Grand Forks-East Grand Forks

Downtown Transportation Study

October 2019

Overcoming Barriers Strengthening Connections

M.P.O. M.P.O. M.P.O.

Grand Forks - East Grand Forks
Metropolitan Planning Organization

Ensuring Opportunities Planning One Community

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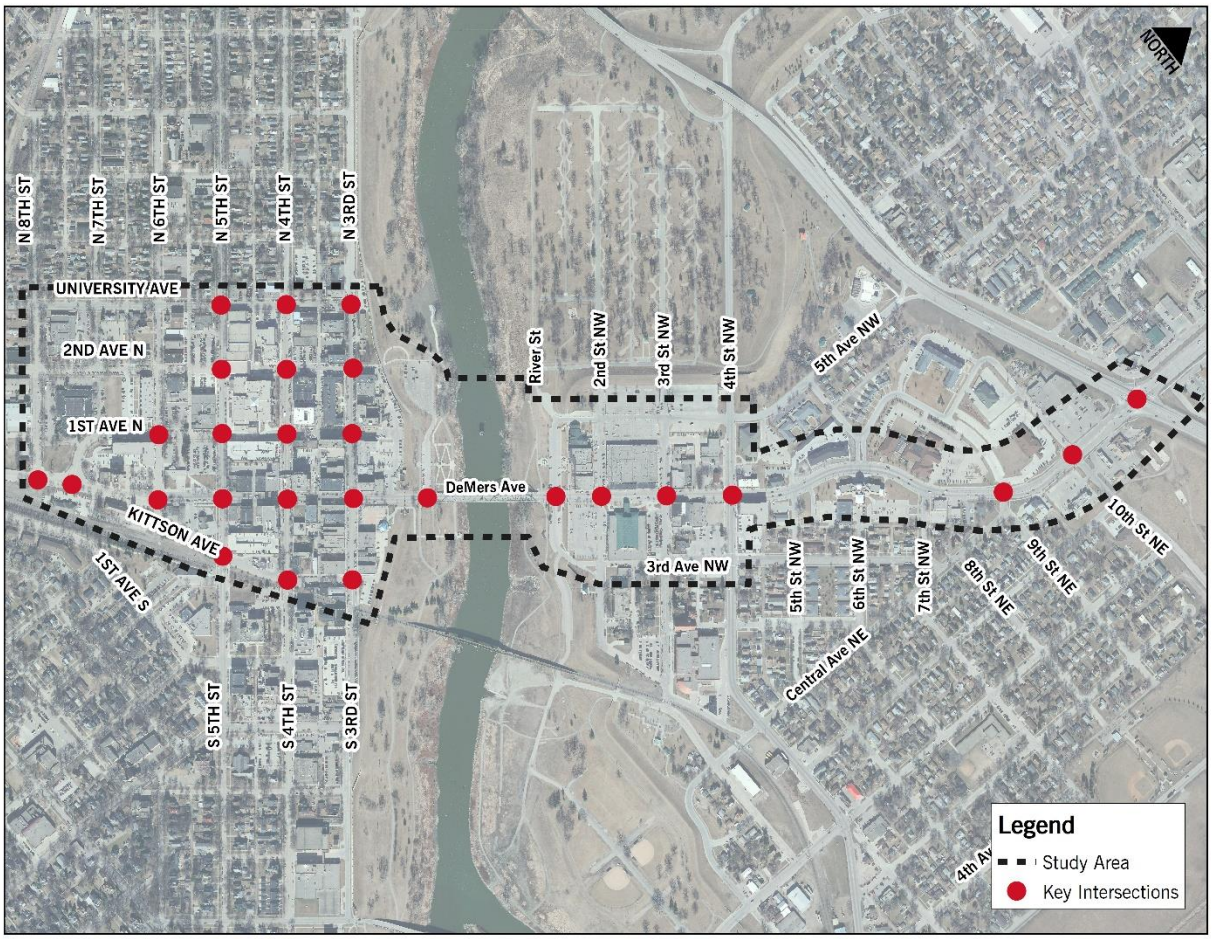
INTRODUCTION

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

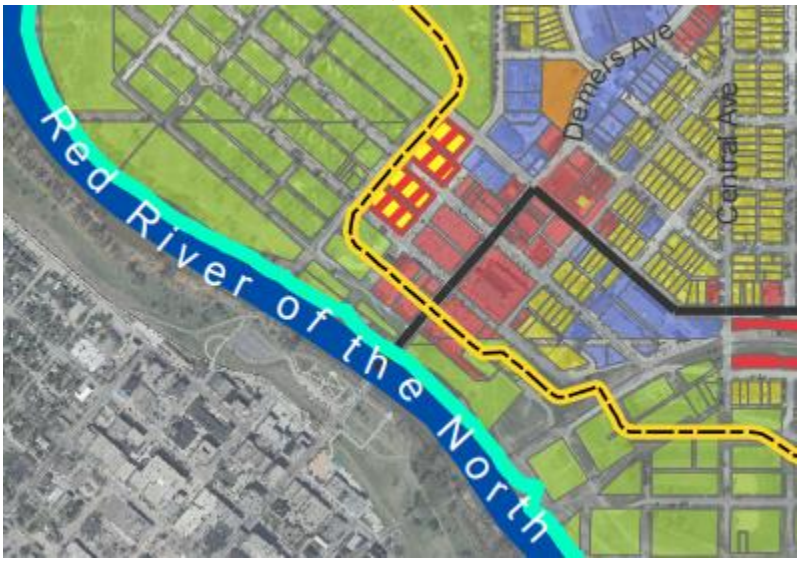
The Grand Forks – East Grand Forks Metropolitan Planning Organization is in the process of completing a parking study in downtown Grand Forks. This study included a turnover and occupancy study and found that around half of the 3,600 parking spaces throughout downtown sit empty on a typical day. Even 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
3rd Street	Reconstruct from DeMers Avenue to University Avenue	Short	$5.3 M
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
3rd Street	Reconstruct from DeMers Avenue to Division Avenue	Long	$11.2 M
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 Street 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

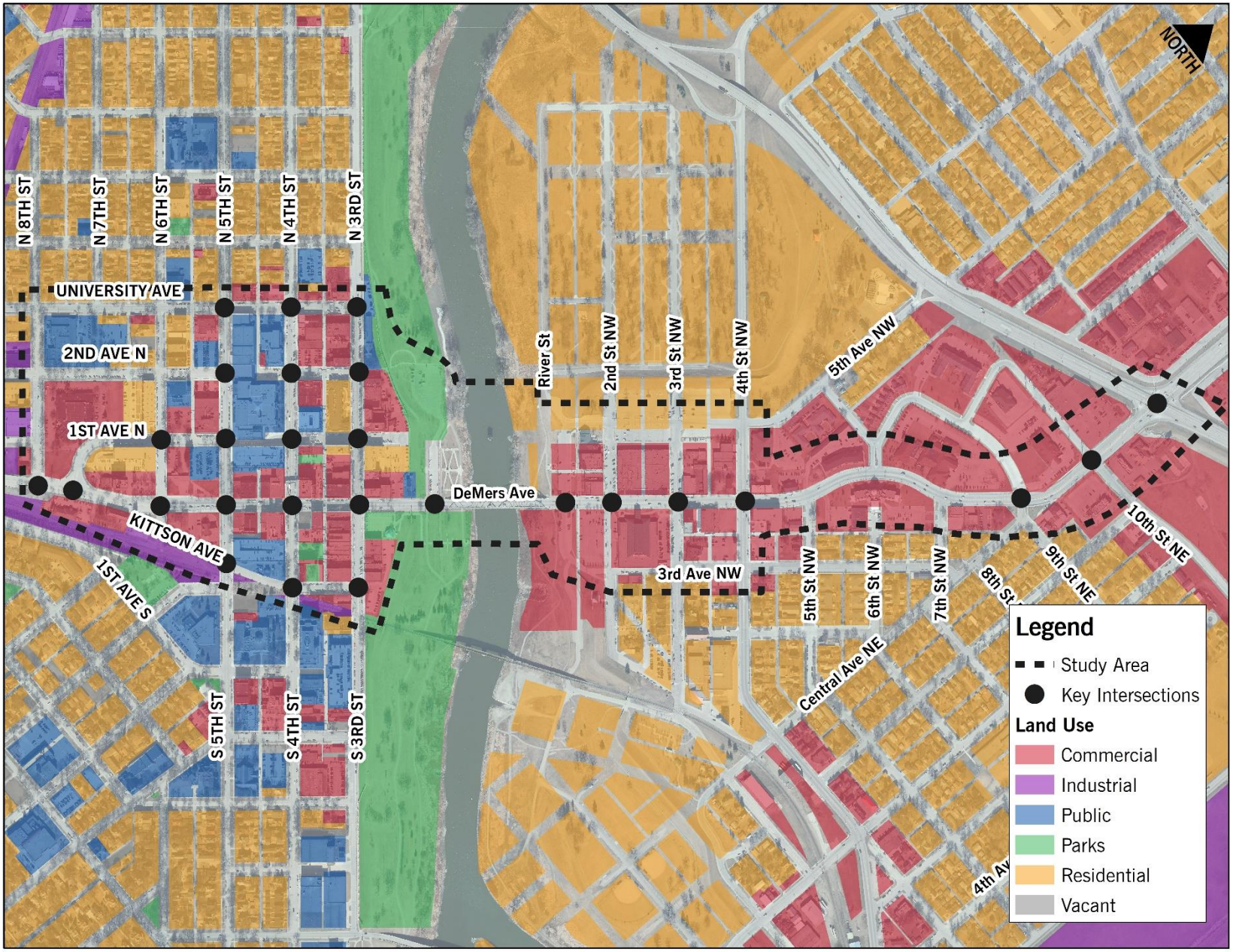
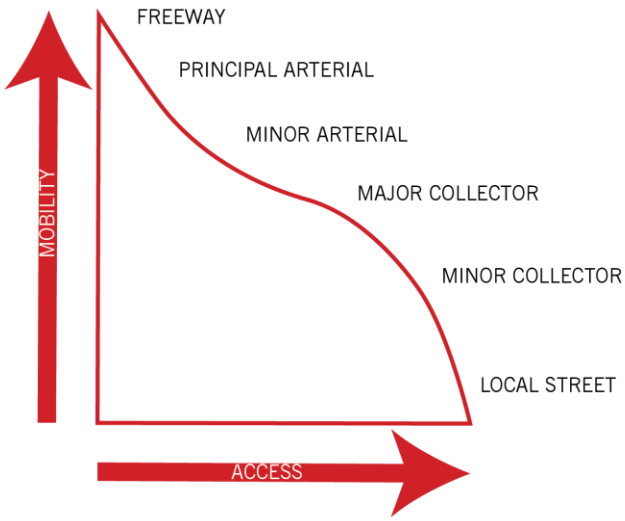


Figure 5: Downtown Action Plan Redevelopment Candidate Sites

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 Road 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

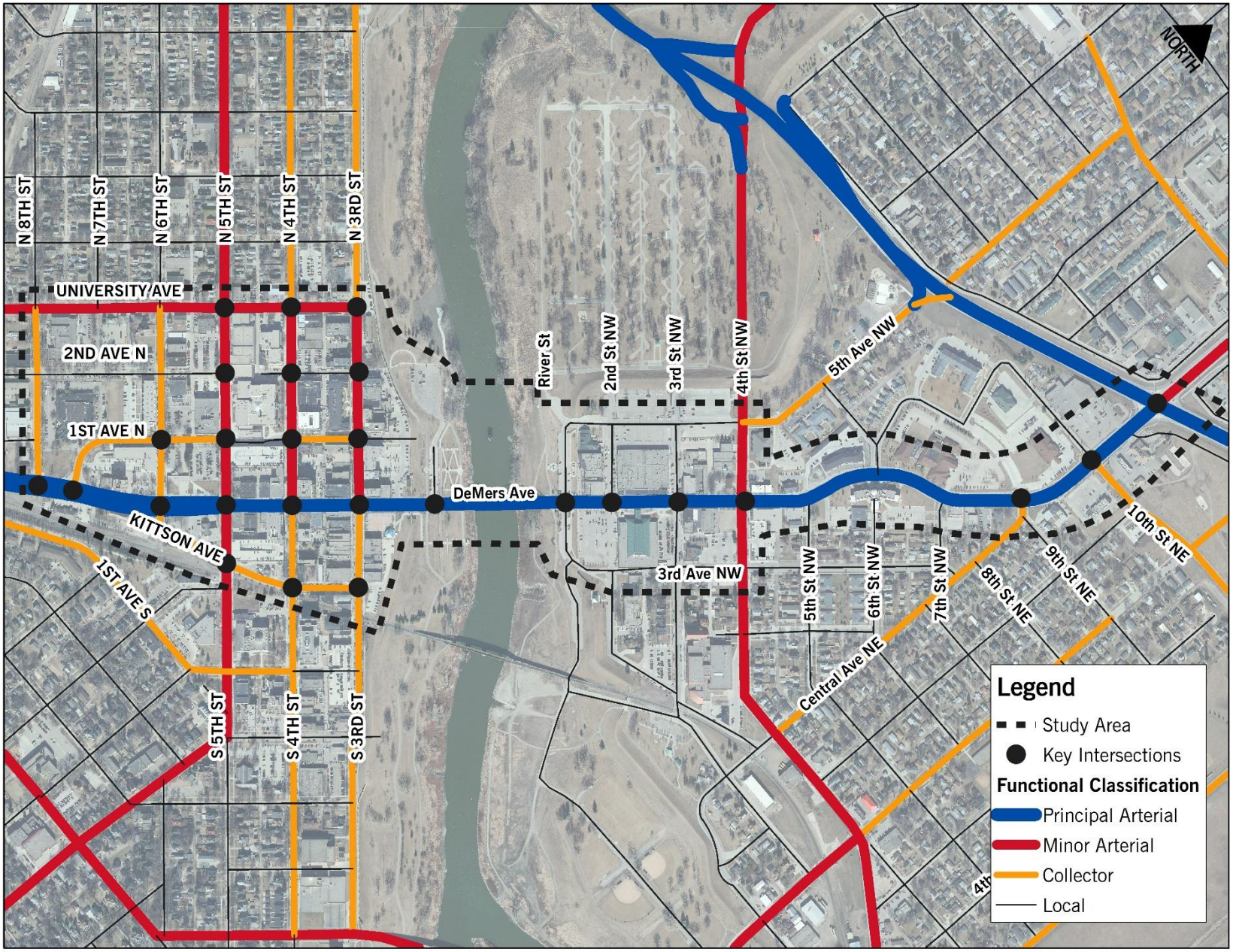
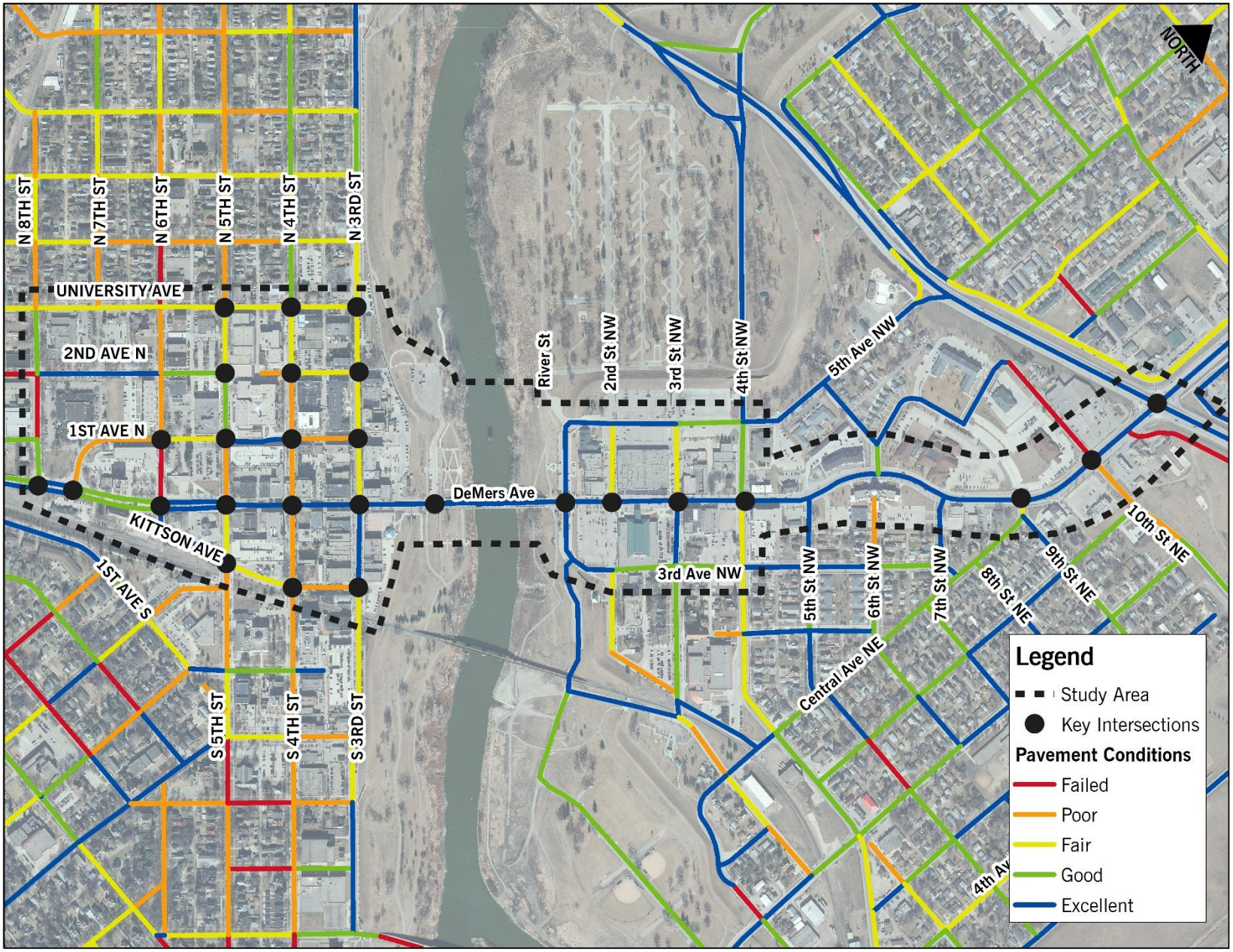


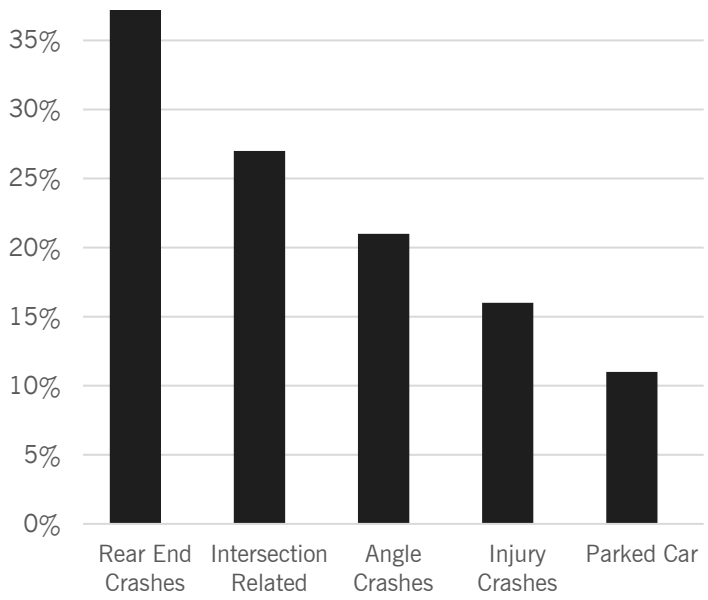
Figure 8: Pavement Conditions



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.

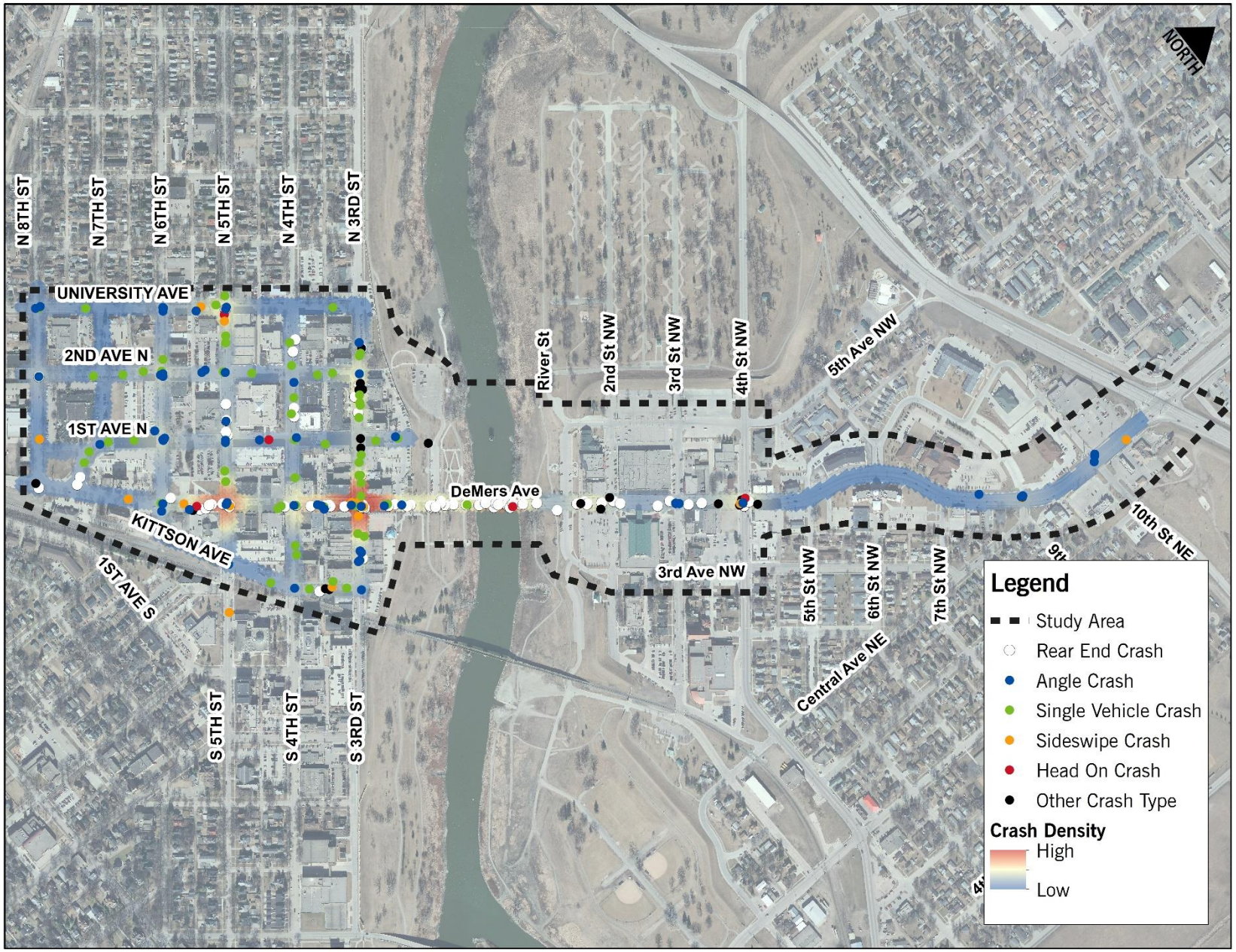
- **DeMers Avenue and 4th Street NW (East Grand Forks**). There were nine crashes (2 Non-Incapacitating, and 7 Property Damage crashes) reported during the analysis period. No predominant trends were observed for the crashes at the intersection.
- **DeMers Avenue and 5th Street (Grand Forks).** There 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 12. 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

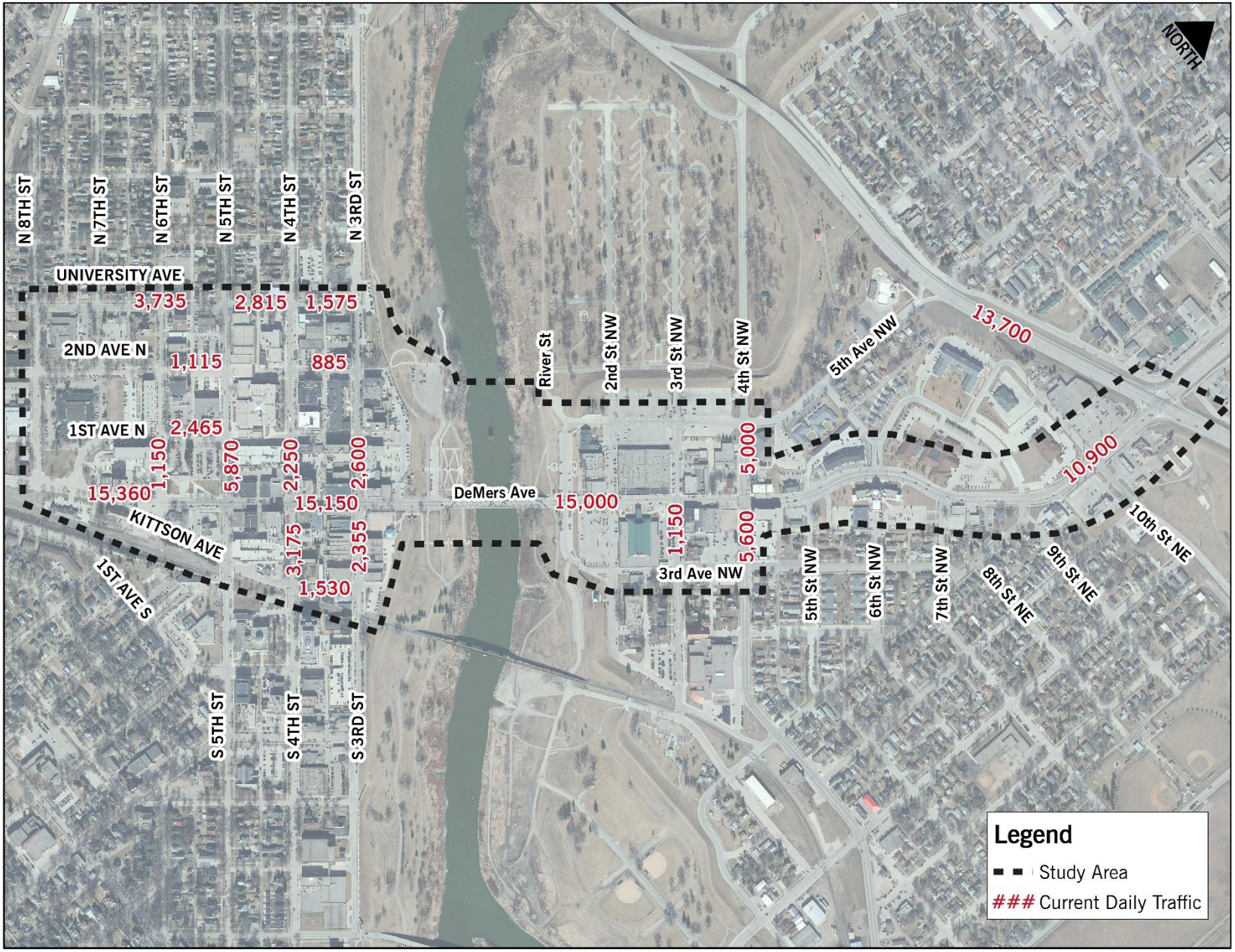
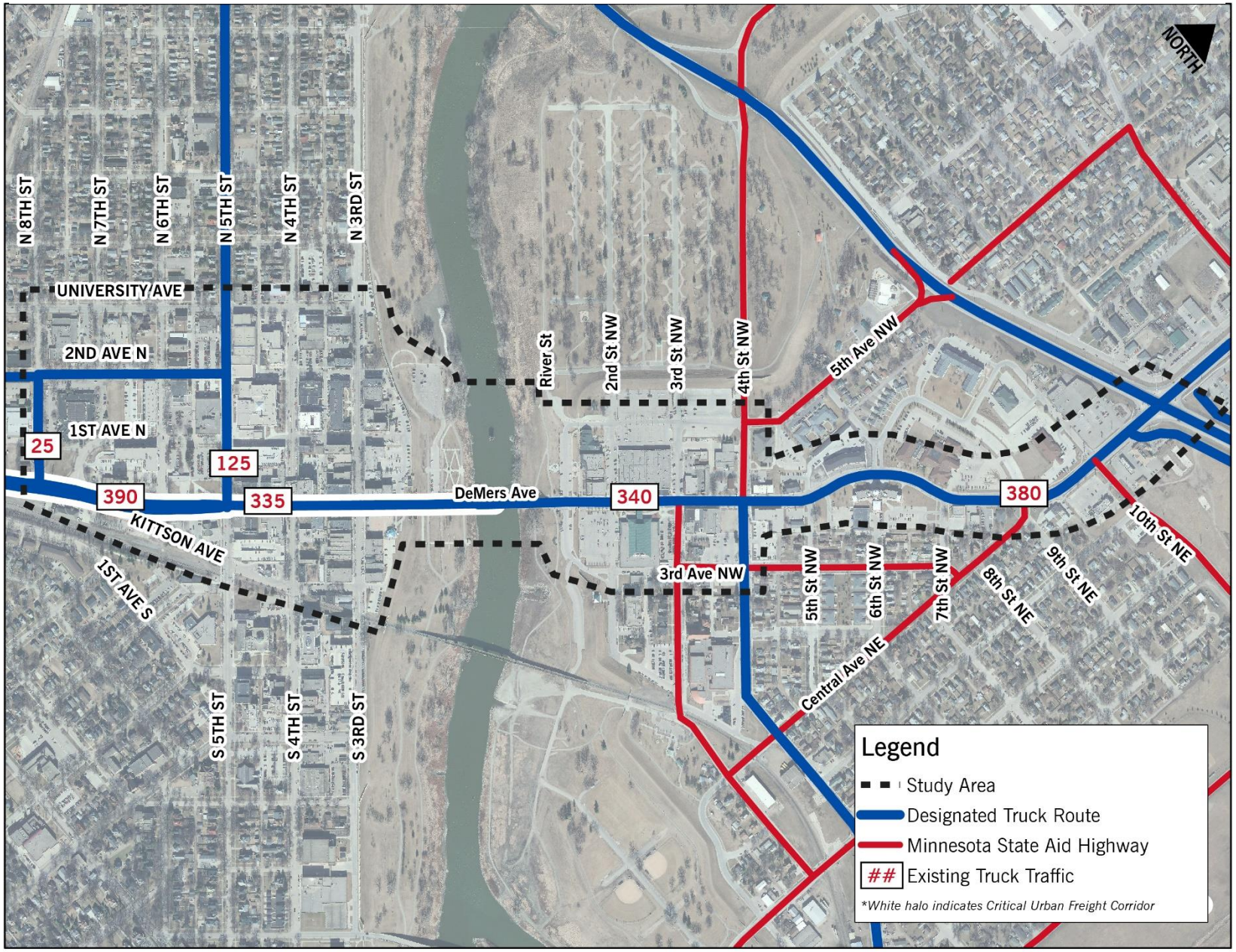


Figure 12: Existing Truck Traffic



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

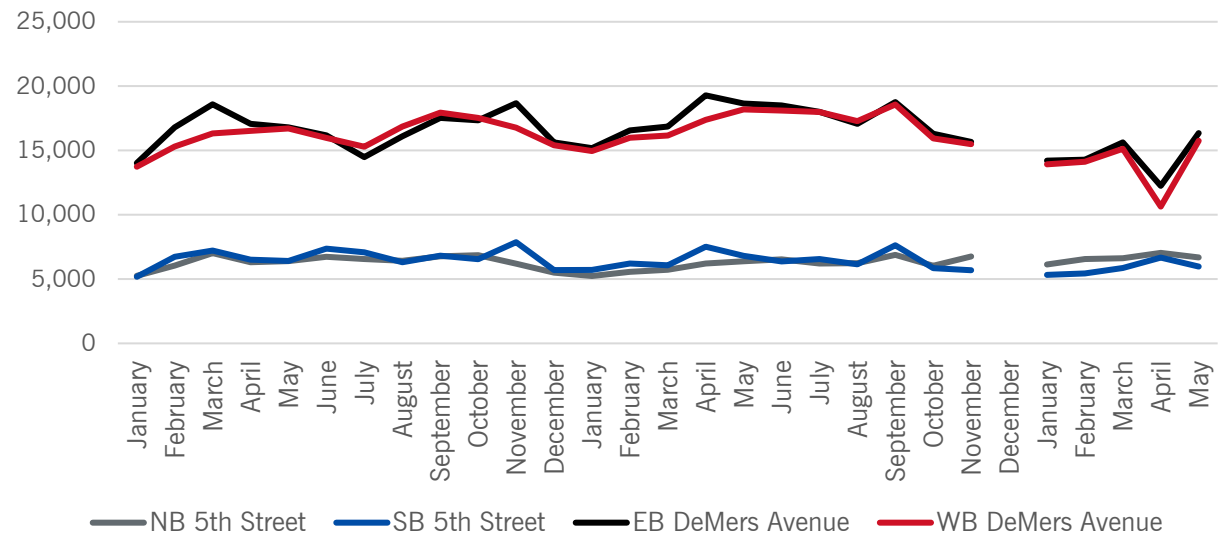
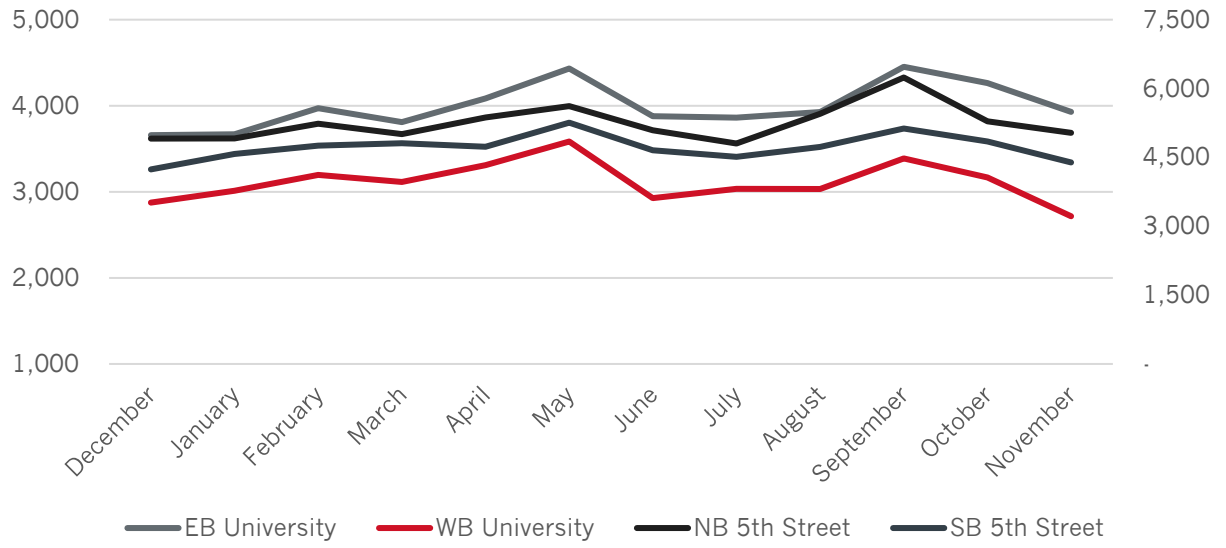


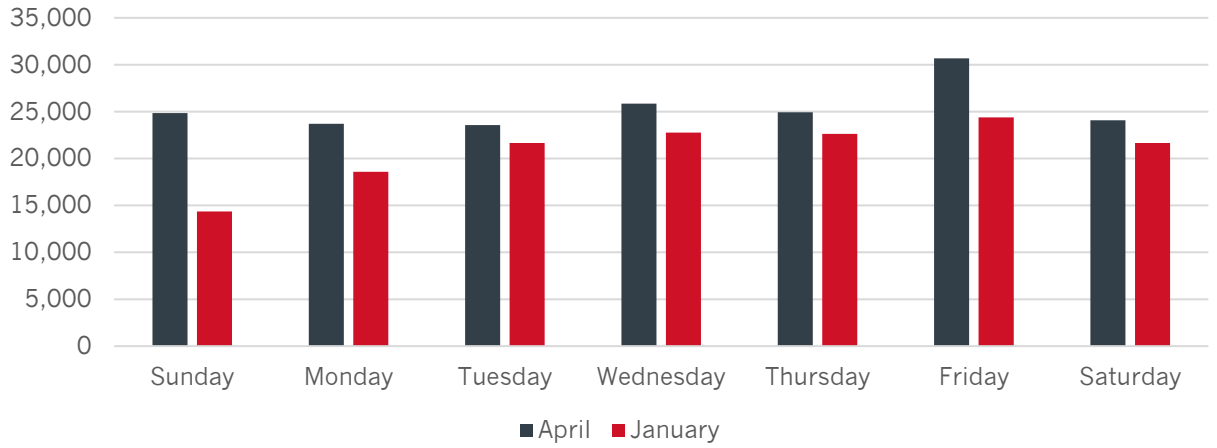
Figure 14: Monthly Traffic Variability at University Avenue and 5th Street



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

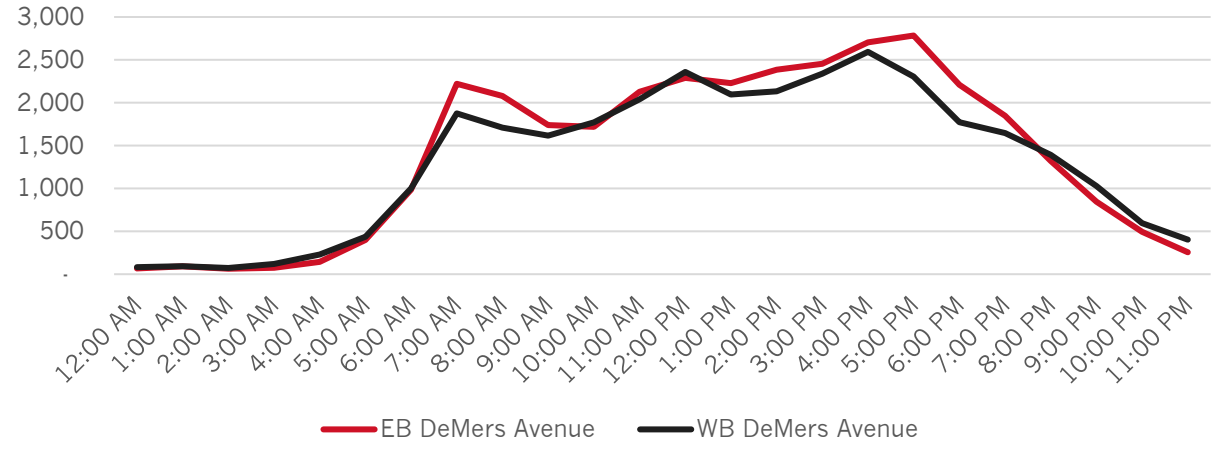


Figure 17: University Avenue at 5th Street Time of Day Profile

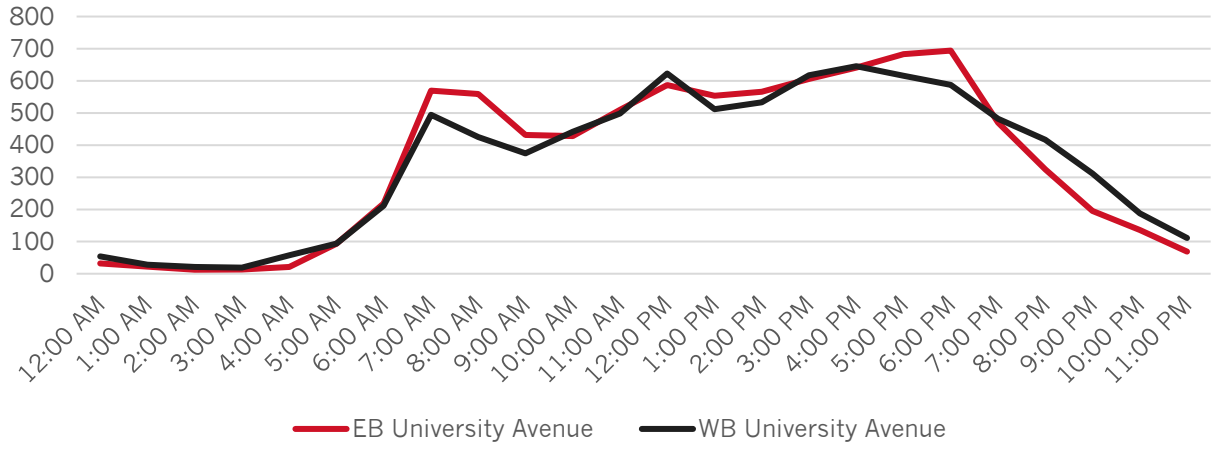
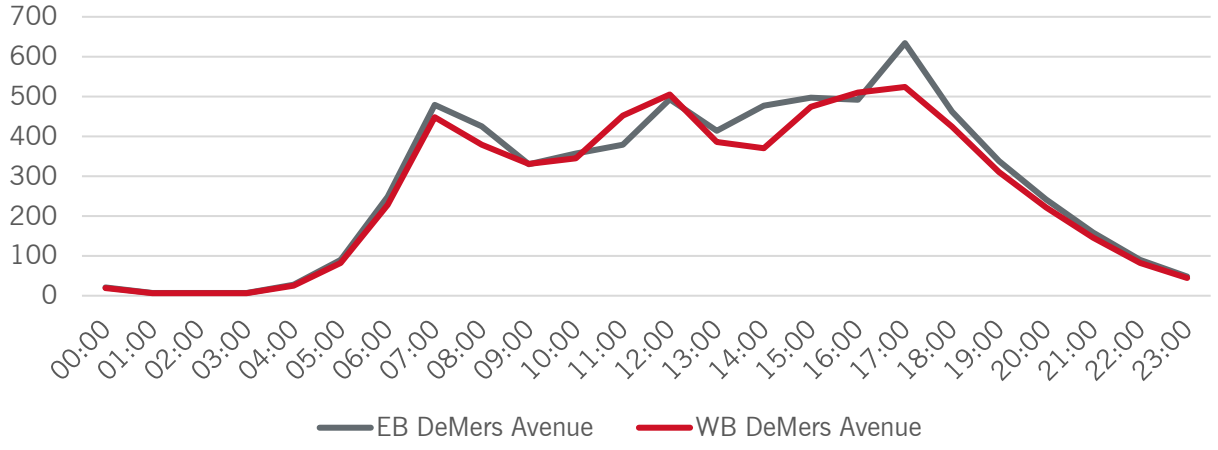


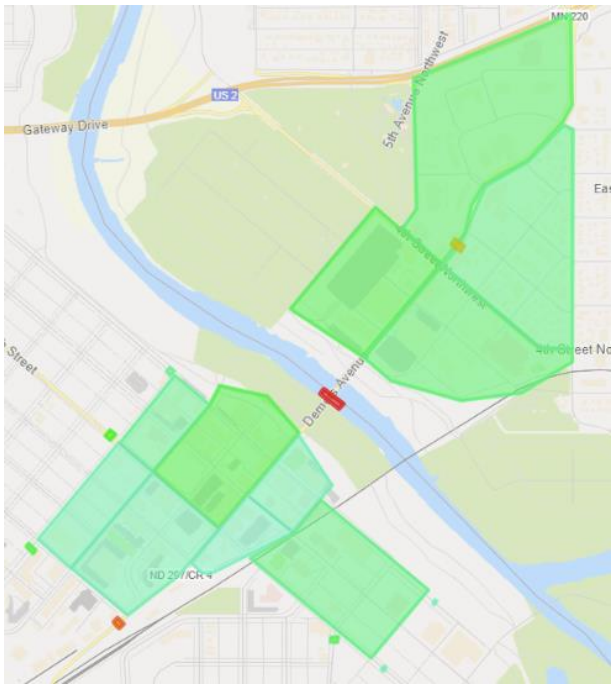
Figure 18: DeMers Avenue at 3rd Street NW Time of Day Profile



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

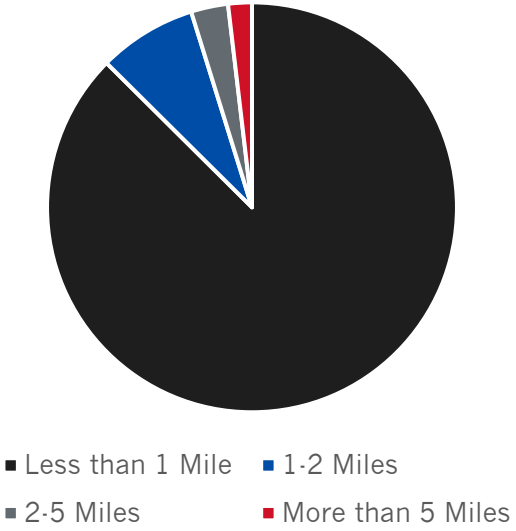


Figure 21: Trip Time

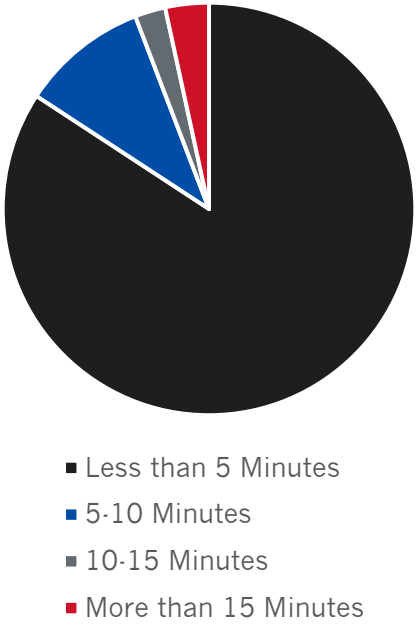
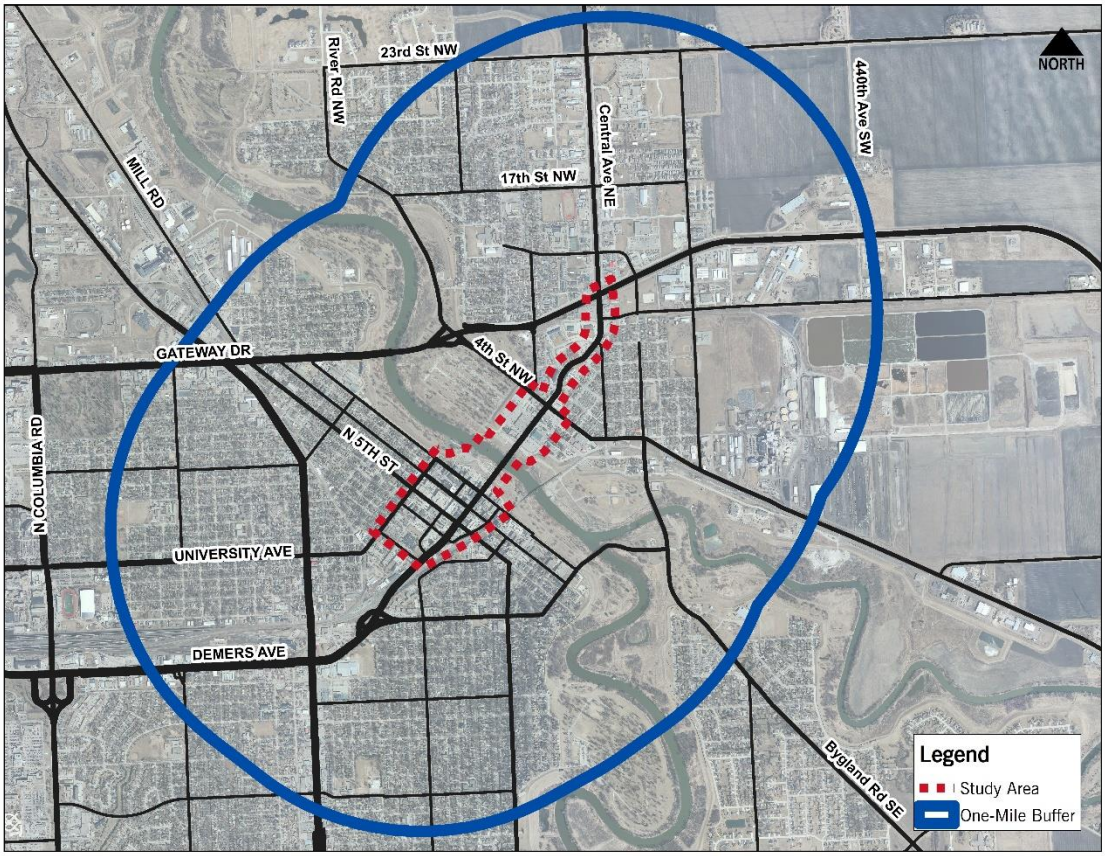


Figure 22: One-Mile Buffer Around Downtown Study Area



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

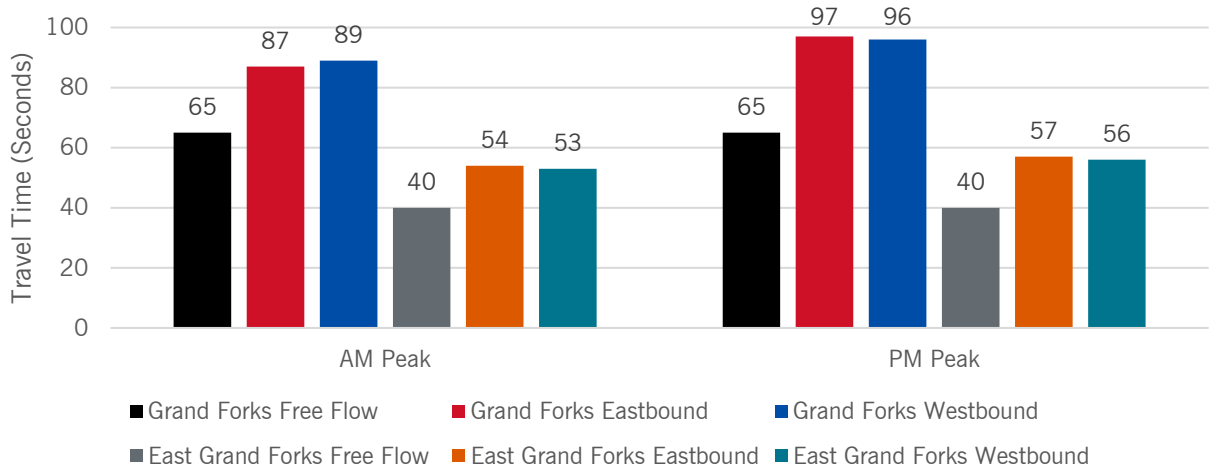


Figure 24: Existing Vehicular Level of Service

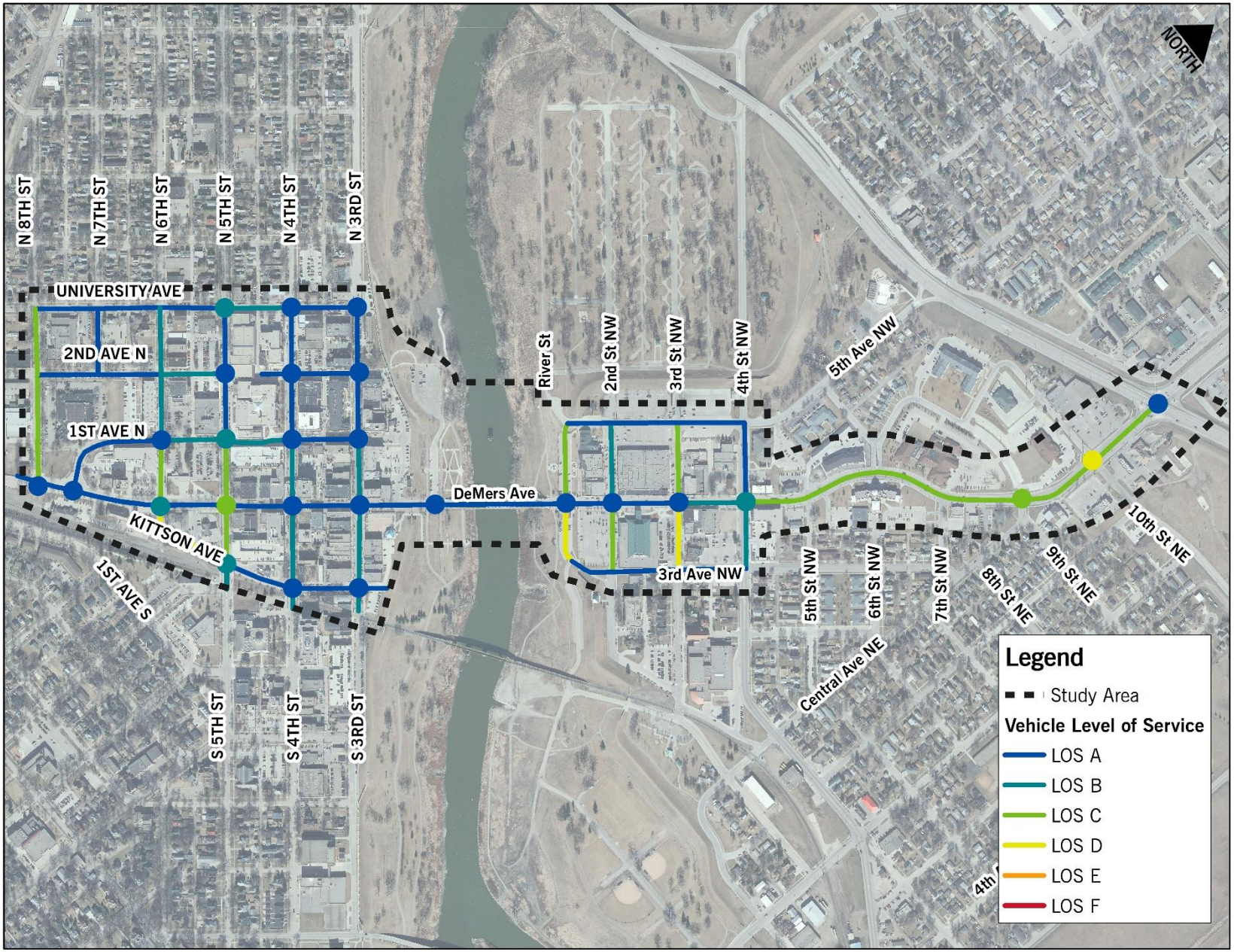


Figure 25: Existing Traffic Control

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

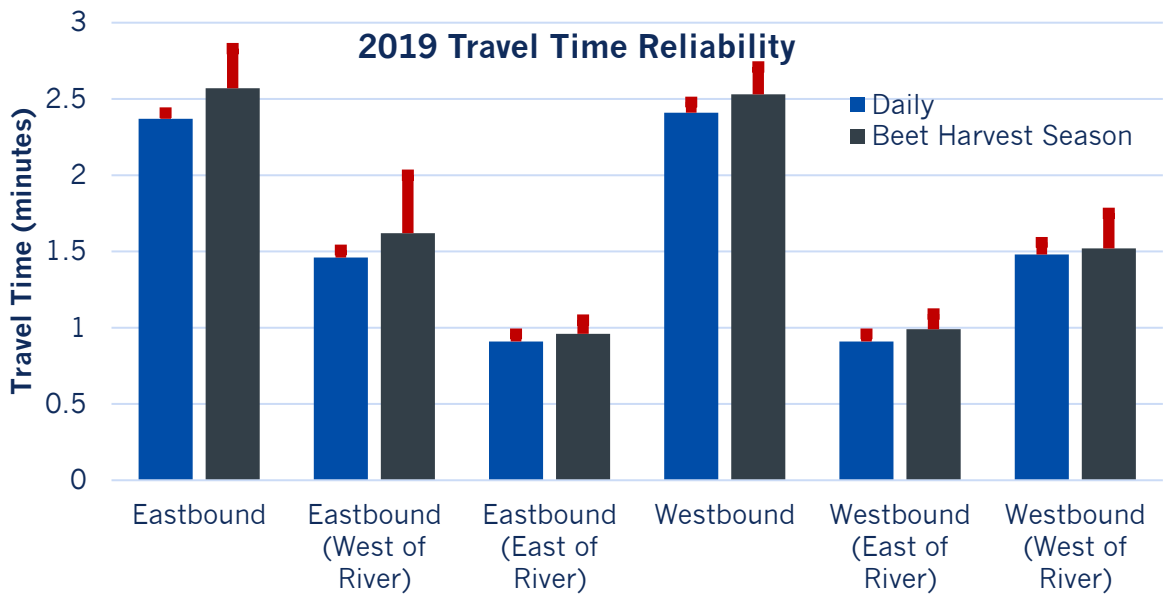
Travel time reliability is a measure of consistency to indicate day-to-day travel times on a given roadway. Most travelers are less tolerant of unexpected delays because they cannot be incorporated into planned travel time, resulting in late arrivals; alternatively budgeting twice as long as needed for 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

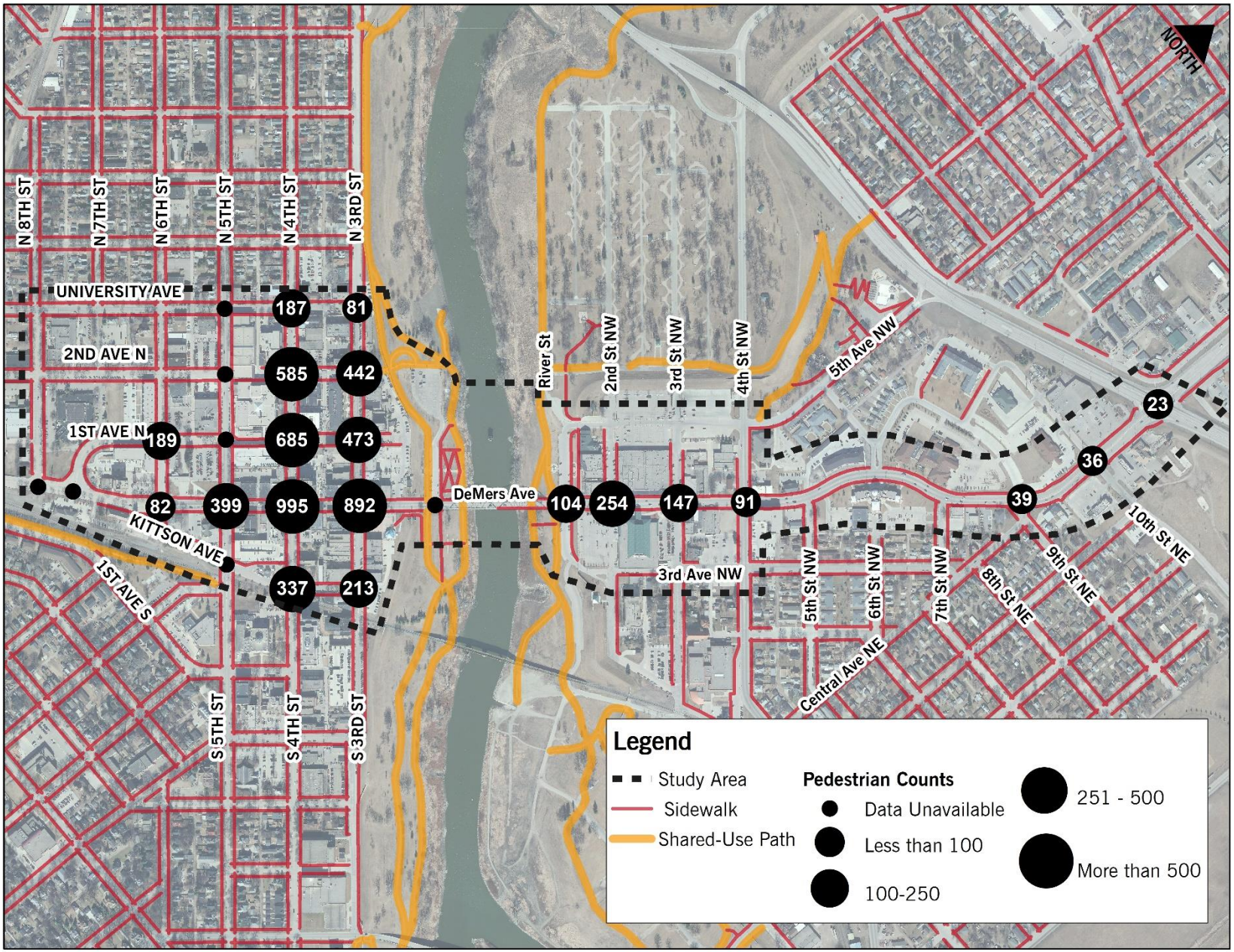
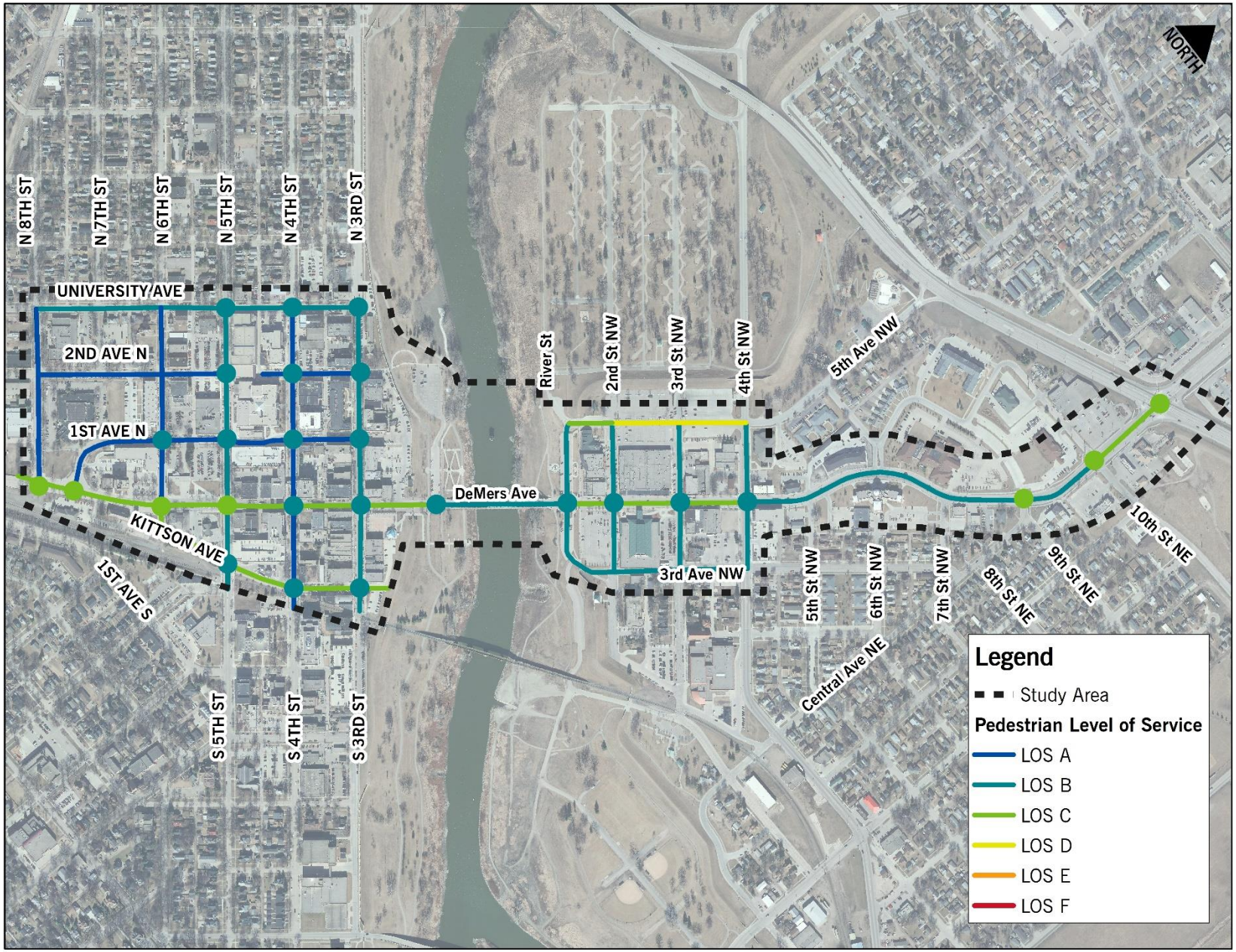


Figure 28: Pedestrian Level of Service



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.

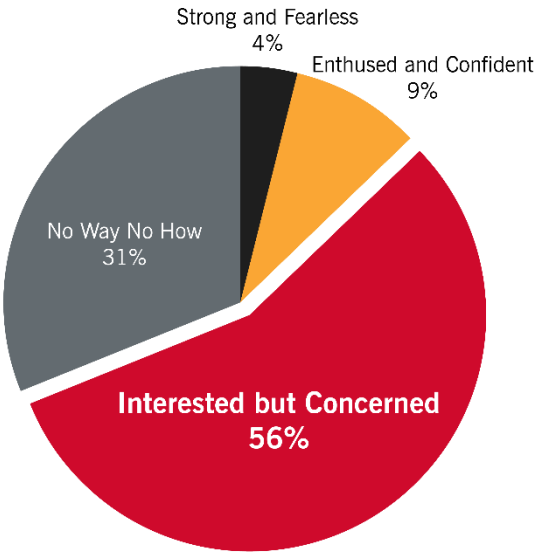
Outside of the Greenway, there are limited dedicated facilities within both downtowns but bicyclists can ride on any roadway in the study area. They are not permitted on the sidewalks within downtowns. The DeMers Avenue reconstruction project did not elect to provide bicycle facilities so alternative 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

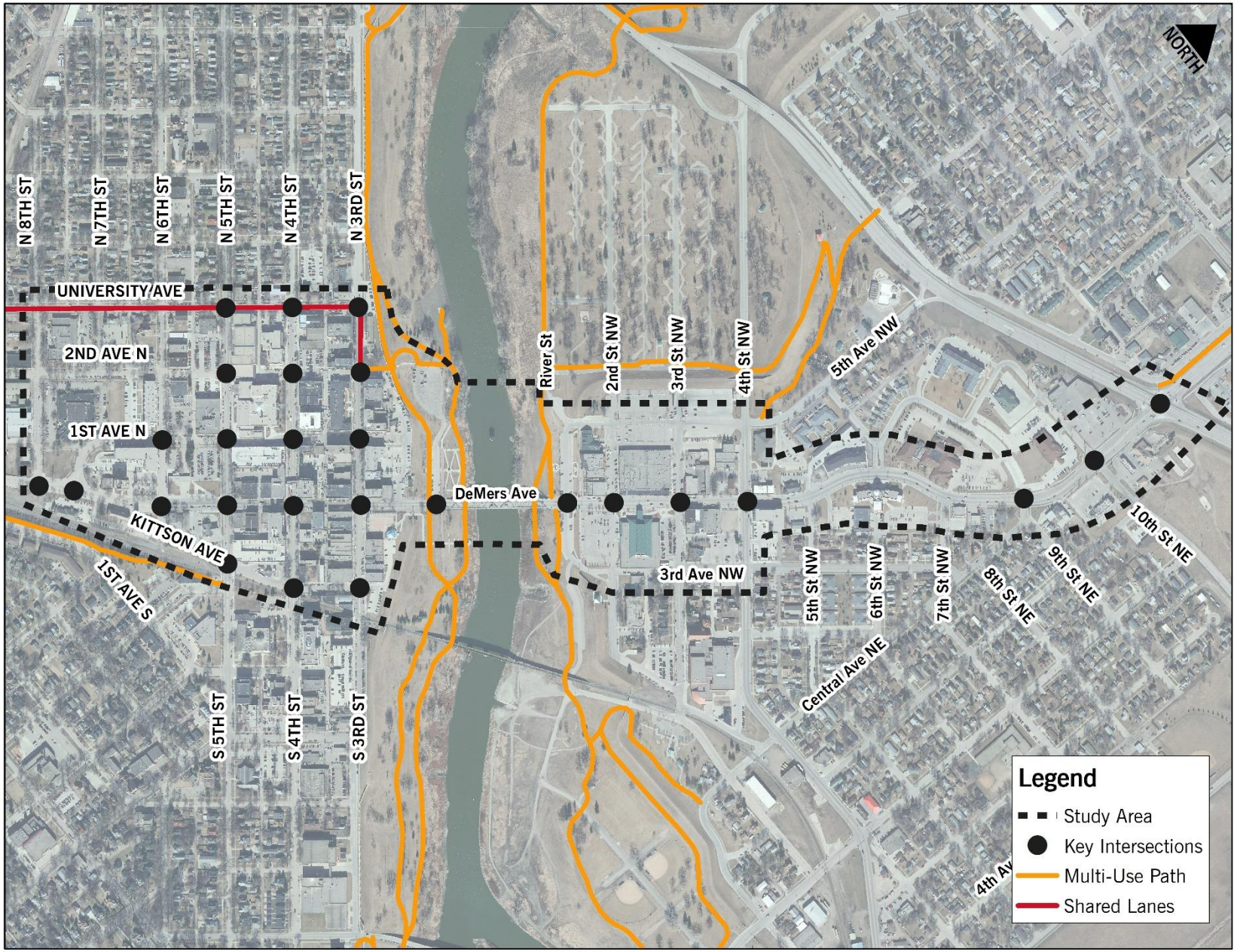
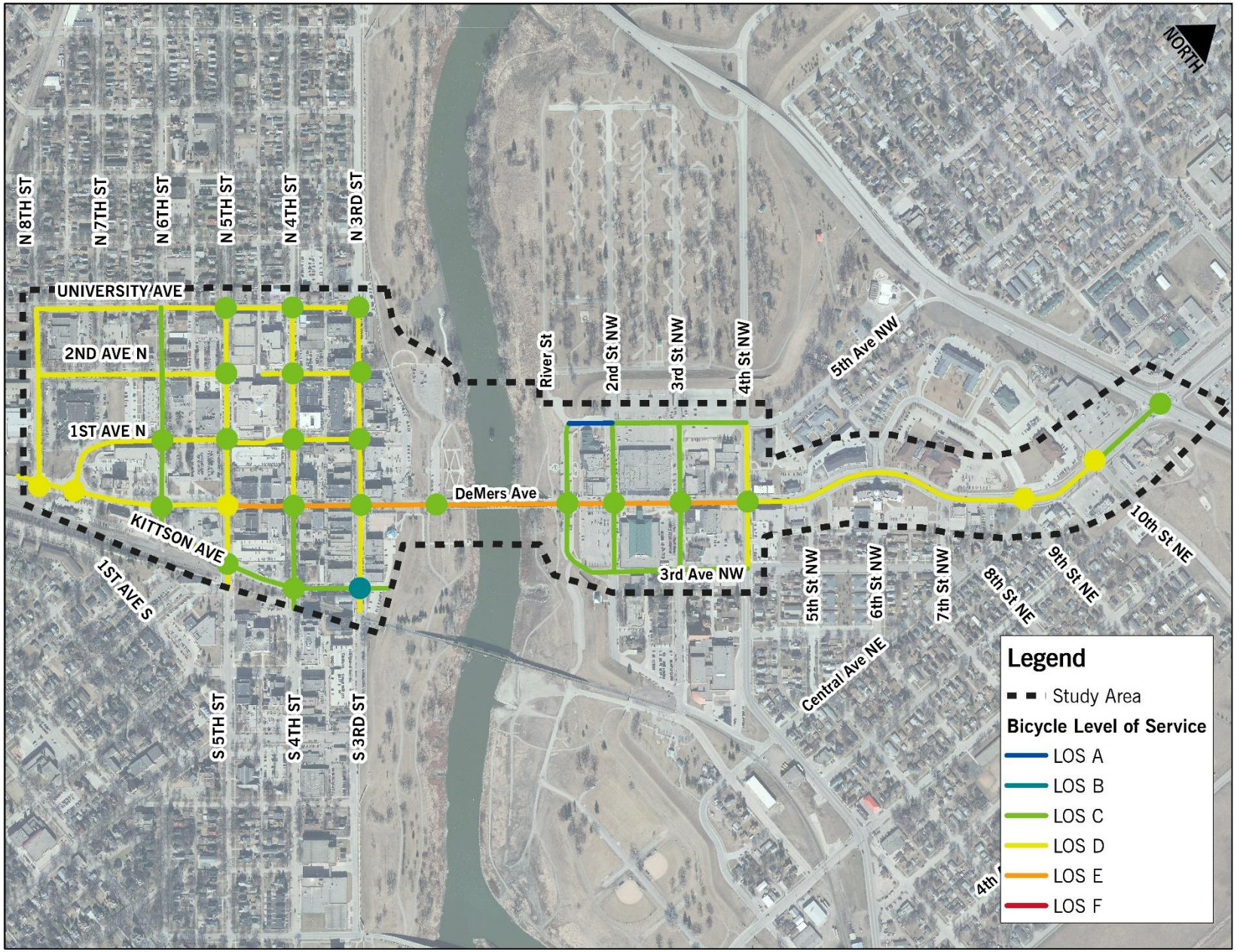


Figure 31: Bicycle Level of Service



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

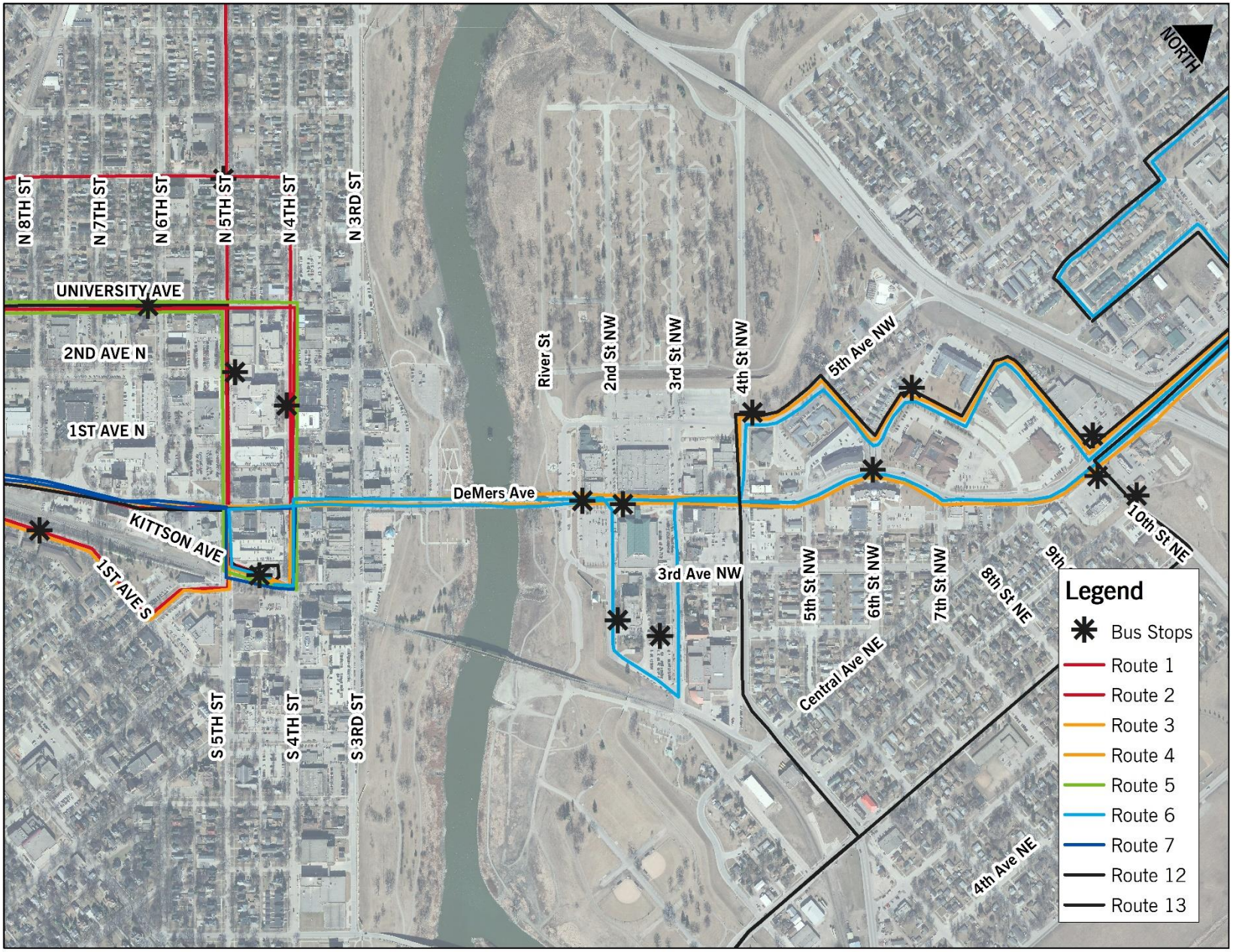


Figure 33: Transit Level of Service

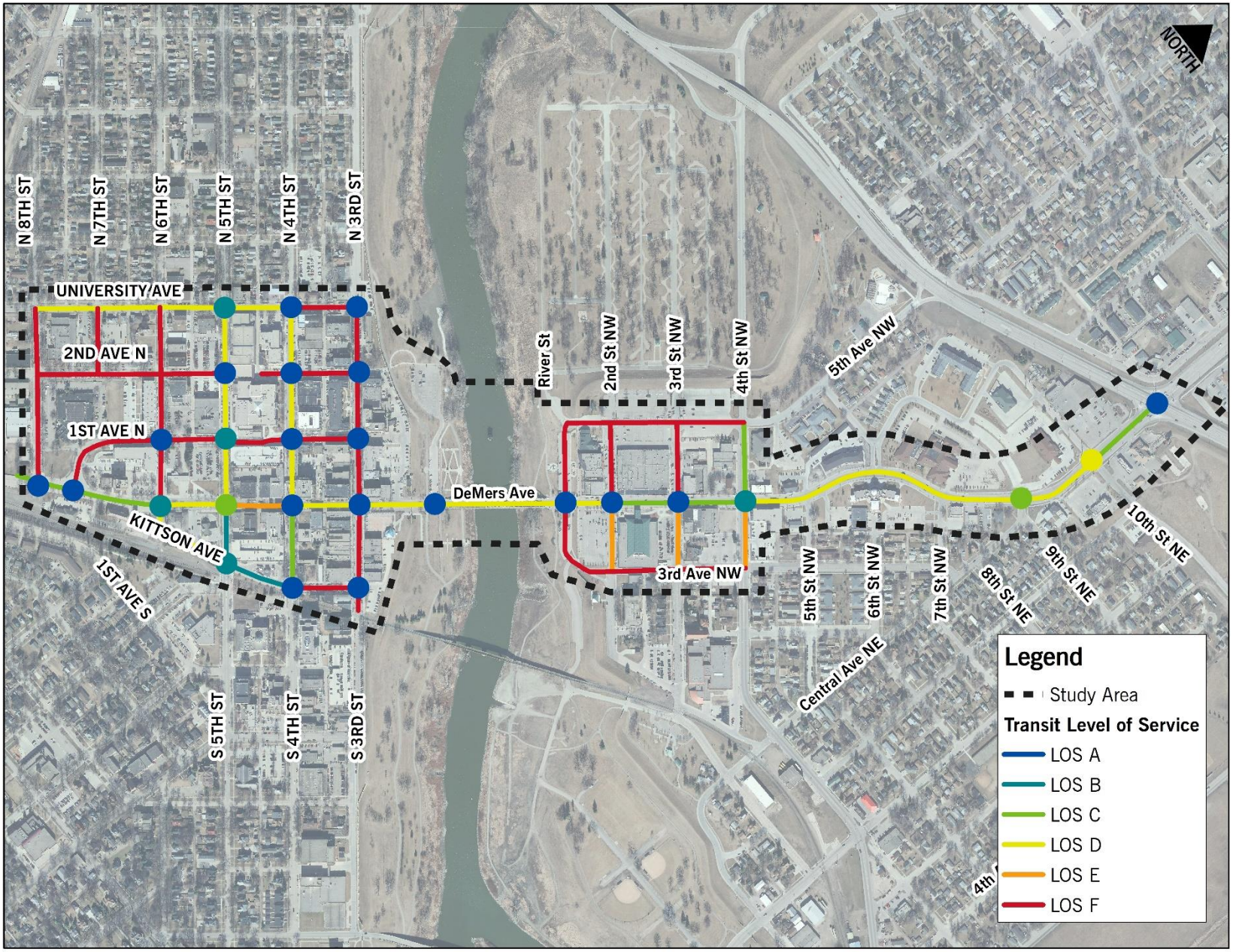
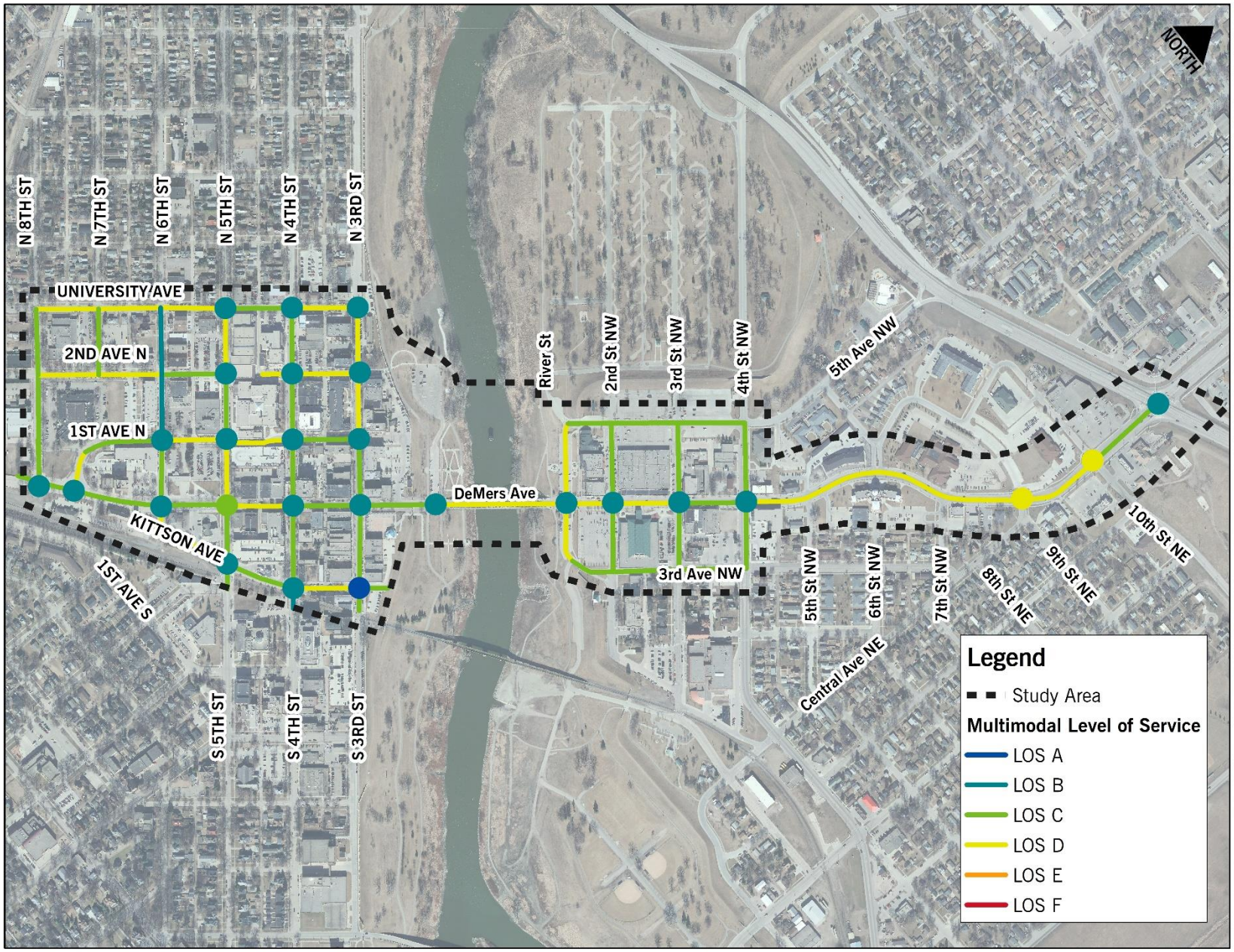


Figure 34: Multimodal Level of Service



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

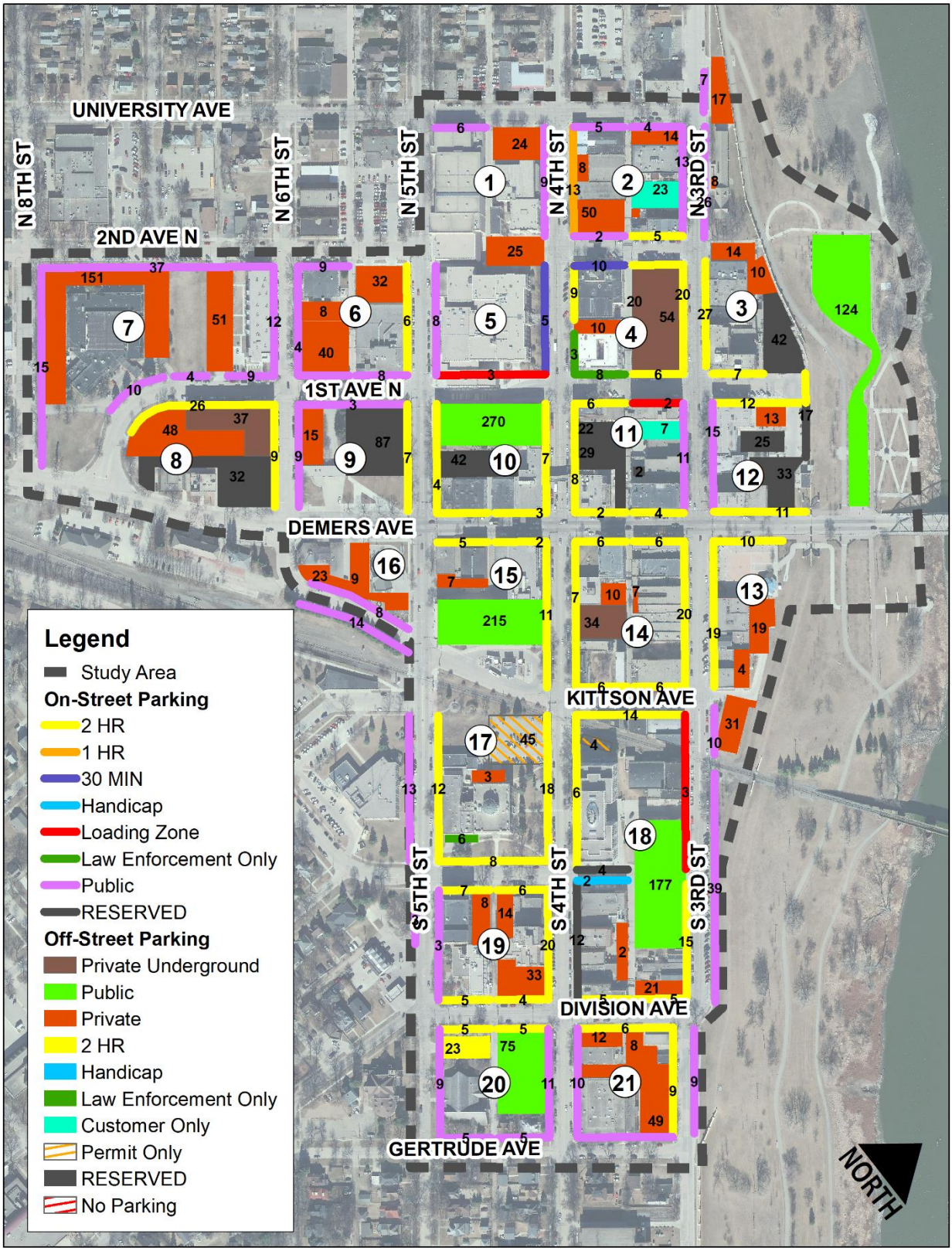


Figure 36: Weekday Parking Availability in Downtown Grand Forks

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

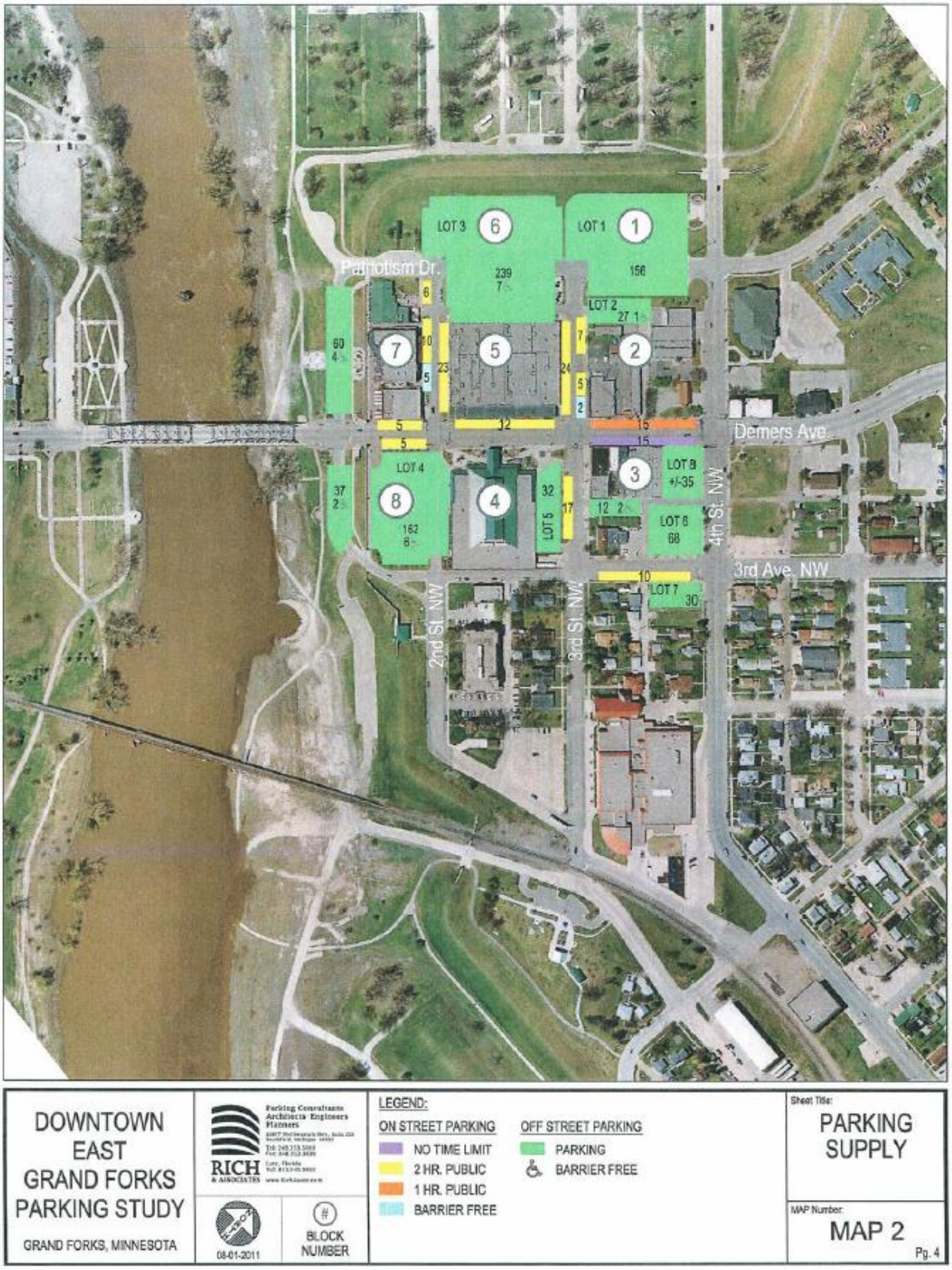


Figure 39: 2011 Daytime Peak Parking Occupancy in Downtown East Grand Forks

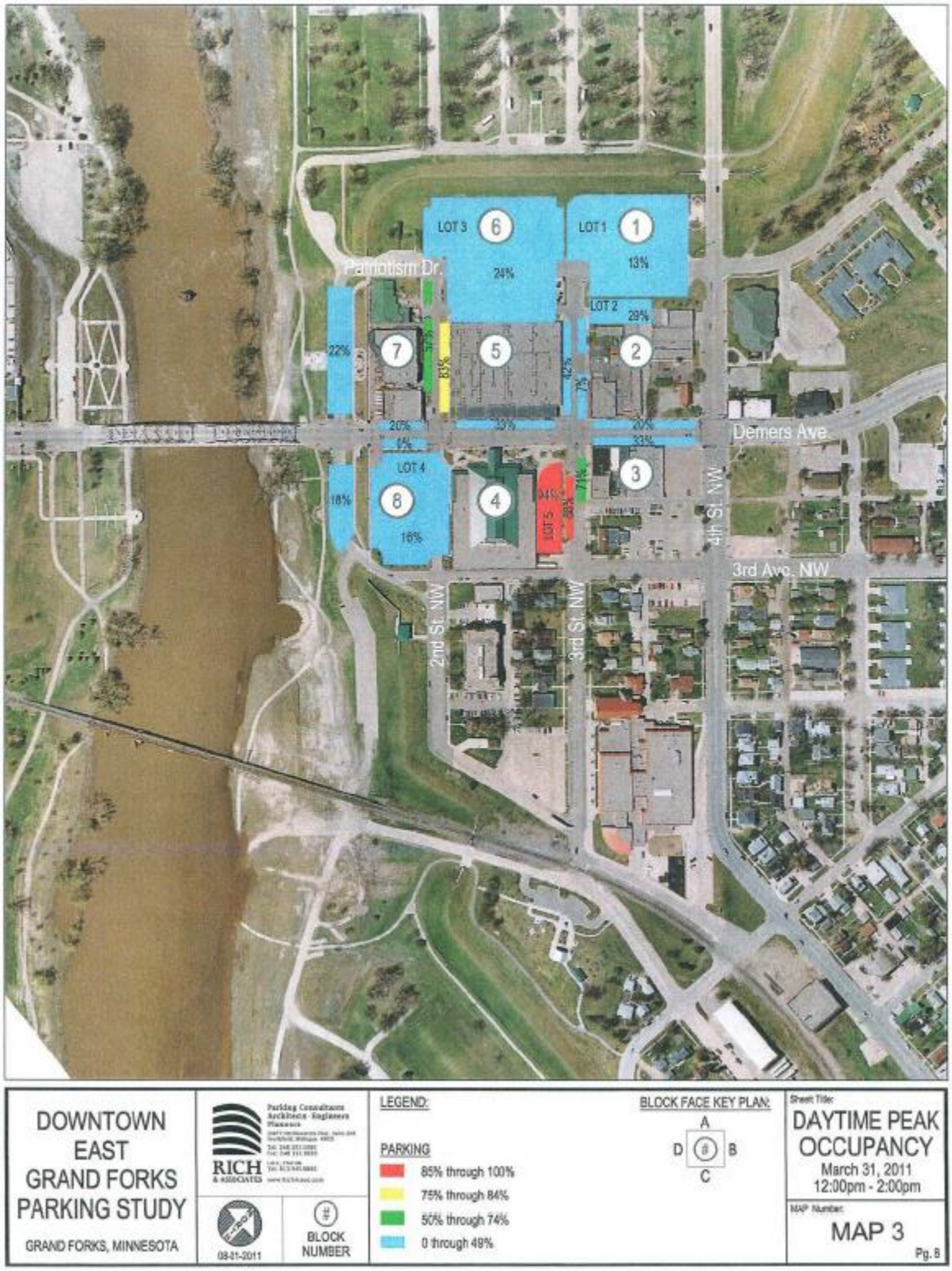


Figure 40: 2011 Evening Peak Parking Occupancy in Downtown East Grand Forks

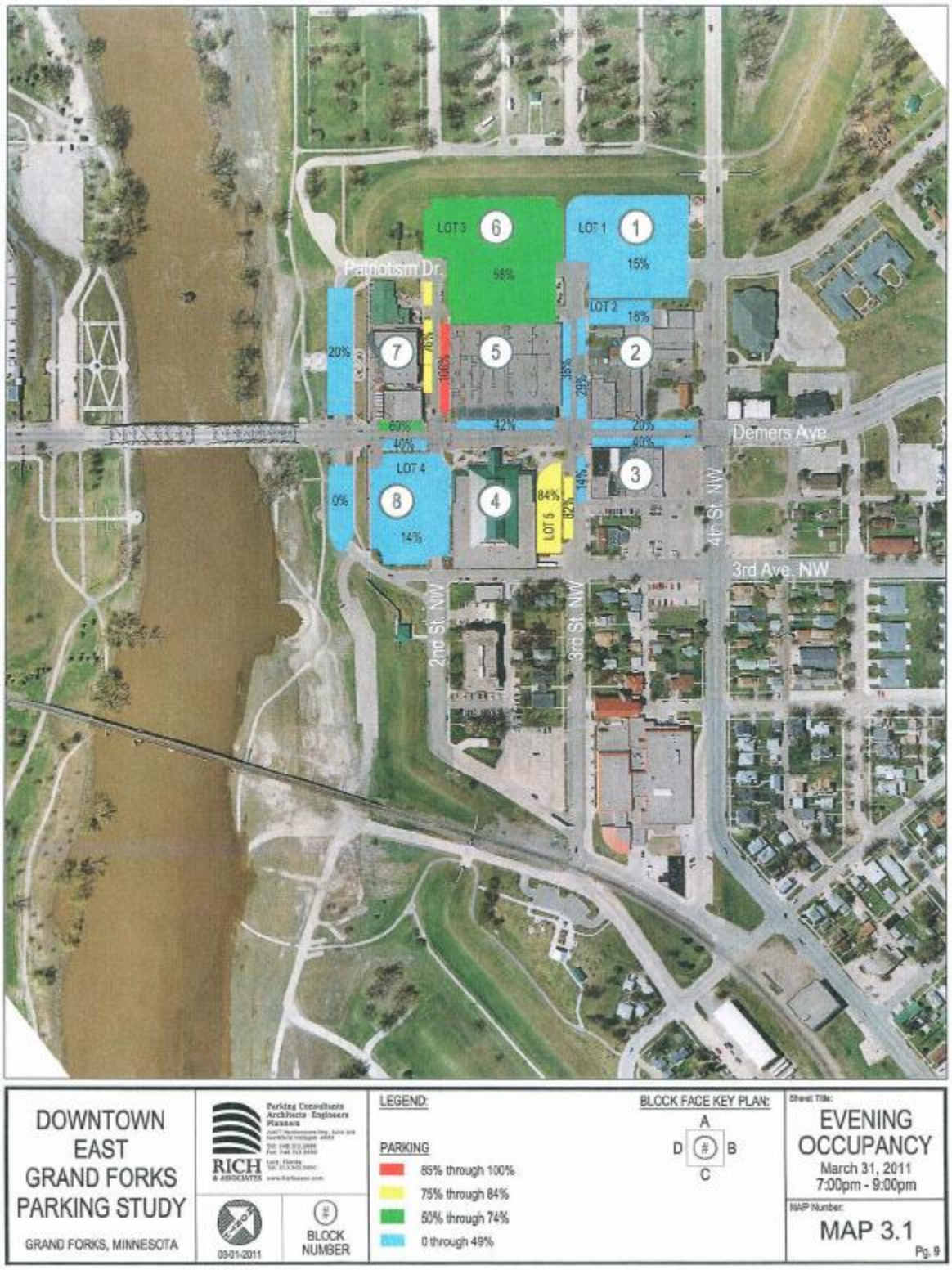
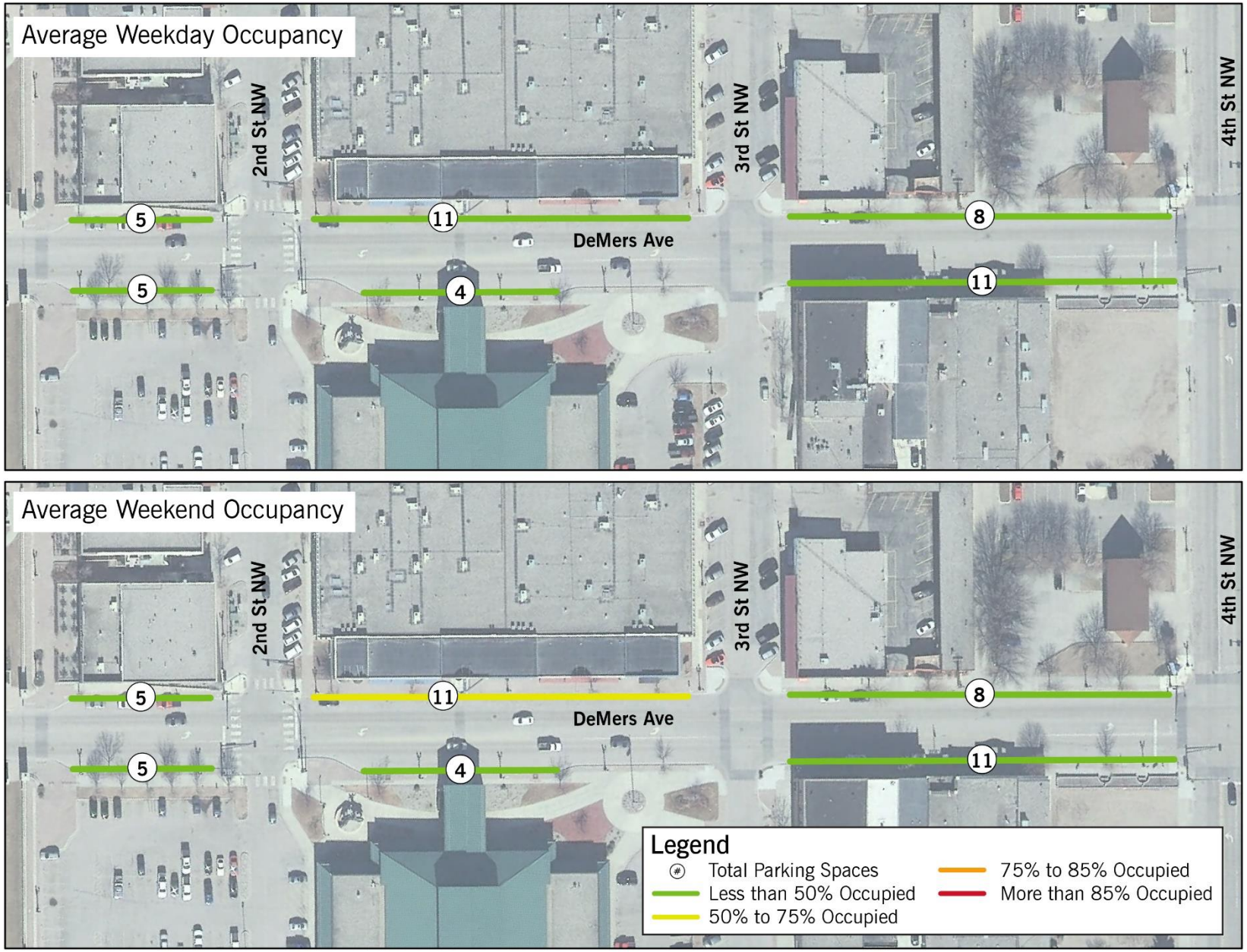



Figure 41: Parking Supply and Average Occupancy in Downtown East Grand Forks