2045 with seven percent higher traffic volumes and six percent truck traffic. 2030 is shown with the blue bars in Figure 58, with 2045 shown in the gray bars. Through 2030, travel time reliability is generally acceptable. However, the expected traffic growth combined with the seasonal traffic growth in 2045, travel time reliability exceeds a the MPO's target of 1.5 for the eastbound direction, specifically for the segment in Grand Forks. This indicates that in the future large

seasonal changes or big events will likely require special accommodations to ensure the operations and reliability of the DeMers Avenue system.

Under the 2045 traffic conditions with the seasonal variability, the average travel time increases to 3.3 minutes for the eastbound direction and 2.7 minutes for the eastbound direction, a 22.2 percent and 8 percent increase compared to a typical 2045 day. For the 95th percentile, travel time increased to 6.2 minutes for the eastbound direction and 4.2 minutes for the westbound direction, an 82.4 percent and 44.8 percent increase compared to a typical 2045 day. The higher traffic demand also results in peak travel times that last longer than an hour as vehicles queued at major entry points (DeMers Avenue, 5th Street in Grand Forks, and 4th Street NW in East Grand Forks) are able to enter the network.

Figure 58: 2030 and 2045 Seasonal Variability Travel Time Reliability



Summary

The majority of the two downtowns are made of low volume roadways that provide efficient operations, given the context. Parking can create momentary friction along some of the more active roadways (i.e. 3rd Street in Grand Forks) but not consistent enough to impact level of service given the low volumes.

DeMers Avenue is the exception. When studied on a component level (intersection nodes and roadway links), the corridor operates mostly acceptable. Queueing and congestion start to build on the west side of the corridor where the corridor transitions from five lanes to three lanes and no traffic control exists and between 3rd Street in Grand Forks and 2nd Street NW in East Grand Forks. These queues and the location of Riverboat Road and River Street create challenging locations to access DeMers Avenue. So, while level of service deficiencies do not arise because of lack of traffic currently using these locations during peak hours, they remain a challenge.

Where DeMers Avenue creates the most driver frustration is when reviewed holistically. The five traffic signals in slightly over a half mile, create compounded delays and friction. The seasonal traffic variability of the two downtowns can also lead to unreliable operations.

Pedestrian Environment

NCHRP 616: Multimodal Level of Service Analysis for Urban Streets provides a formula to calculate a pedestrian level of service for an area that is reflective of the perspective of pedestrians sharing the environment with vehicles. This formula incorporates the existence of sidewalks, separation from motorized vehicles, vehicle volumes, and speeds. Elements of this methodology were incorporated into the 6th Edition of the Highway Capacity Manual (HCM). However, this methodology was found to be preferable over the HCM methodology because of its focus on the user perception.

2030 Pedestrian Level of Service

In the two downtowns, most areas see a pedestrian level of service "B" or better. DeMers Avenue is LOS "C" due primarily to high traffic volumes with LOS "F" at uncontrolled intersections. 2030 Pedestrian LOS is shown in Figure 59.

2045 Pedestrian Level of Service

Even through 2045, most areas in the two downtowns see a pedestrian level of service "B" or better. DeMers Avenue continues to see LOS "C" due primarily to high traffic volumes with LOS "F" at uncontrolled intersections. 2045 Pedestrian LOS is shown in Figure 60.

Summary

The majority of downtown Grand Forks and downtown East Grand Forks has wide sidewalks shielded by parked cars or a parking lane, creating a comfortable experience, even next to major roadways like DeMers Avenue. This comfort and efficiency is well represented in the level of service methodology and the results. Even in locations where the pedestrian level of service is acceptable, there are opportunities to improve the desirability of walking through the two downtowns. Improvements like street furniture, greenery, and other aesthetic improvements can improve the desirability of the pedestrian environment and encourage people to walk.

The one exception is the parking lot north of Riverwalk Center in East Grand Forks. The lack of pedestrian facilities through this area limits people's willingness to walk to nearby destinations.

The majority of key intersections provide acceptable pedestrian level of service due to traffic control or low volume and low-speed streets. Where safety issues arise, improvements like traffic control (i.e. pedestrian beacons) and geometric alternatives (i.e. curb bulb outs) could improve sight lines and pedestrian safety. These types of alternatives will be discussed in further detail later in this study.

DeMers Avenue will become a barrier to pedestrian movements across downtown Grand Forks and East Grand Forks. Unsignalized intersections will become more challenging for pedestrians, especially the mid-block crossing between 2nd Street NW and 3rd Street NW in East Grand Forks. The Sorlie Bridge has a high level of service because of the buffer between traffic and the walkway, but the narrow sidewalk is generally considered a bottleneck.

Bicycle Environment

NCHRP 616: Multimodal Level of Service Analysis for Urban Streets also provides a formula to calculate the bicycle level of service for an area that is reflective of the perspective of bicyclists sharing the environment with vehicles. This formula incorporates the travel lane width, vehicle volumes, speeds, heavy truck traffic and pavement condition. Elements of this methodology were incorporated into the 6th Edition of the Highway Capacity Manual (HCM). However, this methodology was found to be preferable over the HCM methodology because of its focus on the user perception.

While there are planned facilities through the study area, the specific facility type has yet to be determined so was not incorporated into this analysis. Bicycles are not allowed on sidewalks in the downtown study area, although almost all bicycle activity does occur on the sidewalk. There are valid safety reasons to prohibit bike riding on the sidewalks, so all analysis assumed bicyclists on the roadway.

2030 Bicycle Level of Service

In 2030, most roadway segments see LOS "D" or better. DeMers Avenue between 5th Street in Grand Forks and 4th Street NW in East Grand Forks is LOS "E". This is unchanged from the existing LOS. Most intersections experience LOS "C", with some exceptions to uncontrolled intersections on DeMers Avenue in both Grand Forks and East Grand Forks. 2030 bicycle LOS is shown in Figure 61.

2045 Bicycle Level of Service

Through 2045, the segment bicycle level of service remains unchanged, with most areas seeing LOS "D" or better, with the exception of DeMers Avenue. Most intersections operate at LOS "D" or better, with the exception of uncontrolled intersections on DeMers Avenue. 2045 bicycle LOS is shown in Figure 62.

Summary

The quiet side streets through both downtowns provide an acceptable biking environment for most enthused and confident cyclists. However, the lack of dedicated facilities and restrictions to biking on sidewalks, makes it challenging for less confident riders to choose cycling as their mode of transportation. Further, on-street parking is a very real concern for people cycling due to increased conflicts from people backing in- and out- of angled parking spaces and dooring conflicts with parallel parking spaces.

The lack of a connected bicycle network limits people's ability to bike to and through downtown. Without a network, limited facilities in the downtowns are unlikely to see high usage. Connections to the Greenway and the future bicycle facilities on University Avenue will be a good first step in building the bicycle network to and through downtown Grand Forks. The Downtown Action Plan identified additional bicycle connections that will be discussed in the alternatives analysis. In East Grand Forks, there are few connections identified to and through downtown.

DeMers Avenue will be a barrier for bicycle movements across both downtowns. Movements going east-west are limited by high traffic volumes and the Sorlie Bridge. The bridge is a major barrier to bicycle use since riders are required to walk their bike on the sidewalk or bike on the high stress roadway.

Figure 59: 2030 Pedestrian Level of Service

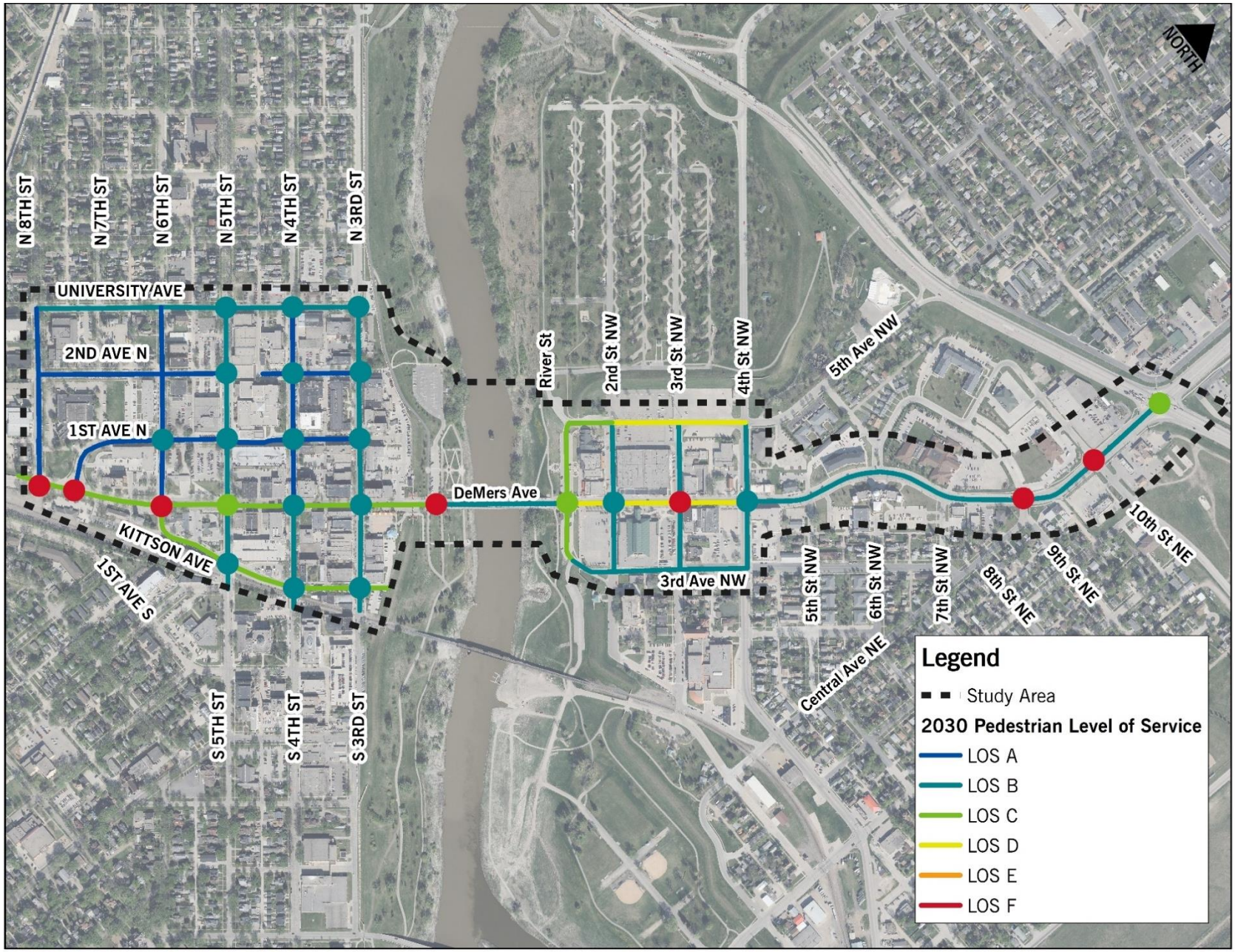


Figure 60: 2045 Pedestrian Level of Service

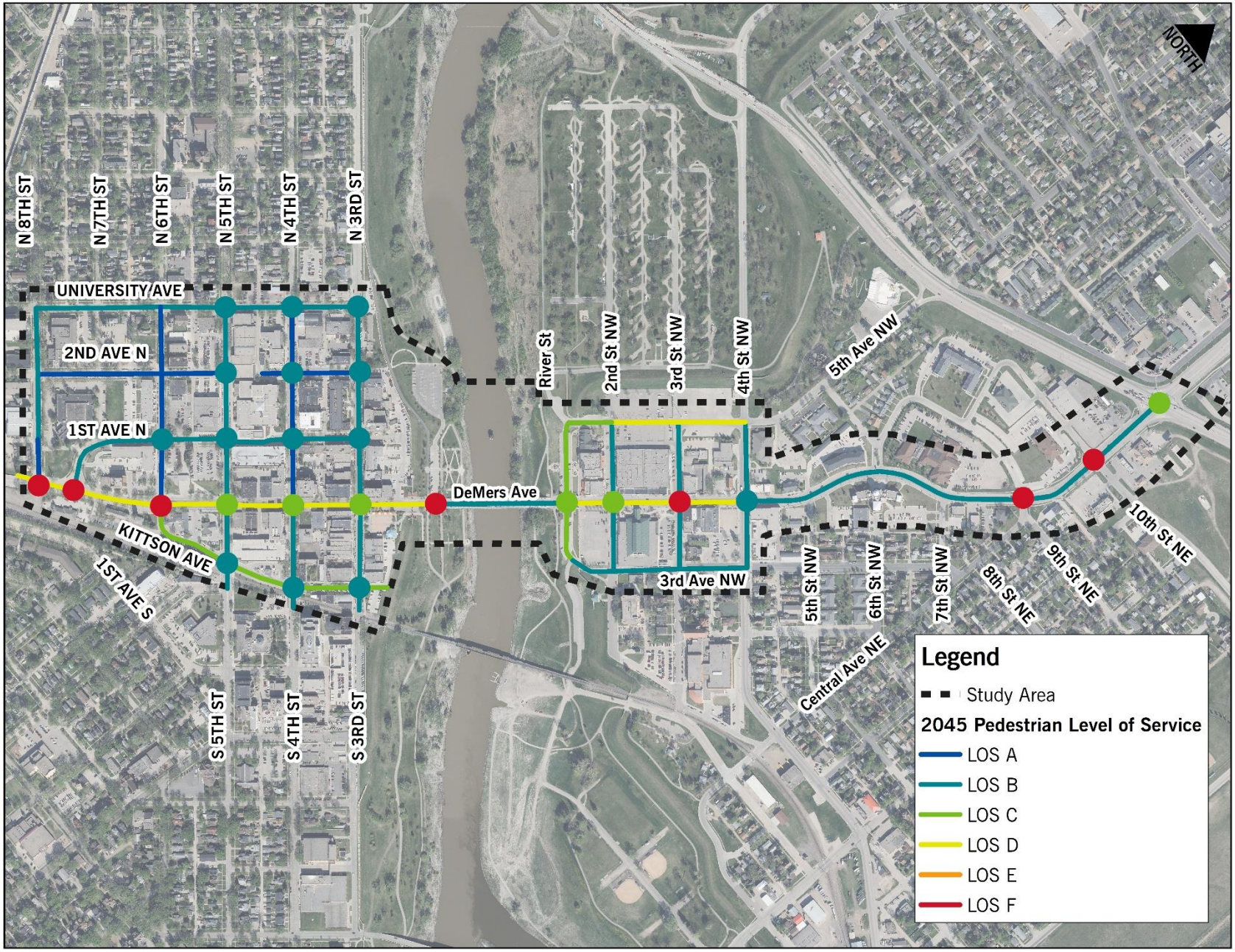


Figure 61: 2030 Bicycle Level of Service

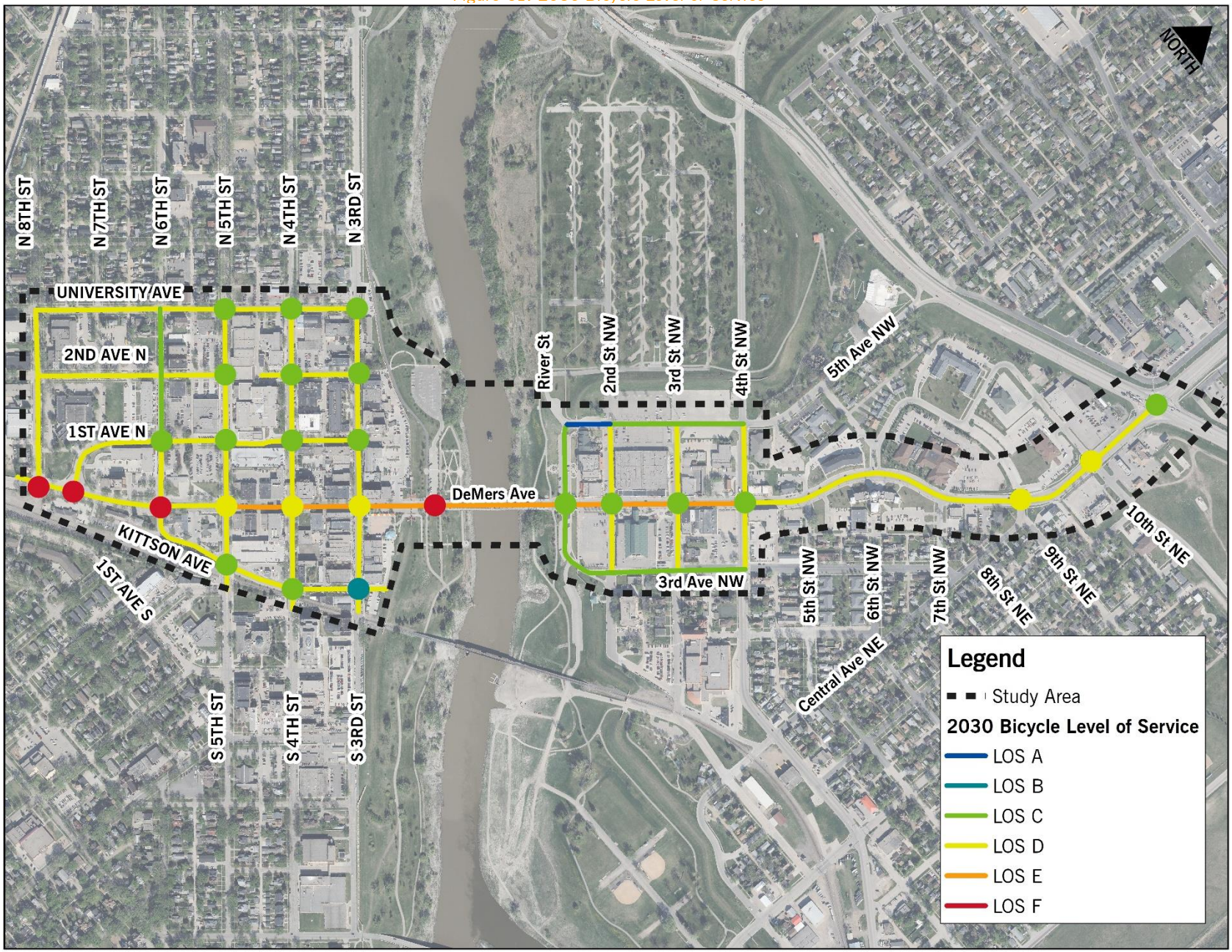
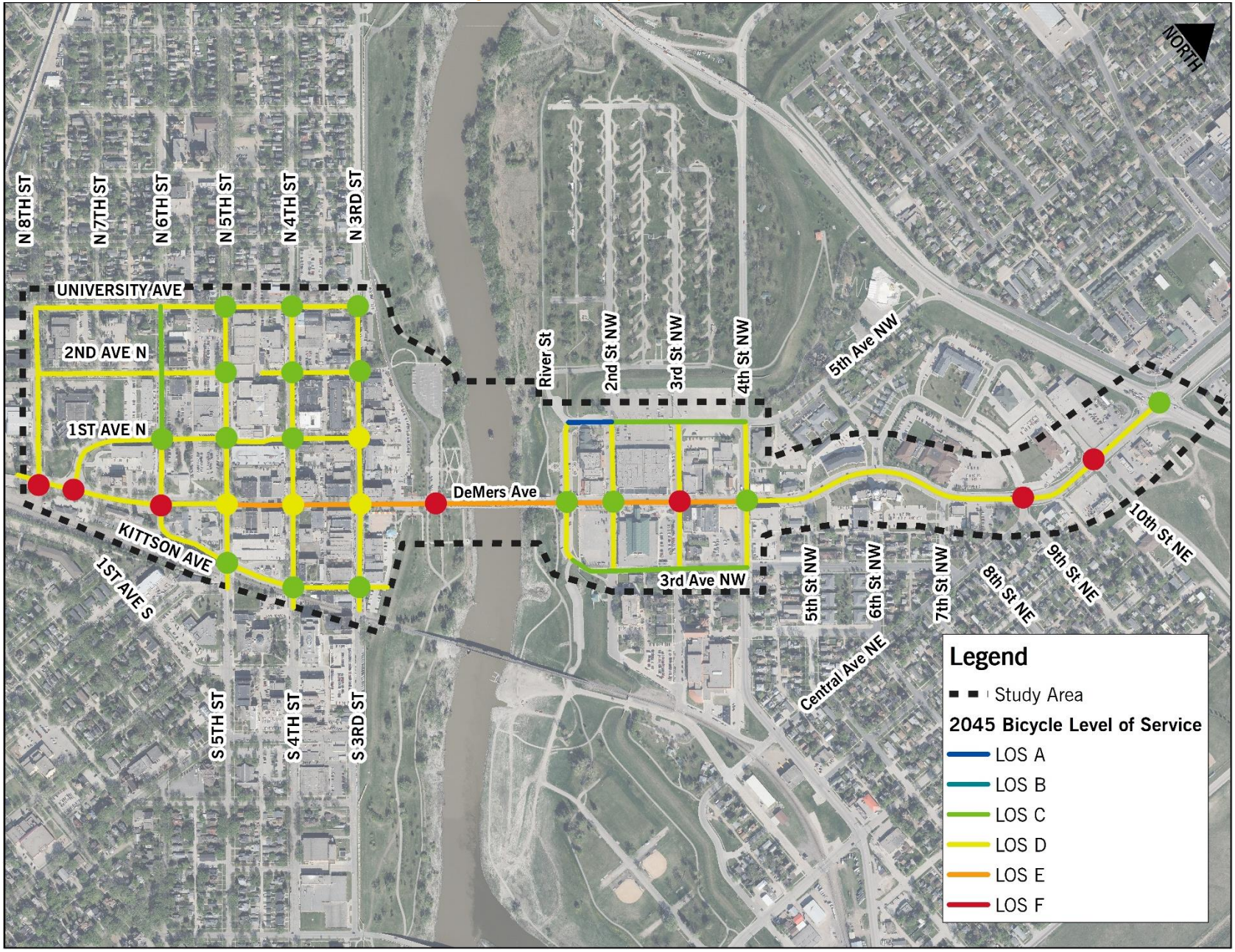


Figure 62: 2045 Bicycle Level of Service



Transit Environment

Transit quality of service is generally determined by service hours, frequency, and the directness of transit routes. For this analysis service frequency was selected and applied to the roadway network; at intersections vehicular level of service was used. It is important to note that while transit users will typically walk up to one-quarter mile to access transit, this level of service analysis was only applied to the roadway and did not consider the walkshed. Given most trips ending in either downtown are less than one-mile, the walkshed likely captures a significant number of trips that could be made with transit.

2030 Transit Level of Service

Transit level of service as currently applied is acceptable on the corridors it serves directly. Transit level of service is shown in Figure 63.

2045 Transit Level of Service

Transit level of service as currently applied is acceptable on the corridors it serves directly. Transit level of service is shown in Figure 64.

Summary

Ultimately, the ability to transfer and regular 30-minute service provides good transit service through the two downtowns. Opportunities to provide circulator service through the two downtowns would further improve transit service, especially for visitors.

As on-street parking utilization and traffic demands increase, transit reliability and on-time service will become more challenging. Pedestrian improvements, like bulb outs, may impact transit vehicle turning movements so should be considered in alternatives analysis.

Multimodal Level of Service

Vehicular, pedestrian, bicycle, and transit level of service was calculated independently throughout the Downtown Grand Forks and East Grand Forks study area. The unweighted multimodal level of service combines each of the four modal levels of service into a single level of service, which is shown by link and intersection.

2030 Multimodal Level of Service

Increasing traffic volumes on DeMers Avenue continue to create compounded delays, reliability concerns, and driver frustration that begins to impact side street operations and overall downtown mobility. For pedestrians, the facilities are adequate but intersections become more challenging due to higher traffic demands and fewer gaps. For bicycles, increased traffic volumes will make biking on the roadways more challenging, especially to less confident cyclists. Poor connectivity between the two downtowns and throughout the downtowns becomes a greater burden. Very few changes to transit level of service.

2030 multimodal level of service is shown in Figure 65.

2045 Multimodal Level of Service

Traffic volumes continue to increase on DeMers Avenue, which further exacerbate the vehicular issues through 2045. Pedestrian and bicyclist movements, especially crossing traffic becomes extremely challenging and results in delays. Very few changes to transit level of service.

2045 multimodal level of service is shown in Figure 66.

Figure 63: 2030 Transit Level of Service

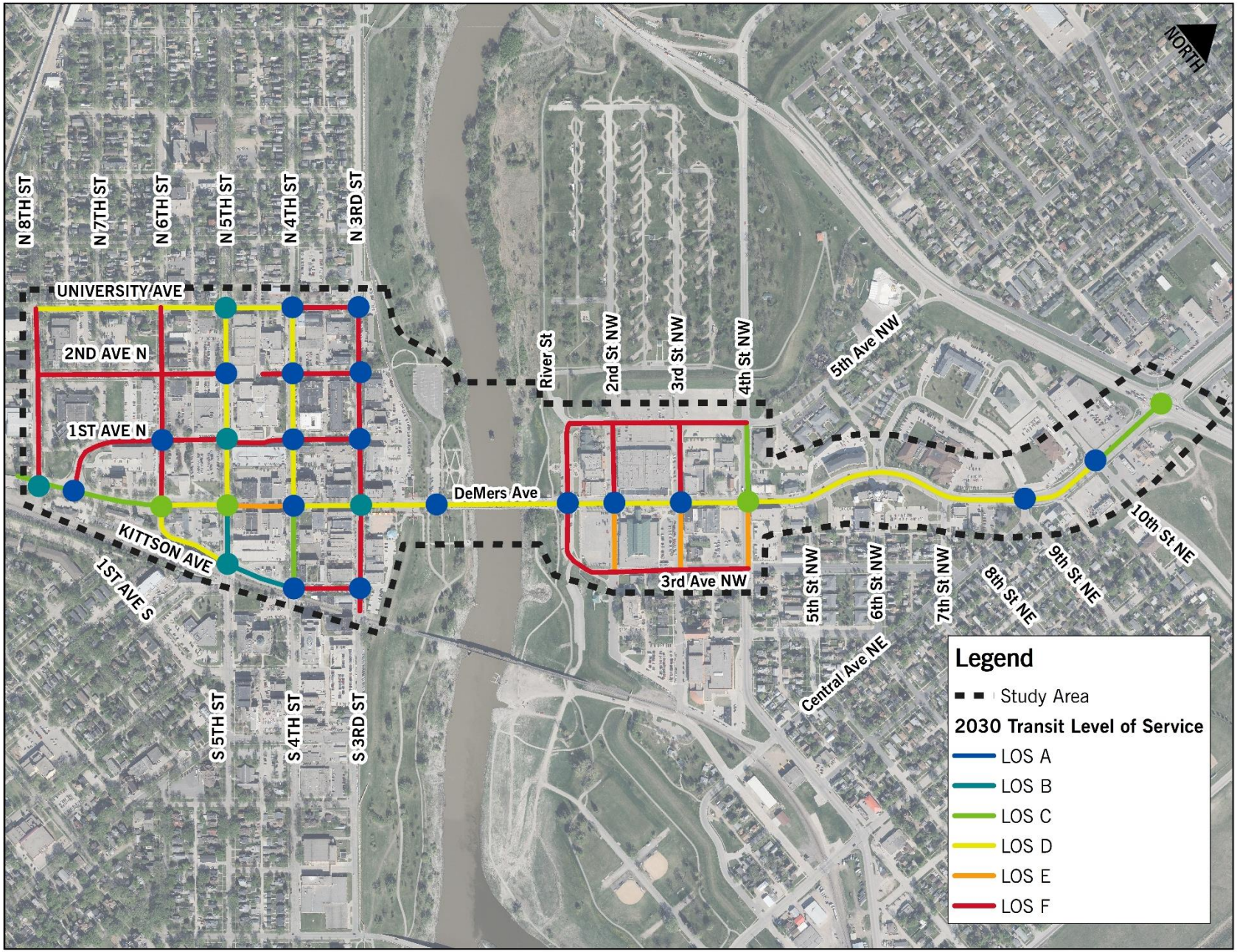


Figure 64: 2045 Transit Level of Service

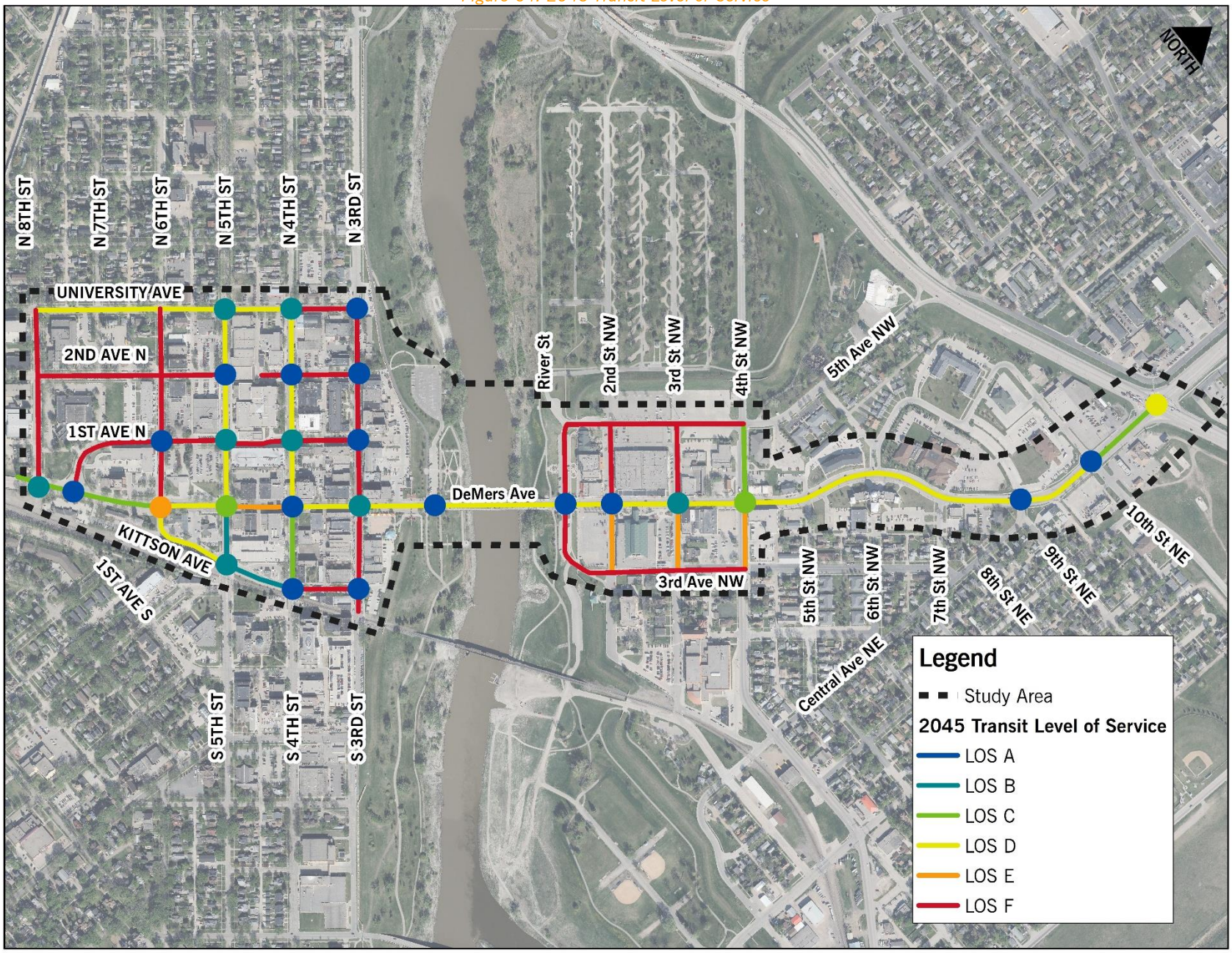


Figure 65: 2030 Multimodal Level of Service

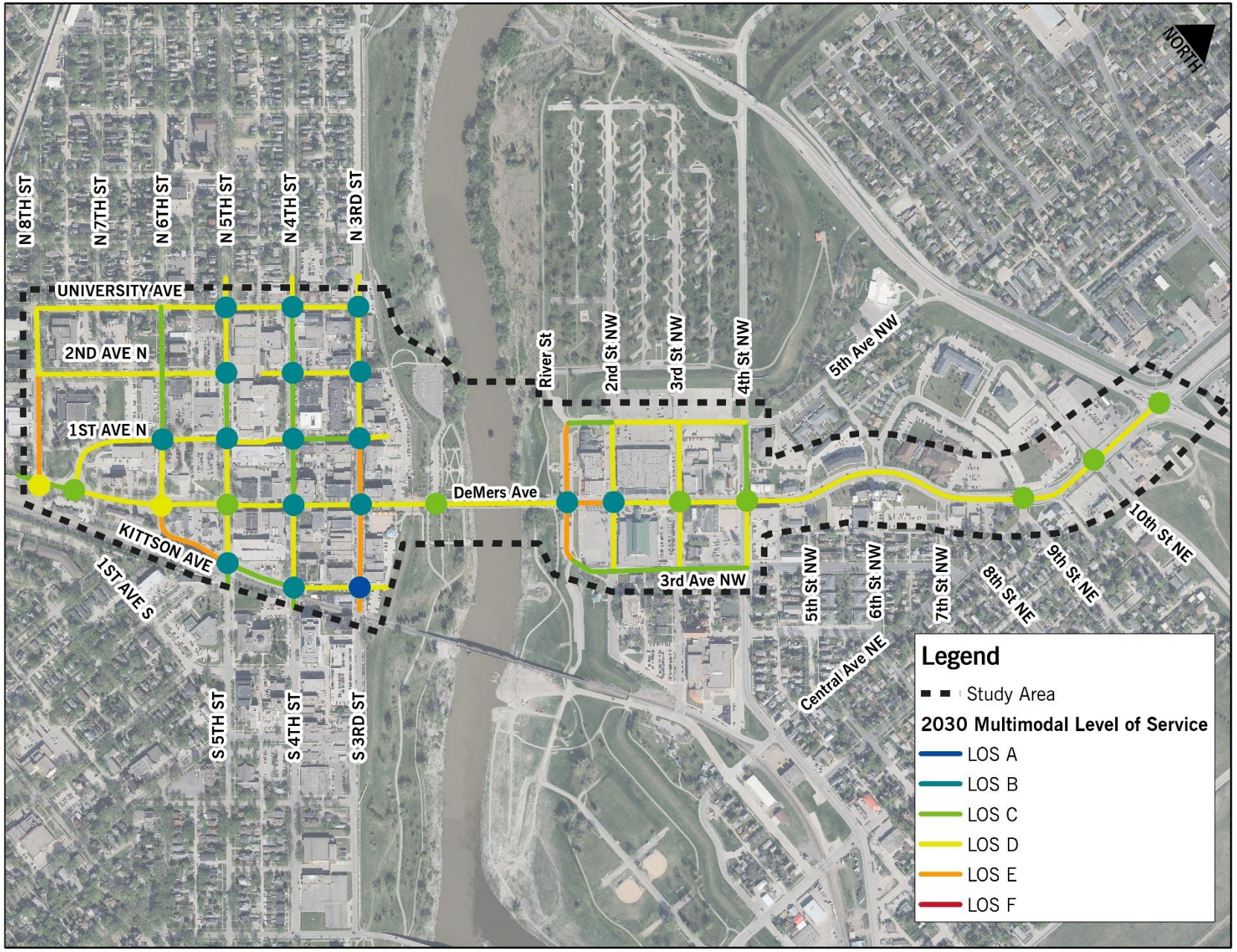
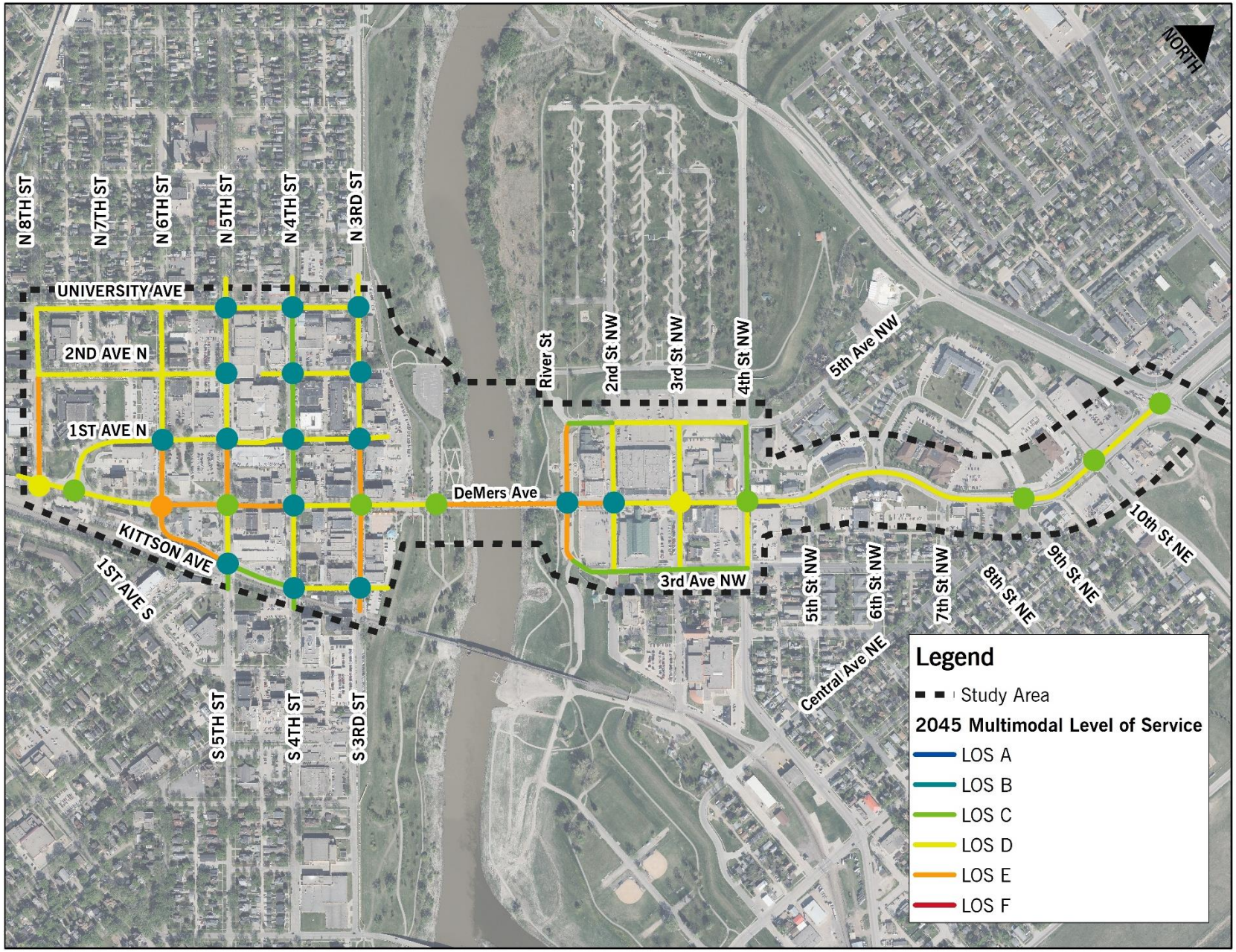


Figure 66: 2045 Multimodal Level of Service



PARKING ENVIRONMENT

Parking in downtown Grand Forks and East Grand Forks is a mix of public on- and off-street and private parking. The right balance must be struck between not providing enough parking, which deters individuals for visiting establishments, and providing too much parking, which has negative environmental impacts through increased impervious surface, financial impacts by using space for parking instead of taxable developments, and perception.

Future Parking Conditions in Grand Forks

The Downtown Grand Forks Parking Study evaluated three future parking demand scenarios:10-year redevelopment scenario; redevelopment plus increased walking, bicycling, and transit; and redevelopment plus autonomous vehicle adoption.

Summary of Scenario Impacts

In the next 10 years, redevelopment and travel trends will undoubtedly change how people travel to and through Downtown Grand Forks, with different impacts to the parking environment.

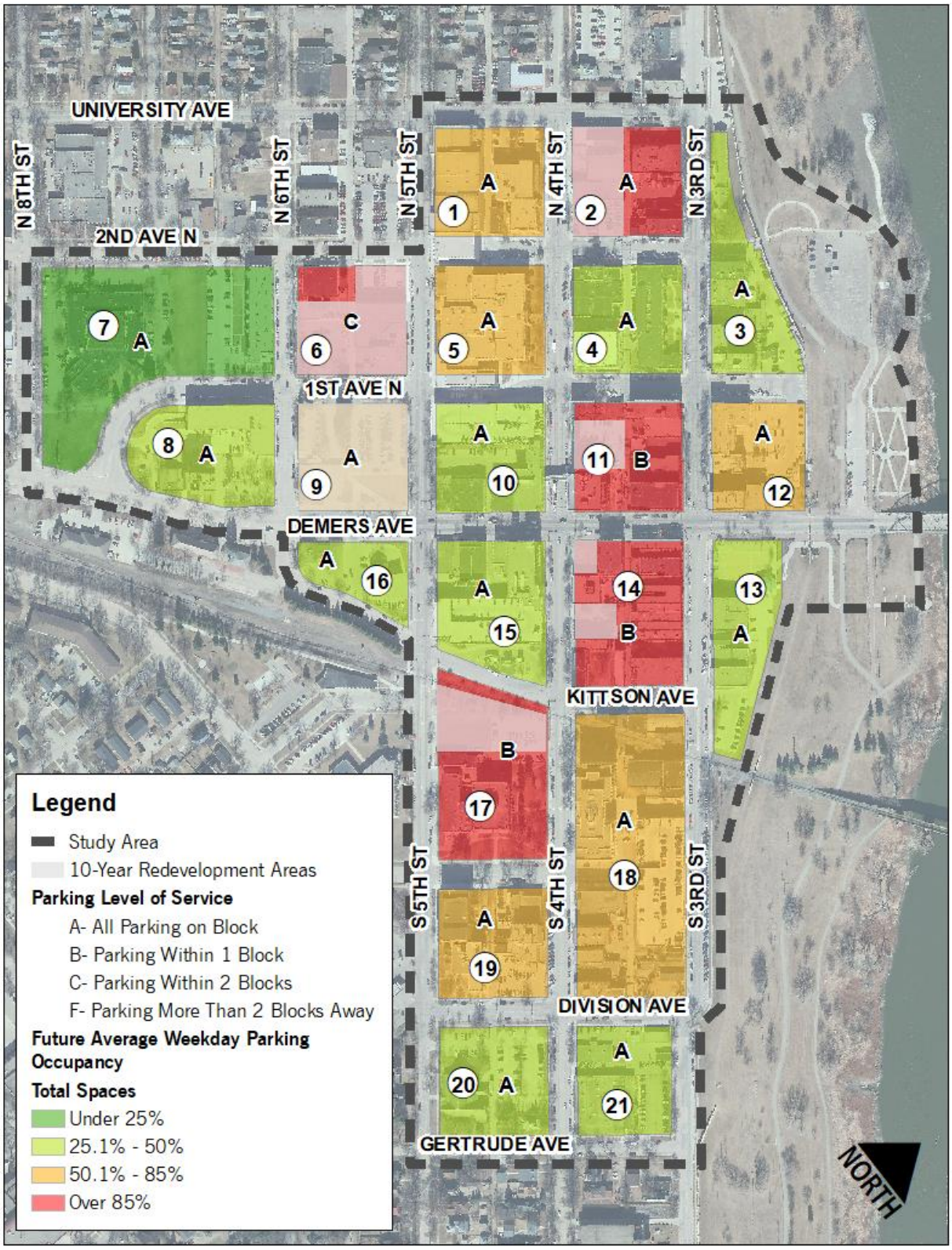
- Redevelopment will increase parking demand in downtown up to 925 parking spaces. This increased demand creates localized parking level of service deficiencies, but most blocks can accommodate necessary parking within one or two blocks of their destination. Public on- and off-street approach capacity, but when private parking is considered, there are nearly 1,300 parking spaces available on a typical weekday.
- Expected reductions in parking demand of 2.5 percent associated with increased walking, bicycling, and transit does not significantly change expected parking level of service. Block 6 public parking remains deficient, but overall, there are around 440 available public parking spaces and 1,340 total parking spaces downtown in a typical weekday.
- Expected reductions in parking demand of 10 percent associated with autonomous vehicle trips further opens up available parking in downtown. Public on- and off-street parking is only 74 percent utilized during a typical weekday, with overall parking just 58 percent utilized during a typical weekday.

Ultimately, the existing parking supply, with effective management, will likely be able to accommodate all new parking demand.

Future Parking Conditions in East Grand Forks

The 2011 Parking Study completed for East Grand Forks did not incorporate a future demand analysis. The study did calculate the maximum parking demand given existing land use and found there would still be 130 available parking spaces in the downtown area (760 of 890 available spaces).

Figure 67: 10-Year Average Weekday Occupancy and Parking Level of Service for All Spaces Under the 10-Year Redevelopment Scenario



WHAT WE HEARD: ISSUES AND OPPORTUNITIES

The first public input meeting for the Downtown Grand Forks – East Grand Forks Transportation Study was held at Riverwalk Centre on March 12th, 2020 from 4:30 PM to 7:00 PM. This open-house style meeting included interactive boards for multiple topics, including the Value Profile to balance modal needs throughout downtown, DeMers Avenue safety and delays, bicycles, pedestrians, transit, and other issues. The activities were also posted online through a survey and an issues map.

The public input opportunity was marketed through a variety of means, including a press release in the Grand Forks Herald and social media posts through the Downtown Development Association, which serves businesses in both Grand Forks and East Grand Forks. The public was incentivized to participate with free popcorn from River Cinema, which attracted multiple movie-goers to provide feedback. In total, 25 people attended the meeting with three more providing feedback online.

In addition to the general public, this feedback summary includes input from the project's Steering Committee. This committee is made up of representatives from the City of Grand Forks (staff and elected officials), City of East Grand Forks (staff and elected officials), the Downtown Development Association, Economic Development Corporation, the Grand Forks – East Grand Forks Metropolitan Planning Organization, Minnesota Department of Transportation, North Dakota Department of Transportation, Federal Highway Administration, Options: Interstate Resource Center for Independent Living, two business owners, and a member of the public representing bicycle and pedestrian users.

SUMMARY OF FEEDBACK

Below is a summary of the feedback received through the Steering Committee, the public open house, and the online feedback opportunities.

VALUE PROFILE

This study's value profile asked the public and the Steering Committee to place a priority on vehicles, pedestrians, bicycles, transit, parking, and costs for five different areas of downtown including DeMers Avenue in Grand Forks, north of DeMers Avenue in Grand Forks, south of DeMers Avenue in Grand Forks, DeMers Avenue in East Grand Forks, and off DeMers Avenue in East Grand Forks. These value profiles guide the development of alternatives, so that they better reflect the community's priorities. This exercise lets the participants detail their preferred balance of the various modes balanced with costs.

Both the steering committee and public prioritized cars and pedestrians highest in each area. Generally, the public prioritized pedestrians highest, whereas the Steering Committee deviated by area. Specifically, the Steering Committee mostly agreed that DeMers Avenue's top priority was the movement of vehicles over all other modes, whereas the other segments showed a more equal balance. The public actually increased the pedestrian weight on DeMers Avenue versus the other areas. Eleven members of the Steering Committee and eight members of the public completed value profiles. The value profiles are shown in Figure 68 and Figure 69.

PEDESTRIANS

The public and Steering Committee were asked to provide feedback on locations where walking was uncomfortable or challenging for a variety of reasons, including high speeds, difficult crossing, missing amenities, and uncomfortable to walk. Generally, the feedback centered on the following locations:

- 3rd Street north and south of DeMers Avenue received a total of 37 comments, 23 of which noted difficult crossings.
- DeMers Avenue west of 5th Street received a total of 16 comments. The wide cross-section, high speeds, and lack of traffic control make crossing here challenging.
- DeMers Avenue in East Grand Forks east of 4th Street NW received a total of eight comments, noting the difficult crossings and high speeds.
- The former bridge pier across the Red River received seven comments.

The feedback is summarized in Figure 70 and Table 4. There were a few comments made that were not location specific (University Drive, around Central High School, etc. These comments were not included in the map.

Figure 68: Public's Value Profile

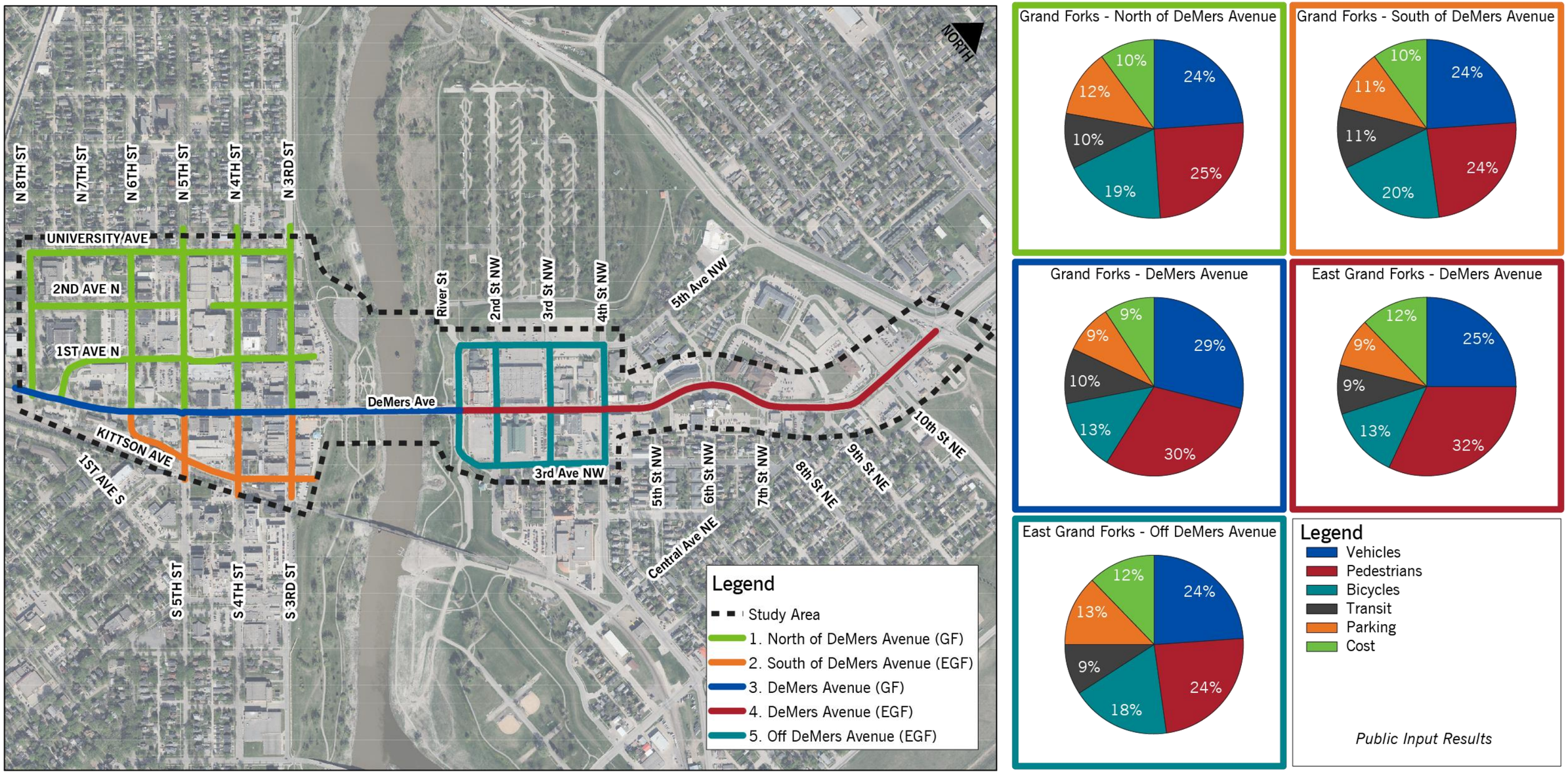
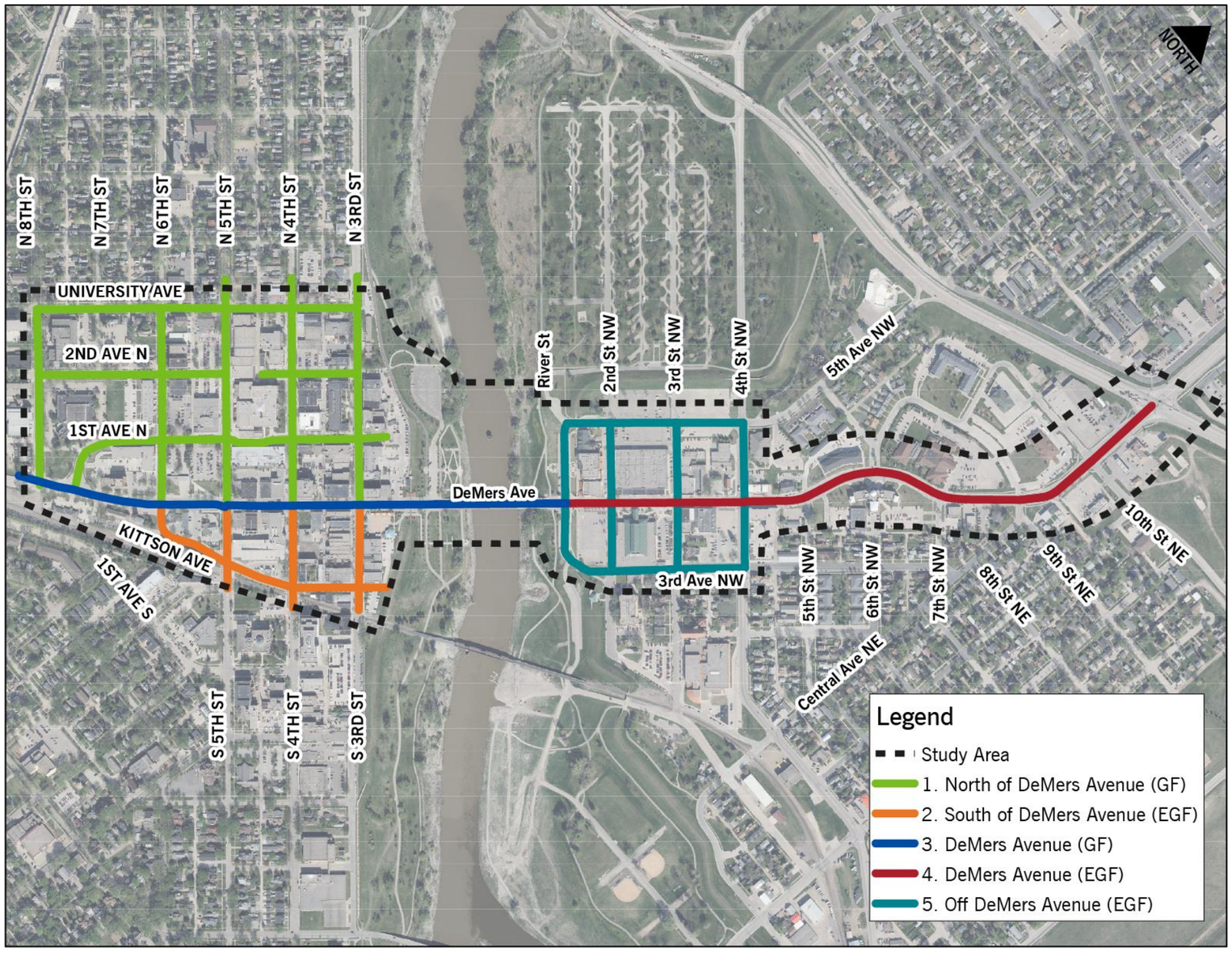


Figure 69: Steering Committee's Value Profile



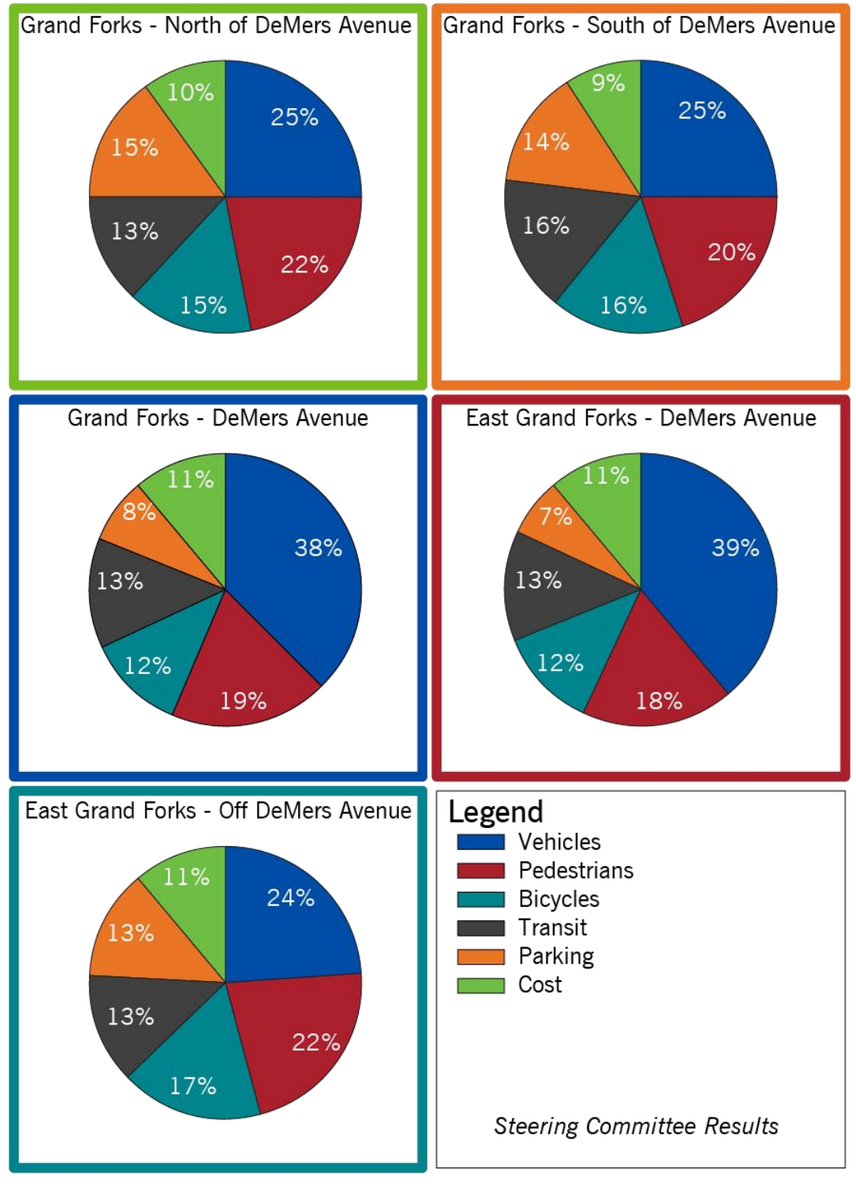


Figure 70: Public and Steering Committee Pedestrian Comments

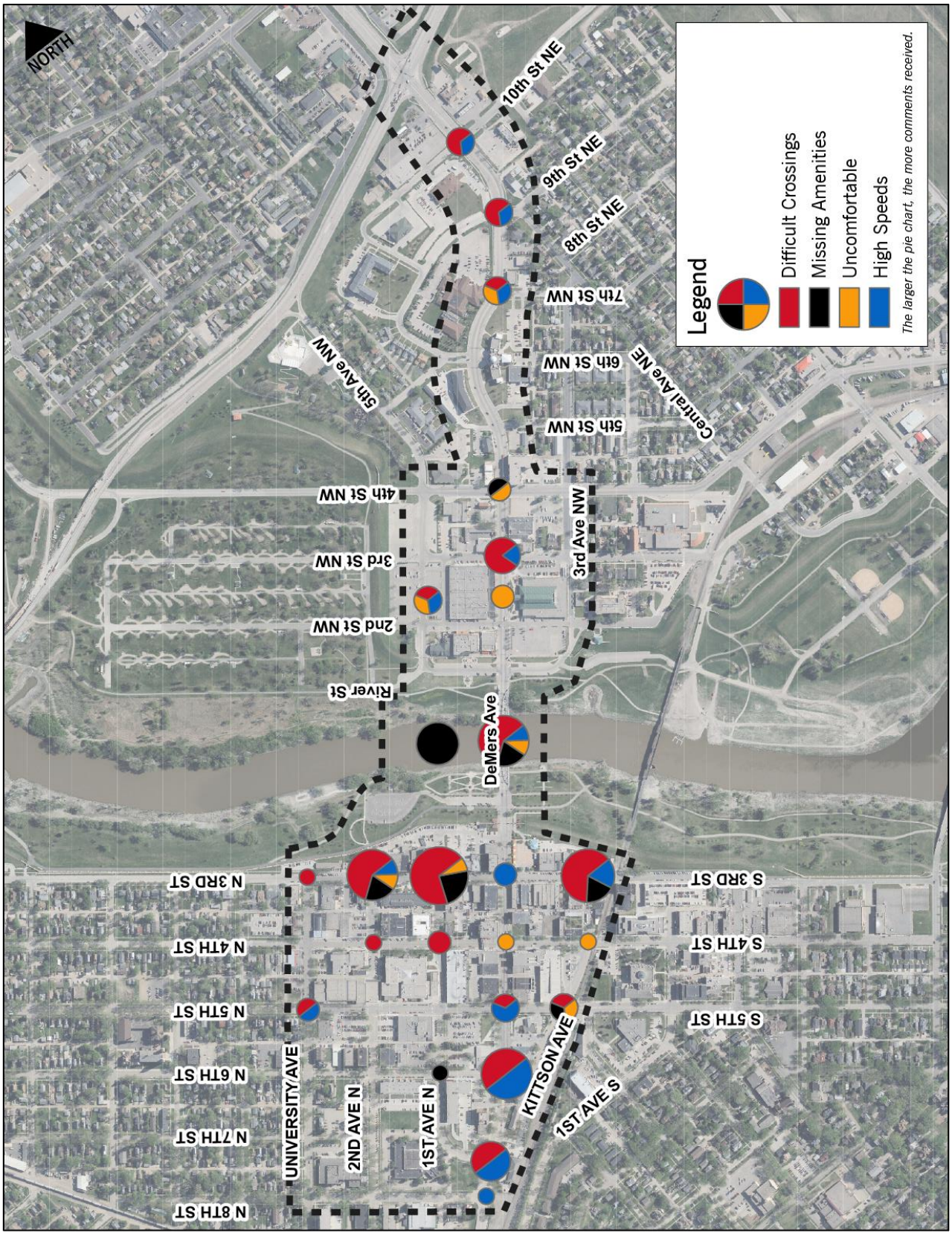


Table 4: Summary of Pedestrian Comments

Location	Difficult Crossings			Missing Amenities			Uncomfortable			High Speed			Total
	SC	Public	Total	SC	Public	Total	SC	Public	Total	SC	Public	Total	
1sts Avenue and 3rd Street	5	4	9		3	3		1	1				13
Kittson Avenue and 3rd Street	5	2	7	2		2				1	1	2	11
2nd Avenue and 3rd Street	3	3	6		2	2		1	1	1		1	10
DeMers Avenue and 6th Street	5		5							3	2	5	10
Sorlie Bridge	5	1	6	1	2	2		1	1	2		1	10
Bridge Pier					7	7							7
DeMers Avenue and 1st Avenue	3		3	1						2	1	3	6
DeMers Avenue and 3rd Street NW	3	1	4							1		1	5
DeMers Avenue and 10th Street NW	1	1	2								1	1	3
DeMers Avenue and 5th Street	1		1							1	1	2	3
DeMers Avenue and 7th Street NW		1	1					1	1		1	1	3
DeMers Avenue and 9th Street NW	2		2							1		1	3
Kittson Avenue and 5th Street		1	1		1	1		1	1				3
River Walk Centre Parking	1		1					1	1		1	1	3
1st Avenue and 4th Street	1	1	2										2
DeMers Avenue and 3rd Street											2	2	2
DeMers Avenue Midblock Crossing								2	2				2
University Avenue and 5th Street	1		1							1		1	2
1st Avenue and 6th Street					1	1							1
2nd Avenue and 4th Street		1	1										1
DeMers Avenue and 4th Street								1	1				1
DeMers Avenue and 8th Street				1						1		1	1
Kittson Avenue and 4th Street								1	1				1
University Avenue and 3rd Street		1	1										1
DeMers Avenue and 4th Street NW				1		1	1		1				2

BICYCLES

The public and Steering Committee were asked to provide feedback for three bicycle items:

- What connections should be prioritized? Northwest-Southwest Grand Forks, connectivity between the two downtowns, connections to the Red River Greenway, connections to East Grand Forks, or something else.
- What's the best route to connect north and south downtown Grand Forks? 3rd Street, 4th Street, or 5th Street.
- What type of bicycle facilities would you use? In-roadway (no facilities), shared lanes, bike lanes, buffered bike lanes, two-way cycle track, one-way raised cycle track, shared-use path.

The results are summarized below.

PRIORITY CONNECTIONS

The public was asked to identify the bicycle connection(s) they would most like to see. The public overwhelmingly preferred an improve connection between the two downtowns. At the public input meeting, most people identified the previous river crossing as an opportunity for this connection. Figure 72 shows the public's bicycle connections preference.

The Steering Committee was asked to prioritize the four different bicycle connections. Figure 71 shows the Steering Committee's priority. The highest total number a bicycle connection could receive was four. The Steering Committee prioritized the connection between the two downtowns, followed by an improved connection to the rest of Grand Forks.

Figure 71: Steering Committee Priority for Bicycle Connections

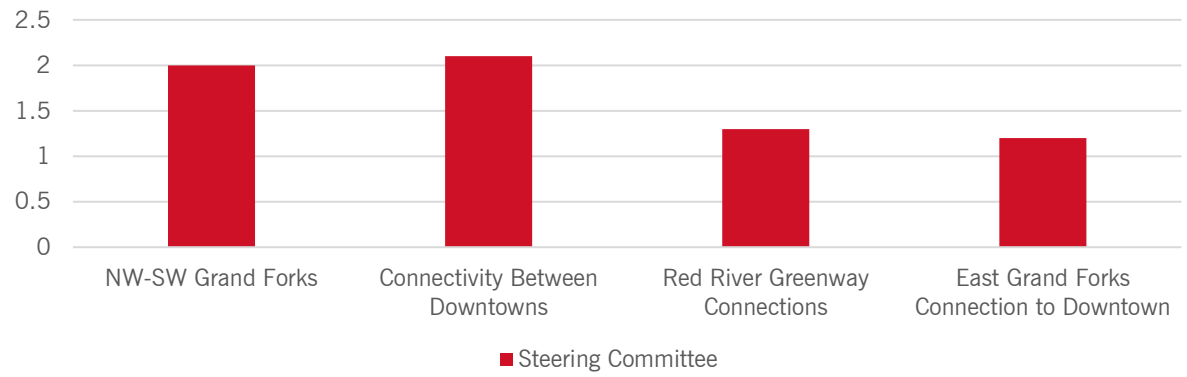
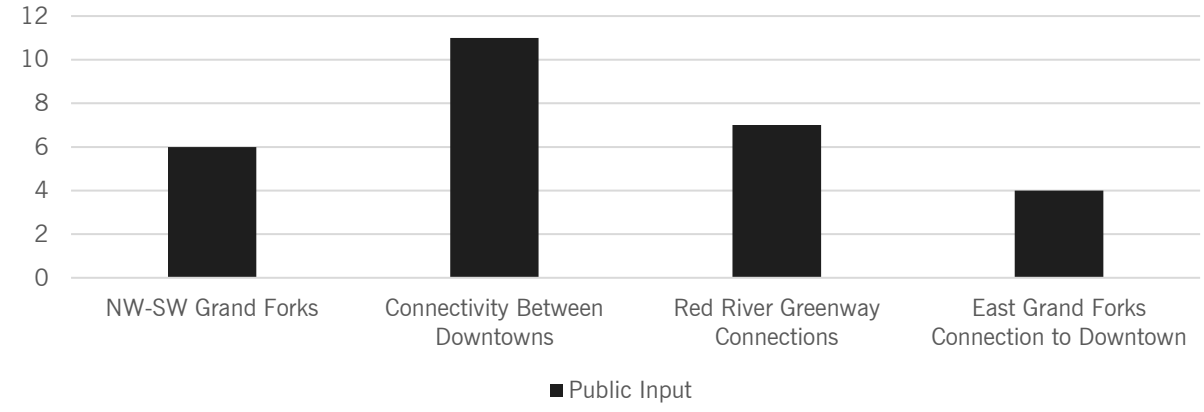


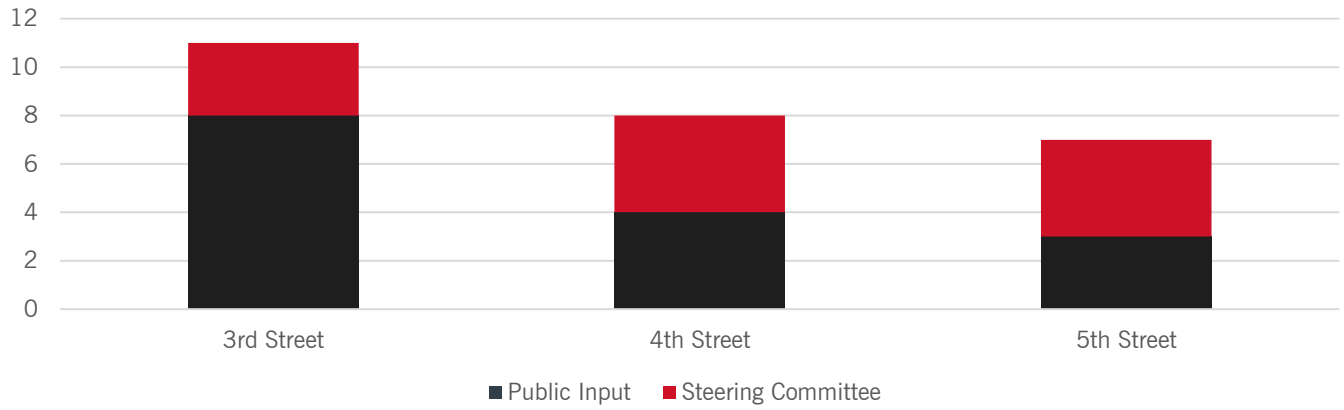
Figure 72: Public Preference for Bicycle Connections



Downtown Grand Forks Routing

The public and Steering Committee were asked to select a preferred north-south connection through Downtown Grand Forks. The public preferred a 3rd Street connection while the Steering Committee was nearly evenly split between the three corridors, as shown in Figure 73.

Figure 73: Public and Steering Committee Preference for Downtown Grand Forks Bicycle Routing

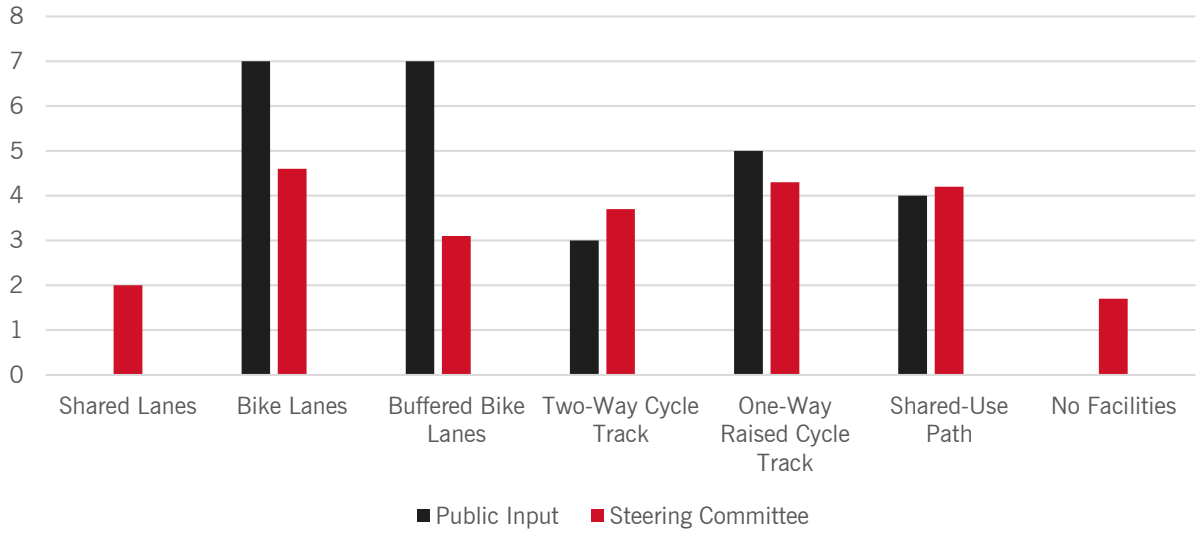


Preferred Bicycle Facilities

The public was asked to identify the types of bicycle facilities they would prefer to ride on ranging from no facilities and sharrows to buffered bike lanes, cycle tracks, and shared-use paths. No one from the public selected shared lanes. Bike lanes and buffered bike lanes received the highest number of votes, followed by a one-way raised cycle track.

The Steering Committee was asked to prioritize the types of facilities on which they would prefer to ride. Figure 74 shows the Steering Committee preference for the different bicycle facility types. The highest total number a facility could receive was seven. The Steering Committee preferred bike lanes, one-way raised cycle track, and shared-use paths. Ultimately, the public and Steering Committee prefers bicycle facilities with buffers or higher protection from vehicle traffic.

Figure 74: Public and Steering Committee Preference for Bicycle Facility Types



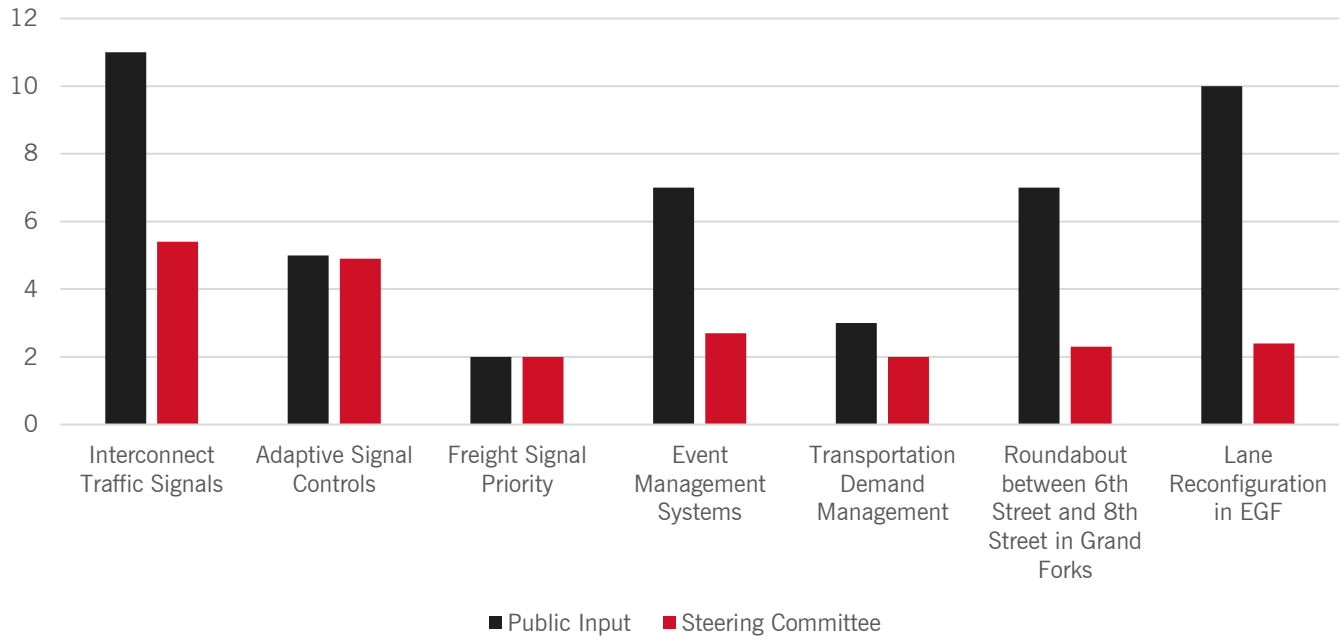
DeMers Avenue

DeMers Avenue was recently reconstructed, but existing and future conditions analysis identified a variety of operational and crash issues along DeMers Avenue in both Grand Forks and East Grand Forks. The public and Steering Committee were asked to provide feedback on potential solutions that would minimize construction impacts including: interconnected traffic signals, adaptive signal controls, freight signal priority, event management systems, transportation demand management, roundabout west of 5th Street in Grand Forks, and lane reconfiguration in East Grand Forks.

The public was asked which solutions they think should be considered along DeMers Avenue. Interconnect traffic signals, event management, a roundabout around 6th Street in Grand Forks, and lane reconfiguration in East Grand Forks were the most popular solutions.

The Steering Committee was asked to prioritize the solutions along DeMers Avenue. Interconnect traffic signals and adaptive signal controls were the most preferred solutions.

Figure 75: Public and Steering Committee Preference for DeMers Avenue Traffic Management Solutions



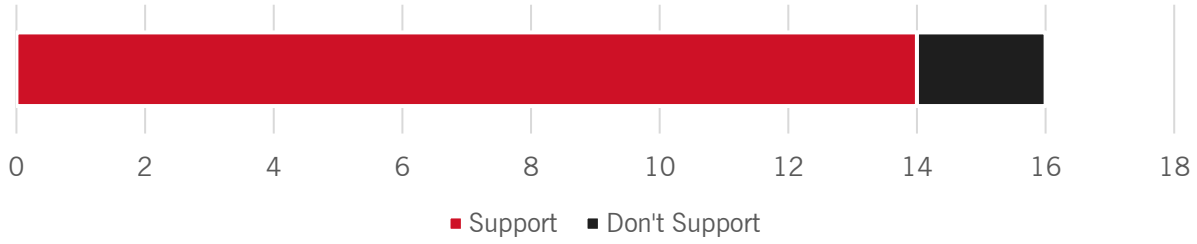
Crash Issues

Two locations were found to have critical crash rates, indicating something at the site may be contributing to higher instances of crashes: 3rd Street and 6th Street.

3rd Street

At 3rd Street, there were 35 total crashes. Of these crashes, 37 percent of crashes directly involved park cars and most others appear to either directly or indirectly related to a motorist trying to park. One solution that was presented to the public and Steering Committee was back-in angle parking, which provides better sight lines for vehicles and bicycles when leaving and the ability to load the vehicle on the curb instead of in the roadway. Both the public and Steering Committee were highly supportive of considering this alternative, as shown in Figure 76. No other alternatives were suggested by the public or Steering Committee.

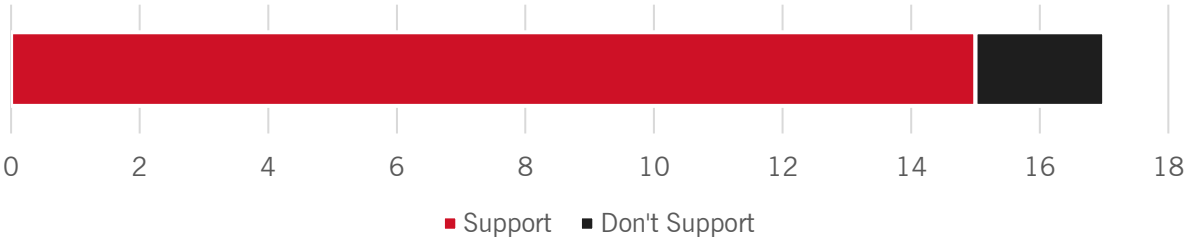
Figure 76: Back-In Angle Parking Public and Steering Committee Support



6th Street

More than half the crashes at the intersections of 1st Avenue and 2nd Avenue with 6th Street were angle crashes, including one fatality at 6th Street and 2nd Avenue. One solution that was presented to the public and Steering Committee was curb bulb-outs, which provides better sight-lines to improve stopping compliance, reduce pedestrian crossing exposure, and slow traffic speeds. Both the public and Steering Committee were highly supportive of considering this alternative, as shown in Figure 77. One member of the Steering Committee suggested mini roundabouts may be an appropriate alternative to consider.

Figure 77: Curb Bulb-Outs Public and Steering Committee Support



Transit

The public and Steering Committee were asked to provide feedback on transit issues including areas that would benefit from increased service, improved stop amenities, or difficult transit movements. The public provided no feedback on transit. The Steering Committee identified the need for service along 3rd Street and improved stop amenities throughout both downtowns.

Trains

While trains were not explicitly included, conversations with the public and Steering Committee indicated train activity south of DeMers Avenue and train noise in East Grand Forks are a concern.

CONCEPT DEVELOPMENT AND ANALYSIS

The Alternatives Analysis Report considered all the findings compiled through the Existing Conditions Report, Future Conditions Report, Steering Committee feedback, and public input to develop a series of potential improvements. Alternatives presented in this report are not necessarily an either-or decision but were developed to complement each other. They can be applied individually or together. No cumulative technical scoring was compiled; however, each section includes a summary of the impacts to each travel mode and a planning level cost estimate.

It is unlikely that all improvements identified in this report will be desired by the community and decision-makers, and even less like that all can be funded. Through later phases of the process, review, refinement and prioritization of concepts will be conducted with the steering committee, public, and decision makers. Implementation strategies will be discussed within the next chapter of the report.

CONCEPT DEVELOPMENT

Concepts were developed with the following approach:

- Concepts were categorized based on the technical needs identified in the Existing Conditions Report and Future Conditions Report. This included traffic operations on DeMers Avenue, high crash locations on 3rd Street and 6th Street, pedestrian needs throughout the study area, bicycle needs throughout the study area, and other mobility options.
- While the technical needs identified a majority of the issues, feedback from the Steering Committee and the public helped prioritize the previously identified issues and identify new concerns. The value profile results and feedback from the public input helped guide concepts for consideration.

SCORING APPROACH

Each concept was assigned two scores:

- Impact to travel mode (vehicles, pedestrians, bicycles and transit). Most concepts will have some impact on the other travel modes, these impacts were not considered in the scoring but will be noted in the summary. Each concept was assigned a

  - (-) if the concept reduced operations and safety for a travel mode.
  - (=) if the concept had no discernible impact for a travel mode.
  - (+) if the concept made some improvements to operations and/or safety.
  - (++) if the concept significantly improved operations and safety.

- Planning level cost estimate. While detailed engineering cost estimates were not budgeted for this study, planning level cost estimates were determined using local knowledge, engineering judgment, and case studies with typical contingencies (30 percent) to account for design and construction engineering. Costs were assigned a range of one ($) to four ($$$$) dollar signs, where

  - One ($) represents no measurable cost change but may include staff time to implement.
  - Two ($$) represents a cost less than $1 million. This may include low cost concepts or concepts that can be incorporated into currently programmed projects. An example may include a curb bulb-out in a reconstruction project.
  - Three ($$$) represents a cost between $1 and $5 million.
  - Four ($$$$) represents a cost greater than $5 million.

VEHICLE CONCEPTS

DeMers Avenue

The DeMers Avenue corridor must balance regional mobility needs with the multimodal safety and operational needs through the two downtowns. Through the technical analysis and Steering Committee and public engagement efforts, multiple operational and safety issues were identified along DeMers Avenue:

- Operationally:
  - While no one signalized intersection operates deficiently, compounded signal delays from closely spaced signalized intersections create long travel times and exacerbate the perceived delays.
  - At unsignalized intersections, finding a gap in traffic on DeMers Avenue is challenging and results in long delays.
  - There is no signal coordination between Grand Forks and East Grand Forks, resulting in additional delay.
  - Heavy truck traffic during spring and fall related to agricultural activities creates seasonal reliability issues.
- Safety:
  - 37 percent of all crashes that occur in both downtowns occur on DeMers Avenue.
  - 64 percent of all injury crashes that occur in both downtowns occur on DeMers Avenue.
  - 71 percent of crashes on DeMers Avenue are rear-end crashes on DeMers Avenue approaches.
  - The DeMers Avenue and 5th Street intersection in Grand Forks and the DeMers Avenue and 4th Street NW intersection in East Grand Forks have above average crash rates. The 4th Street NW intersection was also identified in the MnDOT District 2 Freight Plan as a high truck crash location.

By 2045, vehicles driving on or crossing DeMers Avenue will increase 45 percent, further compounding the operational and safety deficiencies. To address these issues, the no build traffic operations was compared against seven different improvement concepts, including interconnected traffic signals, adaptive signal controls, freight signal priority, event management systems, transportation demand management, and roundabout between 6th Street and 8th Street in Grand Forks. These concepts will be described in more detail below.

The concepts were modeled using Vissim microsimulation software for the DeMers Avenue segment between 8th Street in Grand Forks and 4th Street NW in East Grand Forks. The microsimulation software simulates the movement of every vehicle through an intersection and roadway network and then collects information for associated performance measures like delay, queue lengths, travel times, and density. Analysis of the seven concepts evaluated

- 12-hour average delays per vehicle network wide
- Minor approach latent demand (number of vehicles unable to enter the network due to queueing and delay)
- Eastbound and westbound travel times between 8th Street N and 4th Street NW
- Eastbound and westbound travel time reliability
- Areas of deficient intersection LOS
- Planning level costs

DeMers Avenue Vehicle Concepts

No Build

Under the no build, no changes were made to signal technology or operations nor to any infrastructure. By 2045, there are areas of deficient vehicle operations begin to emerge, especially on the minor approaches of DeMers Avenue intersections. Delays at Kittson Avenue/6th Street begin to affect overall intersections, which is expected to operate at LOS "F". Queues at the DeMers Avenue and 5th Street intersection in Grand Forks often extend through the 6th Street/Kittson Avenue intersection. Queues between 3rd Street in Grand Forks and 2nd Street in East Grand Forks extend onto the Sorlie Bridge, blocking Riverboat Road (GF) and River Street (EGF).

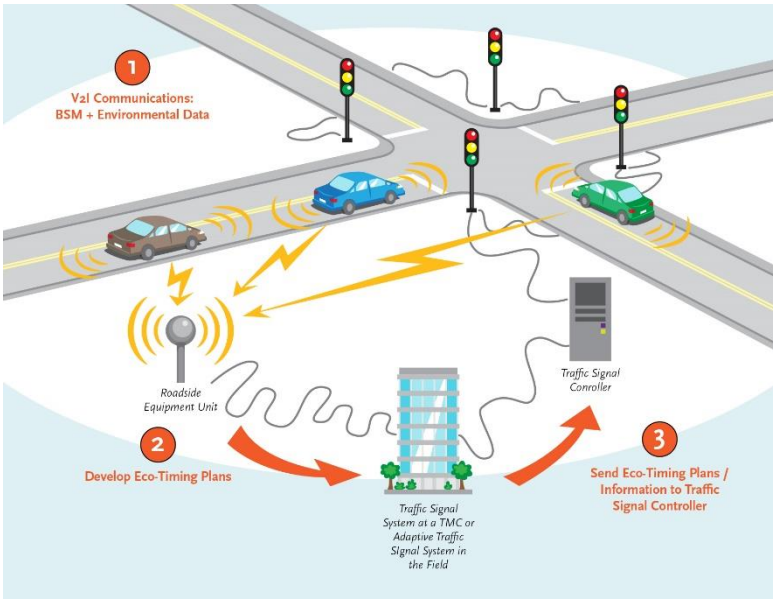
Interconnected Traffic Signals

Interconnected traffic signals allow for communication between signals in Grand Forks and East Grand Forks to better facilitate coordinated traffic flow along DeMers Avenue. The upcoming signal project in East Grand Forks will include these features so no additional technical or cost analysis was completed. The three signals in Grand Forks are already interconnected. More information on implementation can be found later in this report.

Adaptive Signal Control

Adaptive signal control is a traffic management strategy in which traffic signal timing changes based on real-time traffic demand for both short-term special events (i.e. emergency vehicles, transit) and longer-term special events (i.e. downtown events, crashes/closures). To model this, the adaptive signal controllers expanded the cycle lengths, removed maximum timing locks as part of the coordinated signal, and created a system that would time out phases if there was no traffic, while still striving to stay in coordination with mainline movements. Six scenarios were run to show the functionality of an adaptive signal control (ASC) system versus the existing coordinated timings under different volumes and events.

Figure 78: Adaptive Signal Control Process



1) ASC with 2045 volumes.
2) ASC with 2045 seasonal variations associated with beet harvest, which increases truck traffic to around six percent (compared to two percent on a typical day).
3) ASC with 2045 volumes with a simulated crash event at the DeMers Avenue and 3rd Street intersection (Grand Forks). The simulated crash event reduced traffic to five miles per hour at the intersection for two minutes directly following the crash event at 3:00 PM and then reduced traffic speed between 10 and 15 miles per hour for 20 minutes to clear the crash from the intersection.
4) ASC with 2045 volumes with a simulated Central High School event. The event assumed 150 vehicles arriving between 3:00 PM and 4:00 PM and 150 vehicles departing between 6:00 PM and 7:00 PM. These vehicles were added as regional trips originating on DeMers Avenue, with two-thirds

coming and going from the west and one-third coming and going from the east. Vehicles were routed on 4th Street and 5th Street based on their assigned origin and destination.

5) ASC with 2045 volumes and a winter storm event. The winter storm event assumed a 20 percent decrease in traffic, reduced speeds from 30 miles per hour to 20 miles hour and increased all-red time to simulate increased acceleration and deceleration time.
6) ASC with 2045 volumes and a flood event. The flood event assumed the Point Bridge was closed which routes traffic to the Sorlie Bridge and DeMers Avenue using 3rd Street in Grand Forks and 4th Street NW in East Grand Forks.

Summary of ASC Scenarios

Results of the ASC system evaluation shows significant benefits to the DeMers Avenue corridor, as shown in Table 5. The ASC system reduces network delay up to 50 percent by allowing coordinated DeMers Avenue phases to time out or extend based on platoon sizes which vary throughout the day. This helps to minimize minor approach delay and queuing that affects adjacent intersections, especially at 6th Street and 1st Avenue. While this improves overall network operations, it does impact eastbound and westbound travel time reliability because coordinated green signal indications were occasionally broken in favor of high delay side streets.

The ASC system shows its true benefits when considering latent demand and latent delay. Latent demand is the number of vehicles that are waiting to enter the transportation network, typically eastbound DeMers Avenue traffic and on side streets, and latent delay is the total time those vehicles have waited to enter the network. Under a typical 2045 day, the ASC system can process 95 percent more of the latent demand than the existing no build system, saving 778 hours of additional delay. Under the worst scenario, the flood event, the ASC can process 63 percent more of the latent demand than the existing no build system, saving 1,878 hours of additional delay.

A limitation of this analysis is the ASC was compared against a base optimized time-of-day timing plan. While timing plans were adjusted to reflect updated signal timing plans for each Do Nothing scenario, there was not extensive timing plan calibration and analysis. The City does employ special scenario plans for blizzards, flooding scenarios, and beet harvest but these are predominantly plans based on best guesses of travel patterns under these scenarios and would not perfectly reflect and adjust to traffic patterns in the field like ASC. In other words, while the benefits of an adaptive system can be mitigated by up-to-date and diverse signal timing plans given the constant variation through downtown, this scenario would require near constant monitoring and updating of several dozen timing plans to match the performance of an adaptive system. For example, if a new development like the grocery store at 5th Street and DeMers is built, the City may need to adjust several dozen timing plans to reflect this condition.

Cost of Implementation

The cost of implementing adaptive signal control will vary for each City. The City of Grand Forks already has an Advanced Traffic Management System (ATMS) so the costs for their signals will be significantly less than East Grand Forks side where an ATMS must be purchased. The ASC would require an upfront cost of setup at each intersection plus a yearly service fee. The cost for the Grand Forks side would be approximately $28,000 up front and $3,000 annually while the cost for the East Grand Forks side would be $152,000 up front and $2,000 annually. The most cost effective scenario would be that a maintenance agreement be made between the two Cities/State DOTs that allowed the two East Grand Forks downtown signals to be uploaded to Grand Forks ATMS for the purposes of the implementing ASC which would adjust the overall costs from $180,000 to $28,000 for the two cities plus $5,000 annually. These costs assume that there is adequate communications established, and the appropriate traffic signal controllers are installed at the intersections. In addition, these costs could change depending on implementation at other signals across the two cities. The ASC system would require an operational and cost-sharing agreement between the different jurisdictions.

Table 5: No Build vs Adaptive Signal Control Scenario Results

Scenario	Average Network Delay per Vehicle (s)	Latent Demand (veh)	Latent Delay	EB Travel Time (s)	EB LOTTR	WB Travel Time (s)	WB LOTTR	Deficient LOS Locations
2045 No Build	96.6	900	803	152	1.07	151	1.05	4th St NW, 5th St, and 6th St
2045 ASC	65.2 (-31.4)	39 (-861)	24 (-778)	160 (+8)	1.42	162 (+11)	1.58	6th St
2045 No Build – Seasonal Variation	223.2	4,442	4,047	311	1.31	172	1.31	4th St NW, 5th St, and 6th St
2045 ASC – Seasonal Variation	90.8 (-132.4)	101 (-4,341)	56 (-3,991)	192 (-119)	1.35	169 (-3)	1.72	6th St
2045 No Build – Crash Event	97.7	899	802	155	1.19	151	1.06	4th St NW, 5th St, and 6th St
2045 ASC – Crash Event	71.8 (-25.9)	59 (-840)	30 (-772)	170 (+15)	2.01	164 (+13)	1.61	6th St
2045 No Build – School Event	96.3	904	803	152	1.09	151	1.05	4th St NW, 5th St, and 6th St
2045 ASC – School Event	64.6 (-31.7)	33 (-871)	21 (-782)	161 (+9)	1.60	162 (+11)	1.32	6th St
2045 No Build – Winter Storm Event	86.6	202	172	175	1.40	159	1.08	4th St NW and 5th St N
2045 ASC – Winter Storm Event	58.5 (-28.1)	9 (-193)	7 (-165)	183 (+8)	1.48	161 (+2)	1.07	6th St
2045 No Build – Flood Event	202.8	2,993	2,702	304	1.91	158	1.09	4th St NW, 5th St, 6th St, and 8th St
2045 ASC – Flood Event	325.6 (+122.8)	1,115 (-1,878)	805 (-1,898)	250 (-54)	4.23	279 (+121)	6.74	PM Corridor Failure

Freight Signal Priority

Freight signal priority gives additional green time to allow truck traffic to make it through an intersection without stopping. This concept reduces friction and noise caused by trucks frequently starting and stopping. The freight signal priority concept was modeled using 2045 volumes during a beet harvest event and compared to the Beet Harvest timing plans currently used by the City of Grand Forks, which includes the option to either extend or reduce phase lengths by 15 to 20 seconds to prioritize the east to west movement of truck traffic. Freight signal priority would have a minor impact, likely just a few seconds, to side street traffic and pedestrian traffic as these phases are adjusted.

Ultimately, freight signal priority has a negative impact to the DeMers Avenue corridor. With the high truck activity during beet harvest, signal phasing was impacted almost every cycle which interrupted the coordination and minor approach timings. The coordination of DeMers Avenue was interrupted resulting in increased average network delay and travel times as well as a significant negative impact to travel time reliability. The freight signal priority results are shown in Table 6.

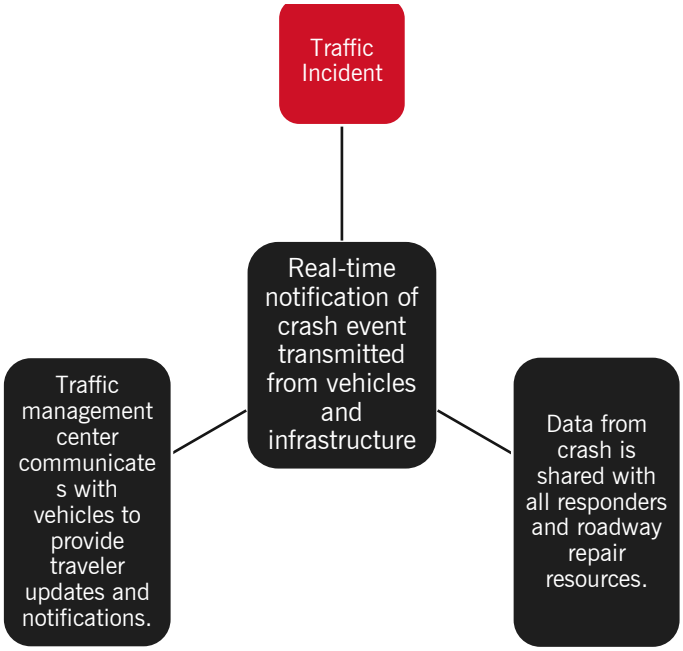
Table 6: No Build vs Freight Signal Priority Results

Scenario	Average Network Delay per Vehicle (s)	Latent Demand (veh)	Latent Delay	EB Travel Time (s)	EB LOTTR	WB Travel Time (s)	WB LOTTR	Deficient LOS Locations
2045 No Build – Beet Harvest	223.2	4,442	4,047	311	1.31	172	1.31	4th St NW, 5th St, and 6th St
Freight Signal Priority –Beet Harvest	313.7 (+90.5)	3,965 (-477)	3,536 (-511)	420 (+109)	3.05	242 (+70)	2.78	PM Corridor Failure

Event Management Systems

Event management systems are a systematic approach to operating the transportation network during high demand times and may include roadway closures, crash information, wayfinding and driver information, turning restrictions, parking information, etc. To replicate the impact an event management system could have on DeMers Avenue operations, a simulated crash event was modeled using similar parameters to the ASC scenario. However, the implementation of an event management system would result in the crash being cleared 50 percent faster, impacting the 3rd Street intersection for just 10 minutes. Because the impact to the network was modeled with reduced speed areas, total vehicle hours traveled (VHT) was used instead of average network delay per vehicle as the traffic operations criteria.

Figure 79: Event Management System Process



An event management system provides no notable improvements on the DeMers Avenue corridor under a crash event. While it reduces the network vehicle hours traveled, it leaves latent demand and eastbound and westbound travel times unchanged. The ASC system provides significantly more benefits under a crash event, as shown in Table 7. The combination of ASC along with Event Management has the potential to provide the most benefits to DeMers Avenue. There are many event management systems used across the country that have special timing scenarios to account for event management response. These systems can be very complex on urban arterial systems given the wide variety of crash types that can occur. Similar systems are generally specific to freeway systems where lane capacity is greater and alternative routing options are available.

Table 7: No Build vs Event Management Systems Results

Scenario	Network VHT 3PM – 4PM (hrs)	Latent Demand (veh)	EB Travel Time (s)	EB LOTTR	WB Travel Time (s)	WB LOTTR	Deficient LOS Locations
2045 No Build – Crash Event	207	899	155	1.19	151	1.06	4th St NW, 5th St, and 6th St
2045 ASC – Crash Event	156 (-51)	59 (-840)	170 (+15)	2.01	164 (+13)	1.61	6th St
2045 Event Management System	202 (-5)	900 (+1)	154 (-1)	1.16	151 (-0)	1.06	4th St NW, 5th St, and 6th St

Cost of Implementation

The cost of an event management system is highly dependent on how it is implemented, this includes the number and type of dynamic message installed, as well as where they are installed and the communication infrastructure in those areas. Costs are approximately $200,000 for each DMS sign, and a minimum of two DMS boards would be needed, one on each end of DeMers Avenue to provide enough opportunity to make a different route selection. The event management system would require an operational and cost-sharing agreement between the different jurisdictions.

Transportation Demand Management

Transportation demand management is the application of strategies and policies to reduce transportation demand or redistribute it to different routes or times. It may include supporting mode shift (more walking, biking, and transit trips), changing work schedules, etc.). Analysis completed earlier in this study found that 87 percent of downtown trips are one mile or less and more than seven percent of people who live in the downtown area walk, bike, or take transit to work. Research compiled by the Federal Highway Administration has found that effective transportation demand management, even in areas with low transit availability, can reduce peak traffic demand by five to 30 percent. Making meaningful changes to mode change can help save space to provide other amenities, as shown in Figure 80. To demonstrate the impact an effective transportation demand management system would have on the DeMers Avenue corridor and the downtown transportation network, the 2045 No Build models were analyzed with a five percent and 10 percent reduction in traffic.

Figure 80: Space to Move 40 People by Different Modes

Transportation demand management generally showed modest benefits under both the five percent and ten percent scenarios, as shown in Table 8. Average network delay per vehicle declined five to 14 percent with latent demand reduced 31 to 60 percent. There were no meaningful reductions in travel time and it did not mitigate deficient intersection operations. While travel demand management on its own will likely not address the issues on DeMers Avenue, it will be an important tool to use as traffic demand increases with new development and redevelopment in the two downtowns.

Table 8: No Build vs Transportation Demand Management Scenario Results

Alternative	Average Network Delay per Vehicle (s)	Latent Demand (veh)	EB Travel Time (s)	EB LOTTR	WB Travel Time (s)	WB LOTTR	Deficient LOS Locations
2045 No Build	96.6	900	152	1.07	151	1.05	4th St NW, 5th St, and 6th St
2045 No Build – 5% Reduction	91.9 (-4.7)	615 (-285)	152 (-0)	1.11	150 (-1)	1.06	4th St NW, 5th St, and 6th St
2045 No Build – 10% Reduction	83.5 (-13.1)	365 (-535)	150 (-1)	1.09	150 (-1)	1.05	4th St NW, 5th St, and 6th St

Transportation Demand Management Strategies

Transportation demand management strategies can be very effective, even in small communities and communities with limited transit. It requires creativity and local knowledge to create an effective plan. National research has found the two strongest factors in effective management strategies are financial incentives and parking management.

Creating localized plans can work for even the most car-oriented communities. The *Traveler Response to Transportation System Changes Handbook, Third Edition* provides estimates of the vehicle trip reduction percentages for areas of low transit availability.

- Aggressive parking pricing can reduce vehicle trips by 47 percent.
- Transit subsidies can reduce vehicle trips by 20 percent.
- Carpool and vanpool subsidies can reduce vehicle trips 10 to 30 percent.
- Bike/walk subsidies can reduce vehicle trips by 30 percent.
- Work from home trends that may continue beyond COVID-19. Work from home in the Grand Forks – East Grand Forks metro has increased from 3.4 percent in 2010 to 4.3 percent in 2018.

As recent events surrounding COVID-19 continue, work from home trends may be dramatically changed. Preliminary studies have shown nearly three-quarters of companies are intending to make remote work for some employees a permanent one. For those considering a permanent remote work environment option, 23 percent said at least 20 percent of their workforce would remain permanently at home. But it is not just companies that are considering this. Employees have repeatedly reported they prefer to work from home, at least part of the time, with one study finding 98 percent of respondents would like to continue working from home at least part of the time, for the rest of their career.

While the above strategies can have major impacts, they need to be done in coordination with private sector participants to encourage their employees, homeowners/renters, and clients/customers to participate and build support for the efforts. Other strategies outside of financial incentives have impacts that are less quantified but remain impactful to traffic management and travel demand management.

- Improving bicycle facilities, pedestrian facilities, and transit facilities are moderately effective in improving mobility and congestion relief but are highly effective at improving livability.
- Parking information is highly effective in improving mobility by providing direct routes to available parking and reducing circulation searching for parking.
- Integrating mixed-use land use development is highly effective in improving mobility but does little for reducing congestion.
- Delivery restrictions or consolidation outside of peak travel times can also be highly effective at reducing congestion, especially in places like downtown where trucks either block parking or a travel lane during their deliveries.

Many of these strategies were also identified in the recently completed Downtown Grand Forks Parking Study.

Cost of Implementation

The cost of implementation will vary based on the plan that is implemented. Infrastructure costs would relate to adding pedestrian and bike facilities and transit service, these costs are addressed in those sections of the report. Other costs that may be included are incentive programs for businesses, which would be determined by the cities and likely involve cost sharing by private sector participants.

Roundabout Between 6th Street and 8th Street in Grand Forks

The Downtown Action Plan identified the DeMers Avenue and 1st Avenue/8th Street location for a roundabout to calm traffic, control traffic speeds coming from the northeast on the DeMers Avenue Overhead Bridge, improve accessibility to adjacent businesses and roadways, and provide an aesthetic enhancement for the gateway to Downtown Grand Forks. Figure 82 shows a conceptual hybrid 2x1 roundabout, with two lanes for eastbound and westbound traffic and one lane for northbound and southbound traffic. Full design was not included as part of this study.

The roundabout concept modeled had no notable impacts to traffic operations. Eastbound and westbound travel time reliability increased very slightly, but still are acceptable. The business access to the south would need to be evaluated to determine the appropriate access configuration. While overall travel times are minimally impacted, trucks are expected to traverse the roundabout much more slowly than other vehicles. There are no existing safety issues at this location, but slowing speeds entering downtown could address downstream crash trends.

Figure 81: Aesthetic Roundabout from Idaho Falls, ID

Figure 82: Multi-Lane Roundabout Concepts at 1st Avenue and 8th Street

The roundabout would work to slow speeds as travelers enter downtown which would be a major benefit to downtown and its multimodal activity. Speeding was noted as a concern during the public input process and the west approach of DeMers Avenue and 5th Street experiences a disproportionate number of crashes that can be directly or indirectly attributed to high speeds. The challenge, however, is that the downward slope from the bridge may make slowing even more challenging if the stop is shifted further west. In other words, this improvement is likely to show benefits within downtown, but may only shift the problem to upstream locations on DeMers Avenue.

The roundabout would also include splitter islands, so would improve pedestrian crossing safety by allowing to cross one direction of traffic at a time. Both the traffic calming and splitter islands would improve overall safety at this intersection. Research completed by MnDOT found hybrid roundabouts reduce serious injury crashes 78 percent. One aspect of a roundabout serving as the gateway to downtown that is not perfectly quantified with a transportation study is aesthetics. A roundabout can offer a location for greenery, signs, statues or other items that can inform drivers they are entering a special part of town. Creating a gateway to downtown has been identified through numerous previous planning efforts.

Table 9: No Build vs 2x1 Roundabout Scenario Results

Alternative	Average Network Delay per Vehicle (s)	Latent Demand (veh)	EB Travel Time (s)	EB LOTTR	WB Travel Time (s)	WB LOTTR	Deficient LOS Locations
2045 – No Build	96.6	900	152	1.07	151	1.05	4th St NW, 5th St, and 6th St
2045 – 2x1RAB	96.6 (0)	898 (-2)	162 (+10)	1.09	160 (+9)	1.06	4th St NW, 5th St, and 6th St

Cost of Implementation

Costs will vary greatly depending on the final design and the required ROW that must be obtained, as well as utilities that may need to be moved. Based on previous projects, with the addition of contingencies, design, and construction costs are estimated to be around $2,000,000 for the 2x1 roundabout.

Summary of DeMers Avenue Vehicle Concepts

The DeMers Avenue concepts evaluated provide a wide range of results for DeMers Avenue traffic operations as shown in Table 10. ASC was able to provide benefits to DeMers Avenue under nearly every scenario evaluated. Event management and transportation demand management provided some benefits, but their long-term effectiveness is questionable. The 2x1 hybrid roundabout did provide modest benefits to operations, but the design, safety, and cost issues may outweigh the potential improvements.

Table 10: Summary of DeMers Avenue Concepts

Concept	Impact to Vehicle Mode	Cost of Implementation	Summary
No Build	(=)	$	While the current system generally works to move traffic, by 2045 there will be increasingly poor operations that will worsen existing crash trends. Compounded delay from the signals will exacerbate driver frustration and seasonal traffic variability results in unacceptable travel time reliability.
Interconnect Traffic Signals	(+)	$$	There are clear benefits to reducing compounded signal delay and potentially lessening the rear end crash trends interconnecting the traffic signals between Grand Forks and East Grand Forks.
Adaptive Signal Control	(++)	$$	ASC showed significant benefits to DeMers Avenue under a range of regularly occurring scenarios. ASC would reduce the staff time to create multiple time-of-day signal timing plans while improving operations.
Freight Signal Priority	(-)	$$	Freight signal priority during high truck traffic times decreases the operational effectiveness of DeMers Avenue.
Event Management	(=)	$$	Event management shows very few benefits to the DeMers Avenue corridor.
Transportation Demand Management	(+)	$ - $$	Reducing demand on DeMers Avenue will be an important strategy to mitigating future operational and safety issues. However, the effectiveness of this practice varies widely.
Roundabout Between 1st Avenue and 8th Street*	(+)	$$$	A 2x1 hybrid roundabout would provide acceptable operations and would likely reduce speeds but create access and bicycle/pedestrian crossing challenges. Hybrid roundabouts have conflicting crash reduction factors, but conclusively do reduce crash severity. The cost would be significant for the modest benefits.

*Concepts provide benefits to alternative modes of travel and will be discussed in later sections of the report.

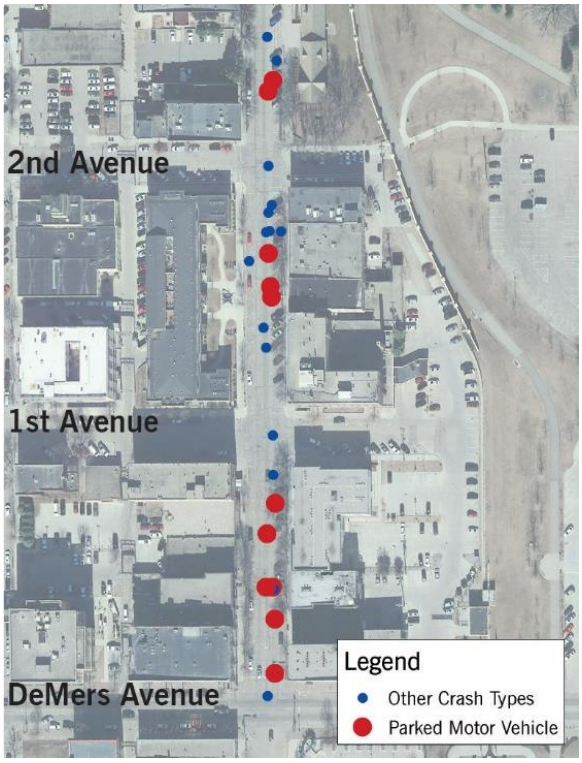
High-Crash Locations

Outside of DeMers Avenue, the existing and future conditions for vehicles show acceptable levels of service throughout the study area. However, several locations were identified as having higher than expected crash rates. This section will focus on these locations, specifically 3rd Street and 6th Street in Grand Forks and 4th Street NW in East Grand Forks.

3rd Street

On 3rd Street, there were 35 total crashes over the past three years. Of these crashes, 37 percent involved parked cars. However, this is likely underreported as vehicles enter and exit parking spaces creating more friction and stop-and-go traffic. A review of geospatial crash information indicates that as many 85 percent of crashes were located in an area that could be indirectly related to parking movements. One possible solution that was identified was back-in angle parking. Back-in angle parking creates better sight lines for vehicles and bicycles when leaving the parking space, reducing conflicts. It also allows people to load their vehicles on the curb, instead of the roadway.

Figure 83: 3rd Street Parking Crashes



Key considerations for implementing back-in angle parking include:

- Consider implementing on a low-volume side street first so the public can become familiar with the maneuvers.
- Consider an information campaign highlighting the safety benefits, the ease, and when the change would be implemented.
- Install proper signage that demonstrates how to use back-in angle parking. An example is shown in Figure 84.
- Ensure back-in angle parking is clearly signed to avoid confusion as to which areas are drive-in and which areas are back-in parking.

Figure 84: Charlotte, NC's Back-In Angle Parking

Summary and Implementation

The public was highly supportive of back-in angle parking on 3rd Street in initial public engagement. This is likely a low-cost solution that can be implemented with upcoming projects on 3rd Street.

Figure 85: 6th Street Crash Locations

6TH STREET

At the intersections of 6th Street and 1st Avenue and 6th Street and 2nd Avenue, there were 13 crashes that occurred over the last five years. More than half of the crashes that occurred were angle crashes. One angle crash resulted in a fatality at the 6th Street and 2nd Avenue intersection. These intersections are stop controlled on the north and south approaches. On-street parking and limited setback for the buildings on the southwest quadrants may limit visibility.

Curb Bulb-Outs

One possible solution that was identified was curb bulb-outs. Curb bulb-outs extend the curbs at corners to improve sight lines, which may improve stopping compliance, reduce pedestrian crossing exposure, and reduce speeds throughout the corridor, resulting in fewer and lower severity crashes. An example from Downtown Fargo is shown in Figure 87. The public was highly supportive of curb bulb-outs on 6th Street in initial public engagement.

Mini Roundabouts

Initial public engagement also identified mini roundabouts as a potential solution. Mini roundabouts operate similarly to traditional roundabouts but feature a traversable median so large vehicles can drive directly across. An example from St. James, Minnesota is shown in Figure 86. Mini roundabouts have been found to reduce angled crashes and traffic speeds.

Summary and Implementation

Both alternatives would likely provide the desired improvements to safety and traffic calming. However, mini roundabouts come with a higher cost. Planning level cost estimates suggest curb bulb-outs would cost $80,000 ($40,000 per intersection) depending on design and site conditions, while mini roundabouts have an estimated cost around $200,000 ($100,000 per intersection), depending on design and site conditions. Given the efficient operations of the intersections under two-way stop control, the bulb-outs may present a better short-term improvement strategy with mini-roundabouts offering a longer-term solution if problems persist. Mini roundabouts are often best suited for locations that require some traffic control.

Figure 87: Curb Bulb-Outs in Downtown Fargo, ND

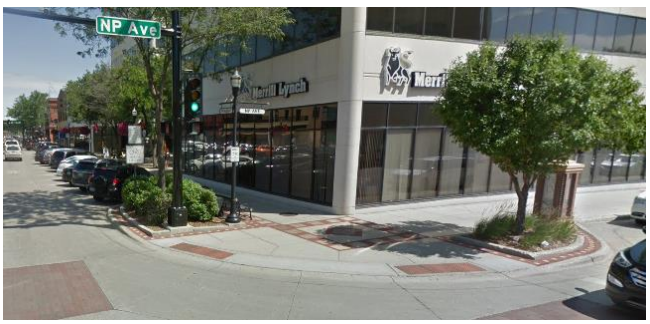
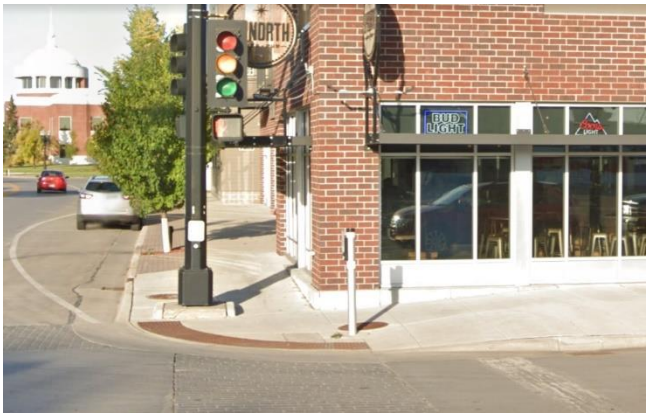


Figure 86: Mini Roundabout in Downtown St. James, MN

4TH STREET NW

The intersection of 4th Street NW with DeMers Avenue was identified as a high truck crash location in the MnDOT District 2 Freight Plan, currently in progress. These crashes primarily relate to truck turning challenges from parking too near the intersection and the signal pole placed too near the curb. One consideration to address this is limiting parking adjacent to the intersection to increase the available space for truck turning movements. The parking removal/restrictions would need to occur on both 4th Street NW and DeMers Avenue. The signal pole and push button could be relocated in upcoming mid-term projects.

Figure 88: Right-Turn Truck Radius Challenges



SUMMARY OF HIGH-CRASH LOCATION CONCEPTS

Both 3rd Street and 6th Street had higher than expected crash rates. On 3rd Street, most crashes involved parked cars and vehicles in the process of entering or exiting a parking space likely contributed to additional friction and crashes. Reverse angle parking would mitigate the current crash trends but likely see push back from the public so would require appropriate education with the change. On 6th Street, both curb bulb-outs and mini roundabouts would potentially mitigate the angle crash trends occurring at the intersections. Improving sight lines and turning radii at 4th Street NW may help mitigate the truck crash trends. The summary of improvements at these locations is shown in Table 11.

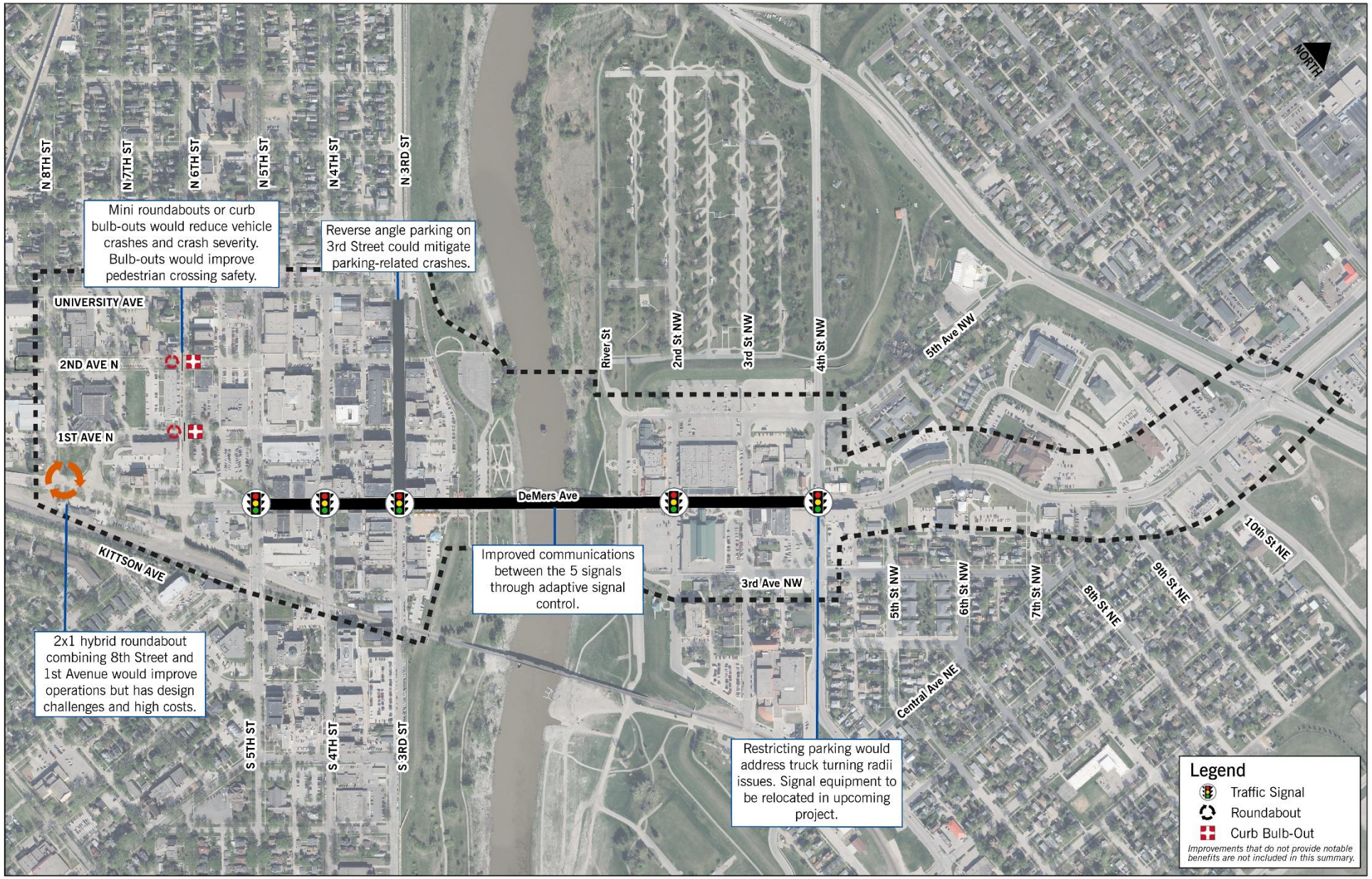
Table 11: Summary of High-Crash Location Concepts

Concept	Impact to Mode	Cost of Implementation	Summary
3rd Street – Reverse Angle Parking	(+)	$$	Implementing reverse angle parking can help improve visibility when exiting the parking space. Initial challenges of unfamiliarity may need to be mitigated with proper driver education. Reverse angle parking would likely mitigate the parking related crashes and improve bicycle safety.
6th Street – Curb Bulb-Outs	(++)	$$	The curb bulb-outs will provide additional space to improve visibility around the 6th Street intersections. They would also likely reduce vehicle speeds, which would lessen crash severity. Pedestrian crossing safety at these locations would be improved by reducing their crossing exposure.
6th Street – Mini Roundabouts	(++)	$$	Mini roundabouts on 6th Street would significantly reduce the angle crashes occurring on this corridor and act to calm traffic.
4th Street NW – Remove Parking and Relocate Signal Equipment	(=)	$ - $$	The parking restrictions would immediately address the challenging turning radius with the signal equipment being relocated during programmed construction projects.

SUMMARY OF VEHICLE CONCEPTS

Most of the vehicle concepts evaluated in this section could be implemented over time to improve vehicle operations and safety through the downtown study area, with limited additional costs, given the number of projects currently planned over the short-, mid-, and long-term. Figure 89 shows the summary of the vehicle concepts considered.

Figure 89: Summary of Vehicle Improvement Concepts



PEDESTRIAN CONCEPTS

Every day, there are thousands of pedestrian movements throughout Downtown Grand Forks and East Grand Forks. From a technical perspective, the pedestrian level of service is acceptable in all areas not on DeMers Avenue. On DeMers Avenue, pedestrian crossings at uncontrolled locations will become more challenging as traffic volumes increase. In addition to these crossing issues, the Steering Committee and public identified a variety of issues that could be addressed through this study.

KEY CONSIDERATIONS

Improving the pedestrian experience through downtown, on both the links and the intersections/crossings, can be accomplished in a variety of ways. Selecting the appropriate facilities and crossing enhancements must consider multiple factors.

- Upgrading traffic control, whether from a two-way stop control to an all-way stop control or a traffic control signal has been proven to create additional issues when applied at locations that do not meet traffic signal warrants. Traffic signal warrants are criteria established by the Federal Highway Administration to install traffic signals based on traffic volumes, pedestrian volumes, crash data and contextual factors (i.e. proximity to a school). Research conducted by FHWA found that removing unwarranted traffic signals may decrease all crash types up to 24 percent. Nearly all the locations identified in the public engagement efforts do not meet guidance for improved traffic control (all-way stop control or traffic control signals).
- Marked crosswalks alone, without other improvements, have not been found to reduce pedestrian crash rates. In some instances, pedestrian crash rates actually increase with marked crosswalks alone. Intersections with high pedestrian exposure, including multi-lane roadways, should seek higher quality pedestrian crossing enhancements.
- Other improvements like curb bulb-outs, rapid flashing beacons, in-roadway signs, and refuge islands improve yielding distance and stopping compliance and reduce pedestrian crossing exposure and vehicle speeds, creating safer pedestrian experiences. These are described below and shown in Figure 90.

    - Curb bulb-outs reduce vehicle-pedestrian crash potential up to 46 percent.
    - Rectangular rapid flashing beacons (RRFBs) have a compliance rate between 72 and 96 percent and a 30 percent increase in yielding distance of 10 feet or more. RRFBs have been found to reduce vehicle-pedestrian crash potential by 69 percent.
    - In-roadway signs have been found to have an 87 percent compliance rate in yielding to pedestrians as well as increasing yielding distance.
    - Pedestrian refuge islands reduce the unprotected crossing length for pedestrians by allowing them to cross one direction of traffic at a time. Refuge islands have been found to reduce vehicle-pedestrian conflicts up to 56 percent at unsignalized intersections on multi-lane roads.

These considerations, along with public and Steering Committee feedback guided the alternatives development for the locations discussed below.

Figure 90: Rectangular Rapid Flashing Beacon (Left), In-Roadway Sign (Center), and Pedestrian Refuge Island (Right)

DeMers Avenue

Crossing DeMers Avenue outside of signalized intersections is challenging, especially west of 5th Street in Grand Forks and east of 4th Street NW in East Grand Forks. These segments are high-speed and high-volume and represent the largest gaps in controlled pedestrian crossings. There are multiple concepts that could be implemented along DeMers Avenue.

Grand Forks

The DeMers Avenue section of this report provided a detailed traffic analysis of a roundabout at the intersection with 1st Avenue. If designed properly, this alternative would reduce speeds for eastbound traffic entering downtown, provide a staged crossing for pedestrians crossing DeMers Avenue, and enhance aesthetics as the gateway to Grand Forks.

Speed Control

Given the primary complaints of crossing DeMers Avenue west of 5th Street is uncontrolled crossings and high speed traffic, there are other alternatives that could be considered either as an interim or permanent solution, if the roundabout is not favorable to the community, decision makers, and funding constraints.

- Dynamic speed display signs provide drivers with feedback about their speed. Research has found dynamic speed display signs reduce speeds up to nine miles per hour, but they have limited long-term effectiveness. This concept could be implemented with, or without the roundabout. With the roundabout, it could help minimize rear-end crashes at the roundabout as drivers decelerate after going downtown hill into the roundabout. Without the roundabout, this improvement could help reduce crashes at DeMers Avenue and 5th Street and could be coupled with another pedestrian crossing enhancement (i.e. beacon) to help improve crossing safety.

East Grand Forks

DeMers Avenue between 4th Street NW and US 2 is nearly a half mile. There are no controlled pedestrian crossing locations in this section. The public identified multiple crossing locations in this segment that are challenging due to lack of traffic control and the wide cross-section. While there are multiple locations an RRFB could be located to provide a safer crossing of DeMers Avenue, 9th Street is likely the most logical location. It would connect residential developments on both sides of DeMers Avenue with the Altru Clinic and Stauss Park. An additional crossing could be considered at 6th Street to connect City Hall with the north side of East Grand Forks. The combination of the crossing enhancements and lane reconfiguration discussed in the bicycle concepts section of this report would further enhance pedestrian crossing safety.

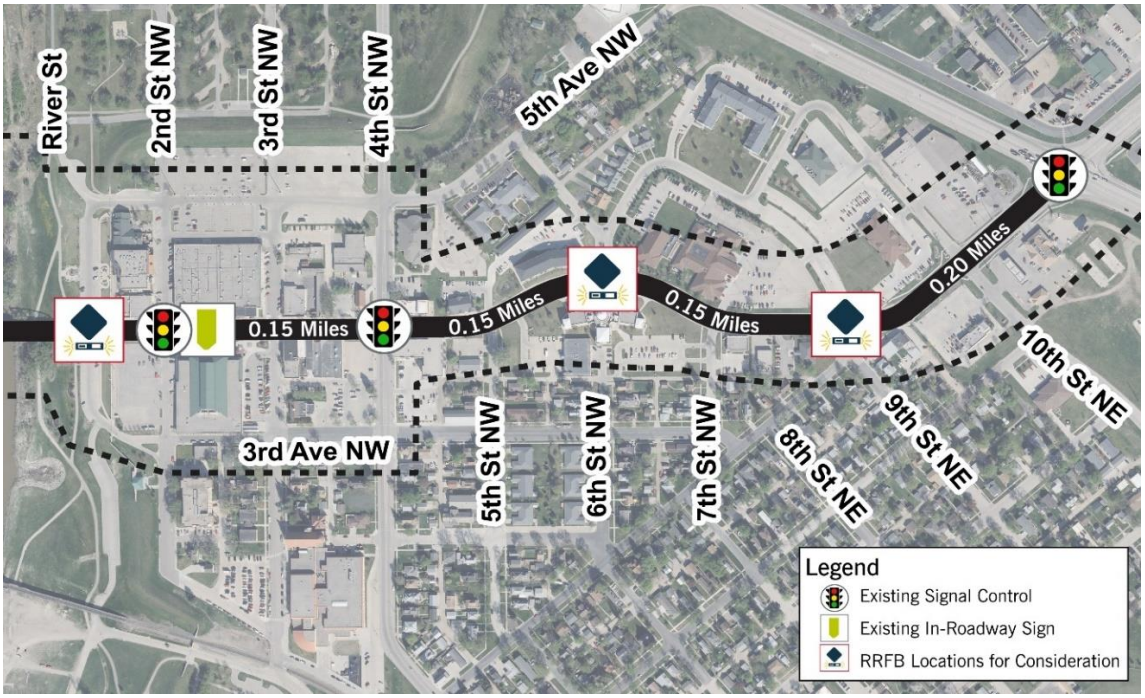
The midblock crossing at Cabela's and River Cinema, between 2nd Street and 3rd Street is marked and stamped with colored concrete and a pedestrian crossing sign. A proposed mill and overlay project would remove this crossing, as well as other colored concrete crossing locations at River Road, 3rd Street NW, and 4th Street NW, because they do not meet ADA standards and replace it with standard concrete and marked crosswalks. At the midblock crossing, the in-roadway signage should remain, with additional consideration for an RRFB, bulb-outs, or a refuge island. Additionally, an RRFB at the uncontrolled River Road location should be considered to allow for a protected crossing from the Greenway. These additional pedestrian protections would reduce crossing exposure, creating a safer pedestrian crossing location within the heart of Downtown Grand Forks. The higher-level crossing protections will also support the transit stops in this area.

Summary and Implementation

To improve the pedestrian experience along DeMers Avenue in East Grand Forks, multiple locations for crossing enhancements were identified as shown in Figure 91. The controlled crossing locations would be approximately every 0.15 miles, or 800 feet.

Each RRFB location is estimated to cost $15,000, for a total cost of $45,000 to $60,000, if the mid-block crossing is upgraded. There is a mid-term project programmed on DeMers Avenue with which these improvements could likely be incorporated.

Figure 91: East Grand Forks Pedestrian Crossing Locations



Summary of DeMers Avenue Pedestrian Concepts

The DeMers Avenue pedestrian concepts would enhance the pedestrian crossing environment, focusing primarily on areas outside of the core downtowns (5th Street in Grand Forks to 4th Street NW in East Grand Forks). While these areas see fewer pedestrian movements, the higher vehicle speeds can result in more severe crashes.

Table 12: Summary of DeMers Avenue Pedestrian Concepts

Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(-)	$	Crossing DeMers Avenue outside of the core area will become increasingly difficult as traffic volumes increase through 2045.
Roundabout Between 1st Avenue and 8th Street	(+)	$$$	If designed correctly, the roundabout would permit a two-stage crossing so pedestrians only need to cross one direction of traffic at a time.
Pedestrian Crossing Enhancements	(+)	$$	While the pedestrian crossing enhancements (RRFBs at River Street, 6th Street, 9th Street and in-roadway sign at the midblock) have proven effectiveness with stop compliance, DeMers Avenue remains very wide east of 4th Street NW.
Pedestrian Crossing Enhancements with Lane Reconfiguration	(++)	$$	The combination of pedestrian crossing enhancements with the lane reconfiguration of DeMers Avenue east of 4th Street NW would provide the safest crossing facilities.

3rd Street and 4th Street in Grand Forks

The 3rd Street and 4th Street corridors are the most active pedestrian corridors in the study area. Crossings on these corridors received a significant amount of feedback from the public and the Steering Committee. Many of the crossing concerns include speed of traffic and difficulty finding gaps in the traffic as well as sight-distance challenges. Curb bulb-outs can begin to address many of the issues identified and can be incorporated on every intersection on 3rd Street and 4th Street to improve the pedestrian experience.

3rd Street

On 3rd Street, curb bulb-outs but should be considered at the following locations:

- 3rd Street and University Avenue. North of this intersection, 3rd Street transitions to a one-way street with excess capacity, resulting in high vehicle speeds and perceived safety issues.
- 3rd Street and 2nd Avenue. This intersection provides direct access to the Red River Greenway and is in the heart of Grand Forks' downtown activity.
- 3rd Street and 1st Avenue. This intersection was previously an all-way stop controlled intersection which people perceived to create a better crossing environment. The all-way stop control was removed as part of the detour for the DeMers Avenue reconstruction project in summer 2019 and was not re-installed because it does not meet the guidance established for all-way stop control.
- 3rd Street and Kittson Avenue. This intersection has been identified as a connection to the Red River Greenway (discussed later in this report) which will likely increase bicycle and pedestrian activity at this location. Destinations on Kittson Avenue likely rely on street parking on 3rd Street, making this crossing an important connection for businesses on Kittson Avenue.
- 3rd Street and Loon Park. As part of a festival street, curb bulb-outs would provide opportunities to more easily block off the roadway to vehicular traffic. Outside of festivals, a midblock crossing of 3rd Street between DeMers Avenue and Kittson Avenue would provide pedestrian crossings of this very long block. Bulb-outs would not likely be necessary at both Loon Park and Kittson Avenue.

4th Street

On 4th Street, curb bulb-outs should be considered at the following locations:

- 4th Street and University Avenue. City Hall Lot C is located north of University Avenue and 4th Street transitions to a two-way street south of University Avenue. While this location does include an all-way stop, the transition point provides a gateway into downtown.
- 4th Street and 2nd Avenue. This location connects City Hall and Central High School with the rest of downtown and sees high pedestrian activity. It is common for students to jay-walk around this intersection, so improving pedestrian visibility and expanding pedestrian space may help improve driver expectancy.
- 4th Street and 1st Avenue. The Central Parking Ramp is located at this intersection. Improving pedestrian experiences surrounding the parking ramp can help encourage its use and a "park once" environment in downtown.
- 4th Street and Kittson Avenue. The Corporate Parking Ramp, the Metro Transit Center, and multiple restaurants surround this intersection. Bulb-outs at this location will need to consider potential impacts to transit vehicles' turning movements.

Additional Crossing Enhancements

Due to the extremely high pedestrian volumes at the 1st Avenue crossings with 3rd Street and 4th Street, additional crossing enhancements like an RRFB may also be considered to further enhance pedestrian visibility and safety.

Summary and Implementation

Installing curb bulb-outs at each location noted above would likely have impacts to on-street parking. However, based on the recently completed Grand Forks Parking Study, there is ample capacity throughout downtown to absorb the parking demand. If these impacts are deemed too significant, prioritizing the locations to support the largest number of pedestrian crossings, as shown in Figure 92. Bulb-outs can be incorporated with upcoming planned projects and phased in outside the active projects, including the 3rd Street project currently in development and the 4th Street project that recently received Urban Grant Program funding.

Additionally, the DeMers Avenue reconstruction project implemented a series of pedestrian crossing improvements including no right-turn on red, pedestrian push buttons, and countdown timers. Bulbouts would not be necessary on DeMers Avenue at this time.

Estimated cost is $220,000 for 3rd Street and $160,000 for 4th Street, depending on site conditions and constraints. RRFBs would add around $30,000 if installed at both 1st Avenue intersections.

Figure 92: Curb Bulb-Out Priorities

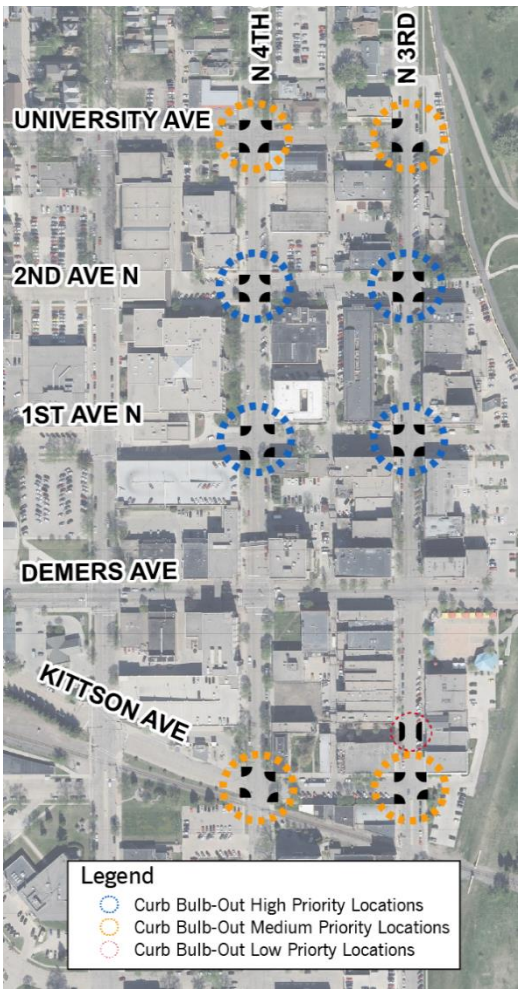


Table 13: Summary of 3rd and 4th Street Improvements

Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(=)	$	Within the core area of Downtown Grand Forks, pedestrian activity is high enough to increase visibility.
3rd Street Curb Bulb-Outs	(++)	$$	Creating comfortable pedestrian crossing locations will encourage people to walk in downtown, helping meet other goals of transportation demand and parking management as well as support the vast number of businesses, services, and events. Bulb-outs can be incorporated into an upcoming project to minimize costs.
4th Street Curb Bulb-Outs	(++)	$$	Creating comfortable pedestrian crossing locations will encourage people to walk in downtown, helping meet other goals of transportation demand and parking management as well as support the vast number of businesses, services, and events.

Link Improvements

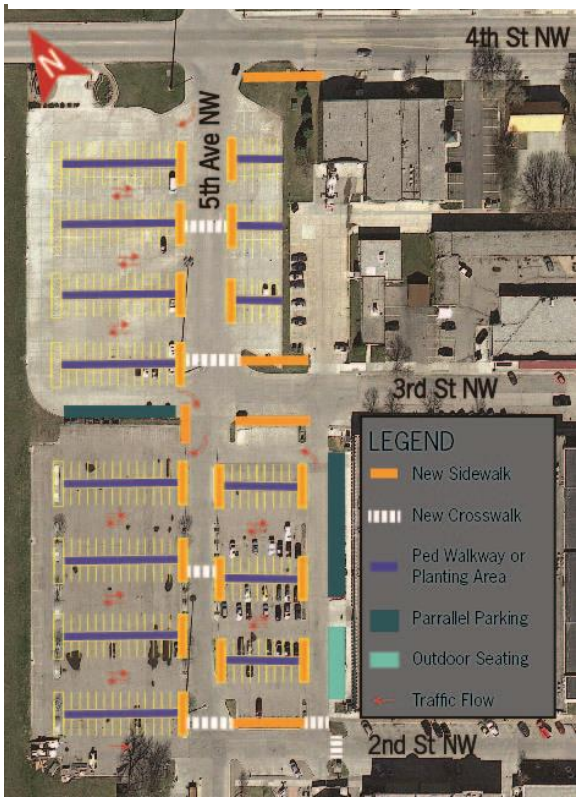
Nearly every roadway in the study area has sidewalks on both sides.

Riverwalk Centre Parking Lots

However, a major missing connection runs along 5th Avenue through the Riverwalk Centre's parking lots. These large parking lots provide no dedicated pedestrian facilities anywhere. While vehicle speeds are typically slow through parking lots, the lack of dedicated space creates conflicts between vehicles and pedestrians walking through parking lots and reduces pedestrian visibility.

The City of East Grand Forks currently owns the two parking lots. With no imminent redevelopment, the next round of maintenance should consider reconfiguring the parking lot to improve the pedestrian experience. This could include

Figure 93: Conceptual Redesign of Riverwalk Centre Parking Lot



- Constructing a sidewalk or shared-use path on 5th Avenue NW/ Patriotism Drive.
- Closing many of the parking rows' access to 5th Avenue and revising circulation to minimize conflicts with bicycles and pedestrians.
- Installing sidewalks within the parking lots to provide dedicated space for pedestrians.
- Providing high-visibility crosswalks on 5th Avenue. If necessary, raised crosswalks or speed tables could be installed to reduce vehicle speeds.
- Incorporating aesthetic features and greenery to provide shade to parked cars and pedestrians, reducing the urban heat island effect and stormwater run-off common with parking lots of this size.

These changes will have impacts to the number of parking stalls in these lots. However, making the parking lots more pedestrian friendly may attract more people to use these lots instead of circulating on 2nd Street NW, DeMers Avenue, and 3rd Street NW.

Cost and Implementation

Minimal work could accomplish this project, with the addition of some sidewalk and restriping the lot like below would still leave approximately 350 parking spaces, but funnel pedestrians to specific locations and increase their visibility and crossing safety. An approximate cost to update this parking lot would $125,000.

Table 14: Summary of Riverwalk Centre Parking Lots

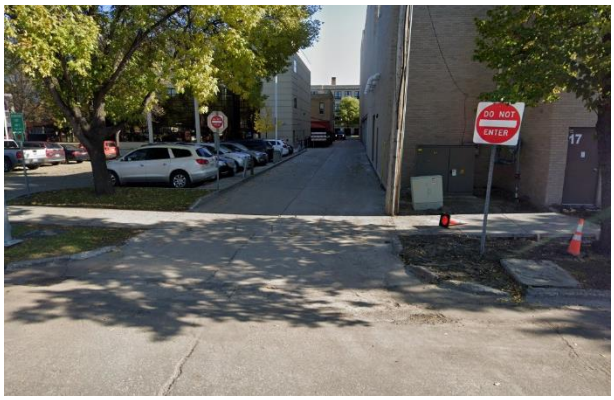
Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(=)	$	The low parking activity does not create immediate safety concerns, but the lack of pedestrian facilities may be uncomfortable for some users.
Riverwalk Centre Parking Lot Reconfiguration	(++)	$$	Creating dedicated pedestrian facilities throughout the parking lot would increase pedestrian safety and comfort and connect the existing Greenway facilities to sidewalks and shared-use paths throughout downtown.

Other Concepts and Policy Considerations

Managing pedestrian facilities is a time-consuming process but can go a long way in providing a high-quality pedestrian experience year-round. Additional concepts and policy considerations

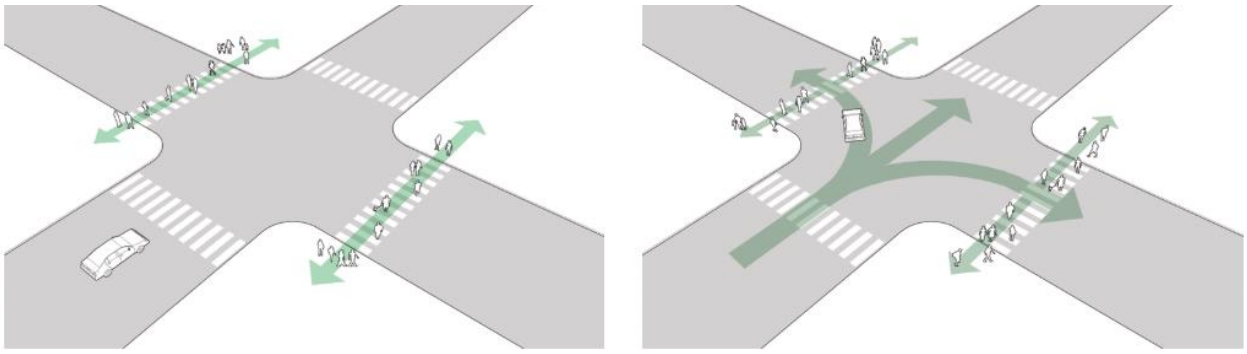
- Grand Forks should complete an Americans with Disabilities Act (ADA) transition plan analysis to identify and program improvements necessary to ensure pedestrian facilities are appropriate for all users. East Grand Forks recently completed an ADA transition plan and has identified necessary improvements. Cities, counties, and state Departments of Transportations should work with the Grand Forks – East Grand Forks MPO to ensure future funding is allocated to regular ADA planning.
  - A proposed project along DeMers Avenue in East Grand Forks would replace the broken brick pavers with concrete to ensure ADA compliance.
- Increase enforcement of winter maintenance to provide high-quality pedestrian facilities year-round. This could mean higher enforcement frequency, harsher fines, or incentives and funding programs for property owners/businesses that comply.
- With the new Central High School parking lot north of University Avenue, students jaywalking at the alleyway has emerged as an issue, despite two controlled intersections approximately 300 feet in both directions (4th Street and 5th Street). While this area likely does not generate a significant number of pedestrian crossings throughout the day, improvements can be made to improve driver expectancy at the crossing. Curb bulb-outs, a marked crosswalk, and additional signage can establish this as a permitted crossing, without impacts to the signal at University Avenue and 5th Street. If further accommodations become necessary, a flashing beacon may be accommodated at this location.

Figure 94: Alleyway at University Avenue



- Consider adjusting signal timing at traffic signal-controlled intersection to incorporate lead pedestrian intervals (LPI). LPI provides three to seven seconds of time where all traffic movements have red indications, allowing pedestrians to enter the intersection first and increase their visibility, as shown in Figure 95. LPI has been found to reduce vehicle-pedestrian collisions up to 60 percent. This change in signal timing is relatively low cost and has minimal impacts to traffic operations. It has already been incorporated at the DeMers Avenue signals in Grand Forks.

Figure 95: Lead Pedestrian Interval Example



Summary and Implementation

Most of the other concepts and policy considerations are low cost improvements that will require additional staff time to enact and enforce the policies. Table 15 shows the summary for the other concepts and policy considerations.

Table 15: Summary of 3rd and 4th Street Improvements

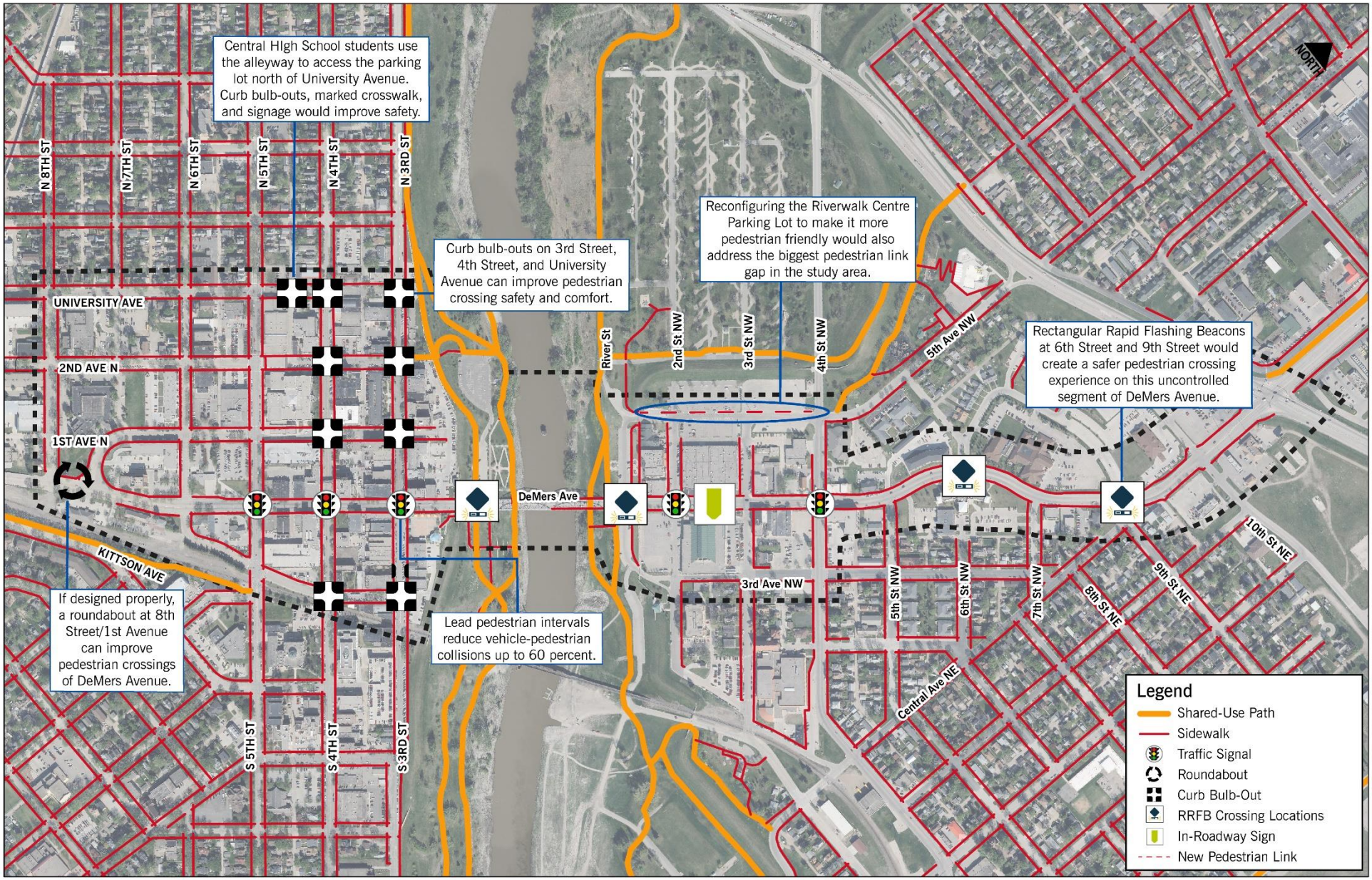
Concept	Impact to Mode	Cost of Implementation	Summary
Grand Forks ADA Transition Plan	(+*)	$$	An ADA transition plan would identify pedestrian improvements but would not result directly in their implementation. Implementation of the improvements would likely cost significantly more.
Winter Maintenance Enforcement	(+)	$	Winter maintenance enforcement would improve the winter walking experience but may be challenging to find the right set of enforcement tools.
Central High School Alleyway Crossing	(+)	$$	Improved crossing facilities at the alleyway will increase visibility of those crossing before and after school.
Lead Pedestrian Interval	(+)	$	Lead pedestrian interval reduces vehicle-pedestrian conflicts up to 60 percent but could have some minor impacts to vehicle level of service.

**The plan would not directly result in improvements to the pedestrian environment, but would identify a significant amount of improvements that would, upon implementation.*

Summary of Pedestrian Concepts

Many of the pedestrian concept identified here can be implemented in the short-term with staff time and currently programmed projects. A summary of the pedestrian concepts for consideration is shown in Figure 96.

Figure 96: Summary of Pedestrian Improvement Concepts



BICYCLE CONCEPTS

Nearly 90 percent of trips ending in Downtown Grand Forks or Downtown East Grand Forks are less than one mile, making them excellent candidates for bicycle trips. Encouraging bicycle trips by all users, not just the "strong and fearless" will require a comprehensive effort in improving bicycle facilities and connections. Research compiled and completed by the National Association of City Transportation Officials (NACTO) has found:

- Riding a bike gets safer as cities build high quality bike lane networks.
- Protected bike lanes increase bike ridership on those streets between 21 and 171 percent.
- Sixty percent of people are interested in biking. Of these, 80 percent would be willing to ride on streets with a separated or protected bike lane.
- Bike share programs increase visibility of cyclists, making riding safer for everyone. Bike share programs are more successful when matched with extensive protected bike lane networks.

NACTO also provides contextual guidance on selecting appropriate facilities for all ages and abilities. While a more detailed chart is provided in the *Urban Bikeway Design Guide*, it is summarized in Table 16. This research and guidance, combined with the public and Steering Committee feedback, guided the development of the alternatives and options discussed below.

Connection Between Downtowns

Improved connections between the two downtowns was one of the most prevalent needs identified through the public and Steering Committee feedback. The Sorlie Bridge is one of three river crossings, but the only one through the core of the two downtowns. It is designated as a historic structure and recent improvements focused on preserving the structure rather than expanding its width for added capacity or multimodal facilities. The current configuration does not provide dedicated facilities for bicyclists and requires they walk their bikes across the bridge. Despite these requirements, cyclists frequently ride across the bridge, creating potential conflicts with pedestrians.

Previous planning efforts have focused on building a new bridge structure on the former railroad pier north of DeMers Avenue, around 1st Avenue N in Grand forks and 5th Avenue NW in East Grand Forks. Completing this connection with a bicycle and pedestrian bridge would provide improved connectivity between the two downtowns for cyclists and a more direct connection for pedestrians.

Without additional infrastructure, dedicated bicycle facilities would be limited to the Greenway on both sides of the river. New bicycle facilities would expand the usefulness and connectivity of a new bridge.

Figure 97: Bicycle and Pedestrian Bridge Connection (From River Forks Downtown Plan Update)

Table 16: NACTO Contextual Guidance for Selecting All Ages and Abilities Bicycle Facilities

Facility Type	Target Vehicle Speed	Daily Traffic	Cross-Section	Key Considerations
Shared Lanes  Source: NACTO	<20 MPH	<2,000	No centerline.	Bicycles share the roadway. Or <50 motor vehicles per hour in peak direction at peak hour.
Conventional Bicycle  Source: NACTO	<25 MPH	<3,000	Single lane each direction.	Low curbside activity.
Buffered Bicycle Lanes  Source: NACTO	<25 MPH	<6,000	Single lane each direction.	Low curbside activity.
Protected Bicycle Lanes/ Cycle Tracks  Source: NACTO	>25 MPH	>6,000	Multiple lanes per direction.	Low curbside activity.
Separated Path  Source: NACTO	Any	Any	Any	None.

Summary and Implementation

The estimated cost of a new bridge across the Red River would approach $2.6 million. Given the sensitivity of the area, potential environmental analysis may be necessary before construction.

Table 17: Summary of 3rd and 4th Street Improvements

Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(=)	$	Bicycle mobility between the two downtowns would be limited to the Sorlie Bridge.
New River Crossing	(++)	$$$	A new bridge crossing would expand bicycle mobility between the two downtowns and the Greenways. The bridge would come with a high cost with no identified funding.

Grand Forks Bicycle Mobility

East-West Through Downtown to the Greenway

Currently, east-west connectivity is provided on the north side of downtown along University Avenue. A recent study of University Avenue recommends keeping University Avenue's shared lanes through downtown with improved bike facilities connecting to UND's campus. Shared lanes/sharrows on this corridor conflicts with NACTO guidance for these types of facilities based on traffic volumes. With traffic volumes greater than 3,000 vehicles per day, this corridor may need buffered and/or protected bicycle lanes to provide an all ages and abilities facility.

On the south side of downtown, there is a shared-use path that runs along the south side of DeMers Avenue and the railway that currently terminates at the intersection of Walnut Street and 5th Street, as shown in Figure 98.

Figure 98: Shared Use Path Terminates at Walnut Street and 5th Street

The Red River Greenway is the premier bicycle facility in Grand Forks and East Grand Forks, running nearly the entire length of the two cities. In Downtown Grand Forks, access to-and-from the Greenway is provided at 2nd Avenue N, DeMers Avenue, and Minnesota Avenue. The half-mile gap between DeMers Avenue and Minnesota Avenue, combined with the lack of dedicated facilities within downtown, limits cyclists' access to Downtown Grand Forks. The Downtown Action Plan identified a concept on Kittson Avenue that would construct a cycle track along Kittson Avenue and

Figure 99: Kittson Avenue Greenway Connection (from Downtown Action Plan)

provide access to the Greenway, as shown in Figure 99. This concept should continue west to 5th Street and Walnut Street to connect the existing shared-use path. One refinement suggested through the early public engagement process was to relocate to the path along the southside of Kittson Avenue and connect to the shared-use path that ends at Walnut Street. This would eliminate additional crossings of 4th Street, minimize conflicts with transit vehicles to/from the Metro Transit Center, and not require the angle parking to be relocated. The parallel parking would still be removed to accommodate the bicycle facility.

This facility would include a 10-foot cycle track, two 11-foot travel lanes, and one 16 foot angle parking lane. Minor revisions may be necessary during project development. There are some additional challenges that will need to be addressed during project development:

- Higher activity on the sidewalk which crosses the railroad on 5th Street may warrant improved railroad crossing amenities, like gate arms, which come with increased costs.
- Any redevelopment that would occur east of 3rd Street, along the levee would need to maintain access to the shared-use path connecting to Greenway.
- Accessing the shared use path along the levee would possibly require an easement through the private parking lot east of 3rd Street.
- Due to the proximity to the levee, the shared use path would likely require a 408 permit and Army Corps of Engineers approval.

These connections are shown in Figure 100.

Figure 100: Connecting the DeMers Avenue SUP to the Red River Greenway

An example cross section of Kittson Avenue currently and how the cycle track would fit the existing curb lines is shown in Figure 102 and Figure 101, respectively.

Figure 102: Existing Kittson Avenue Cross Section

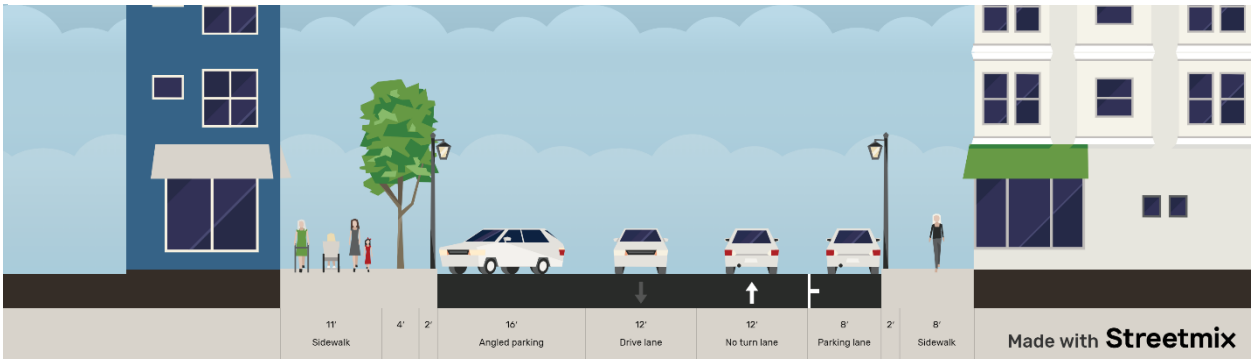
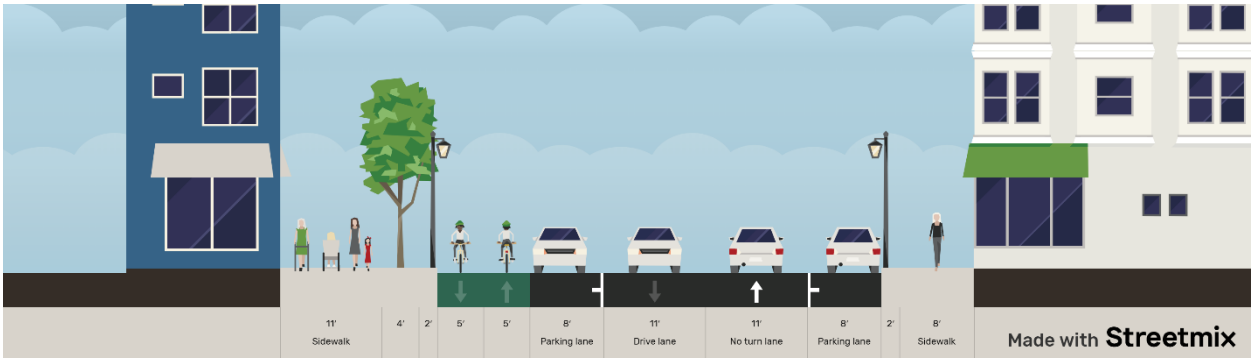


Figure 101: Example Kittson Avenue Cross Section with Cycle Track



North-South Connection through Downtown Grand Forks

Three corridors provide great north-south connectivity through Downtown Grand Forks: 3rd Street, 4th Street, 5th Street. Each corridor has challenges and constraints that would need to be addressed to provide safe and comfortable bicycle facilities.

5th Street

The 5th Street corridor will be reconstructed in 2020. As part of this project, shared lanes will be incorporated. With two lanes of parking, two driving lanes, and a two-way left-turn lane, this corridor is nearly 50 feet wide, encouraging higher speeds and decreasing bicyclist comfort. This will provide a basic bicycle connection, but likely only for the most confident riders. Below is a summary of the bicycle attraction potential of 5th Street.

- The 5th Street corridor has the highest daily traffic of all three corridors, currently carrying between 5,700 and 5,900 vehicles each day. By 2045, this corridor is estimated to carry between 7,400 and 7,900 vehicles each day. This is significantly higher than NACTO guidance for shared lanes (by nearly four times). Central High School's busses and private vehicles stack on 5th Street as they wait for students.
- Heavy truck traffic is 2.4 percent to 2.7 percent.
- There is parallel parking on both sides of the street throughout most of the corridor north of DeMers Avenue and on the east side of the street south of DeMers Avenue.
    - North of DeMers Avenue there are 28 parking spaces. On a typical day, 20 are used, for 71 percent occupancy.
    - South of DeMers Avenue there are 27 parking spaces. On a typical day 10 are used, for 35 percent occupancy.

- Any impacts to parking could be absorbed by the Central Parking Ramp, which sees average occupancy rates around 50 percent.

» The 5th Street corridor would provide direct access to Central High School as well as the new grocery store part of the Pure Development site.

Figure 103: 5th Street Cross-Section

4th Street

The 4th Street corridor is approximately 50 feet wide with parallel parking on both sides throughout most of the corridor, excluding a small section south of 2nd Avenue to University Avenue where there is angle parking on the east side of the corridor. Below is a summary of the bicycle attraction potential of 4th Street.

» The 4th Street corridor has the lowest daily traffic of all three corridors, currently carrying between 2,250 and 2,355 vehicles each day. By 2045, this corridor is estimated to carry between 2,800 and 4,000 vehicles each day. Central High School's students are often picked up on 4th Street, creating brief heavy congestion on the corridor.

» Heavy truck traffic is 2.4 percent to 2.8 percent.

» There is parallel parking throughout most of the corridor with some areas of angled parking.

- North of DeMers Avenue there are 59 parking spaces. On a typical day, 43 are used, for 72 percent occupancy.
- South of DeMers Avenue there are 97 parking spaces. On a typical day 61 are used, for 63 percent occupancy.

» Provides direct access to multiple government buildings, Metro Transit Centre, Central High School, and multiple bars and restaurants.

Figure 104: 4th Street Cross-Section

3rd Street

The 3rd Street corridor is approximately 46 feet with angle parking on the east side of the corridor and parallel parking on the west side of the corridor. It is a two-lane section with left-turn lanes at DeMers Avenue.

- 3rd Street currently carries between 2,355 and 2,600 vehicles each day. By 2045, this corridor is estimated to carry between 3,100 and 4,900 vehicles each day.
- Truck traffic is lowest at 1.2 percent to 1.6 percent.
- There is angle and parallel parking throughout the corridor. This creates both backing conflicts as vehicles leave angle parking spaces and dooring conflicts with vehicles in parallel parking spaces. This corridor experiences a high frequency of parking related crashes currently and sees very high parking turnover.
  - North of DeMers Avenue there are 115 parking spaces. On a typical day, 52 are used, for 45 percent occupancy.
  - South of DeMers Avenue there are 134 parking spaces. On a typical day 94 are used, for 70 percent occupancy.
- Provides direct access to bars, restaurants, and shopping as well as Town Square park.

Figure 105: 3rd Street Cross-Section

Summary

Selecting the appropriate corridor for a north-south bicycle route in Downtown Grand Forks needs to consider all the potential impacts and constraints. However, it must also consider how safe and comfortable the corridor will feel, or could feel, with the appropriate level of investment.

- The 5th Street corridor will provide a basic bicycle facility in 2020. However, its other features, including higher traffic volumes, higher truck traffic volumes, and higher speeds make it uncomfortable for most cyclists. The traffic volumes are significantly higher than NACTO guidance for sharrows. This was the least popular option with the public and Steering Committee.
- Providing high quality facilities on 3rd Street would likely have major impacts to the most heavily utilized parking in Downtown Grand Forks and would be challenging to implement. While the corridor operates slowly and would be appropriate for most adult riders, the number of potential conflicts is significant, especially given the high number of parking related crashes already occurring. This was the most popular option with the public and Steering Committee. Removal of parking in favor of biking facilities would be most impactful along this corridor as it experiences the highest parking demand and turnover within downtown.

» 4th Street is a mix of lower traffic volumes and higher access to bicycle generators. Its wider cross section provides opportunities to implement high quality facilities. Fewer areas of angled parking makes this corridor safer for bicycle facilities and the access to parking ramps along the corridor allows for additional angled parking spaces be converted to parallel parking without serious parking deficiencies. 4th Street is also the geographic center of downtown, allowing for easy access east and west. These factors make 4th Street the ideal candidate for a high-quality bicycle facility.

Estimating a cost to implementation will vary depending on the corridor and type of facility preferred. Costs could be very low and simply include striping sharrows or could be relatively high if curbs and drainage are impacted. All three corridors have some sort of project programmed in the short term, in which these facilities could be incorporated to limit costs.

Table 18: Summary of Downtown Grand Forks North-South Bicycle Route Considerations

	5th Street	4th Street	3rd Street
Width	~50' 2 Parallel Parking Lanes Three-Lane Section with Left-Turn Lane	~50' Parallel and Angled Parking Lanes Three-Lane Section with Left-Turn Lane	~50' Parallel and Angled Parking Lanes Two-Lane Section
Daily Traffic	2019: 5,700 – 5,900 2045: 7,400 – 7,900	2019: 2,250 – 2,355 2045: 2,800 – 4,000	2019: 2,355 – 2,600 2045: 3,100 – 4,900
Heavy Vehicle Traffic	2.4% – 2.7%	2.4% – 2.8%	1.2% – 1.6%
Parking	Parallel Parking 55% Occupied	Parallel and Angled Parking 67% Occupied	Parallel and Angled Parking 59% Occupied Very High Parking Turnover
Generators	Moderate to High	High	High

Example Facility

Constructing a high-quality bicycle facility on 4th Street would have a direct impact to multimodal safety, mode shifts, and property value growth. The 4th Street corridor's traffic volumes and speeds make it the best location from a technical standpoint. However, given the parking activity and vehicular volumes, some type of buffer, whether that is painted with flexible delineators or a raised concrete median, would be necessary to provide a high-quality facility for all ages and abilities. An example buffered bicycle lane with raised median is shown in Figure 106. This configuration would remove one lane of parking to construct a directional buffered bike lane on both sides of the roadway. No roadway capacity would be removed and parking demand could still be supported with this design.

Figure 106: Example Protected Bicycle Lanes on 4th Street

Summary and Implementation

Improving bicycle mobility to and through Downtown Grand Forks will need to incorporate a variety of facilities with a range of potential costs. Table 19 shows the summary of the Grand Forks bicycle mobility concepts.

Table 19: Summary of Grand Forks Bicycle Mobility

Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(=)	$	Bicycle mobility between the two downtowns would be limited to the Sorlie Bridge.
East-West Mobility	(++)	$$	Connecting the Greenway to the existing shared-use path that runs along DeMers Avenue would mitigate a major gap in the bicycle facility network.
North-South Mobility	(++)	$ - $$	Selecting the appropriate facilities and corridor will determine the impact to bicycle mobility. Sharrows on 3rd Street or 5th Street would not provide an all ages facility. Higher-level facilities on 4th Street could be constructed to provide a very comfortable facility but would come with a higher cost.

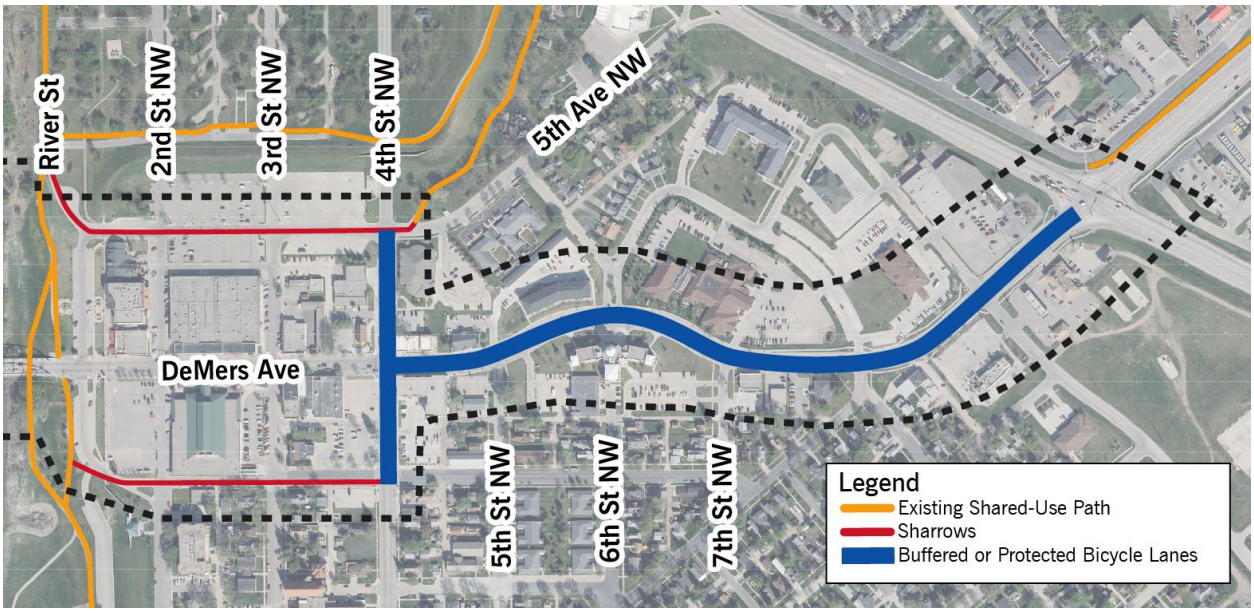
East Grand Forks Bicycle Mobility

Connecting downtown East Grand Forks to the rest of the community requires a network of bicycle facilities both within and to Downtown that are attractive to all ages and abilities. While access to Downtown East Grand Forks is comprehensive, with shared-use paths along the Greenway, MN 220, and through the neighborhoods, once you arrive to downtown, there are no dedicated facilities to provide bicycle mobility within downtown. There are a variety of connections that can be made to develop the network of facilities for all ages and abilities, as shown in Figure 107.

Within the Downtown Study area, the following connections should be considered:

- 5th Avenue NW between the Greenway and 4th Street NW. This is a 30-foot-wide, low-speed, low-volume roadway. Shared lanes would be an appropriate all ages facility at this location. This bike facility would connect to the Greenway using the path northwest of 6th Avenue NW, DeMers Avenue or require a new access altogether.
- 3rd Avenue NW between the Greenway and 4th Street NW. This is a 30 to 50-foot-wide, low-speed, low-volume roadway. Shared lanes or bicycle lanes would be an appropriate all ages facility at this location. A more direct connection to the Greenway at 3rd Avenue would facilitate better bicycle mobility between DeMers Avenue and Hill Street.
- 4th Street between 5th Avenue NW and 3rd Avenue NW. This is a 55-foot wide, high-speed, and medium-volume roadway. South of DeMers Avenue, on-street parking is provided on both sides of the roadway. Buffered or protected bicycle lanes would be an appropriate all ages facility at this location. It would likely require at least one lane of parking to be removed. However, there is adequate off-street parking serving the nearby businesses. Facilities here could conflict with seasonal northbound right-turning truck traffic.
- DeMers Avenue between 4th Street NW and US 2. This is a 60-foot wide, high-speed, high-volume roadway. Buffered or protected bicycle lanes would be an appropriate all ages facility at this location. See below for more discussion on DeMers Avenue.

Figure 107: Bicycle Facility Recommendations in Downtown East Grand Forks



Lane Reconfiguration in East Grand Forks

East of 4th Street NW, DeMers Avenue is very wide and was identified by the public as a major bicycle and pedestrian barrier. It currently includes parking, two travel lanes, two-way left-turn lane, and right-turn lanes.

Reconfiguring this roadway to include buffered bike lanes while maintaining the two travel lanes and two-way left-turn lane would preserve vehicle operations but extend the bicycle connection that ends at US 2 to the downtown core.

This area was outside the microsimulation modeled area but impacts to vehicle operations were evaluated using Synchro software, which uses the Highway Capacity Manual to estimate traffic operations. Based on this analysis, the intersections between 4th Street NW and US 2 operate at acceptably. Figure 108 shows the existing cross- section, while Figure 109 shows an example cross-section that would ensure the bicycle lanes were safe and comfortable for all users and they support traffic calming efforts. This concept would maintain remove one parking lane. Including the buffer as a raised median would increase costs of implementation and may create winter maintenance issues but would prevent vehicles from parking in or encroaching on the bike lanes.

Figure 108: Existing DeMers Avenue Cross Section

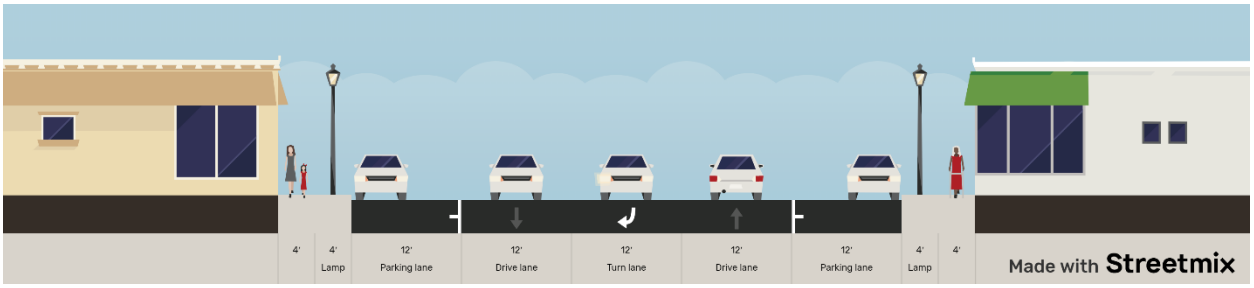
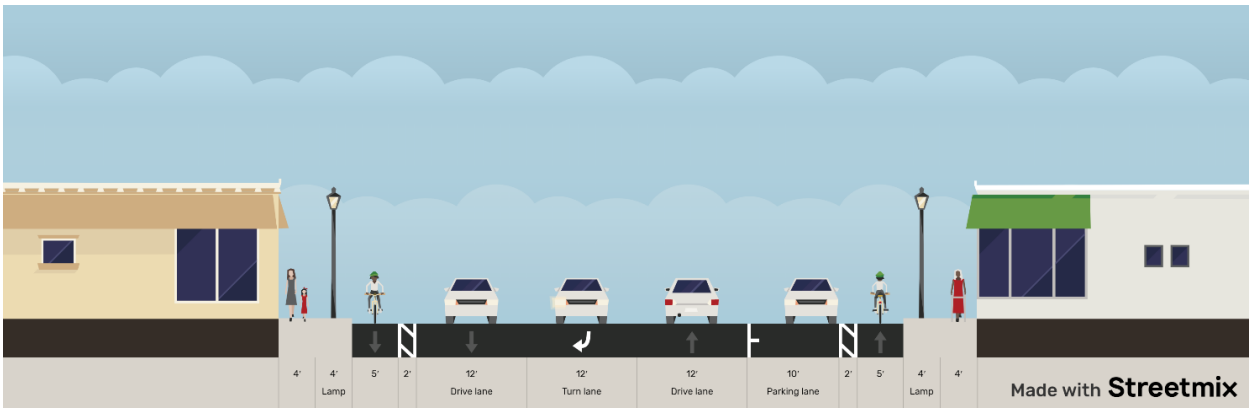


Figure 109: Reconfigured DeMers Avenue Cross Section



Cost of Implementation

Costs to implement a reconfigured section could be very low, if it is simply restriping, which could also be accomplished in the short term. If drivers encroach into the parking lanes, the buffer could be improved to a raised median. Constructing a raised median will be a more expensive project but could be incorporated into the planned mid-term resurfacing project with limited additional costs.

Summary and Implementation

Improving bicycle mobility to and through Downtown East Grand Forks will need to incorporate a variety of facilities with a range of potential costs. Table 20 shows the summary of the Grand Forks bicycle mobility concepts.

Table 20: Summary of East Grand Forks Bicycle Mobility

Concept	Impact to Mode	Cost of Implementation	Summary
No Build	(=)	$	Bicycle mobility to and through Downtown East Grand Forks will be limited.
Shared Lanes on 3rd and 5th Avenues	(+)	$	Sharrows along 5th Avenue NW and 3rd Avenue NW will be low cost. Traffic volumes are low enough on these corridors that the facility should be appropriate for most riders.
Buffered or Protected Lanes on 4th Street NW	(+)	$$	4th Street NW was recently reconstructed and has no currently programmed project. However, stripping buffered bike lanes would provide a safe facility at a relatively low cost.
Buffered or Protected Lanes on DeMers Avenue	(++)	$$	Lane reconfiguration could be accomplished with limited impacts to vehicular operations but would provide significant benefits to bicycle and pedestrian mobility along and across DeMers Avenue. Implementation could be coordinated with mid-term improvement projects on DeMers Avenue.

Supporting Concepts and Policies

Bicycle Parking

Convenient and secure bicycle storage is essential to expand bicycle use through and to Downtown Grand Forks and East Grand Forks. Throughout Downtown Grand Forks, there are bicycle parking locations within the public right-of-way, including permanent bike racks at the edge of the sidewalk, and seasonal racks placed in parking spaces. In Downtown East Grand Forks, there are permanent bicycle racks throughout downtown.

Best practices for locations and styles should be considered for any new or replaced bicycle parking:

- Bicycle parking should be convenient to business fronts but avoid obstructing the walkway. Bicycle parking should be located near major generators as well, like Central High School.
- Bicycle parking should allow the bike frame to make contact at two points. This ensures stability, so bicycles do not tip over, bending their wheels.
- Bicycle lockers should be considered in parking garages and bus transfer locations to provide highly secure and reliable bike parking. These lockers can be reserved and rented to provide a revenue stream.

Figure 110: U-Rack Provides Stability and Security for Bicycles and Can Incorporate Branding Elements

Figure 111: Bike Boxes in Madison, WI

» Bike corrals that use an on-street parking space can also be used during the summer months to supplement the higher bike parking demand during warm weather months. Similar accommodations are already used on 3rd Street in Grand Forks.

Bicycle Accommodations at Intersections

As substantial improvements into the bicycle network are made, bicycle activity will surely increase and potentially justify higher levels of accommodations, especially at intersections. Potential intersection accommodations that may become necessary in the future include:

Figure 112: Bicycle Signals in Winnipeg, MB

» Bike boxes. Bike boxes are a designated area at the head of a traffic lane at a signalized intersection that provides cyclists with a safe and visible way to get ahead of queueing traffic, as shown in Figure 111. Bike boxes also serve to consolidate bicycle activity in the queue, minimizing total delays. Bike boxes are appropriate at signalized intersections with large volumes of right-turning vehicles and high bicycle activity.
» Bicycle signals. Similar to lead pedestrian interval, bicycle signals would provide additional time to bicycles to enter the intersection, improving their visibility and giving the cyclists start up time to get up to full speed. An example bicycle signal from Winnipeg, Manitoba is shown in Figure 112.

These accommodations are not necessarily appropriate in the very short-term. However, are tools that should remain under consideration as bicycle activity increases.

Bike Share

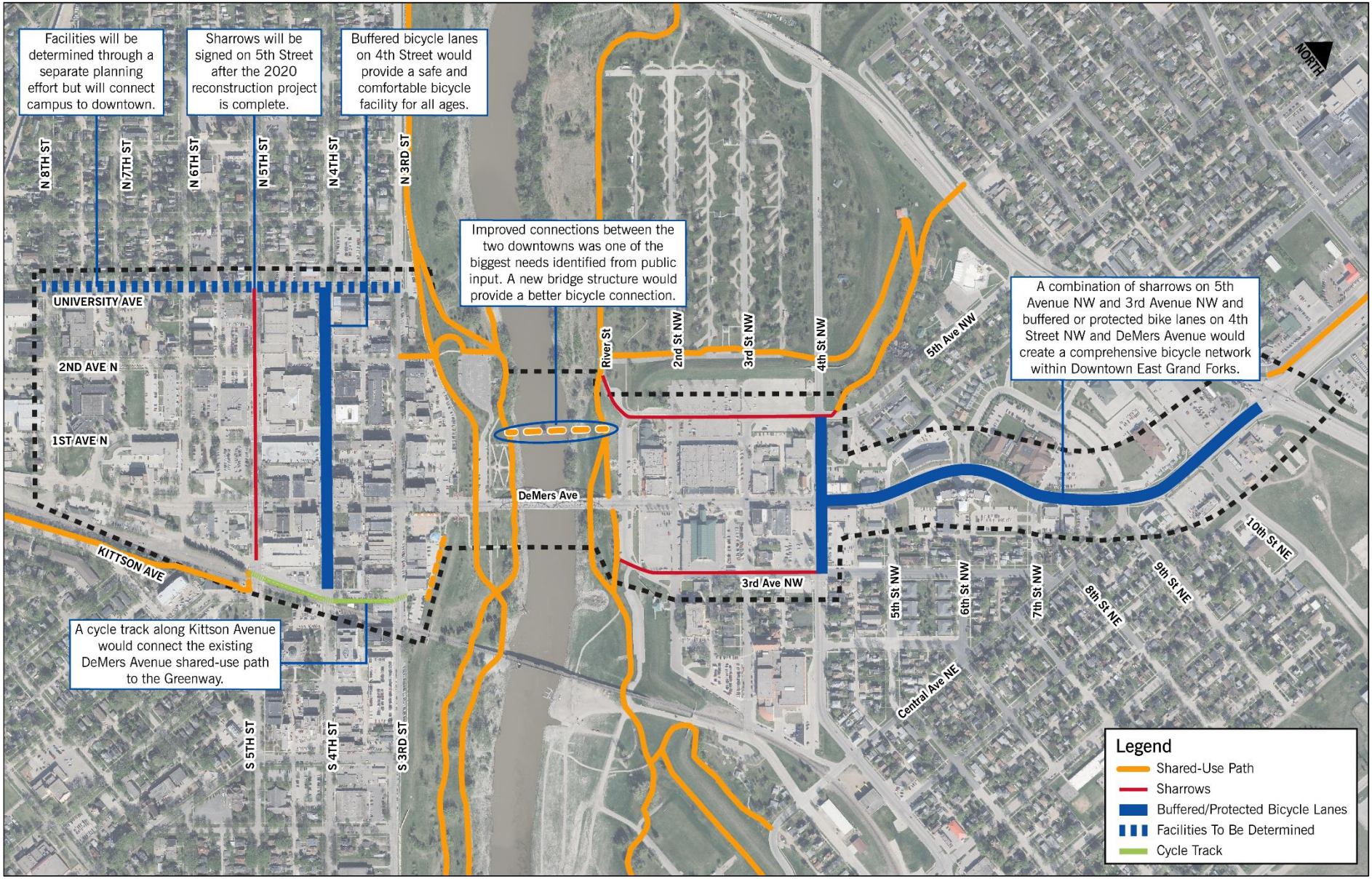
In 2019, the City of Grand Forks established a bike share service with 72 bikes and 17 locations, including 13 in Grand Forks and two in East Grand Forks. In its first three months, Grand Rides had nearly 600 unique riders and more than 1,000 trips. Each trip was an average of a half mile and most trips occurred on Wednesday and Fridays and during the hours of 12 Noon and 4 PM. In May 2020, the bikeshare provider discontinued the service in the Grand Forks – East Grand Forks area due to COVID-19 financial impacts. However, the Downtown Development Association has taken over the bike share program to continue the service. The following policies should be considered.

» Expand the network of high-quality bicycle facilities and locate stations and approved bike racks nearby.
» Provide more information on the City's website, including fixed station locations. Ensure the mobile application has high visibility in both the Google Play Store and the Apple App Store.
» Consider pre-paid cards for people who are unbanked to expand access for low-income individuals.
» Evaluate opportunities to integrate payment cards with Cities Area Transit.

Summary of Bicycle Facility Alternatives

The bicycle facilities identified in this study will help create a comprehensive network of facilities appropriate for cyclists of all ages and abilities. In addition to this study, the University Avenue corridor study will identify bicycle facilities on University Avenue. The future bicycle network for consideration is shown in Figure 113.

Figure 113: Summary of Bicycle Concepts



TRANSIT CONCEPTS

Downtown Grand Forks and East Grand Forks receive the highest levels of transit service in the entire Grand Forks – East Grand Forks metro. This makes trip times fairly competitive:

- During the lunch hour, a one-way trip between Grand Forks City Hall and the Blue Moose Bar and Grill would take three minutes to drive, four minutes to bike, 11 minutes to walk, or 16 minutes to take transit. Drive time does not include walking to-and-from the car or parking, while all other trip times incorporate door-to-door times.
- A matinee that starts at 4PM, a one-way trip between UND's Memorial Union and River Cinema would take around ten minutes to drive, 15 minutes to bike, 45 minutes to walk, or 15 to 34 minutes for transit. Drive time does not include walking to-and-from the car or parking, while all other trip times incorporate door-to-door times.
- During the evening dinner hour (before 6 PM), a one-way trip from Rhombus Guys in Grand Forks to Up North Pizza in East Grand Forks would take three minutes to drive, three minutes to bike, 11 minutes to walk, or six minutes to take transit. Drive time does not include walking to-and-from the car or parking, while all other trip times incorporate door-to-door times.

While transit trip times are very competitive, transit service between the two downtowns ends at 10 PM Monday through Saturday and there is no service on Sundays, with other routes ending around 6 PM. Improving or extending transit service throughout the study area could help maintain its competitiveness and attractiveness for trips that occur after the typical work hours. Despite its competitiveness, transit service and amenities received very few comments throughout the Steering Committee and public engagement process for issues identification and alternatives brainstorming. The feedback that was received throughout this plan primarily focused on

- Improving or adding service throughout downtown, including 3rd Street and 4th Street in Grand Forks.
- Improving stop amenities throughout both downtowns.

These concepts can be considered in the next update of the Transit Development Plan. Every five years, transit receives an in-depth evaluated through the Transit Development Plan (TDP) as part of the Metropolitan Transportation Planning process. In addition to the feedback received here, the 2017 TDP included a variety of downtown specific recommendations that may need to be reevaluated in the next update and are summarized below.

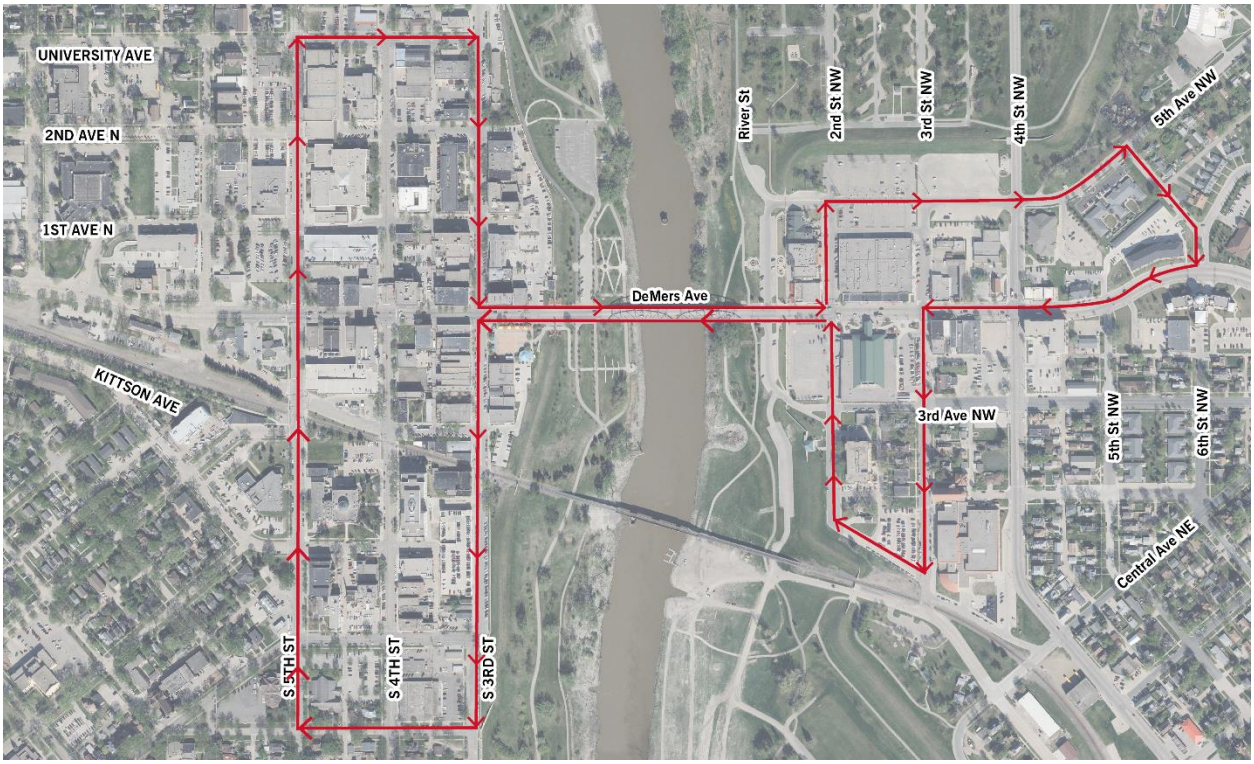
- A shelter was recommended for Downtown East Grand Forks along DeMers Avenue. This is one of the highest boarding locations in East Grand Forks. The current stop locations are directly in front of River Cinema and Cabela's. The stop locations may need to be modified to accommodate a shelter.
- Improving bicycle connections to between the two downtowns to expand access to the Metro Transit Center at Kittson Avenue and 4th Street.
- Provide high quality pedestrian facilities adjacent to transit stops.

The last TDP also considered a downtown circulator and late-night service but it was not able to be funded.

- A potential circulator route is shown in Figure 114. This route could run on 30-minute headways with one vehicle. Route refinements could be made to provide 15 minute service but may reduce the attractiveness of the route if it does not reach enough destinations. A circulator route would encourage people to park once while improving access to both downtowns, especially during inclement weather. An effective circulator route would also support efforts for transportation demand management. The circulator should run until 10 PM.
- System wide late night service would be necessary to support transit trips that may extend beyond 6 PM, like happy hours, dinner, movies, etc. Consideration and evaluation of financial impacts could be given to extend all regular service to 10 PM with late evening service running until midnight.

The TDP update process was last completed in 2017 and will next be updated in 2022. The next TDP will need to balance overall system needs with the needs throughout downtown.

Figure 114: Circulator Route



CARES Act Funding

As part of the 2019 Coronavirus Aid, Relief, and Economic Security (CARES) Act, Cities Area Transit received nearly $4 million to cover lost farebox revenue due to reduced transit ridership, more than the 2018 total operating funds. This money can be used to support capital, operating, and other related expenses. Both the City of Grand Forks and City of East Grand Forks indicated their CARES Act funding will likely be allocated to support existing transit service and needs.

Mobility Hubs

Bicycles, ride share, and transit facilities can often compete for space for amenities. However, when they are coordinated, they can work together to create mobility hubs and effectively use space to support multimodal trip making.

- Bicycles need space for parking and bike share equipment at all times of day.
- Ride-hailing in Grand Forks has dedicated pick-up and drop-off spaces between 10 PM and 3 AM at three locations.
- High quality transit stops include shelters. Transit service ends at 10 PM.

Figure 115: Mobility Hub from Minneapolis, Minnesota

Collaborative mobility hubs that interconnect multiple modes of travel can help facilitate use of alternative modes of travel. Facilitation is completed by connecting first mile/last-mile modes

of travel (i.e. bike share, ride-hailing) with longer modes of travel (transit, parking garage) and often support a combined payment platform to make it easier to integrate between modes.

Locating ride share pick-up and drop-off at transit stops with shelters provides a safe waiting location that do not compete for riders. They would also provide clarity for parking because the area would be a designated no-parking zone throughout the day instead of just at night. The combination between ride-hailing that is predominantly at night and transit which is predominantly during the day, allows for consistent use and reduced conflict at the hub locations.

An example mobility hub from Minneapolis, Minnesota is shown in Figure 115. The City of Minneapolis provided high quality transit shelters, bicycle parking, scooters, car share, street furniture, and information kiosks. Mobility hubs could be located at places like Central High School/Grand Forks City Hall, the Metro Transit Center, Riverboat Road parking lot, the Cabela's parking lot, and East Grand Forks City Hall.

Summary of Transit Concepts

The transit concepts discussed in this section will improve transit quality for existing riders and expand service to potentially attract new riders. The summary of transit concepts is shown in Table 21.

Table 21: Summary of Transit Concepts

Concept	Impact to Transit Mode	Cost of Implementation	Summary
No Build	(=)	$	Downtowns would continue to receive high-quality transit service.
Improved Stop Facilities	(+)	$$	Shelters improve transit riders' perception of service and are appropriate at high rider locations, like downtowns.
Late Evening Transit Service	(++)	$$	Late evening transit service would allow people to fully rely on transit for downtown trips, not just work trips.
Downtown Circulator	(+)	$$	The downtown circulator route would create direct service and run on a 30-minute frequency. This could also benefit parking management on the Grand Forks side, with significant available parking in East Grand Forks.
Mobility Hubs	(+)	$$	Mobility hubs would improve multimodal mobility throughout the two downtowns and serve as an information center for downtown visitors and residents.

PARKING CONCEPTS

Grand Forks

Parking in downtown Grand Forks was recently studied. The recommendations of this study are summarized below. More detail can be found within that study.

- Short-Term
  - Information and marketing campaign to expand availability, visibility, and accessibility of downtown parking information with improved signage and wayfinding.
  - Evaluate parking authority feasibility or different management models to ensure that management strategies are uniformly and consistently applied by the city and county.
  - Modify parking ramp operations and permitting to simplify the process for parking permit holders and clarify parking availability for the public.
  - Prioritize walking and biking investments in downtown.
  - Expand parking enforcement to ensure parking turns over reliably and consistently.

- Streamline the land development code to ensure all properties within downtown are subject to the same parking regulations.

» Mid-Term

- Expand data collection to regularly collect parking information to ensure strategies are having their desired outcomes.
- Prioritize maintenance and improvements to public parking facilities including lighting and security at Riverboat Road, monetizing the parking ramps, and a regular maintenance program for the three parking structures.
- Adopt a graduated parking fine.
- Establish a downtown event management plan to provide information for traffic circulation and routing as well as parking information and availability.

» Long-Term

- Plan for future technology impacts and monitor travel trends to ensure parking management is incorporating the most up to date strategies.
- Establish a parking meter policy and revisit it periodically to ensure the City is prepared for any statewide changes to law.

East Grand Forks

While no parking specific studies have been completed since 2011 in East Grand Forks, many of the recommendations of this study are still relevant. Recommendations from the 2011 parking study include:

» Pedestrian enhancements along 5th Avenue and the River Centre parking lots.
» Improved signage and wayfinding for pedestrians and vehicles.
» Marketing initiatives directed at downtown employers, employees, and visitors.
» Enforcement efforts to ensure employees do not use the two-hour parking spaces.

Parklets

Within the last five years, Grand Forks has been a leader in parklet design and implementation. Parklets use on-street parking to extend pedestrian amenities and/or available outdoor dining spaces. The COVID-19 pandemic has further highlighted the need for open-air dining as one precautionary measure to prevent the spread of the virus. Given the abundance of parking in both Grand Forks and East Grand Forks, parklets may provide an opportunity for restaurants to withstand the impacts of the pandemic in the short-term and fully utilize the curb space more effectively. Both cities should codify parklets and simplify their permitting process. Clarification of where parklets can be located (city streets like 3rd Street, 4th Street in Grand Forks and 2nd Street NW and 3rd Street NW in East Grand Forks) and where they are prohibited (DeMers Avenue, 5th Street in Grand Forks, 4th Street NW in East Grand Forks) should also be incorporated in the city ordinance and permitting information.

Figure 116: Parklet in Downtown Grand Forks

Summary of Parking Concepts

The parking concepts identified in the two parking studies completed for each downtown will improve the parking environment through management techniques and creating a more walkable space for people to park once.

Table 22: Parking Concepts Summary

Concept	Impact to Parking Mode	Cost of Implementation	Summary
No Build	(=)	$	Parking is over supplied but will continue to see areas of high demand through both downtowns.
Grand Forks Parking Study Concepts	(++)	$ - $$$$	The parking study concepts ranged from new policies, minor improvements like signage, and major improvements like new technology and parking structure maintenance.
East Grand Forks Parking Study Concepts	(++)	$ - $$	The parking study concepts ranged from new policies to minor improvements like signage.
Parklets	(-)	$	Parklets use available parking spaces to create more space for people and businesses.

TRAINS AND RAILWAYS

Burlington Northern Santa Fe's (BNSF) Grand Forks Subdivision rail line crosses 5th Street, 4th Street, and 3rd Street in Grand Forks south of DeMers Avenue and along Hill Street south of the study area in East Grand Forks. The train issues in the two cities vary. In Grand Forks, train events block all three north-south roadways in the core of downtown creating delays. In East Grand Forks, trains are not subject to a quiet zone resulting in excessive noise.

Downtown Grand Forks

The Grand Forks subdivision carries eight trains each day with a maximum speed of 20 miles per hour. The traffic volumes at these crossings range from 2,300 to 5,900 under current conditions. By 2045, traffic volumes at these crossings range from 4,000 to 7,300.

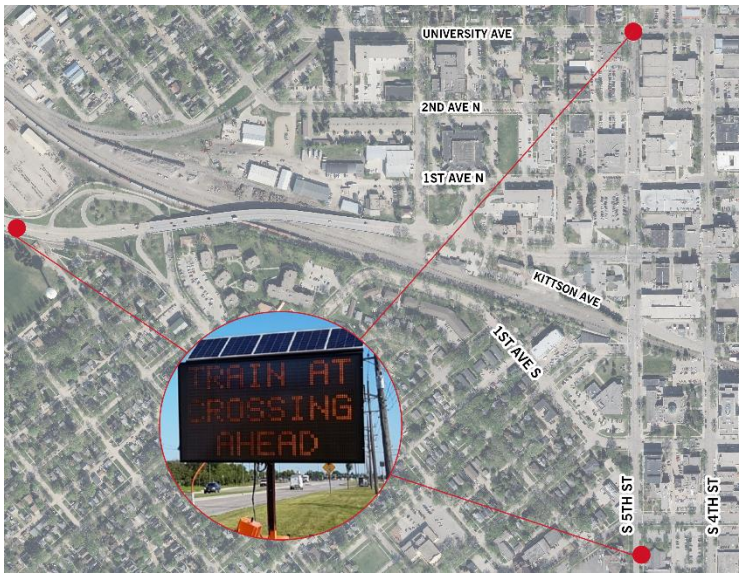
The *Highway-Rail Crossing Handbook 3rd Edition* provides guidance on when grade separations should be considered. The applicable factors are listed and described in Table 23. Based on a high-level analysis, these crossings are not candidates for grade separation because they do not currently meet any thresholds and are unlikely to by 2045. Further, a grade separation would come with extremely high costs and right-of-way needs.

Table 23: Downtown Grand Forks Railroad Grade Separation Criteria

Factor	Description	5th Street Crossing (#081284D)	4th Street Crossing (#081283W)	3rd Street Crossing (#081281H)
Daily Traffic	Greater than 30,000 Vehicles per Day	2045: 7,300	2045: 4,000	2045: 4,900
Train Activity	30 or More Trains per Day	8	8	8
Freight Train Crossing Exposure	Number of Trains x Daily Traffic > 900,000	58,400	32,000	39,200
Accident Prediction	Federal Railroad Administration's Accident Prediction Methodology for Crossing > 0.5	0.0168	0.04487	0.01529
Vehicle Delay	Daily Vehicle Delays > 30 Vehicle Hours	Not Available	Not Available	Not Available

Even though a grade separation here is not warranted, improving traveler information could be accomplished with an intelligent transportation systems (ITS) routing solution, as shown in Figure 117. This solution would implement a variety of technologies to warn drivers of an upcoming train event to allow them to select a different route with advanced train detection and dynamic message signs. Reviewing this opportunity through both downtowns, there appears to be some benefits for traffic heading northeast into downtown along DeMers Avenue that turn southeast across the tracks. Being properly notified would allow these motorists to take the DeMers Avenue and 4th Avenue S interchange to their destinations. A cursory review of traffic volumes making this movement that do not have a destination downtown appears to be relatively modest. This configuration does not appear feasible from the East Grand Forks Side of the river given that all alternative routes would still cross the railroad tracks. Current local practice already uses Hill Street to access the underpass and avoid rail delays. However, creating an official detour using this route would redirect traffic onto low volume corridors that would support bicycle mobility. Additionally, much of the traffic coming from the south uses 4th Street, which does not cross the railroad tracks. The cost to implement with three dynamic message signs (DMS) at a cost of approximately $600,000. The signs would receive information via the econolite controllers in the area.

Figure 117: Dynamic Message Sign for Train Information System



Downtown East Grand Forks

The primary concern for railroad activity in East Grand Forks is train horn noise. The creation of a quiet zone would mitigate the effects of train horn noise but would likely require improved crossing safety measures at the three crossings south of the Downtown Transportation Study study area. Quiet zone designation requirements include:

- Each public crossing must, at a minimum, be equipped with gates. The 3rd Street NW crossing does not currently include gates. The other two crossings do include gates.
- A quiet zone must be one-half mile in length. Between the Red River and the BNSF switching yard is approximately one-half mile.
- A quiet zone may be designated if supplementary safety measures (SSMs) are applied to every at-grade crossing **or** if the Quiet Zone Risk Index (QZRI) is below the Nationwide Significant Risk Threshold (NSRT) **or** if SSMs are applied to reduce the QZRI to a level below the NSRT.
    - SSMs include closure, four-quadrant gates, or two- or three-quadrant gates with medians.

The completion of a quiet zone study is currently in process which will identify the appropriate solutions for these crossings. Costs to implement could become quite costly, depending on the necessary improvements.

Figure 118: Potential East Grand Forks Quiet Zone south of Downtown

Summary of Trains and Railways Concepts

There were two trains and railway concepts discussed for downtown Grand Forks and East Grand Forks. The summary of these concepts is shown in Table 24.

Table 24: Summary of Trains and Railways Concepts

Concept	Impact to Trains/Railway Mode	Cost of Implementation	Summary
No Build	(=)	$	The relatively low train activity in the two downtowns impacts all modes of transportation, however unfrequently.
Train Activity Information through DMS	(++)	$$ - $$$$	The train activity information would help drivers select a better route, reducing congestion associated with train events.
East Grand Forks Quiet Zone	(++)	$$ - $$$$	The improvements associated with the quiet zone would likely improve crossing safety for all modes and provide relief from train horn noise. A quiet zone study is currently in process.

SUMMARY

Multiple alternatives for vehicles, pedestrians, bicycles, transit, and rail were discussed throughout this report. It is unlikely that all improvements are desired by the public and decision-makers and even less likely that each can be funded. Through later phases of the process, review, refinement and prioritization of concepts will be conducted with the steering committee, public and decision makers. Each concept can work independently or in concert to improve the overall transportation environment. Many concepts improve more than one mode of transportation throughout downtown, as shown in Table 25. Figure 119 summarizes the major improvements by mode.

Table 25: Summary of All Improvements

Alternative	Benefits by Mode						Total Benefits	Cost	Summary
	Vehicle	Pedestrian	Bicycles	Transit	Parking	Rail			
No Build	=	=	=	=	=	=	=	$	Doing nothing through 2045 will result in increasingly poor traffic operations, travel time reliability, and crash trends. More driver frustration and higher traffic volumes could result in less safe bicycle and pedestrian conditions.
Interconnect Traffic Signals	+	=	=	+	=	=	++	$$	There are clear benefits to reducing compounded signal delay and potentially lessening the rear end crash trends interconnecting the traffic signals between Grand Forks and East Grand Forks.
Adaptive Signal Control	++	=	=	+	=	=	+++	$$	ASC showed significant benefits to DeMers Avenue under a range of regularly occurring scenarios. ASC would reduce the staff time to create multiple time-of-day signal timing plans while improving operations.
Freight Signal Priority	-	=	=	-	=	=	--	$$	Freight signal priority during high truck traffic times decreases the operational effectiveness of DeMers Avenue.
Event Management	=	=	=	=	=	=	=	$$	Event management shows very few benefits to the DeMers Avenue corridor.
Transportation Demand Management	+	=	=	+	+	=	+++	$ - $$	Reducing demand on DeMers Avenue will be an important strategy to mitigating future operational and safety issues. However, the effectiveness of this practice varies widely.
Roundabout Between 1st Avenue and 8th Street*	+	++	=	=	=	=	+++	$$$	A 2x1 hybrid roundabout would provide acceptable operations and would likely reduce speeds and provide bicycle/ pedestrian crossing benefits if properly designed. Hybrid roundabouts have conflicting crash reduction factors, but conclusively do reduce crash severity. The cost would be significant for the modest benefits.
3rd Street – Reverse Angle Parking	+	=	+	=	=	=	++	$$	Implementing reverse angle parking can help improve visibility when exiting the parking space. Initial challenges of unfamiliarity may need to be mitigated with proper driver education. Reverse angle parking would likely mitigate the parking related crashes and improve bicycle safety.

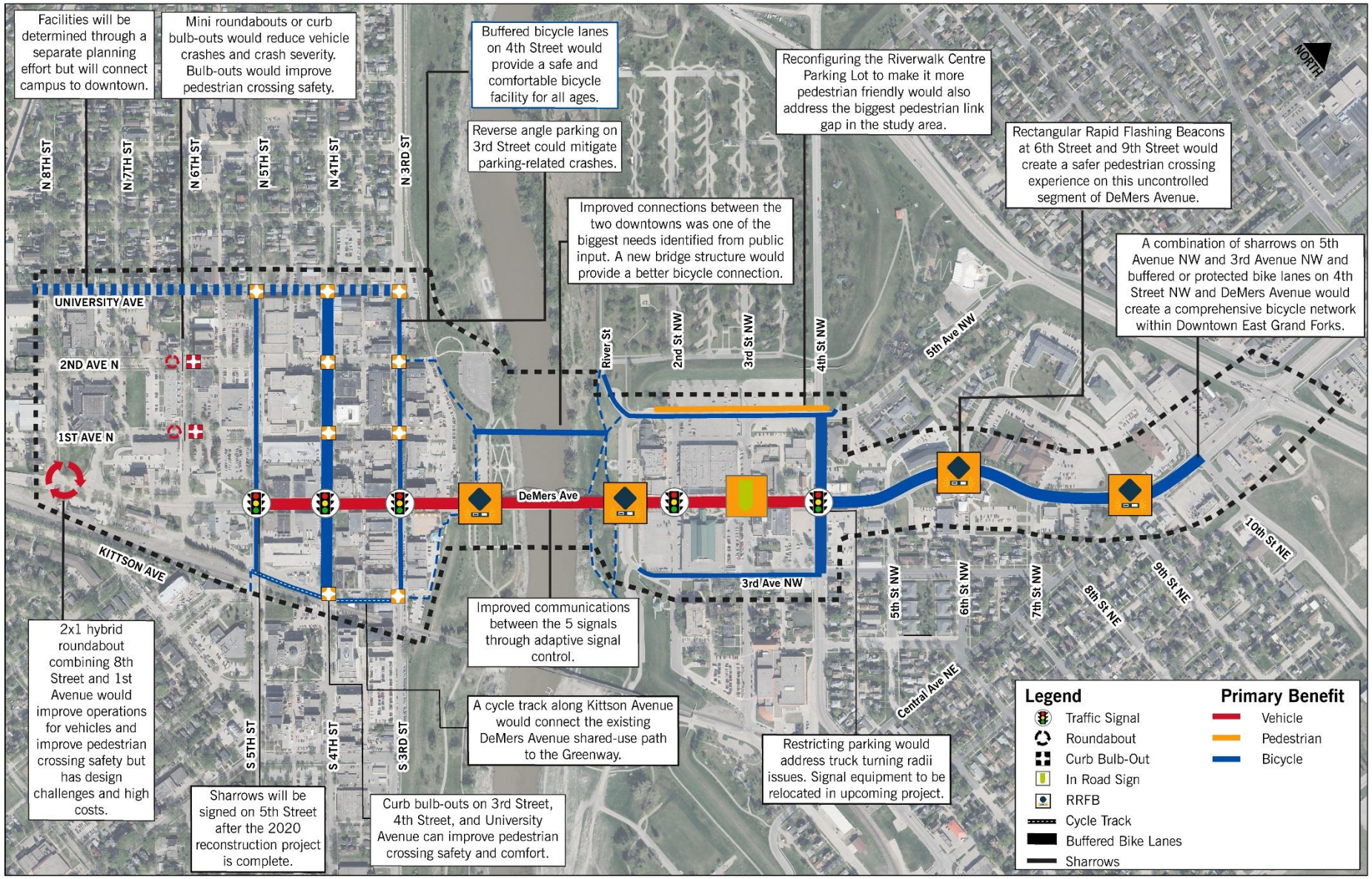
Alternative	Benefits by Mode						Total Benefits	Cost	Summary
	Vehicle	Pedestrian	Bicycles	Transit	Parking	Rail			
6th Street – Curb Bulb-Outs	++	+	=	=	=	=	+++	$$	The curb bulb-outs will provide additional space to improve visibility around the 6th Street intersections. They would also likely reduce vehicle speeds, which would lessen crash severity. Pedestrian crossing safety at these locations would be improved by reducing their crossing exposure.
6th Street – Mini Roundabouts	++	=	=	=	=	=	++	$$	Mini roundabouts on 6th Street would significantly reduce the angle crashes occurring on this corridor and act to calm traffic. These would be considered only if curb bulb-outs were not effective.
4th Street NW – Remove Parking and Relocate Signal Equipment	=	=	=	=	=	=	=	$ - $$	The parking restrictions would immediately address the challenging turning radius with the signal equipment being relocated during programmed construction projects.
DeMers Avenue Pedestrian Crossing Enhancements	=	++	=	=	=	=	++	$$	While the pedestrian crossing enhancements have proven effectiveness with stop compliance, DeMers Avenue remains very wide east of 4th Street NW.
DeMers Avenue Pedestrian Crossing Enhancements with Lane Reconfiguration	=	++	++	=	=	=	++++	$$	The combination of pedestrian crossing enhancements with the lane reconfiguration would provide the safest crossing facilities and expand bicycle mobility.
3rd Street Curb Bulb-Outs	=	++	=	-/=	-	=	=	$$	Creating comfortable pedestrian crossing locations will encourage people to walk in downtown, helping meet other goals of transportation demand and parking management as well as support the vast number of businesses, services, and events. Bulb-outs can be incorporated into an upcoming project to minimize costs.

Alternative	Benefits by Mode						Total Benefits	Cost	Summary
	Vehicle	Pedestrian	Bicycles	Transit	Parking	Rail			
4th Street Curb Bulb-Outs	=	++	=	=	=	=	++	$$	Creating comfortable pedestrian crossing locations will encourage people to walk in downtown, helping meet other goals of transportation demand and parking management as well as support the vast number of businesses, services, and events.
Riverwalk Centre Parking Lot Reconfiguration	=	++	=	=	=	=	++	$$	Creating dedicated pedestrian facilities throughout the parking lot would increase pedestrian safety and comfort and connect the existing Greenway facilities to sidewalks and shared-use paths throughout downtown.
Grand Forks ADA Transition Plan	=	+*	=	+	=	=	++	$$	An ADA transition plan would identify pedestrian improvements but would not result directly in their implementation.
Winter Maintenance Enforcement	=	+	=	=	=	=	+	$	Winter maintenance enforcement would improve the winter walking experience but may be challenging to find the right set of enforcement tools.
Central High School Alleyway Crossing	+	+	=	=	=	=	++	$$	Improved crossing facilities at the alleyway will increase visibility of those crossing before and after school.
Lead Pedestrian Interval	-	++	=	=	=	=	+	$	Lead pedestrian interval reduces vehicle-pedestrian conflicts up to 60 percent but could have some minor impacts to vehicle level of service.
New River Crossing	=	++	++	=	=	=	++++	$$$	A new bridge crossing would expand bicycle mobility between the two downtowns and the Greenways. The bridge would come with a high cost with no identified funding.
Grand Forks East-West Bicycle Mobility	=	=	++	=	=	=	++	$$	Connecting the Greenway to the existing shared-use path that runs along DeMers Avenue would mitigate a major gap in the bicycle facility network.
Grand Forks North-South Bicycle Mobility	=	=	++	=	=	=	++	$ - $$	Selecting the appropriate facilities and corridor will determine the impact to bicycle mobility. Shared lanes on 3rd Street or 5th Street would not provide an all ages facility. Higher-level facilities on 4th Street could be constructed to provide a very comfortable facility but would come with a higher cost.

Alternative	Benefits by Mode						Total Benefits	Cost	Summary
	Vehicle	Pedestrian	Bicycles	Transit	Parking	Rail			
Shared Lanes on 3rd and 5th Avenues in East Grand Forks	=	=	+	=	=	=	+	$	Shared lanes along 5th Avenue NW and 3rd Avenue NW will be low cost. Traffic volumes are low enough on these corridors that the facility should be appropriate for most riders.
Buffered or Protected Lanes on 4th Street NW in East Grand Forks	=	=	++	=	-	=	+	$$	4th Street NW was recently reconstructed and has no currently programmed project. However, stripping buffered bike lanes would provide a safe facility at a relatively low cost.
Buffered or Protected Lanes on DeMers Avenue in East Grand Forks	=	=	++	=	-	=	+	$$	Lane reconfiguration could be accomplished with limited impacts to vehicular operations but would provide significant benefits to bicycle and pedestrian mobility along and across DeMers Avenue. Implementation could be coordinated with mid-term improvement projects on DeMers Avenue.
Improved Transit Stop Facilities	=	=	=	++	=	=	++	$$	Shelters improve transit riders' perception of service and are appropriate at high rider locations, like downtowns.
Late Evening Transit Service	+	=	=	++	+	=	++++	$$	Late evening transit service would allow people to fully rely on transit for downtown trips, not just work trips.
Downtown Circulator	+	=	=	++	+	=	++++	$$	The downtown circulator route would create direct service and run on a 30-minute frequency. This could also benefit parking management on the Grand Forks side, with significant available parking in East Grand Forks.
Mobility Hubs	+	+	+	+	+	=	+++++	$$	Mobility hubs would improve multimodal mobility throughout the two downtowns and serve as an information center for downtown visitors and residents.
Grand Forks Parking Study Concepts	=	+	+	=	++	=	++++	$ - $$$$	The parking study concepts ranged from new policies, minor improvements like signage, and major improvements like new technology and parking structure maintenance.

Alternative	Benefits by Mode						Total Benefits	Cost	Summary
	Vehicle	Pedestrian	Bicycles	Transit	Parking	Rail			
East Grand Forks Parking Study Concepts	=	+	+	=	++	=	++++	$ - $$	The parking study concepts ranged from new policies to minor improvements like signage.
Parklets	=	+	=	=	-	=	=	$	Parklets use available parking spaces to create more space for people and businesses.
Train Activity Information through DMS	+	=	=	=	=	=	+	$$ - $$$$	The train activity information would help drivers select a better route, reducing congestion associated with train events.
East Grand Forks Quiet Zone	+	+	+	+	=	+	+++++	$$ - $$$$	The quiet zone would require a quiet zone study and field review before final recommendations, and costs, could be implemented. The improvements associated with the quiet zone would likely improve crossing safety for all modes and provide relief from train horn noise.

Figure 119: Summary of Concepts



WHAT WE HEARD: COMMUNITY PREFERENCES

After developing and evaluating the multimodal concepts, the general public and the project's Steering Committee was asked to provide feedback on each alternative.

PUBLIC INPUT

The second public input meeting for the Downtown Grand Forks – East Grand Forks Transportation Study was held virtually due to the COVID-19 pandemic. The virtual open-house meeting was held from August 3rd to August 17th, 2020 on the project website, www.dtforksmobility.com. The virtual open house included the following activities:

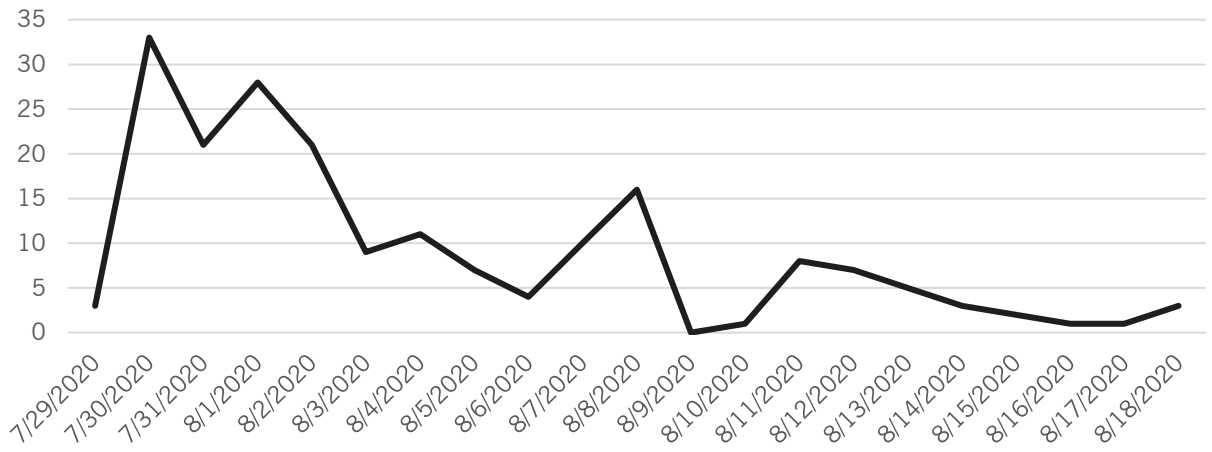
- Short videos which discussed the different alternatives for each mode, including vehicles, pedestrians, bicycles, and transit and trains.
- Project documents for review such as the Alternatives Report, Steering Committee Meeting Summaries, and others.
- A map-based survey on the different alternatives.
- Opportunity for written comments.

The public input opportunity was marketed through a variety of means:

- City of Grand Forks' social media, including Facebook and Nextdoor.
- City of East Grand Forks' social media, including Facebook, as well as a city-wide text alert.
- Grand Forks – East Grand Forks Metropolitan Planning Organization's social media, including Facebook.
- Advertisement in The Exponent, East Grand Forks' community newspaper.
- Advertisement in the Grand Forks Herald.
- The Greenway's email listserv.
- MnDOT District 2's social media, including Twitter and Facebook.
- NDDOT's events calendar and Facebook events.
- Downtown Development Association's weekly email.

In total, there were 204 unique visitors to the website during this virtual open-house, 72 views of the videos, and 73 alternatives surveys completed.

Figure 120: Unique Visitors by Day



STEERING COMMITTEE FEEDBACK

In addition to the public's feedback on the alternatives, the study's Steering Committee was asked to provide the same feedback on each of the different alternatives. The Steering Committee includes representatives from the following organizations:

- Downtown Development Association
- Options Resource Center for Independent Living
- Grand Forks Region Economic Development Corporation
- Cities Area Transit
- City of East Grand Forks (Engineering, Planning, Public Works, and City Council)
- City of Grand Forks (Engineering, Planning, Public Works, and City Council)
- Grand Forks - East Grand Forks MPO
- NDDOT
- MnDOT
- FHWA North Dakota

The Steering Committee was also given the opportunity to identify their top five concepts. The Steering Committee feedback was combined with the public's feedback to develop each concept's priority.

STAKEHOLDER PRIORITIES

The feedback gathered from the public and the Steering Committee was combined to develop each alternative's value score. The value score applied a zero score to unnecessary votes, a score of one to useful votes, and a score of two to critical votes. The scores were then divided by the total number of votes to develop the value score. To summarize these results, alternatives with a value score of 1.25 or greater were considered critical, and the highest priority. Alternatives with a score between 1.00 and 1.25 were considered useful, and those with a score below 1.00 were classified as low priority.

Table 26 shows a summary of the value assignments and the value score. Based on the value score, nine alternatives were identified as high priority projects, eight were identified as medium priority projects, and fourteen were identified as low priority projects. These priorities were considered when developing the implementation plan.

The highest priority concepts generally favored bicycle and pedestrian concepts including the Riverwalk Centre parking lot reconfiguration in East Grand Forks, 3rd Street and 4th Street curb bulb-outs in Grand Forks, pedestrian crossing enhancements in East Grand Forks, the Kittson Avenue cycle track concept in Grand Forks, and the new Red River bicycle and pedestrian crossing. Improving travel time reliability through interconnected traffic signals/adaptive signal control and the 6th Street N curb bulb-outs were also prioritized. Figure 121 shows the highest priority concepts and the unnecessary, useful, and critical votes they received.

The medium priority concepts were generally supportive policies to make walking and biking safer and easier, including winter maintenance enforcement, Grand Forks right-of-way (ROW) ADA transition plan, lead pedestrian interval, and bike policy changes. There were some infrastructure concepts in the medium priority, including the DeMers Avenue lane reconfiguration in East Grand Forks from 4th Street NW to US 2, the East Grand Forks quiet zone, Grand Forks north-south bicycle mobility, and mobility hubs. Figure 122 shows the medium priority concepts and the unnecessary, useful, and critical votes they received.

The remaining concepts were a low priority based on the stakeholder feedback.

Table 26: Stakeholder Priorities

Alternatives	Unnecessary	Useful	Critical	Value score
High Priority				
Riverwalk Centre Parking Lot Reconfiguration (EGF)	2	4	11	1.53
Interconnected Traffic Signals	2	4	11	1.53
Adaptive Signal Control	1	6	9	1.50
East Grand Forks Pedestrian Crossing Enhancements	2	6	10	1.44
4th Street Curb Bulb-Outs (GF)	1	7	9	1.44
Kittson Avenue Cycle Track Concept (GF)	1	9	8	1.39
New River Crossing	4	5	11	1.35
6th Street N Curb Bulb-Outs (GF)	1	10	6	1.29
3rd Street Curb Bulb-Outs (GF)	3	7	8	1.28
Medium Priority				
DeMers Avenue Bike Lanes/Lane Reconfiguration (EGF)	3	8	7	1.22
Winter Maintenance Enforcement	2	8	4	1.14
Grand Forks ROW ADA Transition Plan	4	6	6	1.13
Lead Pedestrian Interval	1	12	2	1.07
East Grand Forks Quiet Zone	4	7	5	1.06
Grand Forks North-South Bicycle Mobility	7	12	8	1.04
Bike Policy Changes	5	10	5	1.00
Mobility Hubs	3	10	3	1.00
Low Priority				
Roundabout Between 1st Avenue and 8th Street (GF)	4	10	3	0.94
Central High School Alley Crossing (GF)	4	10	3	0.94
Parklets	5	9	3	0.88
Downtown Circulator	4	10	2	0.88
Transportation Demand Management	4	9	2	0.87
4th Street NW – Turning Radii Improvements (EGF)	5	12	2	0.84
Improved Transit Stop Facilities	5	12	2	0.84
East Grand Forks Bicycle Network	16	20	9	0.84
Late Evening Transit Service	5	10	1	0.75
3rd Street N Reverse Angle Parking (GF)	6	10	1	0.71
Train Activity Information through DMS	6	9	1	0.69
6th Street N Mini-Roundabouts (GF)	8	8	1	0.59
Event Management	12	4	1	0.35
Freight Signal Priority	14	3	0	0.18

Figure 121: Highest Priority Concepts

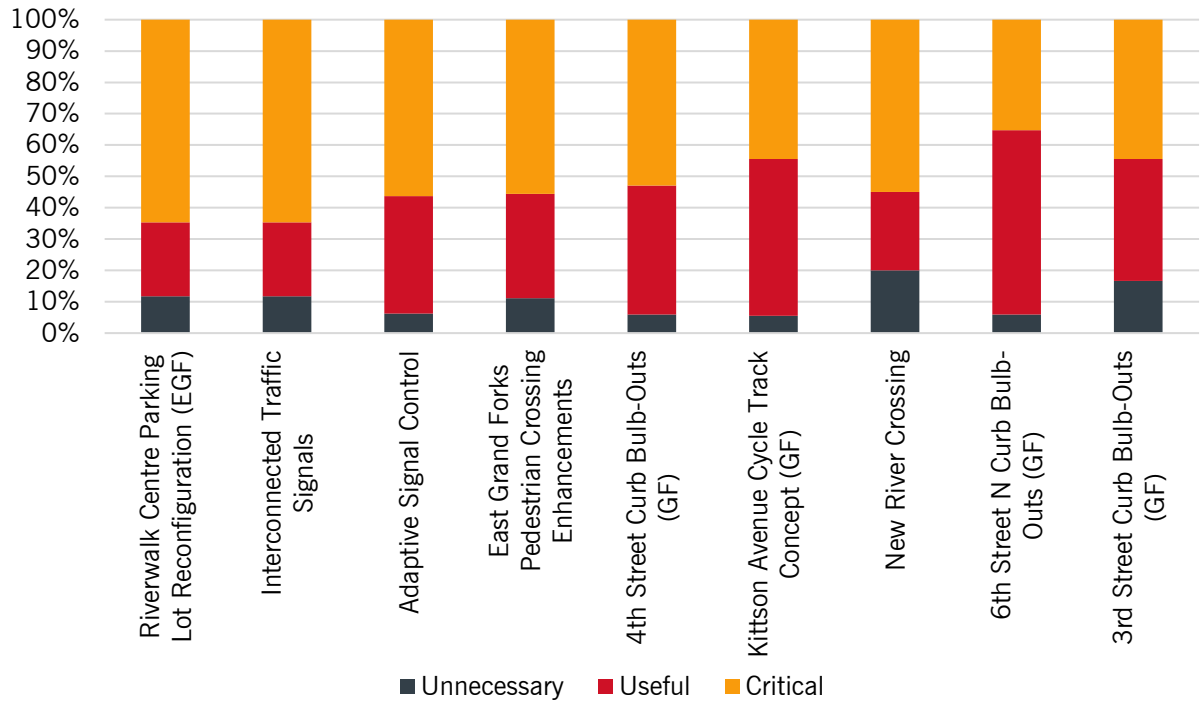
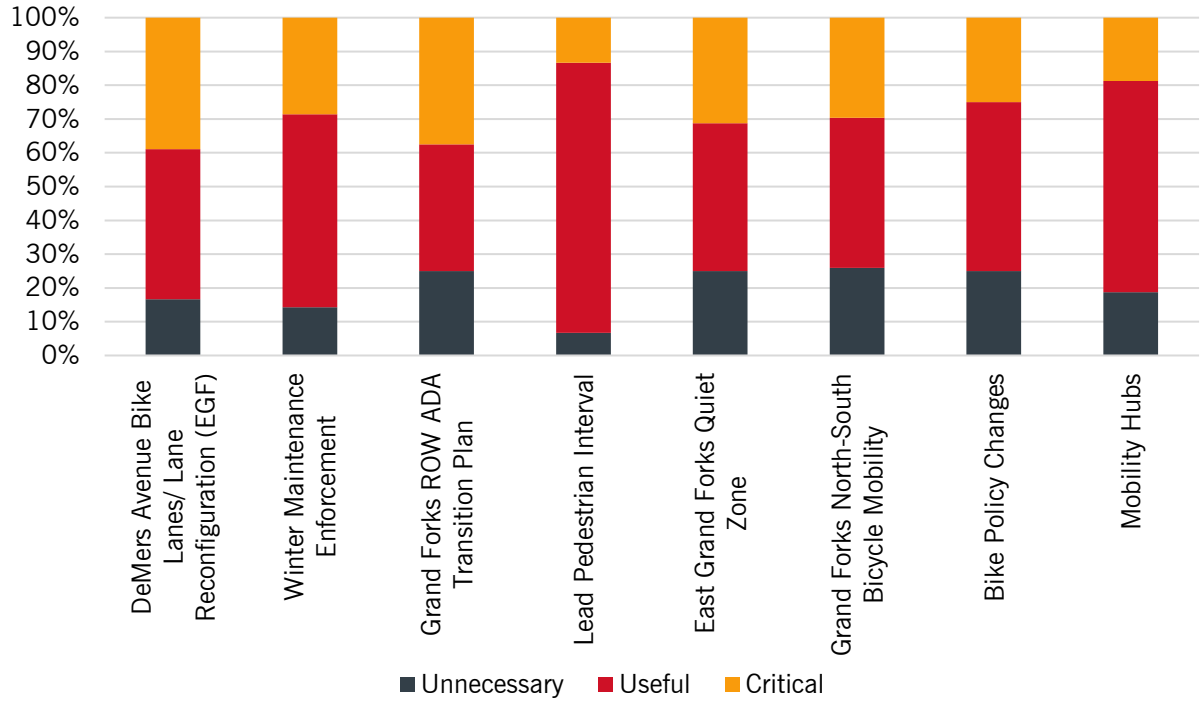


Figure 122: Medium Priority Concepts



PRIORITIES AND IMPLEMENTATION

The goal of this chapter is to develop a set of next steps for the concepts that were proven to be both technically beneficial to the downtown transportation network and a community priority based on the stakeholder feedback. The implementation plan considers those criteria, while working within the constraints of project development and funding.

FUNDING AND IMPLEMENTATION PROCESS

The initial identification and preliminary scoping of transportation projects is generally done through the Metropolitan Transportation Planning (MTP) process. The MTP is a long-range planning document that identifies and prioritizes projects based on both projected needs and expected funding levels. Transportation funds come from a variety of sources, including Federal, State, and local sources (general funds, assessments, and infrastructure sales tax). The MTP planning process was most recently completed in 2019 and identified more than $65 million over the next 25 years for investment in the downtown transportation network. Despite this significant level of investment for Downtown, there were a variety of projects listed as “illustrative”, which means they are of high importance to the community but there is no funding currently identified or available for them.

For a project to be listed in the Transportation Improvement Program (TIP), it must first be a part of the approved MTP. The US Department of Transportation requires the TIP to include projects that will be funded with federal assistance and projects considered regionally significant regardless of funding source. The TIP is a four-year document and is updated annually to account for changes in funding levels from the Federal, State, and local government levels and updates projects that will be programmed in the next four years.

Projects currently programmed in the TIP and MTP provide an opportunity to incorporate many of the concepts considered in this Downtown Transportation Study. Influencing already programmed projects is the easiest way to get these concepts implemented. However, local funds through cities’ capital improvement programs may be secured to implement concepts outside the MTP and TIP process. Projects that do not fit within an existing programmed project will be prioritized based on the technical and stakeholder feedback to assist in the decision-making process if additional funds are identified. Figure 123 shows the transportation project identification, funding, and implementation process, generally.

Figure 123: Transportation Project Funding and Implementation Process

Table 27 shows the projects in downtown Grand Forks and downtown East Grand Forks that have been identified through the MTP and TIP process, their expected time frame, year of expenditure cost, and the Downtown Transportation Study concepts that could be incorporated within these projects. The table includes four time frames: TIP projects (i.e. funded projects) which have been programmed for 2021 through 2024, short-term which is 2025 through 2027, mid-term which is 2028 through 2037, and long-term which is 2038 to 2045.

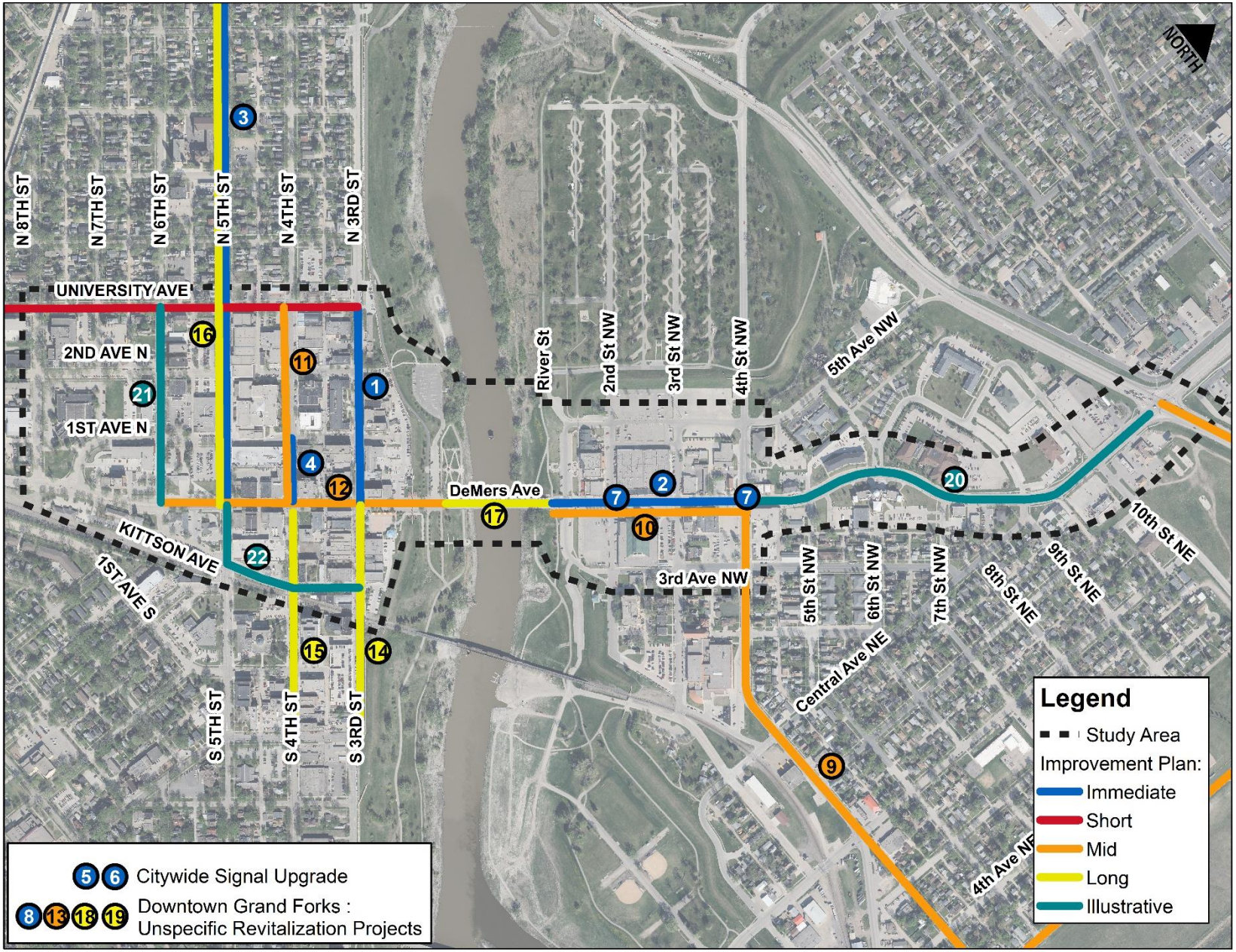
Table 27: Currently Programmed Transportation Projects

ID	Project	Description	Time Frame	YOE Cost*	Downtown Transportation Study Concepts	Concept Priority
1	N 3rd Street	Reconstruct from DeMers Ave to University Ave	2021	$3.5 M	Curb Bulb-Outs	High
					Reverse Angle Parking**	Low
2	DeMers Avenue – EGF	Pavement Repairs and Crossing Improvements	2021	$291 K	Pedestrian Crossing Enhancements	High
3	N 5th Street	Chip Seal from Gateway Dr to DeMers Ave	2022	$100 K	North-South Bike Connectivity (Sharrows)	Medium
4	N 4th Street	Reconstruct from DeMers Ave to 1st Ave N	2022	$2.3 M	Curb Bulb-Outs	High
					North-South Bike Connectivity (Bike Lanes)	Medium
5	Citywide Signal Upgrade	Rehabilitate Traffic Signals on Urban Road System	2022	$3.1M	Lead Pedestrian Interval	Medium
6	Citywide Signal Upgrade	Rehabilitate Traffic Signals on Regional Road System	2024	$6.2 M	Interconnect Signals/ASC	High
7	DeMers Avenue – EGF	Replace 2 traffic signals at 2nd St and 4th St	2024	$1.2 M	Interconnect Signals/ASC	High
					Lead Pedestrian Interval	Medium
8	Downtown Grand Forks	Revitalization – Eastern Area	Short	$1.0 M	No specific concept.	NA
9	4th Street NW (EGF)	Resurface from DeMers Ave to US 2	Mid	$2.0 M	Buffered/Protected Bike Lanes	Low
10	DeMers Avenue – EGF	Concrete Rehabilitation from Red River to 4th St NW	Mid	$3.0 M	Pedestrian Crossing Enhancements	High
11	N 4th Street	Reconstruct from N 1st Ave to University Ave	Mid	$7.3 M	Curb Bulb-Outs	High
					Buffered/Protected Bike Lanes	Medium
12	DeMers Avenue – GF	CPR & Grind from 6th St to Red River	Mid	$158 K	No specific concept.	NA
13	Downtown Grand Forks	Revitalization – Northern Area	Mid	$1.0 M	No specific concept.	NA
14	S 3rd Street	Reconstruct from DeMers Ave to Division Ave	Long	$11.2 M	Curb Bulb-Outs	High
15	S 4th Street	Reconstruct from DeMers Ave to Division Ave	Long	$11.2 M	Curb Bulb-Outs	High
					Buffered/Protected Bike Lanes	Medium
16	N 5th Street	Mill & HBP from Gateway Dr to DeMers Ave	Long	$2.5 M	Sharrows	Medium
17	DeMers Avenue	Repaint Sorlie Bridge	Long	$5.3 M	No specific concept.	NA
18	Downtown Grand Forks	Revitalization – Southern Area	Long	$1.0 M	No specific concept.	NA
19	Downtown Grand Forks	Revitalization – Western Area	Long	$1.0 M	No specific concept.	NA
20	DeMers Avenue - EGF	Reconstruct from 4th St NW to US 2	Illustrative	$2.1 M	Pedestrian Crossing Enhancements	High
					4th Street NW – Turning Radii Changes	Low
					Lane Reconfiguration/ Bike Lanes	Medium
21	N 6th Street	Reconstruct from DeMers Ave to University Ave	Illustrative	$880 K	Curb Bulb-Outs	High
					Mini Roundabouts	Low
22	Kittson Avenue	Reconstruct from DeMers Ave to S 3rd St	Illustrative	$1.0 M	Cycle Track	High

**Year of Expenditure (YOE) costs have been inflation adjusted to the year of anticipated construction. Illustrative projects have no identified funding and reported costs are in 2019 dollars, not year of expenditure dollars like other listed projects.*

***Project development activities occurring concurrently with this study. Project is too far along to incorporate reverse angle parking but will include curb bulb-outs.*

Figure 124: TIP and MTP Projects in the Downtown Transportation Study Study Area



While many of the concepts can be coordinated with the already identified projects, some identified projects are too far along in the project development phase or do not have adequate funding to add to the project's scope to accommodate the Downtown Transportation Study concepts. Projects listed in the MTP still provide flexibility to allow for the addition of concepts identified in this study. Coupling newly identified concepts from this study with previously identified needs in the MTP is an efficient process in project implementation. Additionally, some concepts, like the East Grand Forks quiet zone are being pursued by the city outside of the traditional transportation funding process, so are not listed in the table above, but will be noted in the discussion of the concepts below.

PRIORITIES AND IMPLEMENTATION

Despite the significant investments that are programmed for the downtown study area, community priorities and changing funding levels can result in the removal or reorganization of projects. To help prioritize the concepts into short-, mid-, and long-term time frames, three inputs were used:

- The value score that was developed based on the Steering Committee and public input.
- Identifying funded and programmed projects in which the Downtown Transportation Study concepts can be incorporated.
- Technical merit of the alternatives.

There may be some instances where projects have a lower value score, but a funded project can expedite its implementation.

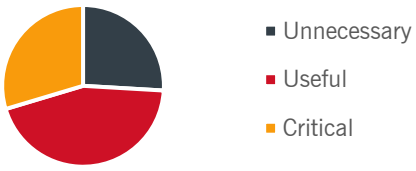
SHORT-TERM CONCEPTS

A variety of Downtown Transportation Study concepts can be implemented, at least partially, in infrastructure projects that have been funded through 2024.

5TH STREET N PAVEMENT MAINTENANCE (GRAND FORKS)

In 2020, a mill and overlay project occurred on 5th Street between Gateway Drive and Kittson Avenue. This project added sharrows to the corridor. Opportunities to extend the sharrows an additional block to connect to the shared-use path that terminates south of Kittson Avenue should be considered. This would help build the downtown Grand Forks bicycle network, eventually connecting to the Kittson Avenue cycle track concept. This would likely require local funds to complete this connection. Table 28 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into the 5th Street reconstruction project.

Table 28: Downtown Transportation Study Concepts Related to the 5th Street Reconstruction

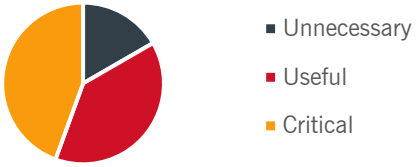
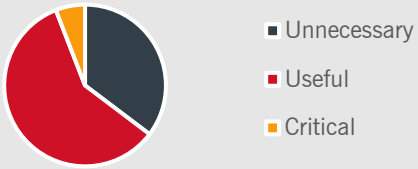
Description	Benefits	Support
Sharrows provide a basic bicycle facility for confident cyclists.	Bicycle facility would connect University Avenue through Downtown Grand Forks.	

3RD STREET N RECONSTRUCTION (GRAND FORKS)

In 2021, 3rd Street from DeMers Avenue to University Avenue will be reconstructed. It will incorporate the curb bulb-outs at 1st Avenue and 2nd Avenue. Efforts to influence the design at University Avenue should be made to ensure curb bulb-outs are included at that intersection as well. This location is where the roadway transitions from a two-way to a one-way roadway and was the source of many complaints regarding speeding vehicles and difficult crossing locations.

The designs do not currently incorporate reverse angle parking; however, the design is flexible enough to allow restriping to occur, should parking related crashes continue to be a major trend on the corridor. Table 29 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into this 3rd Street reconstruction project.

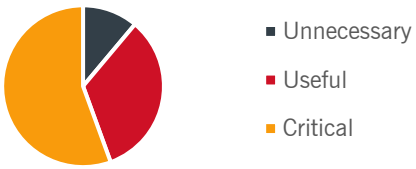
Table 29: Downtown Transportation Study Concepts Related to the 3rd Street Reconstruction

Description	Benefits	Support
Curb bulb-outs extend the curbs at intersections.	Increased visibility and traffic calming effects makes pedestrian crossings safer.	
Reverse angle parking creates better sight lines for vehicles when leaving the parking space.	Reduces crash potential when leaving angled parking spaces.	

DeMers Avenue Crossing Improvements (East Grand Forks)

In 2021, MnDOT will be completing crosswalk, sidewalk, and minor pavement repairs along DeMers Avenue between the Red River and 4th Street. This project could incorporate the RRFB at the River Road intersection. This will increase visibility for pedestrians and cyclists at the uncontrolled intersection. It will maintain the marked crosswalks at 2nd Street, 3rd Street, and 4th Street, as well as the midblock crossing between 2nd Street and 3rd Street. If opportunities exist to expand the scope of this work to include the RRFB recommended at 6th Street, these crossing improvements should be added to this work. Table 34 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into the crossing improvements project.

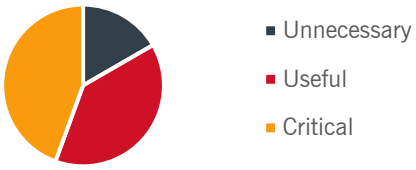
Table 30: Downtown Transportation Study Concepts Related to the DeMers Avenue Crossing Improvements Project

Description	Benefits	Support
Pedestrian crossing enhancements include protected crossings through traffic signals, signage, and RRFBs.	Improved crosswalk features reduce crash potential and increase yielding compliance.	

4th Street N Reconstruction (Grand Forks)

In 2022, 4th Street will be reconstructed between DeMers Avenue and 1st Avenue. The curb bulb-outs identified at the 1st Avenue intersection should be incorporated into this project. Because this project will only incorporate one block, including the high-quality bicycle facilities identified in this study will likely not result in their use and may result in push back for future bicycle facility projects. Modifications to the curb bulb-outs will be required for the bicycle facilities identified for 4th Street. Table 31 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into the 4th Street reconstruction project.

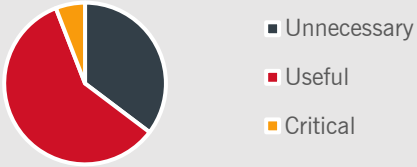
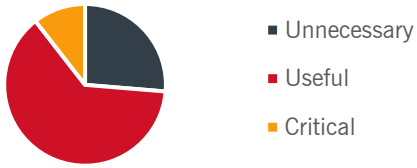
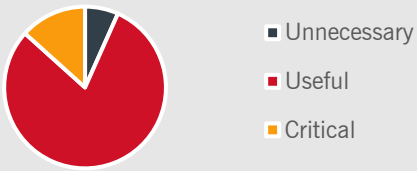
Table 31: Downtown Transportation Study Concepts Related to the 4th Street Reconstruction

Description	Benefits	Support
Curb bulb-outs extend the curbs at intersections.	Increased visibility and traffic calming effects makes pedestrian crossings safer.	

DeMers Avenue Signal System Replacement (East Grand Forks)

In 2024, MnDOT will replace the signals at 2nd Street and 4th Street and incorporate ADA improvements. MnDOT should work with the City of Grand Forks and NDDOT to incorporate the traffic signal interconnect or interconnect and adaptive signal control (ASC) elements in this project to improve DeMers Avenue travel time reliability through 2045. The signals in Grand Forks and the planned signals for the East Grand Forks intersections are both compatible with ASC as currently scoped. Working with the City of Grand Forks and NDDOT, the City of East Grand Forks and MnDOT could incorporate these two signals into Grand Forks' Advanced Traffic Management System (ATMS) and operate these signals at a much lower cost. The cities and state DOTs should work to complete a maintenance and funding agreement to implement ASC with this project. This project should also consider addressing the truck turning radii and crash issues identified at the 4th Street NW and DeMers Avenue intersection as well as incorporating lead pedestrian interval. Table 32 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into the DeMers Avenue signal system replacement project.

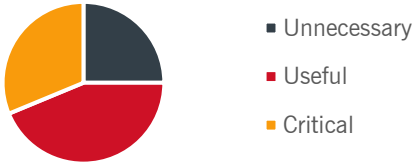
Table 32: Downtown Transportation Study Concepts Related to the DeMers Avenue Signal System Replacement

Description	Benefits	Support
Interconnected traffic signals allow for communication between signals.	Connecting the East Grand Forks signals with the Grand Forks signals should improve travel time reliability.	
Adaptive signal control changes signal timing based on real-time traffic demand.	Traffic signals that respond to real-time traffic demand can maximize the capacity of the corridors and improve travel time reliability.	
4th Street parking restrictions and relocating signal equipment can address the turning radii challenges trucks have at this intersection	Improving the turning radii should reduce the high truck crash rate at this location.	
Lead pedestrian interval provides 3 to 7 seconds for pedestrians to enter the intersection before vehicles are given a green indication.	LPI improves pedestrian visibility and reduces crash potential.	

East Grand Forks Quiet Zone

The City of East Grand Forks has already begun pursuing a quiet zone in coordination with Burlington Northern Santa Fe and the Federal Railroad Administration. Implementing the quiet zone will likely require crossing improvements to enhance crossing safety for vehicles, pedestrians, and bicyclists. These efforts should be continued to finish identifying any potential improvements that need to be completed before the quiet zone can be initiated. Table 33 shows the description, benefits, and support level for the Downtown Transportation Study concepts that could be incorporated into the East Grand Forks quiet zone project.

Table 33: Downtown Transportation Study Concepts Related to the East Grand Forks Quiet Zone

Description	Benefits	Support
The quiet zone would prohibit trains from using their train horns while traveling through downtown East Grand Forks.	The quiet zone improvements would improve crossing safety for vehicles and pedestrians/bicyclists.	

Summary of Short-Term Infrastructure Concepts

Table 34 summarizes the infrastructure concepts that can be implemented with projects that have already secured funding and will be constructed between 2021 and 2024.

Table 34: Summary of Short-Term Infrastructure Concepts

MTP ID	Project	Extents	Downtown Transportation Study Concepts	Notes
NA	N 5th Street Pavement Maintenance (GF)	Gateway Drive to DeMers Avenue	Sharrows/Shared Lanes	Project complete. Will need to work with the City of Grand Forks to add sharrows to Kittson Avenue.
1	N 3rd Street Reconstruction (GF)	DeMers Avenue to University Avenue	Curb Bulb-Outs	Curb bulb-outs south of DeMers Avenue would need to be constructed later. Designs are flexible enough to allow reverse angle parking to be incorporated later.
2	DeMers Avenue Crossing Improvements (EGF)	Red River to 4th Street NW	Crossing Improvements at River Road	Unless scope can be amended to include 6th Street NW and/or 9th Street NW, those crossing improvements would need to occur later.
4	N 4th Street Reconstruction (GF)	DeMers Avenue to 1st Avenue N	Curb Bulb-Outs	Curb bulb-outs at other intersections would need to be constructed later. Designs should be flexible enough to add the protected bike lanes without major disruptions.
7	DeMers Avenue Signal System Replacement (EGF)	DeMers Avenue and 2nd Street NW, 4th Street NW	Interconnected Signals, LPI, truck turning radii	Adding to the scope may exceed the available funding and may need to be completed through a separate project.
NA	East Grand Forks Quiet Zone	South of Downtown	Quiet Zone	Work in progress should continue.

Figure 125: Summary of Short-Term Infrastructure Concepts

High Priority Concepts

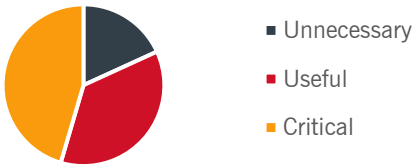
The mid-term concepts are those that could be implemented in the next five to 10 years. These concepts are both policy and infrastructure based.

Riverwalk Centre Parking Lot Reconfiguration (East Grand Forks)

The Riverwalk Centre parking lot reconfiguration had the highest value score of all the concepts considered in this study. Creating dedicated pedestrian facilities throughout the parking lot would increase safety and comfort and expand access to the Greenway facilities and restaurants. The city should begin the project development process to get a more refined cost estimate to assist in securing funding. Because 5th Avenue west of 4th Street NW is a local road, implementing this concept would need to rely on local funding sources, unless it is able to secure Transportation Alternatives grant program funds.

In preparing for this concept's implementation, the City of East Grand Forks should monitor short-term development trends and work with the Downtown Development Association to ensure there is no eminent redevelopment potential for the parking lot. Table 35 summarizes the concept, benefits, and support for the Riverwalk Centre parking lot reconfiguration concept.

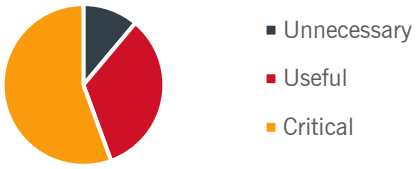
Table 35: Riverwalk Centre Parking Lot Reconfiguration Concept, Benefits, and Support

Description	Benefits	Support
Parking lot reconfiguration would add sidewalks, crosswalks, and aesthetic features to improve the pedestrian environment.	Dedicated pedestrian facilities would increase pedestrian safety and comfort and connect to the Greenway.	

East Grand Forks Pedestrian Crossing Enhancements

The East Grand Forks pedestrian crossing enhancements focused on improving crossing safety along key intersections of DeMers Avenue, including River Road, 2nd Street NW, the midblock crossing between 2nd Street NW and 3rd Street NW, 4th Street NW, 6th Street NW, and 9th Street NW. Most of these crossings (all west of 4th Street NW) will be maintained with the projects currently programmed to occur in 2021. However, the 6th Street NW and 9th Street NW crossings would remain unimproved, unless they can be added to that projects. Given the pedestrian crossing enhancements are relatively low cost, local funds or a Transportation Alternatives grant may be most appropriate to implement the crossing enhancements before the illustrative project along the eastern segment of DeMers Avenue (4th Street NW to US 2, MTP ID #20) can be funded. Table 36 summarizes the concept, benefits, and support for the pedestrian crossing enhancements.

Table 36: East Grand Forks Pedestrian Crossing Enhancements Concept, Benefits, and Support

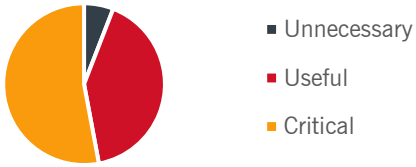
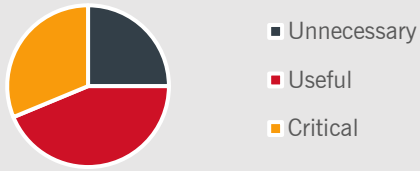
Description	Benefits	Support
Pedestrian crossing enhancements include protected crossings through traffic signals, signage, and RRFBs.	Improved crosswalk features reduce crash potential and increase yielding compliance.	

4TH STREET CURB BULB-OUTS (GRAND FORKS)

Curb bulb-outs on 4th Street would improve pedestrian crossing safety. While one block of 4th Street was able to secure funding through the Urban Grant Program, there are three other intersections (2nd Avenue, University Avenue, Kittson Avenue) along 4th Street that would benefit from constructing curb bulb-outs before the mid-term (ID #11) and long-term (ID #15) programmed projects. The stakeholder feedback received for the 4th Street curb bulb-outs indicated this was a high priority project.

The city should evaluate the 4th Street curb bulb-outs against other downtown priorities to determine how to move these projects forward. If the city elects to defer the implementation of the curb bulb-outs until the mid- and long-term projects identified in the MTP, the reconstruction projects should incorporate the buffered/protected bicycle lanes. Combining the curb bulb-outs and the buffered/protected bicycle lanes into one project would likely make this project highly competitive for Urban Grant and Transportation Alternatives funding. Table 37 shows the 4th Street concepts, benefits, and support.

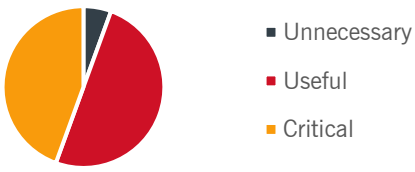
Table 37: 4th Street Concepts, Benefits, and Support

Description	Benefits	Support
Curb bulb-outs extend the curbs at intersections.	Increased visibility and traffic calming effects makes pedestrian crossings safer.	
The buffered/protected bike lanes on 4th Street would connect University Avenue to Kittson Avenue, providing a high-quality bike facility through the core of downtown Grand Forks.	High-quality bike facilities increase bicycle safety and ridership.	

KITTSON AVENUE CYCLE TRACK (GRAND FORKS)

There are a variety of challenges to implementing the Kittson Avenue cycle track, including coordination with the BNSF railroad, acquiring easements, and potential 408 permit and Army Corps of Engineers approval. In addition to these coordination challenges, there has been no funding identified for Kittson Avenue. However, Kittson Avenue from DeMers Avenue to 3rd Street was identified as an illustrative project, with an estimated cost to reconstruct of $1.0 million. Similar levels of funding may be able to be secured by re-allocating the revitalization funds (ID #18), Urban Grant Program funds, Transportation Alternatives grant funds, or local funds. The City of Grand Forks should begin project development activities to ensure the coordination and approval process does not impact any potential funding and implementation. Table 38 summarizes the concept, benefits, and support for the Kittson Avenue cycle track.

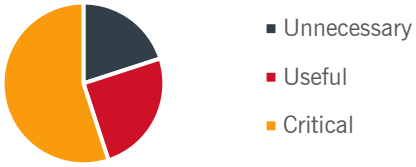
Table 38: Kittson Avenue Cycle Track Concept, Benefits, and Support

Description	Benefits	Support
The cycle track would connect from the shared-use path south of DeMers Avenue to the Greenway.	Provide a high-quality all ages bicycle facility through downtown Grand Forks.	

Bicycle and Pedestrian River Crossing

Constructing a new bicycle and pedestrian river crossing is likely to be one of the most complex and costly concepts considered in this study. The new crossing will likely require an environmental analysis and Army Corps of Engineering approval due to any potential impacts to the Greenway, floodwall, and Red River. The City of Grand Forks and East Grand Forks should begin project development activities, including environmental documentation and preliminary design. Once more refined cost estimates are produced, efforts to secure funding and cost splits between the two cities can be completed. Competitive grant programs like the Main Street Program in North Dakota and the Transportation Alternatives Program may be available to fund a project like the bicycle and pedestrian river crossing. The cities and the MPO will need to determine the river crossing's priority against other downtown and bicycle/pedestrian priorities in the city when pursuing these grant funds. Table 39 summarizes the concept, benefits, and support for the new river crossing.

Table 39: New River Crossing Concept, Benefits, and Support

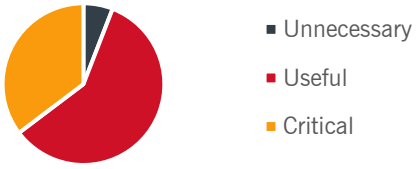
Description	Benefits	Support
Constructing a new bicycle/pedestrian bridge over the Red River would increase mobility for non-auto users and connect to the Greenway.	Increase dedicated space for bicyclists and pedestrians and increase connectivity to the Greenway.	

6th Street N Curb Bulb-Outs (Grand Forks)

The significant angle crash trend along 6th Street N could be attributed to a variety of factors including sight constraints and speeding. Curb bulb-outs would mitigate both factors and was identified as a high priority project through the stakeholder feedback.

While there is no identified funding for 6th Street reconstruction, this corridor may be eligible for Highway Safety Improvement Program (HSIP) funds. While HSIP funds have already been incorporated into the future funds available for the short term, if the crash trends continue, this corridor may have a higher priority than other previously identified safety project locations. The current local Road Safety Program funding program may be appropriate for this location. Local funds may also be appropriate at this location given the crash and injury trends. Table 40 summarizes the concept, benefits, and support for the 6th Street curb bulb-outs.

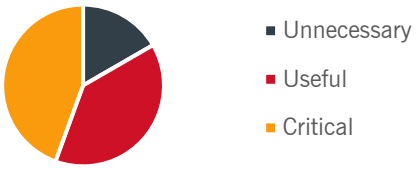
Table 40: 6th Street Curb Bulb-Outs Concept, Benefits, and Support

Description	Benefits	Support
Curb bulb-outs extend the curbs at intersections.	The traffic calming effects of curb bulb-outs should encourage more stopping compliance and reduce angle crash potential.	

3rd Street S Curb Bulb-Outs (Grand Forks)

While the curb bulb-outs north of DeMers Avenue will be constructed with the 2021 project, there are locations south of DeMers Avenue identified for curb bulb-outs to improve pedestrian crossing safety. There is a long-term project programmed for 3rd Street from DeMers Avenue to Division Avenue (ID #14), in which the curb bulb-outs should be incorporated. Table 41 summarizes the concept, benefits, and support for the 3rd Street curb bulb-outs.

Table 41: 3rd Street Curb Bulb-Outs Concept, Benefits, and Support

Description	Benefits	Support
Curb bulb-outs extend the curbs at intersections.	Increased visibility and traffic calming effects makes pedestrian crossings safer.	

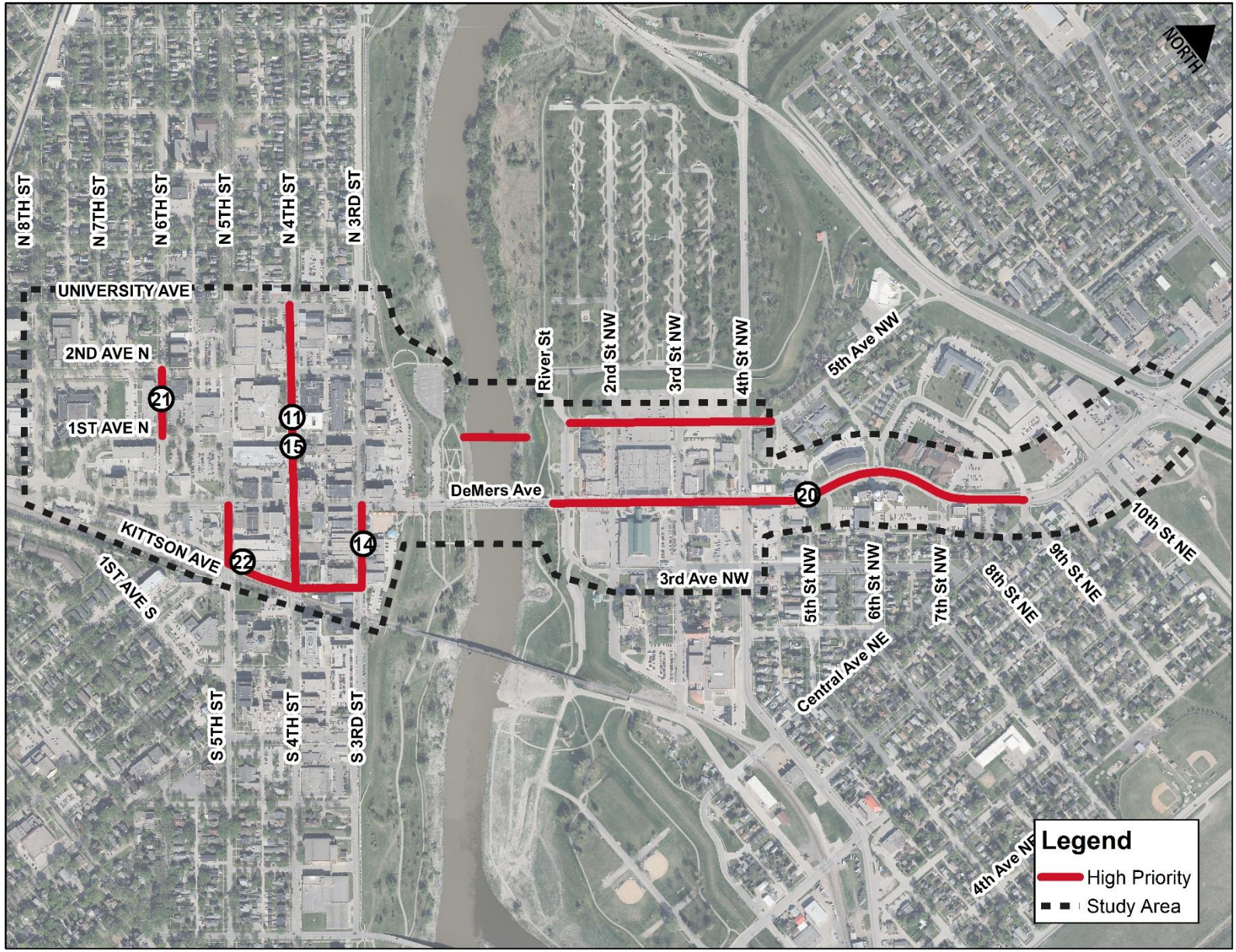
Summary of High Priority Concepts

Table 42 summarizes the high-priority concepts as identified by the stakeholders. Each of these concepts provided a high level of benefits to the overall transportation system. While some of these projects can be coordinated with projects included in the MTP, others are entirely new and have no identified funding. Concepts listed as a high priority, does not mean the concepts will be implemented ahead of other lower priority concepts.

Table 42: Summary of Mid-Term Infrastructure Concepts

MTP ID	Project	Extents	Description	Notes
NA	Riverwalk Centre Parking Lot Reconfiguration (EGF)	Parking Lot/5th Avenue	Reconfiguration to add more pedestrian amenities.	No identified funding.
20	East Grand Forks Pedestrian Crossing Enhancements	Red River to 9th Street NW	Pedestrian crossing enhancements including crosswalks, signage, and RRFBs	Illustrative project in MTP.
11, 15	4th Street Curb Bulb-Outs and Buffered/Protected Bike Lanes (GF)	University Avenue to Kittson Avenue	Curb Bulb-Outs	MTP identified projects in the mid- and long-term for full reconstruction of 4th Street.
22	Kittson Avenue Reconstruction (GF)	DeMers Avenue to S 3rd Street	Kittson Avenue cycle track.	Illustrative project in MTP.
NA	Bicycle and Pedestrian River Crossing	Red River	New bicycle and pedestrian crossing.	No identified funding.
21	N 6th Street Curb Bulb-Outs (GF)	1st Avenue N and 2nd Avenue N	Curb Bulb-Outs	Illustrative project in MTP.
14	S 3rd Street Curb Bulb-Outs – south of DeMers Avenue (GF)	DeMers Avenue to Kittson Avenue	Curb Bulb-Outs	MTP identified project for the long-term.

Figure 126: Summary of High Priority Infrastructure Concepts



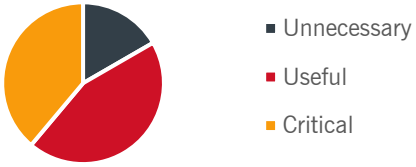
Medium Priority Concepts

DeMers Avenue Lane Reconfiguration

The DeMers Avenue lane reconfiguration between 4th Street NW and US 2 would incorporate buffered/protected bike lanes in East Grand Forks. This concept would transform a lane of parking into buffered bike lanes, while acting to calm traffic and improve pedestrian crossing safety. The RRFBs identified at 6th Street NW and 9th Street NW may or may not be a part of this project. Based on the stakeholder feedback, this project was a medium priority for the community. It would provide a valuable connection from the shared-use paths on Central Avenue and US 2 to downtown.

While this project is relatively low-cost, there are no programmed projects to occur on this segment of DeMers Avenue but there is an illustrative project identified to reconstruct DeMers Avenue. If additional community engagement points to the need to implement this project sooner, local funds could be used to install temporary features until the reconstruction project is funded. Pursuing Transportation Alternatives grant funds could also be appropriate for this project. Table 43 summarizes the concept, benefits, and support for the DeMers Avenue lane reconfiguration.

Table 43: DeMers Avenue Lane Reconfiguration Concept, Benefits, and Support

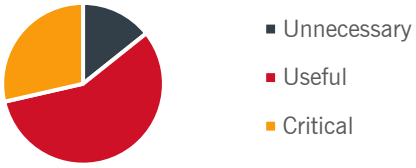
Description	Benefits	Support
Lane reconfiguration to transform a lane of parking to buffered/protected bike lanes.	Dedicated bicycle facilities increase cyclist safety and ridership. Connects downtown with existing path north of US 2.	

Winter Maintenance Enforcement

Creating a downtown environment where people are willing to walk year-round requires a strong winter maintenance enforcement program. Both cities have ordinances that require business owners to remove snow and ice from sidewalks after a snow event. In East Grand Forks, snow must be cleared within 12 hours and in Grand Forks, within 24 hours. If non-compliant, both cities will clear the sidewalk and bill the business owner. However, this is only done if a complaint is made, and it can take up to three days to respond.

To improve the sidewalk clearance rate, the two cities should work with downtown businesses and property owners to understand what level of incentives and penalties would begin to encourage proper winter maintenance. If an ordinance is not enough, the cities could consider a special assessment that would cover professional snow removal. Table 44 summarizes the winter enforcement concept, benefits, and support.

Table 44: Winter Enforcement Concept, Benefits, and Support

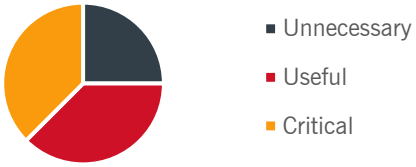
Description	Benefits	Support
Enforcement of snow clearance ordinances to maintain the sidewalk network during winter months.	Improves safety for pedestrians and creates a year-round pedestrian environment.	

Grand Forks Right-of-Way ADA Transition Plan

Completing an Americans with Disabilities Act (ADA) Transition Plan for the City of Grand Forks will identify all locations that do not meet current ADA guidelines. The City of Grand Forks should work with the Grand Forks – East Grand Forks MPO to identify potential funding to complete the transition plan.

Once complete, potential deficiencies can be addressed through the multiple projects identified in Table 27 and the City can begin to seek funding for other deficient locations during the next Metropolitan Transportation Plan, Transportation Improvement Programs, and local funds. Table 45 summarizes the ADA Transition Plan concept, benefits, and support.

Table 45: Grand Forks ADA Transition Plan Concept, Benefits, and Support

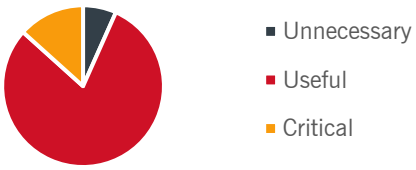
Description	Benefits	Support
Plan identifies locations across Downtown that do not meet ADA standards.	Creates a safe and comfortable pedestrian experience for users of all abilities.	

Lead Pedestrian Interval

Lead pedestrian interval (LPI) permits three to seven seconds for pedestrians to enter the intersection, increasing their visibility and crossing safety. It is currently used on DeMers Avenue in Grand Forks. However, there are seven additional signals in the study area in which LPI could be implemented, including on University Avenue and 5th Street in Grand Forks and DeMers Avenue in East Grand Forks.

The LPI implementation should be prioritized at intersections with the highest pedestrian activity, including the DeMers Avenue corridor in East Grand Forks and the 5th Street corridor in Grand Forks. Both of these locations also have construction projects in the short term that will require signal retiming efforts to occur in 2024 and 2021, respectively. Table 46 summarizes the LPI concept, benefits, and support.

Table 46: Lead Pedestrian Interval Concept, Benefits, and Support

Description	Benefits	Support
Gives pedestrians 3 to 7 second to enter the intersection.	Improves pedestrian visibility and yielding to pedestrians in crosswalks.	

Bicycle Policies

Three bicycle policies were identified to support increased bicycle use across the two downtowns:

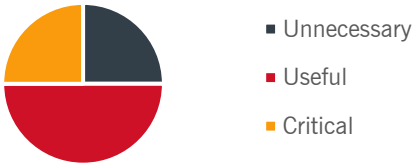
- Bicycle Parking. The best practices for bicycle parking, including location and style, should be published or incorporated in the design standards for downtown. These practices should then be enforced as new bicycle parking is established on both public and private right-of-way. The City of Grand Forks should work to review and renew a previous draft bike parking ordinance to incorporate the concepts in this study.
- Bicycle Accommodations at Intersections. The bicycle signals and boxes are likely not warranted given current bicycle activity in the downtowns. However, as bicycle activity increases and high quality

bicycle facilities are constructed, the cities should include bicycle signals and boxes in their toolbox of potential solutions to increase crossing safety.

» Bike Share. Despite the initial provider of the Grand Forks – East Grand Forks bike share program ending its service in the community, the Downtown Development Association (DDA) has taken over the service and will continue the bike share in downtown. The two cities should work with the DDA to expand their bike share program, share information through their channels, and ensure the bike share program is accessible to low-income individuals.

Table 47 summarizes the bicycle policies concepts, benefits, and support.

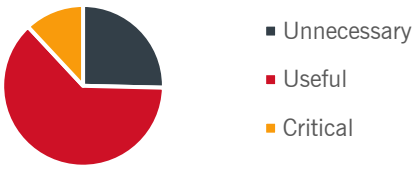
Table 47: Bicycle Policies Concept, Benefits, and Support

Description	Benefits	Support
A series of supportive bicycle policies that will increase the ease of biking through the two downtowns as well as their safety.	Adding more tools to support bicycle safety and mobility is important to increasing ridership.	

Transit Improvements

While only the mobility hubs were found to be of medium priority, the Grand Forks – East Grand Forks MPO regularly updates the Transit Development Plan (TDP), which can more closely evaluate the technical and financial aspects of the transit concepts evaluated in this study, including the downtown circulator, improved stop facilities, late evening service, and mobility hubs. The TDP will be able to more accurately provide an implementation plan, and funding sources for transit elements in downtown. Table 48 summarizes the bicycle policies concepts, benefits, and support.

Table 48: Transit Improvements Concept, Benefits, and Support

Description	Benefits	Support
Transit improvements include mobility hubs, downtown circulator, improved transit stop facilities, and late evening transit service to improve the user experience of transit riders.	High quality transit service can appeal to choice riders and support transportation demand management programs and mode split.	

Summary of Medium Priority Concepts

Table 49 summarizes the medium priority concepts as identified by the stakeholders. Each of these concepts provided a high level of benefits to the overall transportation system. Many of these concepts are policy based, so will come at relatively low costs for implementation, but will rely on staff time and local funds.

Table 49: Summary of Mid-Term Infrastructure Concepts

MTP ID	Project	Extents	Description	Notes
20	DeMers Avenue Lane Reconfiguration	4th Street NW to US 2	Transofrm a parking lane to buffered/ protected bicycle lanes to connect from the shared use path north of US 2 to downtown.	Illustrative project in the MTP.
NA	Winter Maintenance Enforcement	Both Downtowns	Evaluate/enforce snow removal ordinances to create a comfortable pedestrian experience year-round.	Local funds for staff time and enforcement.
NA	Grand Forks ADA Transition Plan	Downtown Grand Forks	Identify locations not in compliance with ADA to improve pedestrian environment for all users.	Funds to complete the plan may come through the MPO. Projects identified in this plan will need further scoping and implementation evaluation.
NA	Lead Pedestrian Interval	Both Downtowns	Incorporate LPI to increase pedestrian visibility when crossing signalized intersections.	Initiating LPI can be done through programmed projects, but will require staff time to maintain.
NA	Bicycle Policies	Both Downtowns	A series of bicycle policies and tools to improve bicycle safety and mobility.	None.
NA	Transit Improvements	Both Downtowns	A series of transit related improvements and policies to improve transit riders experience.	Evaluate closer through a TDP update.

Long-Term Concepts and Future Considerations

Concepts listed in Table 50 were identified as a low priority by the public and the Steering Committee. These projects should not be discarded from future consideration, but also should not replace or de-prioritize any of the concepts discussed above. However, should conditions and priorities change, or opportunities to incorporate them into other programmed projects, these projects could be considered again and should be evaluated in the next MTP update.

Table 50: Concepts for Future Consideration

Project	Description	Value score	Other Notes
Roundabout between 1st Avenue and 8th Street	Combine the intersections of 1st Avenue and 8th Street into one. Acts as traffic calming, a downtown gateway and improves pedestrian crossing safety.	0.94	Will require more in-depth engineering to understand potential impacts and implementation cost.
Central High School Alley Crossing	Add curb bulb-outs, marked crosswalk, and additional signage to establish the alley crossing as a permitted crossing.	0.94	More consideration may be warranted during a University Avenue corridor study and/or tied to the illustrative reconstruction project of University Avenue from Washington Street to 3rd Street.
Parklets	Allow businesses to use on-street parking space to expand their outdoor amenities.	0.88	Pilot programs and lessons learned from the 2020 summer season could result in the implementation of this concept sooner.
Transportation Demand Management	A program to reduce single-occupant vehicle use, spread traffic demand across time periods, and encourage non-auto uses.	0.87	Working with partners like the DDA, CAT, UND, others can help identify resources and policies to support the development of a TDM program.
East Grand Forks Bicycle Network	Sharrows in 5th Avenue and 3rd Avenue and protected/buffered bike lanes on 4th Street.	0.84	The sharrows could be implemented at very low cost at any time. However, they would benefit from completing the bicycle network on 4th Street NW and DeMers Avenue.
3rd Street Reverse Angle Parking	Back-in angle parking improves a driver's visibility while exiting the parking space to reduce the crash potential.	0.71	Current designs for the 3rd Street reconstruction are flexible enough to allow this concept to be implemented with very few impacts to the work that will be completed in 2021.
Train Activity Information	Adding dynamic message signs strategically around downtown to provide drivers with more information to avoid train delays.	0.69	This alternative should be reconsidered if train activity through downtown increases.
6th Street Mini-Roundabouts	Installing mini-roundabouts at the 1st Avenue and 2nd Avenue intersections to mitigate the angle crash trends.	0.59	The public preferred the curb bulb-outs at these locations. However, if the bulb-outs do not sufficiently mitigate the angle crash trend, the mini-roundabouts may be the next mitigation measure.

SUMMARY MAP

Figure 127 shows the concepts that will be implemented through currently programmed projects as well as the high and medium priority concepts identified through the Downtown Transportation Study.

Figure 127: Summary of Implementation Plan for Infrastructure Based Concepts