Grand Forks-East Grand Forks

Downtown Transportation Study

Future Conditions Report

February 2020

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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ENGINEERING, REIMAGINED

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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:

1) **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).
2) **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.
3) **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.
4) **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 1, Figure 2, and Figure 3. This household and jobs growth is shown in Figure 4 and Figure 5.

Figure 1: Redevelopment Candidate Sites from Downtown Action Plan (GF)

Figure 3: Parking Lot Redevelopment from Future Land Use Plan (EGF)

Figure 2: 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:

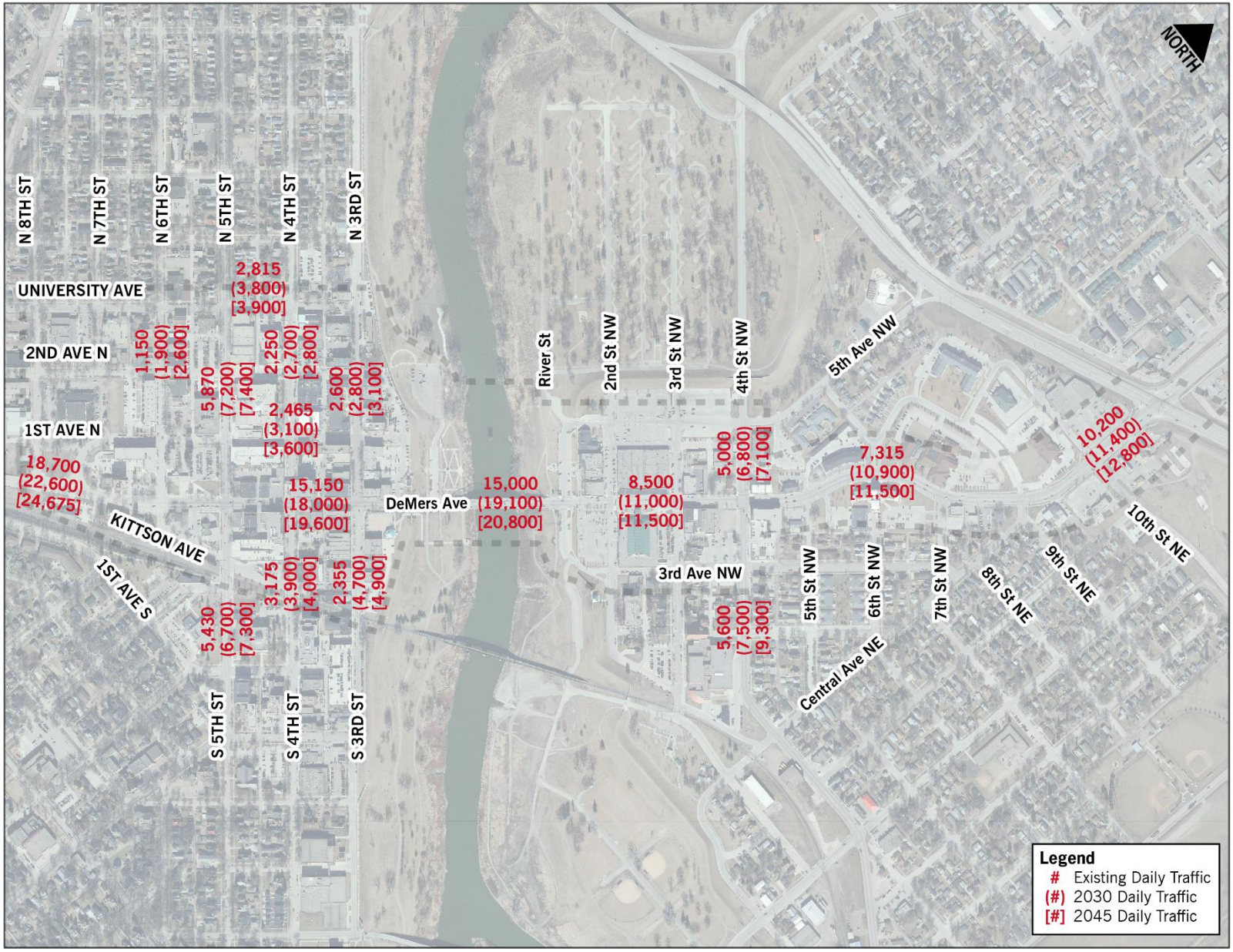
- Some roadways (2nd Avenue in Grand Forks) are not included in the travel demand model. Forecasts for these locations used historical growth from 2010 to 2019 was used and applied to 2030 and 2045.
- Some roadways (4th Street in Grand Forks, DeMers Avenue in East Grand Forks) had 2030 and 2045 forecasts 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 4: 2015 to 2030 Household and Job Growth

Figure 5: 2015 to 2045 Household and Job Growth

Figure 6: Existing and Adjusted 2030 and 2045 ADTs

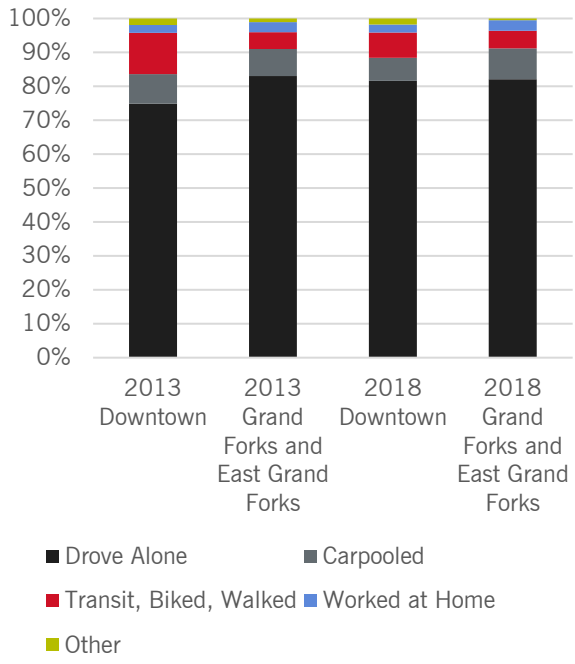


Changes to Travel Behavior

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 7: 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:

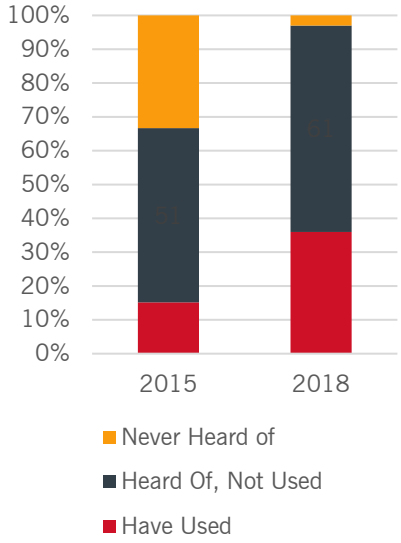
- Encourage people to "park once" and walk to multiple destinations for those that commute downtown instead of circulating looking for parking.
- Potentially reduce car ownership for those who live in or near the downtowns. Short trips would be completed with bike, walk, or transit trips.

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 8: American Adults Who Have Used Ride-Hailing Services

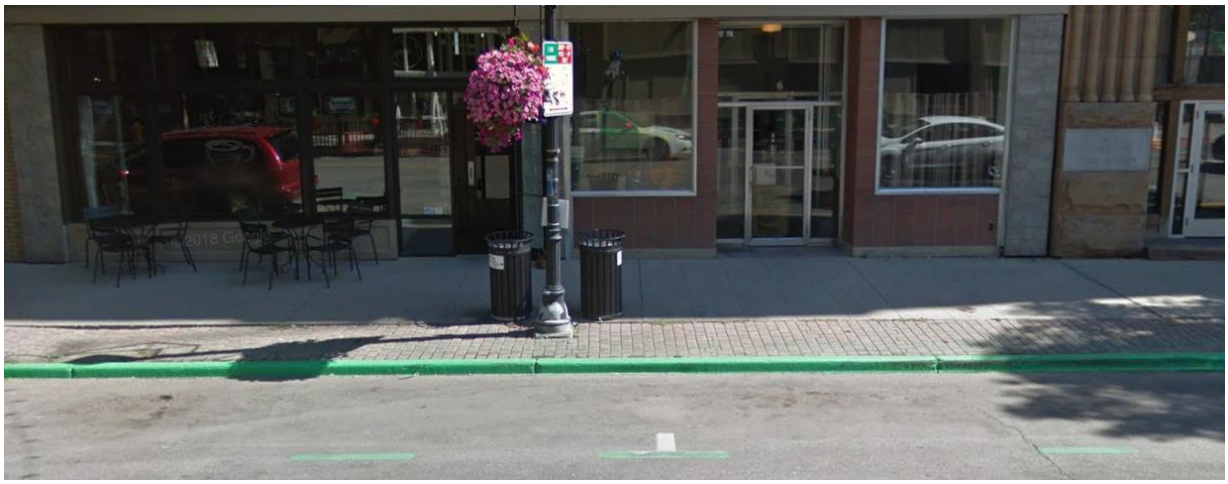


The City of Grand Forks has already experienced some of the impacts increased ride-hailing and car services (party busses, particularly) have on curb space management like double parking and blocking travel lanes. In Summer 2018, the City instituted new policies for ride-hailing drop off spaces, including marking three locations for drop off and pick up only between 10 PM and 3 AM, as shown in Figure 9:

- 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 9: 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 1. 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 1: 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 12.

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 13.

Figure 10: 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 11: 2030 Free Flow v. Average Travel Time on DeMers Avenue

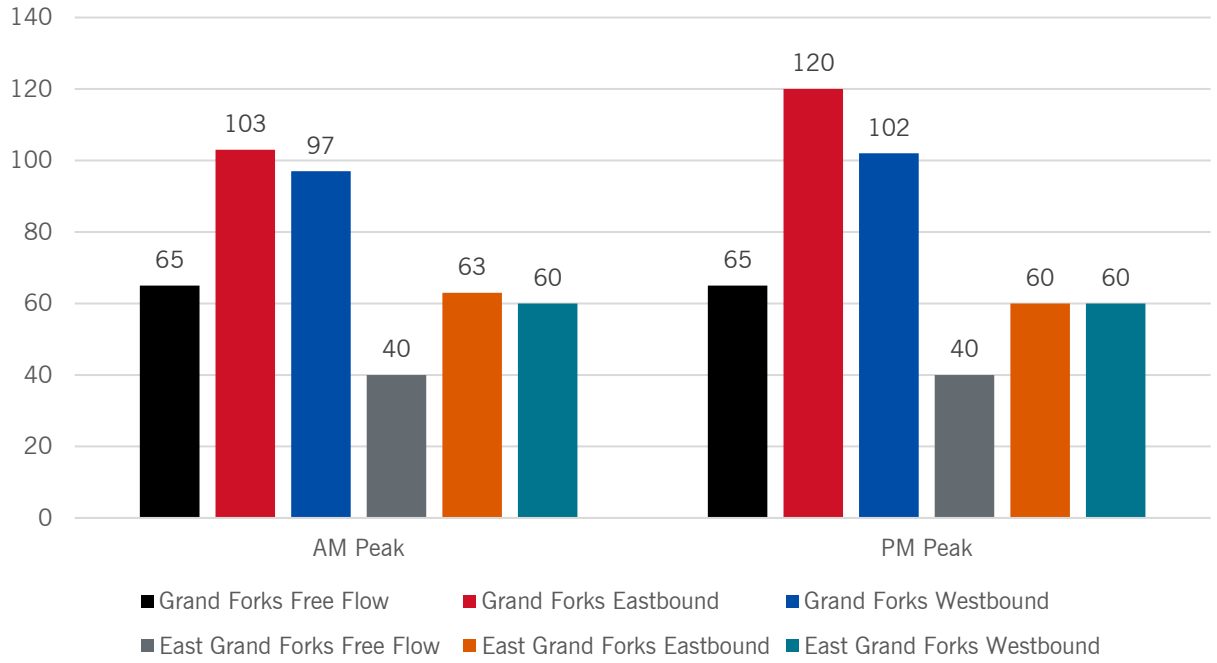


Figure 12: 2030 Vehicle Level of Service

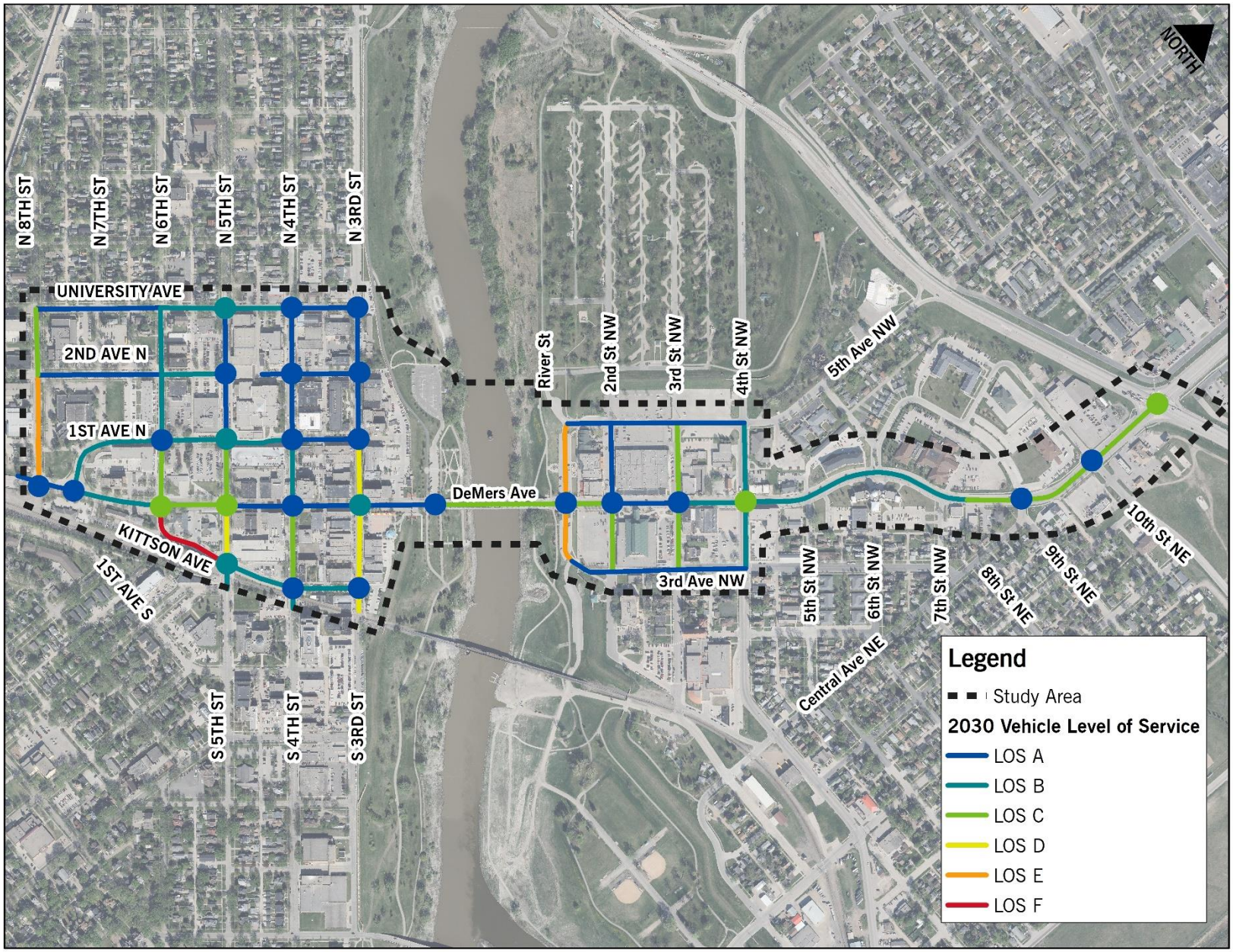
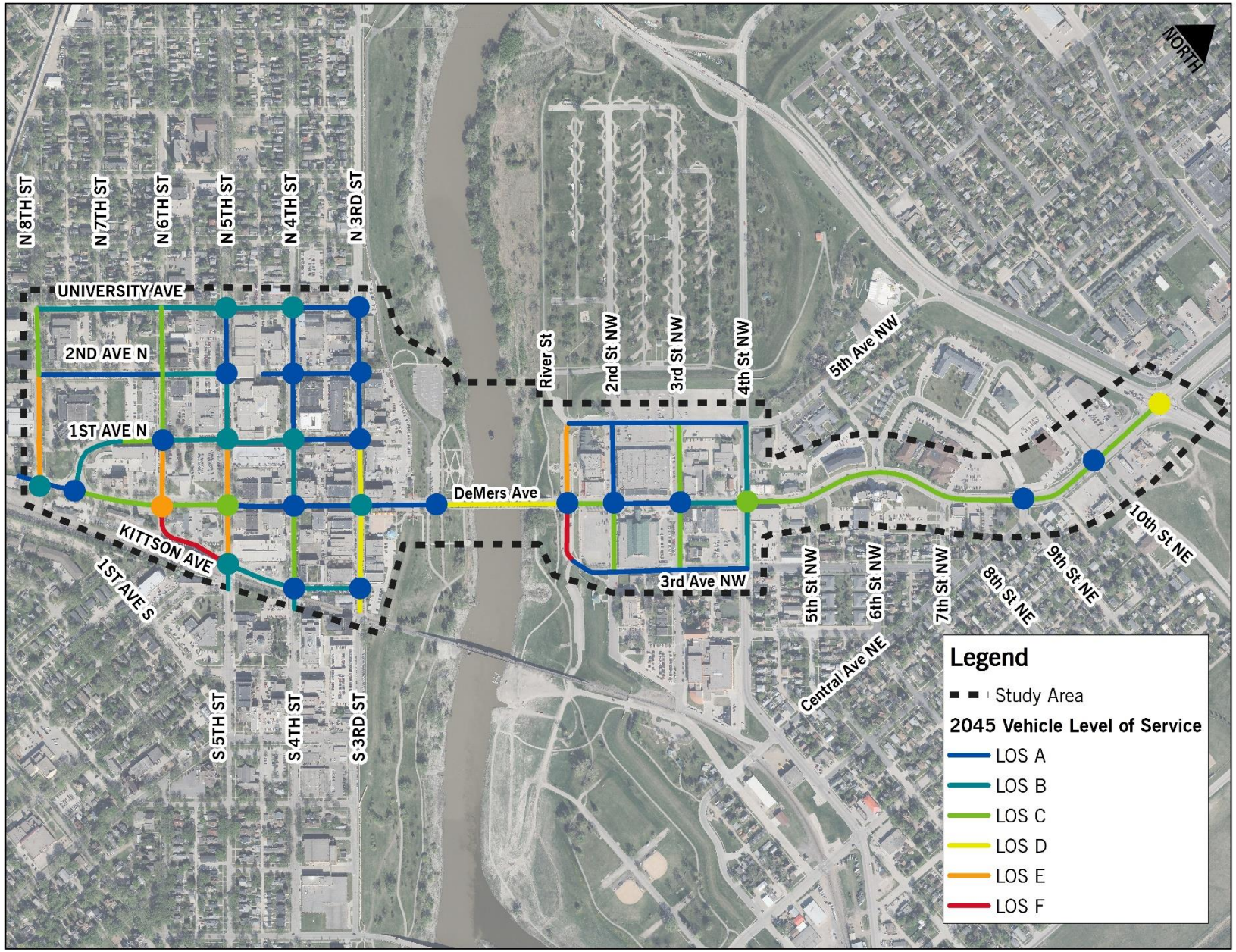


Figure 13: 2045 Vehicle Level of Service

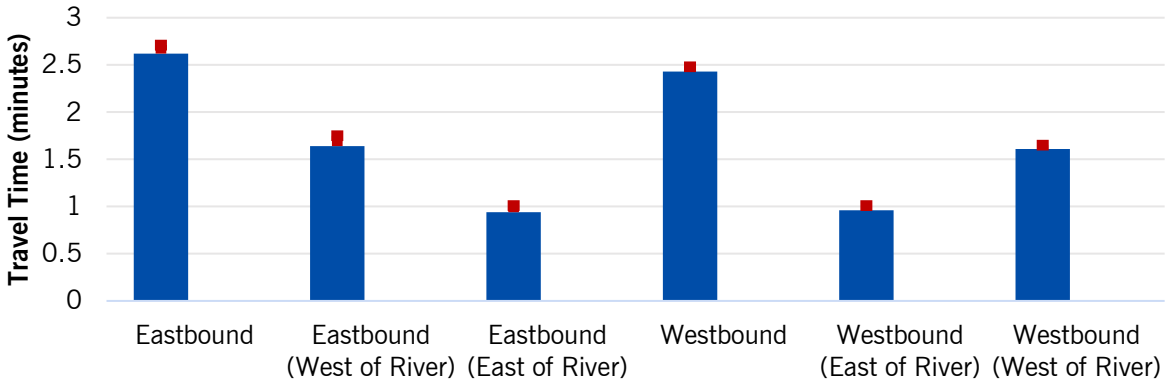


Reliability

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 14. 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 14: 2030 DeMers Avenue Travel Time Reliability



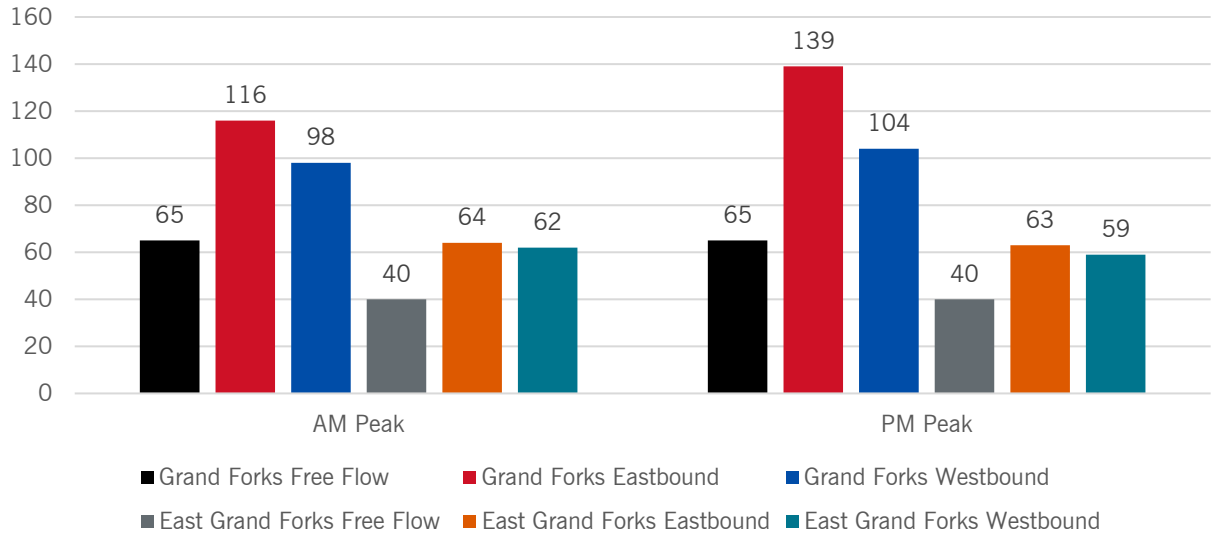
2045 Daily Travel Time and Reliability

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 15: 2045 Free Flow v. Average Travel Time on DeMers Avenue

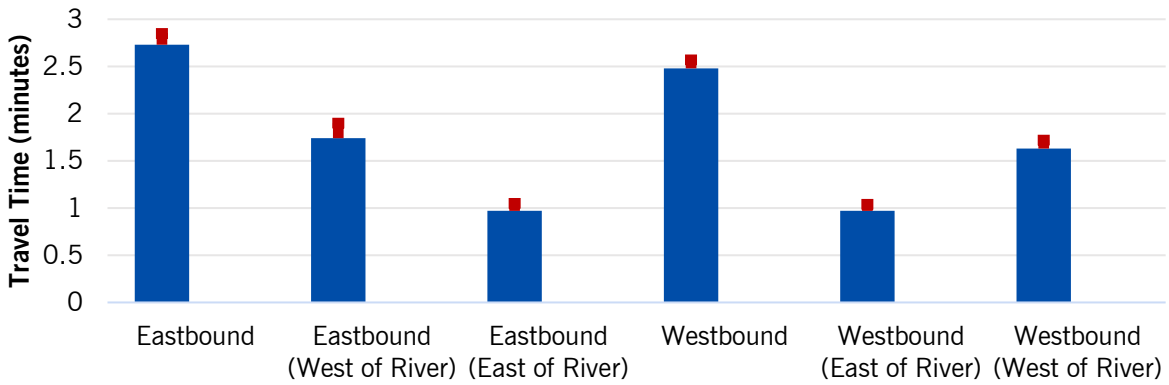


Reliability

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 16. 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 16: 2045 DeMers Avenue Travel Time Reliability



Seasonal Variability

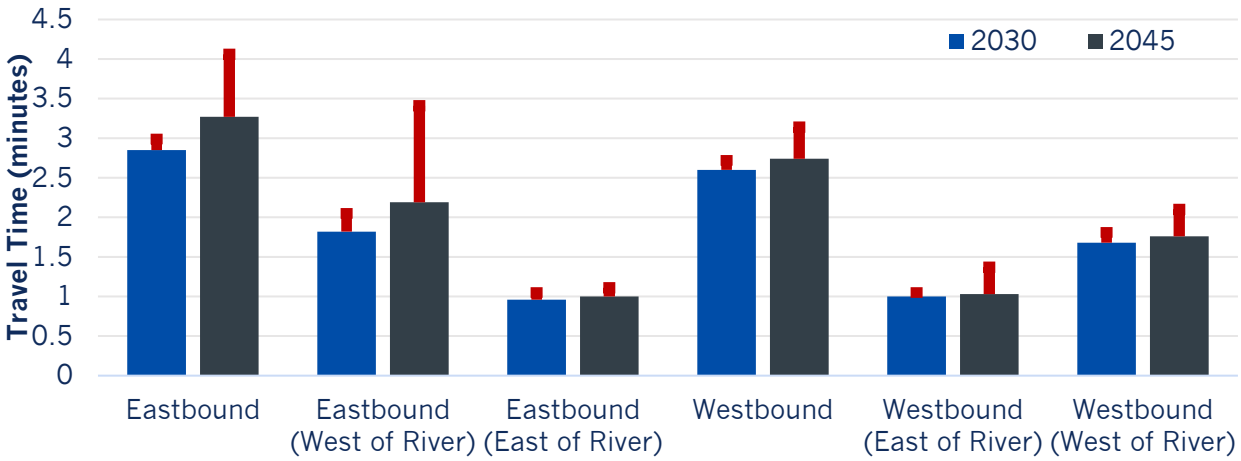
Daily traffic volumes on DeMers Avenue vary across time of day, day of the week, and month of the year, as much as seven percent. During fall beet harvest, truck traffic can approach six percent of total traffic (compared to less than two percent typically).

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 17, 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 17: 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 18.

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 19.

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 20.

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 21.

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 18: 2030 Pedestrian Level of Service

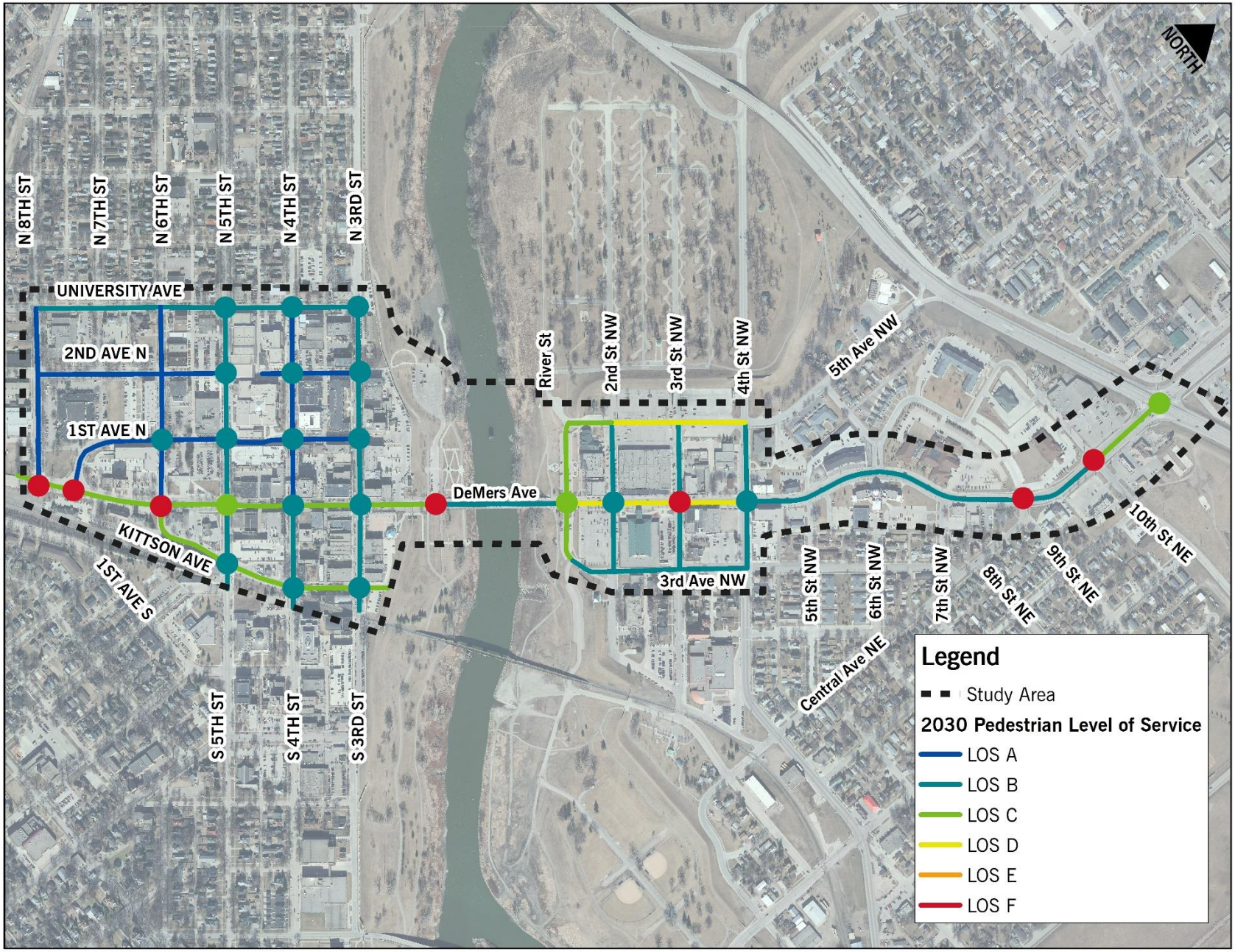


Figure 19: 2045 Pedestrian Level of Service

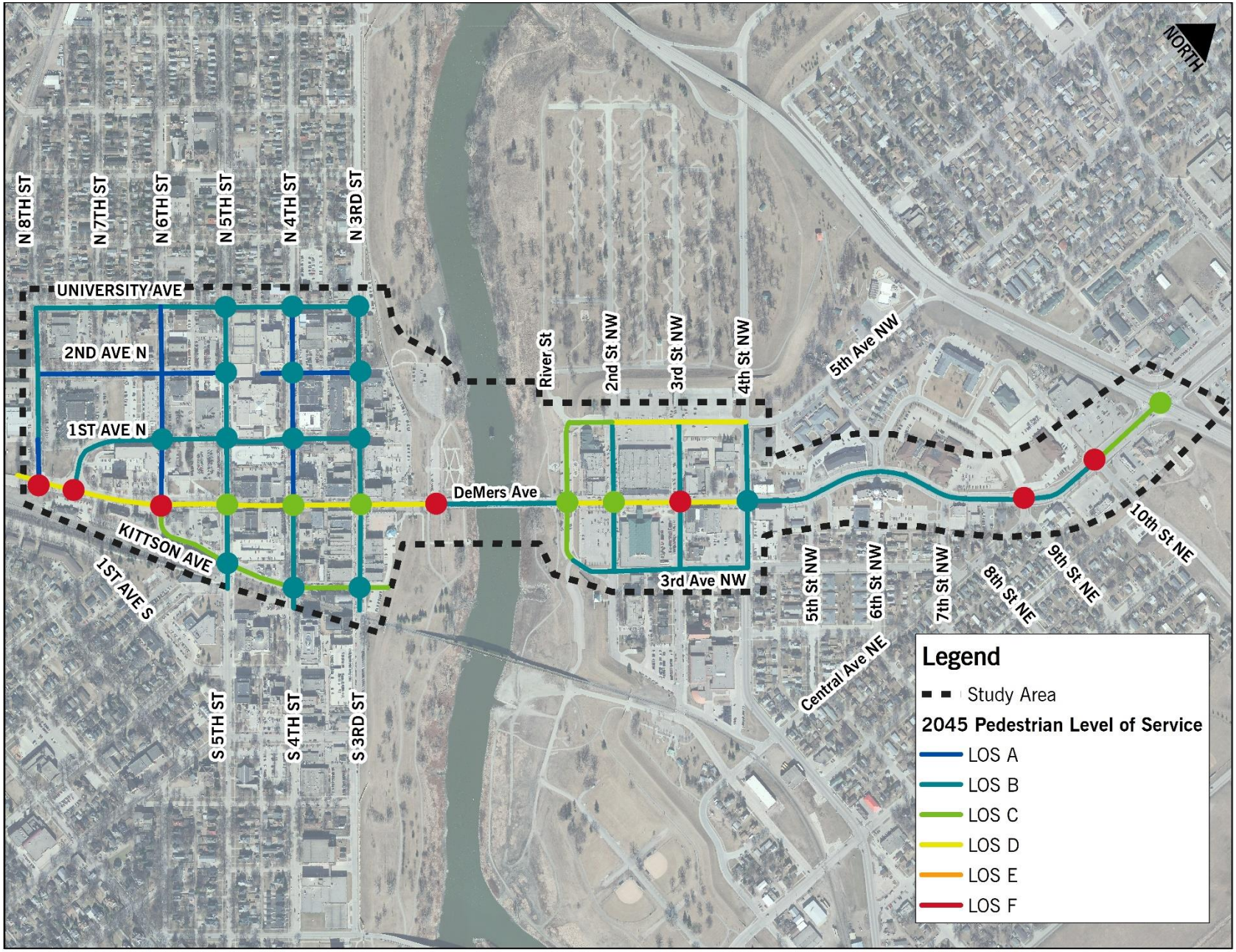


Figure 20: 2030 Bicycle Level of Service

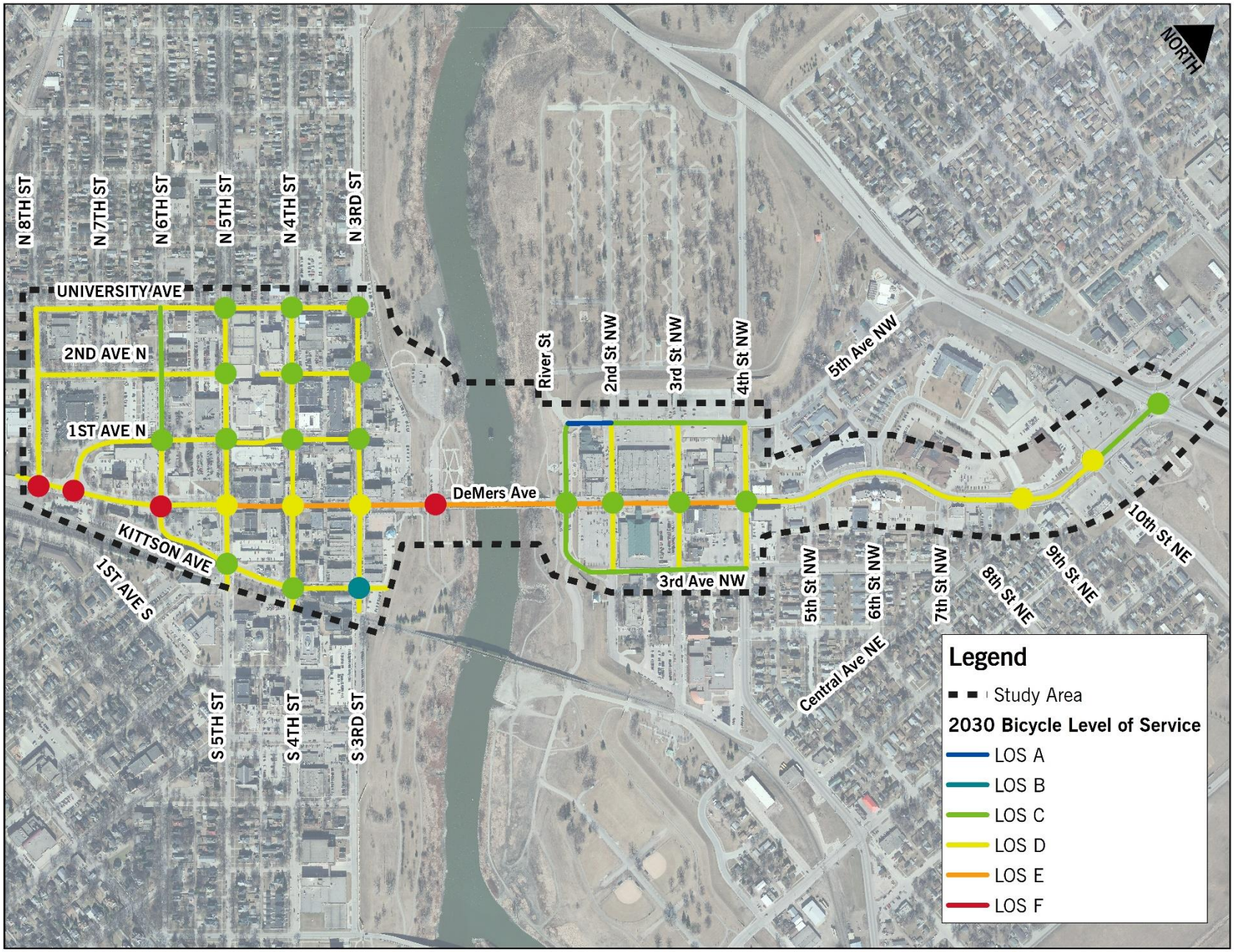
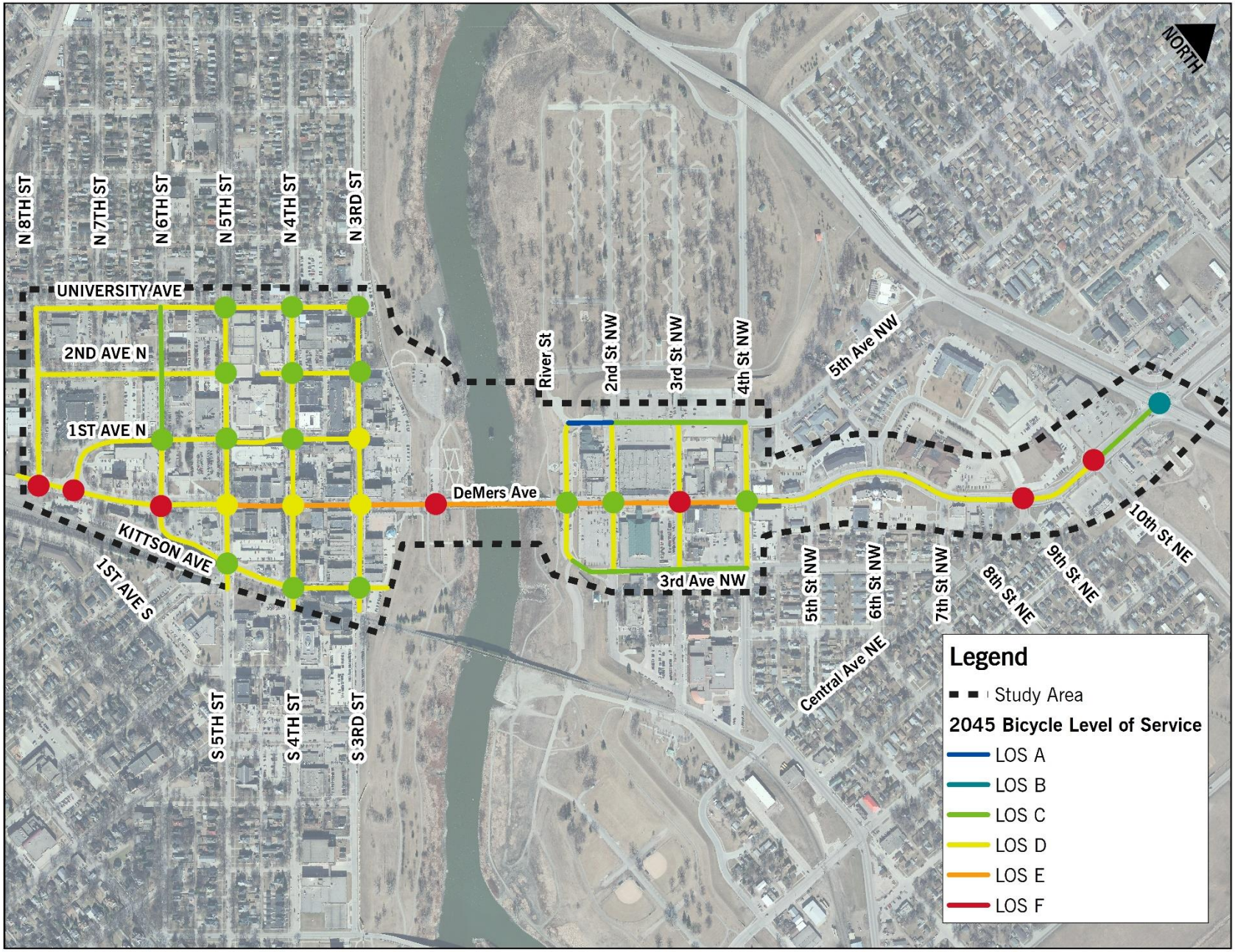


Figure 21: 2045 Bicycle Level of Service



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 22.

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 23.

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 24.

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 25.

Figure 22: 2030 Transit Level of Service

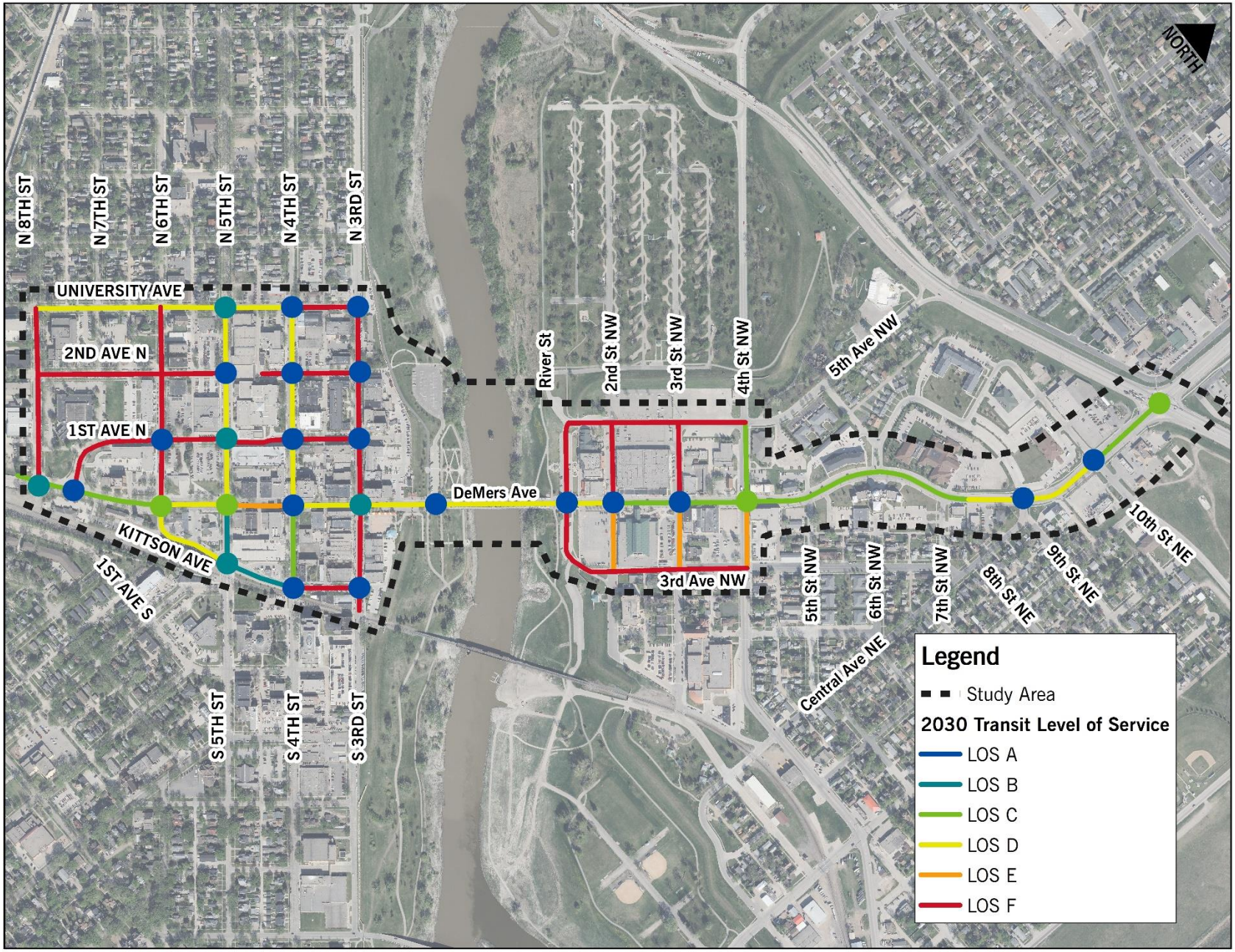


Figure 23: 2045 Transit Level of Service

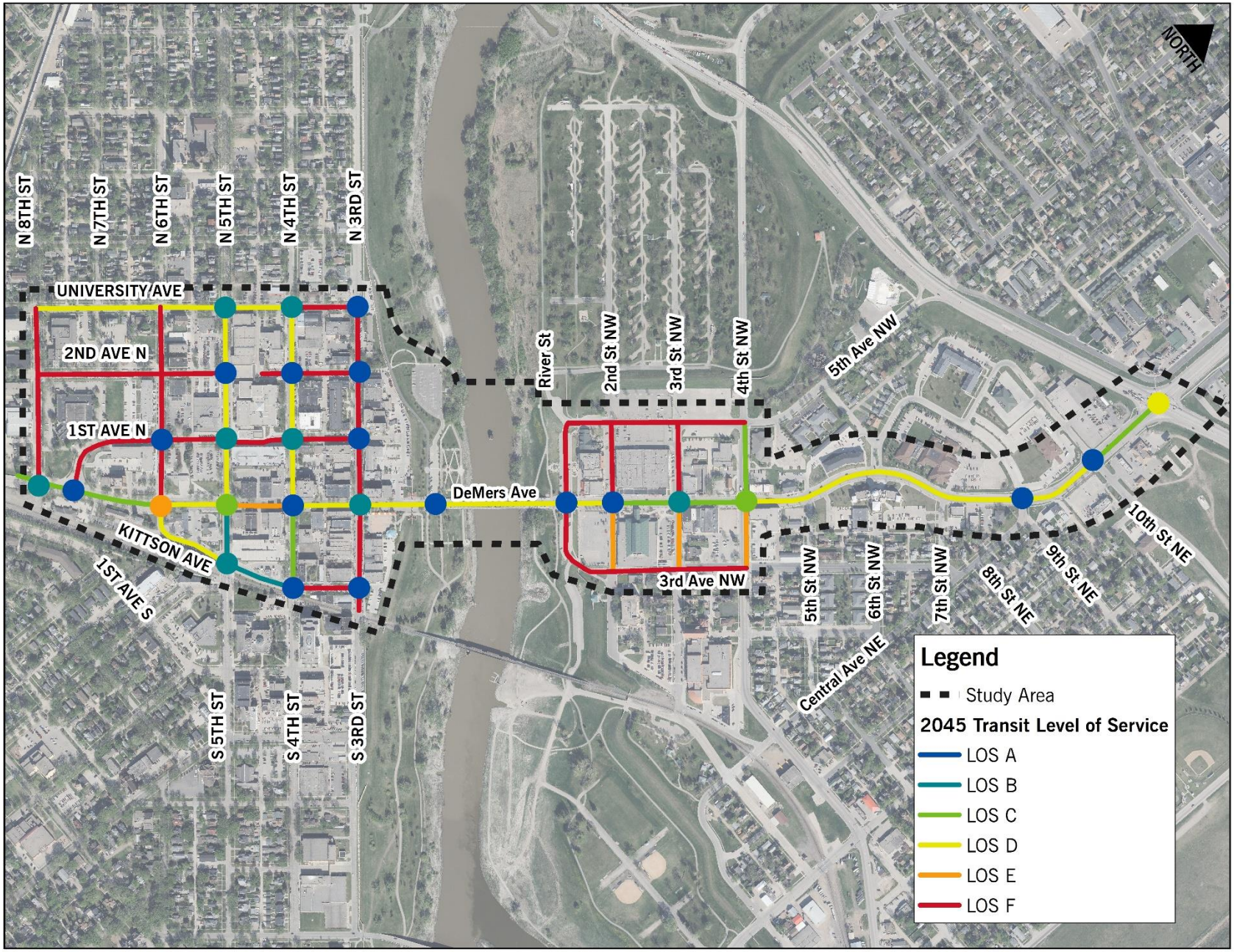


Figure 24: 2030 Multimodal Level of Service

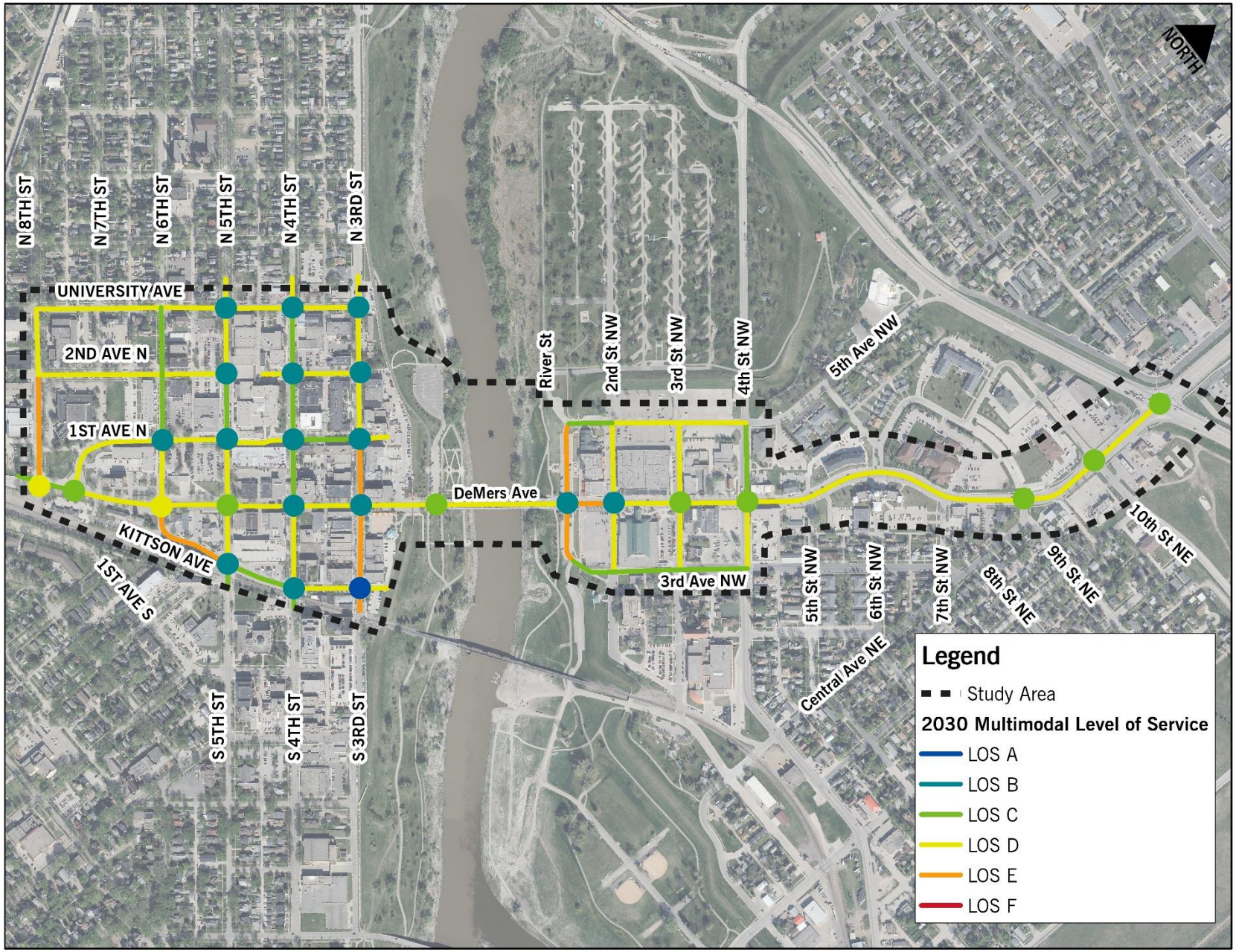
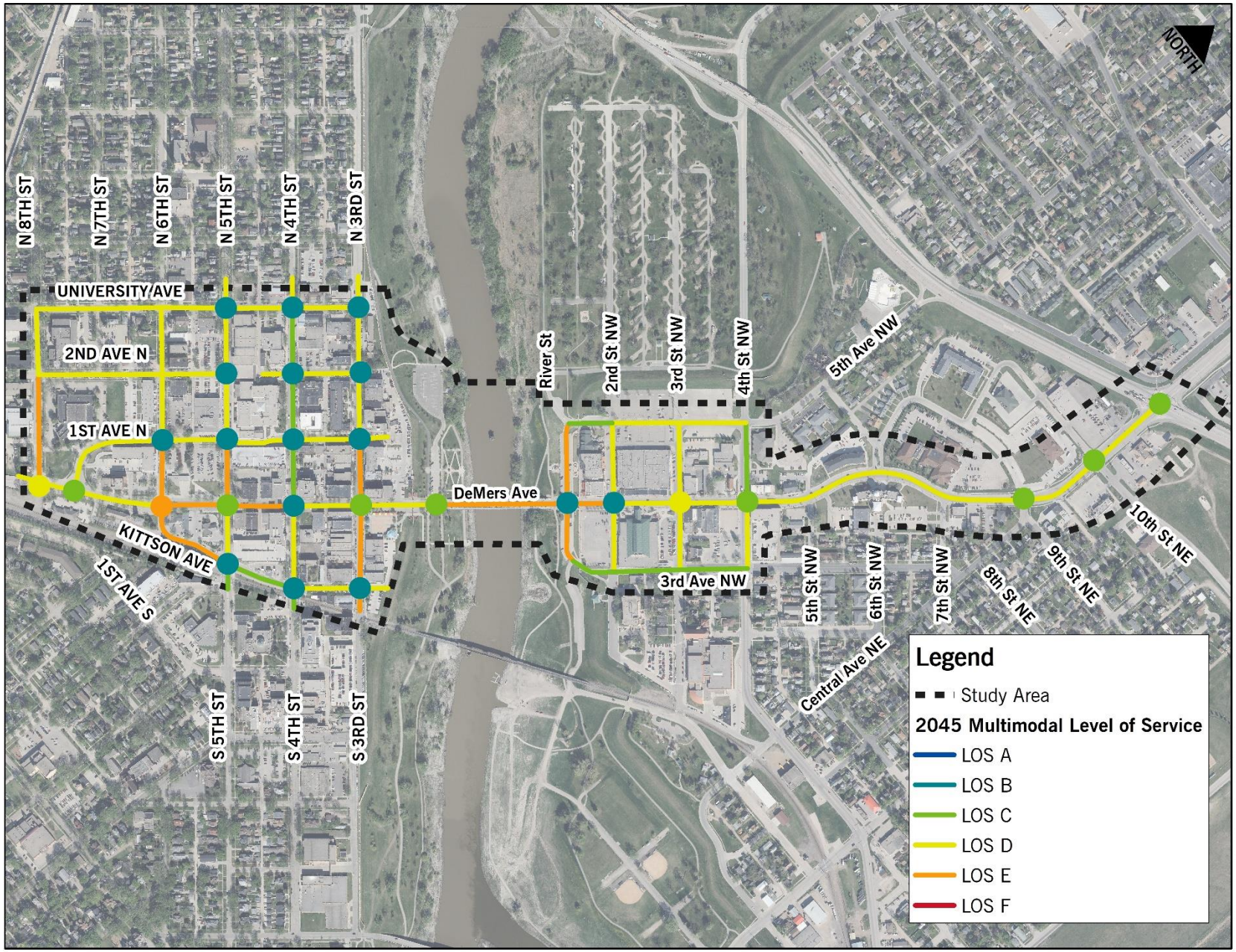


Figure 25: 2045 Multimodal Level of Service



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 26: 10-Year Average Weekday Occupancy and Parking Level of Service for All Spaces Under the 10-Year Redevelopment Scenario